

Mount Trumbull Resource Conservation Area Plan

BUREAU OF LAND MANAGEMENT

ARIZONA STRIP DISTRICT
VERMILLION RESOURCE AREA

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Purpose and Need for the Proposed Action:

The purpose of this plan is to restore ecosystem health, facilitate multiple use management, and ensure human needs are met. The need is to promote biodiversity and sustainable ecosystems and to meet human needs for a variety of uses such as woodland products, high-quality, back-country recreation activities and livestock forage.

Conformance with the Land Use Plan:

The Mount Trumbull Resource Conservation Area (RCA) Plan is in conformance with the Arizona Strip District Resource Management Plan (RMP) and Final Environmental Impact Statement. The draft Arizona Strip District RMP of 1989 generated public comments and controversy regarding the management of ponderosa pine and other resources in the Mount Trumbull/Mount Logan areas of the Vermillion Resource Area. The Bureau of Land Management (BLM), in response to the public's concerns, designated the Mount Trumbull RCA in the final RMP (1992). The RMP directed that the ponderosa pine forest in this area be managed for the enhancement of other resource values. The management prescriptions of the proposed action were constrained by Table II-2 in the Arizona Strip RMP, Page II-49. The need for additional planning for this area was recognized, and a commitment was made to develop management prescriptions for the RCA with the involvement of the public and other resource management agencies.

Regulations and Policy/Relationship to other Plans:

Existing acts and plans were used to provide base information and guidance for the Mount Trumbull RCA Plan. The Federal Land Policy and Management Act (FLPMA) of 1976 mandates the BLM to manage the public lands for multiple use on a sustained yield basis. The Arizona Strip District Resource Management Plan and Final Environmental Impact Statement (1992) guides management of public lands administered by this district including the Mount Trumbull/Logan ecosystem. Various program specific activity plans dealing with vegetation, wildlife, wilderness areas, and fire have guided management actions in this ecosystem in the past. Management direction from all of these plans is presently guiding the various land uses in the Mount Trumbull Resource Conservation Area. Guidance from these activity plans will continue to be followed unless otherwise amended in this plan in order to meet objectives identified in the RCA plan. In formulating this plan an effort was made to determine issues, set objectives and prioritize management actions based upon weak links in the ecosystem, rather than propose actions for specific resource programs.

Area Description:

Location: The Arizona Strip District is located in northwest Arizona. The Mt. Trumbull RCA lies in the south-central portion of the Arizona Strip District. The RCA is bounded on the south by the northern boundaries of Grand Canyon National Park and Lake Mead National Recreation Area. Mount Trumbull and the surrounding terrain rise above the landscape and

are visible from many miles away. At 8029 feet above sea level, the top of Mt. Trumbull is the highest elevation on the Arizona Strip District.

The RCA is located about 60 miles from the nearest paved road. Despite the RCA's remote setting, human presence is part of the ecosystem today, as it was for thousands of years in the past. The RCA encompasses approximately 120,000 acres. However, the boundary is flexible in order to better respond to present and future issues (Appendix A, Map 1). The boundary can be changed in response to future issues and objectives identified by the interdisciplinary RCA team.

Climate: Overall, the climate of the Mount Trumbull RCA is typical of the southwestern United States, somewhat dry and generally pleasant. Skies are often either clear or contain only a few clouds. Precipitation widely varies from year to year. Low humidities and high summer temperatures cause high evapo-transpiration rates. Summer thunderstorms usually occur from July through October. These thunderstorms often contain lightning. Snow is possible from late October through April, but deep and persistent accumulations of snow are rare except at the highest elevations. Spring and early summer months usually are the driest. Total annual precipitation in the RCA can vary from less than 6 inches at Whitmore Canyon to over 20 inches on top of Mount Trumbull. Summer temperatures can exceed 100°F; winter temperatures can drop to slightly below zero°F. Higher elevations are usually cooler. For most of the year, prevailing wind is from the southwest.

Lands: Management guidelines for the Mount Trumbull RCA have been established by the Arizona Strip District RMP and are summarized in the following paragraphs. Most of the land is administered by BLM with the exception of several state sections and several small tracts of private land.

One of the major Vermillion Resource Area decisions as stated in the Arizona Strip RMP 1990 is to make land ownership adjustments by acquiring isolated parcels of state and private lands and by disposing of isolated tracts of public lands. There are 80 acres of public land adjacent to the Arkansas Ranch which are identified for disposal by exchange only. All other parcels of private and state land (as shown in the Arizona Strip District RMP) in the Mount Trumbull RCA are identified for acquisition. This means that if the opportunity arises, the BLM could pursue acquisition with the preferred method being exchange.

Land use authorizations (rights-of-way, leases, permits) are issued on a case-by-case basis and in accordance with site-specific environmental review and decisions established in the Arizona Strip District RMP. Management prescriptions for rights-of-way within the RCA include placement of linear rights-of-way underground along existing roads where feasible (temporary rights-of-way could be excluded from underground placement) and physical facilities at the Mount Logan communication site would not be expanded (existing communication site rights-of-way, not yet constructed, would be grand-fathered and could be built). Also, special stipulations are provided on roads in the Mount Trumbull RCA which are maintained through special authorizations (i.e., rights-of-way, permits, etc.) to protect archaeological resources.

Wildlife: Native mammalian and avian wildlife species that are of hunting or viewing interest in the area include mule deer, coyote, mountain lion, bobcat, gray fox, badger, ringtail cat, cottontail rabbit, black-tailed jackrabbit, Gambel's quail, mourning dove, mallard, teal, and bandtail pigeon. Three others, Merriam's wild turkey, chukar, and Kaibab squirrel, have been introduced to the area. Pronghorn antelope and desert bighorn sheep may also occur in the area.

Over 140 species of non-game birds have been verified in the Mount Trumbull habitat area and at least 60 additional species are suspected. According to O'Brien (1990), the Mount Trumbull area supports three times the bird numbers per unit area as does the Kaibab Plateau because of greater habitat diversity, patchiness, and vegetative layering. Also, Mount Trumbull itself, on the northern edge of the Grand Canyon, rises above the surrounding topography and is visible for over 100 miles; thus, in an ecological sense, it forms a "sky island" which would naturally attract birds.

No native or sport fish live in the RCA.

Existing Wildlife Management:

The Mount Trumbull RCA overlaps the areas managed by two Habitat Management Plans (HMP's). A small amount of the Clayhole HMP (1978) is included in the Mount Trumbull RCA. This HMP deals mostly with pronghorn and mule deer management by providing for habitat improvement by building wildlife water developments and mitigating the impacts of livestock grazing. The Trumbull HMP comprises the majority of the Mount Trumbull RCA (revised 1992). This HMP places emphasis on non-game species, wilderness designations, apparent decline of mule deer numbers, full establishment of wild turkeys, and full establishment of Kaibab squirrels. The overall goal of the Trumbull Habitat Management Plan is to improve or protect wildlife habitat. The 1992 revision emphasized the maintenance of habitat communities and non-game species.

Special Status Species: Special status species that could be found in the area are described in Table 1. Those species receive special management attention in order to preserve their current habitat and numbers or to improve their status.

Table 1. SPECIAL STATUS SPECIES WHICH MAY OCCUR IN THE RCA

COMMON AND SCIENTIFIC NAME	STATUS *	REMARKS
BIRDS		
Peregrine Falcon <u>Falco peregrinus anatum</u>	SC - FE	Not known to nest in RCA, but peregrines do nest in nearby Grand Canyon Nat'l Park, Kanab Creek, etc. 1987 survey for peregrine nest sites searched BLM land in Toroweap Valley and found none.

COMMON AND SCIENTIFIC NAME	STATUS *	REMARKS
Bald Eagle <u>Haliaeetus leucocephalus</u>	SE - FE	Not known to nest in RCA. Highly unlikely due to lack of fish. Occasionally seen flying over area, especially in winter months.
Spotted Owl <u>Strix occidentalis lucida</u>	ST - FT	Not confirmed in RCA. 1991 and 1992 inventories did not locate any spotted owls.
Northern Goshawk <u>Accipiter gentilis</u>	SC - F2	Likely to nest in RCA. In 1980's, one pair was documented to fledge young. Goshawk sightings in the Ponderosa type are common.
Snowy Egret <u>Egretta thula</u>	ST - NL	Not known to be in RCA.
Western Snowy Plover <u>Charadrius alexandrius nivosus</u>	SC - F2	Not known to be in RCA.
Ferruginous Hawk <u>Buteo regalis</u>	ST - F2	Not known to be in RCA. Has been seen approx. 20 miles north of RCA in sagebrush vegetation.
White-Faced Ibis <u>Plegadis chihi</u>	F2	Not known to be in RCA. Has been seen along Clayhole Road in ditch near Colorado City.
Mountain Plover <u>Charadrius montanus</u>	F2	Not known to be in RCA.
Long-Billed Curlew <u>Numenius americanus</u>	F2	Not known to be in RCA. Has been seen approx. 12 miles NW of RCA in sagebrush near Little Robinson Tank in 1991 and further north along Kanab Creek in 1994.
MAMMALS		
Merriam's Kangaroo Rat <u>Dipodomys merriami frenatus</u>	F2	Not known to be in RCA. Type specimen is from Toquerville, UT and others have been collected on the Arizona Strip.
Spotted Bat <u>Euderma maculatum</u>	SC - F2	Not known to be in RCA. Spotted bats have been collected on the Kaibab Plateau and recently on the Arizona Strip along Fort Pearce Wash.
Allen's Big-eared Bat <u>Idionycteris phyllotis</u>	F2	Not known to be in RCA. Specimens have been captured on the Arizona Strip.
Small-footed Myotis <u>Myotis ciliolabrum</u>	F2	Not known to be in RCA. Species habitat is thought to be lower than elevations of the RCA. Specimens have been captured on the Arizona Strip.
Long-eared Myotis <u>Myotis evotis</u>	F2	Not known to be in RCA. Specimens have been captured on the Arizona Strip.

COMMON AND SCIENTIFIC NAME	STATUS *	REMARKS
Fringed Myotis <u>Myotis thysanodes</u>	F2	Not known to be in RCA. Specimens have been captured on the Arizona Strip.
Long-legged myotis <u>Myotis volans</u>	F2	Not known to be in RCA. Specimens have been captured on the Arizona Strip.
Yuma Myotis <u>Myotis yumanensis</u>	F2	Not known to be in RCA. Species habitat is thought to be lower than elevations of the RCA. Specimens have been captured on the Arizona Strip.
Big Free-tailed Bat <u>Nyctinomops macrotis</u>	F2	Not known to be in RCA. Specimens have been captured on the Arizona Strip.
Pale Townsend's big-eared bat <u>Plecotus townsendii pallescens</u>	F2	Not known to be in RCA. Specimens have been captured on the Arizona Strip.
California Leaf-nosed Bat <u>Macrotus californicus</u>	F2	Not known to be in RCA. Species habitat is thought to be lower than elevations of the RCA. Specimens have been captured on the Arizona Strip.
PLANTS		
Mt. Trumbull Beardtongue <u>Penstemon distans</u>	F2	Found on north and east facing slopes between 3900 and 5200 feet in elevation, gen. west of Whitmore Canyon.
Grand Canyon Rose <u>Rosa stellata</u> spp. <u>abyssa</u>	F2	Not known to be in RCA. Does occur on limestone soils along Kanab Creek's west rim approx. 20 miles east of RCA.

EXPLANATION OF STATUS CODES:

FE = FEDERAL ENDANGERED SPECIES
 FT = FEDERAL THREATENED SPECIES
 F2 = FEDERAL CANDIDATE CATEGORY 2 SPECIES
 NL = FEDERALLY NOT LISTED

SE = STATE ENDANGERED SPECIES
 ST = STATE THREATENED SPECIES
 SC = STATE CANDIDATE SPECIES

Geology and Minerals: The Mount Trumbull RCA is located on the Uinkaret Plateau within the Colorado Plateau Physiographic Province. The Uinkaret Plateau is bounded on the east by the Toroweap fault, which passes through Toroweap Valley, and on the west by the Hurricane fault which forms the Hurricane Cliffs. Permian and Triassic sedimentary rocks are exposed in the area and generally dip several degrees to the north. The Permian Kaibab Formation consists of ledge-forming limestone and silty dolomite, and contains gypsum. The Triassic Moenkopi Formation is more extensively exposed and consists of gypsiferous dark reddish-brown siltstone and mudstone. It is non-resistant and weathers into erodible reddish soil. The older sedimentary rocks are overlain by Tertiary-Quaternary volcanic rocks. Mount Trumbull and Mount Logan were formed by cinder cones and basalt flows extruded years ago.

The Mount Trumbull RCA has a low potential for occurrence of oil and gas resources. There are no existing oil and gas leases in the area. However, the Uinkaret Plateau is rated as having a high potential for the occurrence of breccia pipe uranium and gold or copper. There are approximately 20 mining claims within the Mount Trumbull RCA.

Soil, Water, and Air: The parent material for most soils in the RCA is sedimentary with a plentiful amount of volcanic rocks. Primarily on the south and west portion of the RCA these soils have eroded. In some instances (mainly in the juniper/pinyon stands) and due to the lack of ground cover, virtually all the top soil has been removed. Sheet, gully, and rill erosion are common, especially on steeper slopes. Some gullies are 20 feet deep. Severe erosion has caused loss of soil and a lowering of the water table. In this portion of the RCA, all runoff gathers in Langs Run, goes to the Clayhole Wash, then to Fort Pearce Wash, and ultimately into the Colorado River. The northeast portion of the RCA at the head of Toroweap Valley is also susceptible to erosion. Erosion is believed to be perpetuated by the presence of monotypic stands of sagebrush and pinyon and juniper. Understory grasses and forbs are scarce in these monotypic stands, thus root masses and organic matter are lacking which hold soil in place. These monotypic stands of sagebrush and pinyon/juniper are thought to represent climax species. Historically, it is thought that these climax stands of vegetation were periodically disrupted by fire which moved them to a disclimax stage showing greater diversity of vegetation species. Additionally, it is thought that cattle grazing which reduces grass height (fine fuels necessary to carry fire) has reduced the occurrence of fire, thus reducing the periodic disruption of climax stands of sagebrush and pinyon juniper.

There are very few live springs (and no live streams) in the RCA. Almost all the springs have been developed. Most of these developments are on private land and the water rights are owned by private citizens in accordance with state water law. Frequently, pipelines emanate from the springs and distribute water away from the spring sites. To supplement the scant number of springs, a number of run-off dependent ponds and precipitation dependent catchments have been built in the RCA for both wildlife and livestock. With these developments, water is fairly well distributed within the RCA. Maintenance of existing projects is an ever-continuing effort. Overgrowth of undesirable brush species inhibits rather than facilitates water percolation into the soil.

Air quality is a vital concern in the Grand Canyon ecosystem because it directly affects visibility in the Grand Canyon National Park. In the RCA, air quality is fair to excellent depending on prevailing winds. Visibility is good, but there are concerns that air quality and visibility are declining. Prevailing winds come from the west and southwest. These winds can carry varying amounts of hydrocarbons and particulate matter from the urban areas of California, Nevada, and Arizona. Smoke from wildfires is a related concern.

Existing Watershed Management:

In 1963 the Fort Pierce Watershed Plan was implemented. In 1986, a smaller watershed problem area was divided out into a separate sub-unit called the Lang's Run Watershed Plan. Lang's Run is the drainage for the western portion of the Mount Trumbull RCA. Some of the

projects identified in this plan which would improve watershed values included, construction of water diversion structures such as dikes and check-dams, rehabilitation and stabilization of stream terraces and conversion of sagebrush and pinyon/juniper vegetation types to grassland.

The Arizona Strip District Resource Management Plan calls for the designation of the Mount Trumbull RCA to improve watershed conditions. It also calls for the continued implementation of the Lang's Run Watershed Plan.

Recreation, and Visual Resources: Recreation activities that typically occur or have the potential to occur in the Mount Trumbull RCA are: tent/trailer/small RV camping; viewing nature, wildlife, and cultural sites; hiking; hunting; driving for pleasure; off-road vehicle riding; mountain biking; backpacking; picnicking; gathering forest products; and horseback riding. Illegal activities, such as wildlife poaching, artifact collecting and vandalizing archeological sites, also occur.

Specific data on current levels of use is generally not available. Some limited information on hunting is available, however. Each year approximately 60 people have permits to hunt wild turkeys in the RCA. One hundred general season deer permits are issued annually for Unit 13A, a large unit which contains the Mount Trumbull area. An estimated one third of these permitted hunters spend some time in the RCA. A few additional hunters use the RCA while hunting small game, birds, predators, or when using archery equipment to hunt mule deer. Estimated group sizes vary from single visitors (hikers, hunters, etc.) to 15 to 20. Occasionally, larger groups (75 or more) utilize the area for recreational and educational purposes such as family reunions, field schools, government sponsored tours, college-level geology field trips, and nature hikes/talks. Higher elevations in the RCA receive the greatest visitor use from spring through fall. Hunters use the entire area during fall hunts. Spring turkey hunters stay mostly in the ponderosa pine areas. Mid-winter sees the lowest use in higher elevation areas due to snow and impassable roads, with higher use in the Toroweap area.

National holiday weekends usually mean greater visitation to the area. A large family reunion (on private land) on the 4th of July every year brings 400 to 700 people into the RCA.

Local visitors typically come from either southern Utah communities or nearby northwestern Arizona communities such as Fredonia and Colorado City. Regional visitors come from Arizona, Utah, Nevada, Colorado, New Mexico, and California, but other visitors come from all states. International visitors are also common and their numbers are increasing: they seem to be mostly from either Europe or Asia.

Visitors to the Mount Trumbull RCA typically make use of the following types of areas:

- Overnight, undeveloped camp and day-use picnic areas.
- Undeveloped or marginally developed attractions such as Sawmill Site, Uinkaret Pueblo, Tuweep Church, and overlooks atop Mount Logan.
- Random at-large parking for access to sites such as the Mount Trumbull Wilderness and Nampaweap.
- Natural areas with wildlife, scenic, geologic, or vegetative values.

- Transportation corridors to access attractions or destination points such as the National Park Service's (NPS's) Tuweep Overlook.

There are currently no formal visitor facilities in the RCA, with the exception of a water spigot at Nixon Flat.

Most managerial contact with visitors occurs near the Nixon Administrative Site, by encounters along transportation routes, and at the NPS's Tuweep Ranger Station. Directional signing, as well as several interpretive signs also provide managerial contact. Several pamphlets and fliers about RCA resources are typically distributed off-site through mailings or over-the-counter at the BLM area office. In addition, the area is identified by BLM and others in books and by highway signs as a Watchable Wildlife Area for wild turkey and Kaibab squirrel. Hunting opportunities, mostly for wild turkeys at the present time, are periodically publicized by Arizona Game & Fish Department (AGFD) and sporting magazines. The two wilderness areas themselves are identified nationally in a number of publications, including those of BLM, as federally designated wilderness areas. The NPS also informs the public about its Tuweep area.

While much of the RCA generally appears natural to the casual visitor, some areas contain human modifications which affect visual resources. These include:

- BLM administration site - buildings and a fenced area
- Various signs, i.e. interpretive, informational, and directional
- Livestock and wildlife watering structures
- Chainings, plow and seed areas
- Ranch buildings, fences and roads
- Signs of past logging and timber stand management
- Signs of fire fighting, fire suppression, and/or prescribed fires

Viewsheds in the RCA are generally good to outstanding. Typical are views of distant cinder cones and basalt capped mesas, some blanketed with ponderosa pine, pinyon, juniper, oak, or in places, aspen. Views south into Grand Canyon and of the San Francisco Peaks are excellent, as are views of Grassy Mountain and Mount Dellenbaugh to the west. Some viewsheds contain large areas of vegetative manipulations that create a low to moderate visual contrast, depending somewhat upon the age of the treatment.

All visitors going to the Tuweep Overlook in Grand Canyon National Park pass through the RCA. This outstanding overlook is a major attraction for visitors. Undoubtedly, some of these visitors stay overnight in the RCA. Tuweep traffic data, shows a 3-year moderate increase in traffic to that area and currently receives about 12,000 visitors per year. A slower increase at the Toroweap Junction counter, and a decrease at the Hurricane Rim counter is also occurring. It is believed the decrease is due to current construction on the Quail Hill road.

A second major factor for expecting increased visitation is the current rapid population growth of St. George and other local communities. The City of St. George alone is growing by about 500 people per month (12% per year). The overall trend in population growth is expected to

continue for at least the next several years, while the rate of overall population growth will increase at a faster rate as smaller communities around St. George grow. Many of the people moving to St. George are relatively affluent, have plenty of leisure time, and lead an active lifestyle. Some like to explore the public land and its attractions. Thus, visitation to the RCA is expected to increase over time.

Wilderness: The Mount Trumbull Wilderness and Mount Logan Wilderness were incorporated into the National Wilderness Preservation System on August 28, 1984, by the Arizona Wilderness Act of 1984 (Public Law 98-406).

The lands within the Mount Trumbull and Mount Logan Wilderness Areas constitute much of the central mass of the Uinkaret Mountains, a chain of dormant cinder cones, lava flows, and basalt-capped mesas displaying different periods of vulcanism. The remote location of these wildernesses and the screening created by the topography and vegetation combine to provide outstanding opportunities for seclusion and isolation. These same qualities also provide excellent opportunities to view and photograph interesting landforms and sweeping vistas for the Grand Canyon and much of the Arizona Strip. Hiking, primitive camping and hunting opportunities are excellent in these areas. Evidence of prehistoric and historic human use and habitation contribute a different perspective to the natural values present.

Within the 22,500 acres that comprise these wilderness areas, 40 acres in the northeast portion of Mount Logan Wilderness are privately owned and are used in association with the livestock grazing permit for most of the Mount Logan area.

Existing Wilderness Management:

The following are BLM required goals for the management of statutory wilderness.

The first and dominant goal is to provide for the long-term protection and preservation of the areas' wilderness character under a principle of non-degradation. The areas' natural condition, opportunities for solitude, opportunities for primitive and unconfined types of recreation, and any ecological, geological, or other features of scientific, education, scenic, or historical value present will be managed so that they will remain unimpaired.

The second goal is to manage the wilderness areas for the use and enjoyment of visitors in a manner that will leave the areas unimpaired for future use and enjoyment as wilderness. The wilderness resource will be dominant in all management decisions where a choice must be made between preservation of wilderness character and visitor use.

The third goal is to manage the areas using the minimum tool, equipment or structure necessary to successfully, safely and economically accomplish the objective. The chosen tool, equipment or structure should be the one that least degrades wilderness values temporarily or permanently. Management will seek to preserve spontaneity of use and as much freedom from regulation as possible.

The fourth goal is to manage non-conforming but accepted uses permitted by the Wilderness Act and subsequent laws in a manner that will prevent unnecessary or undue degradation of the areas' wilderness character. Nonconforming uses are the exception rather than the rule;

therefore, emphasis is placed on maintaining wilderness character.

Throughout the Mount Trumbull/Mount Logan Wilderness Management Plan, the Arizona Wilderness Act of 1984 and the Wilderness Act of 1964 guide the objectives, policies and the kind, type and method of management actions intended to maintain or enhance the wilderness values. Three opportunity classes or settings (logical extensions of the RCA's recreation settings) guide management of the wildernesses. The three classes, while not formally named, roughly correspond to pristine, primitive recreational and human-influenced or transitional. These classes help determine setting-appropriate actions to better protect values such as naturalness, solitude, and primitive and unconfined recreation.

The incorporated Limits of Acceptable Change (LAC) system provides direction for much of the monitoring and focuses BLM activities to areas where management attention is needed. The plan is intended to be reviewed annually and updated as needed to provide maximum protection for the wilderness values.

On August 28, 1984, the Mount Trumbull and Mount Logan Wildernesses were closed to all forms of mineral entry and appropriation under the General Mining Laws and Leasing Acts. There are presently no known claim locations, no active leases and no history of mining or prospecting in either wilderness.

Since wilderness designation, these areas have been managed primarily to maintain and protect the environmental conditions that existed at the time of designation. Along with the wilderness designation comes an automatic Visual Resource Management (VRM) class I rating. Class I VRM equates to a natural ecological landscape essentially free from man-induced contrast. Since designation, other predesignation resource uses and programs have been managed with guidance from the BLM Manual Section 8560. This RCA plan provides more site-specific guidance and direction to achieve and/or maintain desired wilderness conditions.

District policy requires formal request by employees to the district manager for permission to use motorized or mechanized equipment for administrative purposes. The procedure for authorization requires a thorough analysis that considers the need for such use, as well as possible alternative methods and the reasons they cannot be employed.

In creating the Mount Logan Wilderness Area, Congress included within the exterior wilderness boundary, a 60 foot wide corridor along a 4.4 mile portion of the Slide Mountain-Hells Hollow Road. This corridor is open to public vehicle use, providing direct access to a portion of the wilderness interior.

Currently, under the existing wilderness management plan, prescribed fire is not allowed in opportunity class I wilderness areas.

Cultural Resources: Cultural resource values in the Mount Trumbull RCA are diverse and complex. They include archaeological and architectural sites dating from as early as 8,000 BC to the early 20th century. Archaic, Puebloan, Paiute and Euro-american sites can all be identified within the RCA boundary. These sites may be anything from artifact scatters to

rock art, pueblos, trails or sawmills.

Most of the RCA has not been surveyed for cultural resources but what little survey has been conducted has found extreme densities of archaeological sites in both the pinyon-juniper and ponderosa pine zones. Even with the little amount of archaeological survey done there have already been several hundred sites recorded. It is expected that there are several thousand unrecorded and, as yet unlocated, sites within the RCA boundaries.

Some of the most remarkable cultural resources within the RCA include Witch's Pool where John Wesley Powell met Paiutes in 1870 and the sawmill location where timbers were milled for construction of the St. George Mormon Temple. The historic Temple Trail wagon road, used for hauling the timbers, leads from the RCA 70 miles into St. George, Utah. Also found in the RCA are large Puebloan villages and extensive prehistoric rock art panels at Nampaweap (Billy Goat Canyon).

Known Native American use of the area includes the Paiute, Navajo and Hopi (the latter - living descendants of the Puebloan Culture). Native Americans expressing interest in the management of this area include the Hopi, who have oral migration histories documenting their ancestral presence at Mount Trumbull, and the Kaibab Paiute, whose reservation at Pipe Springs is closest to the RCA. Paiute are known to have lived in the RCA as late as the 1920's. Historic sources document that the Paiute occupied the Mount Trumbull RCA at the time of Euro-american arrival. Increasing visitation to the RCA has led to both intentional vandalism and unintentional damage to prehistoric and historic cultural sites.

Transportation and Access: Transportation access to the RCA is good seasonally via Highway 389 and County Roads 5, 109, 263, and 115. These roads are well-maintained and are impassable only during, and immediately after, the most inclement weather. There are no public utilities, facilities, or services in the RCA.

Acquisition of easements across private lands are negotiated where needed to accomplish public land resource management programs. The Arizona Strip District RMP identified a potential need for acquisition of two routes for legal vehicular access within the Mount Trumbull RCA. These routes will be evaluated and acquisition pursued if determined necessary.

Livestock Grazing: Livestock production in the RCA is mainly a cow/calf operation. Herd sizes vary, but the Mount Trumbull RCA covers portions of five allotments which are permitted for 6,984 animal unit months (AUMs) annually. Each allotment is managed according to an Allotment Management Plan (AMP) developed by BLM and the rancher to protect and improve the vegetation resource. Table 2 describes the RCA's grazing systems.

Table 2. GRAZING ALLOTMENTS IN THE MT. TRUMBULL RCA

ALLOTMENTS	GRAZING SYSTEM	#ANIMALS AND SEASON OF USE	ACTIVE AUMs
Mt. Trumbull	Rest Rotation	144 Cattle - yearlong 5 Horses - yearlong	1558
Crosby	Deferred Rotation	55 Cattle - 7/1 to 12/15	232
Mt. Logan	Rest Rotation	100 Cattle - yearlong	1168
Tuweep	Rest Rotation	180 Cattle - yearlong 2 Horses - yearlong	1616
Big Springs	Deferred Rotation	222 Cattle - yearlong 20 Horses - yearlong	2410

Existing Livestock Grazing Management:

The BLM administers rangeland and grazing management activities in accordance with goals and objectives established in the RMP and AMP's. Management policy and guidance for the five allotments within the RCA is to administer rangeland and grazing management activity in accordance with national guidelines, goals and initiatives set forth in the Taylor Grazing Act of 1934, Federal Land and Policy Management Act of 1976, Public Rangeland Improvement Act of 1978 and the Code of Federal Regulations part 4100.

The intent is to manage and improve rangeland resources within the framework of multiple-use needs and objectives so they are productive for all existing uses. The intent of existing AMP's is to manage, maintain, protect and improve rangeland resources through sound planning, cost-effective investments and management decisions. All AMP's mandate that close monitoring of utilization, condition and trend of rangeland vegetative resources be done, as well as Ecological Site Inventories and Desired Plant Community studies. Currently, utilization, condition, and trend studies are ongoing and Ecological Site Inventory and Desired Plant Community studies are completed. Table 5 shows existing seral stages within the RCA for five vegetation communities.

Utilization of key forage species in each allotment is limited to an average of 50 percent of the current year's growth. Key areas and associated key forage species are identified for each grazing allotment, with the general goal of maintaining or improving the frequency of warm and cool season perennial grasses and browse species.

Vegetation: The ponderosa pine vegetation type was inventoried in the late 1970's and early 1980's. All other major vegetation types were inventoried in 1993. The ponderosa pine was inventoried utilizing sample plots of 1/5 acre. These 1/5 acre plots were rechecked in 1994 and the old data was found reliable; with expected changes evident in that more young trees were found. The shrubby and herbaceous vegetation was inventoried using dry weight and

weight estimates. Weight estimate tables of trees by height and diameter breast height or stump height were also used. Canopy cover was determined for the pinyon/juniper forest. These data plus the species composition by weight estimate of grass, forbs, and shrubs were used to determine a condition class. These condition classes include; potential natural community (PNC), late seral stage, mid seral stage and early seral stage. The ponderosa pine forest was classified using Tree Structural Stages (TSS). This is based on the Vegetation Structural Stages (VSS) described in "Management Recommendations for the Northern Goshawk in Southwestern United States, 1992". The criteria for the different stages is based on number of ponderosa stems per acre and their diameter at breast height (dbh). The dbh class which dominates determines the tree structural stage (TSS) of a 1/5 acre plot of ponderosa pine.

Four ecological condition classes are used to express the degree to which the production of composition of the present plant community reflects that of the potential natural community.

<u>Seral Stage or Ecological Status</u>	<u>Percentage of Present Plant Community that is Climax for the Site</u>
Potential Natural Community (climax)	76-100
Late Seral	51-75
Mid Seral	26-50
Early Seral	0-25

The TSS is a landscape description of the ponderosa forest. The different structural stages are mixed through the landscape with certain stages dominating. But no stand is even aged or even sized.

The following table outlines the description of each TSS. The stages start at one, which is grass, forbs, shrub opening to stage six which is old growth trees. The following table shows the existing TSS of the non-wilderness ponderosa forest.

TABLE 3

Tree Structural Stage (TSS)	1	2	3	4	5	6
Description of TSS	Opening	Seedling Saplings	Young	Middle Aged	Mature Forest	Old Growth
Diameter of Trees	N/A	1" - 4.9"	5"-11.9"	12" - 19.9"	20"-23.9"	24 -31.9"+
Current TSS Class %	4%	29%	34%	27%	2%	4%
Acreage	353	2446	2892	2297	170	340

To determine the seral stages of the two wilderness area's ponderosa pine forest, measurements of canopy cover, with species composition by weight of the understory vegetation were used.

TABLE 4

Stage	Acres	% of Wilderness in this Stage
PNC	1364	43
Late Seral Stage	826	26
Mid Seral Stage	0	0
Early Seral Stage	0	0
Unclassified	984	31

The seral stages of the other plant communities are shown in the table below:

TABLE 5

Seral Stage	Sage-brush	Grassland	Mt. Shrub	Pinyon	Juniper
Late	9106	3354	0	12791	4339
Mid	14327	5682	0	13302	1283
Early	6230	2501	0	1394	0
Unclass.	4218	449	5734	13370	6013
Total	33881	12186	5734	40857	11635

The remainder of the total acreage of the RCA is composed of minor vegetation communities, bare areas, roads and lava flows.

The seral stage for the wilderness area ponderosa pine is a forest with 43% of its acreage in the PNC. The general description of this stage of forest is one with a tree canopy cover of 50-60% and the ponderosa pine being 100% of the canopy cover. Understory species are 60% perennial grasses, 10% Forbs and 25% shrubs, and 5% small ponderosa, oak, etc. 26% of the forest falls into a late seral stage which has less canopy cover or a denser canopy cover with an inverse amount of understory vegetation to the canopy cover. The tree structural stages (TSS) of ponderosa pine outside of wilderness are shown in Table 3.

Further descriptions of the existing vegetation in the Mount Trumbull RCA can be found in tables 6-8.

Fire: Historically, the majority (over 90%) of fires in the Mount Trumbull and Mount Logan areas have been caused by lightning. Most of the fires in the Mount Trumbull area are on the western and southern slopes of the mountain, predominantly in the pinyon-juniper vegetation type, although a few have occurred on top of the mountain in the ponderosa pine type. Most

of the fires in the Mt. Logan area occur in the northwestern portion in the ponderosa pine type. A pre-commercial thinning took place in this particular area about twenty years ago, with much of the thinning slash still lying on the ground. On an average, less than 40 acres burn per year in the ponderosa pine and pinyon/juniper vegetation types.

It is felt that prior to human activities in the area, the ponderosa pine forest was an uneven-aged stand similar to the forest on top of Mount Trumbull. Over 100 years ago, logging began in the RCA to provide lumber for local communities. Since then, more timber harvest has occurred over the years including the timber stand thinning treatment on Mount Logan. Past logging and aggressive fire suppression in the RCA has resulted in the creation of even-aged ponderosa pine stands. Generally exclusion of fire spread, through suppression has caused an increase in fuel loadings, and associated fire danger. In addition, biodiversity has been compromised through perpetuating the establishment of even aged, closed canopy ponderosa pine stands with heavy layers of dead organic matter covering the ground surface.

The pinyon/juniper vegetation type has not been greatly affected by fire. Much of the area in this type does not contain enough surface fuel to carry a fire, and the trees are spaced far enough apart that fires cannot move from tree to tree except under the most extreme burning conditions. Typically, fires in this type are isolated to one tree or a small group of trees.

Interdisciplinary Process:

The team which assembled to develop a plan for the Mount Trumbull ecosystem consists of specialists from a variety of disciplines from the National Park Service, Arizona Game and Fish Department, BLM, BLM grazing permittees and concerned citizens. The interdisciplinary process is cyclic in nature and consists of the 5 following steps: 1) **Scoping** - This step determines the issues requiring change. 2) **Objectives** - Determining objectives articulates issues into measurable and attainable terms. 3) **Management Actions** - This is the implementation stage where management is changed or projects are designed to meet objectives. The interdisciplinary team has modified this step by basing management actions upon the prioritization of weak links in the ecosystem 4) **Monitoring** - Studies are developed and conducted to measure progress in attaining objectives. As a general rule, the interdisciplinary team will review the results of management actions within one year of completion. Monitoring will continue long term as necessary. 5) **Evaluation** - Information from monitoring is used to determine if the management actions have been successful in meeting objectives and resolving issues. Evaluation will be used to determine if additional management actions are needed, and in situations where mitigation techniques were used, if the mitigation was effective. To date, the interdisciplinary team has completed steps 1-3, and has determined the procedures to be used for monitoring.

Mission Statement:

The interdisciplinary process and formulation of the Mount Trumbull RCA plan began with the interdisciplinary team's articulation of a common goal. This common goal was termed the "mission statement" for the RCA team. The mission statement says, "By consensus, define future condition(s) for the Mt.Trumbull Resource Conservation Area. Collectively develop the management actions necessary to achieve those conditions. Desired future conditions and management actions should provide for present and long term human needs while maintaining sound ecosystems."

Adaptive Management:

Adaptive management will be utilized in implementing the Mt. Trumbull RCA plan. This is a "learn by doing" approach based upon scientific method. As results from initial sampling and monitoring are analyzed, restoration plans will be modified or fine tuned to maximize their success in restoring forest health. Management actions carried out to meet objectives are prioritized based upon weak links in the ecosystem. Therefore, issues stemming from weak links will be addressed first through the implementation of management actions. The plan considers 5 years of work at current funding levels. Monitoring and evaluation of these management actions will help determine their effectiveness at resolving issues. The effectiveness of management actions will determine if they will be continued, expanded, refined or abandoned. Plan refinement, through the identification of new issues, the identification of new technologies and information to resolve issues, and monitoring would be an ongoing process by the interdisciplinary team and any interested public or agency representatives. When necessary, supplementary environmental documents would be completed on future, proposed management actions. Large scale tree thinning contracts in the Sawmill Forest Restoration Units, and Lava and Petty Knoll Fuels Reduction Units will be subject to further NEPA review. All other demonstration and experimental, restoration treatments conducted in ponderosa pine forest in cooperation with Northern Arizona University will be addressed in the accompanying environmental assessment (EA) and will not be subject to further NEPA review. In addition, all operational treatments in the pinyon/juniper and sagebrush vegetation communities as described in this plan will be addressed in the accompanying EA and will not be subject to further NEPA review. Through the process of continual refinement, the RCA plan could be continually amended as new issues arise, or new technologies or information become available to resolve existing issues. Thus, the Mount Trumbull RCA plan is expected to have an indefinite life span.

Issues:

The objectives and management actions for the Mount Trumbull RCA plan are issue driven, not program driven as were many activity plans in the past which considered only single resources. Often many of these single use, activity plans overlap within the same geographic region and the objectives of the various plans conflict. This is avoided through the use of an issue driven plan in which the goal is not to further a specific resource, but to benefit many resources through resolving issues within the ecosystem. The members of the interdisciplinary team jointly recorded perceived issues regarding the RCA.

Issues Recognized by the Interdisciplinary Team:

The interdisciplinary team listed the following issues as pertinent to the ecosystem:

- 1) Preservation and enhancement of ponderosa pine forest is desired.
- 2) Heavy fuel loading may lead to a large catastrophic fire.
- 3) The natural fire regime needs to be restored.
- 4) Presently there is a lack of a proactive prescribed fire program.
- 5) Fire suppression activities up to now have led to a buildup of fuels.
- 6) Little or no understory vegetation exists in some areas.
- 7) There is a lack of park-like openings.
- 8) Mexican locust is spreading.
- 9) Maintain gambel oak stands within the forest.
- 10) Improved vertical forest structure and various age classes of ponderosa are needed.

- 11) The health and vigor of the forest is inversely related to its stocking rate (stems/acre).
- 12) The ponderosa forest is linked to the history of the area.
- 13) Ponderosa pine inventory data is not complete, especially in designated wilderness.
- 14) Different size classes of ponderosa are desirable, especially old trees (>24"dbh) and snags.
- 15) Short-term benefits of commercial timber harvesting are outweighed by the long-term adverse impacts.
- 16) The quality and quantity of forage production needs to be increased.
- 17) The usefulness of previous land treatments is being lost due to a lack of maintenance.
- 18) Loss of soil due to erosion is a significant problem in some locations.
- 19) There is a public demand for firewood, fence posts, etc.
- 20) Livestock grazing and fire suppression have led to a buildup of woody species.
- 21) Better watershed management is needed in some locations.

By consensus, the interdisciplinary team decided to place issues 1-21 under one major issue dealing with vegetation in the ecosystem. **Major Issue 1** - "Past and current management practices in the Mount Trumbull RCA are allowing some less than desirable vegetative/soil conditions and are promoting conflicts among different uses of these resources."

- 22) Mule deer numbers are low.
- 23) Existing high quality wild turkey habitat needs to be maintained.
- 24) Where special status species exist, their requirements need to be recognized and managed for.

By consensus, the interdisciplinary team decided to place issues 22-24 under one major issue dealing with animal populations in the ecosystem. **Major Issue 2** - "Some animal (wildlife) populations in the Mount Trumbull RCA are not at preferred levels; they should be managed to their appropriate, potential numbers without adversely impacting other animal species or degrading plant communities to unacceptable levels." However, by consensus the RCA team decided that this issue dealing with animal numbers would be addressed as part of the vegetation issue in this plan. Management of wild animal populations is the primary role of AGFD. Management of domestic livestock is the primary responsibility of grazing permittees. The BLM's role on public lands is the management of vegetation. Thus, the RCA team decided to address the needs of wildlife and livestock through addressing the major vegetation issue. The major issue regarding animal populations in the RCA will not be addressed further in this ecosystem plan.

- 25) Grand Canyon air quality (smoke management) concerns must be considered in using prescribed fire in vegetation management.
- 26) Management needs to be coordinated with adjacent private, state and National Park Service (NPS) land owners.
- 27) Maintain high quality, back country recreation opportunities by preserving remoteness of the Mt. Trumbull area.
- 28) Encourage or discourage accessibility
- 29) Long-term protection of wilderness values of naturalness, solitude, etc.

- 30) Increasing vandalism to cultural resources is a problem.
- 31) How do we maintain the existing recreational experience?
- 32) How do we manage other non-wilderness uses in wilderness?
- 33) Increased recreational use will impact other values.
- 34) There is a spectrum of recreational use.
- 35) Management of BLM's Trumbull area should be compatible with adjacent NPS lands.
- 36) Coordination by BLM with other land owners is important.

By consensus, the interdisciplinary team decided to place issues 25-26 under one major issue dealing with recreation activities in the ecosystem. **Major Issue 3** - "Opportunities for the public to engage in high quality, back country, recreation activities need to be maintained.

Objectives:

To address the two major issues which the interdisciplinary team decided should steer further planning efforts, five objectives were formulated.

To address **Issue 1** - "Past and current management practices in the Mount Trumbull RCA are allowing some less than desirable vegetative/soil conditions and are promoting conflicts among different uses of these resources," the following vegetation objectives were formulated:

Objective 1 - Restore the ponderosa pine vegetation type to a mosaic of uneven aged stands with an understory of grass and forbs with small openings, allowing wildfire to return as a natural process of the ecosystem. Table 6 describes the present and desired plant communities:

TABLE 6

TSS	1	2	3	4	5	6
Description of TSS	Openings	Seedling/Sapling	Young	Middle Aged	Mature Forest	Old Growth
DBH	N/A	1"-4.9'	5-11.9"	12-19.9"	20-23.9"	24-31.9+
Current Average RCA TSS	4%	29%	34%	27%	2%	4%
Long Term Desired TSS*	10%	10%	10%	20%	25%	25%

* In keeping with the adaptive management approach these percentages will be adjusted to be consistent with natural vegetation structures present before fire regime disruption, as determined in the course of plan implementation. (see Planned Management Action section)

Rationale for Objective 1:

Ponderosa forests are adapted to natural, low-intensity, frequent fires. Sustainable ponderosa pine forest ecosystems require low-intensity frequent fires. By restoring natural conditions to the forest, allowing fire to again play its role in the ecosystem will be possible. An uneven aged stand of ponderosa with a higher percentage of old growth trees and an understory of

grass and forbs will restore biodiversity in the ecosystem. Improvements will be seen in wildlife habitat diversity, herbaceous plants, and long term visual aesthetics.

Objective 2 - Manage the pinyon/juniper vegetation type in the Mount Trumbull RCA to increase plant diversity and manage for a diverse, desired plant community as described in Table 7.

TABLE 7

	Perennial Cool Season Grasses	Perennial Warm Season Grasses	Forbs	Browse	Trees/ Shrubs
Existing* Plant Community	trace amounts	trace amounts	1-3%	1%	96-100%
Desired* Plant Community	5-10%	5-10%	5%	5%	70-80%

*percentages are expressed in composition by weight

Rationale for Objective 2:

Adding plant diversity to essentially monotypic stands of the pinyon/juniper vegetation type would increase herbaceous production and biodiversity. Wildlife species and wildlife habitat would become more diverse within this vegetation type. Watershed resources would be improved in the long term by restoring herbaceous plant cover and soil stability.

Objective 3 - Manage the sagebrush/grass vegetation type in the Mount Trumbull RCA to increase biodiversity and manage for a desired plant community as described in Table 8.

TABLE 8

	Perennial Cool Season Grasses	Perennial Warm Season Grasses	Forbs	Browse	Annual Grasses	Trees/ Shrubs
Grassland Desired Plant Community*	2-15%	40-65%	1-5%	10-35%	15-40%	0
Grassland Existing Plant Community*	0	45%	2%	3%	42%	0
Sagebrush Desired Plant Community*	25-30%	16-25%	1-5%	7-15%	trace amounts	25-30%
Sagebrush Existing Plant Community*	0-3%	0-15%	0-1%	0-trace amounts	trace amounts	81-100%

*percentages are expressed in composition by weight

Rationale for Objective 3:

Adding plant diversity to essentially monotypic stands of the sagebrush vegetation type would restore herbaceous production and biodiversity. Wildlife species and habitat within this vegetation type both would become more diverse. Watershed resources would be improved by increasing herbaceous plant cover and associated soil stability. Visual aesthetics would be improved in the long term by increasing vegetative diversity.

To address **Issue 3** - " Opportunities for the public to engage in high quality, backcountry, recreation activities need to be maintained," two recreation objectives were formulated.

Objective 4 - Manage the spectrum of recreational settings in the Resource Conservation Area (as described in Appendix C) so that selected indicators of resource and social conditions are within or below the following ranges described in Table 9.

TABLE 9

Resource Conditions	Natural Setting	Backcountry Setting	Primitive Setting
a. Visitor⁺ impacts at 5 monitoring locations^{**} (see map).	Not to exceed 1 highly impacted and 4 ≤ moderately impacted campsites.	Not to exceed 3 moderately impacted and 2 ≤ minimally impacted campsites.	Not to exceed 1 moderately impacted and 4 ≤ minimally impacted campsites.
b. Impacts from other uses as evaluated at key observation points.^{***}	Not to exceed an overall low visual contrast rating.		Not to exceed an overall low visual contrast rating. Impacts in wilderness must not be noticeable.
SOCIAL CONDITIONS			
c. Annual increase in traffic counts tallied.	No more than 5% at Toroweap junction and Hurricane Rim sites.	No more than 2% at Mt. Logan Road and Death Valley Lake Road sites.	No more than 1% at Mt. Trumbull Trail and Mt. Logan Trail sites.
d. Average # of encounters⁺ with other groups/day.	No more than 20 during peak visitor use periods. ⁺⁺	No more than 10 during peak visitor use periods.	No more than 6 during peak visitor use periods.

- * "Visitors are people who are in the area primarily for a recreational purpose, such as hunting or sightseeing.
- ** Frequency of monitoring campsites for each setting if once every 3 years. Impact ratings will be based on monitoring worksheets developed for the RCA, taking into account such factors as number of campfire rings, litter, vegetative damage, camp size. etc.
- *** BLM Visual Resource Management contrast rating worksheets, using specific key observation points, will be used as projects are proposed. Key observation points are generally selected by determining where the most people might be in site of the project. Contrast rating will assume that the initial construction phase of any project may not meet visual objectives, but that given a reasonable specified time and rehabilitation/mitigation measures, the desired degree of contrast will be met.
- + An "encounter" is any visual or auditory contact with another person or group of persons not part of the observers group while at a designated monitoring site.
- ++ "Peak visitor use periods" are the weekend days associated with: Memorial Day, July 4th, July 24th, Labor Day and the opening of the general season deer hunt.

Rationale for Objective 4:

Attaining this objective will maintain and/or increase visitor enjoyment of the RCA and provide for quality visitor experiences in a variety of settings while lessening impacts on resources. Also, by attaining this objective, specific, achievable targets at which to aim a series of management actions in

order to resolve the issue of maintaining opportunities for high quality recreation will be provided.

Objective 5 - Enhance visitor experience opportunities with information, interpretation, services, and facilities in order for the visitors to make appropriate choices about participation in recreation activities within the RCA using guidelines described in Table 10.

TABLE 10

Management Guidelines	Natural Setting	Backcountry Setting	Primitive Setting
a. Overall management conditions.	Focus on maintaining recreation settings that frequently provide for user confidence and convenience.	Focus on maintaining recreation setting that occasionally provide for user confidence and convenience.	Focus on maintaining recreation settings that rarely provide for user confidence and convenience.
b. Visitor contact with management personnel.	Frequent	Frequent to occasional	Occasional to rare
c. Type, level, and location of visitor information.	Formal, moderate, on-site/off-site	Informal, occasional, off-site	Informal, rare, off-site
d. Signing	Frequent to occasional, generally permanent	Occasional	Rare, temporary
e. Typical road standard	Improved gravel or dirt, frequent maintenance	Dirt, occasionally maintained	Dirt or none, rarely maintained
f. Degree of user facilities development	Moderate to low	Very low to none	None

Rationale for Objective 5:

The purpose of this objective is to provide specific guidelines that will direct a series of management actions related to the kinds and amounts of visitor information, interpretation, services, and facilities in order to respond to the issue of maintaining opportunities for high quality recreation experiences. By providing the appropriate information and services for a variety of recreation experiences, visitor enjoyment of the RCA will be maintained and/or increased. Quality visitor experiences will be enhanced in a variety of settings while lessening impacts on resources.

Priorities:

To prioritize management actions designed to meet objectives and resolve issues, the interdisciplinary team has focused upon weak links in the ecosystem. These weak links basically go to the root of ecological and social problems. By focusing upon weak links in the ecosystem to prioritize management actions, basic ecological and social problems are treated, not symptoms of the problem. The reasoning for this is, the treatment of the basic problem in the ecosystem will cure several symptoms seen in the ecosystem. For each objective, the major weak link in the ecosystem which is hindering the attainment of this objective has been identified.

Ponderosa Pine Vegetation Community Weak Link:

Excessive fuel buildup, the potential for catastrophic fire and the associated loss of old growth trees is the major weak link which is hindering the attainment of the ponderosa pine vegetation community objective.

The following areas have extreme fuel buildup and potential for catastrophic wildfire. The ponderosa pine vegetation community weak link can be corrected in these areas with current BLM resources.

<u>Proposed Project/Area</u>	<u>Legal Description</u>
Sawmill Forest Restoration Units	T.34N., R.8W., secs. 6 and 7
Mt. Logan Wilderness Fuels Reductions Burns	T.34N., R.9W., secs. 12 and 13 T.34N., R.8W., secs. 17 and 18
Lava Fuels Reduction Units	T.34N., R.8W., secs. 8 and 9
Petty Knoll Fuels Reduction Units	T.34N., R.8W., secs. 17 and 18

TABLE 11

Site	Stems per Acre*					Total Stems	Basal Area
	TSS 2 .1-4.9 in	TSS 3 5-11.9 in	TSS 4 12-19.9 in	TSS 5 20-23.9 in	TSS 6 24-32+ in		
Sawmill	46 (23%)	103 (51%)	49 (24%)	2 (1%)	2 (1%)	202	120**
Lava	63 (30%)	83 (39%)	55 (26%)	5 (1%)	8 (4%)	214	149
Petty	28 (13%)	143 (68%)	35 (17%)	0	4 (2%)	210	103

* From 1983 Davis inventory

** From 1994 Hughes inventory

These proposed project areas are shown on Map 2, Appendix A. Fuel loading in these areas is high, ranging from 5-40 tons per acre and averaging 25 tons per acre. Horizontal spacing of trees is very close in these areas. Both the fuel loading and the density of trees in these areas coupled with lack of natural fuel breaks and fire management access roads makes the potential for severe wildfires and loss of old growth trees extreme.

Pinyon/Juniper Vegetation Community Weak Link:

The major weak link which is hindering the attainment of the pinyon/juniper vegetation community objective is the lack of plant diversity in often monotypic stands of this vegetation type. It is thought these monotypic stands of pinyon/juniper represent climax species in mid to late seral stages. Historically, it is thought that these mid seral to climax stands of vegetation were periodically disrupted by fire which moved them to a disclimax stage showing greater diversity of vegetation species. Additionally, it is thought that cattle grazing which reduces grass height (fine fuels necessary to carry fire) has reduced the occurrence of fire, thus reducing the periodic disruption of mid seral, late seral and climax stands of pinyon/juniper.

The following areas have low plant species diversity and show good potential for increased plant diversity. In addition, the Pinyon/Juniper Vegetation Community Weak Link can be corrected in these proposed areas with current BLM resources.

<u>Proposed Project/Area</u>	<u>Legal Description</u>
Tuckup Wood Harvest Area	T.35N., R.7W., secs.10, 14 and 15
Head of Toroweap Valley Wood Harvest Area	T.35N., R.7W., section 6 T.35N., R.8W., section 1
Nixon Wood Harvest Areas	T.34N., R.8W., section 3 T.35N., R.8W., section 34
Sawmill Wood Harvest Areas	T.35N., R.9W., secs. 26 and 35

These project areas are shown on Map 2, Appendix A. These areas are dominated by late and mid seral stage stands (see table 5). Canopy cover in these areas is generally 35-60%. Mid to late seral stages in this vegetation community lack understory plant vegetation and diversity. 96-100% of the composition by weight of the pinyon/juniper vegetation types is in trees.

Sagebrush/Grassland Vegetation Community Weak Link:

The major weak link which is hindering the attainment of the sagebrush/grassland community objective is the lack of plant diversity in often monotypic stands of this vegetation type. These monotypic stands of sagebrush are thought to represent climax species in mid to late seral stages. Historically, it is thought that mid seral to climax stands of this vegetation were periodically disrupted by fire which moved them to a disclimax stage showing greater diversity of vegetation species. Additionally, it is thought that cattle grazing which reduces grass height (fine fuels necessary to carry fire) has reduced the occurrence of fire, thus reducing the periodic disruption of mid seral, late seral and climax stands of sagebrush.

The following areas have low plant species diversity and show good potential for increased plant diversity. In addition, the Sagebrush/Grassland Vegetation Community Weak Link can be corrected in these proposed areas with current BLM resources.

<u>Proposed Project/Area</u>	<u>Legal Description</u>
Cantaloupe Sagebrush Reduction	T.35N., R.7W., secs. 5,7,8,17,18
White Springs Sagebrush Reduction	T.35N. R.8W., secs. 11,12,13,14
Little Oak Springs Chaining Sagebrush Reduction	T.34N., R.8W., secs. 10,11,12
North Toroweap Valley Sagebrush Reduction	T.35N., R.7W., secs. 19,29,30,31
South Toroweap Valley Sagebrush Reduction	T.34N., R.7W., secs. 17,18,19,20,30

These project areas are shown on Map 2, Appendix A. These areas are mainly dominated by mid to late seral stages consisting of 50-100% composition by weight sagebrush. These seral stages lack the herbaceous vegetation abundance and diversity exhibited by the potential natural community for this vegetation type.

Recreation Weak Links:

The major weak links which are hindering the attainment of the recreation resources objectives include the following:

- 1) The need for access management that is compatible and coincides with the diversity of visitor needs for the RCA area.
- 2) The need for the consistent application of a system which relates interpretive and/or informational materials and facilities to the amounts expected and/or needed by users in a spectrum of recreational settings.
- 3) The need for monitoring and correcting downward trends in recreation setting quality due to actions of visitors.
- 4) Development that does not take visual concerns or the cumulative effects on visual resources seriously.

These weak links are hindering attainment of the recreation resources objectives to some extent throughout the entire RCA.

Planned Management Actions:

The following management actions have been developed to meet the 5 specific objectives formulated by the interdisciplinary team. Furthermore, they have been ranked as priority management actions because they directly address weak links within the Mount Trumbull Ecosystem which are hindering attainment of objectives.

Ponderosa Pine Vegetation Community Management Actions:

Adoption of a Prescribed Fire Plan for the Entire RCA - This prescribed natural fire plan addresses three classified and one unclassified fuel type found in the RCA (see Appendix E).

Rationale for this Management Action:

Completion and implementation of this plan provides managers with a decision matrix to determine if fires should be suppressed or monitored, and provides specific information upon management constraints. The prescribed fire plan provides guidance for prescription parameters for all fuel types within the RCA.

Systematic Analysis of Changes in Forest Structure and Fire Regimes:

This analysis would be conducted by research staff from Northern Arizona University, School of Forestry. This analysis would follow well established procedures based on measurement of living and dead trees, reconstruction of pre-disruption forest structure (Covington and Moore 1994), and

dendroecological study of fire regimes (Swetnam and Baisan 1994). The biological diversity of the insect, tree, and herbaceous plant communities in contemporary and pre-disruption forests would be estimated. Young, mature, and old trees would be sampled for tree vigor and capability to resist invading insects and disease. Fire behavior and fuel structures would be assessed. Wildlife habitat for selected key species would be compared under contemporary and pre-disruption forest conditions. Finally, implications for additional human habitat values will be determined by estimating changes in the quantity and quality of natural resources including water, forage, wood, fiber and recreation opportunities. The result of this work would be a detailed characterization of the natural range of variability in pre-disruption forest and a thorough assessment of how these forest have changed up to the present.

Sampling and Analysis of Forest Areas Which Have Been Subject to Disturbance:

This sampling and analysis would be conducted by research staff from Northern Arizona University, School of Forestry. Specific sites where high-intensity wildfire, bark beetle mortality, prescribed broadcast fire, and understory thinning have occurred would be selected for sampling. At each of these sites, the extent, timing, and intensity of the disturbance would be determined and forest and fuel structures would be measured as described above. The full range of key forest health indicators, including biodiversity, tree vigor, fire behavior, fuels, wildlife habitat, and natural resource conditions, would be determined at each site. Once the effects of contemporary disturbance are quantified, each site would be compared to the range of natural variability in pre-disruption forests. The result of this comparison would clarify how contemporary disturbances alter ecological structures and successional processes, providing a basis to predict the effects on southwestern forests of no action, leading to high-intensity wildfire or large-scale bark beetle outbreaks, in contrast to the effects of management intervention through prescribed burning and understory thinning.

Rationale for the Preceding Two Management Actions:

To restore sustainable forest ecosystems, a scientific basis for understanding the structure and dynamics of healthy ecosystems must be developed. These management actions are intended to lay the groundwork for integrated ecosystem management by providing scientists, land managers, and the public with tested procedures for restoring ecosystem health.

Demonstration and Experimental Restoration Plots:

Demonstration and experimental restoration plots would be established jointly between Northern Arizona University, School of Forestry research staff and BLM staff. Demonstration plots would be treated first with varying degrees of understory thinning and prescribed fire. These plots would be selected in areas with good public access and visibility. These demonstrations would present the basic concepts of restoration ecology to the public, land managers, and scientists through field trips, interpretive materials, and workshops. Five demonstration plots of 3-5 acres in size would be treated. Next, experimental plots of 20 acres in size with 5 replicates would be installed in the RCA. These plots would form the scientific study area for detailed measurement of the ecological response to restoration treatments, including: tree establishment, growth, and vigor; herbaceous production; forest floor dynamics; wildlife use; and fuel structure changes. These demonstration and experimental plots would be distributed primarily in the areas described in the Sawmill Forest Restoration Units and Lava and Petty Knoll Fuels Reduction Units. Operational projects in these areas would be designed to accommodate the experimental studies. Livestock grazing would be excluded as necessary from the restoration plots until herbaceous understory vegetation is established.

Rationale for this Management Action:

The benefit derived from these management treatments would be the development of educational plots designed to demonstrate to the public the effects of forestry treatments and restoration of ponderosa pine ecosystems. Monitoring of these plots will provide managers information regarding the best techniques to restore forest health and reduce fuels.

Sawmill Forest Restoration Units - These units are located in T.34N., R.8W., portions of sections 6 and 7. There are a total of 3 restoration units comprised of 123, 172 and 153 acres. These areas are characterized by approximately, five old growth ponderosa pine trees per acre and an abundance of younger age class trees. Management practices have led to an ecosystem which is not sustainable and which is showing increased mortality of old growth trees due to competition with overstocked young age class trees. Restoration of these areas would involve removal of young age class trees to favor old growth trees and to alleviate an overall decline in biological diversity. Management actions in these units would include the following:

1) Selective thinning of TSS 2 and 3 ponderosa pine and potential, limited thinning of TSS 4 ponderosa, only when these trees are in direct competition with TSS 5-6 classes or where they represent an unacceptable fuel risk to TSS 5-6 classes. Thinning would follow leave tree marking by members of the interdisciplinary team including AGFD and BLM specialists. Initially, thinning would be concentrated 50-100 feet from the basal areas of old growth (TSS 5 and 6) trees to reduce competition and ladder fuels. Later, the majority of post settlement, young age class trees will be removed from these areas. Thinning would be carried out through service contracts, pulp/fiber sales and personal and/or commercial wood harvest sales. Harvesting systems could include but are not limited to the following systems:

- Short wooder Trees are hand felled, bucked into four foot lengths, and hand stacked. A machine picks up the stacks and loads them onto metal holding frames. The frames are then forwarded to a landing site where they are loaded onto log trucks.
- Machine feller and whole tree skidder Trees are felled by a machine and stacked in small groups. A rubber tired skidder picks up the trees and skids them to a landing site. Another machine de-limbs the trees and stacks them on a log truck.
- Commercial woodcutters Cutting areas would be assigned to one individual or group. Logs are cut to sell to others for home use. Trees are hand felled, cut up and hauled away in small trucks and trailers. This system would not involve upgrade of existing roads, nor new road construction.
- Individual woodcutters Individuals collect logs for home, personal use. Trees are hand felled, cut up and hauled away in small trucks and trailers. This system would not involve upgrade of existing roads, nor new road construction.

All methods of removing young age class trees from the forest other than commercial and individual woodcutting would be subject to NEPA compliance other than that found in the accompanying environmental assessment in Appendix F.

2) Removal of duff and other ground litter from the basal areas of old growth trees. This will prepare these trees for the use of prescribed fire by preventing root kill from excessive ground heating. The majority of old growth trees in prescribed fire units will be prepared in this manner.

3) Removal of duff and other ground litter from the basal areas of selected snags, and fallen large diameter trees which serve as wildlife habitat in preparation for the use of prescribed fire.

4) Construction of fire line around the perimeter of the units where existing roads and natural fuel breaks would not suffice.

5) Initiation of low intensity prescribed fires (multiple burns may be necessary) to reduce duff depth from a range of 1-10" to a range of .5-2", to reduce fuel loading from a range of 5-40 tons per acre to a range of 2-20 tons per acre, and in conjunction with thinning reduce the basal area of trees to an average of 60 to 80 ft²/acre predominantly consisting of old growth trees.

6) Supplemental seeding would be completed as necessary with native grass and forb species common to the area.

7) Livestock grazing would be excluded (as appropriate) from the treatment area or pasture, until understory herbaceous species are established. Utilization of key forage species would continue to be limited to an average of 50 percent of the current year's growth.

Mt. Logan Wilderness Fuels Reduction Burns - This management action is ongoing and has entailed the piling and burning of thinning slash cut and scattered before the area was designated as wilderness. This action is incorporated in the RCA plan for the purpose of public information only. It has been subject to prior NEPA review and thus is not subject to further NEPA review (see EA-AZ-010-91-22). During the mid 1970's about 700 acres of ponderosa pine in the Mt. Logan area was mechanically thinned to reduce competition between trees and to allow faster growth of the remaining trees. The cut trees were left where they lay causing a dangerous build up of fuels. In 1984, the Mt. Logan Wilderness Area was designated and included 600 acres of the 700 acre thinning. To enhance wilderness values and to reintroduce fire into the area the need existed to remove slash and initiate prescribed fire. Most slash piling and associated pile burning is now completed, however reduction of duff and other ground litter will continue through use of prescribed fire. Currently 4 units comprised of 8.5, 16.5, 30 and 35 acres have their perimeters lined with fire control lines. These units are located in T.34N., R.9W., portions of section 12. These areas may require multiple low intensity fires to reduce duff depth from a range of 1-10" to a range of .5-2" and to reduce fuel loading from a range of 5-40 tons per acre to a range of 2-20 tons per acre. This procedure will continue in units with perimeters to be lined with minimum tool fire control lines in T.34N., R.9W., portions of section 13 and T.34N., R.8W., portions of secs.17 and 18.

Lava Fuels Reduction Units - These management actions would occur in T.34N., R.8W., portions of sections 8 and 9 on approximately 200 acres. Nearly 100 years of fire suppression have led to a hazardous build up of fuels in the RCA. Without restoring the area to natural conditions, the continuation of ecosystem degradation will occur, leading inevitably to crown fires. Until built-up fuels are reduced to the point where wildfires can be allowed to burn naturally, expensive fire control and suppression will continue. Thus, initial work to restore a sustainable ponderosa pine ecosystem will involve fragmenting areas of continuous heavy fuels by restoring pre-disruption ecosystem structure and function, thereby reducing fire hazard. Ecological restoration will allow these areas to serve as anchor points for future fire suppression. These restored fire-breaks will serve as starting lines for potential future restoration efforts. Management actions to reduce fuel loading, fire danger, and associated loss of old growth trees would occur in this order;

1) Selective thinning of TSS 2 and 3 ponderosa pine. A limited number of TSS 4 trees may potentially be cut, but only if they are in direct competition with TSS 5 and 6 trees or pose a fuel risk to TSS 5 and 6 trees. Thinning would follow leave tree marking by members of the interdisciplinary team including AGFD and BLM specialists. Initially, thinning would be concentrated 50-100 feet from the basal areas of old growth (TSS 5 and 6) trees to reduce competition and ladder fuels. Later, the majority of post settlement, young age class trees will be removed from these areas. Thinning would be carried out through service contracts, pulp/fiber sales and personal and/or commercial wood harvest sales. Harvesting systems could include but are not limited to the following systems:

- Short wooder Trees are hand felled, bucked into four foot lengths, and hand stacked. A machine picks up the stacks and loads them onto metal holding frames. The frames are then forwarded to a landing site where they are loaded onto log trucks.
- Machine feller and whole tree skidder Trees are felled by a machine and stacked in small groups. A rubber tired skidder picks up the trees and skids them to a landing site. Another machine de-limbs the trees and stacks them on a log truck.
- Commercial woodcutters Cutting areas would be assigned to one individual or group. Logs are cut to sell to others for home use. Trees are hand felled, cut up and hauled away in small trucks and trailers. This system would not involve the upgrade of existing roads, nor new road construction.
- Individual woodcutters Individuals collect logs for home, personal use. Trees are hand felled, cut up and hauled away in small trucks and trailers. This system would not involve the upgrade of existing roads, nor new road construction.

All methods of removing young age class trees from the forest other than commercial and individual woodcutting would be subject to NEPA compliance other than that found in the accompanying environmental assessment in Appendix F.

- 2) Removal of duff and other ground litter from the basal area of old growth trees. This will prepare these trees for the use of prescribed fire.
- 3) Removal of duff and other ground litter from the basal areas of selected snags, and fallen large diameter trees which serve as wildlife habitat in preparation for the use of prescribed fire.
- 4) Construction of fireline around the perimeter of the units where existing roads and natural fuel breaks would not suffice.
- 5) Initiation of low intensity prescribed fire (multiple burns may be necessary) to reduce duff depth from a range of 1-10" to a range of .5-2", to reduce fuel loading from a range of 5-40 tons per acre to a range of 2-20 tons per acre, and in conjunction with thinning, reduce the basal area of trees to an average of 60 to 80 ft²/acre predominantly consisting of old growth trees.
- 6) Supplemental seeding would be completed as necessary with native grass and forb species common to the area.
- 7) Livestock grazing would be excluded (as appropriate) from the treatment area or pasture, until understory herbaceous species are established. Utilization of key forage species would continue to be limited to an average of 50 percent of the current year's growth.

Petty Knoll Fuels Reduction Units - These management actions would occur in T.34N., R.8W., portions of sections 17 and 18 on approximately 200 acres. Management action to reduce fuel loading, fire danger and associated loss of old growth trees would occur in this order;

- 1) Selective thinning of TSS 2 and 3 ponderosa pine. A limited number of TSS 4 trees may potentially be cut, but only if they are in direct competition with TSS 5 and 6 trees. Thinning would follow leave tree marking by members of the interdisciplinary team including AGFD and BLM specialists. Initially, thinning would be concentrated 50-100 feet from the basal areas of old growth (TSS 5 and 6) trees to reduce competition and ladder fuels. Later, the majority of post settlement,

young age class trees will be removed from these areas. Thinning would be carried out through service contracts, pulp/fiber sales and personal and/or commercial wood harvest sales. Harvesting systems could include but are not limited to the following systems:

- Short wooder Trees are hand felled, bucked into four foot lengths, and hand stacked. A machine picks up the stacks and loads them onto metal holding frames. The frames are then forwarded to a landing site where they are loaded onto log trucks.
- Machine feller and whole tree skidder Trees are felled by a machine and stacked in small groups. A rubber tired skidder picks up the trees and skids them to a landing site. Another machine de-limbs the trees and stacks them on a log truck.
- Commercial woodcutters Cutting areas would be assigned to one individual or group. Logs are cut to sell to others for home use. Trees are hand felled, cut up and hauled away in small trucks and trailers. This system would not involve the upgrade of existing roads, nor new road construction.
- Individual woodcutters Individuals collect logs for home, personal use. Trees are hand felled, cut up and hauled away in small trucks and trailers. This system would not involve the upgrade of existing roads, nor new road construction.

All methods of removing young age class trees from the forest other than commercial and individual woodcutting would be subject to NEPA compliance other than that found in the accompanying environmental assessment in Appendix F.

- 2) Removal of duff and other ground litter from the basal area of old growth trees. This would prepare these trees for the use of prescribed fire.
- 3) Removal of duff and other ground litter from the basal areas of selected snags, and fallen large diameter trees which serve as wildlife habitat in preparation for the use of prescribed fire.
- 4) Construction of fireline around the perimeter of the units where existing roads and natural fuel breaks would not suffice.
- 5) Initiation of low intensity prescribed fire (multiple burns may be necessary) to reduce duff depth from a range of 1-10" to a range of .5-2", to reduce fuel loading from a range of 5-40 tons per acre to a range of 2-20 tons per acre, and in conjunction with thinning, reduce the basal area of trees to an average of 60 to 80 ft²/acre predominantly consisting of old growth trees.
- 6) Supplemental seeding would be completed as necessary with native grass and forb species common to the area.
- 7) Livestock grazing would be excluded (as appropriate) from the treatment area or pasture, until understory herbaceous species are established. Utilization of key forage species would continue to be limited to an average of 50 percent of the current year's growth.

The locations of these management actions are exhibited on Map 2, in Appendix A.

Rationale for the Preceding 3 Management Actions:

Ponderosa pine ecosystems are adapted to frequent low intensity ground fires. Thinning, and prescribed fire will create fire breaks which will stop or slow the spread of high intensity crown fires. In addition, thinning and prescribed fire will move the forest to a stand exhibiting a higher percentage of old growth trees, exhibiting greater openings and therefore greater herbaceous

understory diversity. Furthermore, reduction of current fuel loadings to more natural levels will allow for natural wildfire to again play its role in the ecosystem, and preclude the need for costly fire suppression.

Pinyon/Juniper Vegetation Community Management Actions:

Tuckup Wood Harvest Area - This management action would occur in T.35N., R.7W., portions of sections 10,14, and 15. This action would consist of commercial and/or personal use cutting of pinyon/juniper in small units with irregular edges not to exceed 30 acres in size for a maximum treated area of 200 acres. These units would be interspersed to create a mosaic of openings in the pinyon/juniper woodland. All stems over 3 inches in diameter would be cut and all limb wood exceeding 2 inches in diameter would be harvested. Slash would be deposited in drainages for erosion control, left to lay where it creates a continuous fuel bed, piled where necessary to create a continuous fuel-bed, and later burned under prescription. Where necessary, native grasses and shrubs will be seeded to help re-establish herbaceous vegetation. Livestock would be excluded (as appropriate) from the treated area or pasture, until herbaceous species are established. Utilization of key forage species would be limited to an average of 50 percent of the current years growth. Monies collected from the sale of permits will be retained to cover costs associated with burning/seeding.

Head of Toroweap Valley Wood Harvest Area - This management action would occur in T.35N., R.7W., portions of section 6 and T.35N., R.8W., portions of section 1. The constraints and process for this management action are the same as for the Tuckup Wood Harvest Area.

Nixon Wood Harvest Area - This management action would occur in T.34N., R.8W., portions of section 3 and T.35N., R.8W., portions of section 34. The constraints and process for this management action are the same as for the already described wood harvest areas.

Sawmill Wood Harvest Area - This management action would occur in T.35N., R.8W., portions of sections 26 and 35. The constraints and process for this management action are the same as for the already described wood harvest areas.

Rationale for the Preceding Four Management Actions:

Monotypic stands of pinyon/juniper with little species diversity are thought to represent the climax species for this vegetation community. Historically, it is thought that mid seral, late seral and climax stands of this vegetation were periodically disrupted by fire which moved them to a disclimax stage showing greater diversity of vegetation species. Additionally, it is thought that cattle grazing which reduces grass height (fine fuels necessary to carry fire) has reduced the occurrence of fire, thus reducing the periodic disruption of mid seral, late seral and climax stands of pinyon/juniper. Currently, with the lack of fine fuels necessary to carry natural fire through this vegetation community it is necessary to input energy into the community (in the form of cutting and prescribed, man ignited fire) to move away from the stable state or near climax community now seen in these areas. Movement from a mid seral, late seral or climax community to a disclimax community should increase vegetation species diversity. Therefore, wildlife diversity would be expected to increase as well. Watershed values would benefit by providing a stabilizing ground cover (herbaceous species) which reduces run-off and associated erosion.

These proposed management actions for the Pinyon/Juniper Vegetation community are exhibited on Map 2, Appendix A.

Sagebrush/Grassland Vegetation Community Management Actions:

Cantaloupe Valley Sagebrush Reduction - This management action would occur in T.35N., R.7W., portions of sections 5,7,8,17, and 18. This action would consist of the use of prescribed fire to reduce sagebrush on 800 acres to reduce the amount of big sagebrush on sagebrush dominated sites to improve quality, quantity and diversity of herbaceous species. Livestock grazing would be excluded (as appropriate) from the treated area or pasture, until herbaceous species are established. Utilization of key forage species would be limited to an average of 50 percent of the current years growth.

White Springs Sagebrush Reduction - This management action would occur in T.35N., R.8W., portions of sections 11,12,13, and 14. This action would consist of the use of prescribed fire and/or tebuthiuron to reduce sagebrush on approximately 1000 acres. The presence of fine fuels to carry fire in this area makes the use of prescribed fire the most effective method of sagebrush reduction. Should the use of fire fail to be effective the use of tebuthiuron would be considered. Once use of fire and/or tebuthiuron has been completed, portions of the area will be seeded with herbaceous species to supplement the existing seed source and increase plant diversity. Livestock grazing would be excluded (as appropriate) from the treated area or pasture, until herbaceous species are established. Utilization of key forage species would be limited to an average of 50 percent of the current years growth.

Little Oak Springs Sagebrush Reduction - This management action would occur in T.34N., R.8W., portions of sections 10 - 12. This action would consist of the use of tebuthiuron or prescribed fire to reduce sagebrush in an area which was chained previously. This action would involve approximately 2000 acres. The lack of fine fuels to carry fire makes the use of tebuthiuron the most effective method of sagebrush reduction. However, if weather and fuel conditions are correct, the use of prescribed fire may be attempted. Once use of tebuthiuron and/or fire has been completed, the area will be seeded with herbaceous species to supplement the existing seed source and increase plant diversity. Livestock grazing would be excluded (as appropriate) from the treated area or pasture, until herbaceous species are established. Utilization of key forage species would be limited to an average of 50 percent of the current years growth.

North Toroweap Valley Sagebrush Reduction - This management action would occur in T.35N., R.7W., portions of section 19,29,30, and 31. This management action would consist of the use of prescribed fire and/or tebuthiuron to reduce sagebrush on approximately 1000 acres in an area which was previously chained. The lack of fine fuels to carry fire makes the use of tebuthiuron the most effective method of sagebrush reduction. However, if weather and fuel conditions are correct, the use of prescribed fire may be attempted. Once use of tebuthiuron and/or fire has been completed, portions of the area will be seeded with herbaceous species to supplement the existing seed source and increase plant diversity. Livestock grazing would be excluded (as appropriate) from the treated area or pasture, until herbaceous species are established. Utilization of key forage species would be limited to an average of 50 percent of the current years growth.

South Toroweap Valley Sagebrush Reduction - This management action would occur in T.34N., R.7W., portions of sections 17,18,19,20, and 30. This management action would consist of the use of prescribed fire and/or tebuthiuron to reduce sagebrush on approximately 2000 acres. The lack of fine fuels to carry fire makes the use of tebuthiuron the most effective method of sagebrush reduction. However, if weather and fuel conditions are correct, the use of prescribed fire may be

attempted. Once use of tebuthiuron and/or fire has been completed, the area will be seeded with herbaceous species to supplement the existing seed source and increase plant diversity. Livestock grazing would be excluded (as appropriate) from the treated area or pasture, until herbaceous species are established. Utilization of key forage species would be limited to an average of 50 percent of the current years growth.

Rationale for the Preceding 5 Management Actions:

Monotypic stands of sagebrush with little species diversity are thought to represent the climax species for this vegetation community. Historically, it is thought that mid seral to climax stands of this vegetation were periodically disrupted by fire which moved them to a disclimax stage showing greater diversity of vegetation species. Additionally, it is thought that cattle grazing which reduces grass height (fine fuels necessary to carry fire) has reduced the occurrence of fire, thus reducing the periodic disruption of mid seral, late seral and climax stands of sagebrush. Currently, with the lack of fine fuels necessary to carry natural fire through this vegetation community, it is necessary to input energy into the community (in the form of tebuthiuron application or man ignited fire) to move away from the stable state or near climax community now seen in these areas. Movement from a mid seral, late seral or climax community to disclimax (earlier seral stage) community should increase vegetation species diversity. In turn, this should increase habitat and wildlife species diversity. Additionally, watershed values would benefit by providing ground cover (herbaceous species) to reduce run-off and associated erosion.

Recreation Management Actions:

Management actions for Recreation are divided into 4 categories. These are, Transportation/Access Management Actions, Information/Interpretation Management Actions, Visitor Use Management Actions, and Other Resource Uses/Users Management Actions.

1. Transportation/Access Management Actions

- a. Place all roads or trails where maintenance may be required on the District Transportation Plan, or give a project number prior to maintenance. Set maintenance levels and frequencies to complement the appropriate recreation management setting guidance as shown below.

Mt. Trumbull RCA Road/Trail Maintenance Guidance By Zone				
Road/Trail Description	Maintenance Level Range*	Maintenance Frequency Range*	Road/Trail Type Range*	Other Comments
Natural Setting Roads	3-4	once annually	C or L	Mt. Trumbull Road (County 109)
Backcountry Setting Roads	2-3	once every 2-3 years	L, R, or PR	Temple Trail Road (BLM 1001)

Mt. Trumbull RCA Road/Trail Maintenance Guidance By Zone				
Road/Trail Description	Maintenance Level Range*	Maintenance Frequency Range*	Road/Trail Type Range*	Other Comments
Primitive Setting Roads	0-2	once every 3-4 years or none	R, PR, or NT	Big Spring Road (BLM 1023)
Natural Setting Trails	Scheduled for upkeep of hardened tread, drainage	once annually	Interpretive	Generally non-native tread surface; UFAS** design standard: Challenge Level 1
Backcountry Setting Trails	As needed to maintain tread surface, drainage	once every 2-3 years	Multi-purpose	Generally non-motorized; UFAS design standard: Challenge Level 2; native tread surface
Primitive Setting Trails	Minimum needed for obstruction removal, drainage, or none	once every 3-4 years or none	Multi-purpose	Generally non-motorized; UFAS design standard: Challenge Level 2; native tread surface

* See BLM Manual 9113 for description of Transportation Maintenance Terms

** UFAS is Uniform Federal Accessibility Standard

- b. Maintain BLM roads and trails and request maintenance of County roads in the RCA at the levels and frequencies shown in the preceding table. Maintenance levels, frequencies, and road types are described in BLM Manual 9113.
- c. Inventory all roads and trails in the RCA. Decide which roads or trails to physically close. Rehabilitate and sign closed roads. Produce a RCA road map for public use. Federal register notices would be used to notify the public of any road closures.
- d. Complete road number posting for roads in the Natural and Backcountry Settings, conforming to the latest edition of the *Arizona Strip Visitor Map*.
- e. Rehabilitate, to setting-appropriate standards, roads that have been temporarily upgraded once the purpose of the upgrade is served.

- f. Consider realignments of segments of BLM transportation or project roads or trails when resource damage is occurring or when physical access is inhibited.
- g. Develop specific maintenance actions for each BLM transportation or project road as the need arises using the Vermillion Resource Area Project Road Maintenance process.
- h. Construct short, readily accessible nature trails in ponderosa pine ecosystem restoration areas, for education and information purposes.

Rationale for Transportation/Access Management Actions

Management of accessibility in large part determines amounts, kinds, times, and locations of visitor use. The transportation and access management actions taken together are intended to allow for both administrative/resource user access and for a variety of visitors and recreation activities throughout the RCA, while at the same time carrying out the direction of the RMP to "maintain remoteness" on the Arizona Strip.

The intent is to provide a variety of access types to coincide with the variety of visitor desires. For instance, visitors wanting more of a challenge and uncrowded conditions may need areas where the quality of roads and trails is generally low. Conversely, those wanting little challenge and only some solitude desire areas where road conditions are good and dependable.

2. Information/Interpretation Management Actions

- a. Use the table "Recreation Management Settings" (see Appendix B) for consistent development of overall themes for visitor information and interpretation projects (interpretive sites, brochures, flyers, maps, etc.).
- b. Use the guidance in Appendix D for development of informational/Interpretive signing.
- c. Write a "**Country Roads Interpretive Strategy**" to guide development of interpretive facilities in the natural setting areas in the RCA. This includes any facility needs at Nampaweap, Sawmill/Uinkaret Pueblo, Nixon Flat, Temple Trail, Tuweep Church Site, and Hurricane Rim Overlook. This does not preclude the use of flyers for these sites in the interim.

- d. Assess current directional road signing in the RCA in light of the management setting guidance (see Appendices C and D). Upgrade or revise road signing to conform with this guidance.
- e. Install wilderness portal signs in appropriate locations around Mount Trumbull and Mount Logan Wildernesses.
- f. Interpret cultural values at Witch Pool and geologic values at Mount Logan Overlooks through flyer/brochure/tours only. Provide access and parking at Backcountry Setting-appropriate levels.
- g. Develop a Natural Setting tour flyer or brochure with the theme of vulcanism to be made available at Nixon Flat.
- h. Develop a variety of media presentations (slide presentations, videos, brochures) which inform the public of ecosystem restoration efforts.

Rationale for Information/Interpretation Management Actions

Management of information and interpretive products can contribute greatly to the amounts, kinds, times, and locations of visitor use. Again, the information and interpretive management actions taken together are intended to provide for a variety of visitors and recreation activities throughout the RCA, while at the same time carrying out the direction of the RMP to "maintain remoteness" on the Arizona Strip.

The intent is to provide a decreasing amount of facilities, services, information, and interpretation as visitors move from Natural Settings areas into Backcountry and Primitive Settings. Such visitor services will be designed to compliment the generic needs (or lack thereof) of typical visitors to each zone. Using a multiple setting strategy is intended to connect the right visitor with the right setting for that visitor's outdoor skills, vehicle type, confidence level, and desired activities. This strategy will help visitors better choose what they want to do and where.

3. Visitor Use Management Actions

- a. Continue to send out annual hunter information letter mailings for those having big game permits in the RCA area.
- b. Install and monitor new traffic and trail counters in Backcountry and Primitive settings respectively.

- c. Develop a Ranger patrol strategy for significant cultural and recreational sites/areas that specifies monitoring frequencies, locations, methods.
- d. Conduct a Level III Recreation Inventory with emphasis toward determining visitor recreational preferences.
- e. Construct a trailhead facility in the Nixon Flat area that will:
 - provide parking for 15 vehicles at-one-time.
 - provide potable water that meets State water quality standards.
 - provide for registration and appropriate signing
 - serve as a trailhead for the Mt. Trumbull Trail.
 - provide fencing to eliminate vehicle parking in the wilderness.
 - meet Uniform Federal Accessibility Standards for Challenge Level 2.
 - conform to Natural Setting development levels.
 - provide information and interpretation outlined in the "Country Roads Interpretive Strategy" and ecosystem restoration efforts.
- f. Respond with appropriate management actions if unacceptable trends in resource or social conditions occur. Use of these management actions would only occur following agreement by the interdisciplinary team for their need and following public involvement and notification. The following possible responses are in decreasing order of acceptability:

1) Reducing Unacceptable Campsite Impacts

- Initiate information and education program (Leave No Trace)
- Frequent contact with and education of repeat campers
- Ranger contact
- Campsite restoration/rehabilitation
- Allow open fires in containers only, i.e., fire pan
- Prohibit ground fires
- Equipment requirements, i.e., stoves only
- Close sites to certain types of use
- Limit group size
- Seasonal campsite closures
- Campsite closures
- Require campsite permits
- Harden popular campsites to accommodate concentrated use while limiting impacts (i.e., graveled parking, fire rings)

2) Reducing Increases in Use

- Initiate information and education program (Leave No Trace)
- Initiate more specific marketing of opportunities
- Manipulate road/trail conditions to discourage use
- Limit distribution of informational/interpretive publications
- Promote other regional opportunities
- Ranger contact
- Limit commercial recreation use
- Limit group size
- Enforcement
- Explore redistribution of visitor use patterns
- Encourage use in lesser used Backcountry Settings during peak use periods
- Limit the number of vehicles per group
- Revise RMP remoteness strategy to accommodate greater use

3) Reducing Encounters With Other Groups

- Initiate information and education program (Leave No Trace)
- Redistribute some existing weekend use to occur on weekdays
- Redistribute some peak use to off-season periods
- Promote other regional opportunities
- Ranger contact
- Regulate commercial recreation to low use periods
- Explore further redistribution of visitor use patterns
- Encourage use in less used Backcountry Settings during peak use periods
- Limit the number of vehicles per group
- Limit the number of groups per day in peak use periods
- Enforcement
- Revise RMP and remoteness strategy to accommodate greater use

4) Reducing Vandalism and Illegal Activities

- Initiate information and education program focused on the RCA
- Publicize rewards
- Ranger contact and patrols
- Focus Arizona Site Steward and other volunteer efforts on RCA patrols
- Limit distribution of non-public site information.

Rationale for Visitor Use Management Actions

Management of visitor behavior can contribute to maintaining, improving, or degrading recreational settings. Management actions related to visitor use, when taken together, are intended to ensure that while visitors enjoy a variety of activities in the RCA, they do not contribute to degradation of resource and social conditions.

The intent is also to acquire more accurate information concerning visitor use, profiles, and patterns of use so that if resource and/or social conditions show negative trends, a number of appropriate management responses are available to address the negative change agent(s).

4. Other Resource Uses/Users Management Actions

Management actions should be implemented in the order they appear.

- a. Conduct a Class III Cultural Inventory of the Nampaweap ACEC.
- b. Write an environmental assessment for the proposed field school excavations of Uinkaret Pueblo.
- c. Develop with all permittees (all programs) "clean up" strategies associated with the permitted use by FY96, then maintain clean conditions.
- d. Camouflage paint all above-ground water catchment and storage structures in the RCA where visual contrast exceeds VRM Class II objectives.
- e. Conduct VRM Contrast Rating Evaluations on all projects proposed in the RCA.

Rationale for Other Resource Uses/Users Management Actions

Management of other resource uses and users can also contribute to maintaining, improving, or degrading recreational settings. Again, the management actions taken together should ensure that while these uses of the public lands continue in the RCA, they do not contribute to the degradation of recreational resource and social conditions. Additionally, acquisition of available private and state lands in the RCA would allow management consistency in the area.

Monitoring:

The Vermillion Resource Area will conduct informal evaluations of monitoring data and resource conditions on an annual basis, and will report evaluations to the Mt. Trumbull RCA interdisciplinary team and any other interested agency or public. Interested agencies or public individuals or groups may participate in this evaluation or meeting. Should the evaluation reveal unacceptable conditions, a formal evaluation will be initiated.

Formal evaluations will be conducted in three year intervals or in the event that informal evaluations by the interdisciplinary team reveal unacceptable conditions. Formal evaluations will be completed by the full Mount Trumbull RCA interdisciplinary team and will include the actions below:

- 1.) Management actions that have been completed will be documented.
- 2.) Management actions for future implementation will be identified and prioritized.
- 3.) Monitoring data will be analyzed to determine if plan objectives are being met.
- 4.) If objectives are not being met, new management actions will be developed and recommended by the interdisciplinary team. New issues will be analyzed to determine if existing objectives will adequately respond to them. If existing objectives will resolve new issues, management actions devised to meet the objective will be analyzed by the interdisciplinary team. Next, compliance with the National Environmental Policy Act and all other applicable legislation to protect the environment will be completed, and the action(s) will be implemented.
- 5.) Although vegetation objectives are being met, if other desired conditions are being lost or show a downward trend due to a resource use such as grazing or recreation, the use causing the undesirable condition will be reduced or adjusted.

Newly developed actions identified for implementation will become plan revisions or amendments. Plan amendments will be subject to additional NEPA review and will be available for public review for 30 days before a decision is made to implement the action(s)

Monitoring Ponderosa Pine, Pinyon/Juniper, and Sagebrush/Grassland Objectives:

- 1.) Maintain existing utilization and trend studies at key areas in the ecosystem.
- 2.) Establish additional transects in all Ponderosa Pine proposed treatment areas to determine duff depth, fuel loading, and tree basal area prior to implementation of management actions to increase accuracy of measuring the success of the objective.

Rationale:

Maintaining existing study areas and establishing new transects in ponderosa pine areas will increase accuracy of measuring the success of objectives, and will remedy geographical gaps in the existing data.

Monitoring Recreation Objectives:

- 1.) Monitor 15 selected campsites in 3 different recreation setting areas using the Campsite Impact Analysis Worksheet on a rotating basis, e.g., 3 each year.
- 2.) Monitor all traffic and trail counters monthly.
- 3.) Monitor group encounters in all settings during peak visitation periods in locations specified in Table 9.
- 4.) Conduct a Level III Recreation Inventory with emphasis toward determining visitor recreational preferences.
- 5.) Increase inventories to document cultural sites before information is lost.

Rationale:

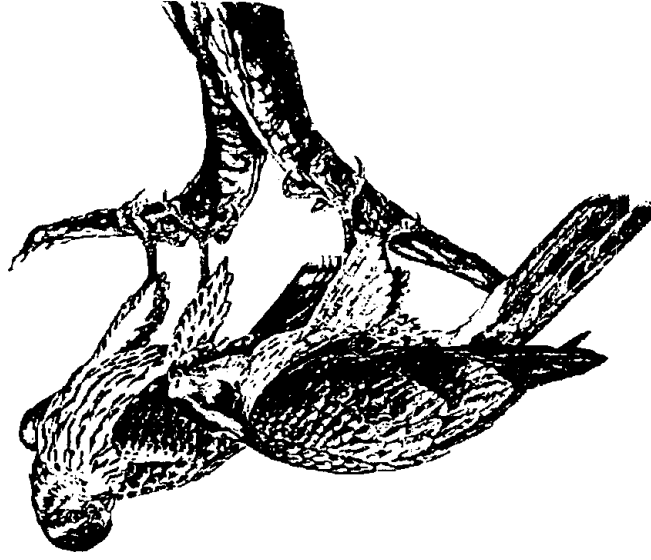
Acquiring more accurate information concerning visitor use and patterns of use will allow management to make the appropriate response should resource and/or social conditions show negative trends.

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Appendix A
Maps



Appendix B

Individual visitor information and interpretation projects such as development of interpretive sites, brochures, flyers, maps, etc. will require common themes and parameters by recreational setting to be effective. The following chart summarizes those themes by giving each setting a thematic name and outlining, from a visitor perspective or orientation, factors that influence realizing recreation experience.

Mt. Trumbull RCA - Factors Influencing Recreation Experience Opportunities			
Factors Influencing Recreation Experience Opportunities	Natural Setting "Country Roads"	Backcountry Setting "Backcountry Pathways"	Primitive Setting "Primitive Passages"
1. Difficulty rating	• Easy	• Difficult	• Advanced
2. Vehicle recommendations	• Sedan (on selected roads during good weather) • Sport vehicle • Moderate clearance needed • Touring/Enduro motorcycle • Mountain bicycle	• 2WD in most areas • High clearance needed • 4WD/ATV in some areas • Enduro/Dirt motorcycle • Mountain bicycle	• Generally non-motorized • 4WD/ATV in some areas • Dirt motorcycle • Mountain bicycle

Mt. Trumbull RCA - Factors Influencing Recreation Experience Opportunities				
Factors Influencing Recreation Experience Opportunities		Natural Setting "Country Roads"	Backcountry Setting "Backcountry Pathways"	Primitive Setting "Primitive Passages"
3. Primary recreational activities		• Sightseeing • Camping • Visiting cultural sites • Viewing wildlife • Photography • Driving for pleasure • Picnicking • Hunting • Pine nut collection • Firewood/Christmas tree cutting	• Sightseeing • Camping • Visiting cultural sites • Viewing wildlife • Photography • Driving for pleasure • Picnicking • Hunting • Pine nut collection • Firewood and Christmas tree cutting • Hiking • Backpacking • Vehicle exploring • Exper. solitude	• Sightseeing • Camping • Viewing wildlife • Photography • Hunting • Pine nut collection • Hiking • Backpacking • Vehicle exploring • Experiencing solitude
4. Time investment		• 1 or more days	• 1 or more days	• 1 or more days
5. Degree of solitude		• Moderate	• Excellent	• Outstanding
6. Map reading skills needed		• Moderate	• Moderate/High	• High
7. Survival skills needed		• Some	• Moderate	• High
8. Likelihood of getting lost if unprepared		• Slight	• Moderate	• High
9. Likelihood of getting help if stranded		• Moderate	• Low	• Very low
10. Probable waiting time for first contact with another party		• 30 minutes to several hours	• Several hours to several days	• Several hours to several days

Mt. Trumbull RCA - Factors Influencing Recreation Experience Opportunities			
Factors Influencing Recreation Experience Opportunities	Natural Setting "Country Roads"	Backcountry Setting "Backcountry Pathways"	Primitive Setting "Primitive Passages"
11. Probable waiting time for summoned help to arrive	• 2 hrs	• 4-6 hrs	• 6+ hrs
12. Drinking water availability	• Very little	• No	• No
13. Gasoline availability	• No	• No	• No
14. Accommodations availability (motel, hookups)	• No	• No	• No
15. Groceries, eating establishments	• No	• No	• No
16. Typical road type	• Improved gravel or dirt; frequent, moderate to high maintenance	• Improved gravel or dirt, infrequent, low maintenance	• Unmaintained or not present
17. Range of typical road conditions	• Good to muddy/impassable	• Fair to impassable	• No roads to very poor
18. Level of informational, directional, or interpretive signing	• Frequent	• Occasional	• Rare
19. Available BLM informational flyers, brochures, etc.	• Some	• Few	• Rare
20. Visitor centers, interpretive sites	• Some	• No	• No
21. Developed campgrounds, picnic areas	• Few	• No	• No

Appendix C

Mt. Trumbull RCA Desired Recreation Conditions

Resource Conditions	Natural Zone	Backcountry Zone	Primitive Zone
Overall Condition	Generally natural with human modifications moderately evident.	Predominantly natural with human modifications somewhat evident.	Predominately natural with human modifications occasionally evident or not present.
Duration and Type of Impacts	Some visitor impacts to soil and vegetation persist from year to year and are typically associated with moderate use in concentration areas such as campsites and overlooks. Other resource user impacts are commonly seen, generally permanent, and typically associated with rural, commodity users.	Most visitor impacts recover annually and are typically associated with light use in concentration areas such as campsites and vegetative gathering sites. Other resource user impacts are occasionally seen, generally permanent, and typically associated with rural, commodity uses.	Most visitor impacts recover annually and are typically associated with very light use in concentration areas such as campsites. Other resource user impacts are either nonexistent or dispersed, seldom seen, generally permanent, and typically associated with rural commodity uses.
Visibility of Impacts	Apparent to many visitors.	Visitor impacts apparent to some: other resource impacts apparent to many visitors.	Unnoticeable to apparent to some visitors.

Mt. Trumbull RCA Desired Recreation Conditions

Social Conditions	Natural Zone	Backcountry Zone	Primitive Zone
Overall Conditions	Opportunities for solitude low to moderate; degree of challenge and risk low.	Opportunities for solitude moderate to excellent; degree of challenge and risk moderate to high.	Opportunities for solitude excellent to outstanding; degree of challenge and risk high to very high.
General level of contacts or encounters with others	Moderate to low	Low	Very low
Inter party contacts or encounters while traveling	Moderate to low	Low	Rare
Inter party contacts or encounters while camped	Moderate to low	Low	Rare
Sights and sounds of other resource users	Common to occasional	Occasional to rare	Rare

Mt. Trumbull RCA Desired Recreation Conditions

Desired Managerial Conditions	Natural Zone	Backcountry Zone	Primitive Zone
Overall Conditions	Focus on maintaining recreation settings that frequently provide for user security and convenience.	Focus on maintaining recreation settings that occasionally provide for user security and convenience.	Focus on maintaining recreation settings that rarely provide for user security and convenience.
Visitor contact with management personnel	Frequent	Frequent to occasional	Occasional to rare
Type, level, and location of visitor information	Formal, moderate, on site/off site	Informal, occasional, off site	Informal, rare, offsite
Signing	Frequent to occasional, generally permanent	Rare, generally temporary	Rare, temporary
Typical road standard	Improved gravel or dirt, frequent maintenance	Dirt, occasionally maintained	Dirt or none, rarely maintained
Degree of user facilities development	Moderate to low	Very low to none	None

Appendix D

Signing

Natural Setting

The Natural Setting area generally includes corridors along higher standard county and BLM roads. Travelers in these areas still require and expect directional information and may desire some on-site interpretation of various resources and values. The desire for risk, challenge, and solitude is low. Since there is a limited number of roads meeting the higher standards needed to accommodate sedans, important visitor information can effectively be provided to the majority of travelers at a small number of sites. Signs typically provided in this setting would be:

- Emergency/hazard signs (those necessary for public health and safety); may be temporary or permanent
- BLM or County road number posts
- Directional signs
- Informational/Interpretive signs or displays
- Portal signs
- Designated trail or route markers

The level of BLM signing will be the minimum necessary to assist visitors in driving the roads in this setting without the benefit of a map. Directional signing will be consistent in its use of popular or common destinations and appropriate mileages and kilometers. Visual sensitivity of the scenic resources along these roads is moderately high, due to the number of vehicles per day.

All signing will meet appropriate standards for the type and purpose of signs. Special signing, such as informational/interpretive, will use design and materials appropriate to the natural settings.

Backcountry Setting

The Backcountry Setting area generally includes areas of lower standard, secondary roads and ways. Travelers expect to be more self-sufficient, using vehicles capable of off-highway travel, possessing maps and a moderate level of outdoor, navigational, and survival skills. These travelers desire backcountry experiences that include a higher degree of risk, challenge, and solitude and a low level of management presence. Numerous access points make it difficult to provide centralized information on-site. Signing in this setting would be limited to the following:

- Emergency/hazard signs (those necessary for public health and safety); should be temporary
- BLM road number posts
- Directional signs (minimum necessary on BLM roads only)

The level of BLM signing will be the minimum necessary to assist visitors in driving

the Backcountry BLM roads only. Directional signing will be the minimum necessary to clarify situations where road number posts are inadequate. Such signing will be consistent in its use of popular or common destinations and appropriate mileages and kilometers. Visual sensitivity of the scenic resources along these roads is moderate, due to the low numbers of vehicles per day along these corridors.

All signing will meet appropriate standards for the type and purpose of signs. Off-site methods, such as mail-out information, will be the primary method of providing information and interpretation.

Primitive Setting

The Primitive Setting includes wilderness areas, other large areas that are roadless, as well as areas of lower standard, secondary roads and ways. Travelers expect to be self-sufficient, using vehicles capable of off-highway travel, possessing maps and a higher level of outdoor, navigational, and survival skills. Additionally, many visitors use non-motorized means of travel, both on trails and cross-country. These travelers desire backcountry experiences that include the highest degree of risk, challenge, and solitude and a very low management presence. Signing in this setting would be limited to:

- Emergency/hazard signs (those needed for public health and safety); should be temporary
- Trailhead information boards, trail signs and markers

The level of BLM signing will be the minimum necessary to assist visitors in emergency situations or at a designated trailhead. All signing will meet appropriate standards for the type and purpose of signs. Wilderness management plans provide guidance for signing involving wilderness areas.

Appendix E

MT. TRUMBULL RCA FIRE PLAN

Fuel Models and Prescriptions

There are three classified fuel types and one unclassified fuel type in the RCA.

NFDRS Fuel Model C (FBPS Fuel Model 2 or 9)

This is the model used for the ponderosa pine stands. The principal fuel carrying a fire in this type is surface litter. Under the prescription, the fire will not involve trees for the most part. If a fire is determined to be located in this fuel type, fuel model C of the decision matrix will be used as a guide as to whether to call the fire a prescribed natural fire or to suppress the fire.

Open ponderosa pine stands typify Model C fuels. Perennial grasses and forbs are the primary ground fuels but there is enough needle litter and branchwood present to contribute significantly to the fuel loading. Some brush and shrubs may be present but they are of little consequence. Vegetation types in the RCA covered by Fuel Model C are closed, ponderosa stands, and some pinyon-juniper stands.

Prescription

The following prescription guidance will be used initially for Fuel Model C.

Temperature	< 75F
Minimum Relative Humidity	> 20%
10 Hour Fuel Moisture	> 15%
1,000 Hr. Fuel Moisture	> 20%
20 Foot Windspeed	< 10 mph
Live Fuel moisture	> 130%

The weather information will be obtained from the Logan Remote Automated Weather Station (RAWS) until personnel are on the fire.

NFDRS Fuel Model K (FBPS Fuel Model 11)

This is the model used for the area of pre-commercial thinning slash area of the Mt. Logan area. If the fire is determined to be located in this fuel type immediate suppression will take place.

Slash fuels from light thinning and partial cuts in conifer stands are represented by Fuel Model K. Typically the slash is scattered about under an open overstory where the loading of all fuels is less than 15 tons/acre.

Prescription

The following prescription guidance will be used initially for fuel model K.

Temperature	<75F
Minimum Relative Humidity	>20%
10 Hour Fuel Moisture	>15%
1000 Hour Fuel Moisture	>20%
20 Foot Windspeed	<10mph

This information will be gathered from the Logan RAWS station and corrected for fire location specifics. If ground monitors are dispatched to a fire in this fuel type, weather observations will be made on site.

Fuel Model T (FBPS Fuel Models 2 and 6)

The sagebrush-grass type is represented by Fuel Model T. The shrubs burn easily and are not dense enough to shade out grass and other herbaceous plants. The shrubs must occupy at least one-third of the site.

Prescription:

The following prescription guidance will be used initially for fuel model T.

Temperature	< 95
Minimum Relative Humidity	> 8%
10 Hour Fuel Moisture	> 5%
20 Foot Windspeed	< 25 mph
Live Fuel Moisture	>110%

NFDRS Fuel Model F (FBPS Fuel Model 6)

Fuel Model F represents stands of pinyon-juniper; however, fire activity will be overrated at low windspeeds and where there are sparse ground fuels. Fuel model F applies to the stands of oakbrush and other chaparral vegetation as well as the more dense stands of pinyon-juniper.

Prescription:

The following prescription guidance will be used initially for Fuel Model F.

Temperature	< 85
Minimum Relative Humidity	> 10%
10 Hour Fuel Moisture	> 5%
20 Foot Windspeed	< 15 mph

This information will be gathered from the Logan RAWS station and corrected for fire location specifics. If ground monitors are dispatched to a fire in this fuel type, weather observations will be made on site.

Unclassified Pinyon-Juniper

This includes those areas of pinyon-juniper where there is not enough of an understory to carry surface fires. The prescription for these areas is the same as for Fuel Model F.

Action Following the Report of an Ignition

Immediately following the report of a fire within any fuel type, the area manager or his/her designated resource advisor, along with the district fire management officer or his/her qualified representative, will recon. the fire and make a recommendation as to the type of action to be taken.

The district logistics coordinator will advise the reconnaissance personnel of the current weather conditions and will assign a fire number to be used until a decision is made on the type of action to be taken.

In wilderness, the district manager, or his/her designated representative, will make the decision as to what action will be followed. If a fire appears that may be of significance, a resource advisor will be immediately dispatched to the fire to provide guidance to the incident commander on the suppression effort, if any.

A decision matrix will be used as a guide in making this decision. The decision matrix will be reviewed daily to ensure that all items are considered on a daily basis. The decision matrix is set up so that the first decision that must be made is the fuel type that is burning and which matrix to follow. This decision will be made as follows:

Suppression Actions In Wilderness

The minimum tool concept will be used in the suppression of fires in the wilderness areas. Priority will be given to methods that least disturb natural features. These include hand-crews and engines operating from wilderness boundary roads. If these resources can not handle the fire, the next resource consideration will be the use of aircraft including both retardant planes and helicopters using water bucket drops.

The use of motorized vehicles, aircraft and power saws in the wilderness areas requires approval by the district manager (except under urgent situations; in which the incident commander will make the decision).

Blade-equipped vehicles will only be used as a last resort in the wilderness areas upon approval by the district manager.

All bladed lines will be rehabilitated and charged against the suppression effort. Any suppression action involving motorized equipment occurring in the wilderness areas will be documented and made part of the wilderness file.

Declare the Fire a Prescribed Natural Fire

If the decision is made to declare the fire a prescribed natural fire then the following actions will be taken:

a. Ponderosa Pine Type

The district manager will designate a prescribed burn manager for the fire. If there is more than one fire, a prescribed fire manager will be assigned to each fire or fire complex.

During the months from May 1 to August 31 the initial job of the prescribed fire manager will be to establish a perimeter of approximately 100 acres utilizing existing barriers wherever possible. Any remaining perimeter will be constructed using hand-tools. He/she will then be responsible to monitor the fire as outlined in the Monitoring and Documentation section that follows. During the months from September 1 to April 30, no perimeter construction will be required but may be used as conditions dictate.

b. Pinyon-Juniper/Sagebrush-Grassland

A prescribed fire manager may or may not be assigned to small fires in these zones. The district manager will assign a prescribed fire manager for fires that are approaching five acres in size. The prescribed burn manager will be responsible for establishing the 100 acre perimeter and monitoring the fire as outlined in the Monitoring and Documentation section that follows.

Fires smaller than 5 acres in size can be monitored periodically from the air. Observations made from the air will be recorded each time a fly-over is made of the fire. In the case of multiple fires, observations will be documented for each specific fire.

Operational Procedures

The logistics coordinator will notify the Arizona BLM State Office that a prescribed natural fire is in progress. Daily updates of the fire will be submitted on the daily fire situation report.

The logistics coordinator will implement the smoke management portion of this plan.

Surrounding agencies will be notified of the prescribed natural fire in progress. These agencies include:

- *Kaibab National Forest
- *Grand Canyon National Park
- *Lake Mead National Recreation Area
- *Dixie National Forest
- *Cedar City District BLM
- *Kaibab Paiute Reservation
- *Truxton Canyon Agency BIA
- *Las Vegas District BLM
- *Glen Canyon National Recreation Area

The district public affairs officer will prepare a news release on the prescribed natural fire in progress and release it to appropriate news media channels.

The maximum number of prescribed natural fires that will be allowed on the district at any one time is limited to five fires, each larger than 10 acres in size. Totally, these prescribed natural fires will not exceed 500 acres at any one time.

From May 1 to August 31, the maximum fire size that will be allowed in the Mt. Trumbull RCA will be 500 acres.

Between September 1 and April 30, burning conditions are not likely to become very intense and no maximum fire size or number is established.

Management Constraints

The fire management officer will prepare a contingency plan when there is prescribed natural fire activity to assure the number or area of live fire is within the district's capacity to manage. The contingency plan will be updated as changes in fire numbers or size changes. The Arizona State Office will keep the district notified of regional or national fire situations that could draw suppression forces from the district. Prescribed natural fires may limit the District's ability to send firefighters to off-district fires. The District Manager and appropriate Area Manager in conjunction with the Arizona State Office will coordinate on the need to keep district personnel available for off-district fires.

In the event of a prescribed natural fire going out of prescription, the prescribed burn manager in conjunction with the District FMO and the appropriate Area Manager will evaluate the situation and determine if the fire will be allowed to burn to the 200 acre perimeter or suppressed inside the perimeter.

If the decision is made to suppress the fire inside the 200 acre perimeter suppression costs will be charged to the resource area. If the fire escapes the 200 acres perimeter it will be

declared a wildfire and suppression costs will be charged to fire suppression funds.

The District Manager has the authority to override this plan when the wildfire situation on the Arizona Strip District becomes so complex that adequate suppression forces are not available to safely manage a prescribed natural fire.

Monitoring and Documentation

Monitoring and documenting the effects of prescribed natural fires on the ecosystem is very important in documenting progress toward vegetative objectives, as well as allowing better prediction of what fires will do the next time they occur in the same area. Ground monitoring of prescribed natural fires as they burn should attempt to secure the following information:

- *Estimate of fuel loading and fuel consumption
- *Vegetation changes
- *Fire intensity and fire behavior
- *Fire weather
- *Fire effects

This information should be analyzed and placed in a file for the fire. Photographs should also be obtained and made part of the file.

It is not possible to obtain the needed information while monitoring fires from the air. Aerial observers should try to ascertain as much information as possible and write a narrative summary of what was occurring with the fire while they were over it. Pertinent notes can be kept in the aircraft and the narrative completed as soon as the observer is back on the ground. Photographs or video footage of the prescribed fire is desirable.

SMOKE MANAGEMENT

A Class I Airshed (Grand Canyon National Park) is located immediately to the south of the RCA. The predominant windflow is from the south. Smoke generated by prescribed natural fire should travel to the north away from the Class I airshed. Smoke accumulations will occur in drainages during the night due to down-slope winds and nocturnal inversion layers. These areas should clear out the following day as temperatures warm up and winds pick up. There are no towns or cities of significant size near the RCA that would be affected by smoke produced by man ignited prescribed and prescribed natural fires.

The following steps will be taken to comply with smoke management requirements

- ✓ The logistics coordinator will contact the Grand Canyon Zone and advise them of the prescribed natural fire in progress. Then appropriate staff will notify the Department of Environmental Quality and obtain the necessary clearance.
- ✓ The prescribed fire incident commander or the District Fire Management Officer (FMO) will prepare a map showing smoke plume projections. Using a red marker for the daytime period, draw a line downwind of the burn for a distance representing 60 miles. Draw a 30-degree vector on each side of this centerline. For a distance reference, strike an arc at the 20, 40 and 60-mile facilities inside this 60-mile arc.
- ✓ Using a blue marker, designate the areas where smoke would probably concentrate at night. This should reflect the shift to down-canyon winds experienced at night, and could be 180-degree turn from the daytime smoke plume projection. Identify any major roads, communities, residences and other facilities inside this area.
- ✓ The logistics coordinator will plot smoke plume projections on the districts land status map. Contacts will be established with Grand Canyon National Park personnel to check for any smoke dispersal problems.
- ✓ In the case that the State of Arizona wants a fire suppressed due to air stagnation conditions, suppression actions will be initiated and charged to the appropriate BLM or State fund.

PRESCRIBED BURNING

Prescribed fires are considered for purposes of fire regime restoration and to meet resource related objectives.

A site-specific plan, approved by the district manager, is required before burning in the wilderness.

REHABILITATION

Rehabilitation measures may be required on some fires. Funding for rehabilitation on areas that are actively suppressed will come from fire suppression rather than resource management funding.

Rehabilitation measures will be considered as a part of the Escaped Fire Situation Analysis and costs will be considered as a part of that analysis.



FIRE BEHAVIOR

The fire behavior by NFDRS fuel model when burning index is high is as follows:

FUEL MODEL C (PONDEROSA PINE)	
Spotting potential	Moderate
Energy release	Moderate
Rate of spread	High
Resistance to control	Low
FUEL MODEL K (PONDEROSA PINE WITH SLASH)	
Spotting potential	High
Energy release	High
Rate of spread	Moderate
Resistance to control	High
FUEL MODEL F (PINYON-JUNIPER BRUSH)	
Spotting potential	Low
Energy release	Moderate to High
Rate of spread	Moderate
Resistance to control	Moderate
FUEL MODEL T (SAGEBRUSH-GRASS)	
Spotting potential	Moderate
Energy release	Moderate to High
Rate of spread	High
Resistance to control	Moderate to High
UNCLASSIFIED (PINYON-JUNIPER WITH NO GROUND FUEL)	
Spotting potential	Low
Energy release	Moderate
Rate of spread	Low
Resistance to control	Low

The previous burning conditions apply to wildfires only and are not associated with fires burning within prescription as outlined above.

DECISION MATRIX (Fuel Model C and K- PONDEROSA PINE, PONDEROSA PINE WITH LIGHT SLASH)

ITEM	ANSWER	ACTION
Life or Property Threatened?	YES	SUPPRESS
Boundary of Non-BLM Lands Threatened?	YES	SUPPRESS
Number of Prescribed Burns < 5	NO	SUPPRESS
Smoke Management Favorable?	NO	SUPPRESS
Conditions Approximate Prescription Guidance?	NO	SUPPRESS
Temperature < 75F		
Minimum Relative Humidity > 20%		
10 Hr. Fuel Moisture > 15%		
1,000 Hr. Fuel Moisture > 20%		
20 Ft. Windspeed < 10 mph		
Live Fuel Moisture > 130 %		
Current Weather Forecast Favorable?	NO	SUPPRESS
Current Fire Behavior Favorable?	NO	SUPPRESS
Ten Day Forecast Favorable?	NO	SUPPRESS
Equipment/Personnel Available?	NO	SUPPRESS
Fire Meeting Wilderness Objectives?(applies only to wilderness fires)	NO	SUPPRESS
Fire is < 100 Acres in Size (5/1 to 8/31)?	NO	SUPPRESS

DECISION MATRIX (Fuel Model F and Unclassified - PINYON-JUNIPER)

ITEM	ANSWER	ACTION
Life or Property Threatened?	YES	SUPPRESS
Boundary of Non-BLM Lands Threatened?	YES	SUPPRESS
Number of Prescribed Burns < 5	NO	SUPPRESS
Smoke Management Favorable?	NO	SUPPRESS
Conditions Approximate Prescription Guidance	NO	SUPPRESS
Temperature < 85F		
Minimum relative Humidity > 10%		
10 Hr. Fuel Moisture > 5%		
20 Ft. Windspeed < 15 mph		
Live Fuel Moisture > 110 %		
Current Weather Forecast Favorable?	NO	SUPPRESS
Current Fire Behavior Favorable?	NO	SUPPRESS
Ten Day Forecast Favorable?	NO	SUPPRESS
Equipment/Personnel Available?	NO	SUPPRESS
Fire Meeting Wilderness Objectives?(applies only to wilderness fires)	NO	SUPPRESS
Fire is < 500 Acres in Size (5/1 to 8/31)?	NO	SUPPRESS

DECISION MATRIX (Fuel Model T - SAGEBRUSH/GRASS)

ITEM	ANSWER	ACTION
Life or Property Threatened?	YES	SUPPRESS
Boundary of Non-BLM Lands Threatened?	YES	SUPPRESS
Number of Prescribed Burns < 5	NO	SUPPRESS
Smoke Management Favorable?	NO	SUPPRESS
Conditions Approximate Prescription Guidance?	NO	SUPPRESS
Temperature < 95F		
Minimum relative Humidity > 8%		
10 Hr. Fuel Moisture > 5%		
20 Ft. Windspeed < 25 mph		
Live Fuel Moisture > 110 %		
Current Weather Forecast Favorable?	NO	SUPPRESS
Current Fire Behavior Favorable?	NO	SUPPRESS
Ten Day Forecast Favorable?	NO	SUPPRESS
Equipment/Personnel Available?	NO	SUPPRESS
Fire Meeting Wilderness Objectives?(applies only to wilderness fires)	NO	SUPPRESS
Fire is < 500 Acres in Size (5/1 to 8/31)?	NO	SUPPRESS

MONITOR FIRE

If the answer to the item matches the response in the answer column, suppress the fire. If not, continue down the item column until all items are satisfied and the decision to monitor the fire can be made.

