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 Falco peregrinus anatum	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 Haliaeetus leucocephalus	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 Strix occidentalis lucida	ST - FT	Not confirmed in RCA. 1991 and 1992 inventories did not locate any spotted owls.
Northern Goshawk Accipiter gentilis	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 Egretta thula	ST - NL	Not known to be in RCA.
Western Snowy Plover Charadrius alexandrius nivosus	SC - F2	Not known to be in RCA.
Ferruginous Hawk Buteo regalis	ST - F2	Not known to be in RCA. Has been seen approx. 20 miles north of RCA in sagebrush vegetation.
White-Faced Ibis Plegadis chihi	F2	Not known to be in RCA. Has been seen along Clayhole Road in ditch near Colorado City.
Mountain Plover Charadrius montanus	F2	Not known to be in RCA.
Long-Billed Curlew Numenius americanus	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 Dopodomys merriami frenatus	F2	Not known to be in RCA. Type specimen is from Toquerville, UT and others have been collected on the Arizona Strip.
Spotted Bat Euderma maculatum	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 Idionycteris phyllotis	F2	Not known to be in RCA. Specimens have been captured on the Arizona Strip.
Small-footed Myotis Myotis ciliolabrum	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 Myotis evotis	F2	Not known to be in RCA. Specimens have been captured on the Arizona Strip.

COMMON AND SCIENTIFIC NAME	STATUS *	REMARKS
Fringed Myotis Myotis thysanodes	F2	Not known to be in RCA. Specimens have been captured on the Arizona Strip.
Long-legged myotis Myotis volans	F2	Not known to be in RCA. Specimens have been captured on the Arizona Strip.
Yuma Myotis Myotis yumanensis	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 Nyctinomops macrotis	F2	Not known to be in RCA. Specimens have been captured on the Arizona Strip.
Pale Townsend's big-eared bat Plecotus townsendii pallescens	F2	Not known to be in RCA. Specimens have been captured on the Arizona Strip.
California Leaf-nosed Bat Macrotus californicus	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 Penstemon distans	F2	Found on north and east facing slopes between 3900 and 5200 feet in elevation, gen. west of Whitmore Canyon.
Grand Canyon Rose Rosa stellata spp. abyssa	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 road 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.

Seral Stage or Ecological Status	Percentage of Present Plant Community that is Climax for the Site
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 to 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.

Proposed Project/Area	Legal Description
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

	Stems per Acre*						
Site	**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**	**Total Stems**	**Basal Area**
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.

Proposed Project/Area	Legal Description
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.

Proposed Project/Area	Legal Description
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 ft^2/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 thses areas to aerve 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 ft^2/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 ft^2/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 tebuthiron 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 restore biodiversity. 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)
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

Mt. Trumbull RCA Road/Trail Maintenance Guidance By Zone

Road/Trail Description	Maintenance Level Range*	Maintenance Frequency Range*	Road/Trail Type Range*	Other Comments
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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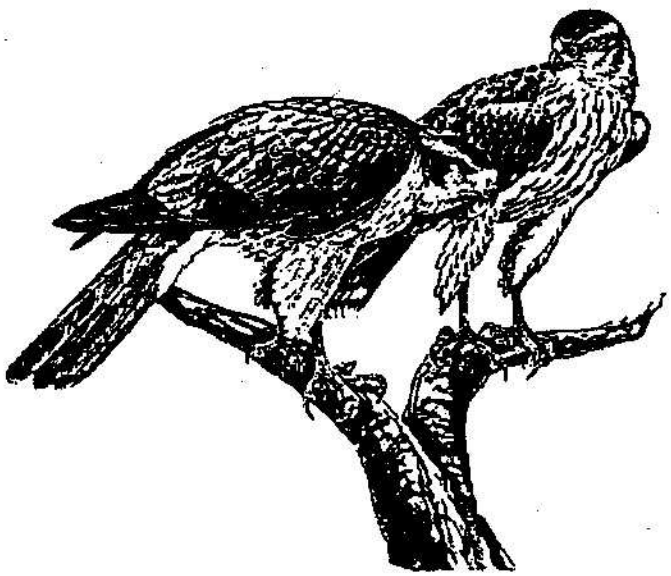
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Appendix A

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
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

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"
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
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

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"**
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

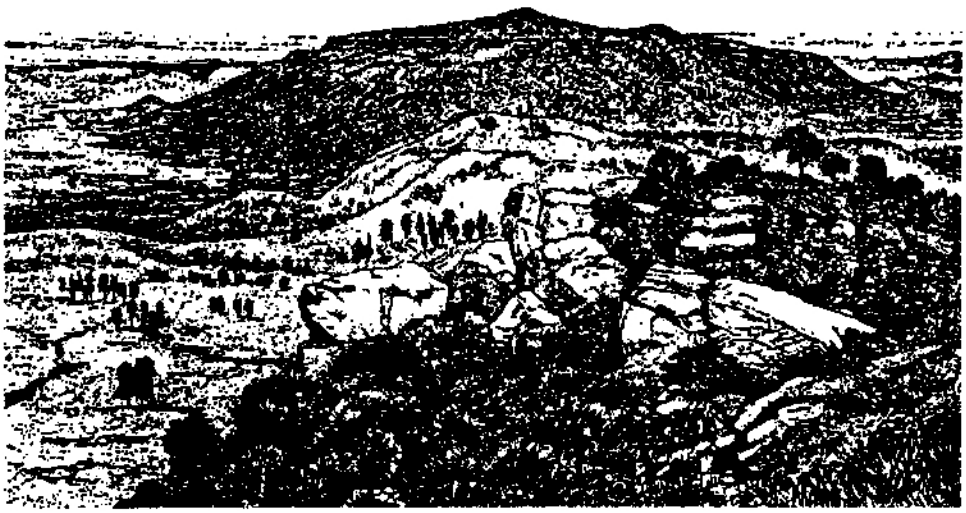
Prescribed fires are considered for purposes of fire regime restoration and to meet resource related objectives.

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
'en 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.

Bureau of Land Management
Arizona Strip District
Mount Trumbull Resource Conservation Area
Environmental Assessment
EA-AZ-010-95-015

July 1995

INTRODUCTION

Purpose and Need for the Proposed Action

The purpose of the proposed action is to restore ecosystem health, facilitate multiple use management, and ensure human needs are met. The need for the proposed action 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 proposed Mount Trumbull Resource Conservation Area (RCA) Plan has been reviewed to determine if it conforms with the land use plan terms and conditions as required by 43 Code of Federal Regulations (CFR) 1610.5 and has been found to be 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 of 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 RCA and any proposed actions dealing with ponderosa pine 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 detailed management prescriptions for the RCA with the involvement of the public and other resource management agencies. The Mount Trumbull RCA Plan is in conformance with the following decisions as found in the Arizona Strip District RMP Implementation Plan* of 1992:

AFFECTED RESOURCE	DECISION NUMBER	PAGE NUMBER
Cultural Resources	CL01	II-1
Forest Resources	FW01, 02, 06, 07, 15	II-3 and 4
Woodland Resources	FW03, 09, 19	II-4 and 5
Grazing Management	GZ01 and GZ21	II-5 and 8

AFFECTED RESOURCE	DECISION NUMBER	PAGE NUMBER
Recreation Resources	RR03 - 10, 13, 17, 20 - 22 24-27	II-12 thru 14
Special Status Species	TE01	II-16
Transportation/Access	TA02 - 04, 08	II-18
Soil, Water, Air Resources	WS01, 16, 20	II-19 and 20
Wildlife Resources	WL02, 22	II-21 and 22

* Copies of both the Arizona Strip District RMP and Final Environmental Impact Statement and the Arizona Strip District RMP Implementation Plan can be reviewed and/or obtained from; Bureau Of Land Management, Arizona Strip District, Vermillion Resource Area, 345 East Riverside Drive, Suite 103, St. George, Utah 84790.

Regulations and Policy/Relationships 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 manage the public lands for multiple use on a sustained yield basis. The Arizona Strip District RMP and Final Environmental Impact Statement (1992) guides management of public lands administered by this district including the Mount Trumbull/Mount 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 RCA. Guidance from these activity plans will continue to be followed unless otherwise amended in this plan in order to meet objectives identified for the RCA. In formulating the RCA Plan, an effort was made to determine issues, set objectives, and priortize management actions based on weak links in the ecosystem, rather than propose actions for specific resource programs.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Proposed Action

The proposed action is the adoption and implementation of the Mount Trumbull RCA Plan. In general, the proposed action would utilize the continued use of an interdisciplinary team and adaptive management to, "By consensus, define future condition(s) for the Mount Trumbull RCA and collectively develop the management actions necessary to achieve those conditions. Additionally, desired future conditions and management actions should provide for present and long term human needs while maintaining sound ecosystems."

The interdisciplinary team which has developed the 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, concerned citizens, and BLM grazing permittees. The interdisciplinary process used in the formulation of the plan is cyclic in nature and is described under the Interdisciplinary Process narrative (page 15) in the RCA Plan.

Adaptive management will be utilized in implementing the Mount Trumbull RCA Plan. 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, any interested public and agency representatives. When necessary, supplementary environmental documents would be completed on future proposed management actions. Through this process, 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. Additional National Environmental Policy Act documentation and compliance, with public involvement, will be necessary for future sales or contracts for the removal of forest products, other than individual or commercial woodcutting.

The objectives and management actions for the Mount Trumbull RCA Plan are issue driven. By consensus the interdisciplinary team identified two major issues which should guide planning efforts for this ecosystem.

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."

2) "Opportunities for the public to engage in high quality, back country, recreation activities need to be maintained."

To address the two major issues, the interdisciplinary team formulated five objectives.

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 in the RCA Plan (page 18) describes the desired plant community.

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 (page 19) of the RCA Plan.

3) Manage the sagebrush/grass vegetation type in the Mount Trumbull RCA to increase biodiversity and to manage for a desired plant community as described in the Table 8 (page 19) of the RCA Plan.

4) Manage the spectrum of recreation settings in the Mount Trumbull RCA (as described in Appendix C of the RCA Plan) so that selected indicators of resource and social conditions are within or below the ranges as described in Table 9 of the RCA Plan.

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 of the RCA Plan.

For each objective, the major weak link in the ecosystem which is hindering the attainment of this objective has been identified.

Ponderosa Pine Vegetative Community Weak Link:
Excessive fuel build-up, 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.

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.

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 (sagebrush).

Recreation Weak Links:
The following weak links are hindering attainment of the recreation resource objectives :

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.

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. The following proposed management actions (see RCA plan, pages 24-39 for more detailed descriptions) could have environmental effects:

1) 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).

2) 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. (see pages 24 and 25 in RCA Plan)

3) 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. (see page 25 in RCA Plan)

4) 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. 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. Thereafter, utilization of key forage species would be limited to an average of 50 percent of the current year's growth. (see pages 25 and 26 in RCA Plan)

5) Sawmill Forest Restoration Units -
This would involve the selective thinning of TSS 2 and 3 ponderosa pine (see table 6 - RCA plan). Initial thinning would be concentrated 50-100 feet from the basal areas of TSS 5 and 6 trees (old growth) to reduce competition and ladder fuels. Later, many small size class (TSS 2 and 3) trees and a few medium size class trees (TSS 4) would be removed from these areas. Basal areas in these units would be reduced to 60-80 ft^2/ acre predominately consisting of old growth trees. Intra-specific competition, wildlife habitat needs, aesthetics and fire hazard would be considered by the interdisciplinary team in determining the intensity and pattern of thinning. Duff and ground litter would be removed from the basal areas of old growth trees to prevent root kill from prescribed fire. This same material would be removed from the basal areas of selected snags, and fallen large diameter trees, which serve as wildlife habitat. Fire line would be constructed where needed around burn units to contain prescribed fires. Low intensity prescribed fires would be initiated to reduce duff depth, fuel loadings, and thin young stands of trees. Thinned areas would be reseeded with native grass, forb and shrub species common to the area as necessary. Livestock grazing would be excluded (as appropriate) from the treatment 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 year's growth. (see pages 26 and 27 in RCA Plan)

6) Lava and Petty Knoll Fuels Reduction Units -
This would involve fragmenting areas of continuous heavy fuels, by restoring pre-disruption ecosystem structure and function thereby reducing fire hazard. Ecological restoration will alow these areas to serve as anchor points for future fire suppression. These fire breaks would serve also serve as starting lines for future forest restoration efforts. Management actions to reduce fuel loading, fire danger and associated loss of old growth trees would involve several steps. Thinning of TSS 2 and 3 ponderosa pine around the bases of TSS 5 and 6 trees would occur initially. Later, many small size class (TSS 2 and 3) trees and a few medium size class trees (TSS 4) would be removed from these areas. Basal areas in these units would be reduced to 60-80 ft^2/ acre

predominantly consisting of old growth trees. Intra-specific competition, wildlife habitat needs, aesthetics and fire hazard would be considered by the interdisciplinary team in determining the intensity and pattern of thinning. A band of thinned forest would be completed effectively breaking up continuous fuels that can contribute to extreme fire spread. Thinning would be followed by removal of duff from the base of old growth trees, selected snags and downed trees, construction of fire lines to contain prescribed fires, and finally initiation of prescribed fire to reduce duff depth and fuel loadings and thin young age class trees. Thinned areas would be reseeded with native grass, forb and shrub species common to the area as necessary. Livestock grazing would be excluded (as appropriate) from the treatment 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 year's growth. (see pages 27-30 in RCA Plan)

7) Pinyon/Juniper Wood Harvest Areas -
Personal use and commercial wood harvest permits would be sold for specified areas to reduce monotypic stands of pinyon/juniper and restore biodiversity. Slash would be placed in drainages for erosion control and/or piled by the permittee for later burning under prescription. Where needed, native grasses and shrubs will be seeded to help re-establish herbaceous vegetation and promote diversity. Livestock grazing would be excluded (as appropriate) from the treatment 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 year's growth. (see page 30 in RCA Plan)

8) Sagebrush Reduction -
Monotypic stands of sagebrush would be made more diverse by two methods. Prescribed fire and selective application of tebuthiuron. Once the application of fire and/or tebuthiuron is completed, treated areas will be reseeded with herbaceous species to supplement existing soil seed sources, and to increase plant diversity. Livestock grazing would be excluded (as appropriate) from the treatment 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 year's growth. (see pages 31 and 32 in RCA Plan)

9) Maintain BLM roads and trails and request maintenance of County Roads in the RCA at levels and frequencies to complement recreation management setting guidance. Place all roads or trails on the District Transportation Plan and maintain at levels and frequencies to complement recreation management setting guidance.

10) Inventory all roads in the RCA. Decide which roads or trails to physically close. Rehabilitate and sign closed roads.

11) Rehabilitate, to setting-appropriate standards, roads that have been temporarily upgraded, once the purpose of the upgrade has been served.

12) Consider realignments of segments of BLM transportation or project roads or trails when resource damage is occurring or when physical access is inhibited.

13) Develop information and interpretation projects and signing throughout the RCA compatible with the various recreation settings.

14) Construct a trailhead facility in the Nixon Flat Area.

15) Limit group size, close campsites seasonally, require campsite permits, and harden popular campsites to accommodate concentrated use to reduce unacceptable campsite conditions where necessary.

16) Limit commercial recreation use, limit group size and limit the number of vehicles per group to reduce use in selected areas and reduce encounters between different camping/recreation groups.

17) Initiate cultural resource information and education programs focused on the RCA. Additionally, publicize rewards given to citizens who provide information on potential cultural resource vandalism. Furthermore, increase public contact in the RCA and limit distribution of non-public cultural resource site information. (see pages 32-39 for additional description of recreation management actions)

No Action Alternative

Current conditions and values would be maintained under this alterative. The RCA area would continue to be managed under a variety of management plans, including 2 Habitat Management Plans, 5 Allotment Management Plans, 1 Wilderness Management Plan, and 1 Watershed Management Plan. Detailed descriptions of existing management from these various plans are found in the Mount Trumbull RCA plan under the narrative dealing with existing management. Generally, by utilizing existing management, the interdisciplinary approach to determine management for public lands would not be used since most of these existing plans were formulated prior to the new trend of involving diverse groups to determine what is best for public lands. The multiple existing management plans for this area often conflict with each other, and are limited in scope, often only focusing upon one resource, rather than the ecosystem as a whole.

By maintaining existing management, a model system utilizing biological indicators of ponderosa pine ecosystem health, as a means of monitoring forest conditions would not be created. The creation of fire breaks which would stop or slow the spread of high intensity crown fires would not occur. Thinning and prescribed fire would not be utilized to protect old growth trees nor to move the forest stand to that which exhibits a higher percentage of old growth trees. Reduction of closed canopy conditions and forest floor litter accumulations, designed to increase herbaceous plant diversity would not occur. Reduction of current fuel loadings to more natural levels would not occur. Natural wildfire would not be allowed to play it's role in the ecosystem.

In Pinyon/Juniper and Sagebrush/Grassland vegetation communities, adoption of the no action alternative would not provide for habitat diversity and re-establishment of perennial grasses and forbs as natural components of the ecosystem. Land treatments dealing with reduction of monotypic stands of pinyon/juniper and sagebrush are currently found in existing watershed and range activity plans. These treatments however, are usually designed to meet program specific

goals only and do not take the ecosystem as a whole into account.

In recreation management, a variety of access types coinciding with a variety of visitor desires would not be provided for. A variety of information and interpretive products intended to provide for a variety of visitor and recreation activities would not be provided for. Management of visitor behavior, insuring visitors enjoy a variety of activities in the area but do not contribute to degradation of the resource and social conditions would not be provided for. All of these provisions would have to be readdressed in another plan dealing solely with recreation activities in the area.

AFFECTED ENVIRONMENT

A description of the affected environment can be found on pages 1-15 of the proposed Mont Trumbull Resource Conservation Area Plan.

ENVIRONMENTAL CONSEQUENCES

The following critical elements of the human environment have been analyzed and would not be affected by either the Proposed Action or the No Action alternative:

1) Areas of critical Environmental Concern
2) Farm Lands (Prime or Unique)
3) Floodplain
4) Native American Religious Concerns
5) Wastes, Hazardous or Solid
6) Wetlands/Riparian Zones
7) Wild and Scenic Rivers

Direct and Indirect Impacts of the Proposed Action:
Direct impacts are those impacts which are caused by the action and occur at the same time and place as the action.

Indirect impacts are those impacts which are caused by the action and occur later in time or are farther removed from the action in distance. Indirect impacts take into account reasonably foreseeable scenarios.

Lands/Realty:
No direct or indirect impacts to lands/realty resources were identified.

Wildlife:
Mechanical removal of ponderosa and prescribed burning in the ponderosa pine vegetation

community would cause direct impacts to two introduced game species found in the RCA. Merriam's wild turkey and Kaibab squirrel would be displaced in the short term from both activities. In addition, existing and potential turkey roost sites could be lost by tree removal and prescribed fire. In addition, some mortality to small mammals and reptiles would occur from the use of prescribed fire, the removal of trees and associated surface disturbance.

The removal of small and medium size (TSS 2-4) ponderosa by mechanical means and fire would cause indirect impacts by causing a net decrease in habitat favored by the Kaibab squirrel. Wildlife species which benefit from a variety of vegetation types and/or less dense stands of pine would benefit from the proposed action. These species include but are not limited to mule deer, band-tailed pigeon, mourning dove, Gambel's quail, cottontail rabbit, gray fox, bobcat, and ringtail cat. The proposed action would create wildlife habitat diversity by opening up and releasing dense stands of ponderosa pine and providing suitable growing conditions for understory grasses, forbs and shrubs.

Another indirect impact involves the conservation of old growth trees through adoption of the proposed action. This would insure that a valuable habitat component for many bird and small mammal species is retained in the ecosystem. Furthermore, thinning and reduction of intra-specific competition in dense pine stands would insure the recruitment of small size class trees into the old growth class, thus maintaining this valuable habitat component for the future.

Special Status Species:
No state or federal endangered, threatened, or candidate species would be directly impacted by the proposed action.

It is recognized that red-tailed hawks and great horned owls benefit from open stands of timber. These species could increase due to implementation of the proposed action, leading to an indirect impact of inter-specific competition with goshawks (a state and federal candidate species). This competition could be manifested through aggression, predation and competition for nest sites and prey. However, the proposed action will not result in broad areas converted to open stands. A 6000 acre territory is recognized as the minimum area necessary for the management of a nesting pair of goshawks. The proposed action would occur in proportionately small treatment blocks in comparison to the recognized figure for goshawk territories. In addition, treatment areas would be designed to avoid smaller territories used surrounding nesting areas. Furthermore, forest treatments would result in a mosaic of pine structural stages, which are required by goshawks.

No other negative indirect impacts are anticipated for species currently listed by the State of Arizona or the United States as endangered, threatened or which are candidates for such listing. However, the proposed action would increase habitat diversity in the ecosystem thereby increasing plant and animal species diversity. An indirect impact of implementing the proposed action would be the restoration of natural processes in the ecosystem. Restoration should end or slow the current trend in the loss of native ecosystems, food webs, flora and fauna. Thus, an indirect beneficial impact would be realized in hopefully restoring special status species habitats, and preventing future listing of additional species.

Geology and Minerals:
No direct or indirect impacts to minerals resources were identified.

Soil, Water and Air:
Prescribed fire would cause direct impacts through short term impairment of air quality in the local airshed surrounding the RCA. Prescription parameters dictate that prior to ignition, winds should be moving in a direction which would carry smoke away from Grand Canyon National Park. Most prescribed fires would have no affect upon air quality in this national park. Generally, air mixing and transport of smoke aloft does not present air quality problems for the communities such as Colorado City and Moccasin, north of the RCA. Smoke duration in the vicinity of the RCA for an individual prescribed fire would be limited in most cases to one burning period, with noticeable lingering smoke lasting in most cases for an additional 1 to 2 days.

Vehicle travel in the RCA from both recreational vehicles and vehicles associated with BLM administered operations in the area would lead to direct impacts to air quality through vehicle emissions and dust. However, the impacts from these vehicles would be short term and transitory.

No foreseeable indirect impacts to air have been identified.

Indirect negative impacts to soil include initial loss of soil from erosion immediately following vegetation treatments in pinyon/juniper and sagebrush/grassland communities by mechanical removal and prescribed fire. Loss of soil currently is occurring in areas found in these vegetation types and designated for treatment. Immediately following treatment these areas could experience increased soil loss due to further exposure of the soil. However, this would be short term loss until grass, forb and shrub species are established thus effectively ending or decelerating the long term loss of soil from these areas. Water quality as it is related to soil and erosion would show the same type of relationship to the proposed action. Water quality could decrease immediately following treatment due to increased particulate matter in run-off water, however once vegetation is established in treatment areas, long term water quality would improve.

An indirect positive impact of the proposed action would be seen in the cycling of water in the ponderosa pine ecosystem. In much of the ponderosa pine ecosystem, unnatural surface litter and humus build-up tends to absorb and hold a large portion of the annual precipitation. Thereby, effectively limiting the amount of water available in the soil for pine and other vegetation species. Reducing litter layers through the proposed action would result in making more water available for use by vegetation.

Construction of a trailhead facility in the Nixon Flat area could encourage more use of the Mount Trumbull trail, thereby leading to potential indirect impacts of erosion caused by increased human use of the trail.

Recreation and Visual Resources:
Recreational users of the area would be directly impacted by having better guidance and interpretation provided by the BLM so they could make informed decisions about destinations in

the RCA. Users with varying degrees of backcountry skills would be directed to the appropriate destinations which match their skill level.

The realignment of roads or trails when resource damage is occurring, could lead direct impacts through a net increase in acreage disturbed, and potential impacts to visual resources until such time as old segments of roads or trails are rehabilitated.

Realignment of roads and trails when resource damage is occurring would cause indirect impacts in the long term by being beneficial to visual qualities of the RCA by reducing unsightly erosion, etc.

Closure of roads as described in recreation planned actions could in some cases cause direct impacts by impairing access by vehicles into areas used by visitors. In addition, the potential limiting of group sizes, requiring campsite permits and seasonally closing campsites, all to reduce unacceptable campsite conditions in areas of concentrated use could initially inconvenience or preclude some users from using the RCA for recreation.

Closure of roads, limiting group sizes, requiring permits and seasonally closing certain campsites would cause indirect beneficial impacts by reducing unacceptable campsite conditions in areas of concentrated use, and lead to long term improvement of visitor experiences in the RCA.

Limiting commercial use, group size, and the number of vehicles per group to reduce use in selected areas could initially cause direct impacts by inconveniencing or precluding some commercial users from using the RCA for recreation.

Limiting commercial use, group size, and the number of vehicles per group to reduce use in selected areas would cause beneficial indirect impacts in the long term by reducing encounters between different camping/recreation groups, thereby maintaining or improving visitor experiences in the RCA.

Vegetation manipulations in woodland or forest areas such as harvest of fuelwood and other forest products accompanied by prescribed fire could lead to direct, short term impacts to visual resources. Stumps, slash, burned areas and temporary roads or road upgrades may impair view-sheds in the short term.

Vegetation manipulations in woodland or forest areas such as harvest of fuelwood and other forest products accompanied by prescribed fire could cause negative direct impacts to visual resources but would have no indirect impacts (i.e. removed further in time from the action) due to rehabilitation and natural revegetation of the sites. .

Vegetation manipulations in sagebrush areas through the use of tebuthiuron and prescribed fire could lead to direct, short term impacts to visual resources. Dead brush, and burned areas may impair view-sheds in the short term.

Vegetation manipulations in sagebrush areas would have no long term, indirect impacts to visual

resources due to future revegetation of the sites with grass, forb and shrub species.

Wilderness:
No direct impacts to wilderness resources were identified.

Construction of a trailhead facility in the Nixon Flat area could encourage more use of the Mount Trumbull trail within the Mount Trumbull Wilderness Area. This could cause indirect impacts to visitors by increasing visitor encounters with other parties within the wilderness area. For visitors seeking solitude, increased encounters with other parties could be viewed as detrimental. However, the proposed trail head facility could help maintain the wilderness aesthetics by concentrating visitor impacts into the trail area.

Cultural Resources:
Cultural resources have the potential to be directly impacted by pinyon/juniper, ponderosa pine and sagebrush/grassland planned management actions. Impacts to cultural resource sites could result from vehicle travel, construction or upgrade of access roads, and other surface disturbing activities such as the construction fireline for prescribed fire. However, all disturbed areas would be inventoried prior to surface disturbance, so impacts could be avoided, reduced and/or mitigated.

Initiation of cultural resource education programs focused on the RCA, publicizing rewards to individuals who notify BLM of possible cultural resource vandalism, increased public contact in the RCA and limiting the distribution of non-public cultural resource site information would cause indirect beneficial impacts by serving to reduce vandalism of cultural resources, while educating the public as to their importance.

Transportation and Access:
Closure of roads as described in the recreation planned management actions could cause direct impacts by hindering vehicle access into some areas. However, roads that are needed for resource management and most public access would not be closed. Roads, causing erosion and that duplicate other roads would be closed.

Maintenance of roads within the RCA to standards which complement recreation setting guidance could cause direct impacts by precluding some visitors from certain areas through the prevalence or lack of road maintenance.

Maintenance of roads within the RCA to standards which complement recreation setting guidance while initially precluding some visitors from certain areas, would cause beneficial indirect impacts by insuring that visitors match their skill and equipment level to the appropriate areas within the RCA.

Livestock Grazing:
Direct impacts to livestock grazing would center around the loss of some vegetation through the use of prescribed fire in meeting vegetation objectives in the RCA. In addition, cattle may be

excluded from treatment areas until seedings to restore/replenish grass, forb and shrub species are established. Furthermore, cattle may be excluded from treatment areas once understory herbaceous species are re-established to prepare the sites for future prescribed and/or natural fire. This exclusion may occur one to three growing seasons prior to scheduled understory prescribed fire (grasses being necessary to carry fire). Utilization would continue to be limited to an average 50% of the current seasons growth.

Although cattle would initially be excluded from areas of vegetation treatments, and periodically to allow for build-up of fine fuels to carry fire, the end result of completion of vegetation planned management actions would be an increase of available forage for ungulate species - an indirect impact.

Vegetation:
Direct impacts to vegetation would include the loss of individual pinyon/juniper trees through the commercial harvest of fuelwood on approximately 600 acres. In the ponderosa pine vegetation type approximately 1000 acres would be subject to the thinning of TSS 2-4 ponderosa pine through commercial harvest of fuelwood and other forest products, as well as through prescribed fire in some cases. In addition, the density of stands of sagebrush on approximately 7000 acres would be reduced through the use of prescribed fire and/or tebuthiuron.

Indirect impacts to vegetation (further removed in time from the action itself) would result in increased vegetation species diversity in all areas treated with planned management actions. The desired plant communities as described in tables 6-8 (pages 18-19) of the Mount Trumbull RCA Plan would be approached. The ponderosa pine vegetation community within the RCA would be exposed to less risk of stand destroying wildfires. Areas restored to more natural conditions through thinning and burning would be sustainable for generations to come. Low intensity ground fires to which this ecosystem has adapted would again play their natural role.

Fire:
No direct impacts to fire management have been identified.

Indirect impacts to fire management would center around the increase of prescribed natural fires (i.e. lightning caused fires allowed to burn under prescription) and human ignited prescribed fires. Active fire suppression in restored areas would not be as prevalent as it is presently, under existing forest fuel conditions.

Direct and Indirect Impacts of the No Action Alternative:

Lands:
No direct or indirect impacts to lands/realty resources were identified.

Wildlife:
No direct impacts to wildlife resources were identified.

Wildlife would be indirectly impacted by the no action alternative because greater habitat diversity would not be created in the RCA. In addition, catastrophic fire, and the associated loss of habitat and life, due to the continued build-up of forest fuels would be an indirect impact.

Indirect impacts of the no action alternative also include the following: The conservation of old growth trees through the elimination of competition with younger age classes and through the reduction of fire hazard would not occur. The release of dense stands of pine through mechanical thinning and prescribed fire, insuring the recruitment of small size classes into the old growth class would not occur. Old growth trees, a valuable habitat component for wildlife would not be retained indefinitely in the ecosystem.

Special Status Species:
No direct impacts to special status species were identified.

An indirect impact of the no action alternative is that mosaics of pine structural stages which are habitat requirements of goshawks would not be created. In addition, habitat diversity in the ecosystem and associated increases in plant and animal species diversity would not occur. The current trend of the loss of native ecosystems, food webs, flora and fauna would not be ended or slowed through restoration efforts. The prevention of the future listing (through restoration efforts) of additional species as endangered or threatened would not be possible.
In addition, catastrophic fire, and associated loss of habitat and life, due to the continued build-up of forest fuels would be an indirect impact.

Geology and Minerals:
No direct or indirect impacts to minerals resources were identified.

Soil, Water and Air:
Vehicle travel in the RCA associated with BLM administered operations in the area would not be as extensive as under the proposed action, thus direct impacts to air quality from dust and vehicle emissions, although short term and transitory, would be less.

An indirect impact of the no action alternative is the long term loss of soils through erosion in areas devoid of understory grasses and forbs in pinyon/juniper woodland and sagebrush stands. Water quality would not improve, due to continued erosion. Another indirect impact to soil could result from catastrophic fire and associated soil loss through erosion and soil sterilization.

Water cycling in the ponderosa pine ecosystem would not be improved since reduction of forest floor litter would not occur.

Indirect impacts to air quality could result in the RCA area and in the Grand Canyon National Park view-shed, due to the continued possibility of large wildfires which could occur under unfavorable wind/air mixing conditions as opposed to favorable conditions experienced with prescribed fires.

Recreation and Visual Resources:

A direct impact to Recreational users of the area would be, appropriate guidance and interpretation provided by the BLM to make informed decisions about destinations in the RCA would be unavailable. Users would not be directed to appropriate destinations matching their backcountry skill level.

Additional long term indirect impacts to recreational users includes the continuation or perpetuation of unacceptable campsite conditions and the potential for increased encounters with other groups. The aesthetics of the area could be changed significantly due to large wildfires.

Long term reduction of resource damage through the realignment of roads and trails causing undesirable conditions would not occur. Indirect negative impacts to visual resources would continue due to such roads and trails.

Wilderness:
No direct impacts to wilderness resources were identified.

Indirect impacts center around the continuation of the unnatural forest fuel build-ups both inside and outside of wilderness. Due to these fuel build-ups, stand replacing fires could occur and eliminate some of the areas outstanding wilderness values.

Cultural Resources:
Cultural resources would not be directly impacted from surface disturbance associated with vegetation treatments.

Cultural resource education programs focused on the RCA would not be initiated. Other methods to reduce vandalism and increase awareness of cultural resources in the RCA would not be initiated. Cultural resources would be indirectly, negatively impacted by adoption of the no action alternative.

Transportation and Access:
No direct or indirect impacts were identified for transportation and access.

Livestock Grazing:
Direct impacts of the no action alternative would be less than the proposed actions. Initial loss of forage due to prescribed fire would not occur. Cattle would not be excluded from areas due to vegetation treatments and the associated restoring/replenishing of grass, forb and shrub species.

An indirect impact would be that available forage which could be utilized by ungulate species within the RCA would not be increased. However, should stand replacing fires wildfires occur, traditional reseeding techniques could result in more livestock forage in previously burned areas.

Vegetation:
Direct impacts of the no action alternative would be less than the proposed action, except in the case of potential catastrophic wildfire. The loss of individual pinyon, juniper and ponderosa pine trees through commercial harvest of fuel wood and other forest products would not occur. In

addition density of sagebrush stands would not be reduced.

An indirect negative impact of the no action alternative is, increased plant species diversity would not be realized. The desired plant communities as described in tables 6-8 of the Mount Trumbull RCA Plan (pages 18-19) would not be approached. The ponderosa pine vegetation community would continue to be exposed to the risk of stand destroying wildfires. The ponderosa ecosystem would not be sustainable and low intensity ground fires to which the ecosystem has adapted would not be allowed to play their natural role.

Fire:
No direct impacts to fire management have been identified.

Indirect impacts to fire management would center around the continued need to suppress most wildfires immediately in the ponderosa pine ecosystem due to unnatural build-ups of forest fuels. Costly and potentially dangerous fire suppression would continue and probably increase due to continuing build-up of forest fuels. Tax dollars would be spent on stop-gap efforts to extinguish fires rather than restoring the ecosystem to the point where natural processes can again play their role.

Cumulative Impacts of the Proposed Action:
To properly determine cumulative impacts Reasonably Foreseeable Future Action (RFFA) analysis as referenced in 40 CFR 1508.7 should be used. These are projections made so that future impacts can be estimated as required by the National Environmental Policy Act.
For the purpose of this analysis, it is assumed that all proposed actions described in the RCA plan would be initiated.

Cumulative impacts can result from individually minor by collectively significant actions taking place over a period of time. Seemingly insignificant actions can add up (more and more of same type of action) or synergistically interact (various actions adding up to cause a new kind of impact) to cause important negative influences on the environment. Due to the number and variety of proposed actions in the Mount Trumbull RCA plan, a relatively detailed cumulative impact analysis is necessary.

The increased use of roads by vehicles and equipment in order to achieve identified objectives of the RCA plan and resultant short-term surface disturbances from initiation of vegetation treatments should be considered from a cumulative impact standpoint. This increased use of roads and initiation of treatments to reach RCA objectives could create both additive and synergistic cumulative impacts. Resources which could be adversely affected include; recreation, visual, cultural and wildlife resources.

Negative cumulative impacts from vegetation treatments would affect recreation and visual resources similarly. Should several small but collectively significant or one large vegetation treatment be initiated these resources would be affected primarily through the creation of visual

contrasts which may not be compatible with visitor use and visual resource management zones. The cumulative impacts from such actions would be both direct (short term) and indirect (long term or occurring a distance in time from the action). The direct, negative, cumulative impacts would result immediately from land treatments and associated vehicle and equipment travel on roads. These impacts would be offset and negated by long term indirect impacts resulting from increased vegetation diversity, soil stability and movement toward more natural ecosystems.

Negative cumulative impacts could affect cultural resources, in spite of mitigation should the various land treatments designed to meet the goals of the RCA plan be carried out. Additive and/or synergistic negative cumulative impacts to future identification and dating of artifacts and features could occur. Negative cumulative impacts could result from increased recreational interpretation and associated use of the RCA. Increased use of the area could result in more vandalism to cultural resources.

Additive and synergistic negative cumulative impacts could affect wildlife resources as a result of carrying out actions to meet the objectives of the RCA plan. Vegetation treatments during breeding, nesting, and brooding seasons could be detrimental to wildlife (especially avian species).

Cumulative Impacts of the No Action Alternative:
Cumulative impacts may last for many years beyond the life of the action that caused the impacts. Such impacts may not be immediately apparent but may take years to manifest themselves. Adoption of the no action alternative would result in such impacts. Cumulative impacts of the no action alternative would result from current management (or lack thereof). By continuing the current level of management within the RCA, vegetation and wildlife resources would experience negative cumulative impacts resulting from neglect (or a lack of management) rather than by specific management actions.

Recreation and visual resources would experience negative indirect cumulative impacts through the adoption of the no action alternative. With no increase in vegetation diversity, nor reduction of erosion, improvement in recreational opportunities, view sheds, and naturalness would not increase in the long term.

Wildlife resources would experience negative, indirect, cumulative impacts through the adoption of the no action alternative. Without removal of unnatural fuel loading and without the reintroduction of fire into the ecosystem, there would continue to be an un-quantified risk of catastrophic wildfire, which could destroy significant blocks of wildlife habitat. This risk would increase over time as fuels continue to build up. In addition, productivity of wildlife habitat would diminish due to continuing canopy closure, loss of plant diversity and loss of potential wildlife water through extensive run-off.

Livestock grazing would experience negative, indirect, cumulative impacts through the adoption of the no action alternative. The quality and quantity of forage would not increase in the RCA. Continuation of erosion would result in less forage available for livestock.

Vegetation resources would experience negative, indirect, cumulative impacts through the

adoption of the no action alternative. Only existing grazing management would occur, no mechanical, fire or chemical treatments would be utilized, thus making it impossible to reach vegetation structural stages determined by the interdisciplinary team as beneficial to many resource values. Pinyon/juniper and sagebrush would remain in complete dominance in extensive areas preventing biodiversity. Ponderosa pine vegetation communities would suffer due to lack of regeneration, stand diversity and loss of old growth trees. Fuel loads would continue to build in ponderosa pine stands. Stand destroying fires would be likely to occur. These fires would have significant impacts on the areas wildlife, recreation, watershed, and aesthetic values. These conditions would exist for the foreseeable future.

Soil, water, and air resources would experience negative, indirect, cumulative impacts through the adoption of the no action alternative. Ecologically and visually detrimental erosion would continue resulting in continued soil loss and reduced water quality.

Mitigation Measures:

1) To mitigate direct impacts regarding the displacement of wild turkey and Kaibab squirrel from thinning and prescribed burning, potential loss of turkey roost trees, and loss of habitat favored by Kaibab squirrels, final treatment areas in the ponderosa pine ecosystem would be designed taking into account suggestions and input of the Arizona Game and Fish Department.

2) To mitigate indirect impacts to goshawks regarding potential inter-specific competition with other raptor species, final treatment areas in the ponderosa pine ecosystem would not cover areas large enough to comprise entire goshawk territories nor compromise nesting areas. In addition, forest treatments would be designed to create mosaics of structural stages of pine which are required by goshawks. Furthermore, suggestions and input from the Arizona Game and Fish Department would be utilized in the final design of forest treatment areas.

3) To mitigate direct impacts to air quality from the use of prescribed fire, prescription parameters dictating that prior to ignition, winds should be blowing in a direction which carries smoke away from the Grand Canyon National Park would continue to be followed.

4) To mitigate indirect impacts regarding soil loss and potential reduction of water quality due to vegetation treatments in the pinyon/juniper and sagebrush/grassland vegetation communities, reseeding would occur at the earliest conducive time following treatment. Species to be utilized in reseeding such areas include:

Arizona Fescue	Smooth Brome
Western Wheatgrass	Prairie Junegrass
Mutton Bluegrass	Longtongue Muttongrass
Sandberg Bluegrass	Big Squirreltail
Intermediate Wheatgrass	Pubescent Wheatgrass
Slender Wheatgrass	Crested Wheatgrass

Sideoats Grama
Needle & Threadgrass
Globemallow
Small Burnet
Kentucky Bluegrass
Bitterbrush
Lewis Flax

5) To mitigate indirect impacts regarding increased human use and potential erosion of the Mount Trumbull trail, due to construction of a trailhead facility in Nixon Flat, trail conditions would be monitored annually, and appropriate maintenance will be completed as needed.

6) To mitigate direct impacts to visual resources associated with the realignment of roads or trails when resource damage is occurring, old road or trail segments would be rehabilitated and re-seeded where possible, at the earliest conducive time following closure.

7) To mitigate direct impacts to visitors from the closure of roads, limiting group sizes, requiring campsite permits, and seasonally closing campsites (all to reduce unacceptable campsite conditions), public involvement would be required in the decision making process when specifics of these potential actions are known.

8) To mitigate direct impacts to commercial users from potential limitations upon commercial use, group size, and the numbers of vehicles allowed per group, public involvement would be required in the decision making process when specifics of these potential actions are known.

9) To mitigate direct impacts to visual resources from vegetation treatments in the pinyon/juniper, ponderosa pine and sagebrush/grassland vegetation communities, boundaries of treatment areas would be irregular, stumps would be cut low, slash would be removed from the site and/or burned and areas would be reseeded with grass, forb and shrub species where necessary.

10) To mitigate indirect impacts to visitors from the potential increase of use of the Mount Trumbull Wilderness Area due to construction of a trailhead facility in Nixon Flat, the Mount Trumbull trail would be interpreted to the public as an area they can expect to receive higher use than often occurs in a wilderness area.

11) To mitigate direct impacts to cultural resources from pinyon/juniper, ponderosa pine and sagebrush/grassland planned management actions, site specific cultural inventories would be conducted to avoid impacts to cultural resources. Compliance with section 106 of the National Historic Preservation Act of 1966 is mandatory. Where impacts can not be avoided, consultation with the State Historic Preservation Office would be required with associated employment of their recommendations.

12) To mitigate direct impacts to cattle grazing resulting from exclusion of cattle from treatment ares, cattle will be excluded from treatment areas only where possible, not entire pastures. Plans for exclusion of cattle from specific areas for revegetation purposes or to allow fine fuels to build up in order to carry prescribed fires will be coordinated with grazing permittees well in advance.

13) To mitigate potential indirect cumulative impacts to cultural resources from increased interpretation and visitor use of the RCA, Law Enforcement and Arizona Site Steward patrols will continue and will increase if the incidence of vandalism rises.

14) To mitigate direct cumulative impacts to visual resources from the upgrade or construction of roads to accomplish planned management actions, all newly constructed access roads will be reclaimed after termination of the specific need. In addition, existing roads which are upgraded will be returned to their prior condition following termination of the specific need.

15) To mitigate cumulative impacts to nesting/brooding avian species from vegetation treatments, mechanical and fire vegetation treatments would be timed accordingly to reduce such conflicts.

16) Negative direct, indirect and cumulative impacts to future federally listed species would be eliminated or avoided through the Endangered Species Act's Section 7 Consultation process.

Residual Impacts:
No residual impacts from the proposed action would remain after application or implementation of mitigation measures.

CONSULTATION AND COORDINATION

Persons and Agencies Consulted:
The following persons were notified by correspondence prior to initiation of the planning effort for the Mount Trumbull RCA and were invited to participate or send a representative as a team member:

Name	Affiliation/Interest
Bruce Palmer	Arizona Chapter of the Wildlife Society
James L. Matson	Kaibab Forest Products Co.
Jim Ruch	Grand Canyon Trust
Tom Britt	Arizona Game & Fish Dept.
Robert S. Chandler	Grand Canyon National Park
Charles Randall	Recreation
Cecil Blake	Ranching
Anthony Heaton	Recreation/Ranching
Orvel Bundy	Ranching

The following persons have participated in the Mount Trumbull RCA planning effort as team members:

Name	Affiliation/Interest

Charles Randall	Recreation
Cecil Blake	Ranching
Anthony Heaton	Recreation/Ranching
Orvel Bundy	Ranching
Willis A. McEwen	Ranching
Roy Hall	Coconino National Forest
Robert Price	Arizona Game & Fish Dept.
Robert Urquidez	Arizona Game & Fish Dept.
John Goodwin	Arizona Game & Fish Dept.
Randy Smith	Arizona Game & Fish Dept.
Tom Finley	Arizona Game & Fish Dept.
Merlin Esplin	Kaibab Forest Products Co.
Pete Wilkin	Cedar City District, BLM
Bruce Palmer	Arizona Chapter of the Wildlife Society
Ed Cummins	Grand Canyon National Park
Clint Oke	Arizona State Office, BLM
Bill Grossi	Arizona State Office, BLM
Kirk Rowdabaugh	Arizona State Office, BLM
Dennis Curtis	Vermillion Resource Area, BLM
Mike Small	Vermillion Resource Area, BLM
Duncan MacDonald	Vermillion Resource Area, BLM
Lee Hughes	Vermillion Resource Area, BLM
Laurie Ford	Vermillion Resource Area, BLM
Marci DeMillion	Vermillion Resource Area, BLM
Kevin Schoppmann	Vermillion Resource Area, BLM
Ken Moore	Vermillion Resource Area, BLM
Bob Sandberg	Vermillion Resource Area, BLM
Tom Folks	Vermillion Resource Area, BLM
Diana Christensen	Vermillion Resource Area, BLM
Phil Seegmiller	Vermillion Resource Area, BLM
Greg Taylor	Vermillion Resource Area, BLM
Trent McCown	Vermillion Resource Area, BLM
Ron Wadsworth	Vermillion Resource Area, BLM
Darryl Hafen	Shivwits Resource Area, BLM
Matt Safford	Arizona Strip District, BLM
Bette Arial	Arizona Strip District, BLM
Roger Taylor	Arizona Strip District, BLM
Bryan Bracken	Arizona Strip District, BLM
Bob Davis	Arizona Strip District, BLM
Becky Hammond	Arizona Strip District, BLM
Julian Anderson	Arizona Strip District, BLM
Eddie Guerrero	Northern Arizona University
Wally Covington	Northern Arizona University
Margaret Moore	Northern Arizona University
Boris Tkacz	

List of Preparers:

Bureau Of Land Management, Vermillion Resource Area Employees

Diana Christensen	Archaeologist
Tom Folks	Recreation/Wilderness Specialist
Laurie Ford	Realty Specialist

Lee Hughes	Ecologist
Duncan MacDonald	Natural Resource Specialist
Ken Moore	Nonrenewable Branch Supervisor
Kevin Schoppmann	Rangeland Management Specialist
Bob Sandberg	Renewable Branch Supervisor
Mike Small	Wildlife Biologist
Greg Taylor	Environmental Protection Specialist

Public Involvement:

The Mount Trumbull Resource Conservation Area team met to formulate the plan during the following periods:

February 1993
June 1993
January 1994
April 1994
November 1994
December 1994
June 1995

In February of 1995, BLM staff briefed the Cultural Preservation Officer and Cultural Advisory Team of the Hopi Nation on planned management actions for the Mount Trumbull RCA.

On July 7, 1995 a letter of notification was sent out to members of the public, government agencies and organizations whom had previously expressed interest in the Mount Trumbull RCA or issues/resources associated with this area. Letters of notification were sent to the following individuals, agencies and organizations.

5-M Inc	American Mustang
American Rivers Southwest Regional Office	Arizona State Land Dept.
Arizona Wildlife Federation	Arizona Chapter of the Wildlife Society
Arizona Dept. of Agriculture	Arizona Dept. of Environmental Quality
Arizona Game and Fish Dept., Habitat Branch	Arizona Game and Fish Dept., Region 2
Arizona State Land Commissioner	Arizona Wilderness Coalition
Coconino County Board of Supervisors	Mohave County Board of Supervisors
Bureau of Indian Affairs, Area Office	St. George, Chamber of Commerce
Page, Chamber of Commerce	Chamberlain and Higbee
City Office of Page	Coconino County Administration Center
Cultural Preservation Office	Dames and Moore
Defenders of Wildlife	Desert Bighorn Council
Div. of Resource Mgmnt., Grand Canyon	Dixie Wildlife Federation
Drachman Institute	Energy Fuels Nuclear Inc.
Coconino County Cooperative Extension	Five County Association of Governments
Friends of the Colorado River	Glen Canyon National Recreation Area
Glover, Gregory and Schoppmann	Grand Canyon National Park, Tuweep
Grand Canyon Trust, St. George	Grand Canyon Trust, Flagstaff
Heaton Livestock Company	HEL Development LTD.
High Desert Research	Hurricane Valley Chamber of Commerce
Jennifer Jack, Archaeological Society	Kaibab Paiute Tribe
Kane County Commission	Lake Mead National Recreation Area

Lake Powell Chronicle
Maricopa Audobon Society
Mayor, City of LaVerkin
Mayor, Hildale Town Corporation
Mayor, City of Santa Clara
Mohave County Public Land Use Commission
Northern Arizona Audobon Society
National Park Service, Env. Quality Div.
Predator Project
Resource Stewardship
Senator John McCain
Shivwits Band of the Paiute Tribe
Sierra Club, Grand Canyon Chapter
Simmons & Hughes
Southern Utah Wilderness Alliance, SLC
Southwestern Field Biologists
St. George, City Manager
Swapp & Johnson
The Amerind Foundation, Inc.
The Hopi Tribe
Town of Fredonia
U.S. Forest Service, Region III
University of Tennessee, Botany Dept.
BLM, Utah State Office
Western Arizona Coalition of Governments
Wilderness Watch
Yuma Audobon Society
Ken Abbott
J.T. Alf
L. Dean Anderson
Rick Arial
George Atwood
Larry Ballard
Sarah Bates
D. Berlin
F. Duane Blake
Ronald Blake
James Boone
Gerry Bourke
Leon Brinkerhoff
Bill Broadbent
Andrea L. Bundy
Daniel Bundy
Elroy Bundy
Ethan & Debra Bundy
Jason & Jeri Bundy
Mark & Leslie Bundy
Orvel & Sara Bundy
DeRalph Bunting
C. Judd Burgess
Marvin Button
Dean Carter
Mike Clark
Ronald Clawson
Mariah Associates, Inc.
Mark Sleight Expeditions, Inc.
Mayor, City of Hurricane
Mayor, Kanab City Corporation
Mayor, Town of Toquerville
Mohave County, Planning and Environmental Commission
National Outdoor Leadership
Paiute Indian Tribe of Utah
Rainbow Resources Outdoor Consultants
River Land Resort
Senator John McCains Office
Sierra Club, Phoenix
Sierra Club, Plateau Group
Soil Conservation Service, Fredonia
Southern Utah Wilderness Alliance, Cedar City
Southwestern Utah's Color Country
Arizona State Land Dept.
SWCA Environmental Consultants
The Forestry Association, Inc.
The Nature Conservancy
U.S. Fish and Wildlife Service, Albuquerque
University of Arizona Cooperative Extension
USU Extension
Washington County Commissioner
Western Hills
Worldwide Explorations
Bingham & Bunker
Mayor Allen Adams, Kanab
Mrs. Irvin Alldredge
Cloanne Andrus
Brent and Nanette Atkin
Gary Baier
Dan Barlow, Mayor of Colorado City
Lewis Beatty
Darrell Blake
Cecil & Ila Mae Blake
Alex Bonham
Howard Booth
Rep. Bud Bowman
William Brinkerhoff
Sidney Brown
Clay Bundy
Eddie & Connie M. Bundy
Elmer Bundy
Glen Bundy
Lowell Bundy
Newman L. Bundy
William H. Bundy
Finley J. Bunting
LaDonna Burgess
Leonard Byerly
Tom Cassidy - American Rivers
Richard Clark
Mason H. Coggin

Carl & Linda Cohan
Russell Corn
B. Cox
W. Cunningham
Philip Y. Denormandie
Doug & Mary DeWitz
Cedric & Daisy Downer
Jack Dykinga
Bruce Eilerts
Robert J. Ellis
Darlo Esplin
LeMoyne Esplin
Richard Farrand
George Ferguson
Donald & David Finicum
Howard Foremaster
Philip Foremaster
Landon Frei
Shelby Frei
A.L. Gainer
Don Dee Gates
Joeseph Gendron
Omer Gifford
Mike Gorrell
Reba Grandrud
Michael Gregory
C.A Griffiths
Wayne Grosz
William Gubler
Grant Hafen
Glenwood Hall
Congressman Jim Hansen
Anthony Heaton
Ferril Heaton
Vard Heaton
G.M. Hemmeter, M.D.
Rep. J. William Hickman
Jerry Holliday
Melvin & Ione Hughes
John Inman
Bruce & Pam Jensen
Sherman & Farric Jensen
Owen & David Johnson
Leroy P. Judd
James Keene
Bevan Killpack
Senator Jon Kyl
Rudi Lambrechtse
Robert Langston
Ronald Madsen
John Marr
Corey & Mary Mayes
Joe McGloin
Janet Monaco
Tom Contreras
Steven Cory
Charles W. Crosby
Jane Cushen
K.C. Deutschlander
Senator Mike Dmitrich
Wallace Duncan
Jack Egbert
Larry Ellicott
Cleve Esplin
Donald Esplin
Stan Esplin
Jack Faught
Bert Fingerhut
Stephen Finucane
LaVar Foremaster
Jane Foster
Leland Frei
Paul Friesma
Dean Gardner
Gail Gaylor
Jamie Gentry
Krista Gooch
Marion Graf
Lee Gregory
Jo Griffith
David Grisez
Rob Grumbles
Clair Hafen
Van Hale
Senator Benjamin Hanley
George Harper
Derryl & Landell Heaton
Fred Heaton
Harold Hedges
Lyle Heyborne
John Hiscock
Ila May Hughes
Russel Hunt
Fred Jackson
Morgan Jensen
John & Tami Snyder
Representative Met Johnson
Tony Judd
Richard Ketchum
Hans Koenig
Clark Lamb
David & Nancy Lamkin
Sandra Lausen
Paul Mangum
Tom Martin
Senator John McCain
Nina Mohit
Dorothy Munoz

WM. B. & WM. M. Nielson
Wayne B. Nuttall
Sharon Orchekowsky
John Pamperin
James Peterson
E.S. Pickett
Elwin Pratt
Ashby Reeve
John Rich
Edwin Riggs
David Ruesch
John Schumaker
Dave & Jane Sell
Duane Shults
Dale Spencer
Congressmen Bo Stump
Russell Sullivan
Jane Tinsley
Robert Traficanti
Nancy Wahl
Paul Weaver
Charles Welch
Jane Whalen
Jim Whitlock
Ken & Julie Woods
Dixie & O.I. Northcott
Matt O'Brien
Bruce Palmer
Garry Pearce
Edwin Pfeifer
Joe Pleggenkuhle
Roger Pugh
Diana & Michael Rice
Elizabeth Ridgely
Kevin Royle
Maggie Sacher
Cabot Sedgewick
Robert Seney
Sue Spears
Joan Stavely
James Sullivan
Superintendent- Zion N.P.
Allen Townsend
Postelle Vaughan
Steven Ward
Dr. Merlin Webb
Frances Werner
Glen Whited
Harry Wilson
Tom Wright

Individuals, agencies and organizations which requested, and were sent copies of the Mount Trumbull RCA Plan and accompanying environmental assessment included the following:

Mohave County Public Land Use Commission
Arizona State Parks
Arizona Dept. Of Mines and Mineral Resources
NOLS attn: Willy Cunningham
Tom Wright
Kaibab National Forest
Mohave County Supervisor
C.D. Dewitz
Mark Sleight
Wallace Duncan
Donn M. Pillmore
Charles Randall
Ed Bundy
Veannetta Laub
Garth Bundy
Sharon Carter
Bean & Jean Luttrell
James Bundy Trustee
Nathaniel Devlin
Owen Bundy
Leslie & Christine Bundy
Henry Carroll
Darrell & Carolyn Weber
Denice Hughes
Defenders of Wildlife
Robin Silver
Congressman Hansen (c/o Rick Arial)
Glen Canyon National Recreation Area
Newman Bundy
Southwest Center for Biological Diversity
Sierra Club attn: Sharon Galbraith
Pipe Springs National Monument
Southern Utah Wilderness Alliance
Kevin Royle
Wallace Covington, NAU
A. Maughan Lee
Ruth Bundy
Daniel and Elizabeth Bundy Trustees
Richard Wynn
Mary Craig
Cecil & Margaret Empey
Abraham Bundy Family Organization
Chester Bundy
Andre Bundy
Larry & Caroline Iverson
Rudger C. Atkin Inc.
Doloras & Nora Bice
Wendel & Kayleen Bundy

John Snyder
Mark Bundy
Levi Iverson
Esplin Cattle Company
Larry Iverson
Vixon V. Adams
Arizona Game & Fish Dept.

Lane Mathis Co. Co-Partnership
Ramon & Edna Martinez
Hannah Iverson
Thelma Masters
Jerry & Netina Bodine
Christopher Rieber
Joe McGloin

FINDING OF NO SIGNIFICANT IMPACTS

Based on the analysis of potential environmental impacts contained in this environmental assessment, impacts are not expected to be significant and an environmental impact statement is not required.

Decision Record
Arizona Strip District
Mount Trumbull Resource Conservation Area
D.R. AZ-010-95-027
Reference Environmental Assessment
E.A. AZ-010-95-015

September 1995

Decision

It is my decision to authorize and implement the Mount Trumbull Resource Conservation Area (RCA) Plan. The decision to implement this plan is in conformance with the Arizona Strip District Resource Management Plan (1992) as required by 43 Code of Federal Regulations 1610.5. Adaptive, ecosystem management will proceed in the RCA, to be conducted by an interdisciplinary team which determines issues, sets objectives, and prioritizes management actions based on weak links in the ecosystem. In addition, the mission statement developed by the interdisciplinary team will continue to provide guidance for the RCA. The mission statement asserts, "By consensus, define future condition(s) for the Mount Trumbull RCA. 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."

Large scale ponderosa forest restoration projects will not occur within the Mount Trumbull RCA until further site specific National Environmental Policy Act (NEPA) compliance is initiated, complete with public involvement. Initially, the following management actions will occur within the Mount Trumbull RCA:

1) 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 of RCA Plan).

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.

2) Systematic Analysis of Changes in Forest Structure and Fire Regimes -
This analysis will be conducted by research staff from Northern Arizona University (NAU), School of Forestry. This analysis will follow well established procedures based on measurement of living and dead trees, reconstruction of pre-disruption forest structure, and dendroecological study of fire regimes. The biological diversity of the insect, tree, and herbaceous plant communities in contemporary and pre-disruption forests will be determined. Young, mature, and old trees will be sampled for tree vigor and capability to resist invading insects and disease. Fire behavior and fuel structures will be assessed. Wildlife habitat for selected key species will be compared under contemporary and pre-disruption forest conditions. Finally, implications for changes in the quantity and quality of natural resources including water, forage, wood, fiber, and recreation opportunity will be drawn. The result of this work will be a detailed characterization of the natural range of variability in pre-disruption forest and a thorough assessment of how ponderosa forests have changed up to the present.

3) Sampling and Analysis of Forest Areas Which Have Been Subject to Disturbance -
This sampling and analysis will 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 will be selected for sampling. At each of these sites, the extent, timing, and intensity of the disturbance will be determined and forest and fuel structures will 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, will be determined at each site. Once the effects of contemporary disturbance are quantified, each site will be compared to the range of natural variability in pre-disruption forests. The result of this comparison will 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 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.

4) Demonstration and Experimental Restoration Plots -
Demonstration and experimental restoration plots will be established jointly between Northern Arizona University, School of Forestry research staff and BLM staff. Total acreage of these restoration plots will be 225 acres. Demonstration plots will be treated first with varying degrees of understory thinning and prescribed fire designed to conserve mature and old-growth trees and restore areas to conditions in which low intensity surface fire can play its natural role. Leave trees will be marked by NAU, BLM and members of the interdisciplinary team. Thinning will remove the majority of seedling, sapling, and pole size trees from these areas thus removing nutrient competition and fire hazard from mature and old-growth trees. Trees which are cut from the restoration plots will be sold as fuelwood, pulpwood, or saw timber if they can be utilized as such. Wood which cannot be sold as fuelwood, fiber or saw timber will be piled and burned in place on the restoration plots. These plots will be selected in areas with good public access and visibility.

The demonstration plots will 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 each will be treated. Next, 5 sets of experimental plots, each set consisting of 2 plots 20 acres in size will be installed in the RCA. These plots will 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 will be distributed primarily in the areas described in EA-AZ-010-95-15 as the Sawmill Forest Restoration Units and Lava and Petty Knoll Fuels Reduction Units. Establishment of demonstration and experimental restoration plots outside of these areas will require additional NEPA compliance. Livestock grazing will be excluded as necessary from the restoration plots until herbaceous understory vegetation is established. Reseeding, if necessary will be completed with native species. To insure that grasses are present to carry low intensity surface fires through these areas on intervals mimicking natural fire intervals, cattle will be excluded as necessary. Thereafter, if surplus forage exists, utilization of key forage species will be limited to an average of 50 percent of the current year's growth.

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 unnatural fuel loading.

5) Tuckup Wood Harvest Area -
This management action will occur in T.35N., R.7W., portions of sections 10,14, and 15. This action will 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 will be interspersed to create a mosaic of openings in the pinyon/juniper woodland. All stems over 3 inches in diameter will be cut and all limb wood exceeding 2 inches in diameter will be harvested. Slash will 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, grasses and shrubs will be seeded to help re-establish herbaceous vegetation. Livestock grazing will be excluded as necessary from the harvest areas until herbaceous understory vegetation is established. To insure that grasses are present in quantities necessary to carry low intensity surface fires through these areas, cattle will be excluded as necessary. Thereafter, if surplus forage exists, utilization of key forage species will be limited to an average of 50 percent of the current year's growth. Monies collected from the sale of permits will be retained to cover costs associated with burning/seeding.

6) Head of Toroweap Valley Wood Harvest Area -
This management action will 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.

7) Nixon Wood Harvest Area -
This management action will 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.

8) Sawmill Wood Harvest Area -
This management action will 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 Pinyon/Juniper 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. A maximum of 800 acres of the total 52,492 acres classified as pinyon/juniper in the RCA will be treated with commercial fuel wood cutting and prescribed fire.

9) Cantaloupe Valley Sagebrush Reduction -
This management action will occur in T.35N., R.7W., portions of sections 5,7,8,17, and 18. This action will 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. Where necessary, grasses and shrubs will be seeded to help re-establish herbaceous vegetation. Livestock grazing will be excluded from the burn area until herbaceous understory vegetation is established. To insure that grasses are present in quantities necessary to carry low intensity fires through these areas, cattle will be excluded periodically to insure enough grasses are present to carry prescribed fires. Thereafter, if surplus forage exists, utilization of key forage species will be limited to an average of 50 percent of the current year's growth.

10) White Springs Sagebrush Reduction -
This management action will occur in T.35N., R.8W., portions of sections 11,12,13, and 14. This action will 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 will 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 will be excluded from the burn/tebuthiuron area until herbaceous understory vegetation is established. To insure that grasses are present in quantities necessary to carry low intensity fires through these areas, cattle will be excluded periodically to insure enough grasses are present to carry prescribed fires. Thereafter, if surplus forage exists, utilization of key forage species will be limited to an average of 50 percent

of the current year's growth.

11) Little Oak Springs Sagebrush Reduction -
This management action will occur in T.34N., R.8W., portions of sections 10 - 12. This action will consist of the use of tebuthiuron or prescribed fire to reduce sagebrush in an area which was chained previously. This action will involve approximately 2000 acres. The lack of fine fuels to carry fire makes the use of tebuthiron 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 will be excluded from the tebuthiuron area until herbaceous understory vegetation is established. To insure that grasses are present in quantities necessary to carry low intensity fires through these areas, cattle will be excluded periodically to insure enough grasses are present to carry prescribed fires. Thereafter, if surplus forage exists, utilization of key forage species will be limited to an average of 50 percent of the current year's growth.

12) North Toroweap Valley Sagebrush Reduction -
This management action will occur in T.35N., R.7W., portions of section 19,29,30, and 31. This management action will 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 will be excluded from the burn/tebuthiuron area until herbaceous understory vegetation is established. To insure that grasses are present in quantities necessary to carry low intensity fires through these areas, cattle will be excluded periodically to insure enough grasses are present to carry prescribed fires. Thereafter, if surplus forage exists, utilization of key forage species will be limited to an average of 50 percent of the current year's growth.

13) South Toroweap Valley Sagebrush Reduction -
This management action will occur in T.34N., R.7W., portions of sections 17,18,19,20, and 30. This management action will 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 will be excluded from the burn/tebuthiuron area until herbaceous understory vegetation is established. To insure that grasses are present in quantities necessary to carry low intensity fires through these areas, cattle will be excluded periodically to insure enough grasses are present to carry prescribed fires. Thereafter, if surplus forage exists, utilization of key forage species will be limited to an average of 50 percent of the current year's 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 restore biodiversity. Additionally, watershed values would benefit by providing ground cover (herbaceous species) to reduce run-off and associated erosion. A maximum of 6,800 acres of the total of 33,881 acres of the sagebrush vegetation type found in the RCA will be subjected to fire and/or tebuthiuron.

14) Maintain BLM roads and trails and request maintenance of County roads in the RCA at levels and frequencies to complement recreation management setting guidance. Place all roads or trails on the District Transportation Plan and maintain at levels and frequencies to complement recreation management setting guidance.

15) Inventory all roads in the RCA. Decide which roads or trails to physically close. Rehabilitate and sign closed roads.

16) Rehabilitate, to appropriate recreation setting standards, roads that have been temporarily upgraded once the purpose of the upgrade has been served.

17) Consider realignments of segments of BLM transportation or project roads or trails when resource damage is occurring or when physical access is inhibited.

18) Develop information and interpretation projects and signing throughout the RCA compatible with the various recreation settings.

19) Construct a trailhead facility in the Nixon Flat Area.

20) Limit group size, close campsites seasonally, require campsite permits, and harden popular campsites to accommodate concentrated use to reduce unacceptable campsite conditions where necessary.

21) Limit commercial recreation use, limit group size and limit the number of vehicles per group to reduce use in selected areas and reduce encounters between different camping/recreation groups.

22) Initiate cultural resource information and education programs focused on the RCA. Additionally, publicize rewards given to citizens who provide information on potential cultural resource vandalism. Furthermore, increase public contact in the RCA and limit distribution of non-public cultural resource site information. (see pages 32-39 of Mount Trumbull RCA Plan for additional description of recreation management actions)

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 will be an ongoing process by the interdisciplinary team, any interested public and agency representatives. When necessary, supplementary environmental documents will be completed on future proposed management actions. Through this process, the RCA Plan will 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. Additional National Environmental Policy Act (NEPA) documentation and compliance, with public involvement, will be necessary for large scale operational ponderosa pine ecosystem restoration treatments and/or manipulation of other vegetation communities.

The following management actions were considered but will not be implemented:

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.

Lava and Petty Knoll Fuels Reduction Units -

These management actions would occur in T.34N., R.8W., portions of sections 8 and 9 on approximately 200 acres and T.34N., R.8W., portions of sections 17 and 18 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 would involve fragmenting areas of continuous heavy fuels by restoring pre-disruption ecosystem structure and function, thereby reducing fire hazard. Ecological restoration would allow these areas to serve as anchor points for future fire suppression. These restored fire-breaks would serve as starting lines for potential future restoration efforts.

The Sawmill Forest Restoration Units and the Lava and Petty Knoll Fuels Reduction Units will be addressed as large operational scale ponderosa pine ecosystem restoration units in future NEPA documents. Results of cooperative NAU and BLM demonstration and experimental ponderosa pine ecosystem restoration plots, 3-20 acres in size will be shown to the public and other agencies. Feedback and cooperation from these groups will then be used to design large scale operational restoration treatments in ponderosa pine forest in the Mount Trumbull RCA.

Rationale for the Decision

The no action alternative, or the continuation of existing management was not selected to guide future management in the RCA because it does not address the mission statement developed by

the interdisciplinary team nor does it meet objectives set for the RCA by the team. Guidance from BLM Handbook 1790-1 states that concerns about land use may be addressed in an RMP/EIS in which several alternative uses of resources are analyzed. In subsequent activity planning, an EA tiered to the RMP/EIS may be prepared to examine site specific impacts. Although there may continue to be public controversy and concern regarding alternative land uses, it is not necessary to reevaluate previously analyzed alternatives if the concerns were adequately addressed in the EIS prepared for the land use plan (RMP).

Rationale for implementing the Mount Trumbull RCA plan is as follows:

Ponderosa forests are adapted to natural, low-intensity, frequent fires. By restoring natural conditions to the forest, fire can again play its natural role in the ecosystem. An uneven aged stand of ponderosa with a higher percentage of old growth trees and understory of grass and forbs will create diversity in the ecosystem. Improvements will be seen in wildlife diversity, forage availability, and long term visual aesthetics.

Adding plant diversity to essentially monotypic stands of the pinyon/juniper vegetation type will increase forage production and biodiversity. Wildlife species and wildlife habitat will become more diverse within this vegetation type. Watershed resources will be improved in the long term by increasing understory plant cover and soil stability. Visual aesthetics will be improved in the long term by increasing vegetative diversity.

By managing the spectrum of recreational settings in the RCA so that selected indicators of resource and social conditions are within or below the ranges described in Table 9 of the RCA Plan (page 20), visitor enjoyment of the RCA will be maintained or increased and will provide for quality visitor experiences in a variety of settings, while lessening impacts to resources. Also, achievable targets at which to aim a series of management actions designed to resolve the issue of maintaining opportunities for high quality recreation will be provided.

Experience opportunities will be enhanced with information, interpretation, services, and facilities provided to visitors so they can make appropriate choices about participation in recreation activities within the RCA. Specific guidelines will direct a series of management actions related to the kinds and amounts of information, interpretation, services, and facilities appropriate for a variety of recreation settings. 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.

Mitigation Measures

1) To mitigate direct impacts regarding the displacement of wild turkey and Kaibab squirrel from thinning and prescribed burning, potential loss of turkey roost trees, and loss of habitat favored by Kaibab squirrels, large scale ponderosa pine ecosystem restoration treatments will be designed taking into account suggestions and input of the Arizona Game and Fish Department.

2) To mitigate indirect impacts to goshawks regarding potential inter-specific competition with other raptor species, final treatment areas in the ponderosa pine ecosystem will not cover areas large enough to comprise entire goshawk territories nor compromise nesting areas. In addition,

forest treatments will be designed to create mosaics of structural stages of pine which are required by goshawks. Furthermore, suggestions and input from the Arizona Game and Fish Department will be utilized in the final design of forest treatment areas.

3) To mitigate direct impacts to air quality from the use of prescribed fire, prescription parameters dictating that prior to ignition, winds should be blowing in a direction which carries smoke away from the Grand Canyon National Park will continue to be followed.

4) To mitigate indirect impacts regarding soil loss and potential reduction of water quality due to vegetation treatments in the pinyon/juniper and sagebrush/grassland vegetation communities, reseeding will occur at the earliest conducive time following treatment. Species to be utilized in reseeding such areas include the following native and non-native species:

Arizona Fescue	Smooth Brome
Western Wheatgrass	Prairie Junegrass
Mutton Bluegrass	Longtongue Muttongrass
Sandberg Bluegrass	Big Squirreltail
Intermediate Wheatgrass	Pubescent Wheatgrass
Slender Wheatgrass	Crested Wheatgrass
Sideoats Grama	Kentucky Bluegrass
Needle & Threadgrass	Bitterbrush
Globemallow	Lewis Flax
Small Burnet	

All restoration treatments in ponderosa pine forest will be reseeded only if necessary. Seeding in these restoration areas will be done with native species only.

5) Results of cooperative NAU and BLM demonstration and experimental ponderosa pine ecosystem restoration plots, 3-20 acres in size will be shown to the public and other agencies. Feedback and cooperation from these groups will then be used to design large scale operational restoration treatments in ponderosa pine forest in the Mount Trumbull RCA.
Future large scale operational restoration treatments are subject to additional NEPA documentation.

6) All snags and selected large down logs will be retained in demonstration and experimental ponderosa pine restoration plots. This will be accomplished by raking organic litter away from them prior to prescribed burning.

7) All mature and old-growth trees greater than 20 inches in diameter (representing trees in age classes greater than 120 years of age) will be retained in demonstration and experimental restoration plots. Organic matter will be removed from the bases of these trees to prevent girdling of the trunk and root mortality from prescribed burning.

8) Cattle will be excluded from ponderosa pine ecosystem restoration treatment areas until native herbaceous understory vegetation is established. In addition, cattle will be excluded from commercial cutting/burn areas in pinyon/juniper woodland, and tebuthiuron/burn areas in sagebrush until herbaceous vegetation is established. To insure that grasses are present in quantities necessary to carry low intensity fires through these areas, cattle will be excluded

periodically to insure enough grasses are present to carry prescribed fires. Thereafter, if surplus forage exists, utilization of key forage species will be limited to an average of 50 percent of the current year's growth.

9) To mitigate direct impacts to cattle grazing resulting from exclusion of cattle from treatment areas, cattle will be excluded from treatment areas only where possible, not entire pastures. Plans for exclusion of cattle from specific areas for revegetation purposes or to allow fine fuels to build up in order to carry prescribed fires will be coordinated with grazing permittees well in advance.

10) To mitigate direct impacts to visual resources from vegetation treatments in the pinyon/juniper, ponderosa pine and sagebrush/grassland vegetation communities, boundaries of treatment areas would be irregular, stumps will be cut low, slash will be removed from the site and/or burned and areas will be reseeded with grass, forb and shrub species where necessary. A buffer of at least 1/4 mile will be utilized between sagebrush manipulations by fire or tebuthiuron and the Mount Trumbull Wilderness Area and Grand Canyon National Park. Visual impacts will be mitigated through the establishment and maintenance of herbaceous vegetation.

11) To mitigate indirect impacts regarding increased human use and potential erosion of the Mount Trumbull trail, due to construction of a trailhead facility in Nixon Flat, trail conditions will be monitored annually, and appropriate maintenance will be completed as needed.

12) To mitigate direct impacts to visual resources associated with the realignment of roads or trails when resource damage is occurring, old road or trail segments will be rehabilitated and re-seeded where possible, at the earliest conducive time following closure.

13) To mitigate direct impacts to visitors from the closure of roads, limiting group sizes, requiring campsite permits, and seasonally closing campsites (all to reduce unacceptable campsite conditions), public involvement will be required in the decision making process when specifics of these potential actions are known.

14) To mitigate direct impacts to commercial users from potential limitations upon commercial use, group size, and the numbers of vehicles allowed per group, public involvement will be required in the decision making process when specifics of these potential actions are known.

15) To mitigate indirect impacts to visitors from the potential increase of use of the Mount Trumbull Wilderness Area due to construction of a trailhead facility in Nixon Flat, the Mount Trumbull trail will be interpreted to the public as an area they can expect to receive higher use than often occurs in a wilderness area.

16) To mitigate direct impacts to cultural resources from pinyon/juniper, ponderosa pine and sagebrush/grassland planned management actions, site specific cultural inventories will be conducted to avoid impacts to cultural resources. Compliance with section 106 of the National Historic Preservation Act of 1966 is mandatory. Where impacts can not be avoided, consultation with the State Historic Preservation Office is required with associated employment of their recommendations.

17) To mitigate potential indirect cumulative impacts to cultural resources from increased

interpretation and visitor use of the RCA, Law Enforcement and Arizona Site Steward patrols will continue and will increase if the incidence of vandalism rises.

18) To mitigate direct cumulative impacts to visual resources from the upgrade or construction of roads to accomplish planned management actions, all newly constructed access roads will be reclaimed after termination of the specific need. In addition, existing roads which are upgraded will be returned to their prior condition following termination of the specific need.

19) To mitigate cumulative impacts to nesting/brooding avian species from vegetation treatments, mechanical and fire vegetation treatments will be timed accordingly to reduce such conflicts.

20) Negative direct, indirect and cumulative impacts to future federally listed species will be eliminated or avoided through the Endangered Species Act's Section 7 Consultation process. Consultation with the U.S. Fish and Wildlife Service (USFWS) is not needed for peregrine falcons. The Arizona Strip District Resource Management Plan and Final Environmental Impact Statement (1992) underwent USFWS review and states that a one mile buffer around peregrine nests indicates the point at which a thorough impact evaluation will begin. Peregrine falcon are not known to nest in the Mount Trumbull RCA. Nests do occur in the Grand Canyon National Park 5-10 miles from the RCA boundary. No "may affect" situation exists relating to this species from proposed actions within the RCA.

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 Mount Trumbull RCA interdisciplinary team and any other interested agency or public. Interested agencies, 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 of the RCA Plan (page 20).

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.

_____ _____Dennis Curtis -

Vermillion Resource Area Manager Date

