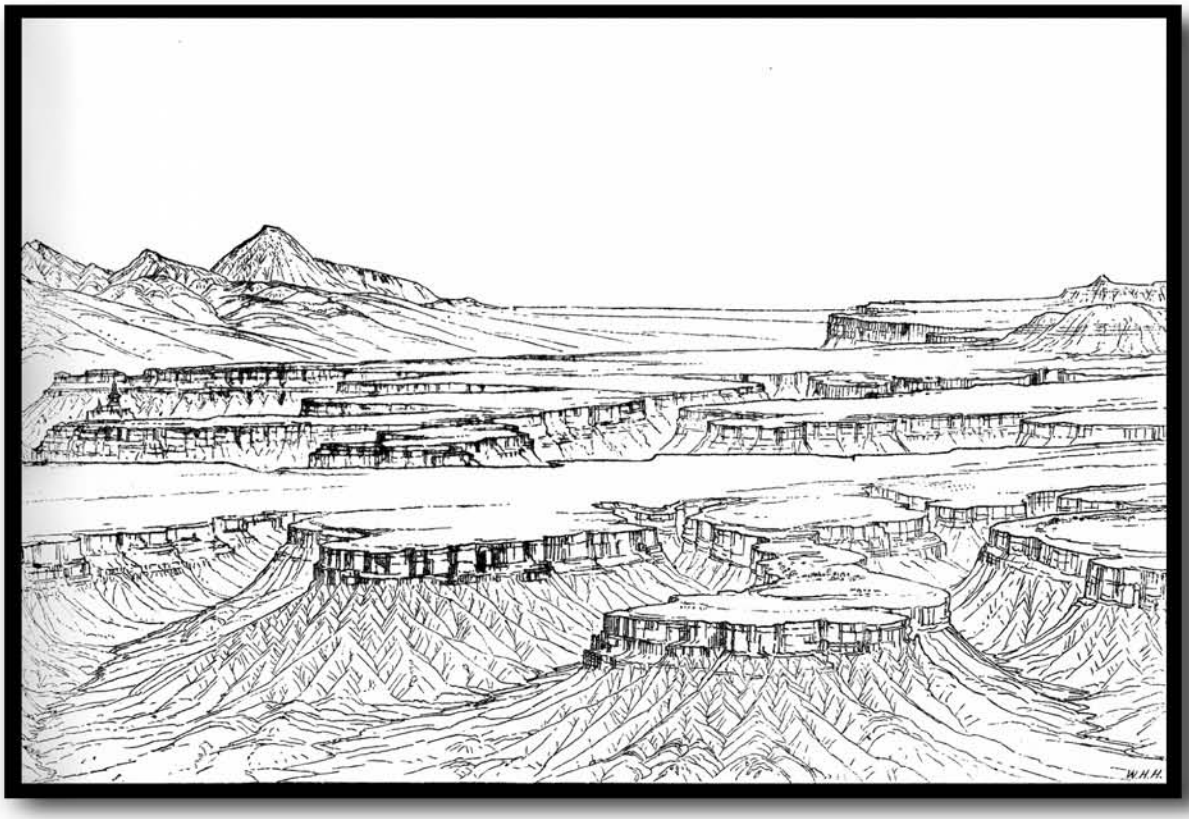
Appendices



"The Arizona Strip is one of the most remote regions on earth. It is five million acres of no electricity, no phone lines, and very little water. The lack of water is what kept it remote, plus the reality that the Grand Canyon defines its southern border. The fact that there are 280 miles of canyon with no highway bridge means there's little reason for anyone to pass that way except out of curiosity. And even then it requires a stout vehicle and an even stouter heart."

Lyman Hafen, 2001

APPENDIX 1.A

GRAND CANYON-PARASHANT NATIONAL MONUMENT PROCLAMATION (#7265)

Establishment of the Grand Canyon-Parashant National Monument (#7265)

By the President of the United States of America

A Proclamation

The Grand Canyon-Parashant National Monument is a vast, biologically diverse, impressive landscape encompassing an array of scientific and historic objects. This remote area of open, undeveloped spaces and engaging scenery is located on the edge of one of the most beautiful places on earth, the Grand Canyon. Despite the hardships created by rugged isolation and the lack of natural waters, the monument has a long and rich human history spanning more than 11,000 years, and an equally rich geologic history spanning almost 2 billion years. Full of natural splendor and a sense of solitude, this area remains remote and unspoiled, qualities that are essential to the protection of the scientific and historic resources it contains. The monument is a geological treasure. Its Paleozoic and Mesozoic sedimentary rock layers are relatively undeformed and unobscured by vegetation, offering a clear view to understanding the geologic history of the Colorado Plateau. Deep canyons, mountains, and lonely buttes testify to the power of geological forces and provide colorful vistas. A variety of formations have been exposed by millennia of erosion by the Colorado River. The Cambrian, Devonian, and Mississippian formations (Muav Limestone, Temple Butte Formation, and the Redwall Limestone) are exposed at the southern end of the lower Grand Wash Cliffs. The Pennsylvanian and Permian formations (Calville Limestone, Esplanade Sandstone, Hermit Shale, Toroweap Formation, and the Kaibab Formation) are well exposed within the Parashant, Andrus, and Whitmore Canyons, and on the Grand Gulch Bench. The Triassic Chinle and Moenkopi Formations are exposed on the Shivwits Plateau, and the purple, pink, and white shale, mudstone, and sandstone of the Triassic Chinle Formation are exposed in Hells Hole.

The monument encompasses the lower portion of the Shivwits Plateau, which forms an important watershed for the Colorado River and the Grand Canyon. The Plateau is bounded on the west by the Grand Wash Cliffs and on the east by the Hurricane Cliffs. These cliffs, formed by large faults that sever the Colorado Plateau slicing north to south through the region, were and are major topographic barriers to travel across the area. The Grand Wash Cliffs juxtapose the colorful, lava-capped Precambrian and Paleozoic strata of the Grand Canyon against the highly faulted terrain, recent lake beds, and desert volcanic peaks of the down-dropped Grand Wash trough. These cliffs, which consist of lower and upper cliffs separated by the Grand Gulch Bench, form a spectacular boundary between the basin and range and the Colorado Plateau geologic provinces. At the south end of the Shivwits Plateau are several important tributaries to the Colorado River, including the rugged and beautiful Parashant, Andrus, and Whitmore canyons. The Plateau here is capped by volcanic rocks with an array of cinder cones and basalt flows, ranging in age from 9 million to only about 1000 years old. Lava from the Whitmore and Toroweap areas flowed into the Grand Canyon and dammed the river many times over the past several million years. The monument is pocketed with sinkholes and breccia pipes, structures associated with volcanism and the collapse of underlying rock layers through ground water dissolution.

Fossils are abundant in the monument. Among these are large numbers of invertebrate fossils, including bryozoans and brachiopods located in the Calville limestone of the Grand Wash Cliffs, and brachiopods, pelecypods, fenestrate bryozoa, and crinoid ossicles in the Toroweap and Kaibab formations of Whitmore Canyon. There are also sponges in nodules and pectenoid pelecypods throughout the Kaibab formation of Parashant Canyon. The Grand Canyon-Parashant National Monument contains portions of geologic faults, including the Dellenbaugh fault, which cuts basalt flows dated 6 to 7 million years old, the

Toroweap fault, which has been active within the last 30,000 years, the Hurricane fault, which forms the Hurricane Cliffs and extends over 150 miles across northern Arizona and into Utah, and the Grand Wash fault, which bounds the west side of the Shivwits Plateau and has approximately 15,000 feet of displacement across the monument.

Archaeological evidence shows much human use of the area over the past centuries. Because of their remoteness and the lack of easy road access, the sites in this area have experienced relatively little vandalism. Their good condition distinguishes them from many prehistoric resources in other areas. Prehistoric use is documented by irreplaceable rock art images, quarries, villages, watchtowers, agricultural features, burial sites, caves, rockshelters, trails, and camps. Current evidence indicates that the monument was utilized by small numbers of hunter-gatherers during the Archaic Period (7000 B.C. to 300 B.C.). Population and utilization of the monument increased during the Ancestral Puebloan Period from the Basketmaker II Phase through the Pueblo II Phase (300 B.C. to 1150 A.D.), as evidenced by the presence of pit houses, habitation rooms, agricultural features, and pueblo structures. Population size decreased during the Pueblo III Phase (1150 A.D. to 1225 A.D.). Southern Paiute groups replaced the Pueblo groups and were occupying the monument at the time of Euro-American contact. Archeological sites in the monument include large concentrations of ancestral Puebloan (Anasazi or Hitsatsinom) villages, a large, intact Pueblo II village, numerous archaic period archeological sites, Ancestral Puebloan sites, and Southern Paiute sites. The monument also contains areas of importance to existing Indian tribes. In 1776, the Escalante-Dominguez expedition of Spanish explorers passed near Mount Trumbull. In the first half of the 19th century, Jedediah Smith, Antonio Armijo, and John C. Fremont explored portions of this remote area. Jacob Hamblin, a noted Mormon pioneer, explored portions of the Shivwits Plateau in 1858 and, with John Wesley Powell, in the 1870s. Clarence Dutton completed some of the first geological explorations of this area and provided some of the most stirring written descriptions. Having traversed this area by wagon at the request of the territorial legislature, Sharlot Hall recommended it for inclusion within the State of Arizona when it gained Statehood in 1912. Early historic sawmills provided timber that was hauled 70 miles along the Temple Trail wagon road from Mt. Trumbull down the Hurricane Cliffs to St. George, Utah. Ranch structures and corrals, fences, water tanks, and the ruins of sawmills are scattered across the monument and tell the stories of the remote family ranches and the lifestyles of early homesteaders. There are several old mining sites dating from the 1870s, showing the history of mining during the late 19th and early 20th centuries. The remote and undeveloped nature of the monument protects these historical sites in nearly their original context.

The monument also contains outstanding biological resources preserved by remoteness and limited travel corridors. The monument is the junction of two physiographic ecoregions: the Mojave Desert and the Colorado Plateau. Individually, these regions contain ecosystems extreme to each other, ranging from stark, arid desert to complex, dramatic higher elevation plateaus, tributaries, and rims of the Grand Canyon. The western margin of the Shivwits Plateau marks the boundary between the Sonoran/Mojave/Great Basin floristic provinces to the west and south, and the Colorado Plateau province to the northeast. This intersection of these biomes is a distinctive and remarkable feature. Riparian corridors link the plateau to the Colorado River corridor below, allowing wildlife movement and plant dispersal. The Shivwits Plateau is in an arid environment with between 14 to 18 inches of precipitation a year. Giant Mojave Yucca cacti proliferate in undisturbed conditions throughout the monument. Diverse wildlife inhabit the monument, including a trophy-quality mule deer herd, Kaibab squirrels, and wild turkey. There are numerous threatened or endangered species as well, including the Mexican spotted owl, the California condor, the desert tortoise, and the southwestern willow flycatcher. There are also candidate or sensitive species, including the spotted bat, the western mastiff bat, the Townsend's big eared

bat, and the goshawk, as well as two federally recognized sensitive rare plant species: *Penstemon distans* and *Rosa stellata*. The ponderosa pine ecosystem in the Mt. Trumbull area is a biological resource of scientific interest, which has been studied to gain important insights regarding dendroclimatic reconstruction, fire history, forest structure change, and the long-term persistence and stability of presettlement pine groups.

Section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431) authorizes the President, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments, and to reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected.

WHEREAS it appears that it would be in the public interest to reserve such lands as a national monument to be known as the Grand Canyon-Parashant National Monument:

NOW, THEREFORE, I, WILLIAM J. CLINTON, President of the United States of America, by the authority vested in me by section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), do proclaim that there are hereby set apart and reserved as the Grand Canyon-Parashant National Monument, for the purpose of protecting the objects identified above, all lands and interests in lands owned or controlled by the United States within the boundaries of the area described on the map entitled ``Grand Canyon-Parashant National Monument" attached to and forming a part of this proclamation. The Federal land and interests in land reserved consist of approximately 1,014,000 acres, which is the smallest area compatible with the proper care and management of the objects to be protected. For the purpose of protecting the objects identified above, all motorized and mechanized vehicle use off road will be prohibited, except for emergency or authorized administrative purposes. Nothing in this proclamation shall be deemed to enlarge or diminish the jurisdiction of the State of Arizona with respect to fish and wildlife management.

The establishment of this monument is subject to valid existing rights.

All Federal lands and interests in lands within the boundaries of this monument are hereby appropriated and withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws, including but not limited to withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the monument. Sale of vegetative material is permitted only if part of an authorized science-based ecological restoration project. Lands and interests in lands within the proposed monument not owned by the United States shall be reserved as a part of the monument upon acquisition of title thereto by the United States.

This proclamation does not reserve water as a matter of Federal law nor relinquish any water rights held by the Federal Government existing on this date. The Federal land managing agencies shall work with appropriate State authorities to ensure that water resources needed for monument purposes are available.

The Secretary of the Interior shall manage the monument through the Bureau of Land Management and the National Park Service, pursuant to applicable legal authorities, to implement the purposes of this proclamation. The National Park Service and the Bureau of Land Management shall manage the monument cooperatively and shall prepare an agreement to share, consistent with applicable laws,

whatever resources are necessary to properly manage the monument; however, the National Park Service shall continue to have primary management authority over the portion of the monument within the Lake Mead National Recreation Area, and the Bureau of Land Management shall have primary management authority over the remaining portion of the monument.

The Bureau of Land Management shall continue to issue and administer grazing leases within the portion of the monument within the Lake Mead National Recreation Area, consistent with the Lake Mead National Recreation Area authorizing legislation. Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing leases on all lands under its jurisdiction shall continue to apply to the remaining portion of the monument.

Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the national monument shall be the dominant reservation. Warning is hereby given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any of the lands thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this eleventh day of January, in the year of our Lord two thousand, and of the Independence of the United States of America the two hundred and twenty-fourth.

WILLIAM J. CLINTON

APPENDIX 1.B

VERMILION CLIFFS NATIONAL MONUMENT PROCLAMATION (#7374)

Establishment of the Vermilion Cliffs National Monument (#7374)

By the President of the United States of America

A Proclamation

Amid the sandstone slickrock, brilliant cliffs, and rolling sandy plateaus of the Vermilion Cliffs National Monument lie outstanding objects of scientific and historic interest. Despite its arid climate and rugged isolation, the monument contains a wide variety of biological objects and has a long and rich human history. Full of natural splendor and a sense of solitude, this area remains remote and unspoiled, qualities that are essential to the protection of the scientific and historic objects it contains.

The monument is a geological treasure. Its centerpiece is the majestic Paria Plateau, a grand terrace lying between two great geologic structures, the East Kaibab and the Echo Cliffs monoclines. The Vermilion Cliffs, which lie along the southern edge of the Paria Plateau, rise 3,000 feet in a spectacular escarpment capped with sandstone underlain by multicolored, actively eroding, dissected layers of shale and sandstone. The stunning Paria River Canyon winds along the east side of the plateau to the Colorado River. Erosion of the sedimentary rocks in this 2,500 foot deep canyon has produced a variety of geologic objects and associated landscape features such as amphitheaters, arches, and massive sandstone walls.

In the northwest portion of the monument lies Coyote Buttes, a geologically spectacular area where crossbeds of the Navajo Sandstone exhibit colorful banding in surreal hues of yellow, orange, pink, and red caused by the precipitation of manganese, iron, and other oxides. Thin veins or fins of calcite cut across the sandstone, adding another dimension to the landscape.

Humans have explored and lived on the plateau and surrounding canyons for thousands of years, since the earliest known hunters and gatherers crossed the area 12,000 or more years ago. Some of the earliest rock art in the Southwest can be found in the monument. High densities of Ancestral Puebloan sites can also be found, including remnants of large and small villages, some with intact standing walls, fieldhouses, trails, granaries, burials, and camps.

The monument was a crossroad for many historic expeditions. In 1776, the Dominguez-Escalante expedition of Spanish explorers traversed the monument in search of a safe crossing of the Colorado River. After a first attempt at crossing the Colorado near the mouth of the Paria River failed, the explorers traveled up the Paria Canyon in the monument until finding a steep hillside they could negotiate with horses. This took them out of the Paria Canyon to the east and up into the Ferry Swale area, after which they achieved their goal at the Crossing of the Fathers east of the monument. Antonio Armijo's 1829 Mexican trading expedition followed the Dominguez route on the way from Santa Fe to Los Angeles.

Later, Mormon exploring parties led by Jacob Hamblin crossed south of the Vermilion Cliffs on missionary expeditions to the Hopi villages. Mormon pioneer John D. Lee established Lee's Ferry on the Colorado River just south of the monument in 1871. This paved the way for homesteads in the monument, still visible in remnants of historic ranch structures and associated objects that tell the stories of early settlement. The route taken by the Mormon explorers along the base of the Paria Plateau would later become known as the Old Arizona Road or Honeymoon Trail. After the temple in St. George, Utah was completed in 1877, the Honeymoon Trail was used by Mormon couples who had already been

married by civil authorities in the Arizona settlements, but also made the arduous trip to St. George to have their marriages solemnized in the temple. The settlement of the monument area by Mormon pioneers overlapped with another historic exploration by John Wesley Powell, who passed through the monument during his scientific surveys of 1871.

The monument contains outstanding biological objects that have been preserved by remoteness and limited travel corridors. The monument's vegetation is a unique combination of cold desert flora and warm desert grassland, and includes one threatened species, Welsh's milkweed. This unusual plant, known only in Utah and Arizona, colonizes and stabilizes shifting sand dunes, but is crowded out once other vegetation encroaches.

Despite sporadic rainfall and widely scattered ephemeral water sources, the monument supports a variety of wildlife species. At least twenty species of raptors have been documented in the monument, as well as a variety of reptiles and amphibians. California condors have been reintroduced into the monument in an effort to establish another wild population of this highly endangered species. Desert bighorn sheep, pronghorn antelope, mountain lion, and other mammals roam the canyons and plateaus. The Paria River supports sensitive native fish, including the flannelmouth sucker and the speckled dace.

Section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431) authorizes the President, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments, and to reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected.

WHEREAS it appears that it would be in the public interest to reserve such lands as a national monument to be known as the Vermilion Cliffs National Monument:

NOW, THEREFORE, I, William J. Clinton, President of the United States of America, by the authority vested in me by section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), do proclaim that there are hereby set apart and reserved as the Vermilion Cliffs National Monument, for the purpose of protecting the objects identified above, all lands and interests in lands owned or controlled by the United States within the boundaries of the area described on the map entitled ``Vermilion Cliffs National Monument" attached to and forming a part of this proclamation.

The Federal land and interests in land reserved consist of approximately 293,000 acres, which is the smallest area compatible with the proper care and management of the objects to be protected.

All Federal lands and interests in lands within the boundaries of this monument are hereby appropriated and withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws, including but not limited to withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the monument. For the purpose of protecting the objects identified above, the Secretary shall prohibit all motorized and mechanized vehicle use off road, except for emergency or authorized administrative purposes.

Lands and interests in lands within the proposed monument not owned by the United States shall be reserved as a part of the monument upon acquisition of title thereto by the United States.

The Secretary of the Interior shall manage the monument through the Bureau of Land Management, pursuant to applicable legal authorities, to implement the purposes of this proclamation.

The Secretary of the Interior shall prepare a transportation plan that addresses the actions, including road closures or travel restrictions, necessary to protect the objects identified in this proclamation.

The establishment of this monument is subject to valid existing rights.

Nothing in this proclamation shall be deemed to enlarge or diminish the jurisdiction of the State of Arizona with respect to fish and wildlife management.

This proclamation does not reserve water as a matter of Federal law.

Nothing in this reservation shall be construed as a relinquishment or reduction of any water use or rights reserved or appropriated by the United States on or before the date of this proclamation. The Secretary shall work with appropriate State authorities to ensure that any water resources needed for monument purposes are available. Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the monument.

Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the national monument shall be the dominant reservation. Warning is hereby given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any of the lands thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this ninth day of November, in the year of our Lord two thousand, and of the Independence of the United States of America the two hundred and twenty-fifth.

WILLIAM J. CLINTON

APPENDIX 1.C

RESULTS OF SCOPING

RESULTS OF SCOPING

On Wednesday, April 24, 2002 (Vol. 67, No. 79, pp. 20155-20156), the Notice of Intent (NOI) to prepare a RMP and GMP for the Parashant and a RMP for Vermilion and to revise the 1992 Arizona Strip RMP was published in the Federal Register (See Appendix 1.F for the NOI). This initiated a 90-day public scoping and comment period.

The agencies then published a newsletter and held 11 open houses in 2002 to encourage public input on the future management of the monuments and the Arizona Strip FO. Eight cooperating agencies and a dozen other federal and state agencies provided information and input into development of the Draft Plan/DEIS. From all this input, the BLM and NPS developed four conceptual alternatives that were presented to the public via newsletters and five open houses. These preliminary alternative public meetings were held in 2003. Information from these meetings, the Cooperating Agencies and interested state and Federal agencies, and the public was then used to develop this Draft Plan/DEIS (See entire Scoping Report at http://www.az.blm.gov/LUP/strip/reports.htm).

COMMUNITY BASED WORKSHOPS AND COLLABORATIVE PLANNING

Before the NOI was published, the following community based workshops were held on and near the Arizona Strip with the assistance of the Partnership Series and James Kent Associates. Members of communities in and near the Arizona Strip were invited to participate; over one hundred people attended these workshops (see Table 1 for the dates and communities in which the workshops were held). The goals of these workshops were:

1) to gather information regarding the future of the Arizona Strip from the local communities, agencies, groups, and individuals;
2) to inform about the upcoming planning effort;
3) to encourage the initiation of community based planning groups on the Arizona Strip; and
4) to encourage active participation and involvement in planning for the future on the Arizona Strip.

Table 1: Community Based Workshops

Event	Dates	Location
Community-Based Partnership*	May 19-21, 2001	St. George, Utah
Community-Based Partnership*	January 31-February 1, 2002	Kaibab Village, Arizona
Community-Based Partnership*	March 2002	St. George, Utah
Community-Based Stewardship**	November 30-December 1, 2002	St. George, Utah
Community-Based Stewardship**	February 22-23, 2002	Page, Arizona

*Offered by the Partnership Series, Community-Based Partnerships and Ecosystems: Ensuring A Healthy Environment, a 3-day workshop
** Offered by James Kent Associates, a 12-hour workshop

James Kent Associates (JKA) also worked with BLM and NPS staff on the Community Discovery process in October of 2001 for the western half of the Arizona Strip and in December of 2001 for the eastern half of the Arizona Strip. JKA and staff worked out of St. George, Utah for the first session and out of Kanab, Utah for the second. Informal interviews were conducted with people living in communities on and adjacent to the Arizona Strip. Their informal input was solicited about concerns on the public lands or on future management.

Some of the main lessons learned from these workshops were:

1) People were concerned about public lands but did not attend unless they were already negatively impacted by land management decision(s).
2) The Arizona Strip is too large a geographic area to have a single community.
3) The perception that the government is going to do what it wants to do anyway kept many people away from workshops.

Formal Presentations to American Indian Tribal, Band, and Chapter Councils

Before and after the NOI was published, in accordance with the National Environmental Policy Act, the National Historic Preservation Act, and Executive Order 13007, meetings were held with American Indian tribal, band, and chapter councils and members. The goal of these meetings was to inform and solicit input into the planning process from all American Indians living on or near the Arizona Strip or having cultural or ancestral ties to those who are living or once lived in the planning area. Table 2 below lists those meetings.

The meetings with the tribal councils had three purposes:

1) to describe the proposed land use plan revisions,
2) to discuss planning schedules; and
3) to gather comments focusing on traditional cultural issues as they related to the planning process.

Table 2: Meetings with American Indian Tribes, Bands, and Councils		
Date	**Tribe, Band, or Council**	**Meeting Location**
2001		
August	Paiute Tribe of Utah General Council	Cedar City, Utah
August 30	Hopi Cultural Resources Advisory Task Team	Second Mesa, Arizona
2002		
January 9	Shivwits Band Council	Shivwits Indian Reservation
February 20	Hopi Cultural Preservation Office	Kykotsmovi, Arizona
February 21	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
March 12	Moapa Paiute Tribe	Moapa, Nevada
April 12	Hualapai Tribal Council	Peach Springs, Arizona
May 14	Kanosh Band	Kanosh, Utah
May 15	Cedar Band	Cedar City, Utah
May 28	Koosharem Band	Cedar City, Utah
July 22	Hualapai Public Scoping	Peach Springs Community Bldg.
October 17	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
December 3	Hopi Tribe	Kykotsmovi, Arizona
2003		
February 5	Las Vegas Paiute Tribe	Las Vegas, Nevada
February 5	Las Vegas Indian Center	Las Vegas, Nevada
March 19	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
September 17	Southern Paiute Tribal Chairpersons Association	Pipe Springs, Arizona
September 18	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
October 14	Moapa Paiute Tribe	Moapa, Nevada
October 14	Navajo Nation-Cameron Chapter	Cameron, Arizona
October 22	Navajo Nation-Tuba City Chapter	St. George, Utah
October 23	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
2004		
January 22	Kanosh Band of the PITU	Cedar City, Utah
February 6	Kaibab Paiute Cultural Resources	Fredonia, Arizona
February 13	PITU Cultural Resources	St. George, Utah
March 30	San Juan Southern Paiute	Hidden Springs, Arizona
September 16	Las Vegas Paiute Tribe	Las Vegas, Nevada
October 2	Kaibab Paiute Tribe Annual Meeting	Kaibab Village, Arizona
October 26	Southern Paiute Tribal Chairpersons Association	St. George, Utah
2005		
May 19	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona

PUBLIC SCOPING MEETINGS

Ten informal open house public scoping meetings were held during the summer of 2002, in order to identify planning issues. An additional open house was held at Peach Springs, Arizona at the invitation of the Hualapai Tribe. Table 3 details these scoping meetings. These open houses provided the public an opportunity to receive information on the Arizona Strip planning effort, to ask questions, and to provide input. In addition, the public was asked questions on what they valued about these lands, what kinds of activities or uses were important to them, and how they wanted to see the land managed.

Table 3. Arizona Strip Public Scoping Meetings

Date	Location	Number of attendees
May 28, 2002 (Tuesday)	Beaver Dam, AZ	17
May 29, 2002 (Wednesday)	St. George, UT	47
May 30, 2002 (Thursday)	Colorado City, AZ	27
May 31, 2002 (Friday)	Fredonia, AZ	23
June 3, 2002 (Monday)	Page, AZ	25
June 4, 2002 (Tuesday)	Flagstaff, AZ	176
June 5, 2002 (Wednesday)	Phoenix, AZ	37
June 6, 2002 (Thursday)	Kingman, AZ	33
June 10, 2002 (Monday)	Salt Lake City, UT	20
June 12, 2002 (Wednesday)	Las Vegas, NV	39
July 22, 2002 (Monday)	Peach Springs, AZ	17
TOTAL		**461**

PLANNING ISSUES AND MANAGEMENT CONCERNS

A planning issue is a matter of wide public concern about resource management problems that may hinder BLM and NPS from fulfilling their missions. Management concerns are topics or points of dispute that involve a resource management activity or land use. Although concerns and issues sometimes overlap, a management concern is generally more important to a few individuals, and a planning issue has a more widespread point-of-conflict.

A total of 2,219 comment letters, with 12,800 individual comments, were received as a result of public scoping in 2002. Sixteen hundred of these, or 72%, were form letters. Table 3 below presents the number of individual comments received per issue. Based on public comments, interagency and staff discussions, and information available on the resources of the Arizona Strip at the present time, the following were identified as the planning issues and management concerns to be addressed on the Arizona Strip Draft Plan/DEIS.

Based on this breakdown, the top issues to be covered in the DEIS were defined and ranked; access, wilderness, protection of resources, livestock grazing, and recreation.

Table 4. Identified Issues*

Category	Number of Comments
Transportation and Access	2,071
Wilderness	1,838
General	1,811
Monument Resources	1,749
Biological Resources	1,649
NEPA and Planning	1,612
Livestock Grazing	302
Recreation	247
Fish and Wildlife	139
Archeological and Historic Resources	134
Arizona Strip Resources	128
Remoteness	103

*Includes 1,600 form letters

Transportation/Access – More than 2,000 comments were received about this issue – more than any other issue. Comments varied from off-highway vehicle (OHV) and four-wheel drive enthusiasts, who wanted to keep as many roads open as possible, to wilderness proponents who favored closing a number of roads. Baseline route inventories have been completed for the planning effort in both monuments and in the Littlefield and St. George Subregions. The resources were not available to complete the route inventories for the Arizona Strip FO in time for consideration in the DEIS.

Wilderness – More than 1,800 comments about wilderness were received. Wilderness is thought by some groups and individuals as the best way to protect resources, particularly those identified in the proclamations for both monuments. Other people expressed concern about creating additional wilderness study areas on the Strip.

Protection of Resources – More than 1,700 people commented on the manner in which to protect and/or manage the natural and cultural resources of the Arizona Strip. Their comments varied according to the individual or group. Included under this issue are monument objects, biological, archaeological, historical, and Arizona Strip resources in general.

Livestock Grazing – About 300 comments were received about grazing. These ranged from supporting all livestock grazing on the Strip to ending all grazing in the monuments. Others advocated ending grazing in ecologically sensitive areas only.

Recreation – About 250 people commented about recreation. People stated they use the isolated Arizona Strip to get away from people and cities, explore, sightsee, hike, backpack, birdwatch, ride ATVs or mountain bikes, and hunt. Recreation demand on the Strip is likely to grow as population in southern Nevada, southern Utah, and northern Arizona increases.

Management concerns were identified by interagency staff and managers as:

1) Restoration of ecological systems
2) Community growth and involvement

Restoration – Restoration of degraded ecosystems is an important management concern. Disruption of the natural fire regime has caused degradation of ecosystems within the Arizona Strip. Grasslands are being overrun by shrubs; shrublands by pinyon and junipers; and ponderosa pine stands are unnaturally thick. Dense pinyon/juniper and ponderosa pine woodlands have the potential to carry catastrophic fire. Riparian areas have also changed due, in part, to invasive, non-native woody plant species.

Community Growth and Involvement - This tri-state region is one of the most rapidly growing areas of the United States. In 2000, St. George, Utah was identified for the first time as a metropolitan area by attaining a population of more than 50,000. Projected growth during the life of the plan will turn the region from mostly rural to urban, particularly in the northwestern portion of the Planning Area near Mesquite, Nevada and St. George, Utah. Involvement of the communities is an important part of the planning effort. Community Based Workshops, broad collaboration, active American Indian consultation and field trips, and Cooperating Agencies helped to involve those most affected by the decisions made in this Draft Plan/DEIS.

PRELIMINARY ALTERNATIVE SCOPING PROCESS

The Arizona Strip planning team prepared preliminary management alternatives for the planning area. The planning team presented the preliminary alternatives to the public beginning in May 2003. This allowed the public an additional opportunity to participate in the overall planning process. Because alternatives are the driving force behind any Environmental Impact Statement (EIS), it was felt that additional public participation at this critical juncture (before the draft EIS was completed) would improve the alternatives and subsequent management plans.

The public received information and an invitation to comment on the preliminary alternatives through several newsletters. Public scoping meetings on these preliminary alternatives were held in five cities in June 2003 (See Table 5 below). This allowed many individuals, organizations, agencies, and groups the opportunity to state their concerns and provide useful suggestions before the finalization of the alternatives.

Another result of the preliminary alternative scoping process was increased awareness and participation in the planning effort at both the local and national levels. Meeting attendance was larger than the initial scoping meetings held during the summer of 2002. The preliminary alternative scoping period generated 6,272 comment letters with a total of 40,741 individual concerns and remarks. This is nearly triple the amount when compared to the 2,219 comment letters received at the scoping meetings in 2002.

Table 5. Public Scoping Meetings, Summer 2003

Date	Place	Attendance	Comments
June 2	Mesquite, NV	13	2
June 3	St. George, UT	85	7
June 4	Fredonia, AZ	41	0
June 5	Kingman, AZ	36	2
June 6	Flagstaff, AZ	174	31
TOTALS		**349**	**42**

Most of those who commented showed their preference for one of the five preliminary alternatives (Preliminary Alternatives A-D, and the No Action Alternative). Many of these individuals also supported their preference by providing a reason why they preferred one preliminary alternative to another. Very few individuals showed a preference for Preliminary Alternative B or C, with most split between Preliminary Alternative A and Preliminary Alternative D and/or the No Action Alternative.

COOPERATING AGENCIES

Ten Cooperating Agencies worked on this Draft Plan/DEIS with the BLM and NPS. They include: Mohave and Coconino counties, Arizona; Washington and Kane counties, Utah; Kaibab Paiute Tribe; Federal Highway Administration; the communities of Fredonia and Colorado City, Arizona; Arizona Department of Transportation and Arizona Game and Fish Department.

Agencies within three federal departments also worked with the NPS and BLM on this Draft Plan/DEIS; the Department of Interior, the Department of Agriculture, and the Department of Defense. Federal agencies within these departments include four BLM offices in Utah and Nevada (Las Vegas, St. George, and Kanab field offices and the Grand Staircase-Escalante National Monument), the North Ranger District of the Kaibab Forest, three units of the NPS (Lake Mead and Glen Canyon NRA and Grand Canyon National Park), the Air Force Regional Environmental Office, and the US Fish and Wildlife Service. In addition, the Arizona State Land Department and the Hopi Tribe also received information on this planning effort along with the Cooperating Agencies.

IMPACT TOPIC CONSIDERED BUT DISMISSED FROM FURTHER EVALUATION

The following impact topic was discussed during the planning process, but was dismissed from further consideration for the reason provided:

Social and Economic Conditions (Indian Trust Assets)

The United States has a trust responsibility to protect and maintain rights or resources reserved by or granted to American Indian tribes or individuals by treaty, statute, and executive order. Assets are anything owned that has monetary value. This trust responsibility requires that agencies such as the BLM and the NPS take reasonable actions when necessary to protect these assets or provide appropriate mitigation or compensation when adverse impact cannot be avoided. The assets need not be owned outright, but could be some other type of property interest, such as a lease or a right to use something. Assets can be real property, physical assets, or intangible property rights.

The Planning Area surrounds the Kaibab-Paiute Indian Reservation on three sides. The Hualapai and Havasupai Reservations are across the Colorado River south of, but not contiguous with, the Parashant. The Navajo Reservation is across the Colorado River east of, but not contiguous with, the Arizona Strip FO. Treaties and Executive Orders creating the reservations on and near the Arizona Strip do not identify specific Indian trust assets off-reservation over which the BLM or NPS has control. No Indian trust assets would be impacted by the management actions presented in the alternatives.

ISSUES CONSIDERED BUT NOT ADDRESSED

The Council on Environmental Quality (CEQ) guidelines for implementing NEPA require federal agencies to analyze all "reasonable" alternatives that substantially meet the purpose and need for this Draft Plan/DEIS. The purpose of this Draft Plan/DEIS is to provide for management of the Parashant and Vermilion within the provisions of the proclamations, to provide management for the Arizona Strip FO, and to meet the requirements of the Federal Land Policy and Management Act (FLPMA), the NPS Organic Act, and other laws and regulations. Because the monument proclamations state that certain uses will not continue and other uses will continue, consistent with federal laws and regulations, actions not complying with the proclamations do not meet the purpose and need for this Draft Plan/DEIS and are, therefore, not included in alternatives that were analyzed in this document.

The following specific alternatives, or actions that could be components of alternatives, were suggested but not analyzed or carried forward because they do not fulfill the requirements and needs of this Draft Plan/DEIS.

Recommendations for BLM Wilderness Study Areas

The Arizona Wilderness Coalition and members of the public provided recommendations on wilderness study areas (WSAs) in the monuments and in the Arizona Strip FO. In addition, the planning team was working toward making recommendations for WSAs in the Draft Plan/DEIS early in the planning process. However, recent guidance clarified that BLM's authority to designate WSAs expired in 1993, resulting in the termination in any attempts to designate new WSAs (See Chapter 1). BLM and NPS have, however, assessed wilderness characteristics (naturalness, solitude, and primitive recreation) on BLM and NPS lands in the Planning Area and proposed management actions regarding where, how, and to what extent these characteristics may be managed under Alternatives B, C, D, and E.

The Arizona Wilderness Coalition also provided comments and proposed management prescriptions on areas managed to maintain or enhance wilderness characteristics. Including this information or these prescriptions would be contrary to BLM policy as outlined in BLM IM 2003-274 and IM 2003-275 and more recent guidance in IM AZ-2005-007, Guidelines for achieving consistency in ongoing and future Arizona Land Use Planning efforts.

NPS proposed wilderness within the Parashant is not affected by the recent BLM guidance regarding WSAs, and no additional NPS lands have been proposed for wilderness in this document. However, as stated above, the NPS has assessed its remaining lands in Parashant for wilderness characteristics.

No Livestock Grazing in the Monuments

Proclamation 7265 for the Parashant states:

> "The BLM shall continue to issue and administer grazing leases within the portion of the monument within the Lake Mead NRA, consistent with the Lake Mead NRA authorizing legislation. Laws, regulations, and policies followed by the BLM in issuing and administering grazing leases on all lands under its jurisdiction shall continue to apply to the remaining portion of the monument."

Proclamation 7374 for the Vermilion similarly states, "Laws, regulations, and policies followed by the BLM in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the monument."

Based on the above proclamation provisions, a no-livestock grazing alternative would not meet the purpose and need of this Draft Plan/DEIS, nor would it meet BLM's principle of multiple use and sustained yield (FLPMA Sec. 302 (a), also see FLPMA Sec. 102(7)).

No Routes in the Monuments

Some public comments proposed closing all routes in the monuments to protect monument objects. Both the Parashant and Vermilion proclamations noted that "outstanding biological objects have been preserved by remoteness and limited travel corridors," and the Parashant proclamation recognized that "because of [archaeological sites'] remoteness and lack of easy road access, the sites have experienced relatively little vandalism." The Secretary of Interior was thus able to recommend these areas for monument designation because of the remoteness, lack of easy road access, and condition of the resources to be protected. Closing all routes in the monuments is thus not vital to protect monument resources. The Secretary also directed the BLM to prepare a transportation plan for the Vermilion, which presupposes the need for maintaining at least some open roads. The need for access by the public and those holding valid existing rights further made the decision to close all roads unreasonable.

Other Alternatives

Outside interests, including state and local governments, tribes, or other interest groups submitted no comprehensive alternatives.

APPENDIX 1.D

RELEVANT LAWS, EXECUTIVE ORDERS, AND MEMORANDUMS

Relevant Laws, Executive Orders, and Memorandums

Law/Regulation	Applies to:
LAWS	
Act of March 3, 1909 as amended and Act of May 11, 1938	Minerals on Indian Lands
Administrative Procedures Act of 1946 5 USC 551 et seq.	Procedures
Airport and Airway Improvement Act of 1982	Conveyance of land for airport
American Indian Religious Freedom Act of 1978 (AIRFA) 42 USC 1996	Native American religious places and access
Antiquities Act of 1906	Cultural Resources, National Monuments, special areas
Archeological Resources Protection Act (ARPA) 16 USC 470	Archaeological resources
Arizona Wilderness Act of 1984	Established eight wilderness areas on Arizona Strip
Clean Air Act of 1970, as amended 1990 42 USC 7401 et seq.	Air quality
Clean Water Act of 1987, as amended 33 USC 1251 et seq.	Surface water quality
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986	Hazardous sites
Electronic FOIA Act of 1996 PL 104-231	Information available in electronic format
Endangered Species Act of 1973(ESA) 16 USC 1531 et seq., as amended	Threatened and endangered species
Energy Policy Act of 1992 42 USC 13201	Energy
Federal Advisory Committee Act of 1972	Public meetings, committees, information
Federal Cave Resource Protection Act of 1988	Caves
Federal Land Exchange Facilitation Act of 1988 (FLEFA), 43 USC 1716, 1740	Federal land exchanges
Federal Land Policy and Management Act of 1976 (FLPMA), 43 USC 1701	Federal lands, special management areas, planning
Federal Noxious Weed Act of 1974, as amended	Noxious weeds
Federal Onshore Oil and Gas Leasing Reform Act of 1987	Oil and Gas

Federal Pollution Control Act, as amended 1972	Watersheds
Freedom of Information Act (FOIA) of 1966 and Electronic Freedom of Information Act, as amended 1996, 5 USC 552	Public Access to information
Government Performance Results Act of 1993	Strategic Goals, program efficiencies
Historic Sites Act of 1935	Historic Sites
Information Technology Management Reform Act of 1996	Use of Information Technology
Land and Water Conservation Fund Act of 1965	Outdoor recreation
Materials Act of 1947, as amended	Mineral materials
Migratory Bird Conservation Act of 1929, as amended	Migratory Birds
Migratory Bird Treaty Act of 1918, as amended	Migratory Birds
Mineral Leasing Act of 1920, as amended and Mineral Leasing Act for Acquired Lands of 1947	Leasable minerals
Mining and Minerals Policy Act of 1970	Mining
Mining in the Parks Act of 1912	Mining
Mining Law of 1872, as amended	Mining claims
National Parks Overflights Act, PL 100-91	Study of overflights and associated noise in national park units, particularly Grand Canyon NP; allows helicopter flights from north rim to Hualapai Reservation to transport individuals to/from boat trips on Colo River
National Parks Air Tour Management Act of 2000	Air tours
National American Graves Protection and Repatriation Act of 1990	Native American human remains, cultural objects, and sacred objects
National Environmental Policy Act of 1969 (NEPA) 42 USC 4321 et seq., as amended	Federal undertakings
National Historic Preservation Act of 1966 (NHPA)	Archaeological and historic properties
National Materials and Minerals Policy Research Development Act of 1980	Mineral resources
National Park Service Organic Act of 1916	
National Parks and Recreation Act of 1978	National Historic Trails
National Trails System Act of 1968, as amended	National Trails

Old Spanish Trail National Historic Trail Act of 2002, PL 107-325	Old Spanish Trail national historic trail designation
Public Rangelands Improvements Act of 1978	Rangeland and wildlife management
Privacy Act of 1974, 5 USC 552a	Privacy of information
Recreation and Public Purposes Act of 1926, as amended and R&PP Amendment Act of 1988	Land disposal for public purposes
Reorganization Plan No. 3 of 1946	Establishes the BLM
Resource Conservation and Recovery Act of 1986, as amended (RCRA)	Hazardous or solid waste
Sikes Act of 1974, 16 USC 1170	Fish and wildlife management
Soil Conservation and Domestic Allotment Act of 1935	Watersheds
Soil and Water Resources Conservation Act of 1977	Conservation, protection, and enhancement of soil, water, and related resources
Surface Mining Control and Reclamation Act of 1977	Coal mining
Taylor Grazing Act of 1934	Livestock grazing
Treasury and General Government Appropriations Act of 2001 (P.L. 106-554; HR 5658)	Sec. 515, Information Quality Act for quality, objectivity, utility, and integrity of information
Timber on the Public Lands 16 USC 594	Protection of timber
Water Quality Act of 1987	Riparian areas, wetlands
Watershed Protection and Flood Control Act of 1954	Watersheds
Wild and Scenic Rivers Act of 1968 (WSRA) 16 USC 1271 et seq.	Wild and scenic rivers
Wild Free Roaming Horse and Burro Act of 1971, as amended 1978	Wild Horse and Burro
Wilderness Act of 1964	Wilderness
ORDERS & MEMORANDUM	
Secretary of the Interior Order 3175 (2 DM 512)	Indian trust assets
Executive Order 11514	Protection and enhancement of environmental quality
Executive Order 11593	Preservation of the cultural environment
Executive Order 11644 & 11989	Off-road vehicles
Executive Order 11988	Flood plain management
Executive Order 11990	Wetlands, riparian zones
Executive Order 12088	Pollution Control
Executive Order 12898	Environmental justice

Executive Order 12906	Data standards
Executive Order 12962	Recreational Fishing
Executive Order 13007	Indian Sacred sites
Executive Order 13112	Invasive species
Executive Order 13175	Tribal Consultation and Coordination
Executive Order 13186	Migratory Birds
Executive Order 13212	Energy policy
Executive Order 13287	Preserve America
Presidential Proclamation 7265 of January 11, 2000	Established Grand Canyon-Parashant National Monument
Presidential Proclamation 7374 of November 19, 2000	Established Vermilion Cliffs National Monument
CEQ memo on Cooperating Agency Status, 1/30/02	Cooperating agency status for federal agencies
CEQ memo on ident. non-federal cooperating agencies, 09/25/2000; CEQ memo on design. non-federal cooperating agencies, 7/28/1999	Cooperating agency status for non-federal agencies
CEQ memo on Environmental Justice, 12/10/1999	Environmental Justice
CEQ memo regarding pollution prevention, 1/12/1993	Pollution prevention and NEPA
CEQ memo on scoping, 4/30/1981	Scoping
CEQ memo on agricultural lands, 8/11/1980 and Analysis of impacts related to agricultural lands, 8/11/1980	Agricultural lands and NEPA
CEQ memo on Wild & Scenic Rivers and NHT, 8/2/1979 and consultation to mitigate effects on rivers, 8/10/1980	Wild and Scenic Rivers and National Historic Trails
CEQ memo on implementing CEQ NEPA regulations, 1/19/1979	NEPA
CEQ memo on implementing E.O. 12114, 3/21/1979	NEPA and federal actions outside the U.S.A
CEQ Guidance on NEPA Regulations, 1983	NEPA
CEQ Guidance on Section 404(r) of Clean Water Act involving dredging and fill, 11/17/1980	Clean Water Act
CEQ 40 most asked questions for NEPA, 3/23/1981	NEPA
CEQ explanation on implementing E.O. 11988 and E.O. 11990, 3/21/1978	Floodplain management and Wetlands
CEQ Env review related to Section 1424(e) of the Safe Drinking Water Act of 1974	Water

APPENDIX 1.E

PLANNING CRITERIA (BLM)

PLANNING CRITERIA (BLM)

BLM planning regulations (43 CFR 1610) require preparation of planning criteria to guide development of all plans. Planning criteria ensure that plans are tailored to the identified issues and ensure that unnecessary data collection and analysis are avoided. Planning criteria are based on applicable law, agency guidance, public comment, and coordination with other Federal, state and local governments, and Native American Indian tribes.

The planning criteria used in developing the plans for Grand Canyon-Parashant National Monument (Parashant), Vermilion Cliffs National Monument (Vermilion), and the Arizona Strip Field Office (Arizona Strip FO) are as follows:

The plans will be completed in compliance with the Federal Land Policy and Management Act. The Parashant Management Plan will also be completed in compliance with the Lake Mead Enabling Legislation and with the National Park Service Organic Act requirements and NPS policies. The Endangered Species Act, the National Environmental Policy Act, the National Historic Preservation Act, the Clean Water Act, and other federal laws and executive orders and management policy requirements would also be met.

The two national monument plans will be consistent with their respective proclamations, meeting their purpose, preserving their significance, and complimenting their mission.

The plan data and maps will present information in three geographic areas, Grand Canyon-Parashant National Monument, Vermilion Cliffs National Monument, and the remaining BLM administered lands on the Arizona Strip. The final products will be four separate Records of Decision and three stand-alone management plans.

Valid existing management decisions from previous plans, if appropriate, may be carried forward into this plan or subsequent activity and/or implementation plans. Decisions from the following plans will be considered and may be modified or amended: Arizona Strip Resource Management Plan (1992) as amended, Mojave Desert Plan Amendment (1998), Lake Mead National Recreation Area General Management Plan (1986), Lake Mead National Recreation Area Resource Management Plan (1999), Lake Mead Burro Management Plan (1995), Lake Management Plan (2002), Parashant (1997) and Mt. Trumbull (1995) Resource Conservation Area Plans, Paria Canyon-Vermilion Cliffs Wilderness Management Plan (1986), Paiute and Beaver Dam Mountains Wilderness Management Plan (1990), Mt. Trumbull and Mt. Logan Wilderness Management Plan (1990), Grand Wash Cliffs Wilderness Management Plan (1990, Cottonwood Point Wilderness Management Plan (1991), Habitat Management Plans and the Arizona Strip Bighorn Sheep Management Plan (May 2001).

The management plan will be consistent with officially approved or adopted resource related plans, policies and programs of other Federal agencies, State and local governments and Indian

tribes, so long as their plans, policies and programs are consistent with the purposes, policies, and programs of Federal laws and regulations.

Terms and Conditions and reasonable and prudent alternatives from all applicable Final Biological Opinions will be implemented. Conservation measures will be included.

Cooperating Agency status will be encouraged for affected Federal, State and local governments and Indian tribes. The environmental analysis input and proposals of Cooperating Agencies will be used to the maximum extent possible consistent with BLM and NPS responsibilities (43 CFR 1501.6 (a) (2).

An adaptive management approach will be followed to achieve desired outcomes. Monitoring outlined in the plan will be used to determine if land use plan level desired outcomes are being achieved. If not, implementation actions and/or allowable uses will be modified to achieve land use plan objectives.

The plan will emphasize ecological restoration and preservation of natural and cultural resources. It will identify opportunities and priorities for research and monitoring related to the key resource values of the two national monuments.

The statewide land health standards, established by the Arizona Resource Advisory Council and approved by the Secretary of Interior, will be used to evaluate all surface disturbing activities on BLM administered lands and on Lake Mead National Recreation Area lands where BLM administers grazing privileges. For NPS lands on the Parashant, policies and procedures by which the NPS carries out its responsibilities under NEPA will be followed (DO-12and DO-55), including identification of thresholds and impairment.

The plan will not identify any BLM lands for designation as Wilderness Study Areas (WSAs). BLM and NPS may, however, maintain or enhance lands with wilderness characteristics such as lands that remain in a natural condition, or those that provide outstanding opportunities for solitude, or primitive and unconfined types of recreation activities. These lands may be managed to maintain or enhance wilderness characteristics. The 1979 Lake Mead National Recreation Area wilderness proposal will be brought forward as the decision of record. Minor, non-controversial changes may be made, if necessary for resource protection concerns. NPS Reference Manual # 41 will be followed for guidance on wilderness preservation and management on NPS land within the monument.

Route inventories will be completed for both monuments and will be used as baseline data for trail and travel management planning. All lands within the monuments would be designated as either “limited” or “closed” to motorized and mechanized vehicle uses. Decisions concerning specific routes in “limited” areas would result in a designated travel management network for the monuments. Arizona Strip lands outside the two monuments will be designated as “open,” “limited” or “closed” to motorized and mechanized vehicle uses. As the availability of route

inventory data allows, decisions concerning specific routes in “limited” areas will be made in the land use plan. Decisions about specific routes for those areas with insufficient inventory would be deferred until inventory is complete. A final travel management network for the Arizona Strip FO will be achieved within 5 years of the LUP ROD. An authorized road system for NPS lands in Parashant was designated in 1986 and will not be readdressed in this plan, except for minor adjustments as needed for resource protection.

The plan will directly involve American Indian tribal governments by providing strategies for the protection of recognized sacred and traditional uses and sites.

The lifestyles of area residents, including the activities of grazing, hunting, other resource uses, and recreation, will be recognized in the plan. Much of the Strip's historic value is connected with ranching operations, both past and present. Vintage ranching structures and facilities hold great historical and social significance and will be incorporated into the plan.

The plan will not address monument or statutory wilderness boundary adjustments.

Any new visitor centers considered would be located outside the monuments and generally within existing communities.

The plans will set forth a framework for managing recreation and commercial activities in order to produce a variety of beneficial outcomes gained through safe and enjoyable visitor experiences and activities that require appropriate natural and community landscapes and to provide for the enjoyment and safety of the visiting public.

The plan will use the Standards for Rangeland Health and Guidelines for Grazing Management to ensure appropriate grazing practices are followed to protect monument values, watershed integrity, and habitats for plant and wildlife species on both BLM and NPS lands.

The plan will consider public input, interests, and values, past and present uses of public land and adjacent land, public benefits of providing goods and services, environmental impacts, social and economic values, public safety, and ecosystem restoration.

APPENDIX 1.F

NOTICE OF INTENT TO PREPARE RESOURCE MANAGEMENT PLANS AND PLAN REVISION

DEPARTMENT OF THE INTERIOR
Bureau of Land Management
National Park Service
Federal Register: April 24, 2002 (Volume 67, Number 79; Pages 20155-20157)

AGENCY: Bureau of Land Management, Arizona Strip Field Office, St. George, Utah; National Park Service, Lake Mead National Recreation Area, Boulder City, Nevada.

ACTION: Notice of Intent to (1) prepare a Resource Management Plan (RMP) for the Grand Canyon Parashant National Monument, designated January 11, 2000, (2) prepare a RMP for the Vermilion Cliffs National Monument, designated November 9, 2000, and (3) revise the 1992 Arizona Strip RMP. These three actions will require a single Environmental Impact Statement (EIS). These lands are located in Mohave and Coconino Counties, Arizona.

SUMMARY: This document provides notice that the Bureau of Land Management (BLM) intends to prepare a RMP with an associated EIS for the Arizona Strip Field Office. BLM will work in cooperation with the National Park Service (NPS) for lands administered by the NPS Lake Mead National Recreation Area in the Grand Canyon Parashant National Monument. Separate plans will be developed for the Vermilion Cliffs National Monument and the Grand Canyon Parashant National Monument. This planning activity encompasses approximately 2,800,000 acres of public land, including 1,052,000 acres in the Grand Canyon Parashant Monument and 293,000 acres in the Vermilion Cliffs National Monument. The plan will fulfill the needs and obligations set forth by the National Environmental Policy Act (NEPA), the Federal Land Policy and Management Act (FLPMA), the National Park Service Organic Act, the Lake Mead National Recreation Area Enabling Legislation, the two monument proclamations, and the NPS and BLM management policies. The BLM will work closely with interested parties to identify the management decisions that are best suited to the needs of the public. This collaborative process will take into account local, regional, and national needs and concerns. This notice initiates the public scoping process to identify planning issues and to develop planning criteria. The scoping process will include an evaluation of the existing RMP in the context of the needs and interests of the public and protection of the objects of historic and scientific interest specified in the proclamations.

COMMENTS: Public meetings will be held throughout the plan scoping and preparation period. In order to ensure local community participation and input, public meeting locations will be rotated among towns, which could include St. George and Kanab, Utah; Flagstaff, Kingman, Page, and Phoenix, Arizona; and Mesquite and Las Vegas, Nevada. Early participation by all those interested is encouraged and will help determine the future management of the Grand Canyon Parashant and Vermilion Cliffs National Monuments and the Arizona Strip Field Office public lands. The publication of this notice will initiate the BLM and NPS scoping comment period. Scoping will last a minimum of 90 days. At least 15 days public notice will be given for activities where the public is invited to attend. Written comments will be accepted throughout the planning process at the addresses shown below. Meetings and comment deadlines will be announced through the local news media, newsletters and the BLM web site (www.az.blm.gov). In addition to the ongoing public participation process, formal opportunities for public participation will be provided through comment on the alternatives and upon publication of the joint BLM draft RMP/EIS and NPS draft General Management Plan (GMP)/EIS. Documents pertinent to this proposal may be examined at the Arizona Strip Field Office located in St. George, Utah. Comments, including names and street addresses of respondents, will be available for public review at the Arizona Strip Field Office located in

St. George, Utah, during regular business hours 7:45 a.m. to 4:15 p.m., Monday through Friday, except holidays, and may be published as part of the EIS. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be available for public inspection in their entirety.

ADDRESSES: For further information and/or to have your name added to our mailing list, contact Dennis Curtis, Telephone 435 688-3202, or Diana Hawks, Telephone 435 688-3266, Bureau of Land Management, Arizona Strip Field Office, 345 E. Riverside Drive, St. George, Utah 84790; Fax 435 688-3388; or Jim Holland, Telephone 702 293-8986, National Park Service, Lake Mead National Recreation Area, 601 Nevada Highway, Boulder City, Nevada 89005; Fax 702 293-8967.

SUPPLEMENTARY INFORMATION: The designation of Grand Canyon Parashant and Vermilion Cliffs National Monuments and the changing needs and interests of the public necessitates a revision of the Arizona Strip RMP, 1992, and Lake Mead National Recreation Area GMP, 1986. Two monument plans and a revised RMP for the remaining BLM Arizona Strip area will be combined into one planning effort. These actions require three separate Records of Decision (ROD) within a single EIS. Preliminary issues and management concerns have been identified by BLM and NPS personnel, other agencies, and in meetings with individuals and user groups. They represent BLM's and NPS's knowledge to date on the existing issues and concerns with current management. The major issue themes that will be addressed in the plan effort are: management and protection of public land resources, recreation/visitor use and safety; access and transportation on the public lands; integrating monument management with community, tribal, and other agency needs; and balancing multiple uses. After gathering public comments, the suggested issues will be placed in one of three categories:

1. Issues to be resolved in the plan.
2. Issues resolved through policy or administrative action.
3. Issues beyond the scope of this plan.

Rationale will be provided in the plan for each issue placed in category 2 or 3. In addition to the preceding major issues, management questions and concerns to be addressed in the plan include, but are not limited to: ecosystem health, riparian condition, threatened and endangered species habitat, wildlife habitat, reintroduction of native species, cultural resource protection and interpretation, recreation/visitor use, rangeland management, woodland product harvest, and minerals management. The following disciplines will be represented on the BLM/NPS planning team: wilderness, recreation, wildlife, range management, botany, fire ecology, forestry, geology, realty, cultural resources, soils, hydrology, Geographic Information Systems (GIS), and engineering. Where necessary and available, outside expertise will be used.

BACKGROUND INFORMATION: On January 11, 2000, the President signed Proclamation 7265, creating the Grand Canyon Parashant National Monument. The monument encompasses approximately 1,052,000 acres of public lands in Mohave County, Arizona. It borders Nevada to the west and Grand Canyon National Park to the south and BLM managed public lands to the east and north. The Vermilion Cliffs National Monument was established by Presidential Proclamation on November 9, 2000, and is under the administration of the BLM. The monument is located on the Colorado Plateau in northern Arizona. It borders the Kaibab National Forest to the west, Glen Canyon National Recreation Area to the east, and the state of Utah to the north.

The Grand Canyon Parashant National Monument proclamation states that the NPS and the BLM shall manage the monument cooperatively and shall prepare an agreement to share, consistent with applicable laws, whatever resources are necessary to properly manage the monument; however, the NPS shall continue to have primary management authority over the portion of the monument within the Lake Mead National Recreation Area, and the BLM shall have primary management authority over the remaining portion of the monument. The plan will need to address and incorporate, to the extent possible, NPS policies, regulations and management directives.

The Arizona Strip RMP was completed in 1992 and amended in 1998 to implement the Mohave Desert Tortoise Recovery Plan. Several significant multi-discipline plans have recently been completed, including the Mt. Trumbull Resource Conservation Area Plan in 1995 and the Parashant Resource Conservation Area Plan in 1997. The Lake Mead National Recreation Area GMP was completed in 1986, and the Shivwits portion of this plan was revised as part of Parashant Interdisciplinary Plan completed cooperatively by the two agencies in 1997. We anticipate incorporating much of the information in the existing plans into this plan revision.

Roger G. Taylor,
Arizona Strip Field Manager
William K. Dickinson,
Lake Mead National Recreation Area, Superintendent.
[FR Doc. 02-9597 Filed 4-23-02; 8:45 am]
BILLING CODE 4310-32-P

APPENDIX 2.A

ARIZONA STANDARDS AND GUIDELINES FOR LIVESTOCK GRAZING MANAGEMENT

ARIZONA STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR GRAZING ADMINISTRATION

INTRODUCTION

The Department of the Interior's final rule for Grazing Administration, issued on February 22, 1995, and effective August 21, 1995, requires that Bureau of Land Management (BLM) State Directors develop State or regional standards and guidelines for grazing administration in consultation with BLM Resource Advisory Councils (RAC), other agencies and the public. The final rule provides that fallback standards and guidelines be implemented, if State standards and guidelines are not developed by February 12, 1997. Arizona Standards and Guidelines and the final rule apply to grazing administration on public lands as indicated by the following quotation from the Federal Register, Volume 60, Number 35, page 9955.

> "The fundamentals of rangeland health, guiding principles for standards and the fallback standards address ecological components that are affected by all uses of public rangelands, not just livestock grazing. However, the scope of this final rule, and therefore the fundamentals of rangeland health of §4180.1, and the standards and guidelines to be made effective under §4180.2, are limited to grazing administration."

Although the process of developing standards and guidelines applies to grazing administration, present rangeland health is the result of the interaction of many factors in addition to livestock grazing. Other contributing factors may include, but are not limited to, past land uses, land use restrictions, recreation, wildlife, rights-of-way, wild horses and burros, mining, fire, weather, and insects and disease.

With BLM's commitment to ecosystem and interdisciplinary resource management, the standards for rangeland health, as developed in this current process, will be incorporated into management goals and objectives. The standards and guidelines for rangeland health for grazing administration, however, are not the only considerations in resolving resource issues.

The following quotations from the Federal Register, Vol. 60, No. 35, page 9956, February 22, 1995, describe the purpose of standards and guidelines and their implementation:

> "The guiding principles for standards and guidelines require that State or regional standards and guidelines address the basic components of healthy rangelands. The Department believes that by implementing grazing-related actions that are consistent with the fundamentals of §4180.1 and the guiding principles of §4180.2, the long-term health of public rangelands can be ensured.

Standards and guidelines will be implemented through terms and conditions of grazing permits, leases, and other authorizations, grazing-related portions of activity plans (including Allotment Management Plans), and through range improvement-related activities.

The Department anticipates that in most cases the standards and guidelines themselves will not be terms and conditions of various authorizations but that the terms and conditions will reflect the standards and guidelines.

The Department intends that assessments and corrective actions will be undertaken in priority order as determined by BLM.

"The Department will use a variety of data including monitoring records, assessments, and knowledge of the locale to assist in making the "significant progress" determination. It is anticipated that in many cases it will take numerous grazing seasons to determine direction and magnitude of trend. However, actions will be taken to establish significant progress toward conformance as soon as sufficient data are available to make informed changes in grazing practices."

FUNDAMENTALS AND DEFINITION OF RANGELAND HEALTH

The Grazing Administration Regulations, at §4180.1 (43 Code of Federal Regulation [CFR] 4180.1), Federal Register Vol. 60, No. 35, pg. 9970, direct that the authorized officer ensures that the following conditions of rangeland health exist:

(a) Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and timing and duration of flow.

(b) Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

(c) Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established BLM management objectives such as meeting wildlife needs.

(d) Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species.

These fundamentals focus on sustaining productivity of a rangeland rather than its uses. Emphasizing the physical and biological functioning of ecosystems to determine rangeland health is consistent with the definition of rangeland health as proposed by the Committee on Rangeland Classification, Board of Agriculture, National Research Council (Rangeland Health, 1994, pg. 4 and 5). This Committee defined Rangeland Health ". . .as the degree to which the integrity of the soil and the ecological processes of rangeland ecosystems are sustained." This committee emphasized ". . .the degree of integrity of the soil and ecological processes that are most important in sustaining the capacity of rangelands to satisfy values and produce commodities." The Committee also recommended that "The determination of whether a rangeland is healthy, at risk, or unhealthy should be based on the evaluation of three criteria: degree of soil stability and watershed function, integrity of nutrient cycles and energy flow, and presence of functioning mechanisms" (Rangeland Health, 1994, pg. 97-98).

Standards describe conditions necessary to encourage proper functioning of ecological processes on specific ecological sites. An ecological site is the logical and practical ecosystem unit upon which to base an interpretation of rangeland health. Ecological site is defined as:

". . . a kind of land with specific physical characteristics which differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its response to management" (Journal of Range Management, 48:279, 1995). Ecological sites result from the interaction of climate, soils, and landform (slope, topographic position). The importance of this concept is that the "health" of different kinds of rangeland must be judged by standards specific to the potential of the ecological site. Acceptable erosion rates, water quality, productivity of plants and animals, and other features are different on each ecological site.

Since there is wide variation of ecological sites in Arizona, standards and guidelines covering these sites must be general. To make standards and guidelines too specific would reduce the ability of BLM and interested publics to select specific objectives, monitoring strategies, and grazing permit terms and conditions appropriate to specific land forms.

Ecological sites have the potential to support several different plant communities. Existing communities are the result of the combination of historical and recent uses and natural events. Management actions may be used to modify plant communities on a site. The desired plant community for a site is defined as follows: "Of the several plant communities that may occupy a site, the one that has been identified through a management plan to best meet the plan's objectives for the site. It must protect the site as a minimum" (Journal of Range Management, 48:279, 1995).

Fundamentals (a) and (b) define physical and biological components of rangeland health and are consistent with the definition of rangeland health as defined by the Committee on Rangeland Classification, Board on Agriculture, National Research Council, as discussed in the paragraph above. These fundamentals provide the basis for sustainable rangelands.

Fundamentals (c) and (d) emphasize compliance with existing laws and regulation and, therefore, define social and political components of rangeland health. Compliance with Fundamentals (c) and (d) is accomplished by managing to attain a specific plant community and associated wildlife species present on ecological sites. These desired plant communities are determined in the BLM planning process, or, where the desired plant community is not identified, a community may be selected that will meet the conditions of Fundamentals (a) and (b) and also adhere to laws and regulations. Arizona Standard 3 is written to comply with Fundamentals (c) and (d) and provide a logical combination of Standards and Guidelines for planning and management purposes.

STANDARD AND GUIDELINE DEFINITIONS

Standards are goals for the desired condition of the biological and physical components and characteristics of rangelands. Standards:

(1) are measurable and attainable; and
(2) comply with various Federal and State statutes, policies, and directives applicable to BLM Rangelands.

Guidelines are management approaches, methods, and practices that are intended to achieve a standard. Guidelines:

(1) typically identify and prescribe methods of influencing or controlling specific public land uses;
(2) are developed and applied consistent with the desired condition and within site capability; and
(3) may be adjusted over time.

IMPLEMENTING STANDARDS AND GUIDELINES

The authorized officer will review existing permitted livestock use, allotment management plans, or other activity plans which identify terms and conditions for management on public land. Existing management practices and levels of use on grazing allotments will be reviewed and evaluated on a priority basis to determine if they meet, or are making significant progress toward meeting, the standards and are in conformance with the guidelines. The review will be interdisciplinary and conducted under existing rules which provide for cooperation, coordination, and consultation with affected individuals, federal, state, and local agencies, tribal governments, private landowners, and interested publics.

This review will use a variety of data, including monitoring records, assessments, and knowledge of the locale to assist in making the significant progress determination. Significance will be determined on a case by case basis, considering site potential, site condition, weather and financial commitment. It is anticipated there will be cases where numerous years will be needed to determine direction and magnitude of trend.

Upon completion of review, the authorized officer shall take appropriate action as soon as practicable but no later than the start of the next grazing year upon determining that the existing grazing management practices or level of use on public land are significant factors contributing to failure to achieve the standards and conform with the guidelines that are made effective under 43 CFR 4180.2. Appropriate action means implementing actions that will result in significant progress toward fulfillment of the standards and significant progress toward conformance with guidelines.

Livestock grazing will continue where significant progress toward meeting standards is being made. Additional activities and practices would not be needed on such allotments. Where new activities or practices are required to assure significant progress toward meeting standards, livestock grazing use can continue contingent upon determinations from monitoring data that the implemented actions are effective in making significant progress toward meeting the standards. In some cases, additional action may be needed as determined by monitoring data over time.

New plans will incorporate an interdisciplinary team approach (Arizona BLM Interdisciplinary Resource Management Handbook, April 1995). The terms and conditions for permitted grazing in these areas will be developed to comply with the goals and objectives of these plans which will be consistent with the standards and guidelines.

ARIZONA STANDARDS AND GUIDELINES

Arizona Standards and Guidelines (S&G) for grazing administration have been developed through a collaborative process involving the Bureau of Land Management State S&G Team and the Arizona Resource Advisory Council. Together, through meetings, conference calls, correspondence, and Open Houses with the public, the BLM State Team and RAC prepared Standards and Guidelines to address the minimum requirements outlined in the grazing regulations. The Standards and Guidelines, criteria for meeting Standards, and indicators are an integrated document that conforms to the fundamentals of rangeland health and the requirements of the regulations when taken as a whole.

Upland sites, riparian-wetland areas, and desired resource conditions are each addressed by a standard and associated guideline.

Standard 1: Upland Sites

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform (ecological site).

Criteria for meeting Standard 1:

Soil conditions support proper functioning of hydrologic, energy, and nutrient cycles. Many factors interact to maintain stable soils and healthy soil conditions, including appropriate amounts of vegetative cover, litter, and soil porosity and organic matter. Under proper functioning conditions, rates of soil loss and infiltration are consistent with the potential of the site.

Ground cover in the form of plants, litter or rock is present in pattern, kind, and amount sufficient to prevent accelerated erosion for the ecological site; or ground cover is increasing as determined by monitoring over an established period of time.

Signs of accelerated erosion are minimal or diminishing for the ecological site as determined by monitoring over an established period of time.

As indicated by such factors as:

Ground Cover
- litter
- live vegetation, amount and type (e.g., grass, shrubs, trees, etc.)
- rock

Signs of erosion
- flow pattern
- gullies
- rills
- plant pedestaling

Exceptions and exemptions (where applicable):

None

Guidelines:

1-1. Management activities will maintain or promote ground cover that will provide for infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological

sites within management units. The ground cover should maintain soil organisms and plants and animals to support the hydrologic and nutrient cycles, and energy flow. Ground cover and signs of erosion are surrogate measures for hydrologic and nutrient cycles and energy flow.

1-2. When grazing practices alone are not likely to restore areas of low infiltration or permeability, land management treatments may be designed and implemented to attain improvement.

Standard 2: Riparian-Wetland Sites

Riparian-wetland areas are in properly functioning condition.

Criteria for meeting Standard 2:

Stream channel morphology and functions are appropriate for proper functioning condition for existing climate, landform, and channel reach characteristics. Riparian-wetland areas are functioning properly when adequate vegetation, land form, or large woody debris is present to dissipate stream energy associated with high water flows.

Riparian-wetland functioning condition assessments are based on examination of hydrologic, vegetative, soil and erosion-deposition factors. BLM has developed a standard checklist to address these factors and make functional assessments. Riparian-wetland areas are functioning properly as indicated by the results of the application of the appropriate checklist.

The checklist for riparian areas is in Technical Reference 1737-9 "Process for Assessing Proper Functioning Condition." The checklist for wetlands is in Technical Reference 1737-11 "Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas." These checklists are reprinted on the pages following the Guidelines for Standard 3.

As indicated by such factors as:

Gradient
Width/depth ratio
Channel roughness and sinuosity of stream channel
Bank stabilization
Reduced erosion
Captured sediment
Ground-water recharge
Dissipation of energy by vegetation

Exceptions and exemptions (where applicable):

Dirt tanks, wells, and other water facilities constructed or placed at a location for the purpose of providing water for livestock and/or wildlife and which have not been determined through local planning efforts to provide for riparian or wetland habitat are exempt.

Water impoundments permitted for construction, mining, or other similar activities are exempt.

Guidelines:

2-1. Management practices maintain or promote sufficient vegetation to maintain, improve or restore riparian-wetland functions of energy dissipation, sediment capture, groundwater recharge and stream bank stability, thus promoting stream channel morphology (e.g., gradient, width/depth ratio, channel roughness and sinuosity) and functions appropriate to climate and landform.
2-2. New facilities are located away from riparian-wetland areas if they conflict with achieving or maintaining riparian-wetland function. Existing facilities are used in a way that does not conflict with riparian-wetland functions or are relocated or modified when incompatible with riparian-wetland functions.

2-3. The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect ecological functions and processes.

Standard 3: Desired Resource Conditions

Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

Criteria for meeting Standard 3:

Upland and riparian-wetland plant communities meet desired plant community objectives. Plant community objectives are determined with consideration for all multiple uses. Objectives also address native species, and the requirements of the Taylor Grazing Act, Federal Land Policy and Management Act, Endangered Species Act, Clean Water Act, and appropriate laws, regulations, and policies.

Desired plant community objectives will be developed to assure that soil conditions and ecosystem function described in Standards 1 and 2 are met. They detail a site-specific plant community, which when obtained, will assure rangeland health, State water quality standards, and habitat for endangered, threatened, and sensitive species. Thus, desired plant community objectives will be used as an indicator of ecosystem function and rangeland health.

As indicated by such factors as:

Composition
Structure
Distribution

Exceptions and exemptions (where applicable):

Ecological sites or stream reaches on which a change in existing vegetation is physically, biologically, or economically impractical.

Guidelines:

3-1. The use and perpetuation of native species will be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands, non-intrusive, non-native plant species are appropriate for use where native species (a) are not available, (b) are not economically feasible, (c) cannot achieve ecological objectives as well as non-native species, and/or (d) cannot compete with already established non-native species.
3-2. Conservation of Federal threatened or endangered, proposed, candidate, and other special status species is promoted by the maintenance or restoration of their habitats.

3-3. Management practices maintain, restore, or enhance water quality in conformance with State or Federal standards.

3-4. Intensity, season and frequency of use, and distribution of grazing use should provide for growth and reproduction of those plant species needed to reach desired plant community objectives.

3-5. Grazing on designated ephemeral (annual and perennial) rangeland may be authorized if the following conditions are met:

ephemeral vegetation is present in draws, washes, and under shrubs and has grown to useable levels at the time grazing begins;

sufficient surface and subsurface soil moisture exists for continued plant growth;

serviceable waters are capable of providing for proper grazing distribution;

sufficient annual vegetation will remain on site to satisfy other resource concerns, (i.e., watershed, wildlife, wild horses and burros); and

monitoring is conducted during grazing to determine if objectives are being met.

3-6. Management practices will target those populations of noxious weeds which can be controlled or eliminated by approved methods.

3-7. Management practices to achieve desired plant communities will consider protection and conservation of known cultural resources, including historical sites, and prehistoric sites and plants of significance to Native American peoples.

STANDARDS AND GUIDELINES ON THE ARIZONA STRIP DISTRICT

The Standards were written by Arizona's Resource Advisory Council (RAC) in 1997. They were accepted and approved that same year by the Secretary of the Interior. The Guidelines apply only to authorized livestock grazing activities, the Standards apply to all programs and all authorized activities. The process of implementing the Standards on all grazing allotments on the Arizona Strip is performed by two teams. The Interdisciplinary Assessment Team (IAT) is made up of resource specialists from the BLM, Arizona Game and Fish Department, the Natural Resources Conservation Service and Mohave County Extension Agency. This team carries out the assessment. The Arizona Resource Advisory Council appointed a nine member Rangeland Resource Team (RRT), to be involved in the process from beginning to end.

- The RRT is constructed similar to the RAC with 3 representatives in each of 3 diverse groups:
    1. Commodities: Livestock Grazing, Mining, Commercial Recreation
    2. Non-Commodities: Wildlife, Environmental, Dispersed Recreation
    3. Local Area Interest: Public-at-large, Native American Interests, Elected Officials
- The RRT has 2 objectives:
    1. Ensure the Standards are consistently applied across allotment boundaries, and
    2. Ensure determinations are based on something…, monitoring data, professional opinion.

    There is a list of members on both teams below.

Each year letters are sent to approximately 700 individuals notifying them which grazing allotments are to be evaluated in the upcoming fiscal year. The recipient is then instructed how to request designation as an "Interested Public" and be involved in the evaluation and decision making process.

BLM grazing regulations at 43CFR 4100.0-5 state "Interested public means an individual, group or organization that has **submitted a written request** to the authorized officer to be provided an opportunity to be involved in the decision making process for the management of livestock grazing on **specific grazing allotments** or has submitted written comments to the authorized officer regarding the management of livestock grazing on a specific allotment"(emphasis added).

The Arizona Strip District holds an issue scoping meeting once a year, where all issues raised are documented as either relating, or not relating, to rangeland health. During the year each allotment with issues that relate to rangeland health is visited, after assembling all available information and monitoring data. Both teams visit sites representing each issue and the IAT determines, by consensus, whether the area is meeting standards. The interested public is invited to the scoping meetings and the field visits. If an area does not meet the standards, the cause is determined and recommendations are made to improve the situation. If the current livestock grazing practices are determined to be the cause of non-attainment, BLM regulations (43 CFR 4180.1) require the modification of the practices by the next grazing season.

The IAT then produces a report documenting the results of the evaluation. The S&G report is sent to the RAC, the RRT, State Agencies having lands or managing resources within the area, and the Interested Public. Any comments received are used in the preparation of an Environmental Assessment for renewing the ten year grazing permit. A Grazing Decision is then issued to the Permittee, State Agencies having lands or managing resources within the area, and the Interested Public. This grazing decision outlines the terms and conditions of the grazing permit and may be protested or appealed by any or all recipients.

APPENDIX 2.B

NOMINATION, EVALUATION, AND DESIGNATION OF SIGNIFICANT CAVES

NOMINATION, EVALUATION, AND DESIGNATION OF SIGNIFICANT CAVES

From the Code of Federal Regulations (CFR) 43 Part 37.11

(a) Nominations for initial and subsequent listings. The authorized officer will give governmental agencies and the public, including those who utilize caves for scientific, educational, and recreational purposes, the opportunity to nominate potential significant caves. The authorized officer will give public notice, including a notice published in the Federal Register, calling for nominations for the initial listing, including procedures for preparing and submitting the nominations. Nominations for subsequent listings will be accepted from governmental agencies and the public by the agency that manages the land where the cave is located as new cave discoveries are made or as new information becomes available. Nominations not approved for designation during the listing process may be resubmitted if better documentation or new information becomes available.

(b) Evaluation for initial and subsequent listings. The evaluation of the nominations for significant caves will be carried out in consultation with individuals and organizations interested in the management and use of cave resources, within the limits imposed by the confidentiality provisions of Sec. 37.12 of this part. Nominations will be evaluated using the criteria in Sec. 37.11(c).

(c) Criteria for significant caves. A significant cave on Federal lands shall possess one or more of the following features, characteristics, or values.

(1) Biota. The cave provides seasonal or yearlong habitat for organisms or animals, or contains species or subspecies of flora or fauna that are native to caves, or are sensitive to disturbance, or are found on State or Federal sensitive, threatened, or endangered species lists.

(2) Cultural. The cave contains historic properties or archaeological resources (as described in 36 CFR 60.4 and 43 CFR 7.3) or other features that are included in or eligible for inclusion in the National Register of Historic Places because of their research importance for history or prehistory, historical associations, or other historical or traditional significance.

(3) Geologic/Mineralogic/Paleontologic. The cave possesses one or more of the following features:

(i) Geologic or mineralogic features that are fragile, or that exhibit interesting formation processes, or that are otherwise useful for study.

(ii) Deposits of sediments or features useful for evaluating past events.

(iii) Paleontologic resources with potential to contribute useful educational and scientific information.

(4) Hydrologic. The cave is a part of a hydrologic system or contains water that is important to humans, biota, or development of cave resources.

(5) Recreational. The cave provides or could provide recreational opportunities or scenic values.

(6) Educational or Scientific. The cave offers opportunities for educational or scientific use; or, the cave is virtually in a pristine state, lacking evidence f contemporary human disturbance or impact; or, the length, volume, total depth, pit depth, height, or similar measurements are notable.

(d) National Park Service policy. The policy of the National Park Service, pursuant to its Organic Act of 1916 (16 U.S.C. 1, et seq.) and Management Policies (Chapter 4:20, Dec. 1988), is that all caves are afforded protection and will be managed in compliance with approved resource management plans. Accordingly, all caves on National Park Service-administered lands are deemed to fall within the definition of ``significant cave."

(e) Special management areas. Within special management areas that are designated wholly or in part due to cave resources found therein, all caves within the so-designated special management area shall be determined to be significant.

(f) Designation and documentation. If the authorized officer determines that a cave nominated and evaluated under paragraphs (a) and (b) of this section meets one or more of the criteria in paragraph (c), the authorized officer will designate the cave as significant. The authorized officer will designate all caves identified in paragraphs (d) and (e) of this section to be significant. The authorized officer will notify the nominating party of the results of the evaluation and designation. Each agency Field Office will retain appropriate documentation for all significant caves located within its administrative boundaries. At a minimum, documentation shall include a statement of finding signed and dated by the authorized officer, and the information used to make the determination. This documentation will be retained as a permanent record in accordance with the confidentiality provision in Sec. 37.12 of this part.

(g) Decision final. Decisions to designate or not designate a cave as significant are made at the sole discretion of the authorized officer and are not subject to further administrative review or appeal under 43 CFR Part 4.

(h) If a cave is determined to be significant, its entire extent, including passages not mapped or discovered at the time of the determination, is deemed significant. This includes caves that extend from lands managed by any Federal agency into lands managed by one or more other bureaus or agencies of the Department of the Interior, as well as caves initially believed to be separate for which interconnecting passages are discovered after significance is determined.

APPENDIX 2.C

VEGETATION TREATMENT TOOLS AND METHODS

Vegetation Treatment Tools and Methods

This appendix briefly describes a variety of vegetation treatment tools and methods that may be used in the BLM lands of the Planning Area. Included are recommendations for uses of the various tools and methods, as well as the advantages and disadvantages of each. At the end of this section is an addendum that applies specifically to NPS lands within the Parashant.

Manual

In manual treatments, plants are cut at or above ground level; plant root systems are pulled or dug out to prevent subsequent sprouting and regrowth; or mulch is placed around desired vegetation to limit the growth of competing vegetation. Hand tools and hand-operated power tools are used in manual vegetation treatments to cut, clear, or prune herbaceous and woody species. Hand tools such as the handsaw, axe, shovel, rake, machete, grubbing hoe, mattock (combination of axe and grubbing hoe), brush hook, and hand clippers, etc. are used in manual treatments. Axes, shovels, grubbing hoes, and mattocks can dig up and cut below the surface to remove the main root of plants such as prickly pear and mesquite that have roots which can quickly resprout in response to surface cutting or clearing. Power tools, such as chain saws and power brush saws, are used to sever the main stem of woody vegetation at or near ground level.

The advantage of manual treatments is that they are species and individual plant specific, can be used in sensitive habitats, and can be used in areas inaccessible for mechanical treatments. The disadvantage is that they are labor intensive and, therefore, expensive.

Mechanical

Mechanical treatments are used to kill or reduce the cover of undesirable vegetation and thus encourage the growth of desirable vegetation. Several different types of mechanical equipment are effective in suppressing, inhibiting, or controlling herbaceous and woody vegetation (Vallentine 1980). Equipment could include wheeled or track type tractors, mowers, shredders, ATV's or specially designed vehicles with attached implements for mechanical vegetation treatments. The best mechanical method for treating undesired plants in a particular location depends on the following factors:

1. Characteristics of the undesired species present such as plant density stem size, woodiness, brittleness, and re-sprouting ability;
2. Need for seedbed preparation and/or re-vegetation,
3. Need to reduce erosion and improve effective ground cover,
4. Soil characteristics such as type, depth, amount and size of rocks, erosion potential, and susceptibility to compaction;
5. Climatic and seasonal conditions,
6. Topography and terrain,
7. Potential cost of project compared to expected results, and
8. Vegetation type.

Wheeled or crawler tractors can uproot and/or push vegetation over (bulldozing) with a heavy, hydraulic controlled blade. Vegetation is either left scattered or pushed into windrows or piles. There are several different kinds of blades available, depending of the type of vegetation and goals of the project. Bulldozing is most effective in removing scattered large brush or trees. Soil disturbance is a disadvantage of bulldozing.

Disk plowing in various forms can be used for removing shallow-rooted herbaceous and woody plants. Several different kinds of root plows are specific for certain types of vegetation. In addition to killing vegetation, disk plowing is effective in loosening the soil surface to prepare it for seeding and to improve the rate of water infiltration. The disadvantages of disk plowing are that it disturbs the soil and provides an opportunity for an increase in invasive non-native plants, it usually kills all species, and it may be expensive. Also, plowing is usually not practical on steep (greater than a 35% to 45% slope) or rocky slopes. Plant species that sprout from roots may survive.

Various tractor attachments are used for mowing, beating, crushing, chopping, or shredding vegetation depending on the nature of the vegetation and goals of the project. Mowing is effective in reducing plant height and usually does not kill vegetation. Mowing is more effective on herbaceous than woody vegetation. On the other hand, a rolling cutter may kill woody non-sprouting vegetation by breaking stems at ground level but leaving herbaceous vegetation. Generally, mowing, beating, crushing, chopping, or shredding disturbs the soil surface minimally. Rocky soil and steep slopes may limit use of this type of equipment. The advantage of using this type of equipment is that selective plants may be targeted to achieve specific goals.

Chaining and cabling are used to remove non-sprouting woody vegetation such as small trees and shrubs by pulling them over. Vegetation removal is accomplished by dragging heavy anchor chains or steel cables, hooked behind two tractors, in a U-shaped manner. Vegetation is either left scattered or pushed into windrows or piles. The chains or cables can also be used to prepare the soil surface for seeding desirable species and to cover seed with soil to improve germination. Although herbaceous vegetation is not normally injured during the treatment, desirable shrubs may be damaged. The disadvantage of this treatment is soil disturbance and that non-desirable "weedy" herbaceous vegetation can survive this treatment. This vegetation treatment method is cost effective as large areas can be readily treated.

Chemical

Until the new Vegetation Management EIS is approved (2004), BLM will use EPA-approved herbicides in accordance with EPA's Endangered Species Pesticide Program covered in the BLM's *Vegetation Treatment on BLM Lands in Thirteen Western States FEIS* (May 1991) and to those approved for use by the Arizona Record of Decision (Page 3, ROD, July 1991). These herbicides are: Atrazine; Bromacil; Bromacil + Diuron; Chlorsulfuron; Clopyralid; 2,4-D, Dicamba; Dicamba + 2,4-D; Diuron; Glyphosate; Glyphosate + 2,4-D; Hexazinone; Imazapyr; Mefluidide; Metsulfuron Methyl; Picloram; Picloram + 2,4-D; Simazine; Sulfometuron Methyl; Tebuthiuron; and Triclopyr as listed on pages 1-19 through 1-32 and project design features listed on pages 1-33 through 1-37 of the FEIS. Once the new ROD for this RMP is signed, BLM will adhere to the standards and guidelines for each approved herbicide set forth in that FEIS.

Herbicide applications are designed to minimize potential impacts on non-target plants and animals, while achieving the objective of the vegetation treatment project. The rates of application depend on the target species, presence and condition of non-target vegetation, soil type, depth to the water table, presence of other water sources, and the requirements of the label. In many circumstances the herbicide chosen, time of treatment, and rate of application of the herbicide is different than the most ideal herbicide application for maximum control of the target plant species in order to minimize damage to the non-target plant species, and to ensure minimum risk to human health and safety.

The herbicides may be applied aerially with helicopters or fixed-wing aircraft, or on the ground using vehicles or manual application devices. Helicopters are more expensive than fixed-wing aircraft, but they are more effective in irregular terrain and in treating specific target vegetation in areas with many vegetation types. Manual applications are generally used for treating small areas or those inaccessible by vehicle.

BLM will work closely with the FWS to ensure that herbicide applications will not affect listed or proposed threatened or endangered species on a project-level basis. If adverse effects are anticipated during informal consultation, then BLM will formally consult on these projects. If FWS develops herbicide guidance for particular species that improves protection beyond the current BLM design features, BLM will consider and incorporate that guidance as it consults with the FWS on a project-level basis. In order to protect listed, proposed, and candidate species, buffer strips may be used.

Project design features may include buffer strips described on page 10 of the ROD, as follows: "Buffer strips would be used adjacent to dwellings, domestic water sources, agriculture land, streams, lakes, and ponds. A minimum buffer strip 100 feet wide will be provided for aerial application, 25 feet for vehicle application and 10 feet for hand application. Any deviations must be in accordance with the label for the herbicide. Herbicides could be wiped on individual plants within 10 feet of water where application is critical." (It should be noted that the new Draft Vegetation Management EIS contains herbicides approved for application over water, and therefore buffer strips may not always be necessary, once the new FEIS is approved.)

The chemicals can be applied by many different methods and the selected technique depends on a number of variables. Some of these are:

1. treatment objective (removal or reduction);
2. accessibility, topography, and size of the treatment area;
3. characteristics of the target species and the desired vegetation;
4. location of sensitive areas in the immediate vicinity (potential environmental impacts);
5. anticipated costs and equipment limitations; and
6. meteorological and vegetative conditions of the treatment area at the time of treatment.

The changes made here are not consistent with the format of the numbered items under the "Mechanical Section." Chemical treatments are generally cost effective and can be species specific. The disadvantages are they are not always species specific and precautions may need to be taken to ensure attainment of treatment objectives.

Biological

Biological control (biocontrol) is the intentional use of living organisms to reduce the population of a pest. It may include the use of insects, nematodes, mite, plant pathogens, and vertebrates. The majority of the noxious weeds in the United States are introduced without their natural enemies. Biocontrol seeks to use some of the native land's biotic factors to suppress populations of these undesirable plants. (Biological Control of Weeds in the West, Western Society of Weed Management, 1996). The eventual impacts of a biocontrol agent on its target plant will be the result of the:

1. density of weeds compared to the density of the agent;
2. effect of the local biotic and abiotic conditions on the agent and on the weed;
3. plant's reproductive ability (seeds only or seeds and vegetative reproduction);
4. agent's ability to stress the plant each year and the plant's ability to maintain and replace root reserves;
5. plant's ability to recover from the effects of the biocontrol agent, and;
6. interactions of multiple biocontrol agents attacking a single weed species.

The changes made here are not consistent with the format of the numbered items under the "Mechanical Section"

The advantages of biocontrol:

1. Once a biocontrol agent becomes established it usually will reproduce, increase its numbers, and continue to attack the target organism, generally without additional costs to the land manager.
2. Biocontrol agents move to host plants anywhere within their climatic range, readily crossing ownership boundaries and some geographical barriers.
3. Approved biocontrol agents are selective – host weeds are attacked without damage to the surrounding vegetation.
4. Properly tested biocontrol agents are not a source of environmental contamination.

The disadvantages of biocontrol:

1. It often takes many years for the populations of the introduced agents to increase to levels that permanently decrease the pest plant population.
2. Some biocontrol agents may be subject to predators.
3. Environmental conditions (shade versus sun, low versus high rainfall, sandy versus clay soils) often exclude some biocontrol agents from certain locations.
4. Biocontrol agents usually do not eradicate weed populations.

Cattle, sheep and goats are domestic animals which can be used as biological agents to control the top growth of certain noxious weeds. The use of grazing as a biological control agent would be conducted in accordance with BLM procedures in the Use of Biological Control Agents of Pests on Public Lands (BLM 1990). The following are some advantages of using domestic animals, mainly sheep or goats, for noxious weed control.

1. They use weeds as a food source.
2. Following a brief adjustment period, they sometimes consume as much as 50 percent of their daily diet of targeted species.
3. Sheep or goats can be used in combination with herbicides.

Some of the disadvantages of using domestic animals are:

1. They also use non-target plants as food sources.
2. The use of domestic animals, like sheep or goats, requires a herder or temporary fencing.
3. The animals may be killed by predators such as coyotes.
4. Most weed species are less palatable than desirable vegetation.
5. They may accelerate movement of nonnative plants through seed ingestion and excretion.
6. They control few, if any, plant species.
7. Domestic livestock may transmit parasites and/or pathogens to resident native wildlife species.

Wildland Fire Use and Prescribed Fire

Wildland Fire Use

Wildland fire use is wildland fire used to protect, maintain, and enhance resources and, when possible, allowed to function in its natural ecological role. Use of fire will be based on approved Fire Management Plans and will follow specific prescriptions contained in operational plans.

The Interagency Standards for Fire and Fire Aviation Operations (2004) will be followed. It includes the following incident management guidance for wildland fire use:

1. Agencies may apply this strategy in managing wildland fires for resource benefit.
2. An approved Fire Management Plan (FMP) is required. This plan identifies specific resource and fire management objectives, a predefined geographic area, and prescriptive criteria that must be met.
3. A Wildland Fire Implementation Plan (WFIP) will be completed for all wildland fires that are managed for resource benefit. This is an operational plan for assessing, analyzing, and selecting strategies for wildland fire use. It is progressively developed and documents appropriate management responses for any wildland fire managed for resource benefits. The plan will be completed in compliance with the guidance found in the Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide (August 1998).
4. Monitoring and Evaluation includes assessment and long term monitoring of the fire treatment to ensure the prescribed fire has met the objectives of the approved prescribed fire plan.

Prescribed Fire

Prescribed fire is the planned application of fire to vegetation, under specific conditions of fuels, weather, and other variables, to ensure the fire remains in a predetermined area and achieves site-specific resource management objectives. Prescribed fire treatments would be implemented in accordance with BLM procedures in Fire Planning (BLM 1987c), Prescribed Fire Management (BLM 1988b), and Fire Training and Qualifications (BLM 1987d).

Prior to conducting a prescribed burn, a written plan must be prepared that takes into consideration existing conditions (amount of fuel, fuel moisture, temperatures, terrain, weather forecasts, etc.) and identifies people responsible for overseeing the fire.

Seeding

Following vegetation management treatments, seed may be applied. All seed will be tested and "state certified" free of weed seeds. Seed priming, covering, and other enhancement techniques may be used to increase germination rates. Seeding encourages development of a desired plant community, mitigates erosion, establishes effective ground cover, and/or encourages development of desirable wildlife habitat attributes. The disadvantages of seeding are that acquiring and applying seed is expensive and germination is not always successful.

NPS Vegetation Treatment Tools and Methods

On NPS lands, individual restoration plans will be prepared, and compliance conducted, for each restoration project. Tools that may be considered include;

- Manual – as written for BLM lands, including chain saws and power brush saws.
- Chemical – as written for BLM lands, except NPS will use EPA and NPS approved pesticides in accordance with NPS Integrated Pest Management (IPM) Policy and Guidelines
- Biological – as written for BLM lands, except the use of cattle, sheep, and goats. NPS use will be in accordance with NPS IPM Policy and Guidelines
- Fire – as written for BLM lands, except in accordance with NPS policies.
- Seeding – As written for BLM, except only native species will be applied to NPS lands in accordance with NPS policies.
- Mechanical -- As written for BLM, except no disk plowing, chaining or cabling will be used on NPS lands. Appropriateness of the tool and method may be required on a project-to-project basis.

All treatments will be consistent with NPS laws, regulations, and policies. The minimum requirement process will be conducted for administrative activities on NPS proposed wilderness.

APPENDIX 2.D

STANDARDS FOR RANGELAND HEALTH IMPLEMENTATION STATUS

Standards for Rangeland Health
Evaluation Results and Evaluation Schedule

Resource Area: Arizona Strip Field Office AZ110

Allotment Name	Allotment Number	Evaluation Result or FY Scheduled
Antelope	05206	Progressing Towards Meeting
Antelope Spring	05210	Meeting
Atkin Well	05207	2005
Badger Creek	05341	Progressing Towards Meeting
Beanhole Well	05334	Progressing Towards Meeting
Beaver Dam Slope	04828	2008
Black Canyon	05256	Meeting
Black Knolls	05264	2005
Black Rock	04841	Evaluation in Draft
Blake Pond	04813	2006
Brown-Shumway	05302	Evaluation in Draft
Button	05308	Evaluation in Draft
Canaan Gap	05205	2005
Cane Beds	05212	Evaluation in Draft
Cedar Knoll	05318	Evaluation in Draft
Cedar Pockets Ut	04866	2007
Cedar Ridge	05303	Evaluation in Draft
Cedar Wash	04842	2005
Chatterly	05307	Evaluation in Draft
Clay Spring	04845	Evaluation in Draft
Clayhole	05215	2005
Cottonwood	05209	2005
Cowboy Butte	05310	Evaluation in Draft
Coyote	05327	Evaluation in Draft
Coyote Spring	04805	Evaluation in Draft
Crosby Tank	05219	2006
Diamond Butte	04833	Evaluation in Draft
Fern Tank	05217	Evaluation in Draft
Ferrin	05246	Evaluation in Draft
Flat Top Well	05214	Meeting
Franks Reservoir	05325	Evaluation in Draft
Fuller Road	05324	Evaluation in Draft
Glazier Dam	05202	Evaluation in Draft
Grama Point	05233	Evaluation in Draft
Gramma Spring	05225	Evaluation in Draft
Gulch	05230	Evaluation in Draft

Resource Area: Arizona Strip Field Office AZ110

Allotment Name	Allotment Number	Evaluation Result or FY Scheduled
Gunsight	05320	Evaluation in Draft
Hacks	05227	Meeting
Harris Well	05238	2006
Hat Knoll	04867	Evaluation in Draft
Head of Hacks	05232	Evaluation in Draft
Herd House	00096	Evaluation in Draft
Highway	04812	2007
Highway	05309	Evaluation in Draft
Homestead	05253	Meeting
House Rock	05331	Progressing Towards Meeting
Hurricane Cliff	05251	Evaluation in Draft
Hurricane Rim	00114	Progressing Towards Meeting
Ivanpah	04858	Evaluation in Draft
Iverson	04834	Meeting
Jackson Tank	04830	2005
Jacob Canyon	05317	2005
Joe	05245	Evaluation in Draft
Johnson Run	05330	Evaluation in Draft
June Tank	05221	Progressing Towards Meeting
Kanab Creek	05321	2007
Kanab Gulch	05224	Evaluation in Draft
Lamb Tank	05257	Evaluation in Draft
Lambing-Starvation	04838	Meeting
Lane	05271	Evaluation in Draft
Lime Spring	02012	2008
Little Tank	04853	Evaluation in Draft
Little Wolf	04814	Evaluation in Draft
Littlefield	04843	2008
Littlefield Comm.	04827	2008
Lizard	04857	2006
Loco Point	05260	Evaluation in Draft
Lost Spring Gap	05316	Evaluation in Draft
Lower Hurricane	04837	Evaluation in Draft
Mainstreet	04808	Evaluation in Draft
Mesquite Community	04832	2008
Moonshine	05237	Meeting
Mormon Well	04844	2008
Mountain Sheep	04824	Meeting
Mud And Cane Spring	04850	Evaluation in Draft
Muggins Flat	05313	Evaluation in Draft

Resource Area: Arizona Strip Field Office AZ110

Allotment Name	Allotment Number	Evaluation Result or FY Scheduled
Mustang Spring	04859	Meeting
Navajo Wells Ut	05348	Evaluation in Draft
Pat's Pond	04862	2005
Pigeon Tank	05322	2007
Pipe Valley	05242	Progressing towards Meeting
Pocum	04871	Evaluation in Draft
Pocum Tank	04840	Evaluation in Draft
Point of Rock	05241	Evaluation in Draft
Pratt Tank	05314	Evaluation in Draft
Purgatory	04831	Meeting
Quail Canyon	04856	Progressing Towards Meeting
Rider	05305	Meeting
Rock Canyon	00099	Evaluation in Draft
Rock Canyon Tank	05319	Evaluation in Draft
Rock Pockets	05213	Evaluation in Draft
Rock Reservoir	05345	Evaluation in Draft
Sage	05311	2005
Scotties Seep	05236	2005
Shinarump	05301	Meeting
Short Creek	05270	2005
Shuttleworth	05315	Evaluation in Draft
Soap Creek	05332	Progressing Towards Meeting
State Line	05244	Evaluation in Draft
Suicide	05323	Evaluation in Draft
Sullivan Canyon	04810	Evaluation in Draft
Sunshine	04863	Evaluation in Draft
Sunshine Tank	05247	2006
Swapp Tank	05248	2006
Temple Trail	05216	Progressing Towards Meeting
Toquer Tank	04861	2006
Tuckup	00097	Progressing Towards Meeting
Valley Wash	05234	Progressing Towards Meeting
Wells	05208	Evaluation in Draft
White Pockets	05243	Meeting
White Sage	05349	2007
Whiterock-Soapstone	04804	Evaluation in Draft
Wildband	05223	2005
Wolfhole Canyon Sp	04811	2006
Wolfhole Lake	04823	2006
Wolfhole Mountain	04839	Meeting
Yellowstone	05263	2005

Resource Area: *Vermilion NM AZ120*

Allotment Name	Allotment Number	Evaluation Result or FY Scheduled
Bunting Well	04847	2005
Ferry Swale	05336	Evaluation in Draft
Sand Hills	05328	2005
Signature Rock	05350	Evaluation in Draft
Wahweap	05340	Evaluation in Draft

Resource Area: Parashant NM AZ130

Allotment Name	Allotment Number	Evaluation Result or FY Scheduled
Belnap	04849	Meeting
Belnap West	04822	Meeting
Big Spring Pipeline	04870	Evaluation in Draft
Cottonwood	04809	2005
Duncan Tank	04820	Evaluation in Draft
Hidden Hills	04825	2008
Hidden Spring	04803	Evaluation in Draft
Imlay	04817	Evaluation in Draft
Jump Canyon	04801	Evaluation in Draft
Last Chance	04815	Evaluation in Draft
Link Spring	04819	Evaluation in Draft
Mosby	04835	2008
Mosby-Nay	04836	2008
Mt Trumbull	04826	Meeting
Mt. Logan	05218	2005
Pakoon	04802	2008
Pakoon Springs	04800	2008
Penns Well	04852	Meeting
Red Pond	04806	2005
Sullivan Tank	04816	Evaluation in Draft
Tuweep	05220	Progressing Towards Meeting
Wildcat	04854	2005

APPENDIX 2.E

CONSERVATION MEASURES FOR SPECIAL STATUS SPECIES

CONSERVATION MEASURES FOR SPECIAL STATUS SPECIES

The following Conservation Measures be implemented as part of the proposed action for all management activities authorized. These Conservation Measures are intended to provide District-wide consistency in reducing or eliminating the effects of management actions on Federally endangered, threatened, proposed, and candidate species, as well as species included on the Wildlife Species of Concern in Arizona and BLM Arizona Sensitive Species lists.

1.0 Conservation Measures for Fire Management Activities

1.1 Wildland Fire Suppression (FS)

The following Conservation Measures would be implemented during fire suppression operations, unless firefighter or public safety, or the protection of property, improvements, or natural resources, render them infeasible during a particular operation. Each Conservation Measure has been given an alphanumerical designation for organizational purposes (*e.g.*, FS-1). Necessary modifications of the Conservation Measures or impacts to Federally protected species and habitat during fire suppression operations would be documented by the Resource Advisor, and coordinated with the USFWS.

FS-1 Protect known locations of habitat occupied by Federally listed species. Minimum Impact Suppression Tactics (M.I.S.T.) would be followed in all areas with known Federally protected species or habitat.

FS-2 Resource Advisors would be designated to coordinate natural resource concerns, including Federally protected species. They would also serve as a field contact representative (FCR) responsible for coordination with the USFWS. Duties would include identifying protective measures endorsed by the Field Office Manager, and delivering these measures to the Incident Commander; surveying prospective campsites, aircraft landing and fueling sites; and performing other duties necessary to ensure adverse effects to Federally protected species and their habitats are minimized. On-the-ground monitors would be designated and used when fire suppression activities occur within identified occupied or suitable habitat for Federally protected species.

FS-3 All personnel on the fire (firefighters and support personnel) would be briefed and educated by Resource Advisors or designated supervisors about listed species and the importance of minimizing impacts to individuals and their habitats. All personnel would be informed of the conservation measures designed to minimize or eliminate take of the species present. This information is best identified in the incident objectives.

FS-4 Permanent road construction would not be permitted during fire suppression activities in habitat occupied by Federally protected species. Construction of temporary roads is approved only if necessary for safety or the protection of property or resources, including Federally protected species habitat. Temporary road construction should be coordinated with the USFWS, through the Resource Advisor.

FS-5 Crew camps, equipment staging areas, and aircraft landing and fueling areas should be located outside of listed species habitats, and preferably in locations that are disturbed. If camps must be located in listed species habitat, the Resource Advisor would be consulted to ensure habitat damage and other effects to listed species are minimized and documented. The Resource Advisor should also consider the potential for indirect effects to listed species or their habitat from the siting of camps and staging areas (*e.g.,* if an area is within the water flow pattern, there may be indirect effects to aquatic habitat or species located off-site).

FS-6 All fire management protocols to protect Federally protected species would be coordinated with local fire suppression agencies that conduct fire suppression on BLM-administered lands to ensure that the agency knows how to minimize impacts to Federally protected species in the area.

FS-7 The effectiveness of fire suppression activities and Conservation Measures for Federally protected species should be evaluated after a fire, when practical, and the results shared with the USFWS and AGFD. Revise future fire suppression plans and tactical applications as needed and as practical.

1.2 Fuels Treatments, Prescribed Burning and other Fuels Management Actions (FT)

The following Conservation Measures are mandatory when implementing wildland fire use, prescribed fires, and proposed vegetation treatments using mechanical, chemical, and/or biological treatment methods:

FT-1 Biologists would be involved in the development of prescribed burn plans and vegetation treatment plans to minimize effects to Federally protected species and their habitats within, adjacent to, and downstream from proposed project sites. Biologists would consider the protection of seasonal and spatial needs of Federally protected species (*e.g.*, avoiding or protecting important use areas or structures and maintaining adequate patches of key habitat components) during project planning and implementation.

FT-2 M.I.S.T. would be followed in all areas with known Federally protected species or habitats.

FT-3 Pre-project surveys and clearances (biological evaluations/assessments) for Federally protected species would be required for each project site before implementation. All applicable Conservation Measures would be applied to areas with unsurveyed suitable habitat for Federally protected species, until a survey has been conducted by qualified personnel to clear the area for the treatment activity.

FT-4 Use of motorized vehicles during prescribed burns or other fuels treatment activities in suitable or occupied habitat would be restricted, to the extent feasible, to existing roads, trails, washes, and temporary fuelbreaks or site-access routes. If off-road travel is deemed necessary, any cross-country travel paths would be surveyed prior to use and would be closed and rehabilitated after the prescribed burn or fuels treatment project is completed.

FT-5 As part of the mandatory fire briefing held prior to prescribed burning, all personnel (firefighters and support personnel) would be briefed and educated by Resource Advisors or designated supervisors about listed species and the importance of minimizing impacts to individuals and their habitats. All personnel would be informed of the Conservation Measures designed to minimize or eliminate take of the species present.

1.3 Rehabilitation and Restoration (RR)

RR-1 When rehabilitating important areas for Federally listed species that have been damaged by fire or other fuels treatments, the biologist would give careful consideration to minimizing short-term and long-term impacts. Someone who is familiar with fire impacts and the needs of the affected species would contribute to rehabilitation plan development. Appropriate timing of rehabilitation and spatial needs of Federally listed species would be addressed in rehabilitation plans.

RR-2 Seed from regionally native or sterile alien (non-native) species of grasses and herbaceous vegetation would be used in areas where reseeding is necessary following ground disturbance to stabilize soils and prevent erosion by both wind and water.

RR-3 Sediment traps or other erosion control methods would be used to reduce or eliminate influx of ash and sediment into aquatic systems.

RR-4 Use of motorized vehicles during rehabilitation or restoration activities in suitable or occupied habitat would be restricted, to the extent feasible, to existing roads, trails, or washes, and to temporary access roads or fuelbreaks created to enable the fire suppression, prescribed burn, or fuels treatment activities to occur. If off-road travel is deemed necessary, any cross-country travel paths would be surveyed prior to use and would be closed and rehabilitated after rehabilitation or restoration activities are completed.

RR-5 All temporary roads, vehicle tracks, skid trails, and off-road vehicle (ORV) trails resulting from fire suppression and the proposed fire management activities be rehabilitated (water bars, etc.), and be closed or made impassible for future use.

RR-6 Burned area emergency rehabilitation (BAER) activities and long-term restoration activities should be monitored, and the results provided to the USFWS and AGFD. Section 7 consultation for BAER activities would be conducted independently, if necessary.

RR-7 **(Recommended)** Develop public education plans that discourage or restrict fires and fire-prone recreation uses during high fire-risk periods. Develop brochures, signs, and other interpretive materials to educate recreationists about the ecological role of fires, and the potential dangers of accidental fires.

1.4 Conservation Measures For Fire Management Activities In Riparian and Aquatic Habitats (RA)

The following Conservation Measures be implemented during fire suppression and fuels treatment operations in riparian, wetland, or aquatic habitats, unless firefighter or public safety, or the protection of property, improvements, or natural resources, render them infeasible during a particular operation. Fuels treatment activities include prescribed fire and mechanical, chemical, and/or biological vegetation treatments in riparian, wetland, and aquatic habitats. Necessary modifications of the Conservation Measures or impacts to Federally protected species and habitat during fire suppression operations would be documented by the Resource Advisor, and coordinated with the USFWS.

RA-1 During wildfire suppression, apply M.I.S.T. within riparian areas. Fire suppression actions in riparian areas should be prioritized to minimize damage to stands of native vegetation from wildfire or suppression operations. To the extent possible, retain large, downed woody materials and snags that are not a hazard to firefighters.

RA-2 Fire suppression and rehabilitation in riparian corridors would be coordinated with the Resource Advisor or qualified biologist approved by BLM.

RA-3 Site-specific implementation plans that include project areas with Federally protected aquatic or riparian-obligate species would specify fire management objectives and wildland fire suppression guidance, taking into account the special concerns related to these species.

RA-4 In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical, use wet firebreaks in sandy overflow channels rather than constructing firelines by hand or with heavy equipment.

RA-5 Construction or development of a crossing for motorized vehicles across a perennial stream would not be permitted, unless an established road already exists or where dry, intermittent sections occur.

RA-6 Avoid the use of fire retardants or chemical foams in riparian habitats or within 300 feet of aquatic habitats, particularly sites occupied by Federally protected species. Apply operational guidelines as stated in the *Interagency Standards for Fire and Fire Aviation Operations 2003 (or updates),* "Environmental Guidelines for Delivery of Retardant or Foam Near Waterways".

RA-7 Priority for placement of fire camps, fire staging areas, and aircraft landing or refueling sites would be outside riparian areas or river/stream corridors.

RA-8 When using water from sources supporting Federally protected species, care must be taken to ensure adverse impacts to these species are minimized or prevented. Unused water from fire abatement activities would not be dumped in sites occupied by Federally protected aquatic species to avoid introducing non-native species, diseases, or parasites.

RA-9 If water is drafted from a stock tank or other body of water for fire suppression, it would not be refilled with water from another tank, lakes, or other water sources that may support non-native fishes, bullfrogs, crayfish, or salamanders.

RA-10 Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems would be required.

RA-11 **(Recommended)** Develop and implement restoration plans for affected riparian or aquatic areas, including long-term monitoring, to document changes in conditions in the riparian zone and watershed that maintain flood regimes and reduce fire susceptibility. Monitor stream water quality and riparian ecosystem health to determine effects of wildfire and fire management activities. Coordinate efforts and results with the USFWS and AGFD.

RA-12 Fire management treatments within or adjacent to riparian and aquatic habitats be designed to provide long-term benefits to aquatic and riparian resources by reducing threats associated with dewatering and surface disturbance, or by improving the condition of the watershed and enhancing watershed function.

RA-13 For priority fire/fuels management areas (*e.g.*, WUIs) with Federally protected species or designated critical habitat downstream, BLM biologists and other resource specialists, as appropriate, in coordination with USFWS and AGFD, determine:

A) The number of acres and the number of projects or phases of projects to occur within one watershed per year.

B) An appropriately-sized buffer adjacent to perennial streams in order to minimize soil and ash from entering the stream.

C) Where livestock grazing occurs in areas that have been burned, specialists would determine when grazing can be resumed. Such deferments from grazing would only occur when necessary to protect streams from increased ash or sediment flow into streams.[1]

If agreement cannot be reached or treatment would not meet fuel reduction objectives, BLM re-initiate consultation. Our authority to make these types of changes is in the regulations at 43 CFR 4110.3-3(b).

2.0 Species Specific Conservation Measures

In addition to the general Conservation Measures listed in **Sections 1.0** and **2.0**, the following species-specific Conservation Measures would be applied to management actions in special status species habitats to the extent possible, and would be required during fuels and vegetation treatment activities. Necessary modifications of the Conservation Measures or impacts to Federally protected species and habitat during implementation of management actions would be documented by the BLM or NPS biologist, and coordinated with the USFWS.

2.1 Reptiles

2.1.1 Desert tortoise, Mojave population (FT)

[1] "Project" means any surface-disturbing activities proposed that may cause disturbance of desert tortoise habitat and/or death or injury of a desert tortoise, with the exception of grazing by livestock and activities associated with fire suppression.

Management Goals, Objectives, and Actions

1. Continue to actively participate in the recovery of the desert tortoise.
2. Assist in implementation of recovery tasks identified in the Recovery Plan.
3. Continue in further development of a monitoring program and adapting line-distance sampling (or other MOG-approved techniques) to the unique characteristics and needs of the Arizona Strip. The Bureau and NPS would also act through the MOG to assist in seeking funding to implement the monitoring program.
4. Fund, aid, or establish research to determine methods for reducing alien annual grasses in desert tortoise habitat.
5. Fund, aid, or establish research to determine the effects of chemical fire retardants on the desert tortoise and its habitat.
6. Continue to assist adjacent land owners in the development of regional planning efforts to implement the recovery plan. Integrate those plans with the Arizona Strip MP.

Conservation Measures for Desert Tortoise

DT-1. Management Guidance for All BLM and NPS-Authorized Actions That Could Result in, Disturbance, Injury, or Death of Desert Tortoise or Modification of Their Habitat.

DT-1.A. For each authorized project[1], BLM and NPS would designate a field contact representative (FCR) who would be responsible for overseeing compliance with these conservation measures and for coordination on compliance with the Service. The FCR, qualified biologist(s) approved by the Bureau and NPS, and authorized biologist (see conservation measure DT-1.I) would have the authority and the responsibility to halt all project activities that are in violation of these terms and conditions. These individuals would have a copy of the terms and conditions of this biological opinion while on the work site.

DT-1.B. A desert tortoise education program would be presented to all project personnel that may encounter tortoises; such as employees, inspectors, supervisors, contractors, and subcontractors; prior to initiation of activities that may result in disturbance of desert tortoise habitat or death or injury of desert tortoises. The education program would include discussions of the following:

1. legal protection of the desert tortoise and sensitivity of the species to human activities;
2. a brief discussion of desert tortoise distribution and ecology;
3. the terms and conditions of applicable biological opinions;
4. project features designed to reduce adverse effects to desert tortoises and their habitat, and to promote the species' long-term survival;
5. protocols during encounters with desert tortoises and associated reporting requirements; and
6. the definition of take and penalties for violations of Federal and State laws.

DT-1.C. To the extent possible, project features would be located in previously-disturbed areas or outside of desert tortoise habitat.

DT-1.D. Project vehicle use would be limited to designated routes (existing routes prior to designation) to the extent possible.

DT-1.E. Areas of new construction or disturbance would be flagged or marked on the ground prior to construction. All construction workers would strictly limit their activities and vehicles to areas that have been marked. Construction personnel would be trained to recognize markers and understand the equipment movement restrictions involved.

DT-1.F. Blading of work areas would be minimized to the extent possible. Disturbance to shrubs would be avoided if possible. If shrubs cannot be avoided during equipment operation or vehicle use, wherever possible they would be crushed rather than excavated or bladed.

DT-1.G. During the tortoise active season (March 15 through October 15), project features that might trap or entangle desert tortoises such as open trenches, pits, open pipes, etc would be covered or modified to prevent entrapment.

DT-1.H. To the extent possible, project activities would be scheduled when tortoises are inactive (October 15 through March 15). The following project activities would only occur from October 15 through March 15: surface disturbance associated with mineral leasing; organized, non-speed vehicular events in DWMAs/ACECs; construction and non-emergency maintenance activities in rights-of-ways in the Beaver Dam and Virgin slopes DWMAs/ACECs; and non-emergency maintenance of existing roads.

DT-1.I. If a tortoise or clutch of tortoise eggs is found in a project area, to the extent practicable activities would be modified to avoid injuring or harming it. If activities cannot be modified, the tortoise/clutch would be moved from harm's way by an the authorized biologist the minimum distance possible within appropriate habitat to ensure its safety from death, injury, or collection associated with the project or other activities. The authorized biologist would be allowed some discretion to ensure that survival of each relocated desert tortoise/clutch is likely. Desert tortoises/clutches would not be translocated to lands outside the administration of the Federal government without the written permission of the landowner. Handling procedures for desert tortoises and their eggs would adhere to protocols outlined in Desert Tortoise Council (1994 with 1996 revisions).

Only biologists authorized by the Service and Arizona Game and Fish Department would handle desert tortoises. If the BLM desires biologists be authorized, the name(s) of the proposed authorized biologist(s) would be submitted to the Service for review and approval at least 15 days prior to the onset of activities that could result in a take. Minimum requirements for authorized biologists include attending the Desert Tortoise Council's training course for handling desert tortoises and/or training by an authorized biologist. The authorized biologist would maintain a record of all desert tortoises encountered during project activities. This information would include for each desert tortoise:

1. The locations and dates of observation
2. General condition and health, including injuries and state of healing and whether animals voided their bladders
3. Location moved from and location moved to
4. Diagnostic markings (i.e. identification numbers of marked lateral scutes)

Desert tortoises that are handled would be marked for future identification. An identification number (using the acrylic paint/epoxy technique) would be placed on the 4th costal scute (Fish and Wildlife Service 1992). No notching of scutes or replacement of fluids with a syringe is authorized.

DT-1.J. At no time would vehicle or equipment fluids be dumped on public lands. All accidental spills must be reported to BLM and NPS and cleaned up immediately, using the best available practices according to the requirements of the law. All spills of federally or State-listed hazardous materials that exceed reportable quantities would be promptly reported to the appropriate State agency and the BLM and NPS.

DT-1.K. For surface-disturbing activities conducted from March 15 to October 15 in desert tortoise habitat, construction and operation activities would be monitored by a qualified desert tortoise biologist approved by the Bureau and NPS. The biologist would be present during all activities in which encounters with tortoises may occur. The biologist would watch for tortoises wandering into construction areas, check under vehicles, check at least three times per day any excavations that might trap tortoises, and conduct other activities necessary to ensure that death or injury of tortoises is minimized.

DT-1.L. Unleashed dogs would be prohibited in project areas.

DT-1.M. In DWMAs/ACECs, vehicles associated with Bureau-authorized projects traveling on unpaved roads in desert tortoise habitat would not exceed speed limits established by the Bureau as necessary to protect desert tortoises. These speed limits would generally not exceed 40 mph even on the best unpaved roads but may be much less than this on some roads.

DT-1.N. Temporary fencing, such as snow fencing, chain link, and other suitable materials would be used in designated areas as determined by the Bureau to reduce encounters with tortoises from March 15 to October 15 on short-term projects, such as construction of power lines, burial of fiber optic cables, etc, where encounters with tortoises are likely.

DT-1.O. Long-term or permanent project sites in which continued encounters with desert tortoises are expected, such as construction of schools under an R&PP lease, roads, power plants, office buildings, and other permanent or long-term projects would be enclosed with desert tortoise barrier fencing to prevent tortoises from wandering onto the project site where they may be subject to collection, death, or injury. Barrier fencing should consist of wire mesh with a maximum mesh size of 1-inch (horizontal) by 2-inch (vertical) fastened securely to posts. The wire mesh would extend at least 18 inches above the ground and preferably 12 inches below the surface of the ground. Where burial is not possible, the lower 12 inches would be folded outward, away from the enclosed site, and fastened to the ground so as to prevent tortoise entry. Any gates or gaps in the fence would be constructed and operated to prevent desert tortoise entry (such as installing "tortoise guards" similar to cattle guards, and/or keeping gates closed). Specific measures for tortoise-proofing gates and gaps would be addressed project by project. Construction of the barrier fence should be in compliance with conservation measure DT-4. Once fence construction is complete, all tortoises within the fence would be relocated outside the fence in accordance with conservation measure 1.I. If more than 20 tortoises be relocated from any one area enclosed by a fence, the Bureau or NPS would contact the Service in regard to disposition of the animals. After the area within the fence has been cleared of tortoises, construction and operation activities may occur within the fence without the presence and monitoring of a biologist (see conservation measure DT-1.K.).

DT-1.P. New paved roads and highways in desert tortoise habitat (only authorized on BLM lands outside of DWMAs/ACECs) or major reconstruction or modifications

of existing paved roads through desert tortoise habitat would be fenced with desert tortoise barrier fencing (see DT-1.O.). Culverts, to allow safe passage of tortoises, would be constructed approximately every mile of new or reconstructed paved road (culverts can also serve the more typical purpose of conducting water under roads). The culvert diameter needed to encourage tortoise use is correlated with culvert length, but generally short culverts of large diameter are most likely to be used. The floor of the culvert would be covered with dirt and maintenance should be performed as necessary to maintain an open corridor for tortoise movement. Culvert design would be coordinated with and approved by the Service.

DT-1.Q. Use of new roads constructed for specific non-public purposes, such as access routes to microwave towers, would be limited to administrative use only.

DT-1.R. Temporary access routes created during project construction would be modified as necessary to prevent further use. Closure of access routes could be achieved by ripping, barricading, posting the route as closed, and/or seeding and planting with native plants.

DT-1.S. In regard to locatable minerals in DWMAs/ACECs, the Bureau would require plans of operations and bonding for any activity above the level of casual use, pursuant to the surface management regulations (43 CFR 3809). The Bureau would approve plans of operation that reduce the chance of take occurring in accordance with these terms and conditions.

DT-1.T. In regard to new rights-of-ways in the Beaver Dam and Virgin slopes DWMAs/ACECs, such rights-of-ways would be routed away from high-density tortoise populations, and along the edges of DWMAs/ACECs. Linear right-of-ways would be placed adjacent or parallel to existing rights-of-ways and share vehicular access. Utilities would be co-located with other utility projects whenever feasible.

DT-1.U. To reduce attraction of potential desert tortoise predators, project sites in desert tortoise habitat would be maintained in a sanitary condition at all times; waste materials at those sites would be placed in covered receptacles and disposed of promptly at an appropriate waste disposal site. "Waste" refers to all discarded matter, including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment. All reasonable effort would also be taken to reduce or eliminate water sources associated with project activities that might attract ravens and other predators.

DT-1.V. After completion of the project, trenches, pits, and other features in which tortoises could be entrapped or entangled, would be filled in, covered, or otherwise modified so they are no longer a hazard to desert tortoises.

DT-1.W. After project completion, measures would be taken to facilitate restoration. Restoration techniques would be tailored to the characteristics of the site and the nature of project impacts. Techniques may include removal of equipment and debris, recontouring; and seeding, planting, transplanting of cacti and yuccas, etc. Only native plant species, preferably from a source on or near the project area, would be used in restoration.

DT-1.X. Retain in federal ownership all areas administratively designated for protection of special status species (e.g. Areas of Critical Environmental Concern (ACECs) and Desert Wildlife Management Areas (DWMAs), designated or proposed critical habitat, and lands supporting listed or proposed species. Specific parcels of category 3 desert tortoise habitat outside of DWMAs/ACECs that do not possess the primary constituent elements required for survival and recovery of the

species may be made available for disposal. Parcels where future development would likely result in appreciable reductions in groundwater flow into the Virgin River or Beaver Dam Wash not be sold or exchanged. A study of groundwater hydrology could be required prior to sale or exchange. Although individual actions may have adverse effects, the net effects of land disposals/exchanges in these areas would be beneficial to federally listed or proposed species.

DT-2. Measures would be taken to limit the extent of projects authorized in DWMAs/ACECs.

DT-2.A. BLM would only authorize mineral leasing in the DWMAs/ACECs with the stipulation of waivable no surface occupancy or no surface occupancy. All activities associated with surface occupancy for mineral leasing within DWMAs/ACECs would be limited to the period October 15 to March 15 and subject to all other conservation measures.

DT-2.B. DWMAs/ACECs would be closed to mineral sales.

DT-2.C. The Bureau/NPS would prohibit live vegetation harvest in DWMAs/ACECs, except salvage in areas where surface disturbance has been authorized.

DT-2.D. Mechanical treatment or vegetation conversion within DWMAs/ACECs would not be authorized unless such treatments benefits or improves desert tortoise management. A mitigation plan for each treatment or conversion would be developed and approved by the Service. A determination that such treatment or conversion benefits or improves desert tortoise management would require concurrence by the Service.

DT-2.E. Within DWMAs/ACECs, the Bureau/NPS would limit public collection of dead and down wood to personal camp use only.

DT-2.F. The Bureau would authorize no R&PP land leases, airport leases, or military maneuvers; and no entries under the Desert Land Entry Act, Carey Act, and Indian Allotments Act in the DWMAs/ACECs.

DT-2.G. All Bureau and NPS lands within DWMAs/ACECs would be retained in public ownership.

DT-2.H. The Bureau would seek to acquire non-Federal lands in the DWMAs/ACECs from willing sellers through sale exchange.

DT-2.I. No new landfills or sewage treatment ponds would be authorized in DWMAs/ACECs.

DT-2.J. No new rights-of-ways would be authorized in the Pakoon DWMA/ACEC. The Bureau would strongly discourage new rights-of-ways and temporary use permits within the Beaver Dam Slope and Virgin Slopes DWMAs/ACECs; such rights-of-ways and temporary use permits within DWMAs/ACECs would only be authorized if no reasonable alternative exists and impacts to tortoises and their habitat can be mitigated. Surface disturbance (before restoration) resulting from all new rights-of-ways and temporary use permits in the DWMAs/ACECs would not exceed 40 acres through the life of the project.

DT-2.K. The Bureau would close DWMAs/ACECs to authorization or renewal of material site rights-of-ways.

DT-2.L. The Bureau/NPS would complete a proposal to close roads and designate routes in the DWMAs/ACECs. Roads targeted for closure would include those that 1) have no purpose, 2) are duplicative or redundant, or 3) are causing high levels of mortality of tortoises. Vehicles would be restricted to existing roads and trails prior to route designation. After designation, vehicles would be restricted to designated routes only. Implementation of the closure/designation plan would include the following actions 1) sign entry portals/major intersections with signs that read "Limited to Designated Roads and Trails", 2) sign all designated routes

as open, 3) and sign along designated routes indicating that driving off of designated routes is not permitted.

DT-2.M. No new paved roads would be authorized in DWMAs/ACECs. Temporary upgrading of existing roads, and construction of new unpaved roads in DWMAs/ACECs could be authorized only if positive benefits to tortoise management occur.

DT-2.N. The Bureau would seek funding and cooperate with Mojave County, Arizona Department of Transportation, Federal Highway Administration, and others on opportunities to erect tortoise barrier fencing along Highway 91 on the Beaver Dam Slope and along other routes where desert tortoise mortality is or becomes significant.

DT-2.O. The Bureau/NPS would maintain or authorize maintenance of existing roads in desert tortoise habitat in accordance with the schedules and specifications provided in this MP and in the District Road Maintenance Plan. Non-emergency maintenance activities would be conducted from October 15 to March 15. Operators of road graders and other maintenance equipment would attend the education program described in conservation measure DT-1.B. Maintenance activities would be limited to previously disturbed areas, unless cleared by a qualified biologist.

DT-2.P. The Bureau would restrict vehicle-based camping in DWMAs/ACECs to within 50 ft of designated routes. Before route designation, vehicle-based camping would be limited to within 50 ft of existing routes. No camping would be authorized for longer than 14 consecutive days in any one area within DWMAs/ACECs.

DT-2.Q. No competitive speed vehicle events would be authorized in DWMAs/ACECs.

DT-2.R. Within desert tortoise DWMAs/ACECs, the Bureau/NPS would apply the following stipulations to any non-speed motor vehicular events (or non-speed portions of speed events) requiring permitting by the Bureau:

1. No organized non-speed events would occur from March 15 through October 15.
2. Permits would be required for events with 50 or more participants.
3. Vehicle travel would be limited to designated routes, or before route designation, to existing routes.
4. Vehicles would not exceed the legal speed limit (posted or unposted) of the road in which they are on during the event.
5. No more than 400 motorcycles or all terrain vehicles, or 300 four-wheeled vehicles would be allowed in any one event.
6. Events would have enough monitors to ensure compliance with regulations.

DT-2.S. The Bureau/NPS would ensure that wildlife management activities do not contribute to the proliferation of predators within desert tortoise habitat.

DT-2.T. New wildlife guzzlers would be permitted on BLM lands in desert tortoise habitat only if they are designed so as to exclude desert tortoises.

DT-2.U. The Bureau would authorize no translocations of desert tortoises from private to public lands unless 1) prior authorization from the Service and Arizona Game and Fish Department is obtained, 2) the desert tortoise population in the area to which a tortoise(s) be moved is depressed, 3) testing of animals to be translocated is conducted to ensure that spread of URTD or other diseases is not facilitated as a result of translocations, 4) handling of desert tortoises is in compliance with conservation measure DT-1.I., and 5) protocols are followed to ensure that translocated animals have the greatest chance for survival and do not disrupt the behavior of resident animals.

DT-2.V. The Bureau/NPS would continue to monitor and patrol the DWMAs/ACECs and desert tortoise habitat, and to investigate illegal activities on public lands in the area. The Bureau would provide law enforcement presence in the DWMAs/ACECs at a level adequate to promote public compliance with use regulations.

DT-2.W. If law enforcement, signing, and public education fail to control illegal public use and violations of DWMA/ACEC regulations, the Bureau/NPS would develop other options, including fencing areas as needed to enhance compliance with regulations.

DT-2.X. The Bureau would cooperate with other agencies and groups to identify areas where uncontrolled dogs are causing desert tortoise mortality. If predation of tortoises by dogs is discovered, the Bureau would encourage Mohave County to enforce ordinances prohibiting uncontrolled dogs in those areas. Dogs are required to be on leash on NPS lands.

DT-2.Y. The Bureau/NPS would authorize no discharge of firearms in the DWMAs/ACECs, except for hunting of big game or upland game birds from September through February, and in association with official Bureau/NPS duties, such as law enforcement or euthanasia of sick or injured burros or cows.

DT-2.Z. The Bureau would assess compensation at the category 1 rate for any proposed projects in the Beaver Dam, Virgin slope, and Pakoon DWMAs/ACECs.

DT-3 Measures would be taken to eliminate or minimize take of desert tortoises resulting from grazing by livestock and burros.

DT-3.A. No livestock grazing would be authorized in the Pakoon DWMA/ACEC. No livestock grazing would be authorized in the Beaver Dam and Virgin slope DWMAs/ACECs from March 15 to October 15.

DT-3.B. Livestock grazing in the Beaver Dam and Virgin slope DWMAs/ACECs between October 15 and March 15, and outside of the DWMAs/ACECs in desert tortoise habitat, would be in compliance with reasonable and prudent measures and terms and conditions of applicable biological opinions (e.g. 2-21-91-F-337).

DT-3.C. The Bureau would set the herd management level to zero in that portion of the Tassi-Gold Butte Herd Management Area (HMA) on Bureau-administered lands in Arizona. Burros would be promptly removed from the HMA in Arizona. The Bureau would cooperate with Lake Mead National Recreation Area and Bureau offices in Nevada to keep the burro population in the HMA at approximately 10 animals or less at any one time. Any burros in the DWMAs/ACECs would be promptly removed.

DT-3.D. No new fences or waters for burro management would be authorized by the Bureau on public lands in desert tortoise habitat.

DT-3.E. Habitat restoration in accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines would not include planting or seeding of nonnative plants.

DT-4 Preconstruction surveys would be conducted to locate desert tortoises that may be injured or killed as a result of proposed activities. Projects would be altered or tortoises in harm's way would be relocated to avoid lethal take of tortoises in project areas.

DT-4.A. Prior to any surface-disturbing activities associated with "projects", as defined in the footnote on page 79, work sites would be surveyed for desert tortoises by a qualified biologist approved by the Bureau/NPS. Areas of new disturbance would

be surveyed with 100-percent coverage. For project activities occurring during the desert tortoise active season (March 15 through October 15), surveys would be conducted within 24 hours of initiation of surface-disturbing activities. Between October 15 and March 15 any new disturbance would be preceded by 100-percent surveys conducted within one week of the proposed activities. During surveys, occupied desert tortoise burrows in or within 40 feet of areas to be disturbed would be excavated using hand tools under the supervision of an authorized biologist. Burrows discovered in areas to be disturbed by project activities would be collapsed or blocked to prevent entry by tortoises (any tortoises in those burrows would be relocated first). Desert tortoises and any desert tortoise eggs found in areas to be disturbed would be relocated in accordance with conservation measure DT-1.I. All handling of desert tortoises and their eggs would be in accordance with conservation measure DT-1.I.

DT-5 Programs to inform and educate the public about the DWMAs/ACECs would be implemented to facilitate compliance with DWMA/ACEC regulations that protect the tortoise, and to build support for desert tortoise recovery efforts.

DT-5.A. The Bureau/NPS would, upon implementation of the route designation/closure plan (conservation measure DT-2.L.), make available to the public a route designation map that displays all open routes, and explains vehicle, camping, recreational, and other public use regulations and opportunities in the DWMAs/ACECs, and explains the purpose of the DWMAs/ACECs.

DT-5.B. The Bureau/NPS would use various mechanisms of public outreach to inform the public about the DWMAs/ACECs and recovery of the desert tortoise. These mechanisms may include interpretive displays at the Interagency Information Center in St. George, interpretive kiosks at entry points to the DWMAs/ACECs, news releases, open houses to answer questions about DWMA/ACEC designation and management, and/or other actions.

DT-6 Include tortoise habitat in the Beaver Dam Mountains, Paiute, and Grand Wash Cliff wilderness areas into the DWMAs/ACECs, or develop wilderness management plans for these areas that address recovery needs of the desert tortoise.

DT-7 Take appropriate action to suppress all wildfires in desert tortoise habitat.

DT-7.A. Take appropriate action to suppress all wildfires in desert tortoise habitat, based on preplanned analysis and consistent with land management objectives, including threats to life and property. Full suppression activities would be initiated within key desert tortoise habitat areas identified in site-specific Fire Management Plans.

DT-7.B. Suppress all wildfires in desert tortoise habitat with minimum surface disturbance, in accordance with the guidelines in Duck et al. (1995) and the 1995 programmatic biological opinion on fire suppression on the Arizona Strip (2-21-95-F-379).

DT-7.C. Pre-position suppression forces in critical areas during periods of high fire dangers.

DT-7.D. As soon as practical, all personnel involved in wildfire suppression (firefighters and support personnel) would be briefed and educated about desert tortoises and the importance of protecting habitat and minimizing take, particularly due to vehicle use. Fire crews would be briefed on the desert tortoise in accordance with Appendix II of Duck et al. (1995).

DT-7.E. If wildfire or suppression activities cannot avoid disturbing a tortoise, the Resource Advisor or monitor would relocate the tortoise, if safety permits. The tortoise would be moved into the closest suitable habitat within two miles of the collection site that would ensure the animal is reasonably safe from death, injury, or collection associated with the wildfire or suppression activities. The qualified biologist would be allowed some discretion to ensure that survival of each relocated tortoise is likely. If the extent or direction of movement of a fire makes sites within two miles of the collection site unsuitable or hazardous to the tortoise or biologists attempting to access the area, the tortoise may be held until a suitable site can be found or habitat is safe to access and not in immediate danger of burning. The Resource Advisor would contact the USFWS Arizona Ecological Services Field Office (AESFO) as soon as possible concerning disposition of any animals held for future release. Desert tortoises would not be placed on lands outside the administration of the Federal government without the written permission of the landowner. Handling procedures for tortoises, including temporary holding facilities and procedures, would adhere to protocols outlined in Desert Tortoise Council (1994).

DT-7.F. Upon locating a dead, injured, or sick desert tortoise, initial notification must be made to the appropriate USFWS Law Enforcement Office within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph, and any other pertinent information. The notification would be sent to the Law Enforcement Office with a copy to the AESFO.

DT-7.G. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. If possible, the remains of intact desert tortoises would be placed with educational or research institutions holding appropriate State and Federal permits. If such institutions are not available, the information noted above would be obtained and the carcass left in place. Arrangements regarding proper disposition of potential museum specimens would be made with the institution prior to implementing the action. Injured animals should be transported to a qualified veterinarian by an authorized biologist. Should any treated desert tortoise survive, the USFWS should be contacted regarding final disposition of the animal.

DT-7.H. The Resource Advisor or monitor(s) would maintain a record of all desert tortoises encountered during fire suppression activities. This information would include for each desert tortoise: 1) locations and dates of observation; 2) general condition and health, including injuries and state of healing, and whether animals voided their bladders; 3) location moved from and to; and 4) diagnostic markings (i.e., identification numbers of marked lateral scutes). No notching of scutes or replacement of fluids with a syringe is authorized.

DT-7.I Prior to moving a vehicle, personnel would inspect under the vehicle for tortoises. If a tortoise is found under the vehicle, the tortoise would be allowed to move away from the vehicle on its own accord, if possible. Otherwise an individual would move the tortoise to a safe locality in accordance with FS-2 and DT-7.E.

DT-7.J. Off-road vehicle activity would be restricted to the minimum necessary to suppress wildfires. Off-road vehicle activity would not be permitted on NPS lands. Vehicles would be parked as close to roads as possible, and vehicles would use wide spots in roads or disturbed areas to turn around. Whenever possible, a biologist or crewperson trained to recognize tortoises and their shelter sites would

precede any vehicle traveling off-road to direct the driver around tortoises and tortoise burrows. Whenever possible, local fire-fighting units should provide direction and leadership during off-road travel because of their expertise and knowledge of area sensitivities.

DT-7.K. Fire-related vehicles would drive slow enough to ensure that tortoises on roads can be identified and avoided.

DT-7.L. Fire crews or rehabilitation crews would, to the extent possible, obliterate off-road vehicle tracks made during fire suppression in tortoise habitat, especially those of tracked vehicles, to reduce future use.

DT-7.M. To the maximum extent practical, campsites, aircraft landing/fueling sites, and equipment staging areas would be located outside of desert tortoise habitat or in previously disturbed areas. If such facilities are located in desert tortoise habitat, 100 percent of the site would be surveyed for desert tortoises by a qualified biologist approved by BLM or NPS, whenever feasible. Any tortoises found would be moved to a safe location in accordance with FS-2 and DT-7.E. All personnel located at these facilities would avoid disturbing active tortoise shelter sites.

DT-7.N. Elevated predation by common ravens or other predators attributable to fire suppression activities would be reduced to the maximum extent possible. Work areas, including campsites, landing/fueling sites, staging areas, etc. would be maintained in a sanitary condition at all times. Waste materials at those sites would be contained in a manner that would avoid attracting predators of desert tortoises. Waste materials would be disposed of at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.

DT-7.O. Backfiring operations are permitted where necessary in desert tortoise habitat. Burning out patches of identified habitat within or adjacent to burned areas is not permitted as a standard fire suppression measure unless necessary for firefighter or public safety or to protect property, improvements, or natural resources.

DT-7.P. Use of foam or retardant is authorized within desert tortoise habitat.

DT-7.Q. Rehabilitation of vegetation in tortoise habitat would be considered, including seeding, planting of perennial species, etc.

DT-7.R. Recovery of vegetation would be monitored, including establishing and monitoring paired plots, inside and outside burned areas in tortoise habitat. Recovery plans would be coordinated with the USFWS and AGFD.

DT-7.S. The effectiveness of wildfire suppression activities and desert tortoise Conservation Measures would be evaluated after a wildfire. Procedures would be revised as needed.

2.2 Amphibians (AM) (Includes Relict leopard frog (FC))

AM-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

AM-2 All personnel performing fire management activities at any creek crossing would be informed of the potential presence of aquatic amphibians and the need to perform their duties to avoid impacts to the habitat.

2.3 Birds

2.3.1 California Condor (FE and 10J)

Management Goals, Objectives, and Actions

1. Continue to actively participate in the recovery of the California condor.
2. Assist in implementation of recovery tasks identified in the Recovery Plan.
3. Implement the protective measures for California condors that are contained in the July 2004 "Recommended Protection Measures for Pesticide Applications in The Southwest Region of the U.S. Fish and Wildlife Service" when conducting chemical treatments.
4. Educate employees and your public users about this species.

Conservation Measures for California Condor

CC-1. Management Guidance for Projects Constructed or Implemented by Authorized or Permitted Members of the Public Within the 10(j) Area

CC-1.A. Immediately prior to the start of an authorized or permitted project, BLM/NPS would contact personnel monitoring California condor locations and movements on the Arizona Strip to determine the locations and status of condors in or near the project area.

CC-1.B. BLM/NPS would request that permit holders notify the BLM/NPS wildlife team lead or condor biologist if California condors visit the worksite while permitted activities are underway. BLM/NPS may encourage permit holders to modify, relocate, or delay project activities where adverse affects to condors may result.

CC-1.C. Where condor nesting activity is known within 0.5 miles of permitted or authorized activities that include operation of heavy machinery, BLM/NPS may encourage the operator to avoid use of the equipment during the active nesting season (February 1- November 30), or as long as the nest is viable.

CC-1.D. Where condors occur within 1.0 mile of permitted or authorized activities that include blasting, BLM/NPS encourage that blasting be postponed until the condors leave the area or are hazed away by personnel permitted to haze condors. Where condor nesting activity is known within 1.0 mile of the project area, BLM/NPS encourage that blasting activity be delayed until after the active nesting season (February 1- November 30), or as long as the nest is viable. These dates may be modified based on the most current information regarding condor nesting.

CC-2. Management Guidance for Projects Constructed or Implemented by BLM/NPS Employees or Contractors Within the 10(j) Area AND For All BLM/NPS-Authorized Actions, Regardless of Proponent, Outside the 10(j) Area on the Arizona Strip.

CC-2.A. Immediately prior to the start of a permitted project, BLM/NPS would contact personnel monitoring California condor locations and movement on the Arizona Strip to determine the locations and status of condors in or near the project area.

CC-2.B. Where California condors visit a worksite while activities are underway, the on-site supervisor would notify the BLM/NPS wildlife team lead or condor biologist. Project workers and supervisors would be instructed to avoid interaction with condors. Project activities would be modified, relocated, or delayed if those activities could have adverse affects on condors. Operations would cease until the bird leaves on its own or until techniques are employed by permitted personnel which results in the individual condor leaving the area.

CC-2.C. Where condor nesting activity is known within 0.5 miles of activities that include operation of heavy machinery, BLM/NPS would direct the operator to cease equipment use during the active nesting season (February 1- November 30), or as long as the nest is viable. Where feasible and consistent with NEPA, BLM/NPS may relocate operations to a site greater than 0.5 miles from the condor nest site.

CC-2.D. Where condors occur within 1.0 miles of activities that include blasting, BLM/NPS would require that blasting be postponed until the condors leave the area or are hazed away by personnel permitted to haze condors. Where condor nesting activity is known within 1.0 miles of the project area, BLM/NPS cease blasting during the active nesting season (February 1- November 30), or as long as the nest is viable. These dates may be modified based on the most current information regarding condor nesting.

CC-3. Management Guidance for All BLM/NPS-Authorized Actions, Regardless of Proponent or location Within the Planning Area.

CC-3.A. The project site would be cleaned up at the end of each day the work is being conducted (e.g., trash removed, scrap materials picked up) to minimize the likelihood of condors visiting the site. BLM/NPS staff may conduct site visits to the area to ensure adequate clean-up measures are taken.

CC-3.B. For projects where potential exists for leakage or spill of hazardous materials, a spill plan would be developed and implemented to prevent water contamination and potential poisoning of condors. The plan would include provisions for immediate clean-up of any hazardous substance, and would define how each hazardous substance would be treated in case of leakage or spill. The plan would be reviewed by the BLM condor lead biologist to ensure condors are adequately addressed.

CC-3.C BLM/NPS would implement the protective measures for California condors that are contained in the March 2004 "Recommended Protection Measures for Pesticide Applications in The Southwest Region of the U.S. Fish and Wildlife Service."

CC-3.D. Use of non-lead ammunition is strongly encouraged for activities involving the discharge of firearms.

CC-4. Management Guidance for All Actions Involving Use of Aircraft, Regardless of Proponent or location Within the Planning Area.

CC-4.A. Aircraft use along the Vermilion Cliffs, Paria Plateau, or any sites where condors are actively breeding or roosting would be minimized to the extent possible. Known active nest sites would be avoided.

CC-4.B. The BLM condor biologist or Wildlife Program Lead would contact the Peregrine Fund, as appropriate, immediately before operations involving aviation begin to check on possible locations of condors in the subject area.

CC-4.C. All BLM/NPS-authorized aviation personnel would be provided literature and/or instructed regarding condor concerns prior to conducting aerial operations.

CC-4.D. Aircraft would maintain and maximize safe flying separation distances from condors in the air or on the ground unless safety concerns override this restriction. If airborne condors approach aircraft, aircraft would give up airspace to the extent possible, as long as this action does not jeopardize safety. Aircraft would keep a minimum of 0.25 miles away from condors located on the ground.

CC-5. Management Guidance for Fire Suppression, Fire Use, Prescribed Fire, and Related Actions Within the Planning Area.

CC-5.A. The Resource Advisor would contact the Peregrine Fund daily (at 520-606-5155 or 520-380-4667) to check on locations of condors during fire suppression or fuels treatment activities involving aviation. This information would be communicated to the Incident Commander and aviation personnel.

CC-5.B. Any presence of condors in the general area of an active fire would be reported immediately to the Resource Advisor, who would in turn advise the BLM condor biologist, as appropriate. The BLM condor biologist or the AZ Strip F.O wildlife team lead would be the primary contacts with the U.S. Fish and Wildlife Service and the Peregrine Fund when such contacts are needed regarding condor concerns.

CC-5.C. Fire dispatch would immediately notify the Peregrine Fund at either (208) 362-3811 or (928) 355-2270 whenever a fire or other event on the Paria Plateau is reported which may conceivably threaten the condor holding pens and facilities atop the Vermilion Cliffs.

CC-5.D. If condors arrive at any area of human activity associated with fire suppression or fuels treatment projects (wildland fire use, prescribed fire, vegetation treatments), the birds would be avoided. The assigned Resource Advisor or a qualified wildlife biologist approved by BLM would be notified, and only permitted personnel would haze the birds from the area.

CC-5.E. All District BLM/NPS fire personnel, including helicopter pilots, would be provided literature or instructed regarding condor concerns. Normally this would be done by the BLM condor biologist when the fire crews first come on and are trained on various subjects, including desert tortoise concerns. If additional pilots come on during the summer, fire dispatch would notify the BLM condor biologist (435 688-3224) so that they can also be briefed.

CC-5.F. All helicopter dip tanks containing water would be covered when not in use or personnel would be stationed nearby until a cover is in place.

CC-5.G. If any fire retardant chemicals must be used in areas where condors are in the vicinity, the application area would be surveyed and any contaminated carcasses would be removed as soon as practical to prevent them from becoming condor food sources.

CC-5.H. Smoke from prescribed fire projects would be prevented from negatively affecting condor holding pens and breeding, nesting, and chick rearing sites. A proposed prescribed fire would not be initiated, or an existing fire use event would be modified or terminated, in order to prevent or stop significant amounts of smoke, or smoke that would remain in place for an extended period of time, or chronic smoke events, from occurring in area(s) where condors are held or attempting to breed, nest, or rear chicks.

CC-5.I. BLM would adhere to the air quality standards set by the Arizona Department of Environmental Quality.

CC-5.J. All camp areas would be kept free from trash.

2.3.2 Southwestern willow flycatcher (FE)

Management Goals and Objectives

1. Continue to actively participate in the recovery of the southwestern willow flycatcher. Assist in implementation of recovery tasks identified in the Recovery Plan.
2. Provide protection from threats and create/secure sufficient habitat to assure maintenance of these populations and/or habitats over time.
3. Increase and improve occupied, suitable, and potential breeding habitat.
4. Continue supporting and participating in southwestern willow flycatcher survey and monitoring efforts on lands in the Planning Area.
5. Work towards restoring native riparian vegetation in sites that have the potential to support future breeding habitat for this species.
6. Continue to support applications for instream flow rights with the Arizona Department of Water Resources in rivers supporting willow flycatcher habitat.
7. Retain riparian area river channels, floodplains, and terraces in federal ownership. Carefully examine all exchanges that could affect water flows (either groundwater or surface water) to ensure that development on those lands not affect riparian habitats.
8. Implement the protective measures for southwestern willow flycatchers that are contained in the July 2004 "Recommended Protection Measures for Pesticide Applications in The Southwest Region of the U.S. Fish and Wildlife Service" when conducting chemical treatments.
9. Continue to conduct southwestern willow flycatcher surveys in suitable habitat.
10. Continue to monitor habitat conditions in suitable and potential southwestern willow flycatcher habitat in order to be able to determine how best to manage these riparian areas to protect this and other riparian dependent species.
11. Educate employees and public users about southwestern willow flycatchers.

Conservation Measures for Southwestern Willow Flycatcher

WF-1. Management Guidance for Achieving Habitat Objectives

WF-1.A. Maintain a policy of "no net loss" of riparian habitat.

WF-1.B. Protect occupied willow flycatcher habitats as a first priority.

WF-1.C. Maintain and increase riparian habitats suitable for southwestern willow flycatcher nesting. Suitable structural characteristics may be achieved through restoring, maintaining, enhancing, and creating habitat. Suitable flycatcher habitat should be managed so that its suitable characteristics are not eliminated or degraded. Manage for large, contiguous blocks of habitat rather than for small fragmented areas. Enhance connectivity to currently isolated suitable sites. Encourage the use of buffer zones between riparian habitats and adjacent upland areas. Promote establishment of areas of slow/back waters.

WF-1.D. Manage potential habitat to achieve structural and vegetation characteristics necessary to support increasing numbers of breeding southwestern willow flycatcher pairs within 5-20 years. Potential flycatcher habitat should be managed to allow natural regeneration (through natural processes) into suitable habitat as rapidly as possible.

WF-1.E. Promote regeneration of native species in regenerating riparian habitats. Restore natural reaches of riparian habitat by restoring intervening degraded segments. In accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines habitat restoration in riparian areas should not include planting or seeding of nonnative plants.

WF-1.F. Restore, protect, and expand riparian migration and stopover habitats in the Planning Area.

WF-1.G. Continue to identify and map suitable and potential habitat areas for southwestern willow flycatchers.

WF-1.H. Close and rehabilitate roads and trails used by off-highway vehicles within riparian areas, or areas with the potential to support riparian vegetation.

WF-2. Management Guidance for Water Management

WF-2.A. Manage water diversions and groundwater withdrawals to maintain streamside vegetation.

WF-2.B. Where possible and practicable, reduce or eliminate physical stresses, such as high salinity or reduced stream flows that favor exotic plants. Do not authorize actions that not allow for natural stream flow regimes including periodic flood events.

WF-2.C. Net effects of land disposals/exchanges in the Virgin River corridor would be beneficial to the southwestern willow flycatcher. All land exchanges or disposals should benefit aquatic and riparian resources by reducing threats to those habitats associated with dewatering and surface disturbance.

WF-2.D. Lands to be acquired would have development potential similar to the disposed lands and would be located in similar proximity to the Virgin River or significant tributaries.

WF-2.E. All acquired lands would not have ground or surface water used or reserved for use by non-Federal interests after it is acquired by the government. All existing

such uses must be terminated upon acquisition and all rights transferred to the Federal government.

WF-2.F. Parcels where future development likely result in appreciable reductions in groundwater flow into the Virgin River or Beaver Dam Wash not be sold or exchanged. A study of groundwater hydrology could be required prior to sale or exchange.

WF-3. Management Guidance for Control of Invasive Exotic Species

WF-3.A. Determine the use vs. availability of invasive exotic species, such as tamarisk, by southwestern willow flycatcher at occupied nesting sites.

WF-3.B. Retain native riparian vegetation in floodplains or channels.

WF-3.C. At native dominated sites, retain tamarisk in occupied flycatcher habitat and, where appropriate, in suitable but unoccupied habitat, unless there is a trend for steady increase of tamarisk.

WF-3.D. In suitable and potential habitats where exotic species are to be removed through chemical or mechanical means, use a temporally staged approach to clear areas so some mature habitat remains throughout the restoration period for potential use by flycatchers.

WF-4. Management Guidance for Minimizing Human Disturbance

WF-4.A. Reduce or eliminate impacts to southwestern willow flycatchers and/or their habitat from recreational activities. Recreation that degrades riparian habitat would be prohibited in riparian areas on Bureau land along the Virgin River. Restrictions could include:

1. Reducing or eliminating recreational fires.
2. Confining camping areas.
3. Locate recreational activity areas away from suitable or potential southwestern willow flycatcher habitat.
4. Minimize trash, debris, and other attractants to scavengers, predators, and brown-headed cowbirds.
5. Provide on-site monitors where recreation conflicts exist.

WF-5. Management Guidance for Grazing Management

WF-5.A. Minimize or eliminate disturbance, injury, mortality, or other forms of take of southwestern willow flycatchers resulting from grazing by livestock.

WF-5.B. Exclude livestock grazing year-round from occupied southwestern willow flycatcher nesting habitat. Unsurveyed suitable habitat should be considered occupied. If livestock are excluded using fencing, fencing should be inspected and maintained annually.

WF-5.C. Exclude livestock grazing from unoccupied suitable southwestern willow flycatcher nesting habitat during the growing season (bud-break to leaf drop). This includes portions of the following allotments: Littlefield Community, Lambing, Kanab Creek, and Wildband.

WF-5.D. In potential habitat, determine if livestock grazing is a major stressor or is otherwise preventing development of the habitat into suitable flycatcher habitat. Where this is the case, exclude livestock grazing from potential southwestern willow flycatcher nesting habitat during the growing season (bud-break to leaf drop).

WF-5.E. Investigate grazing systems, strategies, and intensities for riparian recovery and maintenance.

WF-5.F. Investigate direct effects of livestock grazing on southwestern willow flycatchers and their habitat.

WF-6. Management Guidance for Brown-headed Cowbird Parasitism and Predation

WF-6.A. Increase the amount and quality of riparian habitat to increase habitat patch sizes and local flycatcher population sizes thereby minimizing levels and impacts of cowbird parasitism.

WF-6.B. Collect baseline data on cowbird parasitism.

WF-6.C. Develop and implement cowbird management programs where parasitism rates are greater than 20%. Evaluate effectiveness of cowbird trapping at present locations by monitoring nests for parasitism and reproductive success.

WF-6.D. Reconsider assessment of habitat quality or other threats if cowbird control measures do not increase number of breeding flycatchers.

WF-6.E. Reduce direct impacts that topple or otherwise destroy nests.

WF-7. Management Guidance for Pesticide Issues

WF-7.A. Determine impact of pesticide use on willow flycatcher reproduction adjacent to riparian areas.

WF-7.B. Limit or eliminate use of harmful pesticides adjacent to riparian areas. If used, apply in a manner that avoids drift, according to directions (i.e. not broad applications).

WF-7. Management Guidance for Inventory and Monitoring

WF-7.A. Continue appropriate monitoring of all riparian areas within the Planning Area, including greenline transects, riparian functionality assessments, etc.

WF-7.B. Continue southwestern willow flycatcher habitat assessments at least every third year.

WF-7.C. Continue southwestern willow flycatcher occurrence surveys at least every other year at all suitable habitat locations.

WF-7.D. Implement nest monitoring to determine nesting success, parasitism rates, and predation rates

WF-8. Management Guidance for Fire Suppression and Related Actions

WF-8.A. Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

WF-8.B. Except where fires are active in occupied habitat, minimize unnecessary low-level helicopter flights during the breeding season (April 1 – September 30). Approach bucket dip sites at a 90-degree direction to rivers to minimize flight

time over the river corridor and occupied riparian habitats. Locate landing sites for helicopters at least ¼ mile from occupied sites to avoid impacts to willow flycatchers and their habitat.

WF-8.C. Minimize use of chainsaws or bulldozers to construct firelines through occupied or suitable habitat except where necessary to reduce the overall acreage of occupied habitat or other important habitat areas that otherwise be burned.

WF-8.D. Implement activities to reduce hazardous fuels or improve riparian habitats (prescribed burning or vegetation treatments) within occupied or unsurveyed suitable habitat for southwestern willow flycatchers only during the non-breeding season (October 1 to March 31).

WF-8.E. Avoid developing access roads that result in fragmentation or a reduction in habitat quality. Close and rehabilitate all roads that were necessary for project implementation.

WF-8.F. Prescribed burning would only be allowed within ½ mile of occupied or unsurveyed suitable habitat when weather conditions allow smoke to disperse away from the habitat when birds may be present (breeding season of April 1 – September 30).

WF-8.G. Vegetation treatment projects adjacent to occupied or unsurveyed suitable habitat would only be conducted when willow flycatchers are not present (October 1 – March 31).

WF-8.H. Continue to implement the riparian fire management plan to minimize fire damage in riparian areas, especially those with suitable or potential flycatcher habitat.

2.3.3. Yuma clapper rail (FE)

Management Goals and Objectives

1. Continue to participate in the recovery of the Yuma clapper rail. Assist in implementation of recovery tasks identified in the Recovery Plan.
2. Preserve, protect, and manage rail habitat on the state and federal lands in the Planning Area.
3. Continue supporting and participating in Yuma clapper rail survey and monitoring efforts on lands in the Planning Area.
4. Work towards restoring native riparian vegetation in sites that have the potential to support future breeding habitat for this species.
5. Continue to support applications for instream flow rights with the Arizona Department of Water Resources in areas supporting Yuma clapper rail habitat.
6. Retain riparian area river channels, floodplains, and terraces in federal ownership. Carefully examine all exchanges that could affect water flows (either groundwater or surface water) to ensure that development on those lands not affect riparian habitats.

7. Continue to monitor habitat conditions in Yuma clapper rail habitat in order to be able to determine how best to manage these riparian areas to protect this and other riparian dependent species.
8. Carry out a program of public conservation education and planning directed towards preservation of rail habitat.

Conservation Measures for Yuma Clapper Rail

CR-1. Management Guidance for Achieving Habitat Objectives

CR-1.A. Maintain a policy of "no net loss" of riparian habitat.

CR-1.B. Protect occupied Yuma clapper rail habitats as a first priority.

CR-1.C. Maintain, enhance, restore, and/or create fresh water marsh habitat suitable for Yuma clapper rail nesting. Maintain a mosaic of uneven aged marsh vegetation. Avoid mechanical manipulation during the breeding season (April-June).

CR-1.D. Manage potential habitat to achieve structural and vegetation characteristics necessary to support increasing numbers of breeding Yuma clapper rails. Potential habitat should be managed to allow natural regeneration (through natural processes) into suitable habitat as rapidly as possible.

CR-1.E. Promote regeneration of native species in regenerating riparian habitats. Restore natural reaches of riparian habitat by restoring intervening degraded segments. In accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines habitat restoration in riparian areas should not include planting or seeding of nonnative plants.

CR-1.F. Continue to identify and map suitable and potential habitat areas for Yuma clapper rails.

CR-1.G. Close and rehabilitate roads and trails used by off-highway vehicles within riparian areas, or areas with the potential to support riparian vegetation.

CR-2. Management Guidance for Water Management

CR-2.A. Manage water diversions and groundwater withdrawals to maintain streamside vegetation.

CR-2.B. Where possible and practicable, reduce or eliminate physical stresses, such as high salinity or reduced stream flows that favor exotic plants. Do not authorize actions that not allow for natural stream flow regimes including periodic flood events.

CR-2.C. Net effects of land disposals/exchanges in the Virgin River corridor would be beneficial to the southwestern willow flycatcher. All land exchanges or disposals should benefit aquatic and riparian resources by reducing threats to those habitats associated with dewatering and surface disturbance.

CR-2.D. Lands to be acquired would have development potential similar to the disposed lands and would be located in similar proximity to the Virgin River or significant tributaries.

CR-2.E. All acquired lands would not have ground or surface water used or reserved for use by non-Federal interests after it is acquired by the government. All existing such uses must be terminated upon acquisition and all rights transferred to the Federal government.

CR-2.F. Parcels where future development likely result in appreciable reductions in groundwater flow into the Virgin River or Beaver Dam Wash not be sold or exchanged. A study of groundwater hydrology could be required prior to sale or exchange.

CR-3. Management Guidance for Control of Invasive Species

CR-3.A. Retain native riparian vegetation in floodplains or channels.

CR-3.B. Retain cattail marshes in occupied clapper rail habitat and, where appropriate, in suitable but unoccupied habitat.

CR-4. Management Guidance for Minimizing Human Disturbance

CR-4.A. Reduce or eliminate impacts to Yuma clapper rail and/or their habitat from recreational activities. Recreation that degrades riparian habitat would be prohibited in riparian areas on Bureau land along the Virgin River. Restrictions could include:

1. Reducing or eliminating recreational fires.
2. Confining camping areas.
3. Locate recreational activity areas away from suitable or potential southwestern willow flycatcher habitat.
4. Minimize trash, debris, and other attractants to scavengers and/or predators.
5. Provide on-site monitors where recreation conflicts exist.

CR-5. Management Guidance for Grazing Management

CR-5.A. Minimize or eliminate disturbance, injury, mortality, or other forms of take of Yuma clapper rail resulting from grazing by livestock.

CR-5.B. Exclude livestock grazing from occupied suitable Yuma clapper rail nesting habitat.

CR-5.C. In potential habitat, determine if livestock grazing is a major stressor or is otherwise preventing development of the habitat into suitable clapper rail habitat. Where this is the case, exclude livestock grazing from potential clapper rail habitat during the growing season (bud-break to leaf drop).

CR-5.D. Investigate grazing systems, strategies, and intensities for riparian recovery and maintenance.

CR-5.E. Investigate direct effects of livestock grazing on Yuma clapper rail and their habitat.

CR-6. Management Guidance for Use of Pesticides

CR-6.A. Determine impact of pesticide use on Yuma clapper rail reproduction adjacent to riparian areas.

CR-6.B. Limit or eliminate use of harmful pesticides adjacent to riparian areas. If used, apply in a manner that avoids drift, according to directions (i.e. not broad applications).

CR-7. Management Guidance for Inventory and Monitoring

CR-7.A. Continue appropriate monitoring of all riparian areas within the Planning Area, including greenline transects, riparian functionality assessments, etc.

CR-7.B. Continue Yuma clapper rail habitat assessments at least every third year.

CR-7.C. Continue Yuma clapper rail occurrence surveys at least every other year at all suitable habitat locations.

CR-8. Management Guidance for Fire Suppression and Related Actions

CR-8.A. Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

CR-8.B. Any prescribed fire or vegetation treatment project in occupied or suitable marsh habitat only occur between September 1 and March 15 to avoid the Yuma clapper rail breeding and molting seasons.

CR-8.C. Mechanical removal of overstory habitat (e.g. tamarisk) could occur as early as August 15, after the breeding season for Yuma clapper rails.

CR-8.D. Herbicide application would not occur in Yuma clapper rail habitat and drift-inhibiting agents would be used to assure that the herbicide does not enter adjacent marsh areas.

CR-8.E. Evaluate past surveys for Yuma clapper rails as part of the planning for prescribed fire projects. Post-project surveys should also be conducted to document the regrowth of cattail habitats and occupancy by clapper rails.

CR-8.F. After fire suppression is completed in Yuma clapper rail habitat, review any available survey records of the burn site and record in the fire report the number of rails recorded from the vicinity during these surveys.

2.3.4. Bald eagle (FT)

Management Goals and Objectives

1. Assist in implementation of recovery tasks identified in the Recovery Plan.
2. Preserve, protect, and manage bald eagle habitat on state and federal lands in the Planning Area for bald eagle population maintenance and expansion.
3. Continue to monitor habitat conditions in bald eagle habitats in order to be able to determine how best to manage these areas to protect this and other species.
4. Carry out a program of public conservation education and planning directed towards preservation of bald eagle habitat.

Conservation Measures for Bald Eagle

BE-1. Management Guidance for Achieving Habitat Objectives

BE-1.A. Maintain a policy of "no net loss" of bald eagle habitat.

BE-1.B. Protect occupied bald eagle habitats as a first priority.

BE-1.C. Identify, protect, and improve existing and potential habitat for bald eagle population continuance and expansion. Limit, modify, or relocate land use practices and developments which alter the character of the habitat that make it suitable for bald eagles.

BE-1.D. Maintain and upgrade suitable and potential habitats to insure they remain attractive to bald eagles.

BE-1.E. Analyze and monitor presently used winter roosting locations and the surrounding areas.

BE-1.F. Locate and map important foraging habitat of bald eagles within the Planning Area.

BE-2. Management Guidance for Achieving Population Objectives

BE-2.A. Determine population numbers, distribution, and trends.

BE-2.B. Determine patterns of movement for wintering eagles, including fledglings, immatures, and adults. Determine food habits for bald eagles within the Planning Area.

BE-2.C. Limit, modify, or relocate habitat improvement projects within ½ mile of known bald eagle nest sites. Construction would be limited to the period between December 1 and June 30.

BE-2.D. Limit, modify, or relocate habitat improvement projects within ¼ mile of known bald eagle winter roost areas. Construction would be limited to the period between October 15 and April 15.

BE-2.D. Identify areas for construction of roost and perch poles in the Planning Area to replace natural roosts and perches lost by development or decay.

BE-3. Management Guidance for Use of Pesticides and Herbicides

BE-3.A. Assess the effects of use pesticides and herbicides on bald eagles.

BE-3.B. Reduce or eliminate use of harmful pesticides or herbicides within one mile of bald eagle use areas. If used, apply in a manner that avoids drift, according to directions (i.e. not broad applications).

BE-4. Management Guidance for Minimizing Human Disturbance

BE-4.A. Reduce or eliminate impacts to bald eagles and/or their habitat from recreational activities.

BE-4.B. To the extent practicable, minimize human activity within ½ mile of known bald eagle nest sites between December 1 and June 30.

BE-4.C. To the extent practicable, minimize human activity within ¼ mile of known bald eagle winter roost areas between October 15 and April 15.

BE-5. Management Guidance for Inventory and Monitoring of Bald Eagles and Their Habitat.

BE-5.A. Continue bald eagle habitat assessments at least every third year.

BE-5.B. Continue bald eagle occurrence surveys at least every other year at all suitable habitat locations.

BE-6. Management Guidance for Fire Suppression and Related Actions

BE-6.A. No human activity associated with fire management would be authorized within ½ mile of known bald eagle nest sites between December 1 and June 30.

BE-6.B. No tree cutting would be authorized within ¼ mile of known bald eagle nest trees.

BE-6.C. No human activity associated with fire management would be authorized within ¼ mile of known bald eagle winter roost areas between October 15 and April 15.

BE-6.D. No tree cutting would be authorized within the area immediately around winter roost sites as determined by BLM biologists.

BE-6.E. No helicopter or aircraft activity or aerial retardant application associated with fire management activities would be authorized within ½ mile of bald eagle nest

sites between December 1 and June 30 or winter roost sites between October 15 and April 15.

BE-6.F. Prescribed burn activities outside of nesting season would be conducted in a manner to ensure nest and winter roost sites are more than ½ mile from downwind smoke effects.

BE-6.G. Provide reasonable protective measures so fire prescription or fuels treatment would not consume dominant, large trees as identified by the Resource Advisor or qualified biologist approved by BLM within ½ mile of known nests and roosts of bald eagles Pre-treatment efforts should provide reasonable protection of identified nesting and roosting trees.

BE-6.H. Prepare and implement BAER plans for burned areas that have the potential to cause future erosion problems in the watershed, riparian, or aquatic areas. Objectives of these plans, within watersheds containing bald eagle breeding areas and/or potential habitat, would be to reduce erosion and sedimentation into these habitats.

2.3.5 Mexican spotted owl (FT)

Management Goals, Objectives, and Actions

1. Continue to actively participate in the recovery of the Mexican spotted owl. Assist in implementation of recovery tasks identified in the Recovery Plan.
2. Preserve, protect, and manage Mexican spotted owl habitat on state and federal lands in the Planning Area for population expansion.
3. Continue to inventory and monitor conditions in Mexican spotted owl habitats in order to be able to determine how best to manage these areas.
4. Carry out a program of public conservation education and planning directed towards preservation of Mexican spotted owl habitat.

Conservation Measures for Mexican Spotted Owl

SO-1. Management Guidance for Achieving Habitat Objectives

SO-1.A. Maintain a policy of "no net loss" of Mexican spotted owl habitats.

SO-1.B. Identify, protect, and improve existing and potential habitat for Mexican spotted owl within the Planning Area. Limit, modify, or relocate land use practices and developments which alter the character of the habitat that make it suitable for spotted owls.

SO-1.C. Maintain and increase suitable habitats for Mexican spotted owls in the Planning Area. Suitable structural characteristics may be achieved through restoring, maintaining, enhancing, and creating habitat. Suitable spotted owl habitats should be managed so their suitable characteristics are not eliminated or degraded. Manage for large, contiguous blocks of habitat rather than for small fragmented areas. Enhance connectivity to currently isolated suitable sites. Encourage the use of buffer zones between riparian habitats and adjacent upland areas.

SO-1.D. Manage potential habitat to achieve structural and vegetation characteristics necessary to support Mexican spotted owl within 5-20 years. Allow natural regeneration (through natural processes) into suitable habitat as rapidly as possible.

SO-1.E. Promote regeneration of native species in regenerating riparian habitats. Restore natural reaches of riparian habitat by restoring intervening degraded segments. In accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines habitat restoration in riparian areas should not include planting or seeding of nonnative plants.

SO-2. Management Guidance for Minimizing Human Disturbance

SO-2.A. Assess the presence and intensity of allowable recreational activities within owl habitat. Seasonal closures of specifically designated recreation activities should be considered where appropriate.

SO-3. Management Guidance for Grazing Management

SO-3.A. Determine the effectiveness of current grazing standards and guidelines as they relate to the owl's needs, and devise grazing strategies that can benefit the owl and its prey.

SO-3.B. Monitor grazing use by livestock to determine any changes in the relative composition of herbaceous and woody plants to maintain habitat for owls and their prey.

SO-3.C. Minimize or eliminate disturbance, injury, mortality, or other forms of take of Mexican spotted owls resulting from grazing by livestock.

SO-4. Management Guidance for Inventory and Monitoring

SO-4.A. Continue to implement the habitat monitoring program detailed in the owl recovery plan.

SO-5. Management Guidance for Fire Suppression and Related Actions

SO-5.A. BLM wildlife biologists would be involved early in the decision-making process for fuels management treatments (wildland fire use, prescribed fires, vegetation treatments) that are planned within suitable habitat for Mexican spotted owls.

SO-5.B. Suitable habitat for Mexican spotted owls would be surveyed prior to implementing prescribed fire or vegetation treatment activities on BLM-administered lands to determine if owls are present and their breeding status. These fire management activities would only be implemented within suitable habitat if birds are not present.

SO-5.C. If a spotted owl is discovered during fire suppression or fuels treatment activities (wildland fire use, prescribed fire, vegetation treatments), the Resource Advisor or a qualified wildlife biologist would document the find and assess potential harm to the owl and advise the Incident Commander or project crew boss of methods to prevent harm. The information would include for each owl the location, date, and time of observation and the general condition of the owl. The Resource Advisor or biologist would contact the appropriate USFWS office.

SO-5.D. The following measures would be followed in suitable habitat (occupied or unoccupied) whenever consistent with objectives to reduce hazardous fuels:

1. Incorporate natural variation, such as irregular tree spacing and various stand/patch sizes, into management prescriptions and attempt to mimic natural disturbance patterns.
2. Maintain all species of native vegetation in the landscape, including early seral species. To allow for variation in existing stand structures and provide species diversity, both uneven-aged and even-aged systems may be used as appropriate.
3. Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure.
4. Retain hardwoods, large down logs, large trees, and snags. Emphasize a mix of size and age classes of trees. The mix should include large mature trees, vertical diversity, and other structural and floristic characteristics that typify natural forest conditions.

SO-6 The effects of fire suppression and fuels treatment activities on Mexican spotted owls and their habitat, and the effectiveness of these conservation measures, would be assessed after each fire event or fuels treatment project by the Resource Advisor or local biologist to allow evaluation of these guidelines. Prescriptions for wildland fire use, prescribed fires, and vegetation treatments would be adjusted, if necessary.

2.3.6. Yellow-billed cuckoo (FC)

Management Goals and Objectives

1. Continue to participate in conservation efforts for the yellow-billed cuckoo.
2. Preserve, protect, and manage cuckoo habitat on state and federal lands in the Planning Area.
3. Continue supporting and participating in yellow-billed cuckoo survey and monitoring efforts on lands within the Planning Area.
4. Restore native riparian vegetation in sites that have the potential to support future breeding habitat for this species.
5. Continue to support applications for instream flow rights with the Arizona Department of Water Resources in areas supporting yellow-billed cuckoo habitat.
6. Retain riparian area river channels, floodplains, and terraces in federal ownership. Carefully examine all exchanges that could affect water flows (either groundwater or surface water) to ensure that development on those lands not affect riparian habitats.
7. Continue to monitor habitat conditions in yellow-billed cuckoo habitat in order to be able to determine how best to manage these riparian areas to protect this and other riparian dependent species.
8. Carry out a program of public conservation education and planning directed towards preservation of cuckoo habitat.

Conservation Measures for Yellow-billed Cuckoo

YC-1. Management Guidance for Achieving Habitat Objectives

YC-1.A. Maintain a policy of "no net loss" of riparian habitat.

YC-1.B. Protect occupied yellow-billed cuckoo habitats as a first priority.

YC-1.C. Maintain, enhance, restore, and/or create mature cottonwood-willow gallery forest habitat suitable for yellow-billed cuckoo nesting. Manage for large, contiguous blocks of habitat (>15 ha) in conjunction with removal of competing exotic species (i.e. salt cedar). Encourage the use of buffer zones between riparian habitats and adjacent development. Establish corridors between "islands" of suitable habitat to allow natural dispersal and recolonization of historic habitats.

YC-1.D. Manage potential habitat to achieve structural and vegetation characteristics necessary to support increasing numbers of breeding yellow-billed cuckoo. Potential habitat should be managed to allow natural regeneration (through natural processes) into suitable habitat as rapidly as possible.

YC-1.E. Promote regeneration of native species in regenerating riparian habitats. Restore natural reaches of riparian habitat by restoring intervening degraded segments. In accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines habitat restoration in riparian areas should not include planting or seeding of nonnative plants.

YC-1.F. Continue to identify and map suitable and potential habitat areas for yellow-billed cuckoo.

YC-1.G. Close and rehabilitate roads and trails used by off-highway vehicles within riparian areas, or areas with the potential to support riparian vegetation.

YC-2. Management Guidance for Water Management

YC-2.A. Manage water diversions and groundwater withdrawals to maintain streamside vegetation.

YC-2.B. Where possible and practicable, reduce or eliminate physical stresses, such as high salinity or reduced stream flows that favor exotic plants. Do not authorize actions that not allow for natural stream flow regimes including periodic flood events.

YC-2.C. Net effects of land disposals/exchanges in the Virgin River corridor would be beneficial to yellow-billed cuckoo. All land exchanges or disposals should benefit aquatic and riparian resources by reducing threats to those habitats associated with dewatering and surface disturbance.

YC-2.D. Lands to be acquired would have development potential similar to the disposed lands and would be located in similar proximity to the Virgin River or significant tributaries.

YC-2.E. All acquired lands would not have ground or surface water used or reserved for use by non-Federal interests after it is acquired by the government. All existing such uses must be terminated upon acquisition and all rights transferred to the Federal government.

YC-2.F. Parcels where future development likely result in appreciable reductions in groundwater flow into the Virgin River or Beaver Dam Wash not be sold or exchanged. A study of groundwater hydrology could be required prior to sale or exchange.

YC-2.G. Where practicable, maintain flow regimes that mimic natural level and timing of high and low water to allow accumulation of sediments and subsequent establishment of seedlings.

YC-3. Management Guidance for Control of Invasive Species

YC-3.A. Retain native riparian vegetation in floodplains or channels.

YC-3.B. Retain mature cottonwood-willow gallery forests in yellow-billed cuckoo habitat.

YC-4. Management Guidance for Minimizing Human Disturbance

YC-4.A. Reduce or eliminate impacts to yellow-billed cuckoo and/or their habitat from recreational activities. Recreation that degrades riparian habitat would be prohibited in riparian areas on Bureau land along the Virgin River. Restrictions could include:

1. Reducing or eliminating recreational fires.
2. Confining camping areas.
3. Locate recreational activity areas away from suitable or potential cuckoo habitat.
4. Minimize trash, debris, and other attractants to scavengers and/or predators.

YC-4.B. Avoid intense and repeated human disturbance at nesting areas from 15 May through 1 September.

YC-5. Management Guidance for Grazing Management

YC-5.A. Minimize or eliminate disturbance, injury, or mortality of yellow-billed cuckoo resulting from grazing by livestock.

YC-5.B. Investigate grazing systems, strategies, and intensities for riparian recovery and maintenance.

YC-5.E. Investigate direct effects of livestock grazing on yellow-billed cuckoo and their habitat. Closely monitor grazing impacts on cottonwood and willow seedlings in riparian systems and reduce or remove grazing when seedlings are being impacted.

YC-6. Management Guidance for Use of Pesticides

YC-6.A. Determine impact of pesticide use on yellow-billed cuckoo reproduction adjacent to riparian areas.

YC-6.B. Limit or eliminate use of harmful pesticides adjacent to riparian areas. If used, apply in a manner that avoids drift, according to directions (i.e. not broad

YC-7. Management Guidance for Inventory and Monitoring

YC-7.A. Continue appropriate monitoring of all riparian areas within the Planning Area, including greenline transects, riparian functionality assessments, etc.

YC-7.B. Continue yellow-billed cuckoo habitat assessments at least every third year.

YC-7.C. Continue yellow-billed cuckoo occurrence surveys at least every other year at all suitable habitat locations.

YC-8. Management Guidance for Fire Suppression and Related Actions

YC-8.A. Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

YC-8.B. Any prescribed fire or vegetation treatment project in occupied or suitable marsh habitat only occur between September 1 and March 15 to avoid adverse affects to breeding birds.

YC-8.C. Mechanical removal of overstory habitat (e.g. tamarisk) could occur as early as September 1, after the breeding season for yellow-billed cuckoos.

YC-8.D. Evaluate past surveys for yellow-billed cuckoos as part of the planning for prescribed fire projects. Post-project surveys should also be conducted to document the regrowth of mature cottonwood-willow gallery forests and occupancy by cuckoos.

YC-8.F. After fire suppression is completed in yellow-billed cuckoo habitat, review any available survey records of the burn site and record in the fire report the number of cuckoos recorded from the vicinity during these surveys.

WF-8.H. Continue to implement the riparian fire management plan to minimize fire damage in riparian areas, especially those with suitable or potential flycatcher habitat.

2.3.7. Peregrine Falcon (BLM Sensitive)

Management Goals, Objectives, and Actions

1. Continue to actively participate in the post-delisting recovery monitoring of peregrine falcons in the Planning Area.
2. Preserve, protect, and manage peregrine falcon habitat on state and federal lands in the Planning Area for population expansion.
3. Carry out a program of public conservation education and planning directed towards preservation of peregrine falcon habitat.

Conservation Measures for Peregrine Falcon

PF-1. Management Guidance for Achieving Population Objectives

PF-1.A. Promote regeneration of native species in regenerating riparian habitats. Restore natural reaches of riparian habitat by restoring intervening degraded segments. In accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines habitat restoration in riparian areas should not include planting or seeding of nonnative plants.

PF-2. Management Guidance for Minimizing Human Disturbance

PF-2.A. Assess the presence and intensity of allowable recreational activities within owl habitat. Seasonal closures of specifically designated recreation activities should be considered where appropriate.

PF-2.B. Limit, modify, or relocate authorized actions, including construction projects, to areas more than ½ mile of known peregrine falcon during the active nesting season between April 15 and August 15.

PF-3. Management Guidance for Inventory and Monitoring

PF-3.A. Continue post-delisting recovery monitoring of selected peregrine falcon nest sites in cooperation with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. The monitoring plan calls for five sampling periods at three-year intervals throughout the life of this RMP. Monitoring protocol requires a minimum of two, four-hour visits to a site unless a nest is located sooner.

PF-4. Management Guidance for Fire Suppression and Related Actions

PF-4.A. BLM wildlife biologists would be involved early in the decision-making process for fuels management treatments (wildland fire use, prescribed fires, vegetation treatments) that are planned within ½ mile of active nest sites of peregrine falcon.

PF-4.B. Prior to implementing prescribed fire or vegetation treatment activities on BLM-administered lands, areas within ½ mile of cliff faces that could contain suitable habitat for peregrine falcon would be surveyed. Fire management activities would only be implemented when peregrine falcons are not present.

PF-4.C. If a peregrine falcon is discovered during fire suppression or fuels treatment activities (wildland fire use, prescribed fire, vegetation treatments), the Resource Advisor or a qualified wildlife biologist would document the find, assess potential harm to the falcon, and advise the Incident Commander or project crew boss of methods to prevent harm.

2.4. Virgin River Fishes (VF)

2.4.1. Virgin River chub (FE, CH) and Woundfin Minnow (FE, CH)

Management Goals and Objectives

1. Continue to actively participate in the recovery of Virgin River fishes. Assist in implementation of recovery tasks identified in the Recovery Plan.
2. Provide protection from threats and create/secure sufficient habitat to assure maintenance of these populations and/or habitats over time.
3. Continue supporting and participating in monitoring efforts for Virgin River fishes on lands in the Planning Area.
4. Continue to support applications for instream flow rights with the Arizona Department of Water Resources in rivers supporting willow flycatcher habitat.
5. Retain riparian area river channels, floodplains, and terraces in federal ownership. Carefully examine all exchanges that could affect water flows (either groundwater or surface water) to ensure that development on those lands not affect riparian habitats.
6. Educate employees and public users about Virgin River fishes.

Conservation Measures for Virgin River Fishes

VF-1. Management Guidance for Achieving Habitat Objectives

VF-1.A. Maintain a policy of "no net loss" of riparian habitat.

VF-1.B. Maintain and increase riparian habitats for Virgin River fishes. Suitable structural characteristics may be achieved through restoring, maintaining, enhancing, and creating habitat. Encourage the use of buffer zones between riparian habitats and adjacent upland areas. Promote establishment of areas of slow/back waters.

VF-1.C. Promote regeneration of native species in regenerating riparian habitats. Restore natural reaches of riparian habitat by restoring intervening degraded segments. In accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines habitat restoration in riparian areas should not include planting or seeding of nonnative plants.

VF-1.D. Close and rehabilitate roads and trails used by off-highway vehicles within riparian areas, or areas with the potential to support riparian vegetation.

VF-2. Management Guidance for Water Management

VF-2.A. Manage water diversions and groundwater withdrawals to maintain streamside vegetation.

VF-2.B. Where possible and practicable, reduce or eliminate physical stresses, such as high salinity or reduced stream flows that favor exotic plants. Do not authorize actions that not allow for natural stream flow regimes including periodic flood events.

VF-2.C. Net effects of land disposals/exchanges in the Virgin River corridor would be beneficial to Virgin River fishes. All land exchanges or disposals should benefit aquatic and riparian resources by reducing threats to those habitats associated with dewatering and surface disturbance.

VF-2.D. Lands to be acquired would have development potential similar to the disposed lands and would be located in similar proximity to the Virgin River or significant tributaries.

VF-2.E. All acquired lands would not have ground or surface water used or reserved for use by non-Federal interests after it is acquired by the government. All existing such uses must be terminated upon acquisition and all rights transferred to the Federal government.

VF-2.F. Parcels where future development likely result in appreciable reductions in groundwater flow into the Virgin River or Beaver Dam Wash not be sold or exchanged. A study of groundwater hydrology could be required prior to sale or exchange.

VF-3. Management Guidance for Control of Invasive Exotic Species

VF-3.A. Retain native riparian vegetation in floodplains or channels.

VF-3.B. In habitats where exotic species are to be removed through chemical or mechanical means, use a temporally staged approach to clear areas so some mature habitat remains throughout the restoration period for cover and shade for Virgin River fishes.

VF-4. Management Guidance for Minimizing Human Disturbance

VF-4.A. Reduce or eliminate impacts to Virgin River fishes and their habitat from recreational activities. Recreation that degrades riparian habitat would be prohibited in riparian areas on Bureau land along the Virgin River.

VF-5. Management Guidance for Grazing Management

VF-5.A. Minimize or eliminate disturbance, injury, mortality, or other forms of take of Virgin River fishes resulting from grazing by livestock.

VF-5.B. Investigate grazing systems, strategies, and intensities for riparian recovery and maintenance.

VF-5.C. Investigate direct effects of livestock grazing on Virgin River fishes and their habitat.

VF-6. Management Guidance for Pesticide Issues

VF-6.A. Determine impact of pesticide use on Virgin River fishes.

VF-6.B. Limit or eliminate use of harmful pesticides adjacent to riparian areas. If used, apply in a manner that avoids drift, according to directions (i.e. not broad applications).

VF-7. Management Guidance for Inventory and Monitoring

VF-7.A. Continue appropriate monitoring of all riparian areas within the Planning Area, including greenline transects, riparian functionality assessments, etc.

VF-7.B. Continue monitoring Virgin River fishes within the Planning Area in cooperation with the Virgin River Fishes Recovery Team and the U.S. Fish and Wildlife Service.

VF-8. Management Guidance for Fire Suppression and Related Actions

VF-8.A. Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

VF-8.B. Minimize fire damage in riparian by giving riparian habitat the highest priority for fire response and suppression efforts (second only to human life and property). Focus attention on minimizing fire damage to stands of native vegetation areas.

VF-8.C. Using natural barriers or openings in riparian vegetation is the easiest, safest method to manage a riparian wildfire. Where possible and practical, use wet fire breaks in developing or sandy overflow channels rather than dry breaks.

VF-8.D. Where possible, avoid use chainsaws and/or bulldozers to construct fireline through habitat. When necessary to do so, weigh the potential impacts of such an action against the habitat losses likely to result. Consider are firefighter safety and potential gains in managing the fire.

VF-8.E. Avoid use of backfires during fire suppression activities except where doing so reduces the overall in these areas except where necessary to reduce or eliminate severe fire risk.

VF-8.F. Avoid use of chemical foams or retardants in riparian areas.

VF-8.G. Avoid developing access roads that result in fragmentation or a reduction in habitat quality. Close and rehabilitate all roads that were necessary for project implementation.

VF-8.H. Cooperate with other agencies to develop emergency protocols to decrease the impacts of fire suppression and fuels treatment activities on Federally listed fish species.

2.5. Flowering Plants

Management Goals and Objectives

1. Continue to participate in conservation efforts for special status plant species.
2. Preserve, protect, and manage special status plant habitat on state and federal lands in the Planning Area.
3. Continue monitoring efforts for special status plant populations within the Planning Area.
4. Carry out a program of public conservation education and planning directed towards preservation of special status plant habitat.

Conservation Measures for Special Status Plant

PL-1. Management Guidance for Achieving Habitat Objectives

PL-1.A. Maintain a policy of "no net loss" of special status plant habitats.

PL-2. Management Guidance for Minimizing Human Disturbance

PL-2.A. Reduce or eliminate impacts to special status plants and their habitats from surface disturbing activities.

PL-2.B. Recreational activities that degrade special status plant habitats would be modified or relocated to minimize or eliminate adverse affects.

PL-2.C. Close special status plant ACECs to OHV use. In these ACECs, vehicles would not be allowed to pull off the road to camp. Campfires and collection of fuel wood not be authorized in these ACECs.

PL-3. Management Guidance for Grazing Management

PL-3.A. Minimize or eliminate disturbance, injury, or mortality of special status plants resulting from grazing by livestock.

PL-3.B. Investigate direct effects of livestock grazing on special status plants and their habitats.

PL-3.C. Where grazing by livestock is leading to adverse affects from trampling, implement actions to reduce or mitigate loss of the plant species. Measures could include fencing, seasonal restrictions, or relocation of livestock developments.

PL-3.D. Implement public conservation education programs to inform publics of the value conservation of special status plant habitats and the rules and policies governing their protection.

PL-4. Management Guidance for Use of Herbicides

PL-4.A. Determine impact of herbicides pesticide use on special status plant species.

PL-4.B. Limit or eliminate use of harmful herbicides in areas where special status plants could be affected.

PL-5. Management Guidance for Inventory and Monitoring

PL-5.A. Inventory and map all suitable habitat of special status plant species.

PL-5.B. Continue appropriate monitoring of all special status plant species within the Planning Area.

PL-6. Management Guidance for Fire Suppression and Related Actions

PL-6.A. Known locations and potential habitat for plant populations would be mapped to facilitate planning for wildland fire use, prescribed fires, and vegetation treatments, and to ensure protection of these populations during fire suppression.

PL-6.B. Delineate buffer areas around plant populations prior to prescribed fire and vegetation treatment activities. Coordinate with USFWS during any emergency response and wildland fire use activities to ensure protection of plant populations from fire and fire suppression activities.

PL-6.C. No staging of equipment or personnel would be permitted within 100 meters of identified individuals or populations of special status plant species during fire suppression, wildland fire use, or prescribed fire. Off-road vehicles would not be allowed within the 100-meter buffer area, unless necessary for firefighter or public safety or the protection of property, improvements, or other resources.

PL-6.D. No prescribed burning would be implemented within 100 meters of identified locations or unsurveyed suitable habitat of special status plant species unless specifically designed to maintain or improve the existing population.

APPENDIX 2.F

SPECIAL STATUS SPECIES KNOWN OR SUSPECTED TO OCCUR ON THE ARIZONA STRIP

SPECIAL STATUS SPECIES KNOWN OR SUSPECTED TO OCCUR ON THE ARIZONA STRIP				
COMMON NAME (SCIENTIFIC NAME)	**OCCURRENCE**	**FED. LISTING**	**STATE STATUS**	**BLM SENSITIVE**
INVERTEBRATES				
Grand Wash springsnail (*Pyrgulopsis bacchus*)	Verified		WSC	Sensitive
Desert springsnail (*Pyrgulopsis deserta*)	Verified		WSC	Sensitive
MacNeill sooty wing skipper (*Hesperopsis gracielae*)	Possible			Sensitive
Succineid snails (all species in family Succineidae)	Verified			Sensitive
FISH				
Woundfin (*Plagopterus argentissimus*)	Verified	E	WSC	
Virgin chub (*Gila seminuda*)	Verified	E	WSC	
Virgin spinedace (*Lepidomeda mollispinis mollispinis*)	Verified	CA.	WSC	
Flannelmouth sucker (*Catostomus latipinnis*)	Verified		WSC	
Desert sucker (*Catostomus clarki*)	Verified			Sensitive
Speckled dace (*Rhinichthys osculus*)	Verified			Sensitive
REPTILES AND AMPHIBIANS				
Desert tortoise (*Gopherus agassizii*)	Verified	T	WSC	
Relict leopard frog (*Rana onca*)	Verified	C	WSC	
Northern leopard frog (*Rana pipiens*)	Verified		WSC	
Lowland leopard frog (*Rana yavapaiensis*)	Possible?		WSC	
Chuckwalla (*Sauromalus obesus*)	Verified			Sensitive
Banded Gila monster (*Heloderma suspectum cinctum*)	Verified			Sensitive
Northern sagebrush lizard (*Sceloporus graciosus graciosus*)	Verified			Sensitive
BIRDS				
Bald eagle (*Haliaeetus leucocephalus*)	Verified	T	WSC	
California condor (*Gymnogyps californianus*)	Verified	E	WSC	
Mexican spotted owl (*Strix occidentalis lucida*)	Verified	T	WSC	

SPECIAL STATUS SPECIES KNOWN OR SUSPECTED TO OCCUR ON THE ARIZONA STRIP				
COMMON NAME (SCIENTIFIC NAME)	**OCCURRENCE**	**FED. LISTING**	**STATE STATUS**	**BLM SENSITIVE**
Southwestern willow flycatcher (*Empidonax traillii extimus*)	Verified	E	WSC	
Yuma clapper rail (*Rallus longirostris yumanensis*)	Verified	E	WSC	
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	Verified	C	WSC	
American bittern (*Botaurus lentiginosus*)	Verified		WSC	
Ferruginous hawk (*Buteo regalis*)	Verified		WSC	
Fulvous whistling duck (*Dendrocygna bicolor*)	Verified			Sensitive
Loggerhead shrike (*Lanius ludoviscianus*)	Verified			Sensitive
Northern goshawk (*Accipiter gentilis*)	Verified		WSC	
Snowy egret (*Egretta thula*)	Verified		WSC	
Western burrowing owl (*Athene cunicularia hypugea*)	Verified			Sensitive
White-faced ibis (*Plegadis chihi*)	Verified			Sensitive
Allen's big-eared bat (*Idionycteris phyllotis*)	Verified			Sensitive
Big free-tailed bat (*Nyctinomops macrotis*)	Verified			Sensitive
California leaf-nosed bat (*Macrotus californicus*)	Verified			Sensitive
Fringed myotis (*Myotis thysanodes*)	Verified			Sensitive
Greater western mastiff bat (*Eumops perotis*)	Verified		WSC	
Long-eared myotis (*Myotis evotis*)	Verified			Sensitive
Long-legged myotis (*Myotis volans*)	Verified			Sensitive
Small-footed myotis (*Myotis ciliolabrum*)	Verified			Sensitive
Spotted bat (*Euderma maculatum*)	Verified			Sensitive
Townsend's big-eared bat (*Corynorhinus townsendii*)	Verified		WSC	
Western red bat (*Lasiurus blossevillii*)	Possible		WSC	
House Rock Valley chisel-toothed kangaroo rat (*Dipodomys microps leucotis*)	Verified			Sensitive

SPECIAL STATUS SPECIES KNOWN OR SUSPECTED TO OCCUR ON THE ARIZONA STRIP				
COMMON NAME (SCIENTIFIC NAME)	**OCCURRENCE**	**FED. LISTING**	**STATE STATUS**	**BLM SENSITIVE**
PLANTS				
Brady pincushion cactus (*Pediocactus bradyi*)	Verified	E		
Holmgren milk-vetch (*Astragalus holmgrenionum*)	Verified	E		
Jones' cycladenia (*Cycladenia humilis* var. *jonesii*)	Verified	T		
Siler pincushion cactus (*Pediocactus sileri*)	Verified	T		
Welsh's milkweed (*Asclepias welshii*)	Verified	T		
Fickeisen plains cactus (*Pediocactus peeblesianus* var. *fickeiseniae*)	Verified	C		Sensitive
Black Rock daisy (*Townsendia smithii*)	Verified			Sensitive
Cliff milkvetch (*Astragalus cremnophylax* var. *myriorraphus*)	Verified			Sensitive
Diamond Butte milkvetch (*Astragalus toanus* var. *scidulus*)	Verified			Sensitive
Grand Canyon rose (*Rosa stellata* var. *abyssa*)	Verified			Sensitive
Kaibab pincushion cactus (*Pediocactus paradinei*)	Verified			Sensitive
Mt. Trumbull beardtongue (*Penstemon distans*)	Verified			Sensitive
Paria Plateau fishhook cactus (*Sclerocactus sileri*)	Verified			Sensitive
September 11 stickleaf (*Mentzelia memorabilis*)	Verified			Sensitive
Sheep Range beardtongue (*Penstemon petiolatus*)	Verified			Sensitive
Silverleaf sunray (*Enceliopsis argophylla*)	Verified			Sensitive
Sticky wild buckwheat (*Eriogonum viscidulum*)	Verified			Sensitive
Three hearts (*Tricardia watsonii*)	Possible			Sensitive
Federal Listing: E = Endangered; T = Threatened; C = Candidate; CA = Conservation Agreement State Status: WSC = Wildlife Species of Concern				

APPENDIX 2.G

MIGRATORY BIRDS OF THE ARIZONA STRIP

Migratory Birds of the Arizona Strip

Habitat: G=Grassland, S=Sagebrush, M=Mountain Shrub, C=Conifer, PJ=Pinyon-Juniper, D=Desert Shrub, A=Aquatic, R=Riparian

Summer Migrants	***Habitat***
Common Black Hawk	R
Swainson's Hawk	D
Clapper Rail (Yuma)	A, R
Band-tailed Pigeon	M, C
White-winged Dove	D, R
Inca Dove	D, R
Yellow-billed Cuckoo (western)	D, R
Elf Owl	M, C, PJ, D
Burrowing Owl	G, S, D
Lesser Nighthawk	G, S, M, C, PJ, D
Common Nighthawk	G, S, M, C, PJ, D
Common Poorwill	G, S, M, C, PJ, D
Black Swift	M, C, PJ
Vaux's Swift	M, C, PJ
White-throated Swift	G, S, M, C, PJ, D
Black-chinned Hummingbird	G, S, M, C, PJ, D
Costa's Hummingbird	G, S, PJ, D
Broad-tailed Hummingbird	G, S, D
Olive-sided Flycatcher	C, PJ
Western Wood-pewee	C, R
SW Willow Flycatcher	R
Gray Flycatcher	S, PJ
Dusky Flycatcher	M, C, PJ, R
Cordilleran Flycatcher	M, C, PJ
Vermillion Flycatcher	D, R
Dusky-capped Flycatcher	G, S, M, C, PJ, D, R
Ash-throated Flycatcher	G, S, M, C, PJ, D, R
Brown-crested Flycatcher	D
Cassin's Kingbird	G, S, M, C, PJ, D
Western Kingbird	G, S, M, C, PJ, D
Bell's Vireo	D, R
Gray Vireo	M, PJ, D
Plumberous Vireo	C, PJ
Warbling Vireo	C, R
Tree Swallow	G, S, M, C, PJ, D
Violet-green Swallow	G, S, M, C, PJ, D
Northern Rough-winged Swallow	G, S, M, D
Cliff Swallow	G, S, M, D
Barn Swallow	G, M, D
House Wren	M, C, PJ
Blue-gray Gnatcatcher	M, C, PJ, D
Black-tailed Gnatcatcher	D
Hermit Thrush	M, C, PJ
Gray Catbird	M, C, PJ
Northern Mockingbird	G, S, M, PJ, D

Summer Migrants	***Habitat***
Sage Thrasher	S, D
Bendire's Thrasher	G, S, M, PJ, D
Crissal's Thrasher	S, D
LeConte's Thrasher	D
Orange-crowned Warbler	S, M, C, PJ, D
Virginia's Warbler	M, PJ, D
Lucy's Warbler	PJ, D, R
Yellow Warbler	M, C, R
Yellow-rumped Warbler	M, C, PJ
Black-throated Gray Warbler	M, PJ
Grace's Warbler	C, PJ
MacGillivary's Warbler	M, C, PJ
Common Yellowthroat	S, M, R
Yellow -breasted Chat	C, PJ, R
Hepatic Tanager	M, C, PJ
Summer Tanager	M, C, R
Western Tanager	M, C, PJ
Green-tailed Towhee	S, M, PJ, D, R
Rufous-crowned Sparrow	S, D
Brewer's Sparrow	G, S, M, D
Vesper's Sparrow	G, S, D
Lark Sparrow	G, S, D
Black-throated Sparrow	G, S, M, PJ, D
Black-headed Grosbeak	M, C, PJ
Blue Grosbeak	R
Lazuli Bunting	M, C, R
Brewer's Blackbird	G, S, M, C, PJ, D, R
Great-tailed Grackle	G, D
Brown-headed Cowbird	G, S, M, C, D
Hooded Oriole	R
Bullock's Oriole	M, PJ
Scott's Oriole	G, S, M, PJ, D

Winter Migrants	***Habitat***
Canada Goose	G, A, R
Bald Eagle	G, S, C
Rough-legged Hawk	G, S, M, PJ, D
Merlin	G, S, PJ
Gilded Flicker	PJ
Northern Shrike	S, M, PJ, D
Winter Wren	C
Marsh Wren	R
Black and White Warbler	C, PJ
White-throated Sparrow	G, S, M, C, PJ, D
Harris's Sparrow	C, PJ

Transient	*Habitat*
Greater White-fronted Goose	A, R
Snow Goose	A, R
Tundra Swan	A
Wood Duck	A, R
Gadwall	A, R
American Wigeon	A, R
Mallard	A, R
Blue-winged Teal	A, R
Cinnamon Teal	A, R
Northern Shoveler	A, R
Northern Pintail	A, R
Green-winged Teal	A, R
Canvasback	A, R
Redhead	A, R
Ring-necked Duck	A, R
Greater Scaup	A, R
Lesser Scaup	A, R
Bufflehead	A, R
Common Goldeneye	A, R
Barrow's Goldeneye	A, R
Common Merganser	A, R
Red-breasted Merganser	A, R
Ruddy Duck	A, R
Common Loon	A
Pied-billed Grebe	A, R
Horned Grebe	A, R
Eared Grebe	A, R
Western Grebe	A, R
American White Pelican	A
Double-crested Cormorant	A
American Bittern	A, R
Great Blue Heron	A, R
Great Egret	A, R
Snowy Egret	A, R
Cattle Egret	G, R
Green Heron	A, R
Black-crowned Night Heron	G, A, R
White-faced Ibis	A, R
Osprey	A, R
Zone-tailed Hawk	G, S, M, D
Ferruginous Hawk	G, S, PJ, D
Virginia Rail	A, R
Sora	A, R
American Coot	A, R
Sandhill Crane	A, R
Black-bellied Plover	A, R
Snowy Plover	A, R
Semi-palmated Plover	A, R
Mountain Plover	G
Black-necked Stilt	A, R

Transient	*Habitat*
American Avocet	A, R
Greater Yellowlegs	A, R
Lesser Yellowlegs	A, R
Solitary Sandpiper	A, R
Willet	A, R
Long-billed Curlew	A, R
Marbled Godwit	A, R
Sanderling	A, R
Semi-palmated Sandpiper	A, R
Western Sandpiper	A, R
Least Sandpiper	A, R
Baird's Sandpiper	A, R
Pectoral Sandpiper	A, R
Dunlin	A, R
Long-billed Dowitcher	A, R
Common Snipe	A, R
Wilson's Phalarope	A, R
Red-necked Phalarope	A, R
Franklin's Gull	A
Bonoparte's Gull	A
Ring-billed Gull	A
California Gull	A
Herring Gull	A
Caspian Tern	A
Common Tern	A
Forster's Tern	A
Black Tern	A
Short-eared Owl	G, D
Anna's Hummingbird	G, S, M, C, PJ, D
Calliope Hummingbird	G, S, M, D
Rufous Hummingbird	G, S, M, PJ, D
Bank Swallow	S, M, D
European Starling	G, S, M, C, PJ, D
American Pipit	G, R
Bohemian Waxwing	C, PJ
Cedar Waxwing	C, PJ, R
Magnolia Warbler	C
Townsend's Warbler	C, PJ
Hermit Warbler	C
American Redstart	M
Wilson's Warbler	M, C, PJ, R
Painted Redstart	M, C, PJ
Abert's Towhee	G, R
Cassin's Sparrow	G, S
Black-chinned Sparrow	S, M
Lark Bunting	G, S, M, D
Lincoln's Sparrow	D, R
Golden Crowned Sparrow	G, S, M, D
Pyrrhuloxia	D, R
Indigo Bunting	M, C, R

Transient	***Habitat***
Yellow-headed Blackbird	A, R
Rusty Blackbird	C, R
Pine Grosbeak	C
Purple Finch	G, S, M, C, PJ, D

APPENDIX 2.H

HABITAT MANAGEMENT PLAN CONTENTS

Habitat Management Plan Contents

The following is a list of the typical contents of a wildlife habitat management plan (HMP).

I. Introduction
- Purpose of the Plan
- Reason for Revision
- Accomplishments of Previous HMP for this area
- Policies and Practices in Wildlife Management
- Relationship of this HMP with the Resource Management Plan
  - Cultural Resource Management
  - Wilderness Management
  - Fire
  - Rangeland Management
  - Minerals

II. Ecosystem Description
- Physical Profile
- Biological Profile
  - Vegetative Communities
  - Wildlife Species
  - Ecological Relationships

III. Land Status Administration

IV. Management Goals, Objectives, and Actions
- Wildlife Water Developments
- Vegetation Management
- Special Status Species
- Big Game Species
- Migratory Bird Species
- Upland Game Birds
- Waterfowl and Shorebirds
- Predators and Carnivores
- Nongame Species

V. Annual HMP Progress Report

VI. Coordination

VI. Economic Analysis
- Cost Benefit Analysis
- Project Priorities
- Funding Needs

VII. Appendices

VIII. Environmental Assessment

IX. Decision Record

APPENDIX 2.I

ARIZONA STRIP FIELD OFFICE
OIL AND GAS LEASE STIPULATIONS

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
	CONTROLLED SURFACE USE STIPULATIONS **CRITICAL SOILS, MUNICIPAL WATERSHEDS, FLOODPLAINS. FISH & WILDLIFE, VISUAL AND CULTURAL RESOURCES, HISTORIC AND RECREATION TRAILS** Surface occupancy or use is subject to the following special operating constraints. On the lands described below: For the purpose of: Preserving and protecting critical soils, floodplains, municipal watershed, fish and wildlife, visual resources, cultural resources, and historic and recreation trail corridors from adverse impacts as described in the Resource Management Plan and EIS. Waivers, exceptions, or modifications to this limitation may be specifically approved in writing by the authorized officer of the Bureau of Land Management if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of these stipulations, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)
ASFO 1	**CRITICAL SOILS:** The area has critical soil erosion conditions. New roads will be constructed to avoid critical soils where possible. New roads will be constructed with water bars. Riprap may be required. Road grades in excess of 10 percent will not normally be allowed. In special circumstances, where a road grade of more than 10 percent is allowed, its maximum length will be 1,000 feet. Access grading, exploration, drilling or other activities will be prohibited during wet or muddy periods. Cross-country travel will be allowed only when soils are dry or frozen. BLM will determine what is wet, muddy, or frozen. The limitation does not apply to maintenance and operation of existing wells. Construction and development are to be avoided on slopes in excess of 6 percent. Operations will be located to reduce erosion and improve the opportunity for revegetation within critical soils areas. Reclamation on sites with critical soils will require grading using slopes of 5 percent or less where possible and grading the site so as to collect water for revegetation on-site.
ASFO 2	**SENSITIVE WATERSHEDS**: In order to minimize watershed damage, exploration, drilling, and other development activity in the ___ will be allowed only during the period from April 30 to November 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically approved in writing by the authorized officer of the Bureau of Land Management. The lessee is informed that the floodplain portions of the lease area require special attention to prevent damage to surface resources and contamination to the _____ watersheds. Any surface use within such areas will be strictly controlled or restricted where not essential for operations. Appropriate modifications to imposed restrictions will be made for maintenance and operations of producing oil and gas wells. Construction of access roads and drill pads on slopes in excess of 30 percent will require special design standards to minimize watershed damage in the ___. Drilling operations and any associated construction activities on slopes in excess of 50 percent may require directional drilling to prevent damage to the watershed. Exceptions to these limitations may be specifically approved in writing by the authorized officer of the Bureau of Land Management.
ASFO 3	**WATERSHED SLOPE RESTRICTIONS**: No surface occupancy or other surface disturbance in the ___ will be allowed on slopes in excess of 30 percent without written permission from the authorized officer of the Bureau of Land Management.

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 4	**FLOODPLAIN OCCUPANCY**: No occupancy or other surface disturbance will be allowed within 330 feet of the centerline or within the 100-year recurrence interval floodplain, whichever is greater, of the perennial streams, or within 660 feet of springs, whether flowing or not, located in the _____. This distance may be modified when specifically approved in writing by the authorized officer of the Bureau of Land Management. In order to minimize watershed damage, exploration, and drilling and other development activity in the _____ will be allowed only during the period from April 30 to November 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically approved in writing by the authorized officer of the Bureau of Land Management. Construction of access roads and drill pads on slopes in excess of 30 percent will require special design standards to minimize watershed damage in the ____. Drilling operations and any associated construction activities on slopes in excess of 50 percent may require directional drilling to prevent damage to the watershed. Exceptions to the limitations may be specifically approved in writing by the authorized officer of the Bureau of Land Management.
ASFO 5	**RIPARIAN SPRINGS**: No occupancy or other surface disturbance will be allowed within 0.25 miles of springs, whether flowing or not, as described in _____. This distance may be modified when specifically approved in writing by the authorized officer of the Bureau of Land Management. In order to minimize watershed damage, exploration, and drilling and other development activity at these springs will be allowed only during the period from April 30 to November 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically approved in writing by the authorized officer of the Bureau of Land Management. Construction of access roads and drill pads on slopes in excess of 30 percent will require special design standards to minimize watershed damage in the ____. Drilling operations and any associated construction activities on slopes in excess of 50 percent will not be allowed. Exceptions to the limitations may be specifically approved in writing by the authorized officer of the Bureau of Land Management.
ASFO 6	**RIPARIAN WETLAND HABITAT**: In order to protect riparian/wetland habitat and municipal and non-municipal watershed areas, no occupancy or other surface disturbance will be allowed within 1,200 feet of live water or within 1,200 feet of wetlands as defined by the United States Fish and Wildlife Service in "Classification of Wetlands and Deep Water Habitats of the United States," 1979, page 3 located in the ____. This limitation does not apply to maintenance and operation of producing wells. If the lessee can demonstrate that operations can take place without impact to the resource being protected, an exemption to this stipulation may be granted if approved in writing by the authorized officer in consultation with the District's watershed specialist. For example, exemptions may be allowed where the riparian zone or the hydrologic influence area of phreatophytes exists less than 1,200 feet from live water.
ASFO 7	**FISHERIES / LIVE WATER RESTRICTIONS**: In order to prevent fisheries degradation and water pollution, no drilling will be allowed within 1,200 feet of live water or the reservoirs located in the Virgin or Paria River drainages or Kanab Creek. This distance may be modified when specifically approved in writing by the authorized officer of the Bureau of Land Management.
ASFO 8	**LIVE WATER RESTRICTIONS** No occupancy will be allowed within 1,200 feet of live water ___. This distance may be modified when specifically approved in writing by the authorized officer of the Bureau of Land Management.

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 9	**SPECIAL STATUS SPECIES HABITAT AREA**: Exploration, drilling, and/or other development activity within a special status species ACEC or WHA/VHA may be restricted seasonally to a period when the species is not active. These limitations do not apply to maintenance and operation of producing wells. The authorized officer may grant exception on a case-by-case basis if it can be shown that: (1) Legal rights would be curtailed; (2) The species are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the species. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service.
ASFO 10	**SPECIAL STATUS SPECIES HABITAT SURVEYS**: Special status species habitat surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur within an area of known or suspected occupancy by special status species. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management at the time of year when detection of the species is most likely to occur. If protocols have been established for surveys of the species, these protocols will be used. When surveys are required of the lessee/operator, the consultant hired must be found acceptable to the authorized officer prior to the field survey being conducted. Based on the result of the field survey, the authorized officer will determine appropriate buffer zones.
ASFO 11	**DESERT TORTOISE HABITAT AREAS**: Desert tortoise ACECs would remain open to leasing subject to seasonal restrictions and subject to a waivable no surface occupancy stipulation (WNSO). Surface disturbing activity would be limited to the period from October 15 to March 15 under a seasonal restriction. Surface occupancy could be allowed by a BLM authorized officer after consultation with USFWS on the authorization. The authorized officer may waive this stipulation on a case by case basis if it can be shown that: (1) Desert tortoise are not present in a specific project location, (2) All operations and activities conducted in association with the action take place during the inactive season for desert tortoise (October 15 – March 15), (3) The activity can be conducted in a manner that has no affect on desert tortoise or their critical habitat, (4) The U.S. Fish and Wildlife Service concurs with BLM's determination that the proposed activity would not likely adversely affect desert tortoise or modify their habitat, or; (5) Following consultation with the U.S. Fish and Wildlife Service, an incidental take statement is provided which would allow the project to proceed. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service.
ASFO 12	**DESERT TORTOISE SURVEYS**: Desert tortoise surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur within an area known or suspected to be occupied by desert tortoise. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management at the time of year when detection of the species is most likely to occur. If protocols have been established for surveys of the species, these protocols will be used. When surveys are required of the lessee/operator, the consultant hired must be found acceptable to the authorized officer prior to the field survey being conducted. Based on the result of the field survey, the authorized officer will determine appropriate buffer zones.

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 13	**CRUCIAL MULE DEER SUMMER HABITAT**: Closed to surface use during the crucial summer use period, May 15 through June 30. This seasonal condition would not affect maintenance, and operation activities for production. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department. Off-site mitigation may be required when unreclaimed disturbance caused by activity totals more than ten acres in two years. The off-site mitigation must be within the known habitat, but not necessarily within the crucial habitat area. Off-site mitigation will include seeding or planting vegetation favorable to deer. Revegetation must be established within five years after project completion. Revegetation must be with species palatable to deer and will be deemed successful when seedlings are established and tending towards the density that existed before the surface was disturbed.
ASFO 14	**CRUCIAL DEER WINTER RANGE:** Closed to surface use during the crucial winter use, December 15 to April 30. This seasonal condition would not affect maintenance and operation activities for production. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department. Off-site mitigation may be required when unreclaimed disturbance caused by activity totals more than ten acres in two years. The off-site mitigation must be within the known habitat, but not necessarily within the crucial habitat area. Off-site mitigation will include seeding or planting vegetation favorable to deer. Revegetation must be established within five years after project completion. Revegetation must be with species palatable to deer and will be deemed successful when seedlings are established and tending towards the density that existed before the surface was disturbed.
ASFO 15	**CRUCIAL BIGHORN SHEEP HABITAT**: Closed to surface use during bighorn sheep lambing (April 1 to July 15) and during the rutting period (October 15 to December 31). These seasonal conditions would not affect maintenance and operation activities for production. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department. Off-site mitigation may be required when unreclaimed disturbance caused by activity totals more than ten acres in two years. The off-site mitigation must be within the known habitat, but not necessarily within the crucial habitat area. Off-site mitigation will include seeding or planting vegetation favorable to bighorn sheep. Revegetation must be established within five years after project completion.

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 16	**BIGHORN SHEEP LAMBING AREAS:** In order to protect bighorn sheep lambing habitat, exploration, drilling, and other development activity will be allowed only during the period from July 1to March 15. This limitation does not apply to maintenance and operation of producing wells. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department.
ASFO 17	**PRONGHORN ANTELOPE HABITAT:** Antelope Habitat will be closed during the fawning season (May 15 to June 15). This seasonal condition would not affect maintenance and operation activities for production. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department. Off-site mitigation may be required when unreclaimed disturbance totals more that ten acres in two years in crucial habitat. The off-site mitigation must be within the known habitat area but not necessarily within crucial habitat. Off-site mitigation could include seeding and planting favorable to antelope, or water could be developed to allow animals to use other parts of the habitat area.
ASFO 18	**PRONGHORN ANTELOPE FAWNING AREAS**: In order to protect antelope fawning areas, exploration, drilling and other development activity in the ___ will be allowed only from July 1 to March 15. This limitation does not apply to maintenance and operation of producing wells. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department. Such a determination may result if fawning is completed early and the fawning area is abandoned earlier to allow for disturbing activities for fluid mineral leasing and exploration to start earlier than July 1.
ASFO 19	**CALIFORNIA CONDOR NESTING SITES**: Exploration, drilling, and/or other development activity within 0.5 mile radius of active condor nesting areas would be allowed only from July 1 to March 1 in order to protect these nests. No roost trees will be cut. These limitations do not apply to maintenance and operation of producing wells. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) The birds are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the birds. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Such a determination may result if the nest site no longer exists or other nest sites are found to have taken over in importance to the condors present to allow for disturbing activities for fluid mineral leasing and exploration.

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 20	**BALD EAGLE ROOST SITES:** Exploration, drilling, and/or other development activity within 0.5 mile radius of active or historic bald eagle roost sites will be allowed only from March 15 to November 1 in order to protect these roosts. No roost trees will be cut. These limitations do not apply to maintenance and operation of producing wells. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) Bald eagles are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the eagles. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Such a determination may result if the roost site no longer exists or other roost sites are found to have taken over in importance to the bald eagles present to allow for disturbing activities for fluid mineral leasing and exploration.
ASFO 21	**GOLDEN EAGLE NEST SITES:** No surface occupancy or use is allowed (does not apply to casual use) within 1/2 mile of golden eagle nests which have been active within the past two years. This restriction would not apply to maintenance and operation of existing programs and facilities. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) Golden eagles are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the eagles. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Such a determination may result if the nest site no longer exists or other nest sites are found to have taken over in importance to the eagles present to allow for disturbing activities for fluid mineral leasing and exploration.
ASFO 22	**FERRUGINOUS HAWK NEST SITES:** No surface occupancy or use is allowed (does not apply to casual use) within 1/2 mile of known ferruginous hawk nests, unless it could be shown to the satisfaction of the authorized officer that the nest has not been active within the past 2 years. This restriction would not apply to maintenance and operation of existing programs and facilities. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) The birds are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the birds. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Such a determination may result if the nest site no longer exists or other nest sites are found to have taken over in importance to the hawks present to allow for disturbing activities for fluid mineral leasing and exploration.
ASFO 23	**PEREGRINE FALCON NEST SITES:** No surface occupancy or use is allowed (does not apply to casual use) within 1 mile of known peregrine falcon nests. This restriction would not apply to maintenance and operation of existing programs and facilities. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) Peregrine falcons are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Such a determination may result if the nest site no longer exists or other nest sites are found to have taken over in importance to the falcons present to allow for disturbing activities for fluid mineral leasing and exploration.

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 24	**RAPTOR NESTING SITES**: Exploration, drilling, and/or other development activity within 0.5 mile radius of active or historic raptor nesting areas would be allowed only from July 1 to March 1 in order to protect these roosts. No roost trees will be cut. These limitations do not apply to maintenance and operation of producing wells. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) The birds are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the birds. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Such a determination may result if the nest site no longer exists or other nest sites are found to have taken over in importance to the raptors present to allow for disturbing activities for fluid mineral leasing and exploration.
ASFO 25	**RAPTOR HABITAT SURVEYS**: Raptor surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur within a known nesting complex for raptors. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management at the time of year when detection of the species is most likely to occur. If protocols have been established for surveys of the species, these protocols will be used. When surveys are required of the lessee/operator, the consultant hired must be found acceptable to the authorized officer prior to the field survey being conducted. Based on the result of the field survey, the authorized officer will determine appropriate buffer zones.
ASFO 26	**BURROWING OWL RELEASE SITE** No occupancy or other surface disturbance will be allowed within 0.5 mile radius of active or historic burrowing owl nesting burrows. This restriction would not apply to maintenance and operation of existing programs and facilities. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service.
ASFO 27	**CRUCIAL WATERFOWL HABITAT**: In order to protect crucial waterfowl habitat, exploration, drilling, and other development activity in the ___ will be allowed only during the period from July 15 to March 15. This restriction would not apply to maintenance and operation of existing programs and facilities. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) Waterfowl are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect waterfowl. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service.

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 28	**MIGRATORY BIRD HABITAT**: In order to protect migratory habitat, exploration, drilling, and other development activity in the ___ will be allowed only during the period from July 15 to March 15. This restriction would not apply to maintenance and operation of existing programs and facilities. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) Migratory birds are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect migratory birds. This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service.
ASFO 29	**MIGRATORY BIRD HABITAT SURVEYS**: Migratory bird habitat surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur within one mile of live water known or suspected to be used by migratory birds. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management at the time of year when detection of the species is most likely to occur. If protocols have been established for surveys of the species, these protocols will be used. When surveys are required of the lessee/operator, the consultant hired must be found acceptable to the authorized officer prior to the field survey being conducted. Based on the result of the field survey, the authorized officer will determine appropriate buffer zones.
ASFO 30	**SPECIAL STATUS PLANT SPECIES** No surface occupancy or use is allowed on the lands containing special status plant species habitat (federally listed species only). This restriction would not apply to maintenance and operation of existing programs and facilities. The authorized officer may grant exception on a case by case basis if it can be shown that: (1) Legal rights would be curtailed; (2) The plants are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the plants.
ASFO 31	**SPECIAL STATUS PLANT SURVEYS**: Special status plant surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur within an area known or suspected to be habitat for special status plant species. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management at the time of year when detection of the species is most likely to occur. If protocols have been established for surveys of the species, these protocols will be used. When surveys are required of the lessee/operator, the consultant hired must be found acceptable to the authorized officer prior to the field survey being conducted. Based on the result of the field survey, the authorized officer will determine appropriate buffer zones.
ASFO 32	**VRM CLASS II AREAS:** In order to retain important scenic values in a visual resource management class II area, all changes to landforms or vegetation caused by oil and gas exploration shall be done very subtly. Proposed changes may be seen, but should not attract attention, as observed from key observation points or corridors. Exceptions to this limitation may be specifically authorized in writing by the authorized officer of the surface management agency if it is shown to the satisfaction of the officer that the proposed disturbance or occupancy will not impair the visual resources of the area.
ASFO 33	**VISUAL RESOURCE MANAGEMENT (VRM) CLASS II and III:** These areas have moderate to high quality visual resources. The objectives of these classes are to retain the existing character of the landscape in Class II and to partially retain the existing character of the landscape in Class III. Exploration, drilling and other development or production activities must meet the objectives of VRM Class II and III.

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 34	**HISTORIC AND RECREATION TRAIL CORRIDORS:** In order to reduce conflicts with recreation opportunities along historic and recreation trail corridors on the Arizona Strip, measures may be required of the lessee\operator by the surface management agency to reduce potential visual (including night sky conditions), audible, and recreation setting impacts associated with surface disturbing activities and construction of above ground structures. Exceptions to these measures may be specifically authorized through a permit issued by the federal surface management agency if it is shown to the satisfaction of the authorized officer that the proposed operations and occupancy will not adversely impact recreation opportunities in the vicinity of these trails.
ASFO 35	**CULTURAL RESOURCES:** Cultural properties eligible for or listed on the National Register of Historic Places must be avoided by a sufficient distance to allow permanent protection. If avoidance is not possible, appropriate mitigation would apply, ranging from limited testing or detailed recording to extensive excavation. Any mitigation would be tailored to fit the specific circumstances and may be reviewed by the Arizona State Historic Preservation Officer and the Advisory Council on Historic Preservation. Cultural surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management. Surveys will conform to the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation, including the Professional Qualifications Standards, and with BLM and AZ SHPO requirements and protocols. Cultural surveys must also be performed under a current Arizona BLM Cultural Resource Use Permit. Based on the results of the field survey, the authorized officer will determine appropriate mitigation.
ASFO 36	**LEASE STIPULATION - CULTURAL RESOURCES ACEC** In order to protect cultural resources in the _____ ACEC a waivable no surface occupancy (WNSO) stipulation would apply. Surface occupancy could be allowed when specifically approved in writing by the authorized officer. The authorized officer may waive this stipulation on a case-by-case basis if it can be shown that: (1) Legal rights would be curtailed; (2) Cultural properties listed on or eligible for the National Register of Historic Places are not present in a specific project location, or; (3) The activity can be mitigated, appropriate mitigation would range from limited testing or detailed recording to extensive excavation. Any mitigation will be tailored to fit the specific circumstances and would be reviewed by the Arizona State Historic Preservation Officer and potentially by the Advisory Council on Historic Preservation. Cultural surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur within an ACEC. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management. Surveys will conform to the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation, including the Professional Qualifications Standards, and with BLM and AZ SHPO requirements and protocols. Cultural surveys must also be performed under a current Arizona BLM Cultural Resource Use Permit. Based on the results of the field survey, the authorized officer will determine appropriate mitigation.

APPENDIX 2.J

CULTURAL RESOURCE USE ALLOCATIONS

CULTURAL RESOURCES USE ALLOCATIONS

Cultural Resources, as directed in BLM Manual 8110, are allocated to appropriate use categories and managed in a manner to ensure, protect, or contribute to their assigned use. Use categories provide direction on which sites need to be protected and when or how use should be authorized. Cultural resources can be allocated to the various recognized use categories even before they are individually identified. Classes or types of sites, as well as specific sites, are allocated to one or more use categories during the planning process.

All BLM cultural properties in the Planning Area, whether already recorded or projected to occur will be allocated to the uses listed below, according to their nature and relative preservation value. These allocations pertain to cultural resources, not to areas of land.

Scientific Use applies to archaeological sites suitable for scientific or historic study, using currently available research techniques. Studies may employ non-intrusive methods, such as mapping or photo documentation, or other methods, such as collection or excavation, that result in the property's physical alteration or destruction. Properties allocated to this category must be preserved until their research potential is realized. Research projects, including data recovery, must be approved by the BLM. The majority of the cultural properties in a given geographic area will be allocated to the category of scientific use. Scientific use may be compatible with other use categories when studies involve limited alteration of a property.

Conservation for Future Use category is reserved for exceptionally rare or important cultural properties suitable for long-term preservation. Management objectives emphasize protection of a site's present condition and setting, as well as its preservation, until specified provisions are met in the future. The BLM will restrict activities, including cultural resource uses that threaten the condition of a site allocated to this category. However, this use category may be compatible with other uses, such as traditional use or public use, for which long-term preservation is desirable.

Traditional Use is applied to a property known to be perceived by a specified social and/or cultural group as important in maintaining the cultural identify or heritage of the group. Cultural properties assigned to this category are to be managed in ways that recognize the importance ascribed to them and seek to accommodate their continuing traditional use. Long-term preservation is desirable, with use limitations or protective measures developed through consultations with the appropriate tribes or cultural groups.

Public Use may be applied to a property appropriate as an interpretive exhibit in place or for related educational or recreational uses by the general public. Long-term preservation is desirable, in conjunction with on-site interpretation and/or public visitation. Management actions at specific sites will involve the determination of permitted uses, use limitations, protective measures, and design requirements.

Experimental Use may be applied to a property judged suitable for controlled experimental study that would result in the property's alteration, possibly including loss of integrity and destruction of physical elements. Experimental study should aim toward practical management objectives, such as understanding the kinds and rates of natural or human-caused deterioration, testing the effectiveness of protection measures, or developing new research or interpretive methods. Experimental use should not be applied to properties with strong research potential, traditional cultural importance, or good public use potential, if it would significantly diminish those uses.

Discharged from Management is assigned to properties that have no remaining identifiable use, in reference to the categories described above. Most often these are archaeological sites, such as small surface scatters of artifacts or debris, whose limited research potential is effectively exhausted as soon as they have been documented. This category may also apply to more complex properties that have had their significant information collected and preserved through scientific data recovery to mitigate the impacts of a proposed action. Also, properties destroyed by natural events or human activities may be assigned to this category. Properties discharged from management are removed from further management attention and do not constrain other land uses. Specific cultural properties must be inspected in the field and recorded before they can be discharged from management.

The following desired outcomes and management actions apply to cultural properties allocated to specific cultural resource uses.

Table 1. Cultural Resource use allocations and desired outcomes:

Use Allocation[1]	Desired Outcomes
a. Scientific Use	Preserved until research potential is realized
b. Conservation for Future Use	Preserved until conditions for use are met
c. Traditional Use	Long-term preservation
d. Public Use	Long-term preservation, on-site interpretation
e. Experimental Use	Protected until used
f. Discharged from Management	No use after recording; not preserved

[1] The majority of cultural properties in a given geographic area will fall into categories a and f. The less common properties in categories b through e are likely to be associated with particular settings that can be delineated geographically in the planning process. As the plan is developed, properties in categories b-d will require the most attention to balance their proactive uses with other land and resource uses.

Table 2. Cultural Resource use allocations and management actions:

Use Allocation	Management Action
Scientific Use	Permit appropriate research, including data recovery
Conservation for Future Use	Propose protective measures/designations
Traditional Use	Consult with tribes; determine limitations
Public Use	Determine permitted use[1]
Experimental Use	Determine nature of experiment
Discharged from Management	Remove protective measures

[1] Safeguards against incompatible land and resource uses may be imposed through withdrawals, stipulations on leases and permits, design requirements, and similar measures which are developed and recommended by an appropriately staffed interdisciplinary team.

Table 3. Types of Cultural Properties in the Planning Area and potential Use Allocations

Cultural Property Type	Potential Use Allocation
Habitation; village, town, pueblo, cabin, storage cists, trash middens,	A, B, C, D, E
Caves and Rock Shelters	A, B, C, D, E
Rock Art, historic inscriptions	A, B, C, D, E, F
Agricultural; terraces, water control features, ranching facilities	A, B, C, D, E, F
Resource Use; mines, artifact scatters, roasting pits, quarries, corrals, fences	A, B, C, D, E, F
Roads and trails	B, C, D, F
Sacred sites, cemeteries, graves	B, C

Use Allocations; A=Scientific Use, B=Conservation for Future Use, C=Traditional Use, D=Public Use, E=Experimental Use, F=Discharge from Management

APPENDIX 2.K

ACEC SUMMARY TABLE:
VALUES, RELEVANCE, AND IMPORTANCE CRITERIA

ACEC Summary Table: Values, Relevance, and Importance Criteria		
ACEC NAME (Alternative)	**VALUES**	**RELEVANCE AND IMPORTANCE**
Beaver Dam Slope ACEC (Alts A,B,C,D,E) 51,197 acres in Alt. E	Desert Tortoise Mojave Desert	Habitat essential for maintaining species diversity and critical habitat for threatened desert tortoise, of national worth and distinctiveness. Desert tortoise are fragile resources, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. Threats include loss of habitat, mortality from vehicle and OHV use, collection, disease, and predation.
Black Knolls ACEC (Alts B,C,E) 80 acres in Alt E	Holmgren Milkvetch	Habitat essential for rare, endemic endangered plant species of national worth and distinctiveness. The Holmgren Milkvetch and its community is fragile, sensitive, rare, irreplaceable, unique, endangered, and vulnerable to adverse change. The direct threat is destruction from vehicle and OHV use.
Buckskin ACEC (Alt B) 160 acres in Alt B	Cliff Milkvetch	Habitat essential for the rare, irreplaceable, unique, and sensitive Cliff milkvetch. The Cliff milkvetch has national worth and distinctiveness and is vulnerable to adverse change. The direct threat is from vehicle and OHV use.
Clayhole ACEC (Alt B) 7,362 acres in Alt B	Fick pincushion cactus	Habitat essential for rare, endemic threatened plant species and their communities of national worth and distinctiveness. The pincushion cacti and their communities are fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from vehicle and OHV use.
Coyote Valley ACEC (Alt B) 776 acres in Alt B	Paradine Pincushion Cactus	Habitat essential for endangered plant Paradine pincushion cactus
Fort Pearce ACEC (Alts A,B,C,E) 5,498 acres in Alt E	Critical Watershed Siler Pincushion Cactus	Critical watershed of regional importance for St. George, Utah area. Habitat essential for rare, endemic threatened plant species of national worth and distinctiveness. The Siler Pincushion Cactus and its community is fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from vehicle and OHV use.
Grey Points ACEC (Alt B) 12,881 acres in Alt B	Desert Bighorn Sheep Gierisch Globe Mallow Scenic Wilderness Characteristics	Wildlife resource including a population of desert bighorn sheep and habitat essential for maintaining species diversity. Desert bighorn sheep are a unique wildlife resource and are vulnerable to change. Threats include OHV, disease, domestic livestock, and predation. Habitat essential for rare, sensitive plant species of national worth and distinctiveness. The Gierisch globe mallow and its community is fragile, sensitive, rare, irreplaceable, unique, and vulnerable to adverse change. The direct threat is destruction from OHV use.

ACEC Summary Table: Values, Relevance, and Importance Criteria		
ACEC NAME (Alternative)	**VALUES**	**RELEVANCE AND IMPORTANCE**
		Significant scenic values at the eastern entrance to the Virgin River Gorge. Significant lands of regional and national importance containing wilderness characteristics with a high degree of naturalness, outstanding opportunities for solitude, and opportunities for primitive and unconfined recreation.
Hurricane Cliffs ACEC (Alt B) 23,464 acres in Alt B	Bighorn Sheep Riparian Wilderness characteristics	Essential habitat for maintaining species diversity of desert bighorn sheep, with regional worth and distinctiveness. Threats include loss of habitat, harassment by OHV, disease threat from domestic livestock, and predation. The riparian areas are natural systems that include rare, endemic plant communities and have regional significance. It is fragile, irreplaceable, and unique and is vulnerable to adverse change. Threats include dewatering, loss of habitat due to development, flooding, and alteration of stream channel. Significant lands of regional and national importance containing wilderness characteristics with a high degree of naturalness, outstanding opportunities for solitude, and opportunities for primitive and unconfined recreation.
Johnson Spring ACEC (Alts A,B,C,E) 2,058 acres in Alt E	Cultural Scenic Siler Pincushion Cactus	Significant regionally important cultural resources vulnerable to vandalism and impacts. Significant national and regional scenic values visible from Highway 89 and 89A, the Shinarump Cliffs provide a natural scenic area. Habitat essential for rare, endemic threatened plant species and their communities of national worth and distinctiveness. The pincushion cacti and their communities are fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from OHV use.
Kanab Creek ACEC (Alts B,C,E) 13,146 acres in Alt. E	Cultural Endangered Bird Riparian Scenic Wilderness characteristics	Significant regionally important cultural resources vulnerable to vandalism and impacts. The riparian area is a natural system that includes rare, endemic plant communities and suitable unoccupied habitat for endangered SW willow flycatcher. It has regional significance. The riparian area is fragile, irreplaceable, and unique and is vulnerable to adverse change. Cause for concern is dewatering, loss of habitat due to development, flooding, and alteration of the stream channel. Significant lands of regional importance containing wilderness characteristics with a high degree of naturalness,

ACEC Summary Table: Values, Relevance, and Importance Criteria		
ACEC NAME (Alternative)	**VALUES**	**RELEVANCE AND IMPORTANCE**
		outstanding opportunities for solitude, and opportunities for primitive and unconfined recreation.
Lime Kiln/Hatchet Canyon ACEC (Alt B) 11.731 acres in Alt B	Desert Bighorn Sheep Scenic Wilderness characteristics	Wildlife resource including a population of desert bighorn sheep and habitat essential for maintaining species diversity. Desert bighorn sheep are a unique wildlife resource and are vulnerable to change. Threats include harassment by OHV, disease threat from domestic livestock, and predation. Significant regional scenic values in Lime Kiln Canyon and at the crest of the Virgin Mountains overlooking Mesquite, Nevada to the north and Grand Canyon-Parashant National Monument to the south. Significant lands of regional importance containing wilderness characteristics with a high degree of naturalness, outstanding opportunities for solitude, and opportunities for primitive and unconfined recreation.
Little Black Mountain ACEC (Alts A,B,C,D,E) 241 acres in all Alts	Cultural	Significant regionally important cultural resources vulnerable to vandalism and impacts; rare and significant interpretive site.
Lone Butte ACEC (Alts B, C, E) 1,900 acres in Alt E	Cultural Jones Cyclad Scenic	Essential habitat for threatened Jone's cyclad and associated communities; a rare, endemic terrestrial plant. This area exhibits natural processes and systems and has national worth and distinctiveness. Jone's cyclad is irreplaceable, unique, threatened, and vulnerable to adverse change. Threats include limited distribution and potential for destruction by vehicle and OHV use. Significant regionally important cultural resources vulnerable to vandalism and impacts. Significant national and regional scenic values of this portion of the Vermilion Cliffs along Highway 389.
Lost Spring Mountain ACEC (Alts A,B,C,E) 17,744 acres in Alt E	Cultural Siler Pincushion Cactus Wilderness characteristics	Significant regionally important cultural resources vulnerable to vandalism, OHV damage, and impacts. Habitat essential for rare, endemic threatened plant species and their communities of national worth and distinctiveness. The pincushion cacti and their communities are fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from vehicle and OHV use. Significant lands of regional and national importance containing wilderness characteristics with a high degree of naturalness, outstanding opportunities for solitude, and opportunities for primitive and unconfined recreation.

ACEC Summary Table: Values, Relevance, and Importance Criteria		
ACEC NAME (Alternative)	**VALUES**	**RELEVANCE AND IMPORTANCE**
Marble Canyon ACEC (Alts A,B,C,D,E) 9,852 acres in Alt E	Brady Pincushion Cactus Cultural Raptors Scenic	Habitat essential for rare, endemic threatened plant species and their communities of national worth and distinctiveness. The pincushion cacti and their communities are fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from OHV use. Raptors, particularly the California condor, are known to frequent the ACEC during cooler months of the year. Threats include lead poisoning and human interference. Significant regional important cultural resources vulnerable to vandalism, OHV damage, and impacts in Alt B. Significant national and regional scenic values on the rim of the Colorado River at Marble Canyon.
Moonshine Ridge ACEC (Alts A,B,C,E) 9,231 acres in Alt E	Cultural Scenic Siler Pincushion Cactus	Significant regionally important cultural resources vulnerable to vandalism, OHV damage, and impacts. Significant regional scenic values of the Shinarump cap on Yellowstone Mesa, visible from Highway 389. Habitat essential for rare, endemic threatened plant species and their communities of national worth and distinctiveness. The pincushion cacti and their communities are fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from vehicle and OHV use.
Nampaweap ACEC (Alt A) 535 acres	Cultural	Significant regionally important cultural resources vulnerable to vandalism, OHV damage, and impacts.
Pakoon ACEC (Alt A) **DWMA** (Alts B, C, D, E) 76,014 acres	Desert Tortoise	Habitat essential for maintaining species diversity and critical habitat for threatened desert tortoise, of national worth and distinctiveness. Desert tortoise are fragile resources, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. Threats include loss of habitat, mortality from vehicle and OHV use, collection, disease, and predation.
Shinarump ACEC (Alts B,E) 3,619 acres in Alt E	Cultural Scenic Siler Pincushion Cactus	Significant regionally important cultural resources vulnerable to vandalism, vehicle and OHV damage, and impacts Significant regional scenic values of this portion of the Shinarump cap on mesa tops east of Fredonia visible from Highway 89.

ACEC Summary Table: Values, Relevance, and Importance Criteria		
ACEC NAME (Alternative)	**VALUES**	**RELEVANCE AND IMPORTANCE**
		Habitat essential for rare, endemic threatened plant species and their communities of national worth and distinctiveness. The pincushion cacti and their communities are fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from vehicle and OHV use.
Twist Hills ACEC (2 locations) (Alt B) 1,255 acres in Alt B	Fick Pincushion Cactus	Habitat essential for rare, endemic, terrestrial candidate species of national worth and distinctiveness. The Fick Cactus and its community is fragile, sensitive, rare, irreplaceable, unique, and vulnerable to adverse change. The direct threat is destruction from OHV use.
Virgin River Corridor ACEC (Alts A,B,C,D,E) 2,063 acres in Alt E	Cultural Endangered Fish Riparian Scenic	Significant regionally important cultural resources vulnerable to vandalism, and vehicle and OHV damage. Essential habitat critical to the survival and recovery of the wildlife species including populations of endangered woundfin minnow and endangered Virgin River chub. Threats include loss of habitat, mortality from vehicle and OHV use, collection, disease, and predation. The riparian area is a natural system that includes rare, endemic plant communities and has regional significance. The riparian area is fragile, irreplaceable, and unique and is vulnerable to adverse change. Threats include dewatering, loss of habitat due to development, flooding, and alteration of stream channel. Significant national and regional scenic values in the Virgin River Gorge.
Virgin Slope ACEC (Alts A,B,C,D,E) 40,206 acres in Alt. E	Desert Tortoise Wilderness characteristics	Habitat essential for maintaining species diversity and critical habitat for threatened desert tortoise, of national worth and distinctiveness. Desert tortoise are a fragile resource, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. Threats include loss of habitat, mortality from vehicle and OHV use, collection, disease, and predation. Significant lands of regional and national importance containing wilderness characteristics with a high degree of naturalness, outstanding opportunities for solitude, and opportunities for primitive and unconfined recreation.
Witch Pool ACEC (Alt A) 279 acres	Cultural	Significant regionally important cultural resources vulnerable to vandalism, OHV damage, and impacts.

APPENDIX 2.L

VISUAL RESOURCE MANAGEMENT CLASSES AND CRITERIA FOR CLASSES

Visual Resource Management Classes and Criteria for Classes

A. Introduction

Visual resource values are managed in accordance with visual resource management (VRM) class objectives (standards and guidelines). Following the update of the existing visual resource inventory for the planning effort to incorporate identified National Monument scenic values and higher public sensitivity to those values, VRM classes were designated for all areas of BLM land under all alternatives and for NPS lands under Alternatives B through E. The inventory served as the basis for considering and developing VRM allocations and management for other land uses was fully considered.

By design and policy, VRM management classes may differ from VRM inventory classes, based on management priorities for land uses. Once allocated and following the completion of the land use plan and the signing of the Record of Decision for the EIS, other resource uses and management activities would be managed to be consistent with the VRM objectives established in the land use plan. Visual resource design techniques and best management practices would be used to mitigate the potential for short- and long-term visual impacts from such uses and activities.

Contrast ratings would be required for all major projects proposed on public lands that fall within VRM Class I, II, and III areas which have high sensitivity levels. By using contrast ratings as a design tool to assist management, rather than as a means to preclude development, potential visual impacts to visual resources would be minimized. And it is the VRM class objectives (standards and guidelines) against which a contrast rating effort measures the potential for unacceptable change to landscape conditions.

In applying the VRM Class objectives in the various RMP alternatives, the following general criteria were considered:

- Consider the overall management emphasis intended for each alternative.
- Recognize all applicable special area designations and all land use allocations as VRM classifications are applied.
- Assure that other management activities and land uses being provided for in a specific area may be achieved within the VRM Class objective being set, consistent with special area designations and land use allocations.
- Use the least restrictive class that still achieves objectives to attain desired future conditions.

Setting VRM Class objectives that would make it difficult to achieve management activities or uses identified elsewhere within each plan alternative was avoided during the allocation process. The least restrictive class that would still achieve visual objectives to attain desired future conditions was considered and applied. For example, VRM Class I was typically assigned to those areas where congressionally and administratively decisions have been or will be made to preserve a natural landscape.

VRM Class standards and guidelines are set by Bureau policy and the critical concepts are summarized here (see also Visual Resources Table 2.8, I.B, Resource Standards and Guidelines):

VRM Class I	VRM Class II
Preserve existing character	**Retain** existing character
Natural ecological changes	**Changes repeat the basic elements** of form, line, color, and texture found in the predominant natural features of the characteristic landscape
Very limited management activity	Management activities **may be seen**
Change-**very low**	Change-**low**
Must not attract attention	**Should not attract attention** of casual observer
VRM Class III	**VRM Class IV**
Partially retain existing character	**Allow major modifications** of existing character
Changes should repeat the basic elements in the predominant natural features of the characteristic landscape (management activities not addressed)	**Make every attempt to minimize the impact** of activities through careful location, minimal disturbance, and repeating the basic elements **Provide for management activities** which require major modifications of existing landscape character
Change-**moderate**	Change-**major**
May attract attention but should not dominate the casual observer's view	**May dominate the view** and be the major focus of viewer attention

B. Specific Criteria for VRM Classes by Alternative

The following specific criteria were used to define VRM classes by alternative and are reflected on the GIS maps and in the acreage numbers in this Draft Plan/DEIS.

Alternative B

Class I

- Designated Wilderness (BLM)
- Lake Mead Proposed Wilderness (NPS)
- Selected Areas having wilderness characteristics (Scenic Quality Class A; slopes greater than 30 degrees with no potential for vegetation restoration/treatment)
- Areas having wilderness characteristics in Parashant Canyon and Lower Andrus Canyon
- Within Vermilion Cliffs National Monument (Vermilion), all Scenic Quality Class A areas.

Class II

- Grand Canyon-Parashant National Monument (Parashant) areas outside Class I areas above or Class IV areas below
- Vermilion areas outside Class I areas above
- All Areas of Critical Environmental Concern (ACECs)
- Areas that could be seen from three different vantage points in St. George, Utah area
- Selected areas having wilderness characteristics for Alternative B
- ¼ mile buffer off Historic and Recreation Trails outside Virgin River/I-15 corridor
- Virgin Ridge Special Recreation Management Area (SRMA)
- Virgin River Gorge Recreation Withdrawal

Class III

- All remaining area in the Arizona Strip Field Office (FO) not already listed above or in Class IV below

Class IV

- Utility Corridor
- Mineral Material Sites
    - 100 ft buffer off of known Free Use Permit areas
    - 500 ft buffer off of Common Use or Community Pits
    - Boundary of Mineral Material Sale areas
- Gypsum Mine area outside St. George, Utah

Alternative C

Class I

- Designated Wilderness (BLM)
- Lake Mead Proposed Wilderness (NPS)
- Selected Areas having wilderness characteristics (Scenic Quality A; slopes greater than 30 degrees, no potential for vegetation restoration/treatment)
- Areas having wilderness characteristics in Parashant Canyon, and Lower Andrus Canyon
- Within the Vermilion, the intersection of Scenic Quality Class A areas and Areas having wilderness characteristics.

Class II

- Western part of Parashant outside potential vegetation restoration/treatment areas and Class I areas above or Class III below
- Vermilion areas outside Class I areas above
- Areas that can be seen from three different communities in St. George, Utah area
- Selected areas having wilderness characteristics for Alternative C
- ¼ mile buffer off Historic and Recreation Trails
- Virgin Ridge Special Recreation Management Area (SRMA)
- Virgin River Gorge Recreation Withdrawal

Class III

- Eastern part of Parashant where there is strong potential for future vegetation restoration/treatment
- All remaining area in the Arizona Strip FO not already listed above or in Class IV below

Class IV

- Utility Corridor
- Mineral Material Sites
    - 100 ft buffer off of known Free Use Permit areas
    - 500 ft buffer off of Common Use or Community Pits
    - Boundary of Mineral Material Sale areas
- Gypsum Mine outside St. George, Utah

Alternative D

Class I
- Designated Wilderness (BLM)
- Lake Mead Proposed Wilderness (NPS)

Class II
- Western part of Parashant outside potential vegetation restoration/treatment areas and Class I areas above or Class IV below
- Vermilion areas outside Class I areas above
- Areas that can be seen from three different vantage points in St. George, Utah area
- Selected areas having wilderness characteristics under Alternative D
- ¼ mile buffer off Historic and Recreation Trails
- Virgin Ridge Special Recreation Management Area (SRMA)
- Virgin River Gorge Recreation Withdrawal

Class III
- Eastern part of the Parashant where there is strong potential vegetation restoration/treatment
- All remaining area in the Arizona Strip FO not already listed above

Class IV
- Utility Corridor
- Mineral Material Sites
    - 100 ft buffer off of known Free Use Permit areas
    - 500 ft buffer off of Common Use or Community Pits
    - Boundary of Mineral Material Sale areas
- Gypsum Mine outside St. George, Utah

Alternative E

Class I
- Designated Wilderness (BLM)
- Lake Mead Proposed Wilderness (NPS)

Class II
- Western part of Parashant outside potential vegetation treatment areas and Class I areas above or Class IV below
- Vermilion areas outside Class I areas above
- All ACECs
- Areas that can be seen from three different vantage points in St. George, Utah area
- Selected Areas having wilderness characteristics (slopes greater than 30 degrees, no potential for vegetation treatment or restoration)
- Areas having wilderness characteristics in Parashant Canyon and Lower Andrus Canyon
- ¼ mile buffer off Historic and Recreation Trails outside Virgin River/I-15 corridor
- Virgin Ridge Special Recreation Management Area (SRMA)
- Virgin River Gorge Recreation Withdrawal

Class III

- Eastern part of the Parashant with potential vegetation restoration/treatment
- All remaining area in the Arizona Strip FO not already listed above or in Class IV below

Class IV

- Utility Corridor
- Mineral Material Sites
    - 100 ft buffer off of known Free Use Permit areas
    - 500 ft buffer off of Common Use or Community Pits
    - Boundary of Mineral Material Sale areas
- Gypsum Mine outside St. George, Utah

APPENDIX 2.M

LANDS IDENTIFIED FOR DISPOSAL

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
T. 39 N., R. 6 E.,	0			
sec. 27, SW1/4SW1/4;	40.00	FLPMA 206	None	None
sec. 33, that portion east of Hwy 89A; (acres estimated)	160.00	A&AIA	None	None
sec. 34, W1/2W1/2.	160.00	A&AIA	None	None
T. 39 N., R. 7 E.,	0			
sec. 7, that portion between the wilderness boundary, Hwy 89A, Vermilion Cliffs Lodge, and Badger Creek Subdivision; (acres estimated)	44.00	FLPMA 206	FLPMA 203 & 206, R & PP, FLTFA	FLPMA 203 & 206, R & PP, FLTFA
T. 40 N., R. 3 E.,	0			
sec. 34, SE1/4NE1/4, S1/2NW1/4SE1/4, N1/2SW1/4SE1/4, SE1/4SE1/4, S1/2NE1/4NE1/4, SE1/4NE1/4SW1/4, and NE1/4SE1/4SW1/4.	160.00	FLPMA 206	None	None
T. 41 N., R. 8 E.,	0			
sec. 17, S1/2;	320.00	FLPMA 203 & 206, R&PP	None	None
sec. 18, SE1/4;	160.00	FLPMA 203 & 206, R&PP	None	None
sec. 19, NE1/4;	160.00	FLPMA 203 & 206, R&PP	None	None
sec. 20, NW1/4;	160.00	FLPMA 203 & 206, R&PP	R&PP	R&PP
sec. 21, N1/2N1/2.	160.00	None	R&PP	R&PP
T. 34 N., R. 8 W.,	0			
sec. 15, S1/2SE1/4SW1/4;	20.00	FLPMA 206	None	None
sec. 22, W1/2W1/2NE1/4.	40.00	FLPMA 206	None	None
T. 35 N., R. 10 W.,	0			
sec. 4, lots 1 to 4, inclusive, S1/2N1/2, and S1/2;	642.68	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
sec. 8, N1/2;	320.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 9, N1/2 and SE1/4;	480.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 11, S1/2NW1/4.	80.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 36 N., R. 10 W.,				
sec. 20, S1/2;	320.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 28, W1/2;	320.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 29, NE1/4;	160.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 33, W1/2.	320.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 39 N., R. 1 W.,				
sec. 22, N1/2NE1/4.	80.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 39 N., R. 5 W.,				
sec. 7, E1/2;	320.00	FLPMA 206	None	None
sec. 8, N1/2.	320.00	FLPMA 206	None	None
T. 39 N., R. 6 W.,				
sec. 3, lots 1 and 2, S1/2NE1/4, and SE1/4;	319.98	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 10, E1/2;	320.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 11, S1/2;	320.00	FLPMA 206	None	None
sec. 15, N1/2;	320.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 20, N1/2NE1/4.	80.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 39 N., R. 16 W.,				
sec. 3, SW1/4SE1/4;	40.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 3, N1/2NE1/4SW1/4;	20.00	FLPMA 206		
sec. 4, lot 2;	39.97	FLPMA 203 & 206	FLPMA 203 & 206, FLTFA	FLPMA 203 & 206, FLTFA
sec. 5, lots 2 and 3, inclusive, N1/2 lot 6, and N1/2SW1/4SE1/4; (acres estimated)	118.21	FLPMA 203 & 206	FLPMA 203 & 206, FLTFA	FLPMA 203 & 206, FLTFA

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
sec. 8, lot 4, SE1/4SW1/4, and S1/2SE1/4;	157.49	None	None	FLPMA 203 & 206, R&PP
sec. 9, SW1/4NE1/4 and SE1/4;	200.00	FLPMA 206	None	FLPMA 203 & 206, R&PP, FLTFA
sec. 9, SW1/4;	160.00	None	None	FLPMA 203 & 206, R&PP
sec. 10, W1/2NE1/4, SE1/4NW1/4, and NE1/4SE1/4;	160.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 17, lots 1 to 4, inclusive, and W1/2E1/2.	312.64	None	None	FLPMA 203 & 206, R&PP
T. 40 N., R. 5 W.,				
sec. 6, lots 2, 3, 4, and 7, SE1/4SW14, and SW1/4SE1/4.	196.44	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 6, E1/2SE1/4.	80.00	FLPMA 206	None	None
T. 40 N., R. 6 W.,				
sec. 1, lots 1 to 4, inclusive, SE1/4NE1/4, SW1/4NW1/4, and W1/2SW1/4;	270.36	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 3, lots 1 and 2, S1/2NE1/4, and SE1/4;	294.90	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 4, SW1/4 and W1/2SE1/4;	240.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 5, lots 3 and 4, S1/2NW1/4, E1/2SW1/4, and SE1/4;	375.29	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 6, lot 7, SE1/4SW1/4, and SE1/4;	237.55	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 7, lots 1 to 4, inclusive, E1/2, and E1/2W1/2;	630.16	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec, 8, NW1/4NW1/4;	40.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 9, all;	640.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
sec. 17, S1/2;	320.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 18, lots 1 to 4, inclusive, E1/2, and E1/2W1/2;	630.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 19, lots 1 and 2, NE1/4, and E1/2NW1/4;	314.98	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 20, all;	640.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 27, E1/2;	320.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 34, E1/2.	320.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 40 N., R. 7 W.,				
sec. 1, lots 1 to 4, inclusive, S1/2N1/2, and S1/2;	625.64	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 6, S1/2NE1/4;	80.00	FLPMA 203 & 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 12, all;	640.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 13, all.	640.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 40 N., R. 15 W.,				
sec. 4, lot 6; (1994 RMP Amendment)	18.31	FLMPA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 4, S1/2SE1/4 above Virgin River Rim; (acres estimated)	75.00	FLPMA 203 & 206	None	FLPMA 203 & 206, R&PP, FLTFA
sec. 6, lots 1 to 7, inclusive, S1/2NE1/4, SE1/4NW1/4, and E1/2SW1/4;	462.88	FLPMA 206	None	FLPMA 203 & 206, R&PP, FLTFA
sec. 19, lots 1, 2 (part), and 3 (part), inclusive, west of Virgin River and above rim. (acres estimated)	60.94	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 40 N., R. 16 W.,				

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
sec. 13, SE1/4NE1/4, S1/2SW1/4, and SE1/4 east of I-15; (acres estimated)	220.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 23, E1/2NE1/4, SE1/4, and SE1/4SW1/4 east of I-15; (acres estimated)	260.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 24, N1/2, SW1/4, N1/2SE1/4, and SW1/4SE1/4;	600.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 33, N1/2NE1/4 and NW1/4;	240.00	FLPMA 206	None	FLPMA 203 & 206, R&PP, FLTFA
sec. 34, N1/2NW1/4 north of I-15; (acres estimated)	60.00	FLPMA 206	None	FLPMA 203 & 206, R&PP, FLTFA
sec. 34, N1/2NW1/4 south of I-15. (acres estimated)	20.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 35, SW1/4SW1/4. (1994 RMP Amendment)	40.00	FLPMA 206	None	None
T. 41 N., R. 2 W.,				
sec. 10, E1/2;	320.00	FLPMA 203 & 206, R&PP	None	None
sec. 10, E1/2W1/2, SW1/4 NW1/4, and W1/2SW1/4;	280.00	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 15, E1/2;	320.00	FLPMA 203 & 206, R&PP	None	None
sec. 15, W1/2;	320.00	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 22, all;	640.00	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 23, N1/2;	320.00	FLPMA 206	None	None
sec. 23, S1/2;	320.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 24, NW1/4;	160.00	FLPMA 206	None	None
sec. 24, SW1/4;	160.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
sec. 26, all;	640.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 33, E1/2, E1/2NW1/4, and SW1/4;	560.00	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 34, N1/2 and SW1/4;	480.00	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 35, N1/2N1/2.	160.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 41 N., R. 5 W.,				
sec. 17, N1/2N1/2N1/2NE1/4 and N1/2N1/2N1/2NE1/4NW1/4;	30.00	None	FLPMA 203 & 206	FLPMA 203 & 206
sec. 20, W1/2NW1/4;	80.00	FLPMA 203 & 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 30, lot 3, NE1/4SW1/4;	79.40	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 30, lot 4, SE1/4SW1/4;	79.31	FLPMA 206	None	None
sec. 31, lots 1 to 4, inclusive, E1/2, and E1/2W1/2;	638.52	FLPMA 206	None	None
T. 41 N., R. 6 W.,				
sec. 5, lot 11 and SE1/4SW1/4;	80.73	FLPMA 206	None	None
sec. 8, W1/2E1/2E1/2 and NW1/4SE1/4; (acres estimated)	120.00	FLPMA 206	None	None
sec. 16, S1/2;	320.00	FLPMA 203 & 206, R&PP	None	None
sec. 25, E1/2SE1/4;	80.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 31, S1/2NE1/4, SE1/4NW1/4, NE1/4SW1/4, N1/2SE1/4, and SE1/4SE1/4;	280.00	FLPMA 203 & 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 33, S1/2;	320.00	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
sec. 34, S1/2;	320.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 35, NE1/4 and S1/2.	480.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 41 N., R. 7 W.,				
sec. 4, lots 3 and 4, SW1/4NE1/4, S1/2NW1/4, NE1/4SW1/4, N1/2SE1/4, SE1/4SE1/4;	360.39	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 10, SE1/4NE1/4 and NE1/4SE1/4;	80.00	None	A&AIA	A&AIA
sec. 13, lots 1 to 4, inclusive, NE1/4SW1/4, and W1/2SW1/4;	237.74	FLPMA 203 & 206, A&AIA	FLPMA 203 & 206, R&PP, FLTFA, A&AIA	FLPMA 203 & 206, R&PP, FLTFA, A&AIA
sec. 14, lots 1 to 8, inclusive, S1/2NW1/4, NW1/4SW1/4, S1/2SW1/4, E1/2SE1/4;	451.84	FLPMA 203 & 206, A&AIA	FLPMA 203 & 206, R&PP, FLTFA, A&AIA	FLPMA 203 & 206, R&PP, FLTFA, A&AIA
sec. 23, N1/2NE1/4 and NE1/4NW1/4;	120.00	FLPMA 203 & 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 26, S1/2NE1/4 and S1/2;	400.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 35, all.	640.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 41 N., R. 11 W.,				
sec. 6, lots 1 and 2, S1/2NE1/4, and SE1/4;	321.25	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 7, NE1/4.	160.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 41 N., R. 12 W.,				
sec. 6, lots 1 to 5, inclusive, SE1/4NW1/4;	237.74	FLPMA 203 & 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 7, lots 1 to 4 inclusive, E1/2, and E1/2W1/2 east of 500 kV powerline; (acres estimated)	635.76	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 8, SW1/4NW1/4 and W1/2SW1/4.	120.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
sec. 18, NE1/4 and NE1/4NW1/4 portion east of 500 kV powerline; (acres estimated)	100.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 41 N., R. 13 W.,				
sec. 1, S1/2NE1/4, SE1/4NW1/4, and SE1/4 only portion east of 500 kV powerline; (acres estimated)	280.00	FLPMA 203 & 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 1, SW1/4NW1/4 portion west of 500 kV powerline and W1/2SW1/4; (acres estimated)	120.00	FLPMA 203 & 206	None	None
sec. 12, NE1/4 and NE1/4SE1/4 portions east of 500 kV powerline. (acres estimated)	120.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 41 N., R. 15 W.,				
sec. 28, SW1/4SW1/4SW1/4; (triangle-acres estimated) (1994 RMP Amendment)	5.00	FLPMA 206	None	None
sec. 31, E1/2;	320.00	FLPMA 206	None	None
sec. 33, lot 8, SW1/4NE1/4, NW1/4SE1/4, N1/2SW1/4SE1/4, SE1/4SW1/4SE1/4;	114.86	FLPMA 203 & 206, R&PP	None	None
sec. 33, lots 7 and 9 to 13, inclusive, and E1/2E1/2SE1/4SW1/4;	64.76	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 34, S1/2NE1/4 above Virgin River Rim; (acres estimated)	60.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 35, SE1/4 all south of I-15. (acres estimated)	160.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 42 N., R. 6 W.,				
sec. 32, W1/2SW1/4SE1/4NE1/4SW1/4 and E1/2SE1/4SW1/4NE1/4SW1/4.	2.50	None	None	FLPMA 203 & 206, R&PP

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
T. 42 N., R. 7 W.,				
sec. 33, lots 2, 3, and 4, and S1/2.	393.74	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 42 N., R. 11 W.,				
sec. 31, lots 1 and 2, and SE1/4.	202.46	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 42 N., R. 12 W.,				
sec. 31, lots 1 and 2, and N1/2SE1/4;	139.98	FLPMA 206	None	None
sec. 31, lots 3 to 6, inclusive, E1/2SW1/4, and S1/2SE1/4.	296.41	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
TOTAL ACRES	30840.21			

*Authority for Disposal;
FLPMA 203 – Federal Land Policy and Management Act, Section 203
FLPMA 206 – Federal Land Policy and Management Act, Section 206
FLTFA – Federal Land Transaction Facilitation Act
R&PP – Recreation and Public Purposes Act
A&AIA – Airport and Airways Improvement Act

APPENDIX 2.N

ALLOTMENT MANAGEMENT STATUS AND ALLOTMENT MANAGEMENT PLAN STATUS

ALLOTMENT MANAGEMENT STATUS AND ALLOTMENT MANAGEMENT PLAN STATUS

Resource Area: Arizona Strip Field Office

Allotment Name	Allotment Number	Management Status[2]	AMP[3]	Current Mgt
Antelope	05206	M	A	Rest-Rotation
Antelope Spring	05210	I	A	Best Pasture
Atkin Well	05207	I	A	Deferred
Badger Creek	05341	M	A	Deferred
Beanhole Well	05334	I	A	Deferred
Beaver Dam Slope	04828	M	A	Deferred
Black Canyon	05256	C		Winter Spring
Black Knolls	05264	I	A	Rest-Rotation
Black Rock	04841	I	A	Deferred
Blake Pond	04813	M	A	Deferred
Brown-Shumway	05302	M	A	Deferred
Button	05308	C	A	Winter Spring
Canaan Gap	05205	I	A	Deferred
Cane Beds	05212	M	A	Season Long
Cedar Knoll	05318	M	A	Rest-Rotation
Cedar Pockets Ut	04866	I	A	Deferred
Cedar Ridge	05303	C	A	Spring
Cedar Wash	04842	I	A	Winter
Chatterly	05307	I	A	Deferred
Clay Spring	04845	M	A	Deferred
Clayhole	05215	I	A	Best Pasture
Cottonwood	05209	M	C	Deferred
Cowboy Butte	05310	M	A	Rest-Rotation
Coyote	05327	I	A	Deferred
Coyote Spring	04805	I		Winter Spring
Crosby Tank	05219	I	A	Deferred
Diamond Butte	04833	I		Seasonal Rotation
Fern Tank	05217	I	A	Best Pasture
Ferrin	05246	C		Winter Spring
Flat Top Well	05214	I	A	Deferred
Franks Reservoir	05325	I	A	Rest-Rotation
Fuller Road	05324	I	A	Deferred
Glazier Dam	05202	M	A	Deferred
Grama Point	05233	M	A	Deferred
Gramma Spring	05225	C	A	Winter Spring
Gulch	05230	C		Winter Spring

[2] Management Status equates to the category that the allotment has been placed in reference to management intensity: I=Improve, M=Maintain, C=Custodial (See details below)
[3] Under the AMP label A= AMP developed, C=Coordinated management plan developed.

Resource Area: Arizona Strip Field Office

Allotment Name	Allotment Number	Management Status	AMP	Current Mgt
Gunsight	05320	I	A	Deferred
Hacks	05227	C	A	Winter Spring
Harris Well	05238	C		Winter Spring
Hat Knoll	04867	I	A	Deferred
Head Of Hacks	05232	I	A	Deferred
Herd House	00096	M		Winter Spring
Highway	04812	I	A	Winter
Highway	05309	C	A	Season Long
Home Ranch	05342	C		Winter Spring
Homestead	05253	I	A	Deferred
House Rock	05331	I	A	Deferred
Hurricane Cliff	05251	M		Winter Spring
Hurricane Rim	00114	M	A	Deferred
Ivanpah	04858	M	A	Deferred
Iverson	04834	C		Season Long
Jackson Tank	04830	M	A	Deferred
Jacob Canyon	05317	M	A	Winter Spring
Joe	05245	C		Season Long
Johnson Run	05330	M	A	Deferred
June Tank	05221	I	A	Rest-Rotation
Kanab Creek	05321	C	A	Winter Spring
Kanab Gulch	05224	C		Winter Spring
Lamb Tank	05257	M	A	Rest-Rotation
Lambing-Starvation	04838	M	A	Deferred
Lane	05271	C		Winter Spring
Lime Spring	02012	I		Seasonal Rotation
Little Tank	04853	M	A	Deferred
Little Wolf	04814	M	A	Rest-Rotation
Littlefield	04843	I		Seasonal Rotation
Littlefield Comm.	04827	I		Seasonal Rotation
Lizard	04857	M	A	Deferred
Loco Point	05260	I	A	Deferred
Lost Spring Gap	05316	C	A	Winter Spring
Lower Hurricane	04837	I	A	Best Pasture
Mainstreet	04808	M	A	Best Pasture
Mesquite Community	04832	I	A	Season Long
Moonshine	05237	M	A	Deferred
Mormon Well	04844	I		Winter
Mountain Sheep	04824	C		Winter Spring
Mud And Cane Spring	04850	I	A	Deferred
Muggins Flat	05313	I	A	Rest-Rotation

Resource Area: Arizona Strip Field Office

Allotment Name	Allotment Number	Management Status	AMP	Current Mgt
Mustang Spring	04859	I	A	Deferred
Navajo Wells Ut	05348	M	A	Deferred
Pat's Pond	04862	C		Season Long
Pigeon Tank	05322	I	A	Deferred
Pipe Valley	05242	M		Season Long
Pocum	04871	M		Season Long
Pocum Tank	04840	M	A	Deferred
Point Of Rock	05241	M		Season Long
Pratt Tank	05314	M	A	Rest-Rotation
Purgatory	04831	I	A	Winter Spring
Quail Canyon	04856	M	A	Deferred
Rider	05305	M	A	Winter Spring
Rock Canyon	00099	C		Winter Spring
Rock Canyon Tank	05319	I	A	Deferred
Rock Pockets	05213	M	A	Deferred
Rock Reservoir	05345	I	A	Deferred
Sage	05311	C		Winter Spring
Scotties Seep	05236	I	A	Deferred
Shinarump	05301	C		Summer & Fall
Short Creek	05270	C	A	Season Long
Shuttleworth	05315	M	A	Winter Spring
Soap Creek	05332	I	A	Winter Spring
State Line	05244	C	C	Season Long
Suicide	05323	I		Winter Spring
Sullivan Canyon	04810	I	A	Deferred
Sunshine	04863	I	A	Deferred
Sunshine Tank	05247	I	A	Deferred
Swapp Tank	05248	M	A	Deferred
Temple Trail	05216	I	A	Deferred
Toquer Tank	04861	M	A	Deferred
Tuckup	00097	M	A	Deferred
Valley Wash	05234	M	A	Rest-Rotation
Wells	05208	M	C	Season Long
White Pockets	05243	M		Season Long
White Sage	05349	I	A	Rest-Rotation
Whiterock-Soapstone	04804	M	A	Deferred
Wildband	05223	I	A	Deferred
Wolfhole Canyon Sp	04811	I	A	Deferred
Wolfhole Lake	04823	I	A	Deferred
Wolfhole Mountain	04839	M	A	Deferred
Yellowstone	05263	I	A	Deferred

Resource Area: *Vermilion NM*

Allotment Name	Allotment Number	Management Status	AMP	Current Mgt
Bunting Well	04847	M	A	Deferred
Ferry Swale	05336	M	A	Deferred
Sand Hills	05328	I	A	Rest-Rotation
Signature Rock	05350	I	A	Hgm 8 Past
Wahweap	05340	C		Season Long

Resource Area: Parashant NM

Allotment Name	Allotment Number	Management Status	AMP	Current Mgt
Belnap	04849	I		Summer
Belnap West	04822	M		Winter
Big Spring Pipeline	04870	M	A	Deferred
Cottonwood	04809	I	A	Deferred
Dripping Spring	04818	M	A	Winter Spring
Duncan Tank	04820	M	A	Deferred
Hidden Hills	04825	I	A	Summer & Fall
Hidden Spring	04803	I		Season Long
Imlay	04817	I	A	Winter Spring
Jump Canyon	04801	I	A	Winter Spring
Last Chance	04815	M	A	Deferred
Link Spring	04819	I	A	Deferred
Mosby	04835	M	A	Deferred
Mosby-Nay	04836	I		Deferred
Mt Trumbull	04826	M	A	Deferred
Mt. Logan	05218	I	A	Deferred
Mule Canyon	04821	M	A	Deferred
Pakoon	04802	M	A	Winter Spring
Pakoon Springs	04800	I		Season Long
Parashaunt BLM AMP	04829	M	A	Deferred
Pa's Pocket	04848	I	A	Winter Spring
Penns Well	04852	M	A	Rest-Rotation
Red Pond	04806	M	A	Deferred
Sullivan Tank	04816	M	A	Deferred
Tassi	04851	I		Unavailable
Tuweep	05220	I	A	Rest-Rotation
Wildcat	04854	I	A	Deferred

ALLOTMENT CATEGORIZATION CRITERIA

Maintain (M)

(a) Present range condition is satisfactory.

(b) Allotments have high or moderate resource potential and are producing near their potential (or trend is moving in that direction.)

(c) No serious resource-use conflicts/controversy exist.

(d) Opportunities may exist for positive economic return from public investments.

(e) Present management is satisfactory.

(f) Other criteria appropriate to the ES area.

Improve (I)

(a) Present range condition is unsatisfactory.

(b) Allotments have high to moderate resource production potential and are producing at low to moderate levels.

(c) Serious resource-use conflicts/controversy exists.

(d) Opportunities exist for positive economic return from public investments.

(e) Present management appears unsatisfactory.

(f) Other criteria appropriate to the ES area.

Custodial (C)

(a) Present range condition is not a paramount factor.

(b) Allotments have low resource production potential, and are producing near their potential.

(c) Limited resource-use conflicts/controversy may exist.

(d) Opportunities for positive economic return on public investment do not exist or are constrained by technological or economic factors.

(e) Present management appears satisfactory or is the only logical practice under existing resource conditions or land ownership pattern.

(f) Other criteria appropriate to the ES area.

APPENDIX 2.O

RECLAMATION STIPULATIONS

RECLAMATION STIPULATIONS

Appendix 2.N is a list of #general requirements for preserving and protecting the special environmental and unique resource values of the Arizona Strip. These requirements will guide the formulation of specific stipulations, construction and/or operating standards which will be applied to surface-disturbing activity. They are designed to provide public land users with a clear understanding of what constitutes prevention of unnecessary or undue degradation and what is required for reclamation. These requirements are supported by FLPMA, the Organic Act, and other environmental laws. Suitable site-specific stipulations regarding construction and reclamation and the prevention of unnecessary or undue degradation will be developed by the authorized officer and applied to each authorization In order to minimize long-term impacts and ensure that sites are effectively reclaimed.

UNNECESSARY OR UNDUE DEGRADATION

1. All surface disturbance, including road construction and associated travel, shall be kept to the minimum necessary to accomplish the task. Road upgrade and realignment requests on BLM lands shall include plans for reclamation and a proposal for a post-operations final alignment.

2. All new temporary or existing upgraded roads on BLM lands may require mitigation to reduce the potential adverse impact of fugitive dust as specified by the authorized officer.

3. Where soil characteristics warrant, topsoil shall be stockpiled from a surface depth specified by the authorized officer.

4. All surface-disturbing activities on slopes greater than 15 percent shall include measures to stabilize soils and control surface water runoff.

5. During construction and operation of facilities or improvements, care shall be taken to minimize, to the extent practicable, impacts to the natural and human environments. This may be accomplished through the painting or screening of structures and facilities to blend with the surrounding environment; the suppression of dust and noise; the proper disposal of waste products; and provisions to safeguard public safety.

6. Coloration products may be required along travel corridors and in VRM Class II areas to reduce color contrast and restore the natural color balance.

7. Construction and reclamation activities shall be designed to minimize long-term impacts to natural lines, form, textures and color contrast. Reclamation methods shall avoid disturbing more area or exposing greater color contrast than resulted from the original operation.

8. All facilities or improvements that are no longer needed must be removed.

9. In order to protect the wildlife, the public or other important values and discourage unnecessary public contact with authorized activities, the authorized officer may require improvements or facilities to be fenced, gated and locked.

10. Mineral material disposal in Arizona Strip FO VRM Class II areas shall not be allowed if reasonable alternative sources are available in other VRM classes. Any mineral material disposal sites authorized in VRM Class II shall not compromise the VRM class objectives.

11. All powerlines on BLM lands shall be constructed to minimize visual impacts. This may include burying them along existing roads in VRM Class II, ACECs or RCAs.

12. Applicants shall supply, at the discretion of the authorized officer, pertinent information regarding Impacts from the proposal on surface and groundwater quality and quantity and anticipated impacts from 100-year, 24-hour storm events.

13. All forms of residential occupancy are discouraged on public lands within the Arizona Strip District and prohibited on NPS lands. Exceptions may occur on BLM lands for the protection of public health and safety, the protection of private property. With regard to locatable mineral development on Arizona Strip FO lands, occupants must be actively and diligently engaged in substantially continuous operations. Intermittent, part time, seasonal or recreational mining operations do not meet district occupancy standards. All plans for residential occupancy must be fully incorporated into submitted notices and plans. All proposals for residential occupancy shall be subject to the requirement to prevent unnecessary or undue degradation and shall comply with all applicable state and federal laws, regulations and permits. Residential occupancy not in conformance with applicable laws, Bureau guidelines and district policy will be subject to immediate trespass action by the Bureau.

14. Applicants may be required by the authorized officer to provide inventories for threatened or endangered plants and/or animals and cultural resources. All Inventories shall be performed to Bureau or NPS standards.

15. No surface disturbance shall be authorized which would impact any cultural sites prior to consultation with the State Historic Preservation Officer (SHPO) and threatened or endangered species prior to compliance with the Endangered Species Act.

16. No surface disturbance will be authorized which would impact any cultural property that is allocated to Conservation Use in an approved Cultural Resource Management Plan.

RECLAMATION

1. Reclamation of all surface disturbances must be initiated immediately upon completion of activities, unless otherwise approved by the authorized officer. Reclamation of disturbed areas shall, to the extent practicable, include contouring disturbances to blend with the surrounding

terrain, replacement of topsoil, smoothing and blending the original surface colors to minimize impacts to visual resources, and seed the disturbed areas with a mix specified by the authorized officer.

2. All chemicals, trash, garbage or other foreign material must be removed completely from the project area by the applicant immediately upon completion of the project. All material must be properly disposed of in an approved disposal facility. Exceptions to this limitation shall be approved by the authorized officer.

3. At no time shall vehicle or equipment fluids be dumped on public lands. All accidental spills must be reported to BLM or NPS and be cleaned up immediately, using best available practices and requirements of the law. All spills of federally or state listed hazardous materials which exceed the reportable quantities shall be promptly reported to the appropriate state agency and the Arizona Strip District.

4. Disturbed areas, where soil and rainfall are adequate for anticipated success, shall be revegetated. In all VRM Class II areas, ACECs and RCAs revegetation of native species shall be preferred. Rates and seed mixes shall be determined by the authorized officer.

5. Revegetation efforts must establish a stable biological groundcover equal to or exceeding that which occurred prior to disturbance. Mulching may be appropriate for conserving moisture and holding seed on-site thus improving the chances for successful establishment.

6. All unnecessary roads shall be reclaimed and dosed immediately upon termination of the project. Recontouring all cut slopes to approximately the original contour shall be required. Reclaimed roads shall be barricaded or signed to protect them until reclamation is achieved. All existing roads that require upgrading shall be reclaimed to their original dimensions upon completion of the project. Exceptions must be approved in writing by the authorized officer.

APPENDIX 2.P

MINERALS AND ASSOCIATED LAND CATEGORIES

MINERALS AND ASSOCIATED LAND CATEGORIES

A. Fluid Mineral Leasing Categories

The current leasing policy for fluid minerals employs four land categories to protect natural and human resources while providing maximum opportunity for exploration and development. The categories are:

1) open to leasing with standard stipulations;
2) open to leasing with special terms and conditions or seasonal restrictions;
3) open to leasing with no surface occupancy; and
4) closed to leasing. Exploration, drilling and production would be subject to the applicable operation and reclamation standards.

Category 1: Open to lease subject to standard lease terms and conditions.

Category 2: In order to protect peregrine falcon during the nesting season, exploration, drilling and other surface-disturbing activities will be allowed only during the period from August 1 through March 1. This limitation does not apply to the maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the authorized officer of the federal surface management agency if it is shown to the satisfaction of the authorized officer that no adverse impacts to peregrine falcon would occur.

In order to protect bighorn sheep, exploration, drilling and other surface-disturbing activities will be allowed only during the period from June 1 through November 30. This limitation does not apply to the maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the authorized officer of the federal surface management agency if it is shown to the satisfaction of the authorized officer that adverse impacts to the bighorn sheep would not occur.

In order to protect desert tortoise, exploration, drilling and other surface-disturbing activities will be allowed only during the period from October 15 through March 15, subject to waivable no surface occupancy stipulations. This limitation does not apply to the maintenance and operation of producing wells. Surface occupancy could be allowed by the authorized officer after consultation with the U.S. Fish and Wildlife Service on authorizing a particular Application for a Permit to Drill.

Category 3: In order to protect important scenic values, no surface occupancy or other surface disturbance will be allowed within the Virgin River Gorge scenic withdrawal. Exceptions to this limitation may be specifically authorized in writing by the authorized officer of the federal surface management agency if it is shown to the satisfaction of the authorized officer that the proposed disturbance or occupancy will not substantially impair the visual resources of the area.

In order to protect important scenic values, no surface occupancy or other surface disturbance will be allowed within Kanab Creek, Grama Canyon or the Virgin River Gorge. Exceptions to this limitation may be specifically authorized in writing by the authorized officer of the federal surface management agency if it is shown to the satisfaction of the authorized officer that the proposed disturbance or occupancy will not substantially impair the visual resources of the area.

In order to protect important scenic values, no surface occupancy or other surface disturbance will be allowed on slopes in excess of 30 percent along or within the following areas: the north slopes of Mokiac and Seegmiller mountains; Hurricane Cliffs; Diamond Butte; upper and lower Grand Wash Cliffs; Parashant, Andrus, Hidden, and Dansil canyons; and the Moccasin Mountains. Exceptions to this limitation may be specifically authorized in writing by the authorized officer of the federal surface management agency if it is shown to the satisfaction of the authorized officer that the proposed disturbance or occupancy will not impair the visual resources of the area.

Category 4: In order to protect national monuments and wilderness values, lands are withdrawn from minerals leasing. The Vermilion Cliffs National Monument encompasses the Paria Canyon-Vermilion Cliffs Wilderness. The Grand Canyon-Parashant National Monument encompasses Mount Trumbull Wilderness, Mt. Logan Wilderness, Grand Wash Cliffs Wilderness and part of the Paiute Wilderness. Outside of the monuments the Paiute Wilderness, the Beaver Dam Mountains Wilderness, the Cottonwood Point Wilderness, and the BLM administered portion of the Kanab Creek Wilderness.

In addition to the fluid mineral leasing categories the following conditions apply to special status species and riparian resources.

The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to

result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. 1531 et seq., including completion of any required procedure for conference or consultation.

Riparian and riparian-related resources: Oil and gas, 43 CFR 3101.1-2 allows the Authorized Officer to require activities to be moved up to 200 meters to protect specific resources. The authorized officer may apply this regulation adjacent to riparian zones where site-specific analysis shows a need to further protect riparian-related resources, including Southwest willow flycatcher habitat and nesting sites.

B. Locatable Mineral Land Classifications

Locatable mineral exploration and development work is governed by the 43 CFR 3809 regulations. These regulations require the filing of a notice or a plan of operations prior to the start of operations, excluding casual use, on Federal lands. A notice is required to be filed at least 15 calendar days before commencing exploration causing a surface disturbance of 5 acres or less on which reclamation has not been completed. BLM approval is not required prior to the start of exploration conducted under a notice. Plan of operations are required to be submitted and approved for any bulk sampling that will remove 1,000 tons or more of presumed ore for testing and any mining operations causing surface disturbance in excess of casual use. Surface disturbing activities related to notices and plan of operations would be subject to the operation and reclamation standards contained in Appendix 2.N. Classification of public lands to operation of the mining laws are: Areas Open; Areas Open with Restrictions; Areas Open with a Plan of Operation: and Areas Closed.

Areas Open to the Mining Laws

All public lands in the ASFO with the exception of those lands identified below, are open to the operation of the mining laws. Wilderness areas, national monuments and the Grand Canyon game preserve are closed to the operation of the mining laws. Valid existing rights, however, must be recognized. These rights must be supported by the discovery of a valuable mineral as of the date of designation.

Areas Open to the Mining Laws with Restrictions

Restricted areas are those lands where mining locations are subject to special requirements of law and regulation as a result of powersite withdrawals, public water reserves, and split-estate created under the Stockraising Homestead Act. Additional restrictions could apply in riparian areas or if threatened or endangered species are involved, as stated below.

Areas along the Virgin River drainage, Beaver Dam Wash, Paria River, Kanab Creek and any and all wetlands are protected by provisions on the Wetlands Executive Order (ED 11990, May 24, 1977) and the Floodplain Management Executive Order (EO 11988, May 24, 1977), to avoid or reduce adverse impacts.

In accordance with U.S. Fish and Wildlife consultation requirements under Section 7 of the Endangered Species Act and the Bald Eagle Protection Act, actions necessary to prevent disturbance to threatened and endangered species or golden eagles are required. As such, exploration activities are not allowed to be conducted within certain sensitive periods or within influence zones.

Areas Open to the Mining Laws with a Plan of Operation

Plan of operations are required to be submitted and approved prior to commencing operations in the following special status areas; areas in the National Wild and Scenic Rivers System, and areas designated for potential addition to the system; Designated Areas of Critical Environmental Concern; areas designated as part of the National Wilderness Preservation System and administered by BLM; areas designated as "closed" to off-road vehicle use; any lands or waters known to contain Federally proposed or listed threatened or endangered species or their proposed or designated critical habitat, unless BLM allows for other action under a formal land-use plan or threatened or endangered species recovery plan.

Areas Closed to the Mining Laws

Subject to the valid existing rights, wilderness areas, national monuments, the Virgin River Gorge scenic area, Grand Canyon game preserve and acquired land not formally opened to the operation of the mining laws are closed to the operation of the mining law.

C. Mineral Material Land Classification

Mineral material disposal is discretionary and applications can be denied in cases where the disposal is not in the best public interest. Mineral material disposal sites would be subject to the operation and reclamation standards contained in Appendix - for surface disturbing activities. Classification of public lands for mineral material disposal are; Areas Open Subject to Standard Terms and Conditions, Areas Open with Restrictions, and Areas Closed.

Category 1. Areas Open to Mineral Material Disposals Subject to Standard Terms and Conditions

Category 2. Areas Open to Mineral Material Disposals Subject to Restrictions

Category 3. Restricted areas are those lands where mineral material disposals are subject to special requirements of law and regulation as a result of unpatented mining claims,

powersite withdrawals, split-estate created under the Stockraising Homestead Act and acquired lands under the Taylor Grazing Act. In addition, material disposal in VRM Class II areas would not be allowed if reasonable alternative sources are available.

Category 4. Areas Closed to Mineral Material Disposal

These are lands in wilderness areas, national monuments, the Virgin River Gorge scenic withdrawal, designated Areas of Critical Environmental Concern, except that existing material site will be evaluated for retention in Johnson Spring, Lost Spring Mountain and Moonshine Ridge ACECs, and where there are conflicting non-mineral applications or entries pending which involve title to the mineral estate, such as sales or exchanges.

APPENDIX 2.Q

ARIZONA STRIP MINERAL MATERIAL SITES

Arizona Strip Mineral Material Sites

Township	Range	Section	Legal Description	Authorization Type*	Commodity
34N	9W	19	S2SWNENW	Cold Springs FUP AZA-30993	Soil, Fill
35N	8W	8	S2SESE	Uinkaret FUP AZA-30994	Cinders
37N	7W	32	SWNW,NWSENW	Black Canyon Wash FUP AZA-32475	Sand, Gravel
38N	4W	22	NESWSE NWSESE	Buffalo Ranch Rd FUP AZA-32808	Sand, Gravel
38N	15W	27	NESWSE	Jacob Well FUP AZA-28201	Sand, Gravel
38N	16W	33	NWSESWSE	Eye of Needle FUP AZA-28202	Sand, Gravel
39N	3E	27	SESESE	North House Rock FUP	Gravel
39N	4E	31	LOT 4,W2SESW	AZ SHWY ROW AZPHX-86098	Gravel
39N	7E	18	NESW	Badger Canyon CP AZA-32841	Stone
39N	7E	18	N2NESW,S2SENW	Badger Canyon CU AZA-32923	Flag Stone
39N	2W	13 24	S2SWSW, SWSESW N2NWNW, NWNENW	Little Cedar Knoll CP/FUP AZA-30563/32471	Gravel
39N	3W	6	SENENW	Bitter Seeps CP/FUP AZA-30565/32005	Flag Stone
39W	4W	23	E2NWNE,W2NENE NESESW	Bullrush Stone NS AZA-29441	Flag Stone
39N	6W	34	NENESW,E2NWNESW S2SWSWNE,SESENW	Yellowstone Mesa CP/FUP AZA-30564/32004	Sand, Gravel
39N	12W	11	NWNWSE,NENESW	CC Gravel Pit FUP AZA-30992	Soil, Fill
39N	12W	25	NWSWNW	Wolfhole Valley FUP AZA-31990	Soil, Fill
39N	16W	4	NWNE	Mesquite Vistas NS AZA-30880	Sand, Gravel
39N	16W	4	N2NWSW	Flat Top Dam FUP AZA-31100	Soil, Fill
40N	3E	15	N2NWSE,S2SWNE	West Valley Pit FUP	Gravel
40N	1W	2	E2NESWSW N2SESW,NWSWSE	AZ SHWY ROW AZAR-9440	Gravel
40N	6W	5	SESENWSW	Landfill Clay Pit FUP AZA-30883	Clay
40N	9W	26	NWNW	Antelope Road FUP AZA-32710	Soil, Fill

Township	Range	Section	Legal Description	Authorization Type*	Commodity
40N	12W	26	NESENW	Quail Flat Gravel Pit FUP AZA-31985	Soil, Fill
40N	15W	9	NWSW	Littlefield Rock CUA AZA-31985	Sand, Gravel, Stone
40N	16W	24	SW	Big Bend Wash FUP AZA-33012	Soil, Fill
41N	3E	11	SENE	Coyote Valley Gravel FUP AZA-31989	Soil, Fill
41N	1W	34	N2NWSE	AZ SHWY ROW AZPHX-78901	Gravel
41N	2W	5	LOT 3 (40 acres)	AZ SHWY ROW AZPHX-86767	Gravel
41N	2W	5	SENW W2W2SWNE	AZ SHWY ROW AZPHX-78886	Gravel
41N	7W	14	S2SESW,N2NENW	Airport Pit CP/FUP AZA-27367/32006	Sand, Gravel
41N	9W	3	N2NESW,SWSENW	Antelope Pit CP AZA-32388	Flag Stone

* Authorization Type;
CP – community pit, CUA – common use area, FUP – free use permit, ROW – right-of-way

APPENDIX 2.R

RECREATION MANAGEMENT AREAS

Recreation Management Areas

1. OVERVIEW

Two types of Recreation Management Areas (RMA) would be identified in the land use plan for BLM lands; Special Recreation Management Areas (SRMA) and Extensive Recreation Management Areas (ERMA). In the Parashant only, Special Management Area(s) (SMA) would be identified on NPS lands.

2. SPECIAL RECREATION MANAGEMENT AREAS (SRMAs)

SRMAs would be identified in the planning process as areas with a distinct primary recreation-tourism market as well as a corresponding and distinguishing recreation management strategy. Each SRMA would be focused on the most appropriate recreation market strategy; either Community, Destination, or Undeveloped. SMAs typically involve the NPS proposed wilderness areas, as well as any areas having wilderness characteristics. SRMA/SMAs would undergo further activity-level planning following the completion of the LUP.

In identifying SRMAs and prescribing the management regime for each, and to the extent feasible with the information on-hand, a benefits-based management (BBM) approach would be utilized, although it is integrated with more traditional planning. BBM or "beneficial outcomes" planning focuses on the outcomes of recreation and leisure activities to determine how the experiences benefit the visitor and uses this information as the premise for the planning process. BBM analyzes the "why" people visit an area and participate in a particular activity. Recent visitor surveys as well as public scoping comments and input from cooperating entities were used to develop the appropriate proposed recreation strategy for each SRMA.

a. Recreation Management Strategies

Each SRMA identified has a distinct, primary recreation-tourism market as well as a corresponding and distinguishing recreation management strategy. For each SRMA selected, that primary market-based strategy would be to manage for one of three possibilities: a *destination* recreation-tourism market, a *community* recreation-tourism market, or an *undeveloped* recreation-tourism market. Each is defined below:

Community recreation-tourism market ~ a community or communities dependent on public lands recreation and/or related tourism use, growth, and/or development. Major investments in facilities and visitor assistance are authorized within SRMAs where BLM's strategy is to target demonstrated community recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demand for specific activity, experience, and benefit opportunities. They are produced by maintaining prescribed natural resource and/or community setting character and by structuring and implementing management, marketing, monitoring, and administrative actions accordingly.

Destination recreation-tourism market ~ national or regional recreation-tourism visitors and other constituents who value public lands as recreation-tourism destinations. Major investments in facilities and visitor assistance are authorized within SRMAs where BLM's strategy is to target demonstrated destination recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demand for specific activity, experience, and benefit opportunities. These opportunities are produced through maintenance of prescribed natural resource setting character and by structuring and implementing management, marketing, monitoring, and administrative actions accordingly.

Undeveloped recreation-tourism market ~ national, regional, and/or local recreation-tourism visitors, communities, or other constituents who value public lands for the distinctive kinds of dispersed recreation produced by the vast size and largely open, undeveloped character of their recreation settings. Major investments in facilities are excluded within SRMAs where BLM's strategy is to target demonstrated undeveloped recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demand to sustain distinctive recreation setting characteristics; however, major investments in visitor services are authorized both to sustain those distinctive setting characteristics and to maintain visitor freedom to choose where to go and what to do—all in response to demonstrated demand for undeveloped recreation.

While Destination and Community SRMAs are targeting for demands that may require major facilities and visitor assistance as stated above, Undeveloped SRMAs target for a demand that may require only visitor services, not major facilities, to sustain distinctive settings and maintain the unstructured, freedom to choose activities appropriate in undeveloped settings. It should be noted that "visitor freedom to choose where to go and what to do" does not mean freedom from rules, regulations, travel restrictions, etc., but it refers to the visitors' ability to choose from a variety of unstructured, dispersed recreation activities and locations, versus choosing more structured recreation opportunities tied to specific places and activities in the other two types of SRMAs.

b. Primary Market-Based Strategies identified in the Plan

Each SRMA from Alternative C through E, identifies a distinct primary recreation-tourism market as well as a corresponding and distinguishing recreation management strategy. Each SRMA focuses on the most appropriate recreation market strategy based on preliminary public input; either Community, Destination, or Undeveloped. National Park Service SMA management is blended with SRMA management in two SRMAs in the Parashant.

Parashant SRMA/NPS SMA: The primary strategy for Parashant SRMA/ NPS SMA would be one aimed at an undeveloped recreation-tourism market. Due to its distinctive remote, rugged landscape, its proximity to Grand Canyon, its vast size and the largely open, undeveloped character of its recreation settings, regional and local recreation-tourism visitors value this area for the distinctive kinds of dispersed recreation it produces. There is a demonstrated recreation-

tourism market demand from local community and regional/national visitors for trophy hunting opportunities, guided back country tours, hiking, viewing and appreciating wildland landscapes and cultural sites, canyoneering and motorized/mechanized/non-mechanized exploring.

Paria SRMA: The primary strategy for Paria SRMA would be one aimed at a world-class destination recreation-tourism market. Due to its distinctive landscape of spectacular geology and scenery, challenging terrain, and its connectivity to other world-class sites (GSENM, Glen Canyon NRA), recreation-tourism visitors, ranging from local to international, highly value these public lands as recreation-tourism destinations. There is a demonstrated recreation-tourism market demand from community resident, regional, national and international visitors for viewing unique geology, experiencing a world class slot canyon, backpacking and hiking, appreciation of cultural resources, and hunting.

Gateways SRMA: The primary strategy for Gateways SRMA would be one aimed at a destination recreation-tourism market. Due to its distinctive pathways through a spectacular Northern Arizona landscape of scenic and historic values; its connectivity to other world-class sites (Grand Canyon, GSENM, Lees Ferry); its potential for interpretive facility development by partnering with local recreation providers, recreation-tourism visitors, ranging from local to international, highly value these public lands as recreation-tourism destinations. There is a demonstrated recreation-tourism market demand from regional, national and international visitors for viewing spectacular geology, driving an Arizona State Scenic Road, visiting rustic lodges, viewing natural/cultural history sites and exhibits, and hiking.

Sand Hills SRMA: The primary strategy for Sand Hills SRMA would be one aimed at an undeveloped recreation-tourism market. Due to its distinctive remote, rugged landscape, its vast size and the largely open, undeveloped character of its recreation settings, regional and local recreation-tourism visitors value this area for the distinctive kinds of dispersed recreation it produces. There is a demonstrated recreation-tourism market demand from local community and regional/national visitors for hunting opportunities, guided back country tours, hiking, viewing and appreciating wildland landscapes and cultural sites, and motorized/mechanized/non-mechanized exploring.

Virgin River SRMA: The primary strategy for Virgin River SRMA would be one aimed at a destination recreation-tourism market. Due to its distinctive location along high traffic volume Interstate Highway 15, its place in the Grand Canyon-like landscape of Virgin River Gorge, and ease of access for day and overnight recreation, national, regional, and local recreation-tourism visitors value these public lands as recreation-tourism destinations. There is a demonstrated recreation-tourism market demand from mainly local community residents and regional visitors for day-use and overnight hunting, hiking, family outings, rock climbing, school group field outings (elementary to university), and white water activities. Similarly, there is market demand from local, regional and national visitors for sightseeing, appreciation of geologic resources, rest from travel and escaping the cold winter weather of other locations.

Virgin Ridge SRMA: The primary strategy for Virgin Ridge SRMA would be one aimed at a community recreation-tourism market. Due to its distinctive landscape, its close proximity to the rapidly growing communities of Mesquite, Bunkerville, Logandale, and Overton, NV and Beaver Dam, Scenic and Littlefield, AZ, local recreation-tourism visitors value these public lands as their own 'back-yard' recreation settings. There is a demonstrated recreation-tourism market demand from primarily local communities, as well as some other regional visitors, for motorized/mechanized/non-mechanized exploring, world-class rock climbing, guided middle and front country

St. George Basin SRMA: The primary strategy for St. George Basin SRMA would be one aimed at a community recreation-tourism market. Due to its distinctive landscape, warm winters, and its close proximity to the rapidly growing communities of St. George, Santa Clara, Middleton, Washington, Hurricane and Toquerville, Utah, local recreation-tourism visitors value these public lands as their own 'back-yard' recreation settings. There is a demonstrated recreation-tourism market demand from primarily local communities, as well as some other seasonal regional visitors, for motorized/mechanized/non-mechanized exploring, technical sports, fitness activities, guided middle and front country tours, sightseeing, equestrian, hiking, competitive and organized events, viewing and appreciating natural landscapes and cultural sites.

Fredonia SRMA: The primary strategy for Fredonia SRMA would be one aimed at a community recreation-tourism market. Due to its distinctive landscape and its close proximity to the communities of Fredonia, AZ and Kanab, Utah, local recreation-tourism visitors value these public lands as their own 'back-yard' recreation settings. There is a demonstrated recreation-tourism market demand from primarily local communities, as well as some regional visitors, for motorized/mechanized/non-mechanized exploring, managed target shooting, fitness activities, sightseeing, equestrian, hiking, competitive and organized events, viewing and appreciating natural landscapes and cultural sites.

c. ***Recreation Management Zones***

Within each SRMA, one or more potential Recreation Management Zones (RMZs) were identified, with each zone providing a particular recreation niche. (See Maps 2.7, 2.16, 2.25, and 2.34 for SRMAs with RMZs). Each RMZ was characterized by a description of its desired outcomes (management objective(s), benefits, experiences, activities) and setting prescriptions (physical, social, and administrative conditions required to produce the outcomes.[see Appendix 3.H, Recreation Opportunity Spectrum]) Each RMZ within a SRMA is thus presented to show what the favorite activities would likely be, the experiences derived from participation, and the benefits realized. Additionally, an activity planning framework (see below) was described that addresses basic but broad types of recreation actions (management, marketing, monitoring, and administration) that would achieve desired outcomes.

3. EXTENSIVE RECREATION MANAGEMENT AREAS (ERMAs)

Anything not delineated as a SRMA would be an Extensive RMA (ERMA). ERMAs would only receive the custodial management of visitor health and safety, user conflict and resource protection issues with no activity level planning. Therefore, actions within ERMAs are generally implemented directly from land use plan decisions. Land use plan decisions identified in the various sections of Chapter 2, Table 2.10a Recreation and Visitor Services include recreation management objectives for all ERMAs, as well as custodial recreation management, marketing, monitoring, and administrative support actions.

4. ACTIVITY PLANNING FRAMEWORK

The activity planning framework is intended to outline the essential conditions or structure for implementing actions for SRMAs. This section addresses the structural framework for all actions to be taken by BLM and its collaborating community recreation-tourism providers who affect both recreation setting character and the kinds of recreation opportunities being produced in SRMAs. The framework addresses recreation management, marketing, monitoring, and administrative support actions necessary to achieve the various explicitly stated recreation management objectives and setting prescriptions found in the tables below.

Unless the essential conditions or structure are met, neither management objectives nor prescribed recreation setting character can be achieved because implementing actions are the engine that makes everything happen. In other words, "What is the operating structure to which BLM and its collaborating providers must commit so that planned recreation management objectives and recreation setting prescriptions will, in fact, be achieved?" Much of this structure is found in the Chapter 2, Table 2.10a Recreation and Visitor Services under Part C, Actions to Achieve and Allowable Uses. The following content supplements the Chapter 2 content.

a. Recreation-Tourism Service Delivery System

To implement LUP decisions within the SRMAs, a recreation-tourism service delivery system must be in place and engaged. The delivery system is that combination of public lands and adjoining service communities, including local governments and service providing businesses through which recreation and visitor services are delivered for one or more Special Recreation Management Areas to both visitors and affected community residents. Because BLM is not the only provider of essential recreation and visitor services for the Planning Area, the focus of the system must include other service providers within adjoining service communities upon whom visitors and community residents alike depend.

The recreation-tourism delivery system for the Arizona Strip SRMAs involves more than just programs and activities provided on public lands. In addition to BLM, Forest Service, and the National Park Service, local counties, such as Mohave and Coconino in Arizona and Washington

and Kane County in Utah, as well as American Indians, such as the Paiute and Navajo, also contribute to recreation-tourism delivery, primarily through the management of access to and through landscapes. State governments in Arizona and Utah also play important roles in various facets of recreation delivery, including the management of game and fish and recreation activities on state trust lands, creation and funding of grant programs that enhance OHV and non-motorized recreation opportunities, and providing state law concerning vehicle-related licensing.

For the Planning Area SRMAs, local communities such as Littlefield, Scenic, Beaver Dam, Arizona; Mesquite, Bunkerville, Overton, Nevada; St. George, Hurricane, Washington, Santa Clara, Hildale, Big Water, and Kanab, Utah; and Colorado City, Fredonia, Marble Canyon, Beaver Dam, and Page Arizona would continue to contribute to the delivery of recreation-tourism opportunities to local, regional, national, and international visitors and residents.

Non-government recreation providers also play an important role in delivering recreation-tourism outcomes. Many local and regional businesses provide for a variety of direct recreation opportunities in the areas identified as SRMAs that enable customers to realize specific recreation experience outcomes via numerous commercial and competitive activities or events. Many other private sector businesses also provide indirectly, or 'off-site', to the recreation-tourism delivery, such as local bike shops, OHV dealerships, outdoor equipment retailers, hotels, and restaurants. Taken all together, recreation-tourism opportunities on the Arizona Strip are influenced, guided, constrained, and managed by many providers.

Implementing land use plan decisions for SRMAs, collaborative efforts with other key providers would be essential to achieving desired outcomes. Various types of cooperating agreements would be developed to forge sustainable service partnerships with these providers. Additionally, other existing or new "opportunistic" partnerships with users, interest groups, and NGOs would be developed, restructured, expanded, or otherwise tailored to fit within these overarching agreements among all key affected providers.

b. Implementation of Essential Actions

Following the completion of the land use plan, a Recreation Activity Management Plan (RAMP) would be developed for each SRMA through a public process. SRMA plan content would address the variety of specific actions that BLM, NPS and other key collaborating recreation-tourism providers within adjoining communities would undertake to achieve the production of recreation opportunities and resulting attainment of targeted experience and benefit outcomes.

Implementing actions would need to conform to the overall management framework established by the Plan. In other words, as sets of more specific management actions are developed during activity planning, each and every action should conform to the planning criteria, laws, regulations, policies, and planning allocations. Additionally specific management actions need to conform with State and local provider laws and policies that pertain to activities on public lands.

Through the development of specific activity plans for SRMAs, BLM would integrate and constrain all of the traditional recreation-related programs and initiatives (e.g., OHVs and transportation, rivers and trails, permits and fees, concessions management, accessibility, interpretation, facility management, VRM, etc.) to address only those essential functional actions required to achieve planned outcomes. To better focus on achieving integration and balance of the essential implementation actions, BLM would shift the operational framework from the more traditional approach of managing individual recreation programs as discrete objects to the following four functional areas of recreation and visitor services.

i. **Management** (of resources, visitors, and facilities [i.e., developed recreation sites, roads and trails, recreation concessions, etc.]):

Many of the programs listed above involve recreation management actions, but only those which produce targeted outputs and facilitate the attainment of targeted outcomes would be considered essential. Planned management programs and actions for SRMAs would be constrained by the management framework of the approved RMP, specifically the Recreation and Visitor Services section. By focusing on specific management objectives and settings for each RMZ within a given SRMA, only actions that would directly contribute to achieving objectives and maintaining or enhancing settings would be considered. Planned management programs and actions would be held accountable for how they impact recreation setting character and the kinds of recreation opportunities produced by scheduled evaluations to determine whether or not they contribute to achieving objectives and maintaining settings.

Additionally, planned travel management actions, including route designation actions, would be constrained by recreation management objectives and setting prescriptions, as well as other management objectives related to sensitive resources. Likewise, planned travel-related engineering construction and maintenance actions would be constrained by Travel Management Area setting prescriptions (Appendix 2.B Travel Management Areas, Part D, Route Construction and Maintenance Standards) that are integrated with RMZ setting prescriptions.

ii. **Marketing** (including outreach, information and education, promotion, interpretation, environmental education, and other visitor services):

Marketing actions must match planned management actions. Marketing is where BLM tells its customers that it is providing precisely what it said it would (i.e., implementing actions designed to achieve outcomes). Not all implementing actions would be done by BLM when other providers are involved, so marketing likewise tells customers other providers are doing what they said they would do.

As part of marketing, definitive information about recreation setting character and activity, experience, and benefit opportunities would be integrated into BLM's own information and other outreach media. BLM would also work more closely with industry media through collaborative

efforts to add definitive content to existing and planned industry outreach media and messages to ensure that promotional pieces match customers with the opportunities they seek rather than sell them what media wants. It would be essential that all entities involved with marketing, both BLM and industry media, know and understand:

- how each SRMA is targeting a specific recreation-tourism market and who that market is and where it is located;
- how each such market has one or more specific recreation niches that prescribe RMZ-specific recreation setting characteristics critical to the production of specific outcomes of activity, experience, and benefits; and
- what the ramifications of "off-target" promotional efforts can be; and
- that only the marketing tools (e.g., information, promotion, education, interpretation, etc.) that are best suited for each locale, would be selected as implementing actions.

iii. **Monitoring** (including social, environmental, and administrative indicators and standards (including outreach, information and education, promotion, interpretation, environmental education, and other visitor services):

Various monitoring frameworks would be set in place for BLM and its collaborating partners to implement specific planned monitoring actions. Monitoring recreation outcomes and prescribed recreation setting character attainment is what would drive adaptive management. Monitoring is where outcomes and settings would be measured to gauge if, when, and how to readjust management and marketing actions to achieve standards set for the indicators that were chosen (i.e., monitoring indicators and standards would be extracted directly from the outcomes-based management objectives and setting prescriptions).
Limits of Acceptable Change (LAC) would be the primary framework used to clarify the identity of the indicators, inventory the indicators, evaluate data and set standards for the indicators, and monitor selected indicator sites over time to assess the condition and trend of various recreation settings. In addition to LAC, visitor satisfaction and preference surveys would be used to evaluate the success or failure achieving the objectives. BLM would use standard, approved survey instruments while other providers may employ other methods to monitor conditions and achievement of objectives.

In implementing specific monitoring actions, BLM's collaborating providers would be encouraged to assist by providing visitor and community assessments. A monitoring plan would facilitate achieving the essential conditions needed for coordinated, integrated, efficient monitoring actions to occur.

iv. **Administrative Support** (regulations; permits and fees, including use restrictions where necessary and appropriate; recreation concessions; fiscal; data management; and customer liaison)

Administrative actions, such as those listed above, would be implemented only if they ensure that they:

- support rather than lead the management, marketing, and monitoring actions
- do not thwart the attainment of targeted experience and beneficial outcomes,
- fit within recreation setting prescriptions
- are all complementary and balanced with each other, and
- are limited to only those necessary to achieve all of the above.

APPENDIX 2.S

TRAVEL MANAGEMENT AREAS, TRANSPORTATION PLAN CONTENTS, AND APPROPRIATE ROUTE CONSTRUCTION AND MAINTENANCE STANDARDS BY TRAVEL MANAGEMENT AREA

TRAVEL MANAGEMENT AREAS, TRANSPORTATION PLAN CONTENTS, AND APPROPRIATE ROUTE CONSTRUCTION AND MAINTENANCE STANDARDS BY TRAVEL MANAGEMENT AREA

A. Travel Management Areas (TMAs)

Comprehensive travel management planning addresses all resource use aspects (such as recreational, traditional, casual, agricultural, commercial, and educational) and accompanying modes and conditions of travel on the public lands. In the Plan, four TMAs (polygons) have been delineated in Chapter 2, Table 2.6, Trails and Travel Management I.B.1., TMAs. Acceptable modes of access and travel for each TMA (including over-land and fly-in access [remote airstrips]) were identified in the same table at Trails and Travel Management I.C.2.a., Allowable Uses. In developing these areas, the following components were considered:

a. management units developed in the plan
b. consistency with all resource program goals and objectives;
c. primary travelers;
d. objectives for allowing travel in the area;
e. setting characteristics that are to be maintained (including recreation opportunity system and VRM settings); and
f. primary means of travel allowed to accomplish the objectives and to maintain the setting characteristics.

Following the completion and approval of the Plan, a transportation plan would be developed that would coordinate the implementation of the Trails and Travel Management and Transportation Facilities decisions over the life of the Plan. The potential contents of the transportation plan are shown below. The transportation plan would also include Appropriate Route Construction and Maintenance Standards by TMA, also shown in Section C below.

B. Transportation Plan Contents

1. Designated Trails and Travel Management System

Following the completion and approval of the Resource Management Plan, implementation and management of the defined travel management network (a system of areas, roads and/or trails that would be available for public use, and the specific limitations placed on use) would be documented in the transportation plan including, as a minimum, the following components:

a. A map that displays and describes the intended use of the individual geographic units within the planning area and displays roads and trails for all travel modes.

b. A listing of specific road types and designations such as Federal, state, county, and Tribal roads, BLM administered/maintained roads, and BLM public roads.
c. A listing of roads in congressionally designated conservation units, Presidential conservation designations, and administrative conservation designations such as areas of critical environmental concern.
d. Definitions and additional limitations for specific roads and trails (defined in 43 CFR 8340.0-5(g)).
e. Criteria to add new roads or trails and to specify limitations.
f. A set of guidelines for management, monitoring, and maintenance of the system.
g. A set of indicators to guide future plan maintenance, amendments, or revisions related to travel management network.
h. A list of needed easements and rights-of-ways (to be issued to the BLM or others) to maintain the existing road and trail network providing public land access.
i. A schedule for periodic review of travel management networks to ensure that current resource and travel management objectives are being met (see 43 CFR 8342.3).

2. Preliminary Route Network

Where specific route designation decisions and a subsequent designated system were not practical to define or delineate during the land use planning process, a preliminary network identified during that effort would be documented and a process would be established to select a final travel management network following the completion of the Resource Management Plan. As a separate section of the transportation plan, the following components, as a minimum, would be included for the preliminary route network (the uncompleted travel management network):

a. A map of a preliminary road and trail network;
b. Any LUP-defined short-term management guidance for road and trail access and activities in areas or sub-areas not completed;
c. An outline additional data needs, and a strategy to collect needed information;
d. A clear planning sequence, including public collaboration, criteria and constraints for subsequent road and trail selection and identification;
e. A schedule to complete the area or sub-area road and trail selection process within 5 years of the signing of the ROD for the RMP; and
f. A list of any easements and rights-of-ways (to be issued to the BLM or others) needed to maintain the preliminary or existing road and trail network.

C. Route Construction and Maintenance Standards							
Appropriate Route Construction and Maintenance Standards by TMA							
Functional Class1 and Access Vehicle Type	Route Type2	Route Width3 (ft)	Maintenance Level4	Maintenance Frequency	Speed (mph)	Comments	Hiking, Equestrian, and Bicycle Types
Rural TMA							
State, Federal	Primary Paved, Secondary Paved	Varies	High standards		55-75	State maintenance	Native tread surface to nonnative tread for interpretive trails
Collector-all vehicle types	Primary Unpaved, Secondary Unpaved	20-28	4-5	1	40-50	Mainly County and BLM routes	
Local-all vehicle types	Secondary Unpaved	14-20	3-4	2-3	20-40	Mainly BLM	
Resource-high clearance or 4X4	Tertiary, Single Track	10-14	2	4	10-15	Maintenance is typically as needed, site-specific	
Non-system	Closed, Reclaiming, Abandoned	--	--	--	--	Routes to be closed and rehabilitated	
Backways TMA							
Collector-all vehicle types	Primary Unpaved, Secondary Unpaved	20	4-5	1	40-50	Mainly County and BLM routes	Native tread surface to nonnative tread for interpretive trails
Local-all vehicle types	Secondary Unpaved	14-20	3-4	2-3	20-40	Mainly BLM	
Resource-high clearance or 4X4	Tertiary, Single Track	10-14	2	4 or none	5-15	Maintenance is typically as needed, site-specific	
Non-system		--	--	--	--	Routes to be closed and rehabilitated	
Specialized TMA							
Local-all vehicle types	Secondary Unpaved	14	3	2-3	20-30		Native tread surface, widths to be determined
Resource-high clearance or 4X4	Tertiary, Single Track	10 or two-track	2	4 or none	5-15	Maintenance is typically as needed and/or site-specific	
Resource-hiking, biking, or equestrian	Single Track	Varies	2	2	≤15	Non-motorized use year-round	
Non-system	Closed, Reclaiming, Abandoned	--	--	--	--	Routes to be closed and rehabilitated	
Primitive TMA							
Resource-high clearance or 4X4	Tertiary, Single Track	10, two-track	2	4 or none	5-15	Administrative motorized use and open to non-motorized public use. Maintenance is typically as needed, site-specific	Native tread surface, widths to be determined
Non-system	Closed, Reclaiming, Abandoned	--	--	--	--	Routes to be closed and rehabilitated	

C. Route Construction and Maintenance Standards
Appropriate Route Construction and Maintenance Standards by TMA
1. Functional Classes from BLM Manual Section 9113: Collector: These BLM roads normally provide primary access to large blocks of land and connect with a public road system. Local: These BLM roads normally serve a smaller area than collectors. Local roads carry fewer traffic types. User cost, comfort, and travel time are secondary to construction and maintenance cost considerations. Resource: These BLM roads normally are spur roads that provide point access and connect to local or collector roads. Use restrictions can be applied to prevent conflicts between users. Minimal consideration for user cost, comfort or travel time. Non-system: Routes that will not be included in the transportation system. 2. Route Type: Derived from formal route inventory, which uses these standard types for inventory on BLM and U.S. Forest Service jurisdictions and for Arizona State Trust Lands. 3. Route Width: Width of travel surface only. Does not include associated ditches, bridges, culverts, route cut and fill areas, etc. 4. Route Maintenance Levels : Level 1 - No Maintenance: Roads no longer needed and closed to traffic. Closure devices maintained, drainage stabilized to protect adjacent lands and resource values. Level 2 - Minimal Maintenance: Roads normally open seasonally or year-round and passable for high clearance or 4-wheel drive use. Drainage and grade inspected every 3 years and maintained to correct problems. Level 3 - Maintenance as Needed: Roads open seasonally or year round. Typically natural or aggregate surfaced, but may include low-use bituminous surface, with defined cross-section and drainage. Generally passable by passenger car, but user comfort and convenience are not a high priority. Drainage inspected at least annually and maintained as needed. Grading conducted to provide a reasonable level of riding comfort. Level 4 - Annual maintenance. Roads open all year, except may be closed or have limited access seasonally. Typically single or double lane, aggregate, or bituminous surface, with a higher volume of public traffic than administrative traffic. Roadway maintained at least annually, although a preventative maintenance program may be established. Problems repaired as discovered. Level 5 – In addition to a scheduled maintenance program, these roads have a preventive maintenance program established to maintain the integrity of the system.

APPENDIX 2.T

ROUTE EVALUATION TREE PROCESS©

Route Evaluation Tree Process©

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The Route Evaluation Tree Process© (Route Evaluation Process©) is a tool designed to assist with route evaluation as a basis for creating a successful travel management plan. It builds upon the history of past efforts of route evaluation and designation, assists with addressing the various issues and concerns raised by both private and public entities, and incorporates and assists with addressing the numerous statutory requirements that are a part of this type of planning effort. The Route Evaluation Process© also serves as a tool to help build into the planning process a means by which to achieve desired outcomes that are specifically tailored to the needs and issues unique to a planning area. The Route Evaluation Process© allows systematic consideration of the important issues and concerns when evaluating routes. It is not a replacement for NEPA process, documents, or analysis, but rather is a tool designed to assist with the systematic collection of sensitive resource and route use information that can then be subsequently used to evaluate and potentially designate routes.

To address the many facets of route evaluation and transportation planning the Route Evaluation Process© is broken into a number of smaller finite tasks or steps, which fine tune the information needed to successfully evaluate and eventually designate routes. The process is illustrated on the attached Route Evaluation Tree Process© for Travel Management Planning at the end of this appendix (Attachment 1).

The Route Evaluation Tree©[4] (see CD in the back of this DEIS for the complete diagram of the Route Evaluation Tree©) is one step within the overall Route Evaluation Process©. It takes a systematic approach to collect data and evaluate routes individually, as well as collectively, based upon statutory requirements and issues raised by the public, and plan alternative themes. The result of this process is the creation of different potential designated trails and travel management systems that address most, if not all, of the identified issues and constraints. The data collected by using the Evaluation Tree© software as part of the Route Evaluation Process© may assist agency planners in making potential decisions within the environmental impact analysis process required by the National Environmental Policy Act (NEPA).

[4] The process has previously been referred to as the "Route Evaluation/Designation Decision Tree Process" or "Decision Tree". A "decision tree" is a technique or tool for assisting in the decision making process by leading one through a series of yes/no questions based upon input received (flowchart). A "decision" in the context of NEPA has a more legalistic meaning specifically relating to the NEPA process. The name "Decision Tree" was used to indicate it was created in a flowchart style, however to avoid the potential for misunderstanding of the meaning of the word "decision", it has been removed from the title of the process. Similarly, the word "designation" has been removed from the title of the process to eliminate potential misunderstanding of the function of the process.

Background

Past efforts at Route Evaluation and Designation:
The process of evaluating and designating routes of travel on public lands is a complicated and often controversial process. Designating routes as either open, closed or limited has become increasingly difficult due to a number of factors such as increased environmental concerns and awareness, urban area expansion into rural areas, decreasing public recreational land base and an increase in outdoor recreation by the public. Previous efforts to formally designate the route system for many large planning areas have often either met with poor results (e.g. not been successfully implemented) or have generally failed. A few designation efforts done at a smaller scale (e.g. various ACECs, etc.) have met with some success, but fewer yet have been successfully implemented. These efforts have not been without significant staff time and cost, public involvement, near-stifling public controversy and have often failed due to the lack of public acceptance of processes that are perceived as not adequately addressing the various issues and concerns raised. This situation has usually led to crippling levels of non-compliance and subsequent impacts to the land from un-managed use.

Review of Key Aspects and Criteria to be used in Route Evaluation and Potential Designation:
Given this history, land use planners endeavor to utilize a route evaluation process that employs the successful aspects of past efforts, avoids their pitfalls and involves the public extensively. Consultation with the architects of past route evaluation and designation efforts, other land use planners and extensive collaboration with the public identified a number of issues and concerns that needed to be addressed if a route evaluation - designation process were to be successful. Many of these issues and concerns were derived from the identification of the shortcomings of other past efforts. Principal amongst these criteria, issues and concerns were the following:

- Evaluate and potentially designate routes utilizing substantiated complete data of a variety of types: e.g. not only biological and cultural, but also recreational resources, commercial uses and land ownership.
- Base route evaluation and potential designation to the extent possible on current ground-truthed maps that reflect a variety information that reflects not only use, but very importantly the relationship of those uses with sensitive resources (i.e. not only location, but also route type, use level, and recreational points of interest such as campsites, staging areas, etc.).
- Base route evaluation and potential designation on a process that is systematic in its approach and that can be logically followed.
- Base route evaluation and potential designation on a process that both assess each route on its own merits/issues (i.e. avoid lumping decisions) and that assesses the uses and influences of the route system on a landscape scale.

- Utilize a route evaluation and potential designation process that tracks and neutrally records the information that is a part of each evaluation.
- Base route evaluation and potential designation on a process that not only identifies the desired future condition, but that also places into motion the potential designation of a potential designated trails and travel management system that at a landscape scale facilitates as its eventual outcome features of that desired future condition.
- Base route evaluation and potential designation on a process that establishes a system of routes that work together in a positive synergistic manner to create a functioning "network". In order to achieve this synergism systematically assesses both individually and collectively the implications of potential route designation on biological, cultural and recreational resources, as well as the general access requirements of commercial and private property interests.
- Base route evaluation and potential designation on a process that helps to establish a clearer link between the potential route designation decision and the reasons (e.g. biological, commercial, cultural, private property, recreational, conflict, etc.) most affecting the evaluation and that eventual potential designation.
- Base route evaluation and potential designation on a process that systematically involves the public and clearly incorporates their input.
- Base route evaluation and potential designation decisions on a process that considers: the history of use, public safety, public use conflicts, the intensity and season of use and takes into account the various implications of concentrating versus dispersing use.
- Base route evaluation and subsequent potential designation on a process that addresses:
    - both the number and level of influence from each route as well as the collective impact of the route network on the landscape;
    - the number, density and intensity of use of each route in assessing individual route influences, as well as the collective influence of the network of potential designated trails and travel management system on habitat fragmentation and function;
    - the need to minimize or eliminate the number and intensity of conflicting land uses as well as conflicts between users (e.g. urban interface, noise, dust, visual impacts, quiet use zones, etc.).
- Base route evaluation and potential designation on a process that is considerate of the variety of recreational visitors by offering a variety of routes (e.g. 4WD vs. MC vs. ATV; motorized vs. non-motorized; beginner vs. technical motorized routes; easy vs. strenuous hiking routes to address the needs of the young vs. the old) and that is considerate of the length of the typical visitor's stay by providing enough recreational opportunity for that stay. (The net effect of such considerations has been historically shown to be a decrease in route proliferation.)
- Base route evaluation and potential designation on a process that is considerate of the role and influence of "feeder" routes, is considerate of historic routes and recognizes the statutory need to provide appropriate levels of commercial and private property access.

Recognizing and attempting to address the issues and concerns raised by the public represents only ***one***, albeit very important, ***aspect*** that needs to be considered by a successful route evaluation and potential designation process. A ***second aspect*** that needs to be specifically addressed by a successful route evaluation/potential designation process ***includes the various statutory guidelines that are legally mandated.*** An abbreviated summary of some of the principal legal requirements and some of their most important criteria relative to route evaluation and potential designation includes the following:

BLM Planning Handbook Guidance: Guidance for OHV travel management areas and the designation of OHV areas and routes in the context of land use planning is provided in Appendix C.II.D, Comprehensive Trails and Travel Management and Appendix C.IV.C, Transportation Facilities in the Bureau's Land Use Planning Handbook, H-1601 Land Use Planning Handbook, Release 1-1693, 3,11,2005. This guidance applies to "all resource use aspects (such as recreational, traditional, casual, agricultural, commercial, and educational) and accompanying modes and conditions of travel on the public lands, not just motorized or off-highway vehicle activities."

Statute	**Principal Guiding Criteria affecting potential route designation**
Federal Endangered Species Act (ESA)	• Section 7 requires that the plan (i.e. "action") include steps to assist in the "recovery" of the federally threatened or endangered species. • A principal goal of any planning effort involving federally listed species is to include management goals and associated prescriptions that would lead to a "No Jeopardy" determination from USFWS as part of the Biological Opinion requirement of the ESA.
National Environmental Policy Act (NEPA)	• This act is regarded first and foremost as a public disclosure law requiring the responsible agency(ies) to fully disclose to the public the purpose, the full range of issues and considerations (including environmental) and details of the proposed action and a reasonable range of alternatives. • This act emphasizes the need to disclose to the public impacts of the proposed action and then evaluate the cumulative effects of that action. Such an analysis is to include: both the current situation, as well as the foreseeable future; evaluate both direct and indirect impacts both within the geographical borders of the action, as well as beyond and; include as part of its cumulative impact analysis not only an evaluation of biological and cultural factors, but also include an evaluation of economic and sociological factors (including recreation).
Federal Land Policy and Management Act (FLPMA)	• Management of public lands in to be on the basis of multiple use and sustained yield (i.e. no permanent impairment); • Resource values are to be protected; • Certain lands are to be preserved in their natural condition; • Wild, as well as domestic habitat is to be provided for; • Provide for a balanced and diverse combination of recreational uses; • Provide for human occupancy and use • Provide for economic uses (e.g. range, timber, minerals).

National Park Service Organic Act of 1916	• This act established the National Park Service. Its fundamental purpose is to provide for the conservation of scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.
Historic Preservation Act (HPA) (Section 106)	• Protect identified significant cultural sites; • Confer with Native American Nations on project or action (i.e. Nation to Nation conference)
Antiquities Act of 1906	• Enables the Presidential establishment of National Monuments to protect areas recognized for their special scientific or historic objects or values.
Code of Federal Regulations 43 CFR 8342.1	a. Trails shall be located in a manner to minimize impacts to the physical resources (i.e. soils, watershed, vegetation, air and other resources) and to prevent impairment of wilderness suitability; b. Trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention will be given to protect endangered or threatened species and their habitats; c. Trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.
Code of Federal Regulations 36 CFR Part 4 Vehicles and Traffic Safety	Travel on park roads and designated routes: a. Operating a motor vehicle is prohibited except on park roads, in parking areas, and on routes and areas designated for off-road motor vehicle use. b. Routes and areas designated for off-road motor vehicle use shall be promulgated as special regulations. Routes and areas may be designated only in national recreation areas, national seashores, national lakeshores, and national preserves. c. These regulations shall not be construed to prohibit administrative activities conducted by the NPS, or its agents, in accordance with approved general management plans, or in emergency operations involving threats to life, property, or park resources.
National Parks and Recreation Act of 1978	• This act requires NPS to prepare and revise General Management Plans (GMP) in a timely manner for each NPS unit. GMPs must include resource protection measures, general development locations, timing and costs; carrying capacity analysis, and boundary modifications.
Taylor Grazing Act	• Guarantee the conditional issuance of permits allowing the use of public lands for livestock grazing and mining.
Mining Acts	

The ***third principal aspect*** of a successful evaluation and potential designation process is the inclusion of steps that ensure that the eventual system or network of routes ***helps to collectively achieve the desired future condition***.

The ***last principal aspect***, but certainly not the least, of a successful route evaluation and potential designation process, is inclusion of steps which ***carefully consider area-specific planning issues and challenges,*** and then carefully assesses how **management** protocols designed to **remedy** those issues can best be **implemented**.

Consolidating these four principal aspects of a successful route evaluation and potential designation process into a logical, systematic and recordable process is the challenge that has generally stymied or led to the failure of past route evaluation and designation efforts.

The process of evaluating and potentially designating individual routes route-by-route (Implementation level decisions) is not to be confused with the much broader and more generalized process of evaluating entire "areas" and prescribing potential OHV area designations, such as "Open", "Limited" and "Closed"(Land Use level decisions). The OHV area designation of "Limited" is often clarified with stipulations such as "Limited to existing routes only" or "Limited to designated routes only". It is the latter type of situation that leads to the required route-by-route designation and the use of processes like the Route Evaluation Process© described herein. Areas given "Open" OHV area designations typically do not have any limitations, allow cross-country motorized use and therefore do not need route-by-route analysis or designation.

The following is a brief description of the Route Evaluation Process©. The proper use of the Route Evaluation Process© is based upon on having a reasonably complete inventory of routes and associated information that is determined to be most useful in evaluating those routes and their use. Although a near 100% inventory is optimal, the use of this process is not absolutely contingent upon having a complete route inventory. Due to the manner in which this process uses software for the collection of data about each route, additional routes and route information can be added as it becomes available. However, due to the manner in which this process requires the "route evaluators" to look beyond individual routes by also taking a landscape perspective, having a more complete route inventory enables the evaluators to be more complete in assessing the implications of the collective route potential designated trails and travel management system. Additionally, because the Route Evaluation Process© is designed to help assess the impacts of all types of routes and uses, and because routes of different types (with different uses) can affect not only the environment but also visitors on other routes, the route inventory which is evaluated should not only include motorized routes, but should also include non-motorized routes and non-motorized uses as well.

Preparation for Route Evaluation: Information Gathering Phase (Steps 1 through 8).

Step 1.	Coarsely identify issues for the Planning Area
Step 2a, 2b and 2c.	Identify primary Resource concerns, Access concerns, and Political concerns.
Step 3	Coarsely identify "Desired Future Condition" and Management Objectives for the Planning Area
Step 4a	Breakdown planning region into sub-regions with similar issues
Step 4b	Identify "Hot Spots of Concern" or primary issues within the Planning Area
Step 5	Identify/refine primary issues for each sub-region
Step 6	Coarsely identify sub-region management objectives
Step 7	Identify priority sub-region(s) and boundaries
Step 8	Coarsely develop potential designated trails and travel management system options principally based upon plan alternatives

Steps 1 and 2a, 2b, and 2c: Utilizing information that is available to agency staff, categorize the most pressing issues by identifying the general primary resource constraints, primary access needs (including most heavily used areas), and political concerns for the entire planning area.

During this step, information regarding the planning area and adjoining areas is discussed to better assist in addressing the collective influence of the potential designated trails and travel management system upon sensitive resources, commercial needs and recreational access. By taking this regional or landscape perspective, various resource or use issues and concerns can begin to be identified, including trends (e.g. shifts in use type, movement of people), population changes, urban interface issues, common uses, undesirable practices (e.g. including activities such as illegal dumping or law enforcement issues), resources receiving more influences, areas which need to be protected or preserved, and/or past, present or future adjoining planning efforts. Through the route evaluation/potential designation process and the associated planning efforts, future human activities can be modified through the plan to address the various resource and use issues identified and affect changes towards the desired future condition (see Step 3).

Step 3: In concert with the general planning process, develop and be familiar with the most general or fundamental aspects of the "Desired Future Condition," as well as the Management objectives, for the entire planning area, particularly as they relate to the various resource and use issues and concerns identified above. This may include the overall recreation and travel management objectives for the planning area, bearing in mind the appropriate legislation (e.g. National Conservation Areas) or proclamations (e.g. Monument Proclamation) that may direct or have bearing on those decisions.

Development of Sideboards for Different Alternatives (Steps 4 through 8).

Step 4a: As part of this information gathering phase, fine tune the focus of the evaluation process by breaking the entire planning area into "subregions" or some form of smaller planning units (e.g. "Geographical Units" that are approximately defined by similar issues or management goals with tangible borders.

These issues or goals may include similar resource conflicts or constraints, similar management goals (e.g. National Monument Proclamations) or similar access needs or use levels. Where possible, use logical preexisting physical features or management units as boundaries. For example, jurisdictional boundaries (e.g. Monument boundaries), roads, hydrologic drainages, ridges, watershed units, habitat transition zones or ecozones, or Recreational Opportunity Spectrum (ROS) Class boundaries may be utilized.

The purpose of this step is to focus the subsequent analysis on smaller evaluation subunits without losing the overall perspective of the landscape.

Step 4b: Coarsely identify "hot spots" as the high priority subregions where the issues caused by conflicting resource constraints and public access needs are, or at least perceived to be, most pronounced. In some cases the perceived existence of conflict is as important as real conflict, (e.g. if elected officials are wary of any form of route designation, then treat their area of concern as a separate planning unit.)

Step 5: The initial review coarsely identified issues and concerns. Are there others that may have been exaggerated or overlooked in the first coarse analysis? Are there other T&E or sensitive species that really do need to be evaluated in the context of potential route designation and travel management planning that were initially overlooked because they haven't garnered much attention (e.g. Management Indicator Species, predators, insects, plants)? Are there new recreational activities (e.g. geocaching, rock crawling, modified golf carts, etc.) or any other predictable changes of use or other sensitive resources (e.g. anticipated species listings, "watch lists", etc.) that may be at risk during the life of the plan that need to be considered with a more thorough analysis?

Step 6: Utilizing the background information gained from establishing the subregions (i.e. issues, constraints, uses, etc.), further fine-tune management objectives and the desired future condition for each subregion and the entire planning area, as deemed appropriate.

Step 7: Identify priority subregions utilizing best available information reflecting the known or perceived priority resource issues/constraints, as well as known or perceived priority access needs or use levels (whether commercial, private or recreational). Create maps of the priority subregions such that the area covered goes beyond that identified in step 4b in order to make sure that the evaluation area boundary is sufficiently large to capture all those adjoining areas that either have similar issues or that may be affected by or affect this planning effort. If possible, utilizing appropriate GIS overlays/coverages, evaluate and confirm that those hot spots identified in step 4b do exist. However, as stated above, some priority subregions may be established due to political needs or

public perceptions that were identified as part of the preliminary information gathering phase .

Step 8: After reviewing the comments received and issues identified during the preliminary information gathering phase, the specific categories of issues and concerns would be created (e.g. permitted ranching practices). The alternatives identified during the planning effort may be used in conjunction with the Route Evaluation Process. Routes may be evaluated according to the alternatives identified during the agencies planning effort so that differing transportation systems may be proposed for each alternative identified. The Route Evaluation Process is responding to the plan alternatives and working in conjunction with them to allow the decision maker a tool to consider the transportation system at a scale that ranges from specific route influences to a larger landscape scale that looks at the implications of portions of, or larger still the entire potential designated trails and travel management system.

Data Refinement (Steps 9 through 12)

Step 9	Identify primary data deficiencies related to primary issues
Step 10	Identify how primary data deficiencies can be addressed
Step 11a, 11b, 11c	Agency Staff, Volunteers, Contractors
Step 12	Rectify Data Deficiencies

Step 9: Utilizing the verified and refined list of issues developed in step 5, identify readily available data sources and their state of refinement (e.g. Are they already in a GIS coverage? Are they ready to be put in a GIS coverage? Are they in a state in which they should be or could be converted? Are they useable?). Identify deficiencies in the data (e.g. Have all the locations of sensitive resources (e.g. riparian zones, wintering grounds, etc.) been mapped? Do all of them have to be mapped or is just a subset needed (i.e. just those sensitive resource locations that are located in tandem with or proximate to travel routes?) Have all of the roads and trails within the priority subregions been mapped? Have all or most of the important campgrounds and staging areas been identified?).

Agency staff make the final determination as to the type of routes evaluated through the Evaluation Tree© based upon agency directives and policy. The word "route" may refer to roads, "ways", trails, etc. whether they are maintained or not, whether they are motorized or not, or any other descriptions that may be appropriate for such "routes."

In addition to existing routes, the agency may also review and evaluate the data for known proposed routes with the Evaluation Tree©. While the route evaluation is being performed, should a new route be proposed, that route may also be evaluated.

Steps 10 and 11: At this point in the assessment of data for the subregions, the highest priority data (i.e. most needed and most useful) and the most pressing data deficiencies have been identified. Those data deficiencies can be closed by either modifying existing data sources or by collecting new/supplemental field data. A determination is needed as to who is capable (i.e. ability and time) of addressing these data deficiencies . For example, it may be determined that route mapping data deficiencies could be best filled by the joint efforts of agency/contractor/volunteer survey crews, the net result of which

might not only include the acquisition of needed route data, but perhaps more importantly beneficial and effective public outreach. On the other hand, data deficiencies concerning the presence/absence of sensitive species or habitat is more likely to require professional expertise leaving that work to specialists either from agency or contractor staff. The determination to use contractor staff, as well as the extent to which they would be utilized, to augment agency staff is dependent upon agency staff expertise, workload, amount of work to be performed and the realities of time and budget constraints.

Step 12: Given that the above steps identified the most important data deficiencies and determined how and by whom they might be filled, determine which of those identified data deficiencies need the most time and are most urgent in order to maintain the planning schedule. Further prioritize the order in which the various data deficiencies are to be addressed by revisiting both the goals of the desired future condition and the priority issues/concerns that need to be addressed in an adequate (legally defensible) route evaluation and potential designation process. Identify which of the data sets may or may not be still useful (e.g. too outdated). Identify which data sets, if properly refined might be useful for route evaluation. Identify the amount of work it would take to properly utilize a data set and perform a cost-benefit analysis to evaluate the net worth to the planning process of refining or updating a data set. Discard from consideration those data sets that are deemed too costly and that won't add significantly to the route evaluation process. Identify which data deficiencies clearly need to be addressed in order to perform an adequate evaluation.

Prepare for Route Evaluation (Steps 13 through 16)

Step 13	Divide each sub-region into sub-subregions to be able to create maps at a scale that can clearly portray the coverage information necessary for route evaluation, e.g. 1:24,000 scale
Step 14	Create maps for each sub-subregion for route evaluation
Step 15	Review plan alternatives and fine tune the travel management and potential designated trails and travel management system objectives for each alternative
Step 16	Refine Route Evaluation Tree© (Evaluation Tree©) "Evaluation Questions" to insure that identified resource and use issues are adequately addressed

Step 13: Within the subregions, break the area of analysis into smaller evaluation units or sub-subregions. These sub-subregions may be uniformly influenced by access needs, use levels or have similar resource issues/constraints. Often these smaller planning units are defined by the routes which create their borders. These sub-subregions need to be small enough to have sufficient map detail visible from the GIS coverages for use in answering the standardized questions in the Evaluation Tree© (e.g. 1:24,000 at the smallest scale; larger scales such as even 1:8000 may be necessary for denser route networks or adequate resource conflict analysis).

Step 14: At this point in the process those issues that are expected to most affect the route evaluation process have been identified and to the extent possible the data concerning those issues has been converted into GIS coverages. Create maps of the

subregions utilizing the best available information reflecting the known or perceived sensitive resource issues/constraints, as well as known or perceived access needs or use levels (whether commercial or recreational).

This data will be displayed as point, line and polygon data. For example, pertinent point data might include nesting or reproductive sites, cultural sites, windmills, gates, or cabins for ranching, mining sites, water catchments for wildlife, campsites, utility sites, etc. Examples of line data would include route location and type, streams, washes, fence lines, pipelines and fence lines. Polygon data might include sensitive/critical habitat designations, migration/movement corridors, culturally sensitive areas, fire history polygons, and land ownership and management boundaries. This information would be portrayed on USGS DRGs base maps which display topographic, hydrologic and other general information useful to the route evaluation process.

Steps 15 and 16: At this stage each subregion and sub-subregion map is reviewed by agency staff and management representing a variety of specialties (e.g. natural and/or cultural resources, recreation, law enforcement, minerals, realty and range management). Past, present and future management concerns and issues are reviewed and discussed. These discussions should focus primarily on the direct and indirect effects the use of various motorized routes are having on resources, law enforcement issues, the distribution of recreation, the types of recreation, land use conflicts and maintenance issues. This review process also needs to include "landscape-level" discussions regarding sensitive resources (e.g. sage grouse, elk and regional condition of their habitat) and how those sensitive resources might be affected by varying route densities, level and season of use, adjoining land uses and land use planning documents, changing use patterns and trends (e.g. including recreational changes, growth and development patterns, habitat loss and its implications, etc.), specific problem areas and if appropriate the influence of routes on adjoining non-public lands.

The outcome of this lengthy review and discussion should be two-fold. First, the sideboards and management goals for each plan alternative should now be fine-tuned to include guidelines concerning travel management and potential designated trails and travel management system objectives (and would be subsequently reviewed, analyzed, and fully expanded upon in the subsequent NEPA documentation that references output from the Evaluation Tree©). Secondly, the standardized Evaluation Tree© options would be modified to include specific items resources, issues, uses, and concerns in that planning area. Definitions would be developed for such terms as "proximate" or "zone of influence" based upon the expertise of the agency specialists as they are to be applied to the planning area.

Route Evaluation (Step 17)

Step 17	Evaluate each route utilizing the Evaluation Tree©; concurrently enumerate each route and, as needed, each route segment

At this stage of the process, sub-subregion maps have been created, the highest priority resource and use issues have been identified, the standardized Evaluation Tree© options have been modified and the manner by which each possible route network would typically address the various issues and concerns have been identified. Routes within the sub-subregion are now selected for evaluation utilizing the Evaluation Tree©.

Prior to and throughout the route evaluation at this stage, the actual and potential issues and concerns that have been identified in preceding steps are considered to assist with evaluating the routes and developing potential designated trails and travel management systems from a landscape perspective. Not only are the individual routes reviewed, but their influence within the sub-regions and the larger planning area are also evaluated.

Each route is tracked by assigning to it a specific alphanumeric code. This code generally employs a standardized identification convention that includes one to two letters followed by 4 digits (this number may be customized to correspond with the preferences of the planning agency). The letters would represent the first letter of the sub region (e.g. Lake Mead = LM, Royce Canyon = RC). Four or more numerical digits follow, the first of which represents the sub-subregion in which the route either began or ended, followed by next three or more digits that actually represented the route number in that sub-subregion.

If a route has "spur routes" that clearly are sub-segments of that route or if a need to segment a route is identified (e.g. to highlight significant changes in use, condition or influences, or to enable the route evaluation team the opportunity to expand potential designated trails and travel management system options) then further identification of the route follows via the utilization of lower case letters of the alphabet at the end of the route number.

Typically, evaluation starts with the most highly used "feeder" routes and ends with the most lightly used routes, with the focus being on evaluating all routes within a single area (e.g. within a small watershed or a portion of a sub-subregion) until all routes within that area are evaluated. This focus allows areas with similar issues and concerns to be addressed not only on a route-by-route basis, but also with a larger landscape perspective which allows for consideration of the collective implication of the potential designated trails and travel management system within that area. As each route is evaluated, it is enumerated and split, if necessary, to increase the precision of the evaluation and/or expand the potential designated trails and travel management system options.

The process begins by looking at the route characteristics, such as route conditions (e.g., use level, evidence of construction, route type) and designations under previous planning efforts. This data provides the initial background for the route.

The process then progresses through the Evaluation Tree© gathering specific information about the routes by answering sequentially a number of questions that are arranged in a sieve-like fashion to address the various statutory sideboards and issues and concerns identified earlier in the Route Evaluation Process©. The questions generally fall into the five following categories:

- Identification of legal easements, right-of-ways, and other issues related to permitted commercial access or real-estate title and private property (e.g. vested, prescriptive rights);
- Identification of known or potential influences to specially-protected resources, e.g. listed T&E species or their critical habitat, historic sites (cultural resources eligible for or listed on the National Register of Historic Places) , Monument objects (identified as objects in Monument Proclamations), other sensitive resources, and known visitor conflicts, etc.
- Identification of ways in which to avoid, minimize or mitigate impacts, as well as identification of influences to other sensitive resources such as special management areas, soils values protected by Monument proclamation and identification of cumulative effects, etc.
- Identification of the public uses of a route, including recreational qualities, safety concerns, etc.
- Identification of route redundancy.

Underlying each specific standardized question in the Evaluation Tree© are a series of other related questions or concerns that should be addressed as the route is evaluated for its potential designation (refer to Attachment 2: Underlying Evaluation Tree Questions©). The manner in which the questions are answered leads the route evaluation team down any number of a series of "limbs" or pathways in the Evaluation Tree©, depending upon how each of the sequential questions are answered. The specific questions are discussed in the following paragraphs.

Once the route characteristics are identified, the first question asked of the evaluation team is whether the route is an officially-recognized right-of-way or an officially-recognized County or State route. If the answer to this question is yes, the evaluation team is asked for more detail, such as identification of the right-of-way holder or whether the responsible agency has any plans for the route that may affect the evaluation and potential designation (e.g. route or access point re-alignment).

If the route is not a right-of-way or County or State route, the next question seeks to identify commercial, private property or administrative uses, regional influences (e.g. route serves more than one planning sub-region or serves as a principal means of connectivity within a sub-region), or whether the route is recognized as part of a federal planning document and subject to maintenance. The evaluation team may need to take a "hard look" pause to consider the implications of the potential designation on this route as routes that fall under this category may have specific legal requirements for access that may preclude closing the route without the approval or the right-of-way holder.

Resuming the path through the Evaluation Tree©, if either of the above two questions are answered in the affirmative, the specific access needs are identified by recording the commercial, private property, or administrative uses of the route, and the regional access and/or the federal planning document are also identified. Commercial uses may include such uses as ranching, airstrips, or utilities, and the specifics under each of those categories is identified (e.g. for ranching the uses identified may include such facilities as corrals, water tanks, or ranch headquarters). Administrative uses include access needs from any governmental agency (including the military and state agencies), such as accessing weather stations, monitoring sites, or military training facilities. Regional uses, such as serving as a principal means of connectivity, are identified and the potential local influences afforded by the route are identified (i.e., does the route contribute to the local economy through tourism). Additionally, if the route is recognized as part of a federal planning document and subject to maintenance, there may be specific guidance regarding maintenance activities identified during the evaluation and potential designation process.

Route use and access can also be identified as being "primary", "secondary" or "tertiary" during this process. Primary access indicates that the route serves as the main access point for a specific use. A secondary access indicates that the route may be utilized as an access point, however it is not the most commonly used route to gain access. For example, it could be the route is utilized as an access route only during specific weather conditions if the primary route is subject to flooding. Tertiary access indicates that the route may be utilized as an access route, however it is much less commonly used as such.

Once the access issues are identified, the pathway through the Evaluation Tree© leads to the identification of possible resource influences. The resource implications are addressed by asking: Might the continued use of this route impact State or Federal special status species or their habitat or cultural or any other specially-protected resources or objects identified by Agency planning documents, plan amendments or any other special area designations (e.g. National Monuments)? If this question is answered in the affirmative, the specific potential impacts are then identified. Data collected under this question may address cultural sites/polygons, special designation areas (e.g. Areas of Critical Environmental Concern (ACECs), Wilderness/Wilderness Study Areas), plants and animals (e.g. those listed under the Endangered Species Act, Management Indicator

Species), monument objects, and other items identified by the agency during the issue identification steps of the Route Evaluation Process©.

The impacts to these resources can be identified as "direct" or "indirect" impacts. For example, a "direct" impact to a species may be harassment of the animal through the use of the route, while an "indirect" impact might include degrading the plants upon which an animal feeds and thus reducing the foraging area of the species.

If any of the identified impacts are in violation of statutes governing the protection of the resource (e.g. Endangered Species Act, Historic Preservation Act), the evaluation team takes a "hard look" pause to further consider the route's potential designation based upon the influences to the resource. Consideration is given to whether the impact can be avoided, minimized or mitigated without closing the route, and if so, what steps will need to be taken (e.g. seasonal closure, vehicle type limitations, speed limits, species-specific mitigation measures). If the impacts cannot be avoided, minimized or mitigate without closing the route, the evaluation team identifies that issue. In either case, the evaluation of the route is continued to gather additional data that may be utilized for analysis of the larger planning area (e.g. landscape perspective, collective implications).

Even if the identified impacts are not in violation of statutes governing the protection of the resource, the next question in the pathway of the Evaluation Tree© asks whether the identified impacts can be avoided, minimized or mitigated. The evaluation team considers the impacts and potential means of addressing those impacts and continues along the pathway of the Evaluation Tree©. The specific measures that may be utilized to address the impacts are identified during the potential designation step of the Route Evaluation Process© and this process is discussed in Step 18 below.

Alternatively, if the resource impacts question was answered in the negative, the next question asks whether route closure or some other form of mitigation would address collective effects on various other resources not specifically identified as sensitive or specially protected (e.g. monument values, habitat fragmentation, sensitive soils). Once again, the route evaluation team considers other influences from the route and potential means of addressing those influences and continues along pathway of the Evaluation Tree©. The specific measures that may be utilized to address the influences are identified during the potential designation step of the Route Evaluation Process© and this process is discussed in Step 18 below.

The next question in the Evaluation Tree© gathers information about other uses of the route by asking whether the route contributes to public uses, such as recreational opportunities, potential designated trails and travel management system connectivity, public safety, or other public multi-use access opportunities enumerated in agency Organic laws. If the question pertaining to public uses is answered in the affirmative, the

specific public uses are identified (e.g. hiking, hunting, ATV use, equestrian use). These public uses may also be identified as being "primary", "secondary" or "tertiary" similarly to the access needs.

For some routes, the pathway through the Evaluation Tree© may finish here. However, other routes may have one more question asked to identify possibly route redundancy. The evaluation team is asked whether the uses identified can be met by another route or routes that would minimize the resources impacts or the collective effects. This question once again prompts the evaluation team to consider the route not as a stand-alone route, but also to consider the route in correlation with the area surrounding it, both the immediate area and the larger planning area. If this question is answered in the affirmative, the specifics regarding the other route(s) is provided. However, if the question is answered in the negative, the uses that cannot be met by another route are provided. This question finishes the pathway of questions through the Evaluation Tree©.

Once all the questions along the specific pathway of the Evaluation Tree© have been asked and answered, and the details about each answer collected if necessary, the evaluation team is directed to a specific "rosette" or cluster of possible designations in the Evaluation Tree © for the route based upon the information gathered through the evaluation process. See Step 18 for a discussion of the rosette and the next step in the process.

The questions within the Evaluation Tree© are systematically asked of each route as a means of collecting the specific information for the route. It also provides documentation for the specific evaluation process leading to the potential designation. As the evaluation team progresses through the Evaluation Tree©, the responses to each question are recorded without assigning any weighting to the question responses. When the evaluation team is presented with the potential designations after responding to the questions in the Evaluation Tree©, each potential designated trails and travel management system option as represented by agency staff may review the responses and then weight each answer according to their underlying objectives (see Step 18) which may be based upon route type, condition, natural or cultural resources, environmental concerns, public uses, and/or previous planning process findings. Additionally, the collective effects of the route's influences, uses and potential designations must be considered as part of the evaluation step as they pertain to natural and cultural resources and recreational opportunities. Each potential designated trails and travel management system option may have distinctive management intent or a "game plan" for each sub-subregion that meets the overall objectives of the potential designated trails and travel management system option and therefore, the individual routes within an area will be evaluated and considered individually, but they will also be considered within the context of a larger landscape perspective.

Routes are evaluated based upon the best available knowledge contained in the GIS coverages, the knowledge of the agency staff (including previous planning efforts that may affect the route or area), information provided to the agency from the public, and/or other possible means of obtaining the data (e.g. other local, state and federal resource agencies). If certain information is not available or not available to a sufficient level of detail, notations within the database may be added indicating that additional information is necessary and the route will be re-evaluated after that information has been obtained or confirmed. Additionally, categories within the Evaluation Tree© may be added indicating a "suspected" or "potential" use or influence if the information is not known specifically. Agency staff may then follow up with the appropriate specialists or database to obtain the necessary data and re-evaluate the route to include this information. Additionally, as the public will have opportunity to further review route evaluation data and the potential route designations during both informal and formal comment periods, information previously unknown to the agency may be discovered at that time, allowing for re-evaluation of the route , and changes to the potential designation incorporated as necessary.

Each question along a pathway within the Evaluation Tree© serves as a means of gathering resource specialists' responses and is asked of every route; no pathway is stopped prematurely based upon an answer to any question. This assists the evaluation team in considering combined or collective effects and provides them with a more thorough understanding of issues and uses pertaining not only to the individual route, but also to the sub-subregion, subregion and planning area as a whole. The evaluation team will then be better suited to take into consideration the "landscape perspective" as each route is considered, with a more thorough understanding of the flora and fauna, as well as the commercial, administrative or public uses of the area. This full pathway for each route is the key to a systematic and logical approach, verifying that the same questions are asked of each route and that the same type of information is gathered for each route.

A very important caveat regarding the use of the Evaluation Tree© that cannot be overlooked is that this is *only a tool* that creates a systematic logical repeatable framework for the collection of data utilized for the evaluation of each route. The confidence that one places in its recommendations is only at its highest when the evaluation team has spent adequate time in carrying out all of the steps described above as the Route Evaluation Process© (i.e. knowledge of the guiding statutes, public and agency issues and concerns, environmental constraints and commercial/recreational needs and uses), before utilizing the Evaluation Tree©.

Development of Potential Designated Trails and Travel Management System options (Steps 18 through 21)

Step 18	Recommend and record potential designation code for each route under each potential designated trails and travel management system option as well as special notes regarding e.g., potential impacts, proposed mitigation, etc.
Step 19	Integrate Access and GIS databases to create maps for each potential designated trails and travel management system option showing recommended potential routes
Step 20	Input on range of potential designated trails and travel management system options regarding preferences (e.g., input from staff, management, cooperating agencies, and/or public)
Step 21	Development of preferred potential designated trails and travel management system option as part of range of potential designated trails and travel management system options

Step 18: As the last question in each pathway is answered the evaluation team is provided with a rosette or cluster of the potential designation(s) such as Open, Close, Limit, Mitigate Open or Mitigate Limit. Each of these answers is alphanumerically coded (i.e., "Close 08" or "Open 07") such that the exact sequence of questions, as well as how they were answered, can be re-created in the future. These codes and all data collected throughout the Evaluation Tree© are entered into a database for future use and analysis.

In Steps 15 and 16 above, the plan alternatives were reviewed and the potential designated trails and travel management system travel management objectives for each alternative were fine tuned. Additionally the evaluation questions were fine tuned to insure that identified resource and use issues were adequately addressed. The Evaluation Tree does not set the threshold for acceptable impacts for each of the alternatives. These are instead typically established by agency staff as part of the NEPA process. Each potential designated trails and travel management system option considers the influences and uses identified through the Evaluation Tree and makes a potential designation based upon the sideboards for the alternative guiding that route network option. After completing step 17 for a route, each potential designated trails and travel management system option identifies the potential designation that best meets its objectives for that route and landscape as a whole. By reviewing the uses, resources and issues for each route, the potential designated trails and travel management system option may choose to weight certain concerns higher that others and potentially designate the route according to that weighting. The potential designation code for each potential designated trails and travel management system option is entered into the database for future use and analysis, including linkage with GIS (see Step 19). As each route is evaluated and a potential designation is made, an electronic record specific to that route is established (See Attachment 2: Route Evaluation Report©). The information collected includes:

- The route number;
- UTM coordinates indicating the approximate location of the route;
- The responses to each question of the Evaluation Tree© and, if applicable, the options selected for each question;

- The Evaluation Tree© code denoting potential designation, which as mentioned above would indicate the "leg" or "branch" of the Evaluation Tree© that was followed in arriving at the potential decision;
- The potential decision of Open, Close, Limit, Mitigate Open or Mitigate Limit for each potential designated trails and travel management system option.

Mitigation measures may be suggested during this stage to assist with implementation of the planning documents. Details regarding potential mitigation actions (e.g., actions to be performed, schedules for actions) are discussed by the agency in the subsequent planning documentation. The Evaluation Tree© is a tool to assist with route evaluation and potential designation and does not take the place of any required NEPA analysis.

Step 19: The electronic records are recorded in a database that allows the potential designations to be collectively integrated or joined with the existing route inventory GIS database. This "joining" of the two databases then allows for the production of maps that integrate recommended decisions with the route inventory.

Step 20: After the Route Evaluation Reports© are generated and the databases are linked, further input may be received from staff, management, cooperating agencies and/or the public. Whether at this stage or earlier in the evaluation process additional planning tools (e.g. VRM, ROS) may be utilized to add further analysis or assistance to this process. After reviewing the Route Evaluation Reports©, comments may be recorded on the Staff Evaluation of Preliminary Travel Management Route Designation form (see Attachment 4: Staff Evaluation of Preliminary Travel Management Route Designation Form). Agency staff can then review the feedback, update the routes within the database as may be necessary based upon the new information received during the feedback process and create new Route Evaluation Reports© and maps.

Step 21: Once the additional input has been reviewed and the potential route designations for each potential designated trails and travel management system option are complete, the Potential Preferred Designated Route Network is developed using the Evaluation Tree© data and the potential designations analyzed as required under NEPA. The Preferred Alternative may determine that certain specific information about the routes be weighted more than other considerations, and analysis regarding that determination would be detailed in the NEPA documentation.

As useful as the Evaluation Tree© may be as a tool to systematically evaluate and make potential route designations, there may be circumstances which compel a manager to over-ride the recommendation of the Evaluation Tree©. This circumstance was anticipated and may be addressed within the NEPA document by providing a "statement of overriding considerations."

NEPA Documentation (Steps 22 through 25)

Step 22	Develop and Incorporate Route Evaluation recommendations into the appropriate NEPA document
Step 23	Public Comment and Review of Potential Designated Transportation Network
Step 24	Final Environment Impact Statement (FEIS)
Step 25	Record of Decision (ROD)

Step 22: Integrating the Route Evaluation Process© as a tool with the agency's NEPA requirements and the specific guidelines delineated in agency planning handbooks is an integral component of this process. Travel management planning and the potential route designation create outcomes that are viewed by many professional land management planners as central to the understanding and effective analysis of impacts in any major land use plan and EIS. Simply put, most impacts over which management has control within a management area are related to visitor use trend and patterns (i.e. where they go, how many, how they go, when they go, etc.) Because of this very important and inseparable interrelationship, travel management planning (including potential route designation) should, to the extent possible, be fully integrated and addressed early in the land use planning process. Due to this relationship, the data collected and the recommendations made through the Evaluation Tree© provide a strong base of information for required NEPA analysis in the DEIS, but it does not provide the necessary NEPA analysis on its own.

Step 23: After circulating the DEIS, the public will have the opportunity to review and comment on the proposed route evaluations and potential designations as part of the DEIS. In order to facilitate the ease with which the public can review the information utilized to evaluate the routes, individual route reports are available on a CD in the back of each DEIS. A copy of this CD may be requested from the Arizona Strip District Office at 345 East Riverside Drive, St. George, UT 84790 or by calling (435) 688-3266 or by email to Arizona_Strip@blm.gov. Written comments are submitted to the agency for their review, classification, and incorporation into the FEIS, as needed. Appropriate changes to the potential route designations are then made. At this near final stage, as well as throughout the earlier steps (i.e. steps 1 - 8, 15 – 21, with particularly emphasis on steps 17 – 18) as the potential designated trails and travel management systems are developed, maintenance, law enforcement (e.g. compliance) and budget considerations need to be carefully evaluated for their feasibility and practicality by maintenance, law enforcement and management staff.

Steps 24 and 25: Once the comments have been reviewed by the agency, the FEIS is issued containing any responses to comments and modifications to the text of the DEIS, if necessary. The Record of Decision is the final approval of the FEIS by the agency designating officer.

Public Input and Comment (at various points during Steps 1 through 25)

At various points during the Route Evaluation Process©, the public has the opportunity to provide input or comment on the route evaluations, depending upon the individual agency and the purpose for which they are utilizing the Route Evaluation Process©.

This public involvement may be accomplished in any of the following ways:

- assistance with inventory of the routes to be evaluated and potentially designated;
- submit information to agency staff regarding the use and/or resources for routes, potential designated trails and travel management systems or areas;
- submit information to agency staff regarding specific resources to be considered for avoidance, mitigation, or protection while evaluating the routes
- public meetings to discuss the process;
- informal meetings with agency staff;
- review of maps and Route Evaluation Reports© at agency offices and/or other locations; or
- submit written comments as part of a formal NEPA comment period.

Incorporation of Additional Information / Addressing New Conditions:

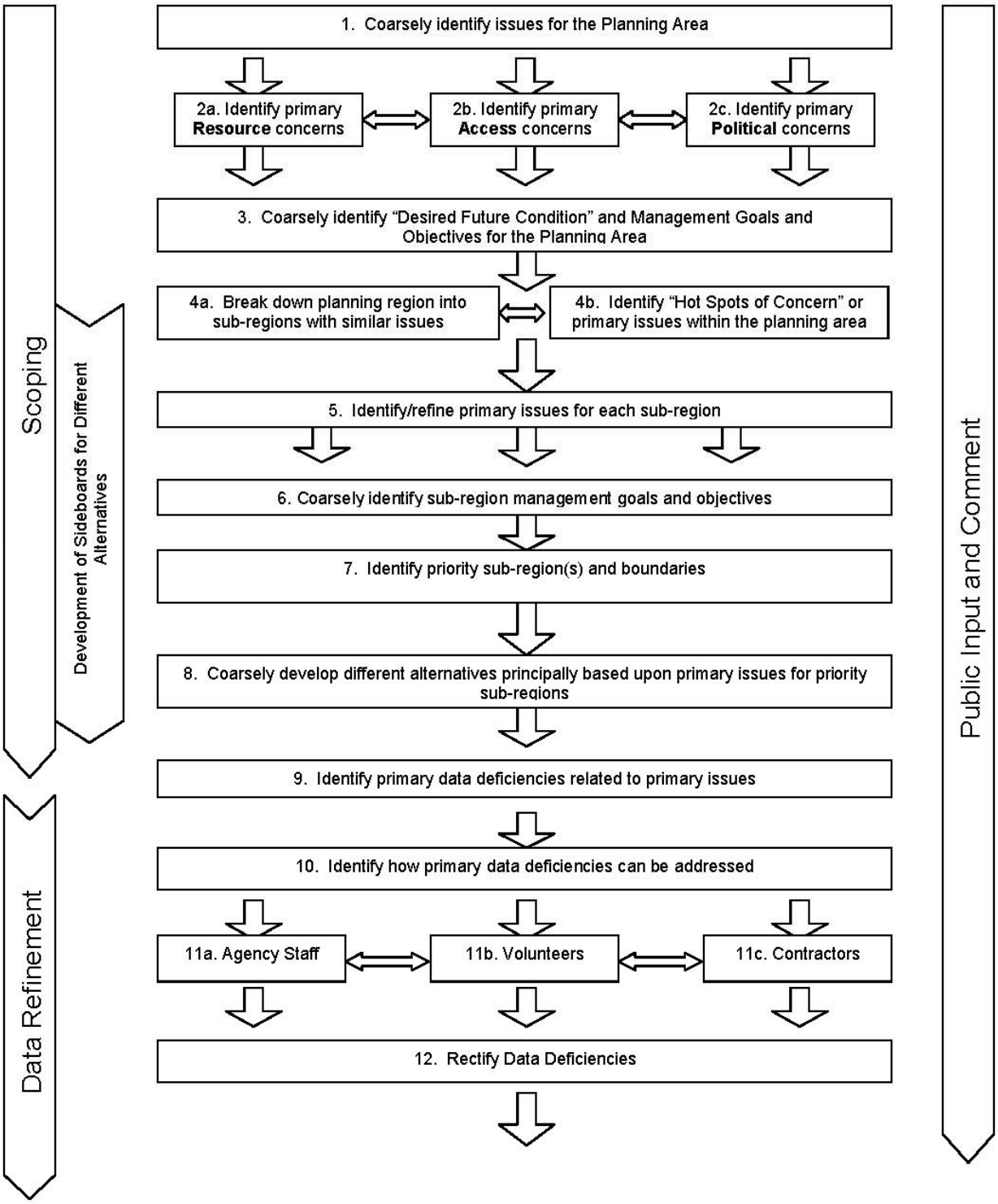
During the life of the plan it can be expected that new information or changing conditions will result in the need to reassess both individual routes and possibly the entire route system. Examples of such changes that might result in such a reevaluation might include: proposals for new routes or route closures, as well as changing recreational trends, shifts in commercial activities, discovery of previously unknown cultural sites and newly listed species The Route Evaluation Tree Process has been designed to address the need for updating via its software database (developed in Access) which allows for the easy incorporation and analysis of new information which can then be used via GIS software interface to modify the potential designation of routes as necessary (i.e. in accordance with NEPA and other pertinent statutes). Once potential route designations have been appropriately modified, those potential route designation changes can be quickly shared with appropriate parties (including the public) via the production of route reports that display the information that was considered as part of each route evaluation, as well as visually via the production of detailed GIS maps. **To view these maps and reports, click here**

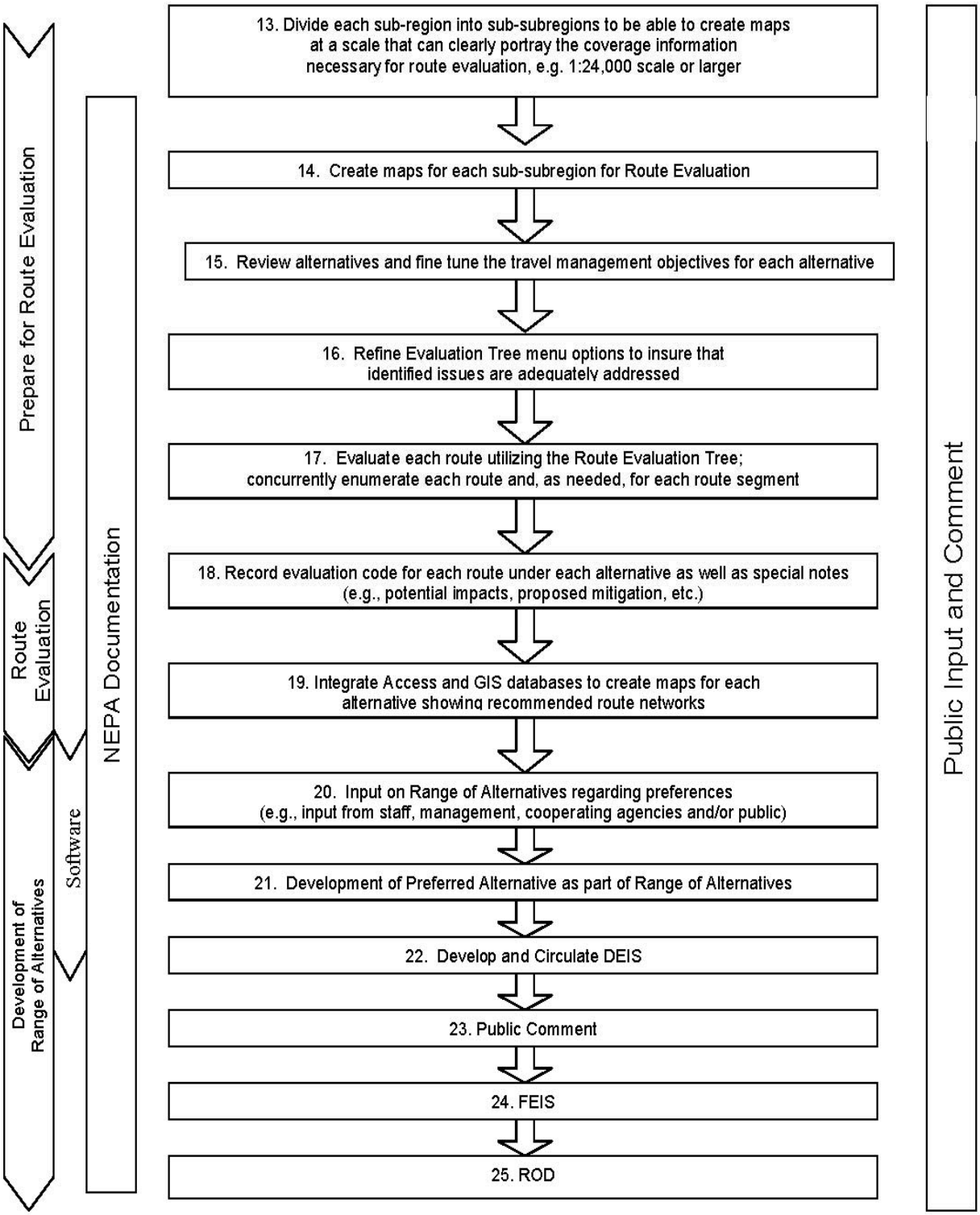
List of Attachments

Attachment 1	**Route Evaluation Tree Process© for Travel Management Planning**
Attachment 2	**Underlying Evaluation Tree Questions©**
Attachment 3	**Route Evaluation Report©**
Attachment 4	**Staff Evaluation of Preliminary Travel Management Route Designation**

Attachment 1

Route Evaluation Process©
for Travel Management Planning


Scoping
Development of Sideboards for Different Alternatives
Data Refinement
Public Input and Comment
1. Coarsely identify issues for the Planning Area
2a. Identify primary Resource concerns
2b. Identify primary Access concerns
2c. Identify primary Political concerns
3. Coarsely identify "Desired Future Condition" and Management Goals and Objectives for the Planning Area
4a. Break down planning region into sub-regions with similar issues
4b. Identify "Hot Spots of Concern" or primary issues within the planning area
5. Identify/refine primary issues for each sub-region
6. Coarsely identify sub-region management goals and objectives
7. Identify priority sub-region(s) and boundaries
8. Coarsely develop different alternatives principally based upon primary issues for priority sub-regions
9. Identify primary data deficiencies related to primary issues
10. Identify how primary data deficiencies can be addressed
11a. Agency Staff
11b. Volunteers
11c. Contractors
12. Rectify Data Deficiencies


Prepare for Route Evaluation
Route Evaluation
Development of Range of Alternatives
Software
NEPA Documentation
13. Divide each sub-region into sub-subregions to be able to create maps at a scale that can clearly portray the coverage information necessary for route evaluation, e.g. 1:24,000 scale or larger
14. Create maps for each sub-subregion for Route Evaluation
15. Review alternatives and fine tune the travel management objectives for each alternative
16. Refine Evaluation Tree menu options to insure that identified issues are adequately addressed
17. Evaluate each route utilizing the Route Evaluation Tree; concurrently enumerate each route and, as needed, for each route segment
18. Record evaluation code for each route under each alternative as well as special notes (e.g., potential impacts, proposed mitigation, etc.)
19. Integrate Access and GIS databases to create maps for each alternative showing recommended route networks
20. Input on Range of Alternatives regarding preferences (e.g., input from staff, management, cooperating agencies and/or public)
21. Development of Preferred Alternative as part of Range of Alternatives
22. Develop and Circulate DEIS
23. Public Comment
24. FEIS
25. ROD
Public Input and Comment

Attachment 2

Route Evaluation Process©

Questions Underlying the Route Evaluation Tree©

Route Evaluation Process©

Step 17 – The Evaluation Tree©

Questions Underlying the Route Evaluation Tree©

Route evaluation and designation accomplished via the Route Evaluation Process© developed by Advanced Resource Solutions, Inc. utilize the Route Evaluation Tree© (Evaluation Tree©) and associated software. The Evaluation Tree© and the drop-down menus in the software are fine tuned as necessary to meet specific planning issues and may be supplemented as appropriate with more specific, issue-oriented questions that underlie the major questions found in the Evaluation Tree©.

These underlying questions are organized by the following 'major question' categories:

- Commercial, Private, and Administrative Access Issues;
- Environmental Issues / Special Resources;
- Recreation and Other Public Access Issues; and
- Route Redundancy Issues

The list below is representative of the underlying questions asked during route evaluation. The list is not all-inclusive as each planning area has issues that are specific to that area. The questions may be asked during the route evaluation sessions to further assist with answering the questions found in the Evaluation Tree©.

Definitions provided as part of these underlying questions are provided as general guidance only and would be modified to match the definitions intended by each agency.

Commercial, Private, Administrative Access Issues

Evaluation Tree© A:
"Is the route an officially recognized Right-of-Way or an officially- recognized County or State route?"

Consider the following:

1. Is the route part of an officially-recognized Right-of-Way? (e.g. part of a utility corridor, serves as access to maintain a commercial site or area)
2. Is the route maintained and legally recognized by another agency of government (tribal, state, county, NPS, Forest Service, etc.) and recognized as an integral part of a larger regional or sub-regional route network ("trunk line")?

Assess and/or take into account:

a) Are there any special or future plans that the responsible agency has for the route that may affect this evaluation?
b) Are there easement acquisition needs for the route?
c) Should the route remain open or should its use be limited in some manner? (e.g., seasonally, by vehicle type, etc)

Evaluation Tree© C:
- Does the route provide commercial or private property access (e.g. via prescriptive or vested rights)
- Is the route a regional route that serves more than one planning sub-region;
- Is the route a principal means of connectivity within a sub-region; or
- Is the route officially recognized as part of a Federal planning document and is subject to maintenance?

Consider the following:

1. Is the route on an existing official agency transportation system?
2. Does the route provide access to a governmental, commercial, industrial, or other non-recreational facility, right-of-way, structure, or to private or non-agency property?
3. Is the route necessary for access to non-federal lands (e.g. private property)?
4. Does the route provide administrative access (e.g. fire management, monitoring sites, etc.)?
5. Does the route provide for the maintenance of facilities necessary for officially permitted commercial activities (e.g. ranching, mining)?
6. Does the route meet the specific definition for a route for evaluation as defined by the agency?
7. Does the route provide continuity between state or county (public) roadway and other agency (e.g. BLM, USFS, NPS, military) routes?
8. Does the route support important access to other lands under the jurisdiction of other agencies (e.g. Recreation Areas)?

Assess and take into account:

a) Does adequate access for commercial, private, or administrative purposes in the route area already exist? If so, does the route represent secondary access?
b) Are multiple access routes needed for commercial or private lands?
c) Should the route be limited to commercial, private, or administrative access only?
d) Is there a history of use for the route? Is the route considered an R.S. 2477 route? Has that assertion been perfected?
e) Is a commercial permittee (e.g. rancher, miner) required to maintain the route under the conditions of the permit; or does the permittee voluntarily maintain the route for operational or permit purposes?

Environmental Issues / Special Resources

Evaluation Tree© B, F, G:
"Might the continued use of this route impact State or Federal special status species or their habitat or cultural or any other specially-protected resources or objects identified by Agency planning documents, plan amendments or any other special area designations (e.g. National Monuments)?"

Consider the following:

1. Might the continued use of route cause unauthorized appropriation, injury, destruction, or removal of any scientific and historic objects of interest in National Monuments?
2. Will the route contribute to or detract from furthering Monument protection and protection of Monument objects?
3. Does the route degrade wilderness values or the roadless character so as to disqualify an area from further consideration as a Wilderness Study Areas?*
4. Does the route (through its actual roadway as well as zone of influence) provide access to and/or pass through, cross over, intersect, or otherwise affect:
   a) special status species' habitats?
   b) cultural, historic, archeological, Tradition Cultural Properties, sites or areas?
   c) any legally or administratively designated or proposed sites or areas (National Monuments, Wilderness (existing, WSAs), ACECs, Research Natural Areas, Critical Habitats, etc.)?

Assess and take into account:

a) Emphasize closure or the minimization of the use of routes through the habitat of any special status species when closure would likely result in benefits to the species.
b) If the route negatively impact any endangered species, archeological site or geologic feature and if so, can the impact be mitigated (e.g. through road maintenance, re-routing or gating)?

Evaluation Tree© E, I, K:
"Would route closure or some other form of mitigation address cumulative effects on various other resources not specifically identified above as sensitive or specially protected?"

Consider the following:

1. Does the route, when combined with other routes, resources, uses, or landscape features, pose any indirect or cumulative effects (such as habitat fragmentation) or contribute in a positive or negative way (such as redundancy for back-up access for emergency or public safety purposes) at a different scale?

2. Will the route contribute to or detract from furthering Monument protection and protection of Monument values?

3. Does the route (through its actual roadway) provide access to and/or pass through, cross over, intersect, or otherwise affect:
   a) other biologically or ecologically important areas ("hot spots"), wildlife migration routes or movement/dispersal corridors, critical winter range, etc.?
   b) geologically important or unique sites or areas (including petroleum, gravel, flagstone, and other mineral resource deposits) or where energy development (including geothermal, wind, etc.) could occur outside of wilderness areas and National Monuments?
   c) floodplains, wetlands, ephemeral or perennial creeks, streams, springs, seeps, or other natural water sources or bodies?
   d) areas, sites, structures, or projects of scientific and/or management interest (livestock or wildlife fencing; water collection or transfer facilities, storage tanks, and drinkers; corrals; rangeland vegetation exclosures; weather gauges; etc.)? (Is there an opportunity to limit this route to Administrative or Commercial Use only?)
   e) areas or sites of past, present, or foreseeable future: native species, natural habitat, range improvement, or other resource restoration/reintroduction projects; fuels management or vegetative treatment projects; and/or invasive species/noxious weed colonization or expansion control projects?
   f) cryptobiotic, highly erodible, or other sensitive or important soils?
   g) dry or wet meadows?
   h) areas or sites important for another reason?
4. Will closure of this route contribute cumulatively to concentrating human use to fewer access routes, possibly to the benefit or in some cases even to the detriment of certain sensitive resources?

5. Assess and take into account:

a) Avoid permanent closure of any route that is the sole access to any source of water for wildlife that requires regular maintenance. (Is there an opportunity to limit this route to Administrative Use only?)
b) If the route were to be designated as closed, is it feasible, given local conditions, to physically close the route in such a way as to ensure permanent closure through public compliance?
c) Does the route support forest or ecosystem restoration activities?

Evaluation Tree© D, H, J:
"Can the impacts to the above sensitive resources be avoided, minimized or mitigated?"

Consider the following:

1. In addition to completely closing and restoring the route, are there other means by which to avoid, minimize or mitigate the potential impacts identified above? Consider limits on use (e.g. season of use or sensitivity, group size, vehicle type, type of activity, etc.) and/or consider various other forms of mitigation (e.g. re-routes,

adaptive management monitoring with identified thresholds of acceptable change and specific response measures.

2. Does the route, when combined with other routes, resources, uses, or landscape features, pose any indirect or cumulative effects (such as habitat fragmentation) or contribute in a positive or negative way (such as redundancy for back-up access for emergency or public safety purposes) at a different scale and how can these impacts be avoided, minimized or mitigated?

3. *Assess and take into account:*
   a) Emphasize closure of routes through wildlife "hot spots" when doing so would likely result in significant benefits to the species or habitat.

Recreation and Other Public Access Issues

Evaluation Tree© L, M, N, O, P, Q, R, S, T, U, V, W:
"Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public multi-use access opportunities enumerated in agency Organic laws?"

Consider the following:

1. Does the route provide recreational opportunity?

2. Will use of the route contribute to or detract from the various expressions of the "public interest" in and for National Monument resources and values, such as scientific inquiry, long-term preservation and public use and enjoyment for present and future generations?

3. Does the route dead-end at a destination point such as a facility, existing or planned public interpretative site, structure, trail head, or camp site which will be left open or accessible?

4. Does the route (through its actual roadway as well as zone of influence) provide access to and/or pass through, cross over, intersect, or otherwise affect areas or sites of public recreational uses (e.g. camp or picnic sites, hiking trail heads, hunting areas, equestrian access, OHV uses, rock-hounding, wildlife watching, spelunking, rock-climbing, sightseeing, scenic vistas, or other recreational activities) which will be left open or accessible?

5. Is the route an important link between recognized recreation use areas or motorized/nonmotorized trails?

6. Does the route provide or potentially provide important sightseeing or driving-for-pleasure opportunities for one or more modes of motorized transportation?

7. Does the route provide or potentially provide important "user experience" opportunities for one or more modes of non-motorized transportation?

8. Does the route provide important access to present commercial outfitters and guides as part of their operations?

9. Is the route an important component in an existing OHV "play" area?

10. Does the route provide access to scenic qualities?

11. Does the route provide a different recreation opportunity, either activity- or setting-related, from opportunities on potentially redundant routes?

Assess and take into account:

a) Would closing this route pose any serious constraints in terms of cost, physical practicality, and/or enforcement?
b) Would allowing this route to remain open pose any serious constraints in terms of cost, physical practicality, and/or enforcement?
c) Does the designation recommendation for this route raise any issues, concerns, impacts, or conflicts not addressed under one or more of the other questions?
d) Is the route important for maintaining "dispersed" recreation use or would its closure contribute to "concentrating" use?
e) Are non-motorized types of recreation uses impacted by the presence of routes and vehicles?
f) Are there one or more alternative routes available to serve the users of the route?
g) Does the route duplicate another route in destination and function?
h) Is the route user-created or the result of administrative process?

Route Redundancy Issues

Evaluation Tree© X, Z, BB, DD, FF, HH:
"Can the commercial, private-property or public uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources??"

Evaluation Tree© Y, AA, CC, EE, GG, II:
"Can the commercial or private-property uses of this route be adequately met by another route that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?"

Evaluation Tree© JJ, KK, LL:
"*Can the public uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?"*

Consider the following:

1. Are there one or more alternative routes available to serve the users of the route?

2. Would the uses of this route generally be regarded as redundant by both the recreating public as well as by commercial or private interests?

3. Might another route adequately meet this route's uses (i.e. both recreational and commercial) in a less environmentally damaging manner?

Assess and take into account:

a) Would the existence of the route lead to proliferation of additional roads or off-route use?
b) Is the route within an area with evidence of soils erosion from proliferation of parallel routes or routes to the same destination?
c) Does the route contribute to habitat degradation from the proliferation of routes in the area?
d) Is the route user-created or the result of administrative process?

Attachment 3

Route Evaluation Report©

Route Evaluation Report

1. REGION: Arizona Strip

2. PLANNING AREA SUBREGION: Parashant (Mohave) Coconino Vermilion

3. ROUTE IDENTIFICATION:

Sub-subregion: **Littlefield**
Planning Route ID: **M1**
Route Start UTM: North: _____ East: _____

4. ROUTE TYPE: (Principal Feeder/Trunk) (Other)

5. POTENTIAL DESIGNATION BY ALTERNATIVE:

Alternative	Alt A	Alt B	Alt C	Alt D
Recommended Designation				
Designation Code #				

6. IF Mitigation or Limited Designation recommended, explain in specific alternative:

Alt A _____ _____
Alt B _____ _____
Alt C _____ _____
Alt D _____ _____

7. Specific Comments/Special Circumstances:

Alt A _____ _____
Alt B _____ _____
Alt C _____ _____
Alt D _____ _____

(OVER)

8. DESIGNATION CRITERIA – 43 CFR 8342.1

(a) Areas and trails shall be located to minimize damage to soil watershed, vegetation, air, or other resources of the public lands and to prevent impairment of wilderness suitability.

(b) Areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention will be given to protect endangered or threatened species and their habitats.

(c) Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands and to ensure the compatibility of such uses with existing conditions in populated areas taking into account noise and other factors.

(d) Areas and trails shall not be located in officially designated wilderness areas or primitive areas. Areas and trails shall be located in natural areas only if the authorized officer determines that off-road vehicle use in such locations will not adversely affect their natural esthetic scenic or other values for which such areas are established.

9. RECOMMENDED BY: _____ _____
Date

_____ _____
Date

10. DECISION APPROVED BY: _____ _____
Authorized Officer Date

Attachment 4

Staff Evaluation of Preliminary Travel Management Route Designation

State of Arizona BLM
Staff Evaluation of Preliminary Travel Management Route Designation

1. Planning Route ID: _____
2. Map Name: _____
3. Alternative (Circle all that apply): **A** **B** **C** **D**
4. Name of Person Commenting: _____ Phone: _____
5. Preliminary Designation Issue (Specify alternative(s) then explain why you disagree with the potential designation(s)):

_____
_____
_____
_____
_____
_____

6. Suggested Designation & Rationale (Specify Alternative(s)):

_____
_____
_____
_____
_____

Management Response

7. Comment Accepted?: **Yes** **No**
8. Rationale:

_____
_____
_____
_____

9. _____ _____
Authorized Officer Date

Route Evaluation Tree©

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Patent Pending

Main Features Include:

1. Logical, standardized, balanced and repeatable approach to route evaluation.
2. Systematic questions to assess compliance with a variety of pertinent statutory requirements including:
   - Valid existing rights and other vested rights or permitted uses
   - Degree of potential impact or degradation to specially protected resources, such as species protected by the Federal Endangered Species Act (ESA), cultural, historic and scientific objects protected by the Historic Preservation and Antiquities Acts (e.g. Monument Proclamations, Section 106) and wilderness values as protected by the Wilderness Act.
   - Implementation of Agency Organic Acts and their charge to balance the public's need/desire for access to Federal lands with resource protection through a philosophy of management for "multiple use". Such consideration includes recognizing the value of providing a range of recreational opportunities and treating those opportunities in accordance with the Organic Acts as a resource worthy of protection.
3. Systematic consideration of access opportunities and resource protection needs on both a narrowly focused route by route assessment, as well as a broad-based cumulative assessment of the total network's effect.
4. Systematic consideration of mitigation and/or limited designation as a means by which to ameliorate resource impacts. Recommended designation options include a range from open to closed, and a number of intermediate actions as a means by which to balance access needs and resource protection.
5. Systematic recordation of data allowing for future retrieval and review/updating of evaluation information as needed (i.e. evaluation pathways are numerically coded).
6. Systematic ability to assess a route's recommended designation status based upon the management goals of each individual alternative.

How does the Tree Work?

1. The region or management area in which the route is located is thoroughly evaluated. Resource protection, recreation and commercial access concerns pertinent to route are identified. The patterns of these identified uses and concerns, as well as their trends are also noted. Other related issues such as law enforcement, route maintenance and user conflicts are further identified.
2. The desired future condition and management goals of each proposed alternative are identified and reviewed.
3. Each route is systematically numbered. This both allows for tracking the evaluation process and enables the public to make comment on specific routes.
4. Each route is systematically assessed by sequentially answering the questions in the Evaluation Tree. Specifically, the questions are assessed and answered in the context of the regional concerns identified in step #1 and the management goals identified in step #2 for each of the alternatives.
5. The recommendation of a designation for each route under each alternative is dictated by addressing the management goals for that alternative.
6. The specific answers to each question for each route are recorded by the final coded answer.
7. Detailed information that may have been critical to the answer of any question(s) or in the determination of the final outcome is recorded as part or the individual route evaluation record.

Recommended Route Designations

Close 01

Close: A route that is recommended for permanent closure to all use. Physical closure may include restoring the route to the degree possible to blend with surrounding landscape, as well as installation of physical barriers and signing at the original departure point, if necessary.

Mitigate/ Limit 09

Mitigate/Limit: A route that is recommended for limited use by certain parties or entities with valid, vested, or implied rights of access, or to certain vehicle types, seasons of use, etc., following mitigation action(s) aimed at avoiding, minimizing or mitigating certain estimated impacts identified during the route evaluation process.

Limit 05

Limit: A route that is recommended for limited use by certain parties or entities with valid, vested, or implied rights of access, or to certain vehicle types, seasons of use, etc.

Mitigate/ Open 05

Mitigate/Open: A route that is recommended open for all uses, following mitigation action(s) aimed at avoiding, minimizing or mitigating certain estimated impacts identified during the route evaluation process.

Open 02

Open: A route that is recommended open for all uses.

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Route Evaluation Tree©

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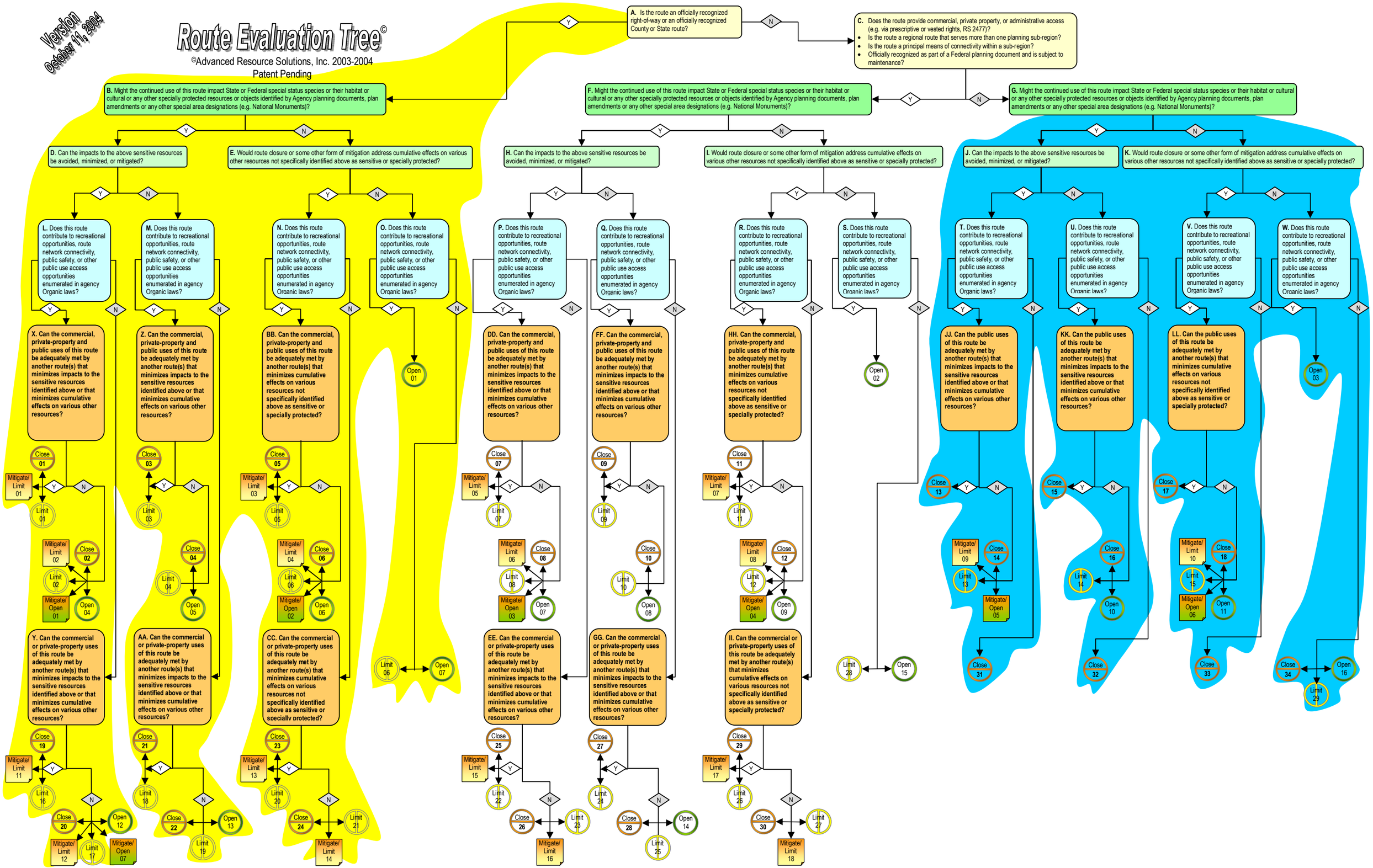
Patent Pending



APPENDIX 3.A

HISTORICAL GEOLOGY AND STRATIGRAPHY OF THE PLANNING AREA

HISTORICAL GEOLOGY AND STRATIGRAPHY OF THE PLANNING AREA

The lithologic descriptions of the geologic units exposed in the Planning Area described below are adapted from Billinglsey, 2000; Billingsley and Workman, 2000; and Billingsley and Wellmeyer, 2003, unless otherwise referenced.

Precambrian

In the Planning Area, the Precambrian crystalline basement is unconformably overlain by Paleozoic through Cenozoic rocks. The Precambrian rocks are divided into two eras: the older Archeozoic and younger Proterozoic. Archeozoic rocks are primarily granite, granite gneiss, schist, diorite porphyry, and related crystalline intrusive rocks (Moore and et al., 1960; Wilson and Moore, 1959) and are not exposed in the Planning Area.

Early Proterozoic rocks are represented by the Vishnu Series, which is exposed in the Virgin Mountains. The Vishnu Series were created during the Mazatzal Revolution, between 1.3 billion and 1.5 billion years ago, by large plutonic intrusions metamorphosing the sedimentary and volcanic rocks into schist, quartzite and metavolcanics while the intrusions assumed a gneissic structure (Hayes, 1969).

Middle and Late Proterozoic rocks include the Grand Canyon Supergroup. The Grand Canyon Supergroup is not exposed in the Planning Area. However, it is, exposed in the bottom of the Grand Canyon, where it comprises as much as 12,000 feet of sediment (Hayes, 1969). The Grand Canyon Supergroup has been divided into the Unkar and Chuar groups (Walcott, 1883, 1895). Rocks of both groups consist dominantly of clastic sedimentary rocks with minor amounts of limestone and basaltic lavas (Hayes, 1969). According to Shride (1967), these rocks were deposited in shallow marine waters and near shore terrestrial environments. As the Proterozoic came to an end a period of structural deformation occurred, referred to as the Grand Canyon Disturbance. It was at the end of this period that diabasic intrusive activity occurred in the sedimentary strata (Wilson, 1962).

Cambrian

After a long period of erosional time known as the Great Unconformity, Cambrian seas covered the Planning Area from the north and deposited large quantities of sediments, represented by the Tonto Group, in a geosynclinal environment that today corresponds to the Virgin-Beaver Dam Mountains area. The Tonto Group**,** in ascending order, are Tapeats Sandstone, Bright Angel Shale, and Muav Limestone.

The Tapeats Sandstone is a brown and red-brown, cliff-forming sandstone and conglomerate. The Bright Angel Shale consists of green and purplish, slope-forming siltstone and shale and red-brown sandstone. It includes an interbedded limestone in the upper part. The Muav Limestone is a gray, brown, and orangish, cliff-forming limestone, dolomite, and interbedded

thin calcareous mudstone. These units have intertonguing relationships and conformable contacts. The Tonto Group thickens to the north across the Wasatch Hingeline to a thickness of approximately 2,200 feet in the Virgin Mountains (Wilson, 1962). This geosynclinal environment persisted throughout most of the Paleozoic era with repeated transgressions and regressions of the seas.

Ordovician and Silurian

In the Planning Area, a hiatus of approximately 100 million years is present which represents a period of erosion or non-deposition that occurred during part of the Late Cambrian, all of the Ordovician and Silurian, and most of the Early and Middle Devonian.

Devonian

During the Middle and Late Devonian, the Planning Area and most of Arizona was flooded by epicontinental seas. Devonian rocks represent the first in a series of marine transgressions following uplift and erosion of Cambrian sediments. Devonian rocks in the Planning Area are represented Temple Butte Formation. By the end of the Devonian the entire state of Arizona was uplifted above sea level and eroded.

The Temple Butte Formation consists of locally fossiliferous, purplish, and gray, ledge-forming dolomite, sandy dolomite, sandstone, mudstone, and limestone, along with purplish, and gray, fine- to coarse-grained, thin- to medium-bedded, ledges of mudstone, sandstone, and dolomite. An unconformity is present at base of Temple Butte Formation and conglomerate fills channels eroded into the underlying Cambrian strata. In the Planning Area, the formation varies between approximately 50 feet from east to nearly 500 feet to the west.

Mississippian

By early to middle Mississippian time, Arizona was again submerged beneath shallow seas. In general, the Mississippian sea was clear and warm as evidenced by an abundance of fossils, and the lack of terrigenous sediments and evaporites (McKee and Gutschick, 1969).

The Mississippian is represented by the units of the Redwall Limestone. It includes four members as described by McKee (1963), they are in ascending order, the Whitmore Wash, Thunder Springs, Mooney Falls, and Horseshoe Mesa Members. Overall, the Redwall Limestone increases in thickness east to west across the Planning Area from about 600 to 800 feet. It is exposed in canyons in the southern portion of the Planning Area, the lower portions of the Grand Wash Cliffs and near the Virgin Mountains.

- The Whitmore Wash Member is grayish, cliff-forming, thick-bedded, fine-grained limestone and dolomite. It is locally fossiliferous and has an unconformable contact with the underlying Temple Butte Formation.

- The Thunder Springs Member consists of cliff-forming, fossiliferous, finely crystalline dolomite and fine- to coarse-grained limestone. The contact is disconformable and planar with the underlying Whitmore Wash Member.
- The Mooney Falls Member is a light-gray, cliff-forming, fine- to coarse-grained, thick- to very thick-bedded, fossiliferous limestone. It is highly karstified and has a disconformable contact with underlying Thunder Springs Member.
- The Horseshoe Mesa Member is light olive-gray, ledge- and cliff-forming, thin-bedded, fine-grained limestone. Fossils are not common except locally and it is highly karstified. The contact is gradational and disconformable with the underlying massive-bedded limestone of the Mooney Falls Member.

The recently discovered Surprise Canyon Formation has been mapped throughout the Grand Canyon and should occur in the Planning Area. It consists of very fossiliferous, dark reddish-brown cliff- and slope-forming siltstone and sandstone, gray limestone and dolomite, and white conglomerate in a dark-red or black sandstone matrix (Billingsley and Beus, 1999). The formation is present only as deposits in erosion channels and infillings of karst features dissolved from the unconformable contact with the Redwall Limestone. It is not mapped in the Planning Area, although it should occur discontinuously where the upper surface of the Redwall Limestone is exposed. The thickness is variable however, at the Grand Canyon the maximum thickness is about 400 feet and the unit thins eastward.

Pennsylvanian

Pennsylvanian rocks are composed of interbedded marine and continental limestones, sandstones and shales. These rocks were deposited during periods of transgression and regression, with each transgression being progressively more wide spread. Erosional processes are evident at the top of each successive unit. Near the Grand Canyon in the Planning Area, Pennsylvanian and lower Permian aged rocks are referred to as the Supai Group. To the north and west, Pennsylvanian aged rocks undergo a facies change from predominantly clastic sediments to carbonates represented by the Callville Formation and Pakoon Limestone. Thickening of the carbonate facies represents a geosynclinal environment, deepening to the north, which persisted from the Cambrian through the Pennsylvanian and into the Permian. These strata are exposed in canyons in the southern portion of the Planning Area, the Grand Wash Cliffs and near the Virgin Mountains.

The Callville Formation occurs in the Basin and Range, Virgin Mountains, and Virgin River canyon areas. The upper part includes rocks mapped as the Pakoon Limestone. The formation also includes rocks mapped as the Bird Spring Formation by Bohannon and others (1991). It is divided into a gypsiferous facies and limestone, cherty limestone, arenaceous limestone, and calcareous sandstone. The overall thickness of the Callville Limestone averages more than 1,000 feet and increases to more than 1,500 feet in the Beaver Dam Mountains (Dobbin, 1939). It has an unconformable contact with the Redwall Limestone or the Surprise Canyon Formation.

The Mississippian through Permian Supai Group, in ascending order, consists of the Watahomigi, Manakacha, Wescogame formations and the Esplanade Sandstone (grades into the Pakoon Limestone to the west). The Mississippian and Pennsylvanian Watahomigi and the Pennsylvanian Manakacha and Wescogame Formations comprise the lower Supai Group. The entire Supai Group becomes the Callville Formation west of the Grand Wash Cliffs.

- The Watahomigi Formation consists of a locally fossiliferous, gray and purplish-red, slope-forming limestone, siltstone, mudstone, and conglomerate. It forms an upper ledge and slope unit and a lower cliff unit. The formation has an unconformable contact with the Redwall Limestone or Surprise Canyon Formation and averages 100 feet thick in the east, thickening to 200 feet along the Grand Wash Cliffs.

- The Manakacha Formation consists of locally fossiliferous, light red, white, and gray sandstone, calcareous sandstone, dark-red siltstone, and gray limestone. The contact between the Manakacha and underlying Watahomigi Formations is unconformable and its average thickness in the Planning area is approximately 180 feet.

- The Wescogame Formation is locally fossiliferous and has an upper slope forming unit and a lower cliff forming unit. The formation is composed of interbedded reddish to gray, fine-grained siltstone, mudstone, and sandstone. It has an unconformable contact with the underlying Manakacha Formation and the thickness ranges from approximately 130 to 210 feet in the Planning Area.

Permian

Pennsylvanian rocks are overlain by the Lower Permian rocks, which in ascending order are, Esplanade Sandstone of the Supai Group, Queantoweap Sandstone, Hermit Shale, Coconino Sandstone, Toroweap Formation, and Kaibab Limestone. The fluvial Esplanade Sandstone is the thickest and most widespread formation in the Supai Group. This formation represents a high energy fluvial environment that grades into the marine Pakoon Limestone between the Hurricane Fault, and the Grand Wash Cliffs. Further west and to the north it becomes the upper member of the Callville Formation. This transition represents an east to west facies change across the Planning Area from continental and deltaic deposits to calcareous sandstone and marine limestone deposited in a geosynclinal basin (Nations and Stump, 1981).

The name Queantoweap Sandstone applies locally to the Virgin River canyon, Virgin Mountains, and Beaver Dam Mountains and represents both aeolian coastal dune and marine offshore environments. The sequence of Esplanade Sandstone, Hermit Shale, Coconino Sandstone, Toroweap Formation, and Kaibab Limestone represent a general trend of regressions and transgressions during the Permian. From the fluvial Esplanade Sandstone and fluvial/marine-shoreline Hermit Formation to the aeolian Coconino Sandstone, followed by development of a sabkha and fluctuations in water depth as the Toroweap Formation was deposited. Afterward a marine transgression occurred resulting in the formation of the Kaibab Limestone. The Kaibab

Limestone is widely exposed across the Planning Area and the older Permian Strata are exposed in canyons in the southern portion of the Planning Area, Hurricane Cliffs, Grand Wash Cliffs and near the Virgin Mountains.

The Esplanade Sandstone is a light-red and pinkish-gray, cliff-forming, fine- to medium-grained, medium-bedded, well-sorted, calcareous sandstone and interbedded, dark-red, slope forming siltstone. It undergoes a gradual facies change west of the Hurricane Fault to a light red and white, calcareous sandstone and grades into the marine Pakoon Limestone west of the Grand Wash Cliffs. The Pakoon Limestone beds are gray, fine- to medium-grained, thin- to medium-bedded limestone and oolitic limestone. The contact with underlying Wescogame Formation of the Supai Group is unconformable and marked by erosion channels. The overall thickness of the Esplanade Sandstone and Pakoon Limestone west of the Hurricane Fault, along the Grand Wash Cliffs is approximately 350 feet.

The Queantoweap Sandstone, present in the Virgin River canyon, Virgin Mountains, and Beaver Dam Mountains is a locally gypsiferous, tan and white, fine-grained to very fine-grained, medium- to thick-bedded, cross-stratified cliff- or ledge-forming sandstone. The contact is gradational between the underlying gypsiferous unit and the upper Callville Limestone. Its thickness is about 400 feet thick at Virgin River canyon.

The Hermit Formation consists of fluvial/marine-shoreline, reddish, slope-forming, fine-grained, thin-bedded siltstone, mudstone, and sandstone. It unconformably overlies Esplanade Sandstone and in the Planning Area is as much as 900 feet thick.

The Coconino Sandstone overlies the Hermit Formation and consists of tan to white, cliff-forming, fine-grained, well-sorted, cross-bedded quartz sandstone of aeolian origin. An unconformable contact with the Hermit Formation is sharp and planar and desiccation cracks in the Hermit are filled with tan sandstone. The Coconino Sandstone ranges between 150 and 200 feet thick in the Planning Area.

The Toroweap Formation overlies the Coconino Sandstone and is subdivided into three members, representing sediments deposited during regressive, transgressive, and regressive sequences, respectively. It includes, in ascending order, the Seligman Members, Brady Canyon and Woods Ranch Members, as defined by Sorauf and Billingsley (1991).

- The Seligman Member is a gray-white to yellowish-red, slope-forming, calcareous sandstone and gray dolomite, containing minor occurrences of white gypsum. It has a gradational contact with the interbedded Coconino and is about 60 feet thick in the Planning Area.

- The Brady Canyon Member consists of fossiliferous, light gray, cliff- and ledge-forming, fine- to coarse-grained, massive limestone containing reddish-orange chert nodules. Contact with the underlying Seligman Member is gradational and is about 150 feet thick in the Planning Area.

- The Woods Ranch Member is a gray and light-red, slope-forming gypsiferous siltstone and silty sandstone. It is interbedded with white laminated gypsum and gray thin-bedded limestone. Contact with underlying Brady Canyon Member is gradational and in the Planning Area the thickness can be as much as 200 feet, but varies widely owing to the solution of gypsum.

The Kaibab Formation overlies the Toroweap Formation and includes, in ascending order, the Fossil Mountain and Harrisburg Members, as defined by Sorauf and Billingsley (1991).

- The Fossil Mountain Member is a light-gray, cliff-forming, fine- to medium-grained, thin- to medium-bedded, cherty limestone containing silicified fossils. An unconformable contact with underlying Woods Ranch Member of Toroweap Formation is attributed to the solution of gypsum and channel erosion. Its thickness in the Planning Area is about 200 to 350 feet.

- The Harrisburg Member is a reddish-gray and brownish-gray, slope-forming siltstone, sandstone, and limestone. Gypsum dissolution is responsible for sinkhole depressions within the Harrisburg Member. Contact with the underlying Fossil Mountain Member is gradational. In the Planning Area, the Harrisburg Member ranges from about 250 to 550 feet thick.

Triassic

The contact between Permian and Triassic strata on the Planning Area represents a hiatus of several tens of millions of years where nondeposition or erosion took place (Nations and Stump, 1981). In the Planning Area, the Triassic Period was a time of general emergence. These strata progress from shallow marine sediments deposited along the margins of seas that existed to the northwest and north to fluvial and lacustrine red beds.

Triassic strata, in ascending order, are the Moenkopi, Chinle Formations, and the (Triassic and Jurassic) Glen Canyon Group's Moenave Formation. The Moenkopi and Chinle Formations are exposed on the western side of the Hurricane fault and to the east in House Rock Valley. The Glen Canyon Group occurs in an outcrop just west of Colorado City, at the Paria Plateau north of House Rock Valley, and in the Grand Wash Trough along the east flank of the Virgin Mountains.

The Moenkopi Formation is divided into, in ascending order, the Timpoweap, Lower Red, Virgin Limestone, Middle Red, Shnabkaib, and Upper Red Members as used by Stewart and others (1972). The unit thickness as a whole thins to the southeast within the Planning Area.

- The Timpoweap Member contains an upper cliff-forming unit and a lower cliff- and slope-forming unit. It contains gray, fine-grained, thick-bedded sandy limestone interbedded with coarse-grained, sandstone and a basal dark-gray, white and red-brown conglomerate derived from the Kaibab Formation. The contact with the underlying Kaibab Formation is unconformable and the thickness ranges from about 0 to 350 feet.

- The Lower Red Member is a red, thin-bedded, slope-forming, sandy siltstone, interbedded with gray, white, and pale yellow laminated gypsum and sandstone. The contact is interbedded or gradational with the underlying Timpoweap Member or otherwise unconformable with the Kaibab Formation and ranging from about 0 to 300 feet thick.

- The Virgin Limestone Member consists of two to four light-gray, thin-bedded to thinly-laminated, ledge-forming limestone beds, several to many feet thick, separated by slopes of white to pale yellow, red, thin-bedded, gypsum and gypsiferous siltstone. The member includes thin beds of brown, red, and green siltstone, gray limestone and green mudstone. It has an unconformable contact with the Lower Red Member and may be as much as 200 feet thick.

- The Middle Red is a thin-bedded, slope-forming, laminated siltstone and sandstone, with white and gray gypsum, minor white platy dolomite, green siltstone, and gray-green to red gypsiferous mudstone. It has a gradational contact with the Virgin Limestone Member and is approximately 150 feet thick.

- The Shnabkaib Members is an interbedded and intertonguing, white, light gray, laminated, slope-forming, aphanitic dolomite, silty gypsum, and red siltstone. It has a gradational contact with the Middle Red Member and is up to 700 feet thick.

- The Upper Red Member is a heterogeneous sequence of cliff and slope-forming red conglomerate, sandstone, siltstone, mudstone with minor gray gypsum. It has an unconformable contact with the underlying Shnabkaib Member and may be up to 200 feet thick.

The Chinle Formation in the Planning Area includes the older fluvial Shinarump and younger lacustrine Petrified Forest Members as defined by Stewart and others (1972).

- The Shinarump Member is an orange-brown, black, tan, cliff-forming, cross-stratified to massive-bedded, coarse-grained, fluvial, pebble conglomerate and conglomeratic sandstone. The contact is unconformable with the underlying Upper Red Member of the

Moenkopi Formation and thickness generally ranging from 50 to 100 feet, thickening to the east.

- The Petrified Forest Member is a white, blue-gray, green-gray, pale-red, and purple-red, slope-forming lacustrian, mudstone, siltstone, and coarse-grained sandstone containing bentonitic clays. It has an unconformable contact with the underlying cliff-forming Shinarump Member with thickness generally ranging between 700 to 1,000 feet, thickening to the east.

The Moenave Formation is divided into, in ascending order, the Dinosaur Canyon, Whitmore Point and Springdale Sandstone Members (Wilson, 1967), which were deposited in a variety of fluvial and lacustrine environments.

- The Dinosaur Canyon Member consists of brown to reddish orange mostly slope-forming, thin-bedded, fine to very fine-grained sandstone and interbedded with lesser amounts of siltstone and mudstone. It has a disconformable contact with the eroded surface of the underlying Chinle Formation and averages between 150 and 200 feet thick.

- The Whitmore Point Member consists of alternating gray, greenish-gray, grayish-red, and pale-brown siltstone and claystone beds (Wilson, 1967). It also contains scarce thin light greenish-gray limestone beds (Folk, 1968). The contact with the Dinosaur Canyon Member is conformable and gradational and is named after the type location Whitmore Point in the Planning Area where it is 70 feet thick.

- The Springdale Sandstone Member is a light to reddish brown, ledge- and cliff-forming, medium- to massively-bedded, fine- to medium-grained, sandstone. The contact with the Whitmore Point Member is generally conformable and with a thickness ranging from approximately 125 to 175 feet, thinning to the west.

Jurassic

In the Planning Area, the Jurassic Period started with the deposition of nonmarine red beds in fluvial, distal fluvial/playa and lacustrine environments that existed as sediments were transported west from a source area in the ancestral Rocky Mountains (Wilson, 1967). As the climate changed, sand dunes spread down from Utah into northern Arizona and overwhelmed the sabkha creating vast dune fields that were subjected to annual monsoon rains (Loope et al., 2001). During the Middle Jurassic a shallow seaway that extended from the north to a point in the Planning Area just south of the Arizona state line and created off-shore shallow marine, tidal flat, sabkha and beach deposits (Doelling and Davis, 1989).

Jurassic strata, in ascending order, are the (Triassic and Jurassic) Kayenta Formation of the Glen Canyon Group, the Navajo Sandstone along with the San Rafael Group's Carmel Formation, and the Entrada Sandstone. The Glen Canyon Group occurs in outcrop just west of Colorado City, at

the Paria Plateau north of House Rock Valley, and in the Grand Wash Trough along the east flank of the Virgin Mountains. The San Rafael Group is mapped only in the extreme northeast on the Paria Plateau and northeast of the Paria River (Bush and Lane, 1980).

The Kayenta Formation is light brown to moderately reddish-orangish brown and consists chiefly of slope and ledge forming mudstones containing numerous interbeds of siltstone and very fine-grained sandstone with thin limestone beds in its upper part. The contact with the Springdale Sandstone Member is conformable and locally gradational. In the Planning Area, the Kayenta ranges in thickness from 115 to 300 feet (Bush and Lane, 1980).

The Navajo Sandstone is a reddish and less commonly pale-yellow to white, cliff-forming, fine-grained, well-sorted quartz arenite sandstone. The sand grains are well-rounded, frosted and poorly to moderately well-cemented by calcium carbonate. The contact with the underlying Kayenta Formation is conformable and gradational. In the Planning Area it ranges from 1680 to 1860 feet in thickness and forms nipples, buttes, and high sheer cliffs where exposed (Bush and Lane, 1980).

The Carmel Formation consists of ledge-forming and slope-forming mudstone, siltstone and fine- to medium-grained, thin- to thick-bedded sandstone. Cementation is weak to moderate and the colors are varied depending on the amount of iron oxide present and include reddish-orange, reddish-brown, white, brown, tan, grayish-brown, and various shades of yellow (Doelling and Davis, 1989). It rests unconformably on the Navajo Sandstone and is approximately 410 feet thick on the Paria Plateau (Bush and Lane, 1980).

The Entrada Sandstone is composed of cliff-forming and slope-forming, orangish to reddish siltstone, claystone and mostly very fine- to fine-grained quartzose sandstone. The contact with the underlying Carmel Formation is unconformable and on the Paria Plateau the Entrada Sandstone is approximately 660 feet thick (Bush and Lane, 1980).

Cretaceous

During the Pre-Cretaceous, regional northeastward tilting took place resulting the uplifting and erosion of rocks deformed during the Nevadan Revolution (Wilson, 1962). The only Cretaceous formation in the Planning Area is the Lower Cretaceous Willow Tank Formation, which was deposited in localized fluvial and lacustrine environments and outcrops in Grand Wash Trough along the east flank of the Virgin Mountains. Other Cretaceous rocks are not present in the Planning Area, either having never been deposited or eroded.

The Willow Tank Formation consists of red, gray, brown and tan, nonmarine claystone, siltstone, sandstone, and conglomerate. The conglomerate occurs mostly at the base as a discontinuous unit, but also occurs throughout formation in small amounts. The contact is unconformable with the underlying Navajo Sandstone and is approximately 200 feet thick (Billingsley and Workman, 2000).

Tertiary and Quaternary

Toward the end of the Cretaceous Period and the beginning of the Tertiary, the Laramide Orogeny resulted in gentle warping and high-angle faulting. North trending faults, developed during the Precambrian Era, were reactivated during this time period and resulted in the formation of many of the structural features presently exposed in the Planning Area (Baillieau and Zollinger, 1980).

In the Basin and Range, Late Cretaceous and early Tertiary compression resulted in major folding, reverse faulting, and thrust faulting that produced the Virgin Mountains (Billingsley and Workman, 2000). East-west extension during the late Miocene began to form the Mesquite Basin, the Grand Wash Trough, and the Grand Wash Cliffs (Hintze, 1986; Bohannon and others, 1993). Sedimentary rocks of both clastic and chemical composition were deposited in nonmarine environments during the formation of the Grand Wash Trough and the Mesquite Basin. Tertiary and Quaternary igneous activity resulted in the formation of pyroclastic deposits and extensive basalt flows in the western half of the Planning Area (Hayes, 1969).

Tertiary sedimentary rocks exposed west of the Grand Wash fault zone on the east flank of the Virgin Mountains are, in ascending order, the Miocene Rainbow Gardens Member of the Horse Spring Formation and the Miocene and Pleistocene Rocks of the Grand Wash Trough in the Grand Wash Trough area (informal name). In the Mesquite Basin, west of the Virgin Mountains, these rocks are named the Muddy Creek Formation and commonly are covered by a thin veneer of Quaternary sediments.

The Rainbow Gardens Member of the Horse Spring Formation is divided (Billingsley and Workman, 2000), in ascending order, into a conglomerate unit, tuffaceous limestone and sandstone unit, and a limestone unit. These units are nonmarine and have a combined thickness of approximately 500 feet. The contact with the Willow Tank Formation is unconformable.

The Rocks of the Grand Wash Trough are composed of a lower conglomerate facies and an upper sandstone and siltstone facies. These units are nonmarine and their thickness ranges from 0 to 1500 feet, thickening southeastward. An angular unconformity exists between the Rocks of the Grand Wash Trough and the Horse Spring Formation (Beard, 1996).

The Muddy Creek Formation outcrops in the Mesquite Basin and consists of lacustrine and fluvial sediments. Along the Virgin River and Beaver Dam Wash, it includes a dark-gray to brown, cliff-forming conglomerate, gravel, and sandstone that is poorly sorted and moderately well bedded. The Muddy Creek Formation in the vicinity of Mesquite, Nevada, is reported to be approximately 650 feet thick (Kowallis and Everett, 1986).

Tertiary and Quaternary tectonism resulted in igneous activity that produced pyroclastic deposits and extensive basalt flows on the western half of the Planning Area. The basalt is generally thin in these areas, but may reach thicknesses in excess of 200 to 300 feet in the southern Shivwits and Uinkaret plateau areas where extensive flows developed. Associated with these basalts are deposits of pumice. These deposits are generally of moderate size and occur in close proximity to the volcanic vents.

Unconsolidated Quaternary sediment occurs as alluvial fill west of the Grand Wash Cliffs and west of the Beaver Dam and Virgin Mountains. The alluvial deposits are composed of fluvial terrace-gravel and alluvial fan deposits. Landslide deposits are most common around and below Tertiary or Quaternary volcanic outcrops.

References Cited

Ash, S.R. and May, D.D., 1969, Petrified Forest; The Story Behind the Scenery: Petrified Forest Museum Association, 32 p.

Beus, S.S., 1980, Late Devonian (Frasnian) Paleogeography and Paleoenvironments: SEPM, Rocky Mtn., Sec. Paleogeography Symposium 1, p. 55-69.

Billingsley, G.H., and Beus, S.S., 1999, Geology of the Surprise Canyon Formation of the Grand Canyon, Arizona: Flagstaff, Ariz., Museum of Northern Arizona Press, Museum of Northern Arizona Bulletin 61, 254 p., 9 plates.

Billingsley, G.H. and Wellmeyer J.L., 2002, Geologic Map of the Mount Trumbull 30'x 60' Quadrangle, Mohave and Coconino Counties, Northwestern Arizona: U.S. Geological Survey, Geologic Investigations Series Map I-2766, w/ pamphlet, 36 p.

Bissell, H.J., 1969, Permian and Lower Triassic Transition from the Shelf to Basin (Grand Canyon, Arizona to Spring Mountains, Nevada). In Geology and Natural History of the Grand Canyon Region: Four Corners Geological Society, 5th Field Conference, p. 135-169.

Boyd, D.W. and Newell, N.D., 1978, Unusual Pelecypods from the Permian of Arizona and New Mexico: Geological Society of America, Abstracts with Programs, 10, 97 p.

Breed, W.J. and Wright, B.A., 1968, The Age of Dinosaurs in Northern Arizona: Museum of Northern Arizona, booklet, 44 p.

Cheevers, C.W., 1980, Stratigraphic Analysis of the Kaibab Formation in Northern Arizona, Southern Utah and Southern Nevada: Northern Arizona State University M.S. Thesis, 144 p.

Cisne, J.L., 1971, Paleoecology of Trilobites of the Kaibab Limestone (Permian) in Arizona, Utah, and Nevada: Journal of Paleontology, 45, p. 525-533.

Colbert, E.H., 1974, Mesozoic Vertebrates of Northern Arizona. In Geology of Northern Arizona (Karlstrom, T.N.V. et al, eds.): Geological Society of America, Rocky Mountain section meeting, Flagstaff, Arizona, p. 208-219.

Cole, K., 1982, Late Quaternary Zonation of Vegetation in the Eastern Grand Canyon: Science, 217(4565), p. 1142-1145.

Farmer, M.F., 1956, Tracks and Trackways of Northern Arizona: Plateau, 28, p. 54-66.

Gordon, M.JR., and McKee, E.D., 1978, Significance of the Invertebrate Fauna of the Watahomigi Formation (Supai group). Geological Society of America, Abstracts with Programs, 10(3), p. 107.

Gregory, H.E., 1950, Geology and Geography of the Zion Park Region, Utah and Arizona: U. S. Geological Survey, Professional Paper, 220, 200 p.

Gregory, J.T., 1957, Significance of Fossil Vertebrates for Correlation of Late Triassic Continental Deposits of North America: In E1 Mesozoica del hemisferia occidental y sus correlaciones mundiales, International Geological Congress, 20th Session, Section II, p. 7-25.

Harshbarger, J.W., Repenning C.A., and Irwin, J.H., 1957, Stratigraphy of the Uppermost Triassic and the Jurassic Rocks of the Navajo Country: U.S. Geological Survey Professional Paper 291, p. 1-74.

Hintze, L.F., 1986, Stratigraphy and Structure of the Beaver Dam Mountains in Griffen, D.T. and Phillips, R.W., eds., Thrusting and Extentional Structures and Mineralization in the Beaver Dam Mountains, Southwestern Utah: Utah Geological Association Publication 15, p. 1-36.

Irwin, C.D., 1977, Stratigraphic Analysis of Upper Permian and Lower Triassic Strata in Southern Utah: American Association of Petroleum Geologists, Bulletin, 55, p. 1976-2007.

Longwell, C.R., 1928, Geology of the Muddy Mountains, Nevada, with a Section through the Virgin Range to the Grand Wash Cliffs, Arizona: U.S. Geological Survey, Bulletin 798, 152 p.

McKee, E.D., 1935, A Conularia from the Permian of Arizona: Journal of Paleontology, 9, p. 427-429.

McKee, E.D., 1938, The Environment and History of the Toroweap and Kaibab Formations of Northern Arizona and Southern Utah: Carnegie Institution of Washington Publication No. 492, 268 p.

McKee, E.D., 1944, Tracks that go uphill. Plateau, 16, p. 61-72.

McKee, E.D., 1963, Nomenclature for lithologic subdivisions of the Redwall Limestone, Arizona: U.S. Geological Survey Professional Paper 475–C, p. 21–22.

McKee, E.D., 1965, Ancient landscapes of the Grand Canyon region: The geology of Grand Canyon, Zion, Bryce, Petrified Forest and Painted Desert, Northland Press, Flagstaff, Arizona, p. 1-52.

McKee, E.D., 1969, Paleozoic rocks of the Grand Canyon. In Geology and natural history of the Grand Canyon region: Four Corners Geological Society, 5th Field Conference, p. 78-90.

McKee, E.D., 1979, The Esplanade Sandstone of the Grand Canyon**:** In Permianland, D. L. Boars (ed.), Four Corners Geological Society, Field Conference Guidebook, 9, p. 67-79.

McKee, E.D., 1982a, The Supai Group of Grand Canyon: U.S. Geological Survey Professional Paper 1173, 504 p.

McKee, E.D., 1982b, Distribution and Age of Fauna and Flora, In The Supai Group of Grand Canyon (McKee, E. D.), U. S. Geological Survey, Professional Paper 1173, p. 75-112.

McKee, E.D., 1982c, Environment of deposition of sandstone bodies, In The Supai Group of Grand Canyon (McKee, E. D.), U. S. Geological Survey, Professional Paper 1173, p. 245-262.

McKee, E.D. and Gutschick, R.C., 1969,. History of the Redwall Limestone of Northern Arizona: The Geological Society of America Memoir 114, p. 726.

McNair, A.H., 1951, Paleozoic stratigraphy of part of northwestern Arizona: American Association of Petroleum Geologists Bulletin 35, p. 503–541.

Mead, J.I., 1981, The Last 30,000 Years of Faunal History within the Grand Canyon, Quaternary Research, 15, p. 311-326.

Munger, R.D., 1963, Geology of the California Company Number 1 St. George Unit a Re-evaluation: Intermountain Association of Petroleum Geologists, 12th Annual Field Conference, p. 181-192.

Nations, D. and Stump, E., 1981, Geology of Arizona: Kendall/Hunt Publishing Company, 221 p.

Parmalee, P.W., 1969, California Condor and Other Birds from Stanton's Cave, Arizona: Journal of Arizona Acadamy of Sciences, 5, p. 204-206.

Pierce, W.H., 1979, The Mississippian and Pennsylvanian (Carboniferous) System in the United States, Arizona: U. S. Geological Survey, Professional Paper, 1110-Z, p. 21-220.

Poborski, S.J., 1954, Virgin Formation (Triassic) of the St. George, Utah, area: Geological Society of America Bulletin, v. 65, no. 10, p. 971-1006.

Rahm, D.A., 1974, Reading the rocks; A Guide to the Geologic Secrets of the Canyons, Mesas and Buttes of the American Southwest: San Francisco, Sierra Club Book, 1-160 p.

Rawson, R.R. and Turner-Peterson, C.E., 1980, Paleogeography of Northern Arizona During the Deposition of the Permian Toroweap Formation, In Paleozoic Paleogeography of the West-central United States, SEPM, p. 341-352.

Santucci, V.L., 2000, A Survey of the Paleontological Resources from the National Parks and Monuments in Utah in Geology of Utah's Parks and Monuments, 1st ed.: 2000 Utah Geological Association Pub. 28, p. 535-556.

Schleh, E.E., 1966, Stratigraphic Section of Toroweap and Kaibab Formations in Parashant Canyon, Arizona: Arizona Geological Society Digest, 8, p. 57-64.

Sorauf, J.E., and Billingsley, G.H., 1991, Members of the Toroweap and Kaibab Formations, Lower Permian, northern Arizona and sowthwestern Utah; The Mountain Geologist, v. 28, no. 1, p. 9-24.

Shimer, H.W., 1919, Permo-Triassic of Northwestern Arizona: Geological Society of America, Bulletin, 30, p. 471-498.

Steed, D.A., 1980, Geology of the Virgin River Gorge, Northwest Arizona: Brigham Young University Geology Studies, 27, p. 96-115.

Stokes, W.L., 1991, Petrified mini-forests of the Navajo Sandstone, east-central Utah: Utah Geological Survey, Survey Notes, v. 25. no. 1, p. 14-19.

Wells, J.D., 1960, Stratigraphy and Structure of the House Rock Valley Area, Coconino County, Arizona: U. S. Geological Survey, Bulletin, 1081-D, p. 117-158.

Wilson, R.F., 1967, Whitmore Point, a new member of the Moenave Formation in Utah and Arizona: Plateau, v. 40 no. 1, p. 29-40.

APPENDIX 3.B

PALEONTOLOGICAL RESOURCES IN GEOLOGICAL UNITS OF THE PLANNING AREA

PALEONTOLOGICAL RESOURCES IN GEOLOGIC UNITS IN THE PLANNING AREA

Precambrian or Archeozoic and Proterozoic Eras (4.6 Billion to 570 Million Years Ago)
The Precambrian rocks located within the Planning Area contain no paleontological resources.

Paleozoic Era (570 to 240 Million Years Ago)
The Paleozoic Era is divided into seven periods: Cambrian, Ordovician, Silurian, Devonian, Mississippian, Pennsylvanian, and Permian.

Cambrian Period (570 to 500 Million Years Ago)
The Cambrian Formations present in the Planning Area are collectively referred to as the Tonto Group. The Tonto Group includes the Tapeats Sandstone, Bright Angle Shale, and the Muave Limestone:

- Tapeats Sandstone (Lower and Middle Cambrian): No vertebrate or invertebrate fossils reported within the formation.
- Bright Angle Shale (Middle Cambrian): No vertebrate fossils are reported from within the formation. Hard to find trilobites and worm trails are known to occur (Longwell, 1928).
- Muave Limestone (Middle Cambrian): No vertebrate fossils are reported from within the formation. Occasional fossil brachiopods, hyolithids, eocrinoids, trilobites and ostacods are known to occur (McKee, 1982a).

Ordovician Period (500 to 435 Million Years Ago)
Ordovician rocks are not present on the Planning Area and correspond to a stratigraphic break that represents a period of erosion or non-deposition.

Silurian Period (435 to 410 Million Years Ago)
Silurian rocks are not present on the Planning Area and correspond to a stratigraphic break that represents a period of erosion or non-deposition.

Devonian Period (410 to 360 Million Years Ago)
Devonian rocks are represented in the Planning Area by the Temple Butte Formation (Middle and Upper Devonian). Vertebrate fossils of an uncommon fish (*Placoderms*) are reported from within the formation in the eastern Grand Canyon area (Beus, 1980). Locally fossiliferous beds may contain algae and invertebrate conodonts, crinoid plates, brachiopods, mollusks and corals (McKee, 1969).

Mississippian Period (360 to 330 Million Years Ago)
Mississippian strata in the Planning Area are referred to as the Redwall Limestone (Lower and Upper Mississippian). It includes four members as described by McKee (1963): the Whitmore Wash, Thunder Springs, Mooney Falls, and Horseshoe Mesa Members. No vertebrate fossils are reported from within the formation. The Whitmore Wash, Thunder Springs, and Mooney Falls members contain abundant invertebrate fossils and include foraminifers, corals, bryozoans, gastropods, pelecypods, cephalolpods, blastoids, and crinoids (Mckee and Gutschick, 1969). Fossils are not common in the Horseshoe Mesa Member, except locally. In the Virgin River Gorge, the Horseshoe Mesa Member contains gastopods, brachiopods, crinoids and bryozoan fragments (Steed, 1980).

The recently discovered Surprise Canyon Formation (Upper Mississippian) has been mapped throughout the Grand Canyon and should occur in the Planning Area. Vertebrate fossils of shark teeth are reported from within the formation. Abundant invertebrate fossil foraminifers, conodonts, plants, brachiopods, gastropods, echinoderms, trilobites, and corals are known to occur (Billingsley and Beus, 1999).

Pennsylvanian Period (330 to 290 Million Years Ago)
In the Grand Canyon area , Pennsylvanian and lower Permian aged strata are referred to as the Supai Group. The Supai Group consists of the Watahomigi, Manakacha, Wescogame formations and the Permian Esplanade Sandstone. To the north, these rocks undergo a facies change from predominantly clastic sediments to carbonates represented by the Callville Formation.

- Callville Formation (Lower, Middle and Upper Pennsylvanian; Lower Permian): No vertebrate fossils are reported from within the formation. Locally fossiliferous limestone beds may contain algae and invertebrate

fusulinids, conodonts, trilobites (in uppermost beds), bryozoans, brachiopods, crinoids, and corals (Longwell, 1928; McNair, 1951; Munger, 1963; Pierce, 1979).

- Watahomigi Formation (Upper Mississippian and Lower Pennsylvanian): No vertebrate fossils are reported from within the formation. Locally fossiliferous limestone beds may contain algae and invertebrate foraminifera, fusulinids, conodonts, pelecypods, brachiopods, gastropods, bivalves, trilobites, bryozoans, corals, echinoid and crinoid fragments (Gordon and McKee, 1978; Pierce, 1979; McKee, 1982a; McKee, 1982b).
- Manakacha Formation (Middle Pennsylvanian): No vertebrate fossils are reported from within the formation. Locally fossiliferous limestone beds may contain algae and invertebrate foraminifera, fusulinids, brachiopods, gastropods, bivalves, trilobites, bryozoans, and corals (McKee, 1982b).
- Wescogame Formation (Upper Pennsylvanian): Vertebrate fossils of shark (*Deltodus*) teeth and trackways of quadrupeds (McKee, 1982b) are reported from within the formation. Locally fossiliferous beds may contain invertebrate foraminifera, fusulinids, pelecypods, gastropods, and corals (McKee, 1982a).

Permian Period (290 to 240 Million Years Ago)

The Permian Formations present in the Planning Area are the Esplanade Sandstone of the Supai Group (grades into the Pakoon Limestone to the west), Quantoweap Sandstone (local to the Beaver Dam, Virgin Mountains and the Virgin River Canyon), Hermit Shale, Coconino Sandstone, Toroweap Formation and Kaibab Formation.

- Esplanade Sandstone and Pakoon Limestone west of Hurricane Fault (Lower Permian): Vertebrate trackways having the appearance of horse hoof prints (McKee, 1982b) are reported from within this formation. Locally fossiliferous beds may contain algae and invertebrate fusulinids, brachiopods, gastropods, bryozoans, echinoderms, and corals (McKee, 1979; McKee, 1982c; McNair, 1951; Pierce, 1979).
- Queantoweap Sandstone (Lower Permian**):** No vertebrate or invertebrate fossils are known to occur within the formation, although it is locally intensely burrowed (Hintze, 1986).
- Hermit Formation (Lower Permian): Vertebrate (amphibians) trackways are reported in the formation (McKee, 1965). Sparse invertebrate fossils may include plants (ferns and cone bearing plants), worm tracks, and insect wings (McKee, 1965).
- Coconino Sandstone (Lower Permian): Vertebrate (amphibians and reptiles) trackways are reported in the formation (Farmer, 1956; McKee, 1944; Rahm, 1974). Invertebrate tracks, and trails (worms, insects, and arthropods) are known to occur (Brady, 1939). Marine fossils (unspecified) in the limestone tongues are locally abundant (Bissell, 1969).
- Toroweap Formation (Lower Permian): Includes the Seligman Members, Brady Canyon and Woods Ranch Members, as defined by Sorauf and Billingsley (1991). No vertebrate fossils are known to occur within the formation. Locally fossiliferous limestone beds may contain abundant invertebrate brachiopods, gastropods, bryozoans, crinoids, horn corals, and sponge fragments (Hintze, 1986). Sparse echinoid spines, ostracodes, and trilobite fragments are also known to occur (Billingsley and Wellmeyer, 2003; Rawson and Turner-Peterson, 1980). Locally, abundant pelecypods are also reported 14 to 20 feet below the contact with the Kaibab Formation (Cheevers, 1980).
- Kaibab Formation (Lower Permian): Includes the Fossil Mountain and Harrisburg Members, as defined by Sorauf and Billingsley (1991). No vertebrate fossils are known to occur within the formation. Locally fossiliferous limestone beds may contain algae and abundant invertebrate burrows, worm trails, brachiopods, crinoids, gastropods, pelecypods, corals, bryozoans, cephalopods, and sponges (Bissell, 1969; Cheevers, 1890; McKee, 1969; Schleh, 1966 and Wells, 1960) and rare reef-building corals (*Chaetetes milleporaceus* and *Lophophyllum profundum*, McKee, 1938). Furthermore, unusual pelecypods (*Scaphellina concinna*, Boyd and Newell, 1978), known only in Arizona and Wyoming, along with rare and new species of trilobites (*Delaria macclintocki* and *Delaria snowi*, Cisne, 1971), and the discovery of a marine invertebrate of uncertain classification (*Conularia kaibabensis*, McKee, 1935), are reported.

Mesozoic Era (240 to 66 Million Years Ago)

The Mesozoic Era is often referred to as the "age of dinosaurs." The Mesozoic Era is divided into three periods: Triassic, Jurassic, and Cretaceous.

Triassic Period (240 to 205 Million Years Ago)

The Triassic Formations present in the Planning Area consist of the Moenkopi Formation, Chinle Formation and the Moenave Formation of the Glen Canyon Group.

- Moenkopi Formation (Lower and Middle? Triassic): Includes the Timpoweap, Lower Red, Virgin Limestone, Middle Red, Shnabkaib and Upper Red Members as defined by Stewart and others (1972). Vertebrate fish, amphibians and a variety of reptiles including their tracks are reported (Breed and Wright, 1968). Locally fossiliferous beds containing algae, wood and invertebrate worm trails, pelecypods, ostracodes, scaphopods, brachiopods, gastropods, cephalopods (amminoids), and crinoids are known to occur (Gregory, 1950; Irwin, 1977; Poborski, 1954 and Shimer,1919).
- Chinle Formation (Upper Triassic): Includes the Shinarump and Petrified Forest Members as defined by Stewart and others (1972). Vertebrate fossils of fish, amphibians, phytosaurs and other reptilian remains including their tracks are reported in this formation (Breed and Wright, 1968). Locally fossiliferous beds containing invertebrate pelecypods, gastropods, and insects are known to occur (Ash and May, 1969; Gregory, 1957). Fossilized plants, wood fragments, logs, are widespread and abundant (Nations and Stump, 1981).
- Moenave Formation (Upper Triassic and Lower Jurassic): Is divided into the Dinosaur Canyon, Whitmore Point and Springdale Sandstone Members (Wilson, 1967). Vertebrate fossils of fish, reptile (*Protosuchus*) and dinosaur bones (*Coelophysis* and *Dilophosaurus*) including their tracks are reported (Breed and Wright, 1968). Locally fossiliferous beds containing plants and invertebrate ostracodes are known to occur (Harshbarger, et al., 1957; Wells, 1960).

Jurassic Period (205 to138 Million Years Ago)

The Jurassic Formations present in the Planning Area are the Kayenta Formation and Navajo Sandstone of the Glen Canyon Group along with the Carmel Formation and Entrada Sandstone of the San Rafael Group.

- Kayenta Formation (Upper Triassic? and Lower Jurassic): Vertebrate fossils of amphibians, crocodillans, turtles, lizards, dinosaurs and early mammals are reported east of the Planning Area, near Tuba City. In the Planning Area, some beds of the Kayenta Formation are locally fossiliferous and may contain various dinosaurs based on findings of bones and footprints (Colbert, 1974; Harshbarger, et al., 1957). Plant and invertebrate fossils are not known to occur.
- Navajo Sandstone (Lower Jurassic): Fossilized dinosaur tracks and invertebrate burrows are known to occur in the formation (Colbert, 1974; Harshbarger, et al., 1957). Localized, lenticular beds of limestone or dolomite containing fossil dinosaur bones, invertebrate ostracodes, brachiopods, trace fossils, and plants and algae are reported (Stokes, 1991).
- Carmel Formation (Middle Jurassic): No vertebrate fossils are known to occur within the formation. Fossiliferous beds of the Carmel Formation at Zion National Park, approximately 20 miles north, contain algae, invertebrate gastropods, crinoids, pectens, oysters, and other bivalves (Santucci, 2003).
- Entrada Sandstone (Upper Jurassic): No vertebrate or invertebrate fossils known to occur within the formation.

Cretaceous Period (138 to 66 Million Years Ago)

- The only Cretaceous Formation present in the Planning Area is the Willow Tank Formation (Lower Cretaceous). No vertebrate or invertebrate fossils known to occur within the formation.

Cenozoic Era (66 Million Years Ago to Present Day)

The Cenozoic Era, also known as the "age of mammals" spans from 66 million years ago to the present day. The Cenozoic Era is broken into two periods of geologic time: the Tertiary and the Quaternary. The Tertiary Period is further broken down into five epochs,: the Paleocene, Eocene, Oligocene, Miocene, and Pliocene. The Quaternary Period is broken down into two epochs: the Pleistocene (the time of the "ice ages") and Holocene (or Recent, our current epoch of geologic time).

Tertiary Period (66 to 1.6 Million Years Ago)

The Tertiary Period is broken down into five epochs: the Paleocene, Eocene, Oligocene, Miocene, and Pliocene.

- Paleocene-Eocene-Oligocene Epoch (66 to 24 Million Years Ago): There are no rocks or paleontological resources of Paleocene, Eocene, or Oligocene age in the Planning Area.
- Miocene-Pliocene-Pleistocene Epoch: Strata of this age in the Planning Area consist of the Rainbow Gardens Member of the Horse Spring Formation, Rocks of the Grand Wash Trough, and Muddy Creek Formation.
- Rainbow Gardens Member of the Horse Spring Formation (Miocene): No vertebrate or invertebrate fossils known to occur within the formation.
- Rocks of the Grand Wash Trough (Miocene and Pleistocene): No vertebrate or invertebrate fossils known to occur within the formation. Fresh water plant fossils are reported in the Formation (Billingsley, G., personal

communication, February 2004). • Muddy Creek Formation (Miocene and Pleistocene): Fossil camel bones are described in the Muddy Creek Formation (Longwell, 1928), the location is probably from southeastern Nevada near the Arizona border. These and other vertebrates could exist in the Planning Area.
Quaternary Period (1.6 Million Years Ago to Present Day) The Quaternary Period is broken down into two epochs: the Pleistocene and Holocene. • Vertebrate fossil bones of fish, reptile, bird and mammals of probable Late Pleistocene age have been found in caves (Mead, 1981; Parmalee, 1969). Fossilized packrat middens indicate which plant species were present in the Late Pleistocene and Holocene (Cole, 1982).
Source: Created according to: Hansen, W.R., 1991, Suggestions to authors of reports of the United States Geological Survey (7th edition): Washington, D.C., U.S. Geological Survey, 289 pp.

References Cited

Ash, S.R. and May, D.D., 1969, Petrified Forest; The Story Behind the Scenery: Petrified Forest Museum Association, 32 p.

Beus, S.S., 1980, Late Devonian (Frasnian) Paleogeography and Paleoenvironments: SEPM, Rocky Mtn., Sec. Paleogeography Symposium 1, p. 55-69.

Billingsley, G.H., and Beus, S.S., 1999, Geology of the Surprise Canyon Formation of the Grand Canyon, Arizona: Flagstaff, Ariz., Museum of Northern Arizona Press, Museum of Northern Arizona Bulletin 61, 254 p., 9 plates.

Billingsley, G.H. and Wellmeyer J.L., 2002, Geologic Map of the Mount Trumbull 30'x 60' Quadrangle, Mohave and Coconino Counties, Northwestern Arizona: U.S. Geological Survey, Geologic Investigations Series Map I-2766, w/ pamphlet, 36 p.

Bissell, H.J., 1969, Permian and Lower Triassic Transition from the Shelf to Basin (Grand Canyon, Arizona to Spring Mountains, Nevada). In Geology and Natural History of the Grand Canyon Region: Four Corners Geological Society, 5th Field Conference, p. 135-169.

Boyd, D.W. and Newell, N.D., 1978, Unusual Pelecypods from the Permian of Arizona and New Mexico: Geological Society of America, Abstracts with Programs, 10, 97 p.

Breed, W.J. and Wright, B.A., 1968, The Age of Dinosaurs in Northern Arizona: Museum of Northern Arizona, booklet, 44 p.

Cheevers, C.W., 1980, Stratigraphic Analysis of the Kaibab Formation in Northern Arizona, Southern Utah and Southern Nevada: Northern Arizona State University M.S. Thesis, 144 p.

Cisne, J.L., 1971, Paleoecology of Trilobites of the Kaibab Limestone (Permian) in Arizona, Utah, and Nevada: Journal of Paleontology, 45, p. 525-533.

Colbert, E.H., 1974, Mesozoic Vertebrates of Northern Arizona. In Geology of Northern Arizona (Karlstrom, T.N.V. et al, eds.): Geological Society of America, Rocky Mountain section meeting, Flagstaff, Arizona, p. 208-219.

Cole, K., 1982, Late Quaternary Zonation of Vegetation in the Eastern Grand Canyon: Science, 217(4565), p. 1142-1145.

Farmer, M.F., 1956, Tracks and Trackways of Northern Arizona: Plateau, 28, p. 54-66.

Gordon, M.JR., and McKee, E.D., 1978, Significance of the Invertebrate Fauna of the Watahomigi Formation (Supai group). Geological Society of America, Abstracts with Programs, 10(3), p. 107.

Gregory, H.E., 1950, Geology and Geography of the Zion Park Region, Utah and Arizona: U. S. Geological Survey, Professional Paper, 220, 200 p.

Gregory, J.T., 1957, Significance of Fossil Vertebrates for Correlation of Late Triassic Continental Deposits of North America: In E1 Mesozoica del hemisferia occidental y sus correlaciones mundiales, International Geological Congress, 20th Session, Section II, p. 7-25.

Harshbarger, J.W., Repenning C.A., and Irwin, J.H., 1957, Stratigraphy of the Uppermost Triassic and the Jurassic Rocks of the Navajo Country: U.S. Geological Survey Professional Paper 291, p. 1-74.

Hintze, L.F., 1986, Stratigraphy and Structure of the Beaver Dam Mountains in Griffen, D.T. and Phillips, R.W., eds., Thrusting and Extentional Structures and Mineralization in the Beaver Dam Mountains, Southwestern Utah: Utah Geological Association Publication 15, p. 1-36.

Irwin, C.D., 1977, Stratigraphic Analysis of Upper Permian and Lower Triassic Strata in Southern Utah: American Association of Petroleum Geologists, Bulletin, 55, p. 1976-2007.

Longwell, C.R., 1928, Geology of the Muddy Mountains, Nevada, with a Section through the Virgin Range to the Grand Wash Cliffs, Arizona: U.S. Geological Survey, Bulletin 798, 152 p.

McKee, E.D., 1935, A Conularia from the Permian of Arizona: Journal of Paleontology, 9, p. 427-429.

McKee, E.D., 1938, The Environment and History of the Toroweap and Kaibab Formations of Northern Arizona and Southern Utah: Carnegie Institution of Washington Publication No. 492, 268 p.

McKee, E.D., 1944, Tracks that go uphill. Plateau, 16, p. 61-72.

McKee, E.D., 1963, Nomenclature for lithologic subdivisions of the Redwall Limestone, Arizona: U.S. Geological Survey Professional Paper 475–C, p. 21–22.

McKee, E.D., 1965, Ancient landscapes of the Grand Canyon region: The geology of Grand Canyon, Zion, Bryce, Petrified Forest and Painted Desert, Northland Press, Flagstaff, Arizona, p. 1-52.

McKee, E.D., 1969, Paleozoic rocks of the Grand Canyon. In Geology and natural history of the Grand Canyon region: Four Corners Geological Society, 5th Field Conference, p. 78-90.

McKee, E.D., 1979, The Esplanade Sandstone of the Grand Canyon**:** In Permianland, D. L. Boars (ed.), Four Corners Geological Society, Field Conference Guidebook, 9, p. 67-79.

McKee, E.D., 1982a, The Supai Group of Grand Canyon: U.S. Geological Survey Professional Paper 1173, 504 p.

McKee, E.D., 1982b, Distribution and Age of Fauna and Flora, In The Supai Group of Grand Canyon (McKee, E. D.), U. S. Geological Survey, Professional Paper 1173, p. 75-112.

McKee, E.D., 1982c, Environment of deposition of sandstone bodies, In The Supai Group of Grand Canyon (McKee, E. D.), U. S. Geological Survey, Professional Paper 1173, p. 245-262.

McKee, E.D. and Gutschick, R.C., 1969,. History of the Redwall Limestone of Northern Arizona: The Geological Society of America Memoir 114, p. 726.

McNair, A.H., 1951, Paleozoic stratigraphy of part of northwestern Arizona: American Association of Petroleum Geologists Bulletin 35, p. 503–541.

Mead, J.I., 1981, The Last 30,000 Years of Faunal History within the Grand Canyon, Quaternary Research, 15, p. 311-326.

Munger, R.D., 1963, Geology of the California Company Number 1 St. George Unit a Re-evaluation: Intermountain Association of Petroleum Geologists, 12th Annual Field Conference, p. 181-192.

Nations, D. and Stump, E., 1981, Geology of Arizona: Kendall/Hunt Publishing Company, 221 p.

Parmalee, P.W., 1969, California Condor and Other Birds from Stanton's Cave, Arizona: Journal of Arizona Acadamy of Sciences, 5, p. 204-206.

Pierce, W.H., 1979, The Mississippian and Pennsylvanian (Carboniferous) System in the United States, Arizona: U. S. Geological Survey, Professional Paper, 1110-Z, p. 21-220.

Poborski, S.J., 1954, Virgin Formation (Triassic) of the St. George, Utah, area: Geological Society of America Bulletin, v. 65, no. 10, p. 971-1006.

Rahm, D.A., 1974, Reading the rocks; A Guide to the Geologic Secrets of the Canyons, Mesas and Buttes of the American Southwest: San Francisco, Sierra Club Book, 1-160 p.

Rawson, R.R. and Turner-Peterson, C.E., 1980, Paleogeography of Northern Arizona During the Deposition of the Permian Toroweap Formation, In Paleozoic Paleogeography of the West-central United States, SEPM, p. 341-352.

Santucci, V.L., 2000, A Survey of the Paleontological Resources from the National Parks and Monuments in Utah in Geology of Utah's Parks and Monuments, 1st ed.: 2000 Utah Geological Association Pub. 28, p. 535-556.

Schleh, E.E., 1966, Stratigraphic Section of Toroweap and Kaibab Formations in Parashant Canyon, Arizona: Arizona Geological Society Digest, 8, p. 57-64.

Sorauf, J.E., and Billingsley, G.H., 1991, Members of the Toroweap and Kaibab Formations, Lower Permian, northern Arizona and sowthwestern Utah; The Mountain Geologist, v. 28, no. 1, p. 9-24.

Shimer, H.W., 1919, Permo-Triassic of Northwestern Arizona: Geological Society of America, Bulletin, 30, p. 471-498.

Steed, D.A., 1980, Geology of the Virgin River Gorge, Northwest Arizona: Brigham Young University Geology Studies, 27, p. 96-115.

Stokes, W.L., 1991, Petrified mini-forests of the Navajo Sandstone, east-central Utah: Utah Geological Survey, Survey Notes, v. 25. no. 1, p. 14-19.

Wells, J.D., 1960, Stratigraphy and Structure of the House Rock Valley Area, Coconino County, Arizona: U. S. Geological Survey, Bulletin, 1081-D, p. 117-158.

Wilson, R.F., 1967, Whitmore Point, a new member of the Moenave Formation in Utah and Arizona: Plateau, v. 40 no. 1, p. 29-40.

APPENDIX 3.C

DEFINITIONS FOR BLM FIRE MANAGEMENT ALLOCATIONS

DEFINITIONS FOR BLM FIRE MANAGEMENT ALLOCATIONS

The Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management directs the assignment of BLM–administered public lands to one of the following two land use allocations:

Wildland Fire Use: Areas suitable for wildland fire use for resource management benefit

Areas where wildland fire is desired, and there are few or no constraints for its use. Where conditions are suitable, unplanned and planned wildfire may be used to achieve desired objectives, such as to improve vegetation, wildlife habitat or watershed conditions, maintain non-hazardous levels of fuels, reduce the hazardous effects of unplanned wildland fires, and meet resource objectives. Where fuel loading is high but conditions are not initially suitable for wildland fire, fuel loads are reduced by mechanical, chemical or biological means to reduce hazardous fuels levels and meet resource objectives (includes WUI areas).

Non Wildland Fire Use: Areas not suitable for wildland fire use for resource benefit

This allocation includes areas where mitigation and suppression are required to prevent direct threats to life or property. It includes areas where fire never played a large role, historically, in the development and maintenance of the ecosystem, and some areas where fire return intervals were very long. It also includes areas (including some WUI areas) where an unplanned ignition could have negative effects to the ecosystem unless some form of mitigation takes place. Mitigation may include mechanical, biological, chemical, or prescribed fire means to maintain non-hazardous levels of fuels, reduce the hazardous effects of unplanned wildland fires, and meet resource objectives.

The allocation of lands is based on the desired future condition of vegetation communities, ecological conditions, and ecological risks. The allocation of lands is determined by contrasting current and historical conditions and ecological risks associated with any changes. The condition class concept helps describe alterations in key ecosystem components such as species composition, structural stage, stand age, canopy closure, and fuel loadings. BLM Fire Management Plans will include the two allocations and identify areas for including fire use, mechanical, biological, or chemical means to maintain non-hazardous levels of fuels, reduce the hazardous effects of unplanned wildland fires, and meet resource objectives. They will also identify areas for exclusion from fire (through fire suppression), chemical, mechanical, and/or biological treatments.

APPENDIX 3.D

IDENTIFICATION OF WILDERNESS CHARACTERISTICS ON THE ARIZONA STRIP

IDENTIFICATION OF WILDERNESS CHARACTERISTICS ON THE ARIZONA STRIP

BACKGROUND

The official manual for wilderness inventory, *Wilderness Inventory and Study Procedures Handbook (H-1630-1)*, was rescinded September 29, 2003 by Bureau of Land Management (BLM) Instruction Memorandum 2003-274, *BLM Implementation of the Settlement of Utah v. Norton Regarding Wilderness Study*. Instruction Memorandum 2003-275, Change 1, *Consideration of Wilderness Characteristics in Land Use Plans*, was issued on October 23, 2003 and is the sole guidance for the consideration of wilderness characteristics in the land use planning process.

Instruction Memorandum 2003-275, Change 1 states that "the BLM may consider information on wilderness characteristics, along with information on other uses and values, when preparing land use plans." The guidance also states that the consideration of wilderness characteristics in the land use planning process has the potential for three distinct outcomes:

1) giving priority to other uses over the protection of wilderness characteristics;

2) giving priority to other uses but applying management restrictions to protect some or all of the wilderness characteristics; and

3) giving priority to the protection of wilderness characteristics.

The current guidance also authorizes the BLM to consider wilderness proposals from the public during the land use planning process. A proposal for additional wilderness study areas was received from the Arizona Wilderness Coalition (AWC) during scoping. This information may be used to assist in developing a range of alternatives. Since alternatives are developed to reflect a reasonable range of management options, consideration of all legitimate information sources, including wilderness characteristics, is a valid part of the planning process.

In order to plan for and manage BLM and National Park Service (NPS) lands as seamlessly as possible, the NPS adopted the BLM's process to identify and protect lands having wilderness characteristics on NPS lands outside of proposed wilderness.

Identifying Wilderness Characteristics

Before wilderness characteristics can be considered in the land use planning process, those characteristics must first be identified. BLM IM 2003-275, Change 1, Attachment 1, provides definitions for each of three distinct wilderness characteristics that were evaluated: Naturalness, Solitude, and Primitive, Unconfined Recreation. Under the previous wilderness inventory handbook guidance, these characteristics were inventoried and collectively, along with size criteria and optional supplemental values, considered as "wilderness character," tied to the Wilderness Act of 1964. Under IM 2003-274 and 275, Change 1, wilderness characteristics do not fall under Wilderness Act definitions or process, but are defined by the IM and considered in planning under the auspices of the Federal Land Policy and Management Act (FLPMA).

Therefore, though the terms "naturalness", "solitude", and "primitive, unconfined recreation" are the same, what they mean and how they are evaluated differ greatly. For instance, under the previous wilderness inventory handbook, a combination of size, naturalness and either solitude and/or primitive, unconfined recreation were required to be present for "wilderness character" to be deemed present. Whereas, under BLM IM 2003-275, Change 1, there is no requirement for a combination of wilderness characteristics to be considered in the land use planning process; theoretically, only one characteristic could be present and/or considered. This important distinction, among others, affected the findings of the evaluation of all areas proposed.

To summarize, all areas were initially proposed under the now-rescinded guidance that was based in the Wilderness Act and used criteria that is now-revoked. Using the current BLM IM 2003-275, Change 1 guidance, evaluation results in somewhat different findings than would have resulted had the policy guidance not changed. This was the basis for the work that took place to identify those areas of the Arizona Strip that contain one or more wilderness characteristics. This process also satisfies the requirement to adequately analyze the wilderness proposal submitted by the AWC.

IDENTIFICATION OF INDIVIDUAL CHARACTERISTICS

The current guidance states that wilderness characteristics are those "features of the land associated with the concept of wilderness that may be considered in land use planning when BLM determines that those characteristics are reasonably present, of sufficient value (condition, uniqueness, relevance, importance) and need (trend, risk), and are practical to manage." This guidance was applied to the identification of all three types of wilderness characteristics.

Overview of Wilderness Characteristics Identification Process

The process of identifying areas having wilderness characteristics began with the proposal for additional wilderness study areas submitted by the AWC. The proposal came in the form of hard

copy maps and GIS data. The GIS data submission was for the Grand Canyon Parashant National Monument only. The remainder of their proposal was recreated in GIS by BLM/NPS from submitted hard copy maps.

The AWC proposal was used as the basis for field evaluations and subsequent identification of lands with wilderness characteristics. BLM/NPS staff also identified several potential areas with wilderness characteristics that were did not coincide with the AWC proposal.

The process was conducted in three parts: field evaluation, GIS data development and analysis, and alternative development.

Field Evaluation

The individual units that comprise the AWC proposal and those preliminarily identified by BLM recreation planners were used as a base layer on GIS generated field maps. Maps were created for each proposed unit by BLM and NPS staff, using existing GIS data themes, such as, known transportation routes, cultural information, water sources, campsite information, etc. AWC proposed route closures were then color coded on each map for field identification.

The first step in the screening process was to assess each unit in the field, using the *Wilderness characteristics assessment* form to document field observations (see sample form below).

Because numerous photographs were part of the AWC proposal document, an effort was made to replicate a sampling of photo points to verify information and document features. At numerous sites, the submitted photographs were not taken at the locations stated, and in some cases were not within the proposed units.

In the field, the data collection process entailed assessing each unit using the standardized format mentioned above (*Wilderness Characteristics Assessment* form.) Photos were taken that reflected a variety of information. Features such as transportation routes, water developments, grazing related facilities, historic structures, unique geologic features, etc. were recorded.

Office Evaluation

With all of the field information complete, the data development process began. This consisted of drawing polygons for each of the three wilderness characteristics, based on data gathered in the field and other GIS data sources. Each characteristic was treated as a separate and unique entity using the following criteria, and new GIS layers were the end result.

The final step in the initial documentation process was downloading digital photos, completing the narratives, and generating new GIS data that reflected existing site conditions for each unit. All of the information is assembled into a case file type format with the AWC information and BLM/NPS information assembled by AWC proposed unit and/or subunit.

Naturalness

The primary factor when determining the existence of naturalness was based on the following from IM 2003-275, Attachment 1: "Lands and resources exhibit a high degree of naturalness when affected primarily by the forces of nature and where the imprint of human activity is substantially unnoticeable. BLM has authority to inventory, assess, and/or monitor the attributes of the lands and resources on public lands, which, taken together, are an indication of an area's naturalness. These attributes may include the presence or absence of roads and trails, fences or other improvements; the nature and extent of landscape modifications; the presence of native vegetation communities; and the connectivity of habitats."

Working from the initial base layer polygons (from AWC and BLM/NPS planners), areas within those polygons that met the naturalness criteria based on field evaluations were then identified using the following techniques.

1. Well-used routes that would remain open as part of the route evaluation process were cherry stemmed (buffered) to exclude them.
2. Some seldom used routes were included in the new polygons only if it was determined that they did not detract from the overall naturalness of an area. Many of these routes were later proposed to be closed as part of the route evaluation process.
3. Routes that were being reclaimed by natural processes were included in the new polygons because it was assumed that they would gradually fade into the natural landscape over time.
4. Most highly visible fences and range improvements were excluded from the new polygons because they detract from the naturalness of an area. This did not include all fences and range improvements, as some were determined to be substantially unnoticeable and thus did not detract from the overall naturalness of an area. In this case, substantially unnoticeable was assumed for developments that were small, insignificant, or situated so that they are difficult to see.
5. Vegetation treatments and other significant landscape modifications were excluded from the new polygons unless they had recovered to the point where they were substantially unnoticeable.
6. The final step was a cumulative assessment and conclusion about on-the-ground observations. How did the area appear overall? If there was a lack of modification and the area mostly "natural," it was included. If modifications were predominant, it was excluded.

Solitude and Primitive/Unconfined Recreation

In the current guidance, these two wilderness characteristics share the following definition. "Visitors may have outstanding opportunities for solitude, or primitive and unconfined types of

recreation when the sights, sounds, and evidence of other people are rare or infrequent, where visitors can be isolated, alone or secluded from others, where the use of an area is through non-motorized, non-mechanical means, and where no or minimal recreation facilities are encountered."

Sharing the same definition did not necessarily mean they shared the same polygons. Solitude and Primitive Recreation are separate and distinct concepts, though they often coexist.

Solitude

Solitude exists in the absence of human contact and since the majority of human contact on the Arizona Strip occurs in proximity to motorized routes it was determined to use the existing Recreation Opportunity Spectrum (ROS) GIS data to help define this layer.

ROS remoteness criteria is based on the effects of possible sights of and sounds from roadways. The majority of areas that mapped remoteness as Primitive (P) and Semi-Primitive Non-Motorized (SPNM) classes on the Arizona Strip are true roadless areas, being at least ½-mile from any road. These areas almost always corresponded with the AWC proposed areas. The P and SPNM units were used in conjunction with the new naturalness layer to help create a solitude layer. The following techniques were used:

1. The newly created "Naturalness" GIS layer was used as a starting point.
2. The P and SPNM units were selected from the ROS layer and used as a preliminary "Solitude" layer.
3. A union was performed on the Naturalness and Solitude layers. The new layer contained the attributes of both layers.
4. Where the naturalness and solitude layers overlapped, new polygons were created to form the final "Solitude" layer.

It should be noted that solitude polygons were generated in GIS using the standard ½-mile offset from roads. It is possible that some of these polygons would have been larger if vegetative and topographic screening were factored into the determination. This situation was recognized during the process and final lines were redrawn on an individual basis later in the process.

Primitive/Unconfined Recreation

Primitive recreation polygons were defined by analyzing where the use of the area is typically through non-motorized, non-mechanical means, and where no or minimal developed recreation facilities exist. Additionally, primitive recreation polygons were derived by analyzing the following GIS data layers and through the field knowledge of existing staff. Polygons were

drawn for areas that were determined to contain high quality (outstanding) opportunities for primitive/unconfined recreation.

1. Naturalness
2. Solitude
3. High quality primitive areas previously defined in the planning effort
4. Recreation Opportunity Spectrum
5. Topography
6. Route Inventory
7. Staff knowledge

ALTERNATIVE DEVELOPMENT

After lands with wilderness characteristics had been adequately mapped, the next step was to determine how the supply of wilderness characteristics fit into each of the alternatives. While no selection criteria currently exists, IM 2003-275, Change 1 provides three components that offered an adequate framework.

Excerpt from IM 2003-275, Change 1:

Features of the land associated with the concept of wilderness that may be considered in land use planning when the BLM determines that those characteristics are ***reasonably present****, of* ***sufficient value*** *(condition, uniqueness, relevance, importance), and* ***need*** *(trend, risk), and are* ***practical to manage****.*

Ranking Areas with Wilderness Characteristics

Each of the three components noted above was used as a basis for determining the quality and providing a ranking for areas with wilderness characteristics. The process was straightforward. Points were applied to each polygon in each of the three wilderness characteristic classes based on three specific criteria—Value, Sensitivity, and Manageability. The result is three sets of numbers that provide information on each polygon. That information complies with IM 2003-275, Change 1, by defining how valuable each area is, how manageable each area is, and how much each area is at risk from outside influences.

There was only one pre-determined criteria. For an area to be considered during the ranking process, it must contain at least two of the three wilderness characteristics: Naturalness, Solitude, or Primitive/Unconfined Recreation.

The Ranking Process

The process below was used by Arizona Strip District Recreation/Wilderness planners to provide a numeric score for each area with wilderness characteristics.

VALUE

A yes answer to any of the statements in this section results in the listed point total for that statement.

1. Overlaps with an additional (third) wilderness characteristic polygon.
   12 Points

2. Is contiguous to an existing designated wilderness or an NPS proposed wilderness area.
   8 Points

3. Any portion of the polygon area is coincidental with a corresponding Semi-Primitive Non-Motorized ROS polygon.
   5 Points

4. Contains listed species or other critical T and E plant/wildlife habitat that would be enhanced/protected by MWC status.
   3 Points

5. Contains known cultural sites or areas that would be enhanced/protected by MWC status.
   2 Points

6. Any portion of the polygon area is coincidental with VRM inventory class 2.
   2 Points

7. Contains specific geologic, biologic, or other natural features that are distinctive or exceptional.
   2 Points

Total Possible Points for Value Section: 34

NEED (trend, risk)
A yes answer to any of the statements in this section results in the listed point total for that statement.

1. This area is considered to be at high risk. This may be due to one or more of the following conditions:
   a. The area is in close proximity to a community interface zone (generally less than ten miles)
   b. The area is outside national monument, existing ACEC boundaries, other protective withdrawals, or special designations.
   c. The topography is generally low relief and/or has large sections along the boundary that are conducive to unauthorized motorized access.

d. The area has high potential for increased visitation over the next twenty years.

10 Points

2. This area is considered to be at moderate risk. This may be due to one or more of the following conditions:
   a. The area is within moderate proximity to a community interface zone (generally between 10 and 25 miles);
   b. The area may be either inside or outside national monument, existing ACEC boundaries, other protective withdrawals, or special designations.
   c. The topography is generally low to moderate relief and/or has some sections along the boundary that are conducive to unauthorized motorized access.
   d. The area has moderate potential for increased visitation over the next twenty years.

   6 Points

3. This area is considered to be at low risk. This may be due to one or more of the following conditions:
   a. The area is a considerable distance from a community interface zone (generally more than 25 miles)
   b. The area may be either inside or outside national monument, existing ACEC boundaries, other protective withdrawals, or special designations.
   c. The topography is generally moderate to high relief and/or has few sections along the boundary that are conducive to unauthorized motorized access.
   d. The area has low potential for increased visitation over the next twenty years.

   3 Points

4. This area is considered to be at low risk. This may be due to one or more of the following conditions:
   a. The area is a considerable distance from a community interface zone (generally more than 25 miles)
   b. The area is inside a national monument, existing ACEC boundary, other protective withdrawal, or special designation.
   c. The topography is generally moderate to high relief and/or has no sections along the boundary that are conducive to unauthorized motorized access.
   d. The area has very low potential for increased visitation over the next twenty years.

   1 Point

Total Possible Points for Sensitivity Section: 10

MANAGEABILITY

A yes answer to any of the statements in this section results in the listed point total for that statement.

1. Management of this area is the most efficient and effective, due to one or more of the following conditions:
    a. Topographic or vegetative features provide natural barriers to vehicular intrusions.
    b. Vehicular access to the perimeter is limited by natural barriers and parking is clustered in areas considered easy to manage.
    c. Current use patterns are well known and are not expected to place additional stress on the resources required to manage the area.
    d. Future use patterns and outdoor trends are not expected to place additional stress on the resources required to manage area.
    e. Budget constraints are not expected to affect the resources required for adequate management of the area.
    f. Enforcement activities are expected to be minimal.

    10 Points

2. Management of this area is efficient and effective, due to one or more of the following conditions:
    a. Topographic or vegetative features provide some natural barriers to vehicular intrusions, but portions of the area may be more difficult to manage.
    b. Vehicular access to a majority of the perimeter is limited by natural barriers and a most of the parking is clustered in areas considered easy to manage, but may be scattered in other areas.
    c. Current use patterns are known or can be predicted and are expected to place a minimal amount of additional stress on the resources required to manage the area.
    d. Future use patterns and outdoor trends are expected to place a minimal amount of additional stress on the resources required to manage the area.
    e. Budget constraints are expected to have a minimal effect on the resources required for adequate management of the area.
    f. Enforcement activities are expected to be minimal to moderate.

    6 Points

3. Management of this area is moderately efficient and effective, due to one or more of the following conditions:
    a. Topographic or vegetative features provide few natural barriers to vehicular intrusions, and portions of the area may be difficult to manage.
    b. Vehicular access to most of the perimeter is not limited by natural barriers and most of the parking is dispersed over the perimeter.
    c. Current use patterns may or may not be well known and are expected to place a moderate amount of stress on the resources required to manage the area.

d. Future use patterns and outdoor trends are expected to place a moderate amount of stress on the resources required to manage the area.
e. Budget constraints may have a negative effect on the resources required for adequate management of the area.
f. Enforcement activities are expected to be moderate.

3 Points

4. Management of this area is the least efficient and effective, due to one or more of the following conditions:
   a. Topographic or vegetative features provide almost no natural barriers to vehicular intrusions, and portions of the area may be very difficult to manage.
   b. Vehicular access to most of the perimeter is unlimited and parking areas are widely dispersed.
   c. Current use patterns may or may not be known and are expected to place a significant amount of stress on the resources required to manage the area .
   d. Future use patterns and outdoor trends are expected to place a significant amount of stress on the resources required to manage the area.
   e. Budget constraints will negatively affect adequate management of the area.
   f. Enforcement activities are expected to be significant.

1 Point

Total Possible Points for Manageability Section: 10

Final Alternative Determination

Once a numeric total had been assigned to each area with wilderness characteristics, GIS maps were generated for both monuments and for the Arizona Strip Field Office. The maps contained wilderness characteristic polygons and their numeric ranking. In addition, other applicable planning data was placed on the maps. Using all available information, managers then made the final decision on which areas, or portions thereof, would be included in each alternative.

Sample of Standardized Evaluation Form

WILDERNESS CHARACTERISTICS ASSESSMENT

Area Name:

Proposal Source: Public _____ BLM _____ Other _____

Documentation Team:

Date:

I. PROPOSAL SUMMARY: (Provide a synopsis of the proposal and/or new resource information that has been provided as part of the planning process.)

II. AREA DESCRIPTION: (Include a concise summary of pertinent information listed below.)

A. Land Ownership & Acreage:

B. Topography:

C. Vegetation:

D. Existing Issues:

E. Current Management Allocations/Prescriptions (RMP, AMP, HMP, etc.):

F. Location and Access:

G. List of Topographic Maps:

Area Name:

III. NATURALNESS

Evaluate the extent to which past and present human activities have been established and the degree to which they might affect naturalness as defined: *"Lands and resources exhibit a high degree of naturalness when **affected primarily** by the forces of nature and where the **imprint** of human activity is **substantially unnoticeable**." (IM 2003-275, Attachment 1)*

DEFINITIONS: Affected: "Acted upon , influenced. To have brought about a change in."; **Primarily:** "At first; originally. Principally; chiefly." **Imprint:** "A distinguishing influence or effect."; **Substantial:** "Being of considerable importance, value, degree, amount, or extent." **Unnoticeable:** "Not readily attracting notice (observation, attention)"

Summary of Attributes	Yes	No	If No, list #
Are motor vehicle travel routes absent from the area?			
Are fences or other developments absent from the area?			
Are other landscape modifications, such as vegetative treatment areas, active or inactive mines, spoils, or prospects, etc., absent from the area?			
Are native vegetation communities present?			
Does the area provide or contribute to the connectivity of habitats?			
Do the proposal's photo points and/or descriptions accurately reflect existing conditions?			
Do developments create visual contrast levels that cause them to be 'substantially noticeable'?			

Document the information above using photo points, field maps and appropriate GIS themes including a "Naturalness" layer.

Narrative: (Describe your assessment of the attributes listed above. Provide rationale for your determination of whether or not the attributes, when taken together, indicate the presence or absence of natural conditions in the area or portions of the area. If determined to be present, does the area exhibit a **high degree** of naturalness.)

Present travel routes: (List or attach map)

Photo Points: (List and attach)

Area Name:

IV. SOLITUDE

Evaluate the extent to which **outstanding opportunities** for solitude exist in the area as defined: *"When the sights, sounds, and evidence of other people are **rare** or **infrequent** and where visitors can be isolated, alone or **secluded** from others." (IM 2003-275, Attachment 1)*

DEFINITIONS: Outstanding: "Standing out; projecting outward or upward. Conspicuous among other of its kind; prominent. Pre-eminent among others of its kind; distinguished."; **Opportunity:** "A favorable or promising combination of circumstances. A favorable time or circumstance."; **Rare**: "Infrequently occurring; uncommon. Highly valued owing to uncommonness; special."; **Infrequent**: "Not frequent; rare. Not occurring regularly; occasional."; **Secluded**: "Removed or remote from others; solitary. Screened from view."

Summary of Attributes	Yes	No
Does the area possess a landform that is of moderate to rugged relief that would provide some degree of screening from other people who might be in the area?		
Does the area possess adequate vegetation that would provide some degree of screening from other people who might be in the area?		
Does the size of the area contribute to creating opportunities for visitors to enjoy the area without frequent contact with others in the area?		
Are sights, sounds and evidence of other people in area rare or infrequent?		
Are sights, sounds and evidence of low-flying aircraft infrequent?		
Does the area allow visitors to be isolated, alone or secluded from others?		
If vehicle routes are present, is the distance from such routes, existing vegetative cover and/or infrequent use of the route adequate to allow for solitude?		
Is the area distant from communities and urbanization or difficult to reach by motor vehicle?		

Document the information above using photo points, field maps and appropriate GIS themes including a "Solitude" layer.

Narrative: (Describe your assessment of the attributes listed above. Provide rationale for your determination of whether or not the attributes, when taken together; indicate **outstanding** opportunities for solitude in the area or portions of the area. Describe relevant visitor use statistics (RMiS) and typical activities, where available. Also assess the effect of topography and vegetation as factors that affect the potential for screening visitors from one another.)

Area Name:

V. PRIMITIVE/UNCONFINED RECREATION

Evaluate the extent to which **outstanding opportunities** for **primitive** and **unconfined** types of recreation exist in the area as defined: *"Where the use of the area is through non-motorized, non-mechanical means, and where no or minimal developed recreation facilities are encountered." (IM 2003-275, Attachment 1)* Consider setting-appropriate types of recreation activities, such as those listed in the ROS Activity Characterization.

DEFINITIONS: Outstanding: "Standing out; projecting outward or upward. Conspicuous among other of its kind; prominent. Pre-eminent among others of its kind; distinguished."; **Opportunity:** "A favorable or promising combination of circumstances. A favorable time or circumstance."; **Primitive**: "Of or relating to an earliest or original stage or state. Marked by simplicity or crudity; unsophisticated."; **Unconfined**: "Not kept within bounds; not restricted. Not restricted in movement."

Summary of Attributes	Yes	No	If No, list #
Is the current recreational use of the area mostly non-motorized, non-mechanical?			
Does the area have minimal or no developed recreation facilities?			
Is the size of the area conducive to primitive and unconfined types of outdoor recreation activities?			
Are there features or attractions within the area that lend themselves to primitive and unconfined types of outdoor recreation activities?			

Document the information above using photo points, field maps and appropriate GIS themes including a "Primitive/Unconfined Recreation" layer.

Narrative: (Describe your assessment of the attributes listed above. Provide rationale for your determination of whether or not the attributes, when taken together, indicate **outstanding** opportunities for primitive and unconfined types of recreation in the area or portions of the area.)

APPENDIX 3.E

ALLOTMENT ACRES AND ANIMAL UNIT MONTHS (AUMs) BY LAND STATUS

ALLOTMENT ACRES BY LAND STATUS					
Allotment	**Allotment Number**	**State Acres**	**Private Acres**	**Other Federal Acres**	**Public Acres**
Parashant					
Belnap	04849	640	1,550		7,279
Belnap West	04822		120		4,317
Big Spring Pipeline	04870	1,280	280	13,680	36,790
Cottonwood	04809				33,129
Dripping Spring	04818			9,774	1,290
Duncan Tank	04820	1,220	2,168		6,250
Hidden Hills	04825	3,428			45,999
Hidden Spring	04803	565			18,642
Imlay	04817	320			15,534
Jump Canyon	04801	1,840			26,108
Last Chance	04815	640			9,072
Lime Spring	02012		160		3,596
Link Spring	04819	320			27,689
Mosby	04835	434			1,136
Mosby-Nay	04836	1,847			29,107
Mt Trumbull	04826	2,000	2,240	15,817	13,210
Mt. Logan	05218	1,120			18,996
Mud And Cane Spring	04850	1,921			81,910
Mule Canyon	04821			15,133	1,291
Pakoon	04802	280			55,938
Pakoon Springs	04800	648	240		36,466
Parashaunt Amp	04829				52,923
Pa's Pocket	04848	606			8,087
Penns Well	04852	640	620		4,225
Red Pond	04806	1,670	80	11,302	51,461
Sullivan Tank	04816				13,392
Tassi	04851	600	163	49,600	61,967
Tuweep	05220	2,799			41,650
Wildcat	04854	2,562	5,341		87,159
Summary for Parashant (29 detail records)		**27,380**	**12,962**	**115,306**	**794,613**
Vermilion					
Badger Creek	05341				6,272
Beanhole Well	05334	1,960			18,960
Bunting Well	04847	36,614			22,670
Coyote	05327	4,040			36,721
Ferry Swale	05336	4,584	0	16,994	18,200

ALLOTMENT ACRES BY LAND STATUS					
Allotment	Allotment Number	State Acres	Private Acres	Other Federal Acres	Public Acres
House Rock	05331	920	210		16,909
Sand Hills	05328	11,727	260		186,082
Signature Rock	05350		840		3,840
Soap Creek	05332	5,840	355	3,760	116,592
Wahweap	05340			5,990	
Summary for Vermilion (10 detail records)		**65,685**	**1,665**	**26,744**	**426,246**
Arizona Strip FO					
Antelope	05206	1,280	40		14,390
Antelope Spring	05210	1,920	760		14,940
Atkin Well	05207	477	2,555		25,220
Beaver Dam Slope	04828	715	358		30,623
Black Canyon	05256	640			2,160
Black Knolls	05264	2,040	120		38,589
Black Rock	04841	3,540	590		36,392
Blake Pond	04813	1,255	80		19,388
Brown-Shumway	05302				1,477
Button	05308	640	520		4,500
Canaan Gap	05205	650	2,430		5,460
Cane Beds	05212	1,230	2,435		12,105
Cedar Knoll	05318				17,951
Cedar Pockets Ut	04866				11,256
Cedar Ridge	05303				1,420
Cedar Wash	04842				14,354
Chatterly	05307	640	80		4,170
Clay Spring	04845				11,921
Clayhole	05215	12,876	280		112,411
Cottonwood	05209				3,520
Cowboy Butte	05310	605	330		3,120
Coyote Spring	04805	360			20,437
Crosby Tank	05219	650	1,920		10,187
Diamond Butte	04833	320	1,600		3,536
Fern Tank	05217	2,960	40		48,269
Ferrin	05246				2,820
Flat Top Well	05214	1,120			8,625
Franks Reservoir	05325	711			6,589
Fuller Road	05324	2,618			24,333
Glazier Dam	05202	2,562	640		6,787
Grama Point	05233	320			23,265
Gramma Spring	05225				4,495

ALLOTMENT ACRES BY LAND STATUS					
Allotment	Allotment Number	State Acres	Private Acres	Other Federal Acres	Public Acres
Gulch	05230				3,400
Gunsight	05320				7,230
Hacks	05227	80			4,250
Harris Well	05238		4,160		2,640
Hat Knoll	04867		40		3,160
Head Of Hacks	05232	1,920			29,490
Herd House	00096	192	10		2,390
Highway	05309	2,790	1,280		13,010
Highway	04812				11,378
Home Ranch	05342				80
Homestead	05253	1,920	3,959		8,625
Hurricane Cliff	05251	320			5,040
Hurricane Rim	00114	960			8,395
Ivanpah	04858	1,279	680		12,997
Iverson	04834		2,080		320
Jackson Tank	04830				8,013
Jacob Canyon	05317	640			3,200
Joe	05245	3,320			320
Johnson Run	05330	1,240	720		8,243
June Tank	05221	4,480			111,316
Kanab Creek	05321	640			4,260
Kanab Gulch	05224				4,260
Lamb Tank	05257	640	640		6,990
Lambing-Starvation	04838	1,623			10,913
Lane	05271				640
Little Tank	04853	1,609			4,356
Little Wolf	04814				7,662
Littlefield	04843	148	881		2,097
Littlefield Comm.	04827	1,030	4,780		71,854
Lizard	04857	8,315			4,198
Loco Point	05260	640			5,720
Lost Spring Gap	05316				790
Lower Hurricane	04837	180	161		23,526
Mainstreet	04808	23,406	8,246	156,454	
Mesquite Community	04832			10,000	38,073
Moonshine	05237	320			9,725
Mormon Well	04844	2,806	155		12,892
Mountain Sheep	04824				1,960
Muggins Flat	05313	800			11,088
Mustang Spring	04859	640			9,308
Navajo Wells Ut	05348	960	360		6,736

ALLOTMENT ACRES BY LAND STATUS					
Allotment	Allotment Number	State Acres	Private Acres	Other Federal Acres	Public Acres
Pat's Pond	04862				640
Pigeon Tank	05322				10,825
Pipe Valley	05242	62			4,463
Pocum	04871				13,006
Pocum Tank	04840		200		8,212
Point Of Rock	05241	2,280	640		6,261
Pratt Tank	05314	1,370	920		21,905
Purgatory	04831				4,970
Quail Canyon	04856	160			15,784
Rider	05305	640			2,410
Rock Canyon	00099	407	640		1,360
Rock Canyon Tank	05319	1,080			21,990
Rock Pockets	05213	2,628	20		19,830
Rock Reservoir	05345				1,105
Sage	05311	280			3,380
Scotties Seep	05236	640			6,783
Shinarump	05301	463			1,100
Short Creek	05270	2,412	2,998		2,233
Shuttleworth	05315	120			9,437
State Line	05244		1,180		605
Suicide	05323				4,830
Sullivan Canyon	04810				25,302
Sunshine	04863				17,522
Sunshine Tank	05247	80			7,140
Swapp Tank	05248				9,373
Temple Trail	05216	1,241	120		21,812
Toquer Tank	04861	640			11,785
Tuckup	00097	639			12,638
Valley Wash	05234	840			3,835
Wells	05208		640		5,490
White Pockets	05243				3,450
White Sage	05349	1,330			11,010
Whiterock-Soapstone	04804		42		18,388
Wildband	05223	4,620	260		37,451
Wolfhole - Canyon Sp	04811	2,560	160		33,757
Wolfhole Lake	04823		640		12,590
Wolfhole Mountain	04839				6,699
Yellowstone	05263	760	1,850		8,311
Summary for Arizona Strip FO (111 detail records)		**128,279**	**53,240**	**166,454**	**1,432,937**
Grand Total for Arizona Strip District		**221,344**	**67,867**	**308,504**	**2,653,796**

ALLOTMENT AUMs BY LAND STATUS					
Allotment Name	**Allotment Number**	**State AUMs**	**Private AUMs**	**Other Federal AUMs**	**Public AUMs**
Parashant					
Belnap	4849	72	19		534
Belnap West	4822		23		204
Big Spring Pipeline	4870	216	16	689	1,721
Cottonwood	4809				1,867
Dripping Spring	4818			420	28
Duncan Tank	4820	120	282		429
Hidden Hills	4825	172			1,907
Hidden Spring	4803	48			1,256
Imlay	4817	36			734
Jump Canyon	4801	175			1,863
Last Chance	4815	94			609
Lime Spring	2012				Ephemeral
Link Spring	4819	42			1,094
Mosby	4835	48			81
Mosby-Nay	4836	96			1,148
Mt Trumbull	4826	187	80	445	1,113
Mt. Logan	5218	126			930
Mud And Cane Spring	4850	108			4,716
Mule Canyon	4821			433	152
Pakoon	4802	18			1,624
Pakoon Springs	4800	48	6		1,394
Parashaunt Amp	4829				2,308
Pa's Pocket	4848	62			479
Penns Well	4852	84	69		299
Red Pond	4806				2,793
Sullivan Tank	4816				456
Tassi	4851			0	0
Tuweep	5220	173			1,785
Wildcat	4854	288	575		4,593
Summary for Parashant (29 detail records)		**2,213**	**1,070**	**1,987**	**36,117**

ALLOTMENT AUMs BY LAND STATUS					
Allotment Name	**Allotment Number**	**State AUMs**	**Private AUMs**	**Other Federal AUMs**	**Public AUMs**
Vermilion					
Badger Creek	5341				93
Beanhole Well	5334	257			1,314
Bunting Well	4847	3,280			1,320
Coyote	5327	360			2,060
Ferry Swale	5336			849	828
House Rock	5331	105	17		1,755
Sand Hills	5328	1,320	24		15,081
Signature Rock	5350		52		382
Soap Creek	5332	386	25	78	6,867
Wahweap	5340			276	0
Summary for Vermilion (10 detail records)		**5,708**	**118**	**1,203**	**29,700**
Arizona Strip FO					
Antelope	5206	168	3		1,227
Antelope Spring	5210	240	67		1,157
Atkin Well	5207	35	397		2,339
Beaver Dam Slope	4828	21	7		897
Black Canyon	5256	72			243
Black Knolls	5264	240	28		1,338
Black Rock	4841				1,463
Blake Pond	4813	96	6		1,317
Brown-Shumway	5302				114
Button	5308	48	26		277
Canaan Gap	5205	97	248		279
Cane Beds	5212	171	105		324
Cedar Knoll	5318				720
Cedar Pockets Ut	4866				375
Cedar Ridge	5303				78
Cedar Wash	4842				333
Chatterly	5307	48	4		323
Clay Spring	4845				1,207
Clayhole	5215	1,516	64		10,082
Cottonwood	5209				312
Cowboy Butte	5310	41	32		184
Coyote Spring	4805	48			1,359
Crosby Tank	5219	72	150		470
Diamond Butte	4833	36	217		395

ALLOTMENT AUMs BY LAND STATUS					
Allotment Name	Allotment Number	State AUMs	Private AUMs	Other Federal AUMs	Public AUMs
Fern Tank	5217	381	3		4,806
Ferrin	5246				120
Flat Top Well	5214	112			874
Franks Reservoir	5325				265
Fuller Road	5324	194			1,102
Glazier Dam	5202	211	58		571
Grama Point	5233	21			2,057
Gramma Spring	5225				360
Gulch	5230				96
Gunsight	5320				425
Hacks	5227	9			247
Harris Well	5238		604		272
Hat Knoll	4867				500
Head Of Hacks	5232	251			2,664
Herd House	96	12			95
Highway	4812	13			200
Highway	5309	266	181		429
Home Ranch	5342				6
Homestead	5253	253	485		654
Hurricane Cliff	5251	35			464
Hurricane Rim	114	109			3,424
Ivanpah	4858	168	75		601
Iverson	4834		306		64
Jackson Tank	4830				857
Jacob Canyon	5317	49			139
Joe	5245	515			24
Johnson Run	5330	107	17		253
June Tank	5221	525			8,206
Kanab Creek	5321	72			168
Kanab Gulch	5224				143
Lamb Tank	5257	84	61		423
Lambing-Starvation	4838	72			471
Lane	5271				54
Little Tank	4853	180			693
Little Wolf	4814				328
Littlefield	4843				120
Littlefield Comm.	4827	80	32		2,615
Lizard	4857	588			210
Loco Point	5260	51			535
Lost Spring Gap	5316				48
Lower Hurricane	4837		13		2,316
Mainstreet	4808	2,532	1,207		14,535

ALLOTMENT AUMs BY LAND STATUS					
Allotment Name	Allotment Number	State AUMs	Private AUMs	Other Federal AUMs	Public AUMs
Mesquite Community	4832			500	1,906
Moonshine	5237	42			824
Mormon Well	4844	82			420
Mountain Sheep	4824				96
Muggins Flat	5313	58			305
Mustang Spring	4859	72			491
Navajo Wells Ut	5348	44	16		376
Pat'S Pond	4862				60
Pigeon Tank	5322				299
Pipe Valley	5242	7			412
Pocum	4871				813
Pocum Tank	4840		9		494
Point Of Rock	5241	412	89		682
Pratt Tank	5314	108	68		800
Purgatory	4831				318
Quail Canyon	4856	6			808
Rider	5305	45			108
Rock Canyon	99	38	65		126
Rock Canyon Tank	5319	36			891
Rock Pockets	5213	346	3		1,760
Rock Reservoir	5345				22
Sage	5311	36			243
Scotties Seep	5236	70			710
Shinarump	5301	35			40
Short Creek	5270	234	314		252
Shuttleworth	5315	12			661
State Line	5244		156		29
Suicide	5323				280
Sullivan Canyon	4810				864
Sunshine	4863				1,440
Sunshine Tank	5247	8			752
Swapp Tank	5248				958
Temple Trail	5216	141	13		2,370
Toquer Tank	4861	103			1,801
Tuckup	97	60			792
Valley Wash	5234	96			328
Wells	5208		74		310
White Pockets	5243				420
White Sage	5349	49			429
Whiterock-Soapstone	4804				1,320
Wildband	5223	449	8		3,802
Wolfhole - Canyon Sp	4811	329			1,867

Wolfhole Lake	4823		40		928
Wolfhole Mountain	4839				315
Yellowstone	5263	218	174		897
Summary for Arizona Strip FO (111 detail records)		**12,975**	**5,425**	**500**	**113,066**
Grand Total of Arizona Strip District		**20,896**	**6,613**	**3,690**	**178,883**
Total Public AUMS for Arizona Strip					**182,573**

APPENDIX 3.F

MINERAL POTENTIAL ON THE ARIZONA STRIP

Mineral Potential on the Arizona Strip

Mineral Potential Definitions and Levels of Certainty are used to classify the likelihood mineral occurrences on public lands. The levels of mineral potential are classified as No Potential, Low Potential, Moderate Potential, High Potential and Not Determined. These levels are defined below:

O No Potential: The geologic environment, the inferred geologic processes; and the lack of mineral occurrences do not indicate potential for accumulation of mineral resources.

L Low Potential: The geologic environment and the inferred geologic processes indicate low potential for accumulation and preservation of mineral resources.

M Moderate Potential: The geologic environment, the inferred geologic processes, and the reported occurrences or valid geochemical / geophysical anomaly indicate moderate potential for accumulation and preservation of mineral resources.

H High Potential: The geologic environment, the inferred geologic processes, the reported mineral occurrences and/or valid geochemical/geophysical anomaly, and the known mines or deposits indicate high potential for accumulation of mineral resources. The "known mines and deposits" do not have to be within the area that is being classified, but have to be within the same type of geologic environment.

ND Not Determined: Mineral(s) potential not determined due to lack of relevant data. The notation does not require a level-of-certainty qualifier.

The level of certainty is used to qualify the assigned mineral potential by describing the amount of data and evidence used in determining the assigned mineral potential. The categories for levels of certainty are given as A, B, C and D. These levels are defined below:

A The available data are insufficient and/or cannot be considered as direct or indirect evidence to support or refute the possible existence of mineral resources within the respective area.

B The available data provide indirect evidence to support or refute the possible existence of mineral resources.

C The available data provide direct evidence but are quantitatively minimal to support or refute the possible existence of mineral resources.

D The available data provide abundant direct and indirect evidence to support or refute the possible existence of mineral resources.

For determination of No Potential a certainty level of D is used. This class shall seldom be used, and when used it should be for a specific commodity only. For example, if the available data show that the surface and subsurface type of rock in the respective area is batholithic (igneous intrusive), one can conclude with reasonable certainty, the area does not have potential for coal.

As used in this classification, "potential" refers to potential for the presence (occurrence) of a concentration of one or more energy and/or mineral resources. It does not refer to or imply potential for development and/or extraction of the mineral resource(s). It does not imply that the potential concentration is or may be economic.

The level of potential and level of certainty for mineral resources in the Arizona Strip FO is show in the Table 1 below.

Table 1. Mineral Resource Potential Ratings

Mineral Resource	Level of Potential	Level of Certainty
Coal	No Potential	D
Oil and Gas	Moderate Potential	C
Geothermal	Moderate Potential	B
Sodium	Moderate Potential	C
Potassium	Low Potential	C
Metallic Minerals	High Potential	D
Uranium	High Potential	D
Non-Metallic	High Potential	D
Common Varieties	High Potential	D

Potential for the Occurrence of Mineral Resources on the Arizona Strip

1. Coal

The geologic history and rock units preserved in the Arizona Strip FO are not conducive to the formation and preservation of coal resources. Therefore, there is no potential for the occurrence of this mineral resource. The certainty that coal does not exist is very high and has been assigned a certainty level of D.

2. Oil and Gas

Known oil and gas resources are not significant within the Arizona Strip FO and no economic occurrences of oil or gas have been encountered to date. However, the Arizona Strip FO has been only lightly explored for these resources with the vast majority of these wells drilled on the Colorado Plateau. To date (April 2002) a total of 64 well were drilled on the , with an average of

one application for permit to drill received every two years for the last ten years. As of February 2002 there are approximately 66,815 acres leased and 24,033 pending lease for oil and gas on BLM land in the .

Ryder (1983) rated the oil and gas potential of the Arizona Strip FO as moderate in the north-central and extreme western portions. This rating was based on several oil shows reported from wells drilled in the area and the location of the tracts in relation to the Paleozoic hinge line. In the case of the moderate potential in the north-central area, consideration was also given to that area's location in relation to the Virgin oil field in southwest Utah. In both areas, Ryder speculated that any hydrocarbons present would have migrated into the area from the Rocky Mountain Geosyncline lying to the west. Heylmun (1987) rated the Arizona Strip FO as having good potential for oil accumulations in northwest-striking, anticlinal folds and other structural traps located away from major fault zones. Good potential was also assigned to the Shnabkaib member of the Moenkopi Formation and the Toroweap Formation where stratigraphic traps may exist. Reynolds and others (1988) recognized the Proterozoic Chuar group as a potential source rock for hydrocarbons in northern Arizona. Thus, it would appear that the many thousands of feet of marine sediment that lie in and immediately adjacent to the Arizona Strip FO to the west could provide at least a moderate potential for the origination and possible migration of hydrocarbons into the area. Rauzi (1990) associates oil and gas potential on the Arizona Strip FO with Cordilleran shelf deposits and considers the truncated Cambrian and Ordovician units in the westernmost part of the Arizona Strip FO and the common facies changes from carbonate to clastic beds as favorable for stratigraphic and structural accumulations of oil and gas.

Those areas identified by Ryder (1983) as having moderate potential for hydrocarbon accumulations are carried forth here. Oil and gas accumulations which could underlie the probably occur in structural or stratigraphic traps within rocks of upper Proterozoic through upper Paleozoic ages. The certainty of oil and gas in this area is supported by direct evidence in the form of oil and gas shows in wells. However, the evidence does not support or refute the existence of a valuable resource and is assigned a certainty level of C.

Tertiary and Quaternary erosion along the major drainages crossing most of the southern and eastern portion of the would tend to lower the potential for the preservation of hydrocarbon accumulations due to probable groundwater flushing and is rated as having low potential. In this area only indirect evidence indicates a possibility that oil and gas may not exist. Thus, most of the southern and eastern portion of the is rated as having a low potential on this basis. The certainty that oil and gas resources do not exist in this area is supported only by indirect evidence and, therefore, is assigned a certainty level of B.

3. Geothermal

No geothermal leases have been issued on the . Extensive exploration for geothermal resources in the Arizona Strip FO has not occurred, though warm springs and wells occur in the area. These occurrences and springs do not lie in areas of identified anomalous geothermal regions

(Giardina and Conley, 1978). Due to the lack of indicated geothermal anomalies in the vicinity of the Arizona Strip FO, the warm water occurrences are probably related to the deep circulation of ground water along fault zones. The geothermal resources in these areas are thus expected to be limited in extent and quality. They are very low temperature and not presently usable for purposes other than space heating. This use requires the point use to be located in close proximity to the heat source. Given the lack of population centers in close proximity to these occurrences, these springs and wells have no immediate potential for space heating applications.

The Arizona Strip FO is moderately favorable for the occurrence of low temperature geothermal resources, particularly along major fault zones. The certainty that these resources exists is supported by only indirect evidence in the form of geologic inference. It has therefore been assigned a certainty level of B.

4. Sodium and Potassium

No solid mineral leases have been issued on the Arizona Strip FO. Sodium deposits have been reported from the Muddy Creek Formation near Mesquite, Nevada and are contained within small isolated playa deposits (Wilson and Roseveare, 1949). Though information of a quantitative nature is lacking, this area has been classified as potentially valuable for sodium. Other than reconnaissance work, no activity is known to have occurred for the exploration or development of the sodium resource. Based on the reported occurrence of sodium within the Muddy Creek Formation in this area, the area covered by the Muddy Creek Formation has been assigned a moderate potential for that occurrence. The available data provide direct evidence but are quantitatively minimal to support the possible existence of a sodium mineral resource and the area has been assigned a certainty level of C.

The geologic history and rock units preserved in the Arizona Strip FO are not conducive to the formation and preservation of potassium resources. Therefore, there is low potential for the occurrence of this mineral resource. The available data provide quantitatively minimal direct evidence to support or refute the possible existence of potassium and has been assigned a certainty level of C.

5. Metallic Minerals

In general, the occurrences of metallic minerals in the Arizona Strip FO are related to three main types of mineralizing processes which include: epithermal precious and base metal deposits associated with normal, thrust and detachment faults in the Basin and Range province, such as carbonate-hosted gold deposits; collapse structures, commonly referred to as breccia pipes, which are polymetallic as a group and on the Arizona Strip FO host economically important uranium deposits; and stratabound deposits, containing uranium, copper and gold. Residual placer gold deposits result from the erosion of auriferous rocks.

a. Carbonate Hosted Gold

Carbonate hosted gold shows a moderate potential for occurrence in the Virgin Mountains. Any gold mineralization present would be of the bulk-tonnage, low-grade type described by Berger (1986) and Fisher and Juilland (1986). Mineralization would be associated with normal, thrust, and possibly detachment faults in the area. Small deposits and anomalies of tungsten, copper, sliver, arsenic, molybdenum, lead, and zinc have been identified in the area (Villalobos and Ham, 1981). These elements were identified by Berger (1986) as being either pathfinder elements or elements occurring in small deposits in the vicinity of gold mineralization. Due to the indirect evidence available, the level of certainty that deposits of this nature exist is assigned Level B.

b. Placer Gold

Placer gold deposits reportedly occur along the lower western slope of the Beaver Dam and Virgin Mountains. Based on the geologic environment, the inferred geologic processes, and reported occurrence of gold, the alluvial material along Beaver Dam Wash shows a moderate potential for the occurrence of gold. Available data provide direct evidence but are quantitatively minimal to support the existence of a mineral resource of this type in this area and is therefore assigned a certainty level of C.

c. Breccia Pipe Related

Breccia pipe deposits containing precious and base metal occur along the lower Grand Wash Cliffs and eastern slope of the Virgin Mountains. These deposits reportedly contain copper (up to 23 percent), silver (up to 10 ounces per ton), and relatively minor amounts of lead, zinc, uranium, and gold (Keith and others, 1983). Germanium and Gallium occur in the Apex deposit in Utah (Bernstein, 1986). These two elements reportedly occur in breccia pipes occurring along the Lower Grand Clash Cliffs (Winston, 1988). Based on the known deposits of this nature, the Lower Grand Wash Cliffs area and eastern slope of the Virgin Mountains are rated as having a high potential for the occurrence of breccia pipe related metallic mineral resources. The level of certainty that these deposits exist is supported by abundant direct and indirect evidence and assigned a certainty level of D.

6. Uranium

Favorable environments for the occurrence of uranium minerals within the Arizona Strip FO include breccia pipe related uranium deposits and sandstone type uranium deposits. Breccia pipes originate in fractured Redwall Limestone and form collapse features in overlying rocks as recent as the Chinle Formation. Uranium mineralization occurs in the Supai through Toroweap formations (Krewedl and Carisey, 1986). Exploration and development operations for uranium deposits were very active on the Arizona Strip FO during the 1980s up through the mid-1990s.

These activities resulted in the discovery of eighteen uranium deposits and the construction of six uranium mines (Hack Canyon Mine, Hermit Mine, Pigeon Mine, Arizona 1 Mine, Pinenut Mine and Kanab North Mine). The mines were developed in breccia pipes found near Kanab Creek and its tributaries. The total production from these mines was 9,600 tons of U_3O_8 and the proven reserves in the remaining deposits are estimated at 12,250 tones of U_3O_8 (Smith, R., personal communication, April 2002). Most of the developed deposits contained copper and silver, in addition to uranium. In the 1980s the price of uranium fell dramatically negatively affecting the economics of uranium mining. Currently three of the mines (Arizona 1 Mine, Pinenut Mine and Kanab North Mine) are undergoing care and maintenance in "stand by" mode and the other three mines have been closed and reclaimed. Generally, the reclaimed mines have responded very well to reclamation efforts undertaken. Through 1990, when production was suspended, uranium output from the Arizona Strip FO has totaled 23.3 million pounds of U_3O_8 with an average grade of about 0.60% U_3O_8 (McMurray, 1996?).

Sandstone type uranium deposits occur in the Petrified Forest and Shinarump members of the Chinle Formation. These deposits typically occur in medium to coarse grained sandstones and conglomerates deposited along ancient stream channels, Uranium mineralization is associated with carbonaceous material contained within the sandstone and conglomerates. Uranium was produced from sandstone type deposits in the 1950s (Keith et al., 1983; Scarborough, 1981; Baillieu and Zollinger, 1980). Approximately 1,524 tons of uranium ore averaging 0.201% U30 was produced from the Vermillion Cliffs deposits between 1954 and 1957 (Scarborough, 1981). These deposits are located within the present day Vermillion Cliffs National Monument. Uranium was produced from similar deposits in the Rainbow Hills mining district though no production figures are available.

Based on the geologic environment, known deposits and mines in these areas there is a high potential for the occurrence of uranium resources. The level of certainty that these deposits exist is supported by abundant direct and indirect evidence and assigned a certainty level of D.

7. Gypsum

On the Arizona Strip FO, potentially favorable environments for the occurrence of gypsum include sabkha environments associated with marine regressions in rocks of Permian and Triassic age. Large gypsum deposits occur in the northwestern portion of the Arizona Strip FO. These deposits occur in the upper portion of the Pakoon Dolomite (Hintze, 1986), the Harrisburg Member of the Kaibab Formation (Nielson, 1986; Cheevers and Rawson, 1979), and the Lower Red Member of the Moenkopi Formation (Hintze, 1986; Nielson, 1986; Moore, 1972).

Gypsum occurring the Pakoon Dolomite, known as the Cedar Pocket deposit, has been assayed by the U.S. Bureau of Mines and the BLM, it found to be of good quality, being relatively pure and free of acid insoluble residue and suitable for cement, agricultural, filler, wallboard, and food and pharmaceutical markets. A mining claim validity examination was conducted by the BLM on the Cedar Pocket deposit. A reserve estimate was made containing approximately 32.5

million tons of gypsum (Kershaw, 1994) and 40 acres patented. This deposit has been mined intermittently, presently the mine is inactive.

Near Black Rock Gulch gypsum occurrences are wide spread and several mines have been developed in the Harrisburg member of the Kaibab Formation. Commercial production has been established at three mines Snowflake, Gypsum City and Domtar Ridge near Black Rock Gulch. Initial production during mine start-up in 1990 was approximately 7,000 tons of gypsum. The annual production in 2001 was approximately 700,000 tons of gypsum, while the total production from these mines is approximately 5 million tons of gypsum (Cercala, D., personal communication, May 2002). The Snowflake and Gypsum City operations were mined out and have been reclaimed. The initial reserve estimate for the Domtar Ridge Mine was approximately 93 million tons and inferred resources may be as high as 5 billion tons (Cercala, D., personal communication, 1997). The principal uses for this commodity include manufacturing wall board and portland cement, other uses include agricultural, pharmaceutical, feed grade, food processing and mineral additives. The predicted trend is an increase in production for both the near future and the long term.

Based on the known occurrence of gypsum in these formations and the developed mines, areas where the Toroweap, Kaibab and Moenkopi formations are exposed have been assigned a high potential for the occurrence of gypsum. The gypsum deposit in the Pakoon Dolomite appears to be an isolated occurrence in the Cedar Pockets area and, as such, the Pakoon Dolomite in the Cedar Pockets area has high potential for the occurrence of gypsum. The level of certainty that these deposits exist is supported by abundant direct and indirect evidence and assigned a certainty level of D.

8. Common Variety Materials

Common variety minerals are important in construction and to collectors. These minerals include sand, gravel, cinders, building stone, petrified wood, etc. These commodities occur in various locales throughout the Arizona Strip FO. Development of construction materials depends, to a large extent, upon the location of construction projects or population centers. Petrified wood may be sought after wherever it is found as it is generally collected as a hobby or sold by commercial enterprises as specimens. Potentially favorable environments for the occurrence of common variety include Permian through Quaternary sedimentary and volcanic rocks.

a. Sand and Gravel

In the western portion of the Arizona Strip FO, gravel is abundant along the lower portions of the western slopes of the Virgin and Beaver Dam Mountains. Here alluvial fans have formed and the gravel is expected to be unsorted but of good quality.

Gravel in this area is also occurs along the Beaver Dam Wash and the Virgin River. Well sorted good quality gravel is expected in the stream channels and along stream terraces that have

formed along both sides of the channels. Based on the surface exposures of gravel in these environments, these areas are assigned a high favorability for the occurrence of gravel with a certainty level of D.

Sand and gravel resources, in significant accumulations, are relatively scarce in the central portion of the Arizona Strip FO. Large deposits are confined to isolated exposures of gravel in lower portions of the Moenkopi Formation, for example both Cedar Knoll and Little Cedar Knoll are these types. These deposits, though few, contain substantial quantities of good quality gravel. The remainder of the central portion of the Arizona Strip FO is relatively gravel-poor. Good quality gravel is confined to exposures of the Shinarump Member of the Chinle Formation, and Quarternary aged ephemeral stream channels cut into the Kaibab Formation. Quaternary aged alluvial fan deposits formed along the western slope of the Hurricane Cliffs. Examples of deposits developed in these environments include the Yellowstone Mesa community pit in the Shinarump Member and a stream channel deposit west of Hack Reservoir. Gravel deposits within the Shinarump Member may be cemented and drilling, blasting or ripping may be required to develop the gravel resources in some areas. Gravel that occurs in Quaternary stream channel deposit would probably be confined to a relatively narrow zone, averaging approx. 75 feet in width. Gravel from alluvial fans on the western slope of the Hurricane Cliffs provides a significant source of gravel just north of the Arizona Strip FO in Utah. This same environment could contain significant gravel resources in Arizona. Based on the known occurrence of gravel in these environments, these areas have been assigned a high potential for occurrence. The certainty that gravel exists in these areas is high and assigned a certainty level of D.

In the extreme eastern portion of the Arizona Strip FO, gravel is again relatively scarce. In the House Rock-Valley area the Shinarump Member of the Chinle may contain good quality gravel in large quantities. However, accessible exposures of this unit are rare and gravel from this unit should not be counted on for a long term source. Recent gravel deposits of large quantity and relatively good quality have formed at the bottom of the western slope of the Kaibab monocline. Gravel in these deposits is expected to be relatively poorly sorted with sizes ranging from boulder to sand. In addition to these two types of deposits, the potential also exists for stream channel gravels to occur on exposures of the Kaibab Formation. Deposits of this nature would be similar to those described above in the central portion of the Arizona Strip FO. Based on the physical exposures of gravel from these environments in the House Rock Valley area, they have been assigned a high potential for the occurrence of gravel with a certainty level of D.

b. Building Stone

Building stone occurs throughout the Arizona Strip FO. Local demand is expected to be met by the existing sites established for this use. Due to the widespread occurrence of this commodity no attempt has been made to classify areas of high potential.

c. Cinders

Cinders are known to occur in the immediate vicinity of some of the volcanic centers on the Shivwits and Uinkaret plateaus. Only those deposits identified under occurrences, however, have been designated as high potential, with a certainty level of D.

APPENDIX 3.G

ARIZONA STRIP OIL AND GAS WELLS

Arizona Strip Oil and Gas Wells

Township	Range	Section	¼¼Sec.	TD	Lowest Fm. Penetrated	Reported Oil Shows
36N	09W	30	NESW	5961	Precambrian granite	Minor show
37N	09W	18	SESE	3560		Show reported
37N	12W	15	SESE	5000		
38N	05W	31	NWSE	4666	Cambrian Bright Angel Sh.	Temple Butte Fm.
38N	07W	17	NWSW	32		
38N	07W	17	SWSW	460	Permian Toroweap	Show reported
38N	07W	17	SWSW	1780	Permian Hermit Shale	Coconino Ss.
38N	07W	29	NWNE	1115	Permian Hermit Shale	No show
38N	10W	17	SWNE	3125	Pennsylvanian Callville	Minor show
39N	02E	32	NENE	3868	Cambrian Bright Angel Sh.	No show
39N	05W	10	NWNE	1600	Permian Toroweap "	Moenkopi, Kaibab
39N	06W	14	SWNW	2303	Permian Coconino Ss.	Several shows
39N	06W	35	SESW	1820	Permian Toroweap	Toroweap Fm.
39N	07W	2	NESE	4031	Mississippian	Minor show CO2, He
39N	13W	35	SESW	4015	Mississippian	Minor show
40N	02E	21	SESE	4016	Cambrian Muave	No show
40N	02E	25				
40N	06W	12	NWSW	2202	Permian Kaibab	Minor show
40N	06W	26	NWNW	7070	Cambrian Tapeats Ss.	Moenkopi, Toroweap
40N	06W	26	NWNW	595	Triassic Moenkopi	
40N	06W	27	NENE	2500	Permian Hermit Shale	Moenkopi good show
40N	08W	28	SESW	120		
40N	08W	28	SESW	3753	Mississippian	
40N	09W	18	NESW	4509	Devonian	Minor show
41N	01E	19	SWNW	420	Permian Kaibab	
41N	01E	19	SWNW	620	Permian Kaibab	
41N	01E	19	SWNW	3756	Cambrian Muave	
41N	01W	22				
41N	01W	23	NWSE	550	Permian Kaibab	
41N	01W	24	SENE	4760		
41N	01W	24	NWSE	900		
41N	01W	24	NWSE	500	Permian Kaibab	
41N	01W	24	NESW	750	Permian	
41N	01W	24	NESW	480	Permian Kaibab	
41N	01W	24	NENW	540	Permian Kaibab	
41N	01W	24	NWSE	491	Permian Kaibab	
41N	01W	24	NWSE	470		
41N	01W	24	NWSE	482	Permian Kaibab	
41N	01W	24	NWSE	900		
41N	01W	24				
41N	02E	13	SENE	700	Permian Hermit	No Show
41N	06W	16	SESE	542		Inadequate test
41N	08W	18	NENW	1522		Minor show
41N	09W	28	NWSE	4150	Mississippian	Pakoon Fm.
41N	09W	33	NWNW	3430	Mississippian	Minor show
41N	11W	3				
41N	11W	10	NENW			
41N	11W	10	NESE	1500		

41N	12W	23	NENE	1980
41N	15W	29	NWSE	2600
41N	16W	16	SWNE	900
42N	08W	31	SWSW	936
42N	11W	35	NESW	1432
42N	15W	32	SW?	1405
42N	15W	32	SE	545

APPENDIX 3.H

RECREATION OPPORTUNITY SPECTRUM

Recreation Opportunity Spectrum (ROS)
Criteria for Chapter 3 Classification & Chapter 2 Prescriptions

The following tables describes the recreation setting character conditions required to produce recreation opportunities and facilitate the attainment of both recreation experiences and beneficial outcomes, as targeted in Special Recreation Management Areas in Chapter 2. This characterization of settings is used for both describing existing setting character (Chapter 3) and prescribing desired setting character (Chapter 2). Indicators and standards for monitoring setting conditions would be derived and/or developed from the a. through i. components in the tables.

PHYSICAL – Resources & Facilities: Character of the natural landscape					
Primitive	**Semi-Primitive Non-Motorized**	**Semi-Primitive Motorized**	**Roaded Natural**	**Rural**	**Urban**
OVERALL PHYSICAL CHARACTERISTICS					
Area is characterized by essentially unmodified natural environment of fairly large size.	Area is characterized by predominantly natural or natural-appearing environment of moderate to large size.	Area is characterized by predominantly natural or natural-appearing environment of moderate to large size.	Area is characterized by predominantly natural-appearing environment with moderate evidences of the sights and sounds of man. Such evidences usually harmonize with the natural environment. Resource modification and utilization practices are evident, but harmonize with the natural environment.	Area is characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident.	Area is characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans, on-site, are predominant.
a. Remoteness					
>3 miles from any road	>½ mile from any kind of road, but not as distant as 3 miles, and no road is in sight	On or near 4WD roads, but at least ½ mile from all improved roads, though they may not be in sight	On or near improved country roads, but at least ½ mile from all highways	On or near primary highways, but still within a rural area	On or near primary highways, municipal streets, and roads within towns or cities
b. Naturalness					
Undisturbed natural landscape	Naturally-appearing landscape having modifications not readily noticeable	Naturally-appearing landscape except for obvious primitive roads	Landscape partially modified by roads, utility lines, etc., but none overpower natural landscape features	Natural landscape substantially modified by agriculture or industrial development	Urbanized developments dominate this landscape
c. Facilities					
None	Some primitive trails made of native materials such as log bridges and carved wooden signs	Maintained and marked trails, simple trailhead developments, improved signs, and very basic toilets	Improved yet modest, rustic facilities such as campgrounds, restrooms, trails, and interpretive signs	Modern facilities such as campgrounds, group shelters, boat launches, and occasional exhibits	Elaborate full-service facilities such as laundry, groceries, and book stores

SOCIAL – Visitor Use & Users: Character of recreation & tourism use					
Primitive	**Semi-Primitive Non-Motorized**	**Semi-Primitive Motorized**	**Roaded Natural**	**Rural**	**Urban**
OVERALL SOCIAL CHARACTERISTICS					
Interaction between users is very low and evidence of other users is minimal.	Interaction between users is low, but there is often evidence of other users.	Concentration of users is low, but there is often evidence of other users.	Interaction between users may be low to moderate, but with evidence of other users prevalent.	Interaction between users is often moderate to high.	Large numbers of users can be expected, both on-site and in nearby areas.
d. Group Size (other than your own)					
Fewer than or equal to 3 people per group	4-6 people per group	7-12 people per group	13-25 people per group	26-50 people per group	Greater than 50 people per group
e. Contacts (w/other groups)					
Fewer than 3 encounters per day at campsites and fewer than 6 encounters per day on travel routes	3-6 encounters/day off travel routes(e.g., campsites) and 7-15 encounters/day on travel routes	7-14 encounters/day off travel routes(e.g., staging areas) and 15-19 encounters/day en route	15-19 encounters/day off travel routes(e.g., campgrounds) and 30 or more encounters/day en route	People seem to be everywhere, but human contact is still intermittent	Other people consistently in view
f. Evidence of Use					
Only footprints may be observed	Footprints plus slight vegetation trampling at campsites & travel routes. Only infrequent litter	Vehicle tracks and occasional litter and soil erosion. Vegetation becoming worn	Well-worn soils and vegetation, but often gravel surfaced for erosion control. Litter may be frequent	Paved routes protect soils and vegetation, but noise, litter, and facility impacts are pervasive	A busy place with what seems like constant noise. Unavoidable litter seems to be a lifestyle choice

ADMINISTRATIVE – Administrative & Service Setting: How public land managers, county commissioners and municipal governments, and local businesses care for the area and serve visitors and local residents					
Primitive	**Semi-Primitive Non-Motorized**	**Semi-Primitive Motorized**	**Roaded Natural**	**Rural**	**Urban**
OVERALL ADMINISTRATIVE CHARACTERISTICS					
The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is not permitted.	The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is not permitted.	The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is permitted.	Conventional motorized use is provided for in construction standards and design of facilities.	A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate densities are provided far away from developed facilities. Facilities for intensified motorized use and parking are available.	Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.
g. Visitor Services					
None is available on-site	Basic maps, but area personnel seldom available to provide on-site assistance	Area brochures and maps, plus area personnel occasionally present to provide on-site assistance	Information materials describe recreation areas and activities. Area personnel are periodically available	Everything described to the left in this row, and describe experiences and benefits available. Area personnel do on-site education	Everything described to the left in this row, plus regularly scheduled on-site outdoor skills demonstrations and clinics
h. Management Controls					
No visitor controls apparent. No use limits. Enforcement presence very rare.	Signs at key access points on basic user ethics. May have back country use restrictions. Enforcement presence rare	Occasional regulatory signing. Motorized and mechanized use restrictions. Random enforcement presence	Rules clearly posted with some seasonal or day-of-week use restrictions. Periodic enforcement presence	Regulations prominent. Total use limited by permit, reservation, etc. Routine enforcement presence	Continuous enforcement to redistribute use and reduce user conflicts, hazards, and resource damage
i. Mechanized Use					
None whatsoever	Mountain bikes and perhaps other mechanized use, but all is non-motorized	4WD, ATV, dirt bikes, or snowmobiles in addition to non-motorized, mechanized use	2WD vehicles predominant, but also 4WD and non-motorized, mechanized use	Ordinary highway auto and truck traffic is characteristic	Wide variety of street vehicle and highway traffic is ever-present

APPENDIX 3.I

SOCIOECONOMIC PROFILE OF THE PLANNING AREA

TABLE OF CONTENTS

SOCIOECONOMICS 1

OVERVIEW 1

COUNTY AND COMMUNITY PROFILES 9

Coconino County, Arizona 9
Fredonia 13
Page and Greenehaven 13
The Marble Canyon Area 14
Mohave County, Arizona 15
Colorado City 18
Virgin River Communities 19
Kaibab Paiute Reservation and the Community of Moccasin, Arizona 19
Kane County, Utah 20
Kanab 24
Big Water 24
Washington County, Utah 24
Hildale 28
Hurricane 28
Ivins 29
St. George 29
Santa Clara 29
Washington 30
Clark County, Nevada 30
Bunkerville 33
Mesquite 33
Lincoln County, Nevada 34

LIST OF TABLES

Table 1: Population of cities/towns in the Study Area 3
Table 2: Labor, Unemployment, Income, and Household/Family Size in the Study Area 4
Table 3: Employment by Occupation in the Study Area 5
Table 4: Employment by Industry in the Study Area 6
Table 5: Education Attainment (percent) in the Study Area 8
Table 6: Coconino County Employment by Industry from 1970 to 2000 11
Table 7: New Income by Type in Coconino County 12
Table 8: Employment by Industry from 1970 to 2000 16
Table 9 :New Income by Type in Mohave County 18
Table 10 Employment by Industry in Kane county from 1982-2000 22
Table 11: New Income by Type in Kane County 23

Table 12: Employment by Industry in Washington County from 1970 to 2000 26
Table 13: New Income by Type in Washington County 27

LIST OF FIGURES

Figure 1, Population Growth in Coconino County, Arizona, 1970-2000.....9
Figure 2: Employment by Industry in Coconino County, 1970-2000.....10
Figure 3. Personal Income by Type in Coconino County, 1970-2000.....12
Figure 4. Population Growth in Mohave County, Arizona, 1970-2000 15
Figure 5. Employment by Industry in Mohave County, 1970-2000.....16
Figure 6. Personal Income by Type in Mohave County, 1970-2000.....17
Figure 7. Population Growth in Kane County, Utah, 1970-2000.....21
Figure 8. Employment by Industry in Kane County, 1970-2000.....22
Figure 9. Personal Income by Type in Kane County, 1970-2000.....23
Figure 10. Population Growth in Washington County, Utah, 1970-2000.....25
Figure 11. Personal Income by Industry in Washington County, 1970-2000.....26
Figure 12. Personal Income by Type in Washington County, 1970-2000.....27
Figure 13. Population Growth in Clark County, Nevada, 1970-2000 31
Figure 14. Employment by Industry in Clark County, Nevada, 1970-2000.....32
Figure 15. Personal Income by Type in Clark County, Nevada, 1970-2000.....33
Figure 16. Population Growth in Lincoln County, Nevada, 1970-2000.....34
Figure 17. Employment by Industry in Lincoln County, Nevada, 1970-2000 35
Figure 18. Personal Income by Type in Lincoln County, Nevada, 1970-2000 36

SOCIOECONOMICS

OVERVIEW

The Planning Area encompasses northern portions of Coconino and Mohave Counties in Arizona. Due to the size of the Planning Area and its influence on neighboring states, counties, and communities, the socioeconomic study area also includes southern Washington and Kane counties, Utah, and extreme southeastern Clark and Lincoln counties, Nevada. Sixteen individual communities or community groupings reside within the study area. These communities and counties are described in this section according to their population, economy, employment, and economic characteristics.

Unless otherwise stated, data used in the socioeconomic affected environment were obtained from the U.S. Census, either directly (2000 numbers) or from longitudinal analysis prepared by the Sonoran Institute. While more up-to-date data are available (e.g., population estimates for 2003), such data are not consistent as they may be available for some counties and communities, but not others, and are based on estimates instead of actual census numbers. Using the census data allows greater reliability in comparisons between communities within the study area, as well as comparisons with state and national figures.

In general, the study area is sparsely populated but has an exceptional growth rate. When combined, the 16 communities/community groupings, which span three states and five counties, have a total population of 104,687. Almost half of this number lives in one city, St. George, Utah. Thirteen of the communities experienced an average population increase of 75.1 percent over the ten-year period between 1990 and 2000, which is remarkable when compared to the national average increase of 11.6 percent over the same period. Population data for 1990 is not available for three of the communities in the study area. Population data for the study area, states, and the nation are provided in Table 1. Longer trends in population growth are provided for each county in the study area on the following pages.

The 16 communities/community groupings in the study area had a combined civilian labor force of 45,512 in 2000. Unemployment rates were higher than the national average of 3.7 percent in some parts of the study area. For example, the unemployment rate for Coconino County, Arizona was 4.8 percent (compared to the state average rate of 3.4 percent), and was as high as 5.2 percent in the town of Fredonia. Although the unemployment rate for Mohave County, Arizona was the same as the national rate, some towns within the study area had much higher rates, ranging up to 7.9 percent in the Virgin River communities. Rates were lower than the national average in both Kane and Washington Counties, Utah, with rates as low as 1.3 percent in the town of Hildale, and 2.1 percent in Santa Clara. More detail is available in Table 2. Per capita income for most communities was several thousand dollars lower than the national average. These and other economic statistics are also presented in Table 2

Employment by occupation is shown in Table 3, and is shown over time for individual counties in the pages that follow. The study area is diverse in terms of employment opportunities, with no single occupation dominating the whole area. However, in all study areas, the vast majority of economic growth has been in the services and professional sector, along with more moderate growth in the government and construction sectors. Traditional sources of employment, such as agriculture, have grown more slowly or not at all. Although a few communities are dependent on lower-wage, often tourism-related service jobs such as those in the arts, entertainment, recreation, accommodation, and food services industry, in most of the counties within the study area the majority of growth has taken place in higher-paid components of the services sector, such as the professional, managerial, health and education areas. Table 4 shows employment by industry for the study area.

In order to ensure that the communities in the Planning Area are able to attract higher-paying jobs in "knowledge-based" areas of the service sector, attention should be paid to the level of educational attainment. As Table 5 demonstrates, the communities and counties within the study area vary in terms of educational attainment. Coconino County appears to have the greatest percent of individuals with at least a bachelor's degree (30 percent compared to the nations 24.4 percent), although the communities within the Coconino County portion of the study area do not show this trend. Mohave County has the least percent of individuals with at least a bachelor's degree (10 percent), with Colorado City only having 5.1 percent of its population with at least a bachelor's degree and the highest percent (29.4) of individuals with less than high school education, higher than any other community or county in the study area.

In addition to employment figures, it is important to consider sources of income in the Planning area. Doing so reveals that the largest source of income for most of the counties is actually non-labor (income from investments, retirement, social security, etc.). The service and professional segment of the economy is also growing rapidly in most areas, as is evident in the county graphs on the following pages.

The prevalence of non-labor income has important implications for the management of public lands. Much of the income in this sector is brought by individuals who are not tied to a specific job or industry, but rather have flexibility in where they choose to live. Examples of people contributing this type of income include retirees, second and vacation homeowners, and "footloose" entrepreneurs in knowledge-based industries who depend on telecommunications more than location to accomplish their jobs. These groups tend to be attracted to rural areas by the small-town atmosphere and slower pace of life, the lower cost of living, and by the presence of public lands, which offer recreational opportunities and a desirable setting in which to live.

Table 1: Population of cities/towns in the Study Area

	U.S Census Data		% change 1990-2000	Projections					
	1990	**2000**		**2010**	% change 2000-2010	**2020**	% change 2010-2020	**2030**	% change 2020-2030
UNITED STATES	248,709,873	281,421,906	11.6	- -	- -	- -	- -	- -	- -
Arizona	3,665,228	5,130,632	40.0	6,145,108	19.8	7,363,604	19.8	8,621,114	17.1
Coconino County	96,591	116,320	20.4	147,352	26.7	169,343	14.9	189,868	12.1
Fredonia	1,207	1,036	-14.1	1,507	45.5	1,671	10.9	1,811	8.4
Page	6,598	6,809	3.1	11,128	63.4	13,057	17.3	14,841	13.7
Mohave County	93,497	155,032	65.8	194,403	25.4	236,396	21.6	270,785	14.5
Colorado City	2,426	3,334	37.4	5,500	65.0	6,626	20.5	7,598	14.7
Kaibab CDP	- -	275	- -	- -	- -	- -	- -	- -	- -
Kaibab Paiute Tribe	165	196	18.8	- -	- -	- -	- -	- -	- -
Virgin River Comm.	- -	1,531	- -	- -	- -	- -	- -	- -	- -
Utah	1,722,850	2,275,861	32.1	- -	- -	- -	- -	- -	- -
Kane County	5,169	6,046	17.0	8,238	36.3	11,243	36.5	14,924	32.7
Big Water	326	417	27.9	539	29.3	736	36.5	977	32.7
Kanab	3,289	3,564	8.4	5,849	64.1	7,983	36.5	10,596	32.7
Washington County	48,560	90,354	86.1	122,272	35.3	165,346	35.2	218,198	32.0
Hildale	1,325	1,895	43.0	3,343	76.4	4,521	35.2	5,965	32.0
Hurricane	3,915	8,250	110.7	10,711	29.8	14,484	35.2	19,113	32.0
Ivins	1,630	4,450	173	6,431	44.5	8,697	35.2	11,477	32.0
St. George	28,502	49,663	74.2	68,773	38.5	93,000	35.2	122,727	32.0
Santa Clara	2,322	4,630	99.4	6,562	41.7	8,874	35.2	11,710	32.0
Washington	4,198	8,186	95	10,283	25.6	13,906	35.2	18,351	32.0
Nevada	1,201,833	1,998,257	66.3	- -	- -	- -	- -	- -	- -
Clark County	741,459	1,375,765	85.5	1,827,770	32.9	- -	- -	- -	- -
Bunkerville CDP	- -	1,014	- -	- -	- -	- -	- -	- -	- -
Mesquite	1,871	9,389	401.8	21,000[1]	123.7	- -	- -	- -	- -
Lincoln County	3,775	4,165	10.3	4,280	2.8	- -	- -	- -	- -

CDP = Census Designated Place;"- -" = No Data Available

Data Sources: U.S. Census Bureau – all 1990 and 2000 numbers; Arizona Dept. of Economic Security, Research Administration — all Arizona projections; Five County Association of Governments — all Utah projections; Department of Cultural Affairs — Nevada county projections; City of Mesquite — Mesquite projections ([1] 2008 estimate)

Table 2: Labor, Unemployment, Income, and Household/Family Size in the Study Area

	Population	Civilian labor force	Un-employ-ment Rate	Per Capita Income	Family Income	Household Income	House-hold Size	Family Size
UNITED STATES	281,421,906	137,668,798	3.7	21,587	50,046	41,994	2.59	3.14
Arizona	5,130,632	2,366,372	3.4	20,275	46,723	40.558	2.64	3.18
Coconino County	116,320	59,647	4.8	17,139	45,873	38,256	2.80	3.36
Fredonia	1,036	433	5.2	13,309	30,913	30,288	2.89	3.25
Page	6,809	3,617	4.4	18,691	54,323	46,935	2.90	3.33
Mohave County	155,032	65,048	3.7	16,788	36,311	31,521	2.45	2.87
Colorado City	3,334	917	2.7	5,293	32,344	32,826	7.51	7.58
Kaibab CDP	275	120	6.2	9,421	22,679	21,458	3.13	3.53
Kaibab Paiute Tribe	196	109	6.8	7,951	21,250	20,000	3.02	3.49
Virgin River Com.	1,531	762	7.9	14,201	34,878	31,202	2.65	3.12
Utah	2,233,169	1,098,923	3.4	18,185	51,022	45,726	3.13	3.57
Kane County	6,046	2,816	3.3	15,455	40,030	34,247	2.67	3.21
Big Water	417	244	3.7	15,026	37,917	30,278	2.44	2.97
Kanab	3,564	1,568	2.5	16,128	40,778	35,125	2.64	3.17
Washington County	90,354	37,711	3.2	15,873	41,845	37,212	2.97	3.36
Hildale	1,895	466	1.3	4,782	31,750	32,679	8.17	8.10
Hurricane	8.250	3,372	3.3	13,353	36,955	32,865	2.97	3.38
Ivins	4,450	1,946	2.8	16,743	43,103	41,297	3.10	3.35
St. George	49,663	21,442	3.5	17,022	41,788	36,505	2.81	3.21
Santa Clara	4,630	3,019	2.1	15,957	55,000	52,770	3.78	3.96
Washington	8,186	3,137	2.4	14,032	39,003	35,341	3.00	3.37
Nevada	1,998,257	995,200	4.0	21,989	50,849	44,581	2.62	3.14
Clark County	1,375,765	682,073	4.2	21,785	50,485	44,616	2.65	3.17
Bunkerville CDP	1,014	479	4.3	16,820	46,098	45,076	3.93	4.27
Mesquite	9,389	3,990	3.6	20,191	42,941	40,392	2.66	3.08
Lincoln County	4,165	1,538	2.5	17,326	45,588	31,979	2.48	3.15

Table 3: Employment by Occupation in the Study Area

	Management, professional, and related occupations		Service occupations		Sales and office occupations		Farming, fishing, and forestry occupations		Construction, extraction, and maintenance occupations		Production, transportation, and material moving occupations	
	#	%	#	%	#	%	#	%	#	%	#	%
UNITED STATES	43,646,731	33.6	19,276,947	14.9	34,621,390	26.7	951,810	0.7	12,256,138	9.4	18,968,496	14.6
Arizona	730,001	32.7	362,547	16.2	636,970	28.5	13,839	0.6	245,578	11.0	244,015	10.9
Coconino County	19,309	34.8	10,610	19.1	14,240	25.7	274	0.5	5,548	10.0	5,529	10.0
Fredonia	75	18.9	86	21.7	83	21.0	2	0.5	51	12.9	99	25.0
Page	1,073	31.6	563	16.6	805	23.7	18	0.5	512	15.1	425	12.5
Mohave County	12,366	20.4	15,237	25.2	16,892	27.9	261	0.4	7,989	13.2	7,772	12.8
Colorado City	154	17.6	76	8.7	192	21.9	8	0.9	278	31.8	167	19.1
Kaibab CDP	20	18.2	36	32.7	18	16.4	- -	- -	18	16.4	18	16.4
Kaibab Paiute Tribe	17	17.2	36	36.4	14	14.1	- -	- -	14	14.1	18	18.2
Virgin River Comm.	63	9.0	248	35.3	185	26.4	3	0.4	139	21.9	64	9.1
Utah	339,310	32.5	145,862	14.0	301,556	28.9	5,417	0.5	110,873	10.6	141,334	13.5
Kane County	779	29.2	480	18.0	651	24.4	32	1.2	409	15.3	315	11.8
Big Water	52	22.4	46	19.8	77	33.2	- -	- -	29	12.5	28	12.1
Kanab	421	28.1	269	17.9	370	24.7	13	0.9	218	14.5	209	13.9
Washington County	9,575	26.9	6,517	18.3	9,799	27.5	148	0.4	4,914	13.8	4,693	13.2
Hildale	122	26.8	29	6.4	109	24.0	2	0.4	92	20.2	101	22.2
Hurricane	755	23.7	483	15.2	754	32.7	- -	- -	567	17.8	624	19.6
Ivins	449	24.2	362	19.5	526	28.3	6	0.3	260	14.0	255	13.7
St. George	5,488	27.3	3,839	19.1	5,876	29.2	68	0.3	2,439	12.1	2,408	12.0
Santa Clara	634	33.1	337	17.6	583	30.5	1	0.1	212	11.1	147	7.7
Washington	673	22.5	678	22.7	768	25.7	- -	- -	529	17.7	343	11.5
Nevada	239,717	25.7	229,795	24.6	257,647	27.6	2,499	0.3	106,600	11.4	97,022	10.4
Clark County	155,520	24.4	171,589	26.9	177,727	27.9	653	0.1	71,502	11.2	60,348	9.5
Bunkerville CDP	70	15.6	153	34.1	107	23.8	- -	- -	67	14.9	52	11.6
Mesquite	787	21.1	1,564	42.0	878	23.6	- -	- -	291	7.8	207	5.6
Lincoln County	368	25.2	295	20.2	371	25.4	49	3.4	244	16.7	131	9.0

CDP = Census Designated Place; "- -" = No Data Available; Data Sources: U.S. Census Bureau, Census 2000

Table 4: Employment by Industry in the Study Area

	Agriculture, forestry, fishing and hunting, and mining		Construction		Manufacturing		Wholesale trade		Retail trade		Transportation and warehousing, and utilities	
	#	%	#	%	#	%	#	%	#	%	#	%
UNITED STATES	2,426,053	1.9	8,801,507	6.8	18,286,005	14.1	4,666,757	3.6	15,221,716	11.7	6,740,102	5.2
Arizona	32,676	1.5	193,464	8.7	228,590	10.2	73,441	3.3	273,864	12.3	111,186	5.0
Coconino County	957	1.7	4,265	7.7	2,881	5.2	910	1.6	7,308	13.2	2,991	5.4
Fredonia	15	3.8	57	14.4	34	8.6	2	0.5	64	16.2	20	5.1
Page	29	0.9	187	5.5	83	2.4	43	1.3	470	13.8	601	17.7
Mohave County	602	1.0	5,849	9.7	4,266	7.0	1,308	2.2	8,328	13.8	3,476	5.7
Colorado City	13	1.5	230	26.3	142	16.2	13	1.5	115	13.1	48	5.5
Kaibab CDP	- -	- -	9	8.2	24	21.8	- -	- -	2	1.8	4	3.6
Kaibab Paiute Tribe	- -	- -	5	5.1	24	24.2	- -	- -	2	2.0	4	4.0
Virgin River Com.	14	2.8	70	14.0	19	3.8	3	0.6	32	6.4	23	4.6
Utah	20,288	1.9	85,954	8.2	126,299	12.1	36,729	3.5	133,249	12.8	51,249	4.9
Kane County	148	5.6	234	8.8	149	5.6	35	1.3	293	11.0	213	8.0
Big Water	6	2.6	16	6.9	9	3.9	4	1.7	45	19.4	20	8.6
Kanab	65	4.3	121	8.1	107	7.1	20	1.3	171	11.4	129	8.6
Washington County	383	1.1	4,776	13.4	2,349	6.6	934	2.6	6,112	17.1	1,614	4.5
Hildale	9	2.0	85	18.7	85	18.7	4	0.9	52	11.4	19	4.2
Hurricane	29	0.9	527	16.6	313	9.8	80	2.5	637	20.0	162	5.1
Ivins	15	0.8	234	12.6	109	5.9	48	2.6	307	16.5	126	6.8
St. George	150	0.7	2,499	12.4	1,171	5.8	600	3.0	3,503	17.4	783	3.9
Santa Clara	10	0.5	213	11.1	65	3.4	45	2.4	327	17.1	75	3.9
Washington	- -	- -	471	15.7	189	6.3	33	1.1	537	18.0	147	4.9
Nevada	14,938	1.6	86,327	9.2	45,794	4.9	25,121	2.7	105,382	11.3	48,102	5.2
Clark County	1,724	0.3	62,115	9.7	23,478	3.7	15,064	2.4	71,237	11.2	32,410	5.1
Bunkerville CDP	5	1.1	40	8.9	28	6.2	- -	- -	36	8.0	21	4.7
Mesquite	13	0.3	295	7.9	101	2.7	40	1.1	372	10.0	82	2.2
Lincoln County	107	7.3	167	11.5	26	1.8	27	1.9	213	14.6	107	7.3

CDP = Census Designated Place; "- -" = No Data Available; Data Sources: U.S. Census Bureau, Census 2000

Table 4: Employment by Industry in the Study Area (continued)

	Information		Finance, insurance, real estate, rental and leasing		Professional, scientific, mgmt., admin. and waste mgmt.		Educational, health and social services;		Arts, entertainment, recreation, accomd., and food services		Other services (except public administration)		Public Administration	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
UNITED STATES	3,996,564	3.1	8,934,972	6.9	12,061,865	9.3	25,843,029	19.9	10,210,295	7.9	6,320,632	4.9	6,212,015	4.8
Arizona	62,577	2.8	175,311	7.9	229,660	10.3	402,183	18.0	225,129	10.1	103,305	4.6	121,618	5.4
Coconino County	851	1.5	2,167	3.9	3,290	5.9	14,918	26.9	9,035	16.3	2,183	3.9	3,754	6.8
Fredonia	- -	- -	- -	- -	15	3.8	70	17.7	53	13.4	40	10.1	26	6.6
Page	41	1.2	181	5.3	104	3.1	713	21.0	682	20.1	115	3.4	147	4.3
Mohave County	978	1.6	2,770	4.6	3,133	5.2	9,070	15.0	15,020	24.8	2,980	4.9	2,737	4.5
Colorado City	6	0.7	13	1.5	33	3.8	141	16.1	48	5.5	48	5.5	25	2.9
Kaibab CDP	- -	- -	2	1.8	- -	- -	11	10.0	23	20.9	10	9.1	25	22.7
Kaibab Paiute Tribe	- -	- -	2	2.0	- -	- -	11	11.1	23	23.2	6	6.1	22	22.2
Virgin River Com.	5	1.0	14	2.8	17	3.4	45	9.0	248	49.5	- -	- -	11	2.2
Utah	34,712	3.3	70,996	6.8	98,148	9.4	200,272	19.2	83,035	8.0	46,128	4.4	57,303	5.5
Kane County	37	1.4	92	3.5	101	3.8	399	15.0	504	18.9	251	9.4	210	7.9
Big Water	3	1.3	9	3.9	2	0.9	28	12.1	59	25.4	16	6.9	15	6.5
Kanab	18	1.2	59	3.9	73	4.9	241	16.1	211	14.1	160	10.7	125	8.3
Washington County	595	1.7	2,019	5.7	2,449	6.9	6,687	18.8	4,615	12.9	1,852	5.2	1,261	3.5
Hildale	2	0.4	14	3.1	17	3.7	88	19.3	21	4.6	40	8.8	19	4.2
Hurricane	32	1.0	83	2.6	152	4.8	598	18.8	393	12.3	100	3.1	77	2.4
Ivins	33	1.8	72	3.9	132	7.1	313	16.8	258	13.9	145	7.8	66	3.6
St. George	385	1.9	1,338	6.7	1,511	7.5	3,651	18.1	2,741	13.6	1,104	5.5	682	3.4
Santa Clara	33	1.7	155	8.1	162	8.5	428	22.4	208	10.9	101	5.3	92	4.8
Washington	48	1.6	108	3.6	202	6.8	660	22.1	321	10.7	165	5.5	110	3.7
Nevada	20,969	2.2	60,216	6.5	82,172	8.8	119,967	12.9	245,679	26.3	36,742	3.9	41,871	4.5
Clark County	14,464	2.3	43,631	6.8	58,783	9.2	74,923	11.8	191,596	30.1	24,656	3.9	23,258	3.6
Bunkerville CDP	12	2.7	19	4.2	42	9.4	46	10.2	183	40.8	10	2.2	7	1.6
Mesquite	35	0.9	188	5.0	250	6.7	313	8.4	1,876	50.3	59	1.6	103	2.8
Lincoln County	52	3.6	40	2.7	38	2.6	313	21.5	155	10.6	32	2.2	181	12.4

CDP = Census Designated Place; "- -" = No Data Available; Data Sources: U.S. Census Bureau, Census 2000

Table 5: Education Attainment (percent) in the Study Area

	Less than high school	High School Graduate	Some College	Associate Degree	Bachelor's degree	Graduate or Professional Degree
UNITED STATES	19.6	28.6	21.0	6.3	15.5	8.9
Arizona	19.0	24.3	26.4	6.7	15.2	8.4
Coconino County	16.3	21.6	26.3	5.9	18.7	11.3
Fredonia	25.4	31.5	28.9	4.4	6.1	3.7
Page	12.3	28.3	30.9	9.1	12.9	6.6
Mohave County	22.5	34.9	27.1	5.6	6.4	3.6
Colorado City	29.4	39.4	17.8	8.3	4.7	0.4
Kaibab CDP	18.7	33.3	30.9	8.1	8.9	- -
Kaibab Paiute Tribe	17.0	36.6	30.4	8.9	7.1	- -
Virgin River Com.	21.7	32.2	24.8	3.2	5.7	2.3
Utah	12.3	24.6	29.1	7.9	17.9	8.3
Kane County	13.6	26.2	32.3	6.8	14.0	7.2
Big Water	14.8	38.8	27.7	6.8	10.8	1.1
Kanab	13.3	25.5	32.2	5.6	14.5	8.8
Washington County	12.4	26.7	31.9	8.0	13.9	7.0
Hildale	26.8	42.5	18.2	3.7	6.9	1.9
Hurricane	15.8	24.6	32.7	7.7	12.9	6.3
Ivins	10.0	28.0	33.1	8.9	13.6	6.5
St. George	12.2	26.3	31.3	8.2	14.5	7.5
Santa Clara	5.9	21.4	34.2	11.0	19.0	8.6
Washington	12.7	27.7	33.6	7.6	11.4	7.0
Nevada	19.3	29.3	27.0	6.2	12.1	6.1
Clark County	20.5	29.9	26.4	5.9	11.5	5.9
Bunkerville CDP	28.5	28.9	26.4	4.9	11.3	- -
Mesquite	22.7	31.9	25.3	5.6	9.3	5.3
Lincoln County	17.0	37.8	24.4	5.8	10.0	5.0

CDP = Census Designated Place; "- -" = No Data Available
Data Sources: U.S. Census Bureau – all 2000 numbers

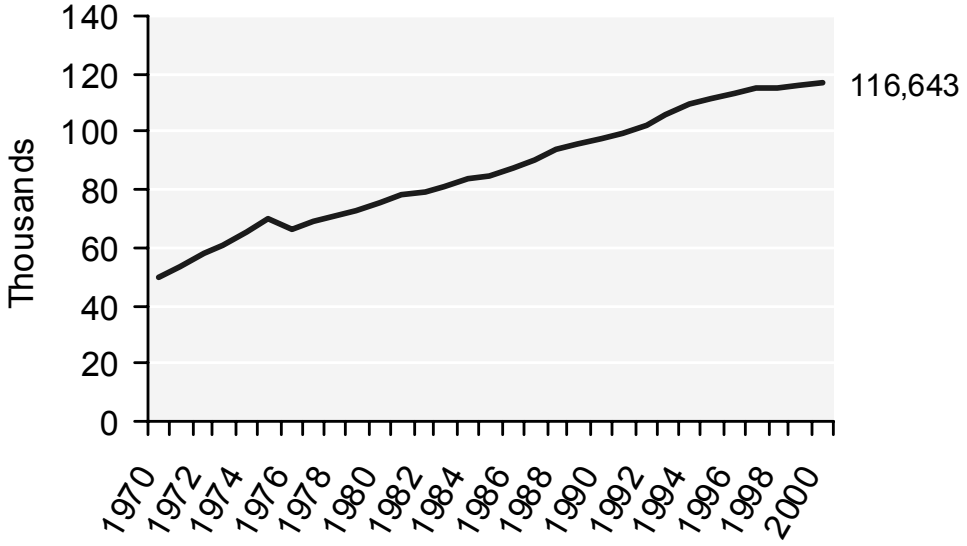
COUNTY AND COMMUNITY PROFILES

Coconino County, Arizona

Coconino County is the second largest county in the United States in terms of area, encompassing 18,608 square miles. It is also one of the most sparsely populated counties in the nation, with a population of 116,320 in 2000. The county's major population center is Flagstaff, which had a 2000 population of 52,894; much of the remainder is rural. The Arizona Strip portion of the county, in particular, is rural with minimal population found in the small isolated communities of Fredonia, Greenehaven, and Marble Canyon. Indian reservations, including the Navajo, Hopi, Paiute, Havasupai, and Hualapai nations, comprise 38.1 percent of the land. The U.S. Forest Service and BLM manage 32.3 percent of the land; the state of Arizona owns 9.5 percent; other public lands comprise 6.8 percent; and private individuals and corporations own the remaining 13.3 percent.

Figure 1 illustrates the population growth in Coconino County from 1970 to 2000. From 1990 and 2000, the population in Coconino County grew by 20.4 percent. Although this is a greater increase than the national average of 11.6 percent over the same ten-year period, it is half as much as the population growth in Arizona, which experienced a 40 percent increase. According to Arizona Department of Economic Security (DES) projections, Coconino County is expected to grow by 63.2 percent between 2000 and 2030, reaching a population of 189,868.

Figure 1. Population Growth in Coconino County, Arizona, 1970-2000 (Sonoran Institute 2003)



In 2000, Coconino County had a labor force of 70,657 people, an unemployment rate of 5.4 percent compared to a state rate of 4.7 percent and a national rate of 4.8 percent, and a per capita income of $17,139, which was lower than the state and national averages of $20,275 and $21,587 respectively. Employment by occupation in the county is similar to the state and nation,

with the greatest percentage of workers employed in the Services and Professional sector at 66.4 percent, government at 21.5 percent, and construction at 6.6 percent. More detail about how employment in various sectors has changed over the past 30 years can be found in Figure 2 and Table 6.

Figure 2: Employment by Industry in Coconino County, 1970-2000 (Sonoran Institute 2003)

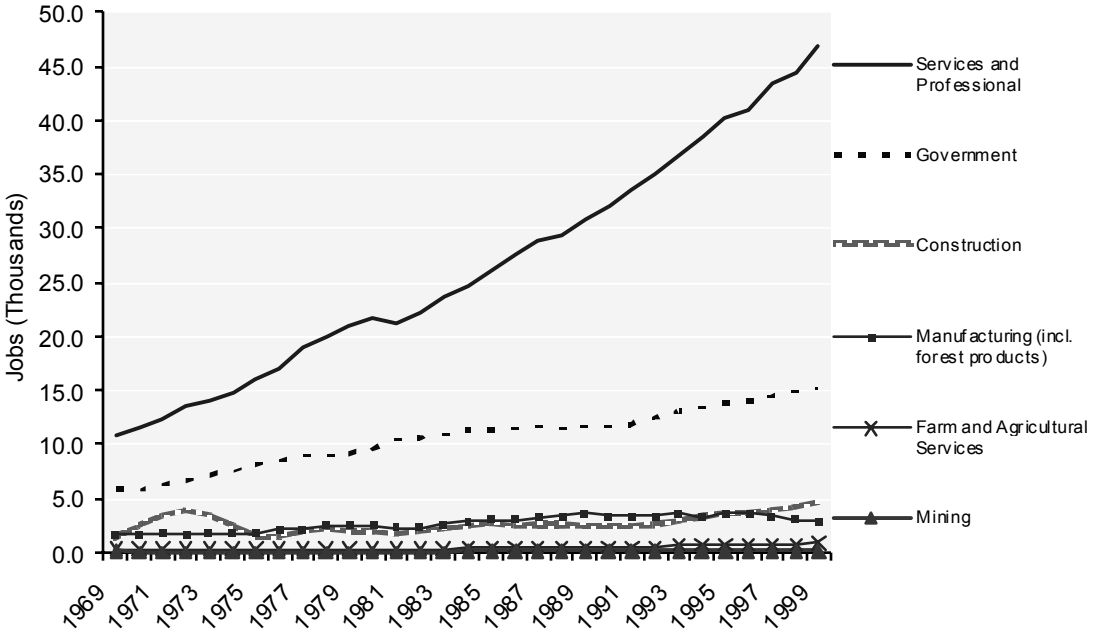


Table 6: Coconino County Employment by Industry from 1970 to 2000						
	1970	**% of Total**	**2000**	**% of Total**	**New Employment**	**% of New Employment**
Total Employment	20,145	NA	70,657	NA	50,512	NA
Wage and Salary Employment	17,677	87.7%	56,140	79.5%	38,463	76.1%
Self Employment	2,468	12.3%	14,517	20.5%	12,049	23.9%
Farm and Agricultural Services	338	1.7%	810	1.1%	472	0.9%
Farm Services	283	1.4%	239	0.3%	-44	NA
Agricultural Services	55	0.3%	571	0.8%	516	1.0%
Mining	100	0.5%	153	0.2%	53	0.1%
Manufacturing (incl. forest products)	1,577	7.8%	2,919	4.1%	1,342	2.7%
Services and Professional	10,915	54.2%	46,928	66.4%	36,013	71.3%
Transportation & Public Utilities	962	4.8%	2,012	2.8%	1,050	2.1%
Wholesale Trade	395	2.0%	1,337	1.9%	942	1.9%
Retail Trade	4,350	21.6%	15,353	21.7%	11,003	21.8%
Finance, Insurance & Real Estate	815	4.0%	4,726	6.7%	3,911	7.7%
Services (Health, Legal, Business, Others)	4,393	21.8%	23,500	33.3%	19,107	37.8%
Construction	1,271	6.3%	4,690	6.6%	3,419	6.8%
Government	5,944	29.5%	15,157	21.5%	9,213	18.2%

Agricultural Services include soil preparation services, crop services, etc. It also includes forestry services, such as reforestation services, and fishing, hunting, and trapping. Manufacturing includes paper, lumber and wood products manufacturing.
Source: Sonoran Institute 2003

As would be expected from reviewing Figure 2 and Table 6, the largest source of income for Coconino County residents in 2000 was the services and professional segment of the economy; however almost as many individuals were dependent upon non-labor sources of income. In fact, more individuals were dependent upon non-labor sources of income such as retirement funds, rentals, and investments in preceding years. Figure 3 and Table 7 illustrate the near equal reliance of Coconino County residents on service and professional and non-labor sources of income for the past ten years.

Figure 3. Personal Income by Type in Coconino County, 1970-2000 (Sonoran Institute)

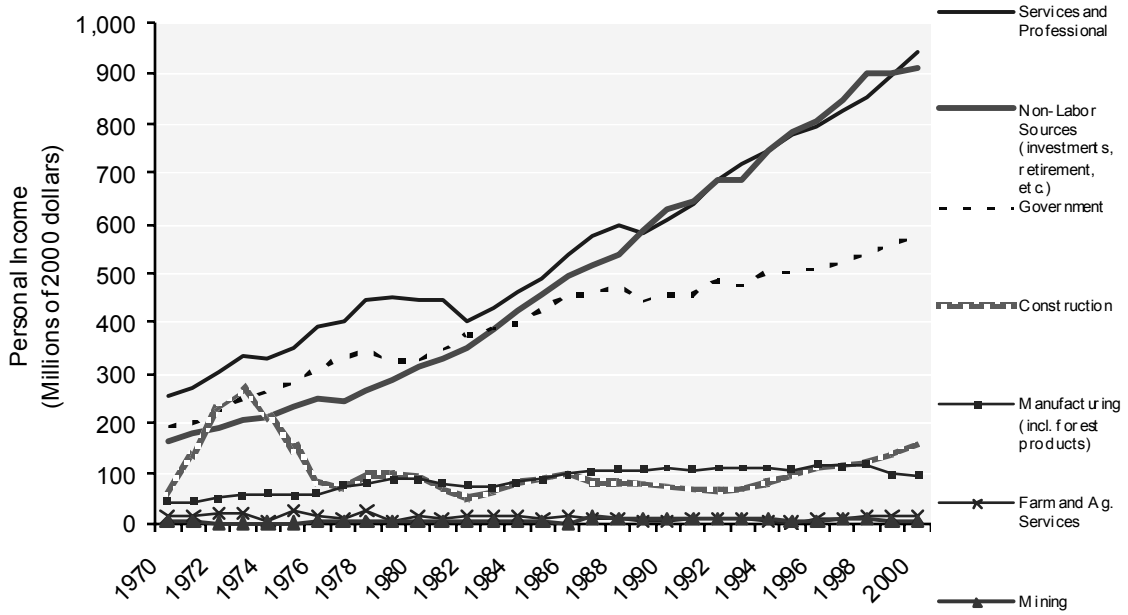


Table 7: New Income by Type in Coconino County						
	1970	**% of Total in 1970**	**2000**	**% of Total in 2000**	**New Income 1970 to 2000**	**% of New Income**
Total Personal Income*	678	NA	2,557	NA	1,879	NA
Farm and Agricultural Services	13	1.9%	11	0.4%	-3	NA
Farm	12	1.8%	3	0.1%	-10	NA
Ag. Services	1	0.1%	8	0.3%	7	0%
Mining	4	0.6%	3	0.1%	-1	NA
Manufacturing (incl. forest products)	45	6.6%	94	3.7%	49	3%
Services and Professional	251	37.0%	947	37.0%	696	37%
Transportation & Public Utilities	41	6.1%	78	3.0%	37	2%
Wholesale Trade	12	1.8%	38	1.5%	25	1%
Retail Trade	95	14.0%	243	9.5%	149	8%
Finance, Insurance & Real Estate	12	1.8%	65	2.5%	53	3%
Services (Health, Legal, Business, Others)	91	13.4%	523	20.5%	432	23%
Construction	64	9.4%	156	6.1%	92	5%
Government	194	28.6%	571	22.3%	377	20%
Non-Labor Income	161	23.8%	909	35.6%	748	40%
Dividends, Interest & Rent	92	13.6%	566	22.1%	474	25%
Transfer Payments	69	10.2%	343	13.4%	274	15%

All figures in millions of 2000 dollars
*The sum of the above categories do not add to total due to adjustments made for place of residence and personal contributions for social security insurance made by the U.S. Department of Commerce.
Source: Sonoran Institute 2003

Fredonia

Fredonia is the northernmost town in Coconino County. Located at the intersection of U.S. Hwy 89A and State Highway 389 near the Utah border on the Arizona Strip, the town has an area of 7.4 square miles and sits at approximately 4,800 feet in elevation. Founded in 1885, Fredonia is the largest town in the Coconino County portion of the Arizona Strip. Although the State of Arizona saw a 40 percent increase in population growth between 1990 and 2000, Fredonia saw a 13 percent decrease in population over the same period, from 1,207 in 1990 to 1,036 in 2000. However, the community's population is projected to steadily increase over the next 30 years to a population of 1,811 (Arizona DES 2000).

Fredonia's economy has been derived historically from agriculture, timber, and mining. Since the closing of the sawmill in 1995, the town has been trying to identify a new and viable industry and is coming to rely on tourism from visitors to the Arizona Strip and nearby national parks, national forests, monuments, and other recreation sites. There were 433 people in Fredonia's civilian labor force in 2000. Sixty-two percent of workers worked out of town and 43 percent worked out of state. However, the average commute time for 63 percent of workers was less than 20 minutes, suggesting that they did not travel far, most likely to Kanab, Utah, only 10 miles away.

In 2000, Fredonia's unemployment rate was only 5.2 percent; however, per capita income was $13,309, which was 62 percent lower than the national per capita income of $21,587.

Page and Greenehaven

The City of Page is a planned community located just east of the Colorado River and the Arizona Strip. It is situated near the Utah border and adjacent to Lake Powell. Named for John C. Page, Commissioner of the Bureau of Reclamation under Franklin Roosevelt, Page was originally planned and developed for the workers building Glen Canyon Dam in 1957. The City of Page was incorporated on March 1, 1975 and includes 16.6 square miles of land on Manson Mesa. The city saw almost no growth during the 10-year period from 1990 to 2000, during which population increased by a mere 3.1 percent from 6,598 to 6,809. However, Page's population is projected to more than double over the next 30 years to a population of 14,481.

The unemployment rate in Page in 2000 was 6.1 percent and per capita income was $18,691. The current economic structure supporting Page depends largely on tourism drawn by the lake as well as the Salt River Project Navajo Generating Station. The largest industry is the educational, health, and social services industry, which employs 21 percent of the workforce, followed by arts, entertainment, recreation, accommodation, and food services that encompass 20 percent of the workforce. The vast majority of employees who live in Page work within Arizona (97 percent) and Coconino County (93 percent), with a smaller majority (62 percent) working directly in town. Even those who work out of town do not travel far from home as 80 percent of workers commute less than 20 minutes.

The community of Greenehaven consists of 491 acres bordered on the north by the Arizona-Utah state line and situated on Highway 89 northwest of Page. The area is located on the western side of Lake Powell and has views of Wahweap Bay, Castle Rock, Lone Rock, and other features along the Bay. Development of this community began in 1980 with a rezoning to Planned Community and creation of a master plan for a mixed use community encompassing resort, residential, commercial, and light industrial uses. Originally state trust land, the area is now surrounded by Glen Canyon NRA lands. The commercial areas have seen development of only a convenience market with gas sales and a boat storage facility. Greenehaven serves as both a residential community for the city of Page, and a vacation home area for Lake Powell.

The Marble Canyon Area

The Marble Canyon area is located within the eastern portion of the Planning Area, east of Kaibab National Forest. It consists of a series of lodges along Highway 89A at the base of the Vermilion Cliffs: Vermilion Cliffs Lodge, Marble Canyon Lodge, and Cliff Dweller's Lodge, as well as isolated home sites and ranches. All of these communities/businesses are now located on the southern border of Vermilion Cliffs National Monument. The communities/businesses were developed after 1928, the year that Navajo Bridge was constructed to allow vehicular access across the Colorado River south of Lees Ferry. They are now popular stopping places for visitors to Vermilion and adjacent public lands, as well as river runners preparing for a trip through Grand Canyon (originating at nearby Lees Ferry); anglers visiting the Lees Ferry trout fishery; and tourists who are traveling to the North Rim of the Grand Canyon, Lake Powell, or other tourist destinations in the area.

Marble Canyon is located immediately west of Navajo Bridge and the Colorado River and about six miles from Lees Ferry. The community encompasses 60 acres north of Highway 89A and 113 acres south of the highway. Only a small portion of this land is developed, including a 51-room motel, restaurant, convenience store/trading post, post office, gas station, airstrip, and residences for managers and employees. Marble Canyon Lodge employs 45-65 people during the peak summer season; however, business is year-round. Approximately 20 licensed fishing guides work in the area (SWCA 1999).

Vermilion Cliffs Lodge encompasses 10 developed acres and includes the 11-room Lees Ferry Lodge, restaurant, fishing supply and art store, and employee housing. Badger Creek is adjacent to Vermilion Cliffs and encompasses 38 acres of land split into 27 parcels ranging in size from one to three acres and primarily developed with residential single-family homes, and a commercial warehouse used by a local river outfitter.

Cliff Dwellers includes a 24-acre parcel occupied by a 20-room lodge, restaurant, fly shop, gas station, and employee housing; a river company warehouse; three large undeveloped parcels of land surrounding the lodge; seven 40-acre parcels of which one has been developed; the Cliff Dweller Homeland subdivision, consisting of six undeveloped 5-acre lots; and one 20-acre parcel

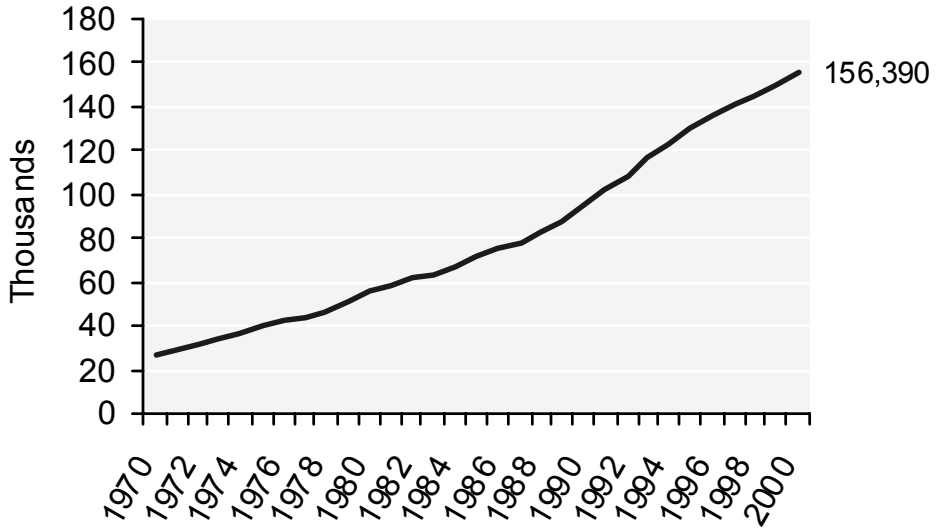
occupied by a single family residence (personal communication, Sue Pratt, Coconino County Planner, September 2003). In 1999, Cliff Dwellers Lodge employed 13-14 employees during the summer months and 3-4 employees during the winter months (SWCA 1999).

Mohave County, Arizona

Mohave County is the second largest county in the state geographically, encompassing 8,519,680 acres. It is bisected by the Grand Canyon, requiring travelers to go through Utah or Nevada to travel between northern and southern sections of the county. The BLM manages 55.2 percent of the land, NPS manages 14.3 percent, USFS manages less than one percent, Indian reservations make up 6.7 percent, the state of Arizona owns 6.6 percent, and individuals and corporations own 17.2 percent.

Figure 4 illustrates population growth in Mohave County from 1970 to 2000. In 2000, the population was 156,390, which was a remarkable 65.8 percent higher than its 1990 population of 93,497. This 10-year growth rate was 25 percent greater than Arizona's during the same period, and over 50 percent greater than that of the nation. Mojave County is projected to continue its remarkable growth rate by adding another 25 percent by 2010 and 75 percent by 2030. Since 1970, the county has grown by 130,052 people, an increase of 494 percent.

Figure 4. Population Growth in Mohave County, Arizona, 1970-2000 (Sonoran Institute 2003)



In 2000, the civilian labor force consisted of 65,040 people and the unemployment rate was 7.0 percent. Per capita income in the county was $16,788, roughly three to four thousand dollars less than Arizona and the nation. Mohave County's dependence on tourism is indicated by its main industry being the arts, entertainment, recreation, accommodation, and food services, which employed one quarter of all workers. The dominance and rapid growth of the service and professional industries over the past 30 years is presented in Figure 5 and Table 8.

Figure 5. Employment by Industry in Mohave County, 1970-2000 (Sonoran Institute 2003)

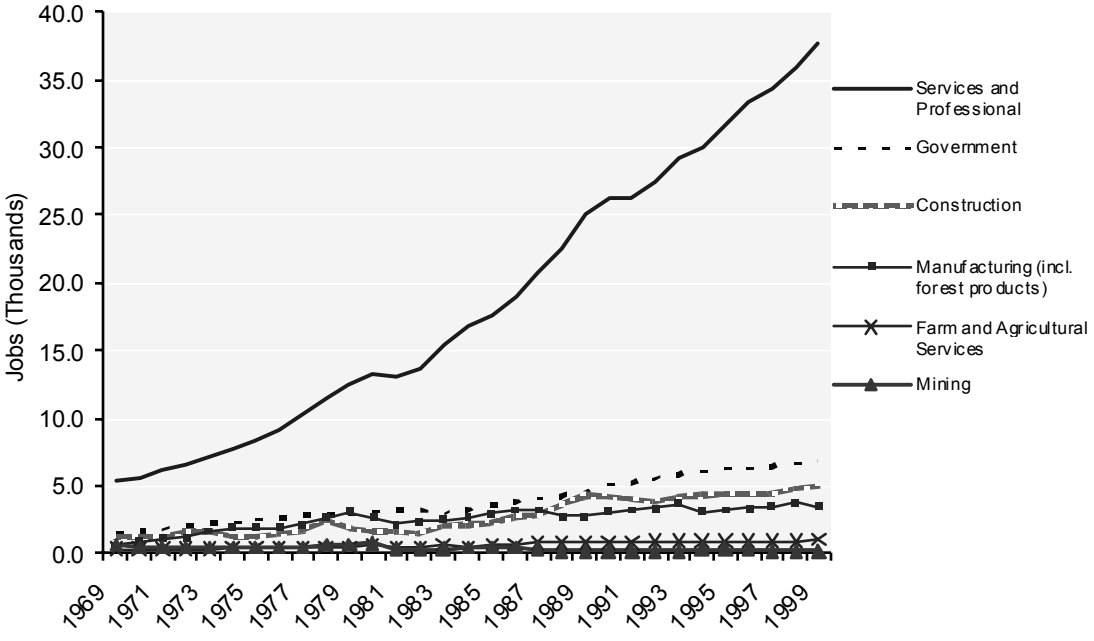


Table 8: Employment by Industry from 1970 to 2000						
	1970	**% of Total**	**2000**	**% of Total**	**New Employment**	**% of New Employment**
Total Employment	9,295	NA	54,017	NA	44,722	NA
Wage and Salary Employment	7,181	77.3%	42,428	78.5%	35,247	78.8%
Self Employment	2,114	22.7%	11,589	21.5%	9,475	21.2%
Farm and Agricultural Services	334	3.6%	956	1.8%	622	1.4%
Farm	293	3.2%	338	0.6%	45	0.1%
Agricultural Services*	41	0.4%	618	1.1%	577	1.3%
Mining	525	5.6%	149	0.3%	-376	NA
Manufacturing (incl. forest products)	575	6.2%	3,503	6.5%	2,928	6.5%
Services and Professional	5,287	56.9%	37,751	69.9%	32,464	72.6%
Transportation & Public Utilities	396	4.3%	2,434	4.5%	2,038	4.6%
Wholesale Trade	135	1.5%	1,460	2.7%	1,325	3.0%
Retail Trade	1,885	20.3%	13,097	24.2%	11,212	25.1%
Finance, Insurance & Real Estate	899	9.7%	4,596	8.5%	3,697	8.3%
Services (Health, Legal, Business, Others)	1,972	21.2%	16,164	29.9%	14,192	31.7%
Construction	1,137	12.2%	4,891	9.1%	3,754	8.4%
Government	1,437	15.5%	6,767	12.5%	5,330	11.9%

*Agricultural Services include soil preparation services, crop services, etc. It also includes forestry services, such as reforestation services, and fishing, hunting, and trapping. Manufacturing includes paper, lumber and wood products manufacturing.
Source: Sonoran Institute

While Figure 5 and Table 8 illustrate that the service and professional industry comprises the majority of employment in Mohave County, non-labor sources were the largest source of income in 2000. As Figure 6 and Table 9 illustrate, residents in the county consistently and increasingly depended upon non-labor sources of income beginning in 1974.

Figure 6. Personal Income by Type in Mohave County, 1970-2000 (Sonoran Institute 2003)

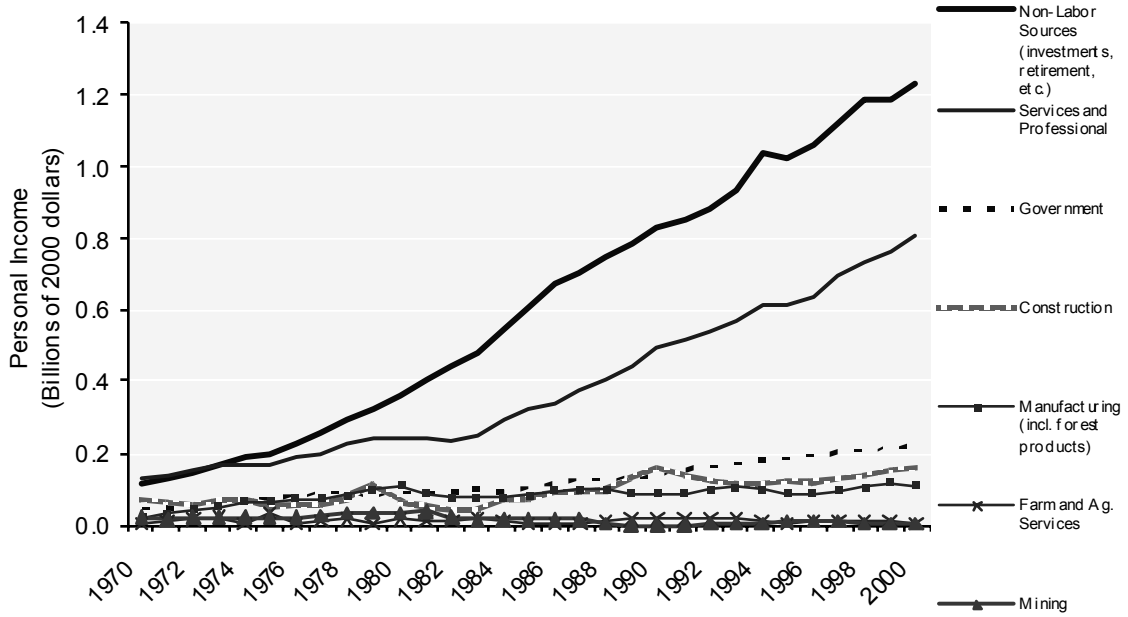


Table 9 :New Income by Type in Mohave County

	1970	% of Total in 1970	2000	% of Total in 2000	New Income 1970 to 2000	% of New Income
Total Personal Income*	442	NA	2,866	NA	2,424	NA
Farm and Agricultural Services	8	1.8%	8	0.3%	0	0%
Farm	7	1.6%	0	0.0%	-7	NA
Agricultural Services	1	0.2%	9	0.3%	8	0%
Mining	21	4.8%	5	0.2%	-16	NA
Manufacturing (incl. forest products)	22	5.0%	109	3.8%	87	4%
Services and Professional	132	29.8%	805	28.1%	673	28%
Transportation & Public Utilities	17	3.8%	86	3.0%	69	3%
Wholesale Trade	3	0.7%	46	1.6%	43	2%
Retail Trade	51	11.5%	220	7.7%	169	7%
Finance, Insurance & Real Estate	10	2.2%	69	2.4%	60	2%
Services (Health, Legal, Business, Others)	51	11.5%	383	13.4%	332	14%
Construction	64	14.5%	158	5.5%	94	4%
Government	42	9.6%	222	7.7%	180	7%
Non-Labor Income	114	25.8%	1,234	43.0%	1,120	46%
Dividends, Interest & Rent	71	16.1%	579	20.2%	508	21%
Transfer Payments	43	9.7%	654	22.8%	612	25%

All figures in millions of 2000 dollars
*The sum of the above categories do not add to total due to adjustments made for place of residence and personal contributions for social security insurance made by the U.S. Department of Commerce.
Source: Sonoran Institute 2003

Colorado City

Colorado City is on the northern border of Arizona on Highway 389, adjacent to Hildale, Utah. It was originally called Short Creek due to a nearby stream that sank into the sand before it ran very far. The first settlers were ranchers and cattlemen who came to the area in the early 1900's. In about 1930, a group of religious fundamentalists from Utah seeking refuge played a major part in shaping the community into its current form. The name of the community was officially changed to Colorado City in 1963. In 2000, the population of Colorado City was 3,334, which was a 34 percent increase over 1990. The population is projected to nearly double over the next 20 years to a population of 7,598.

Residents of Colorado City are primarily employed in construction, extractive industries, and maintenance occupations, which employ 31.8 percent of the workforce, followed by sales and office occupations, which employ 21.9 percent of the workforce. The main single industry is construction, which employs 26.3 percent of the workforce. Nearly half of the employees living in Colorado City work out of state, mainly in Hildale, Utah, which has an active industrial park and service industry. The commute to work for 78 percent of workers was under 20 minutes. The unemployment rate in Colorado City in 2000 was only 4.6 percent; however, per capita income for the town is the lowest in the study area at $5,292, less than one third of the per capita

income in Coconino County and nearly one forth of the national average. This is caused by Colorado City's large family size of 7.58 people, more than twice the national average of 3.14.

Virgin River Communities

The Virgin River communities of Desert Springs, Beaver Dam, Littlefield, Scenic, and Arvada lie along Interstate 15, between the Virgin River Gorge and the Nevada state line. The area offers scenic views of the Beaver Dam Mountains, Virgin Mountains, and the Virgin River Valley. The economy was originally based on agriculture and grazing, but agriculture proved difficult along the Virgin River as frequent flooding destroyed crops. In recent years, the communities have experienced tremendous development pressure as the rapidly growing communities of Mesquite, Nevada and St. George, Utah expand into Arizona. The communities provide living areas for retirees and much of Mesquite's workforce (personal communication, Christine Ballard, Mohave County Planner, October 2003). In 2000, the population of the Virgin River communities was 1,531. No census information is available for 1990 and no projections have been made.

Tourism is the main economic contributor to the area due to Interstate 15 and the casinos, spas, hotels, and golf resorts located in Mesquite, Nevada. Some may also be attracted by the natural amenities, such as the scenery and outdoor recreational opportunities offered on public lands. This is reflected in the fact that over a third of the population, 35.3 percent, are employed in service occupations, followed by 26.4 employed in sales and office occupations. The centrality of tourism is also reflected in the fact that 50.7 percent of the employees living in the Virgin River communities are employed in the arts, entertainment, recreation, accommodations, and food services. While some of these employees travel to the neighboring states of Nevada and Utah to work, the average commute time is less than 18 minutes, indicating that many work near home. The per capita income was $14,201, which is the highest in the Mohave County communities examined, but over $2,000 below the county average, and roughly six to seven thousand dollars below state and national averages. The unemployment rate in 2000 was 7.9 percent.

Kaibab Paiute Reservation and the Community of Moccasin, Arizona

The Kaibab-Paiute Reservation is located in the north central portion of the Arizona Strip on the Utah border. While the majority of the reservation is in Mohave County, the southeastern most section is located in Coconino County. The reservation has an area of 120,413 acres and consists of five villages: Kaibab, Steam Boat, Juniper Estes, Six-Mile, and Redhills. The community of Moccasin and Pipe Springs National Monument are located in the middle of the reservation but not on reservation lands. For census purposes, Moccasin is combined with the Kaibab-Paiute Reservation and referred to as Kaibab CDP (Census Designated Place). In 2000, Kaibab CDP had a population of 275, with 196 in the Reservation and 79 in the community of Moccasin. The population on the Reservation grew by 18.8 percent between 1990 and 2000. No 1990 census 1990 data is available for Kaibab CDP and no population projections have been made.

Because Arizona Highway 389 crosses the reservation and is the main route for travel between Las Vegas, Nevada, and Lake Powell, the Kaibab-Paiute economy is centered on tourism. Pipe Springs National Monument also draws a significant number of visitors. A majority of workers in Kaibab CDP are employed in service occupations. In 2000, per capita income on the Reservation was $7,951and $9,421 on Kaibab CDP. Both numbers are roughly half of the per capita income for Mohave County during the same period. Forty-four percent of workers living in Kaibab CDP traveled out of state to work, with an average commute time of 24 minutes. In 2000, the unemployment rate for the reservation was 9.2 percent. There were only 11 people in the workforce living off reservations lands in Kaibab CDP, all of whom were employed in 2000.

Kane County, Utah

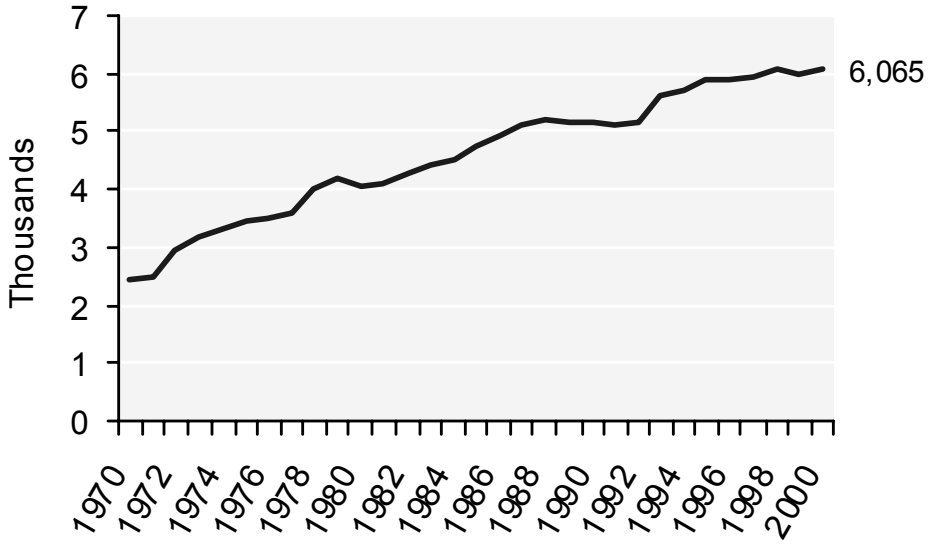
Kane County was founded by Mormon settlers in the 1860's. Since that time, the Planning Area has been used for grazing cattle and sheep, supporting families living in Kanab, St. George, and other southern Utah communities. Southern Utah ranchers continue to use the Planning Area, especially for winter grazing purposes. Today, however, only a small portion of Kane County's population is employed by farm and agricultural services (see Tables 3 and 4).

Kane County is adjacent to the Planning Area. Its residents have had a long history of association with the Arizona Strip. Geographically, culturally, and economically the people of Kane County have strong ties with the people and resources on the Arizona Strip.

The BLM flagstone/sandstone rock quarries in the Planning Area are of commercial importance to southern Utah rock businesses as well as to private residents as a source of decorative rock. Hunting and motorized tour guides based in Kane County depend on the natural resources in the Planning Area for their businesses. Tourism, in general, is an important feature of Kane County's economy as travelers often pass through on their way to visit the various national parks, monuments, and recreation areas in the vicinity, including the monuments found in the Planning Area (personal communication, Mark Habbeshaw, Kane County Commission, September 2003).

Kane County is sparsely populated, although it has been experiencing a slow and steady growth. Figure 7 illustrates the county's population from 1970 to 2000. Between 1990 and 2000, the population grew by only 17.0 percent. Although this is a greater increase than the national average, it is half as much as the population growth in neighboring Arizona, which experienced a 37.4 percent increase. Kane County is projected to grow over the three decades between 2000 and 2030, reaching a population of approximately 9,783 people.

Figure 7. Population Growth in Kane County, Utah, 1970-2000 (Sonoran Institute 2003)



In 2000, Kane County had a labor force of 2,816 people, an unemployment rate of 5.3 percent, and a per capita income of $17,139. Employment by occupation in the county is similar to Utah and the nation, with the greatest percentage of workers employed in management, professional, and related occupations (see Table 3). Since 1982, when complete data became available, the employment profile of Kane County has changed considerably, with significant growth in the Services and Professional sector, and nearly no growth in farm and agricultural services. This is presented in Figure 8 and Table 10.

Figure 8. Employment by Industry in Kane County, 1970-2000 (Sonoran Institute 2003)

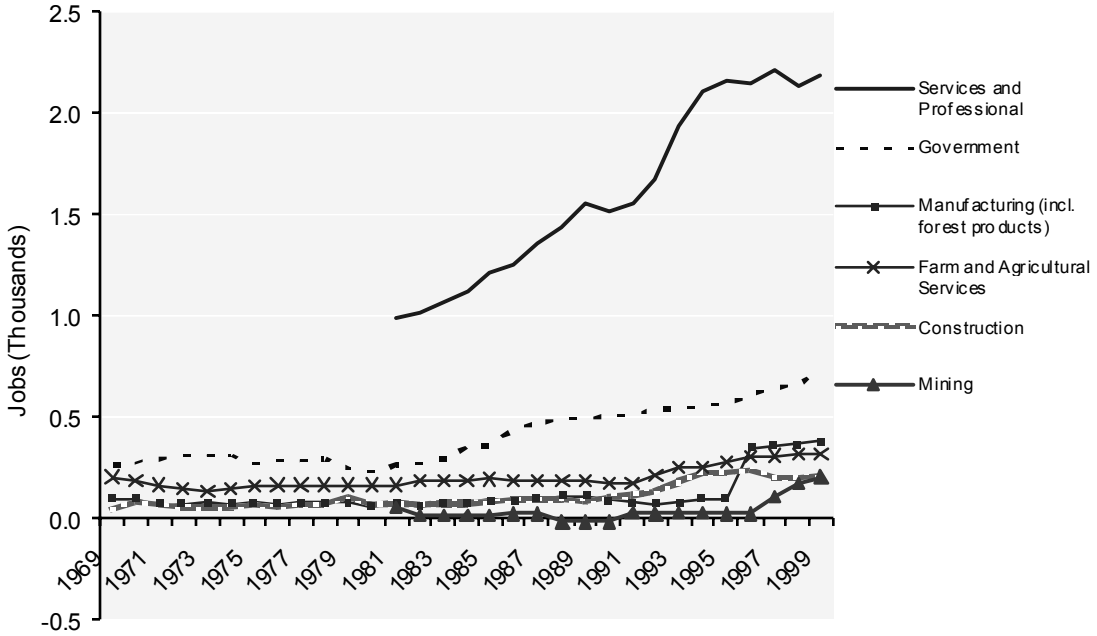


Table 10 Employment by Industry in Kane county from 1982-2000						
	1982	**% of Total**	**2000**	**% of Total**	**New Employment**	**% of New Employment**
Total Employment	1,599	NA	3,992	NA	2,393	NA
Wage and Salary Employment	1,075	67.2%	2,966	74.3%	1,891	79.0%
Self Employment	524	32.8%	1,026	25.7%	502	21.0%
Farm and Agricultural Services	164	10.3%	322	8.1%	158	6.6%
Farm	156	9.8%	185	4.6%	29	1.2%
Agricultural Services	8	0.5%	137	3.4%	129	5.4%
Mining	44	2.8%	200	5.0%	156	6.5%
Manufacturing (incl. forest products)	75	4.7%	376	9.4%	301	12.6%
Services and Professional	989	61.9%	2,185	54.7%	1,196	50.0%
Transportation & Public Utilities	107	6.7%	99	2.5%	-8	NA
Wholesale Trade	26	1.6%	41	1.0%	15	0.6%
Retail Trade	393	24.6%	804	20.1%	411	17.2%
Finance, Insurance & Real Estate	55	3.4%	267	6.7%	212	8.9%
Services (Health, Legal, Business, etc.)	408	25.5%	974	24.4%	566	23.7%
Construction	66	4.1%	201	5.0%	135	5.6%
Government	261	16.3%	708	17.7%	447	18.7%

Agricultural Services include soil preparation services, crop services, etc. It also includes forestry services, such as reforestation services, and fishing, hunting, and trapping. Manufacturing includes paper, lumber and wood products manufacturing; Source: Sonoran Institute 2003

Income sources have also undergone significant change since 1982, with non-labor income outpacing services, and significant growth in the government sector (including many new BLM jobs in Utah). This is illustrated in Figure 9 and Table 11.

Figure 9. Personal Income by Type in Kane County, 1970-2000 (Sonoran Institute 2003)

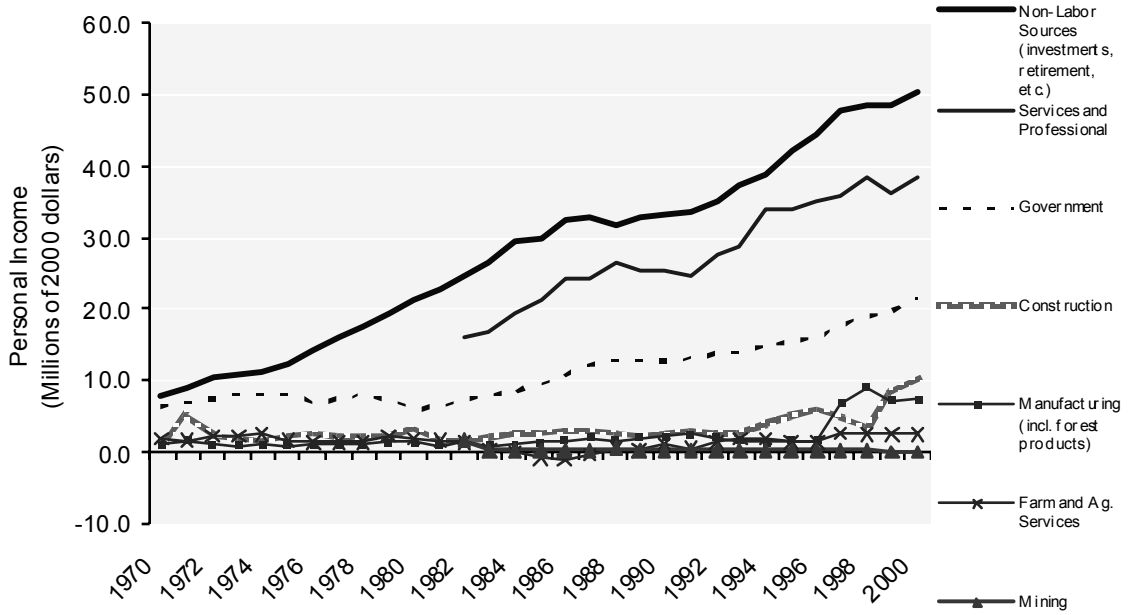


Table 11: New Income by Type in Kane County						
	1982	**% of Total in 1982**	**2000**	**% of Total in 2000**	**New Income 1982 to 2000**	**% of New Income**
Total Personal Income*	61	NA	143	NA	82	NA
Farm and Agricultural Services	1	1.9%	9	6.6%	8	10%
Farm	1	1.9%	0	0.3%	-1	NA
Agricultural Services	0	0.0%	9	6.3%	9	11%
Mining	2	2.5%	0	0.0%	-2	NA
Manufacturing (incl. forest products)	1	2.2%	7	5.2%	6	7%
Services and Professional	16	26.5%	38	26.9%	22	27%
Transportation & Public Utilities	2	4.1%	4	2.9%	2	2%
Wholesale Trade	1	1.9%	1	0.4%	-1	NA
Retail Trade	5	9.0%	10	7.0%	5	6%
Finance, Insurance & Real Estate	1	1.4%	3	2.0%	2	2%
Services (Health, Legal, Business, Others)	6	10.2%	21	14.5%	15	18%
Construction	1	2.1%	4	2.5%	2	3%
Government	7	12.0%	21	15.0%	14	17%
Non-Labor Income	24	40.0%	50	35.2%	26	32%
Dividends, Interest & Rent	15	25.2%	26	18.5%	11	13%
Transfer Payments	9	14.7%	24	16.7%	15	18%

All figures in millions of 2000 dollars
*The sum of the above categories do not add to total due to adjustments made for place of residence and personal contributions for social security insurance made by the U.S. Department of Commerce.
Source: Sonoran Institute 2003

Kanab

The city of Kanab is located near the southern border of Utah, about seven miles north of Fredonia, Arizona. It was established in 1870 by Mormon pioneers and is now known as the hub in the "Grand Circle of National Parks." The population of Kanab in 2000 was 3,564, which was only slightly more than an eight percent increase from 1990. However, Kanab's population is projected to increase between 2000 and 2030 to a population of 5,654.

Kanab's economy was once based primarily on mining, ranching, and lumber manufacturing, but made a transition to a tourism-based economy during the 1990's. In the early 1990's, Kanab lost more than 500 jobs in timber and uranium mining (Grand Canyon Trust 1997). Today, Kanab is a major stopping place for travelers visiting the North Rim of Grand Canyon, Zion National Park, Bryce Canyon National Park, Glen Canyon National Recreation Area, and Grand Staircase-Escalante National Monument, as well as the Vermilion and Parashant.

In 2000, there were 1,568 people in Kanab's workforce, with an unemployment rate of 4.3 percent, which was one percent below the county's unemployment rate during the same period. Per capita income in 2000 was $16,128.

Big Water

The town of Big Water is located on Highway 89 about 16 miles northwest of Page, Arizona. In 2000, there were 417 people in the town, which was a 27.9 percent increase from 1990. While this rate is over 10 percent higher than the county's growth rate over the same period, it is still lower than the average growth rate for Utah. The community is expected to continue to grow, more than doubling in size by 2030 to a population of 977.

Big Water's civilian labor force in 2000 was 244, with an unemployment rate of 4.9 percent. Roughly, a third of those employees worked in sales and office occupations. The largest industry in terms of employment was the arts, entertainment, recreation, accommodation, and food services. Seventy percent of employees living in Big Water work out of state, with the average commute time being just over 20 minutes. This suggests that most people work in nearby Page, Arizona. Per capita income in 2000 was $15,026.

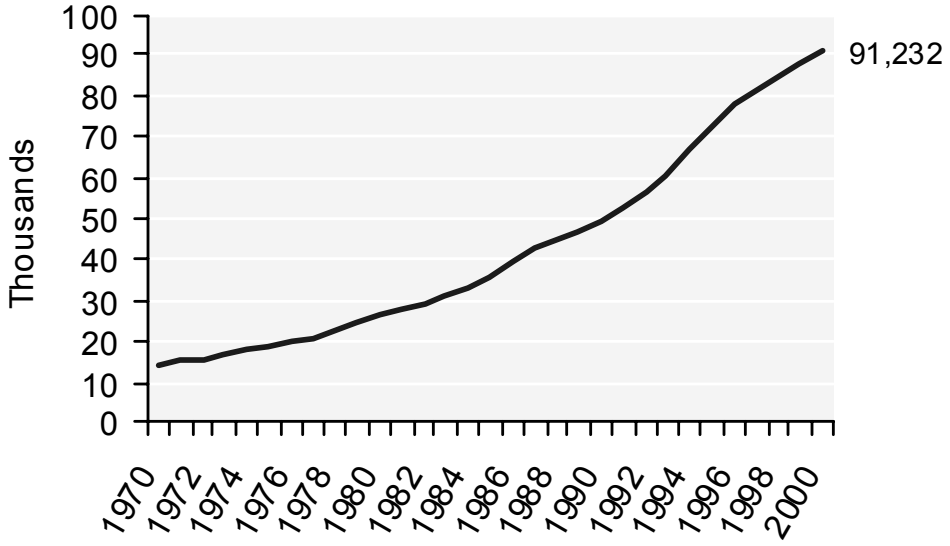
Washington County, Utah

Washington County is in the southwest corner of Utah. It is directly north of the western portion of the Planning Area. During the 1800's when no state line existed, the Arizona Strip was a natural extension of the early settlements in Washington County. Beginning in the 1850's, Mormon Pioneers settled in small communities along the Santa Clara and Virgin rivers in what is today Utah, Arizona, and Nevada. Farming and livestock raising were the predominate economic activities. The Planning Area provided a natural area for livestock grazing by providing pastures away from the growing communities. Many of the same families that

homesteaded and ranched in the Planning Area continue to graze livestock there and live in the cities and towns of southern Utah.

Today, Washington County is one of the fastest growing counties in the United States and the State of Utah. In 2000, the population of the county reached 91,232, which is a staggering 86.1 percent increase from the 1990 population of 48,564, and an increase of 556 percent since 1970. Figure 10 illustrates this rapid rate of increase. The County is expected to maintain its accelerated rate of growth, reaching 353,922 in 2030. Approximately 85 percent of the county's residents in 2000 live within the southern end of the county, near the border with Arizona, and thus in close proximity to the Planning Area. These communities include Hildale, Hurricane, Ivins, Santa Clara, St. George, and Washington, and are discussed in this section.

Figure 10. Population Growth in Washington County, Utah, 1970-2000 (Sonoran Institute 2003)



Washington County's civilian work force was 37,711 in 2000, with an unemployment rate of 5.5 percent. Per capita income was $15,873, which was $2,312 lower than Utah's and $5,714 lower than the national average (see Table 3). The primary employment for county residents was sales and office occupations followed by service occupations. The major industries were educational, health and social services, followed by retail trade and construction. The arts, entertainment, recreation, accommodation, and food services industry accounted for only 12.9 percent of the jobs in the county. As a whole, however, the service and professional industry has increasingly dominated personal income in the County, as is illustrated in Figure 11 and Table 12.

Figure 11. Personal Income by Industry in Washington County, 1970-2000 (Sonoran Institute 2003)

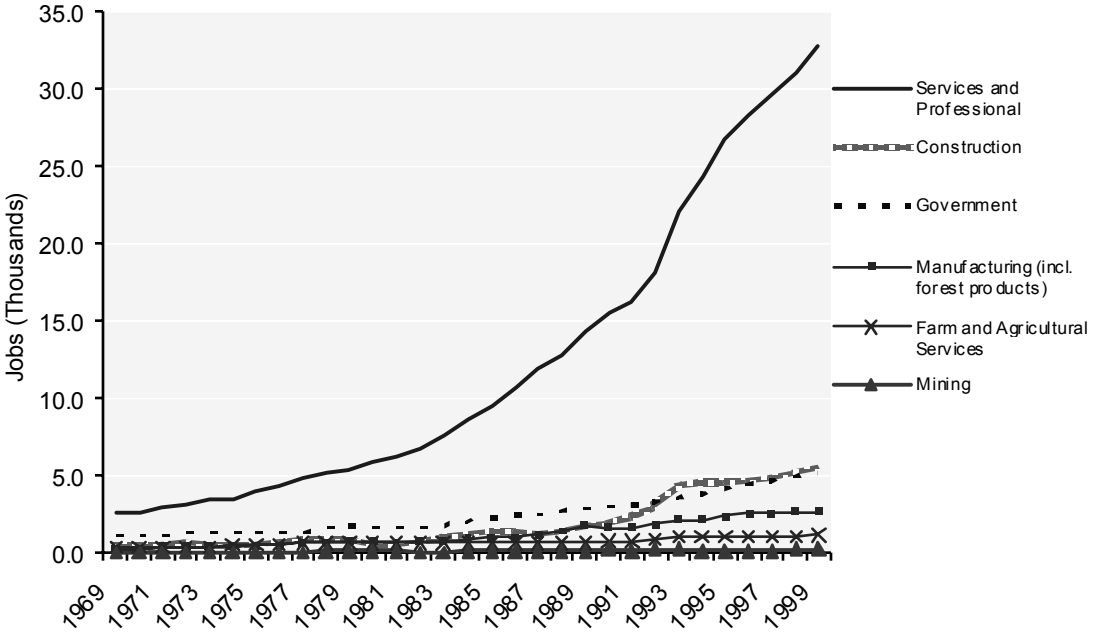


Table 12: Employment by Industry in Washington County from 1970 to 2000						
	1970	% of Total	2000	% of Total	New Employment	% of New Employment
Total Employment	4,819	NA	47,443	NA	42,624	NA
Wage and Salary Employment	3,699	76.8%	35,715	75.3%	32,016	75.1%
Self Employment	1,120	23.2%	11,728	24.7%	10,608	24.9%
Farm and Agricultural Services	428	8.9%	1,120	2.4%	692	1.6%
Farm	384	8.0%	560	1.2%	176	0.4%
Agricultural Services	44	0.9%	560	1.2%	516	1.2%
Mining	8	0.2%	213	0.4%	205	0.5%
Manufacturing (incl. forest products)	250	5.2%	2,634	5.6%	2,384	5.6%
Services and Professional	2,545	52.8%	32,780	69.1%	30,235	70.9%
Transportation & Public Utilities	112	2.3%	1,972	4.2%	1,860	4.4%
Wholesale Trade	211	4.4%	1,165	2.5%	954	2.2%
Retail Trade	1,142	23.7%	10,924	23.0%	9,782	22.9%
Finance, Insurance & Real Estate	282	5.9%	5,136	10.8%	4,854	11.4%
Services (Health, Legal, Business, Others)	798	16.6%	13,583	28.6%	12,785	30.0%
Construction	444	9.2%	5,553	11.7%	5,109	12.0%
Government	1,144	23.7%	5,143	10.8%	3,999	9.4%

Agricultural Services include soil preparation services, crop services, etc. It also includes forestry services, such as reforestation services, and fishing, hunting, and trapping. Manufacturing includes paper, lumber and wood products manufacturing; Source: Sonoran Institute 2003

While the service and professional industry dominated the employment sources of personal income, more people were dependent upon non-labor sources of income. This source of income

has overtaken services and professional industry sources since about 1985, with the latter keeping pace in second place since then. This is illustrated in Figure 12 and Table 13.

Figure 12. Personal Income by Type in Washington County, 1970-2000 (Sonoran Institute 2003)

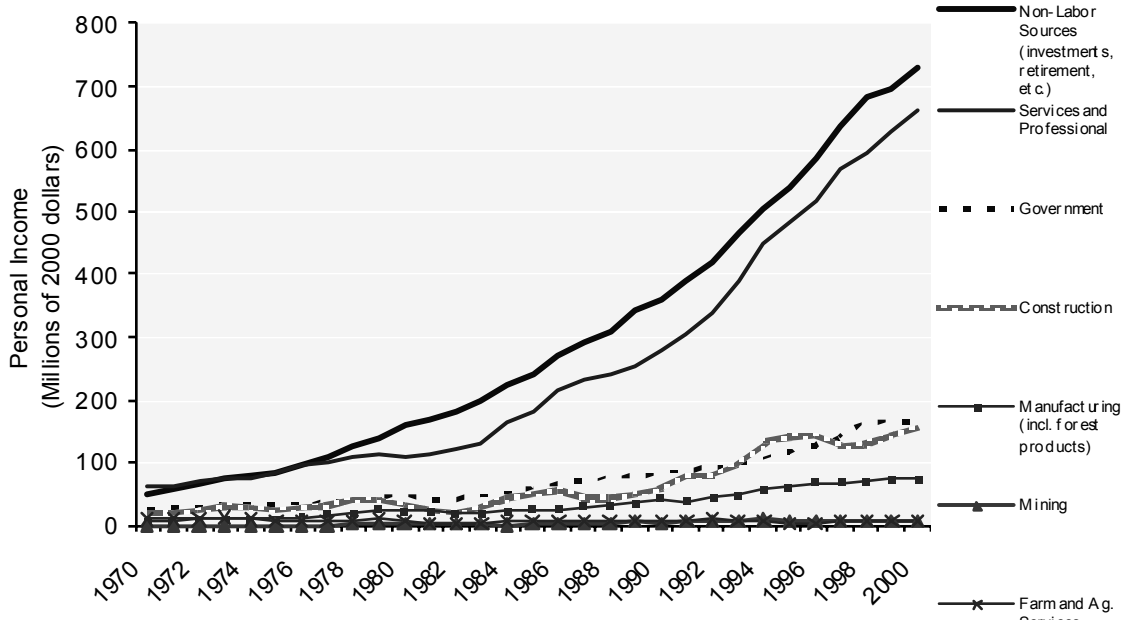


Table 13: New Income by Type in Washington County						
	1970	% of Total in 1970	2000	% of Total in 2000	New Income 1970 to 2000	% of New Income
Total Personal Income*	172	NA	1,727	NA	1,555	NA
Farm and Agricultural Services	11	6.2%	7	0.4%	-4	NA
Farm	10	5.7%	-1	-0.1%	-11	NA
Agricultural Services	1	0.5%	8	0.5%	7	0%
Mining	0	0.1%	7	0.4%	7	0%
Manufacturing (incl. forest products)	5	2.9%	71	4.1%	66	4%
Services and Professional	60	34.9%	662	38.3%	602	39%
Transportation & Public Utilities	4	2.3%	71	4.1%	67	4%
Wholesale Trade	8	4.4%	29	1.7%	22	1%
Retail Trade	25	14.7%	177	10.2%	151	10%
Finance, Insurance & Real Estate	4	2.4%	80	4.7%	76	5%
Services (Health, Legal, Business, Others)	19	11.1%	304	17.6%	285	18%
Construction	19	10.9%	153	8.9%	134	9%
Government	26	15.2%	162	9.4%	136	9%
Non-Labor Income	51	29.8%	728	42.2%	677	44%
Dividends, Interest & Rent	31	17.9%	427	24.7%	396	25%
Transfer Payments	20	11.9%	301	17.4%	280	18%

All figures in millions of 2000 dollars; Source: Sonoran Institute 2003
The sum of the above categories do not add to total due to adjustments made for place of residence and personal contributions for social security insurance made by the U.S. Department of Commerce.

Hildale

Hildale is a small community in the southeastern corner of Washington County, located directly north of the Utah/Arizona border and in close proximity to Colorado City, Arizona, which is considered its "sister" community. Hildale was incorporated in 1963 and was settled primarily as a religious retreat. The town has continued to grow and develop both commercially and industrially with a population in 2000 of 1,895. The community grew at a rate of 43 percent from 1,325 in 1990. Although this is a high growth rate, nearly three times the national rate during the same period, it is only half that of the county's 10-year rate of 86.1 percent. Hildale is projected to triple in size by 2030 to a population of 5,965.

The civilian work force in 2000 was 466, with an unemployment rate of 2.4, the lowest in the study area. However, Hildale also had the lowest per capita income in the study area at $4,782. Similar to Colorado City, this discrepancy between extremely low unemployment rates and extremely low per capita income can be tied to extremely high family size of 8.10 people per family. This is the largest family size in the study area, which is staggering when compared to the national average of 3.14. The largest single industry where Hildale residents work was educational, health, and social services at 19.3 percent, followed by manufacturing and construction, both at 18.7 percent. Slightly less than one third of the residents work out of state, probably in the nearby community of Colorado City as the vast majority traveled less than 20 minutes to their work place.

Hurricane

The city of Hurricane is located in south central Washington County, about 10 miles north of the Utah state line. It began as a farming area for residents of other nearby communities and was incorporated in 1912. Hurricane's population in 2000 was 8,250, which was an enormous 110.7 percent increase from the 1990 population of 3,915. The city is expected to continue growing, although not quite as rapidly, reaching a population of 18,351 in 2030. Growth in southern Hurricane will continue until it reaches the Arizona border and the Planning Area. A new reservoir, Sand Hollow, is on the southwestern side of town. Several golf courses and associated planned communities will be constructed near this reservoir. The southern belt route, a four-lane highway, is planned for construction in this area as well. It will lead to the new St. George Airport, projected to be completed in 2010, and connect to Interstate 15 at mile marker 2, just north of the Arizona border.

In 2000, there were 3,372 people in Hurricane's civilian labor force, and the unemployment rate was 5.6 percent, and per capita income was relatively low at $13,353. Roughly, one third of the residents worked in sales and office occupations, followed by 23.7 percent in management, professional, and related occupations. Retail trade was the largest industry, employing 20 percent of Hurricane's work force, followed by educational, health and social services and construction, which employed 19.3 percent and 16.6 percent, respectively. The vast majority (95 percent) worked in state, commuting an average of 22.3 minutes to work, probably to St. George.

Ivins

Incorporated in 1935, the town of Ivins was originally a farm area for early settlers of the Santa Clara area. Incorporated in 1935, Ivins has become an upscale bedroom community and retirement destination with developments such as Kayenta, which emphasizes the natural features of the land. The town's population in 2000 was 4,450, which is an amazing 173 percent increase from the 1990 population of only 1,630. The town is expected to continue its rapid growth, increasing another 158 percent by 2030 to a population of 11, 470.

Ivins' civilian labor force in 2000 was 1,946, with an unemployment rate of 4.5 percent. Per capita income was $16,743. The largest group of workers, 28.3 percent, residing in Ivins was employed in sales and office occupations, followed by 24.2 percent working in management, professional, and related occupations. No single industry was dominant, with educational, health, and social services employing 16.8 percent of Ivins' residents, followed by retail at 16.5 percent.

St. George

St. George is the capital seat of Washington County. The southern boundary of the city is the Utah/Arizona state line. St. George was settled in the 1850's by pioneers who were sent to the area by their leader, Brigham Young and incorporated in 1862. With a population of 49,669 in 2000, a 74.2 percent increase from the 1990 population of 28,502, St. George is by far the largest community in the study area. The city is projected to grow to a population of 185,809 by 2030.

St George's civilian labor force in 2000 was 21,442 and the unemployment rate was 6.1 percent, which was over one percentage point higher than the rate for Utah over the same period. St. George had one of the highest per capita incomes in the county at $17,022. The types of occupations that employed the majority of St. George's work force were similar to that of Washington County, with no single industry dominating the workforce. Educational, health and social services was the largest industry employing 18.8 percent of the workforce, followed by retail trade employing 17.4 percent. Those living in St. George work fairly close to home, with 83 percent working in town and an average commute time of less than 15 minutes. Only three percent work out of state.

Santa Clara

Santa Clara was one of the first communities to be settled in southern Utah in the early 1850s when a group of Swiss settlers arrived in the area. The community was incorporated 1915 and is now considered a bedroom community of St. George. Santa Clara's population in 2000 was 4,630, an amazing 99.1 percent increase from the 1990 population of 2,322. The city is projected to grow another 153 percent by 2030 to a population of 11,710.

In 2000, Santa Clara had a civilian labor force of 3,019 and an unemployment rate of 3.2 percent, which was almost two percentage points below the Utah's unemployment rate. Per capita income for the city was $15,975. However, family income was $55,000, more than five thousand dollars above the national average, and household income was $52,770, more than ten thousand dollars above the national average. The largest group of Santa Clara's residents, 33.1 percent, worked in management, professional, and related occupations, followed by 30.5 percent who worked in sales and office occupations. The largest industry was educational, health, and social services, which employed 22.4 percent of the population, followed by retail trade, which employed 17.1 percent of the population. The majority of the population worked close to their homes, with an average commute of 17.5 minutes, most likely to St. George.

Washington

Pioneer settlers sent to southern Utah to grow cotton during the Civil War founded the city of Washington and the area became known as "Utah's Dixie." The city was incorporated in 1870. In 2000, Washington had a population of 8,186, which was a 95 percent increase from 4,198 in 1990. The city is expected to continue its rapid growth in the future, with a projected growth of 124 percent to a population of 18,351 over the next 30 years.

Southern Washington is known as Washington Fields and is quickly converting from farmland to subdivisions. South of Washington Fields is the area called Little Valley, another newly developing bedroom community associated with St. George. It, too, is experiencing rapid growth and is located only 4-6 miles north of the Planning Area. Eventually the private and state lands in this area, in both Utah and Arizona, will become residential and commercial areas.

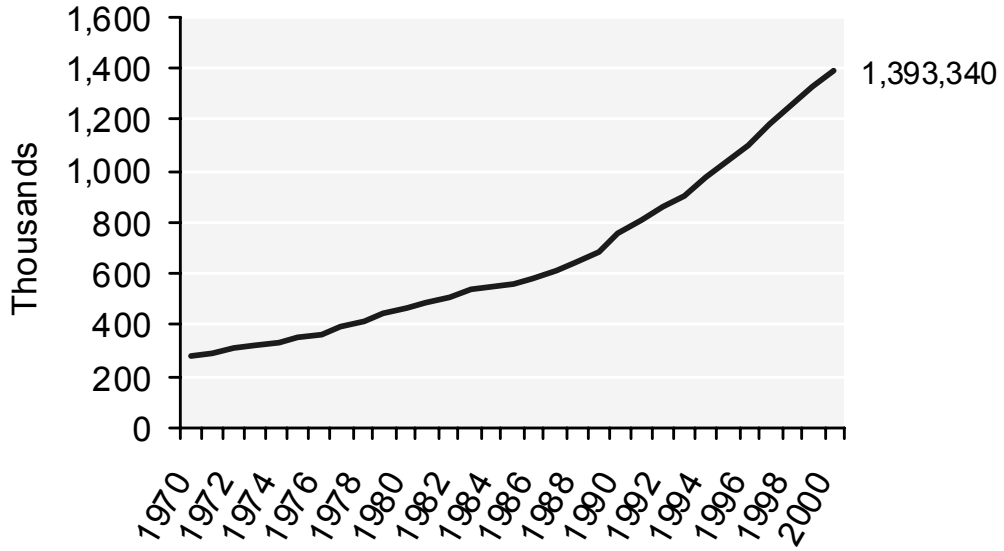
In 2000, Washington's civilian labor force consisted of 3,137 people. The unemployment rate was 4.7 percent, and per capita income was $14,032. The largest percentage of the workforce, 25.7 percent, was employed in sales and office occupations, while 22.5 percent were employed in management, professional, and related occupations. The industry that employed the greatest percentage of workers was educational, health, and social services (22.1 percent), followed by retail sales (18 percent) and construction (15.7 percent). Ninety-eight percent of workers are employed in state, with 79 percent working in town. The average commute time was less than 14 minutes with most likely working in St. George. Recent commercial/retail growth since 2000, including the location of several big box retailers, has provided more employment and tax revenue to the town.

Clark County, Nevada

Clark County is located in Nevada's southern-most point and is the home of Las Vegas. Similar to Washington County, its neighbor, Clark County has recently been experiencing a phenomenal growth rate. Over the 10-year period between 1990 and 2000, the county grew by 85.5 percent, from 741,459 to 1,375,765 people, making Clark County the most populated county in the study

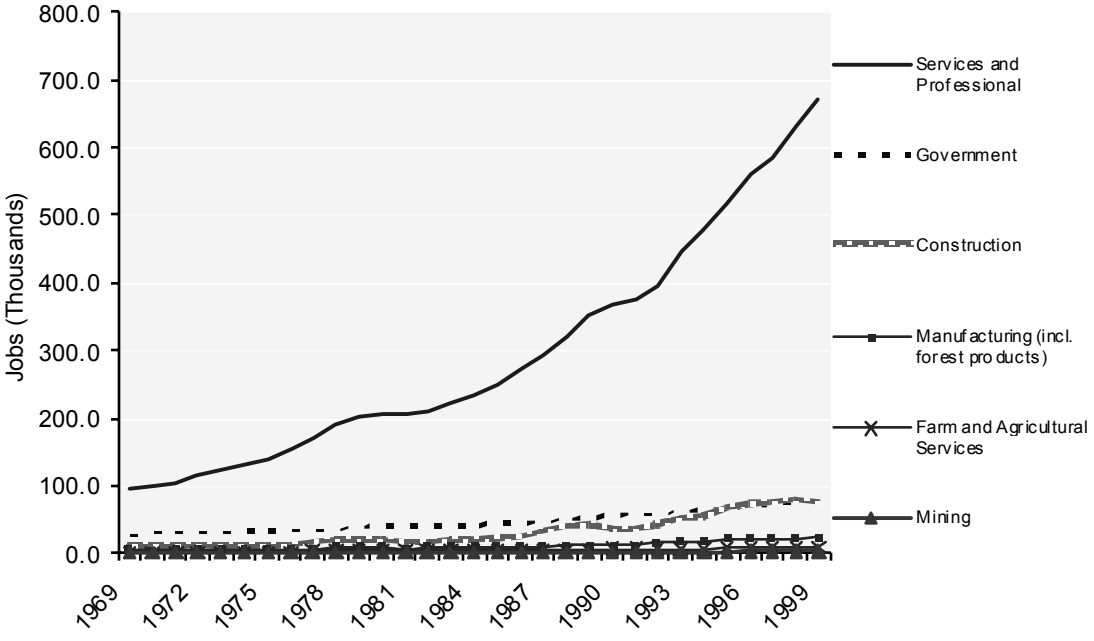
area. Figure 13 illustrates this rapid rate population growth. It is projected to grow another 32.9 percent over the next ten-year period, reaching a population of 1,827,770 by 2010. Most of the county's residents, however, live within the Las Vegas area, approximately 100 miles from the Planning Area.

Figure 13. Population Growth in Clark County, Nevada, 1970-2000 (Sonoran Institute 2003)



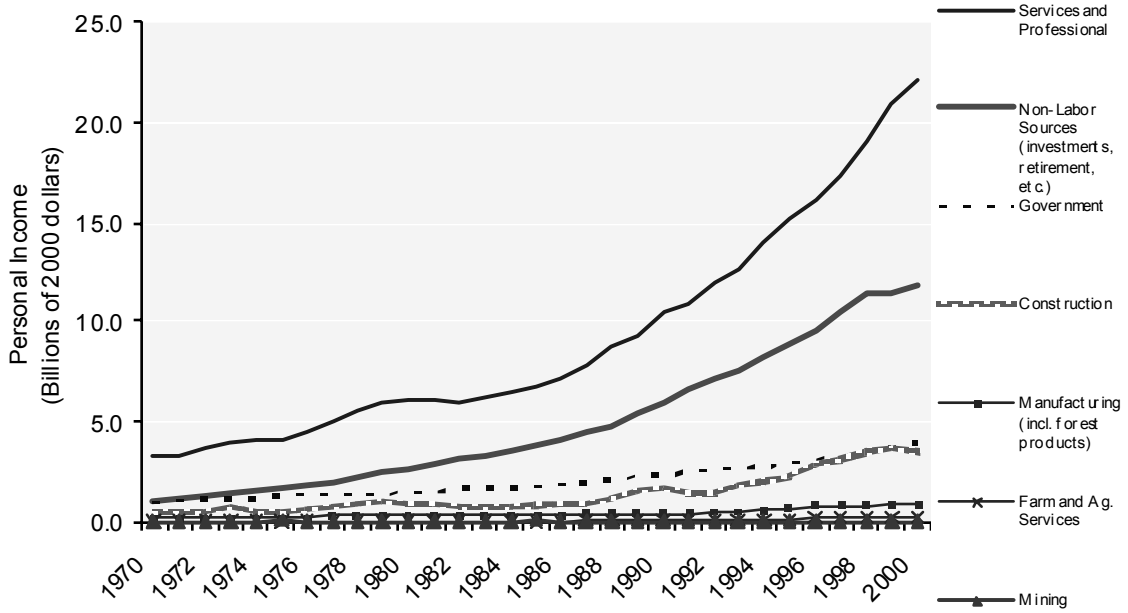
The civilian labor force in Clark County in 2000 was 682,073, with an unemployment rate of 6.6 percent, which is slightly higher than Nevada's unemployment rate of 6.2 percent and almost a percentage point higher than the national rate of 5.8 percent. Per capita income for the county was $21,785, which is the highest in the study area and close to Nevada and national averages. The majority of Clark County's workforce is divided into three occupations: sales and office occupations at 27.9 percent; service occupations at 26.9 percent; and management, professional, and related occupations at 24.4 percent. The largest industry is the arts, entertainment, recreation, accommodation, and food services industry, which employ 30.1 percent of Clark County residents. This can be expected due to the influence of Las Vegas and surrounding area, which depends almost exclusively upon the entertainment industry. Figure 14 illustrates the rapid growth of jobs in the service and professional industry compared to other industries in from 1970 to 2000.

Figure 14. Employment by Industry in Clark County, Nevada, 1970-2000 (Sonoran Institute).



While the growth of non-labor sources of income grew steadily between 1970 and 1998, with a reduced growth rate between 1998 and 2000, employment sources from the service and professional industry was consistently the greatest contributor of personal income, as illustrated in Figure 15.

Figure 15. Personal Income by Type in Clark County, Nevada, 1970-2000 (Sonoran Institute).



Bunkerville

Bunkerville is a small community located on the Virgin River south of Interstate 15, just east of Mesquite. The town was one of the early Mormon farming settlements in the late 1800s. It had a population of 1,014 in 2000. Bunkerville's workforce in 2000 was 479, with an unemployment rate of 6.3 percent, and a per capita income of $16,820. Over one third of Bunkerville's residents, 34.1 percent, were employed in service occupations, followed by 23.8 percent employed in sales and office occupations. The single largest industry is arts, entertainment, recreation, accommodation, and food services, which employed 40.8 percent of Bunkerville's residents. This industry, however, is not located within the community as most of these employees, 95 percent, work out of town, but in state, and travel an average of 25.6 minutes to work. This suggests that majority of the workforce work in nearby Mesquite, where the economy is based on tourism due to numerous casinos, hotels, and resorts, as well as being an important stop for travelers on Interstate 15.

Mesquite

The city of Mesquite is a resort and retirement community located on the Virgin River and Interstate 15 next to the Nevada/Arizona border. The first attempts to settle the area occurred in the mid 1800's and were unsuccessful due to flash floods. In 1884, six families from Bunkerville rebuilt the area and established the community. The building of Interstate 15 in the 1970's ensured Mesquite's success, allowing the city to incorporate in 1984. Today, the city is a popular resort and retirement area that hosts several casinos, hotels, and golf course communities. It is the fastest growing city in the study area and one of the fastest growing cities

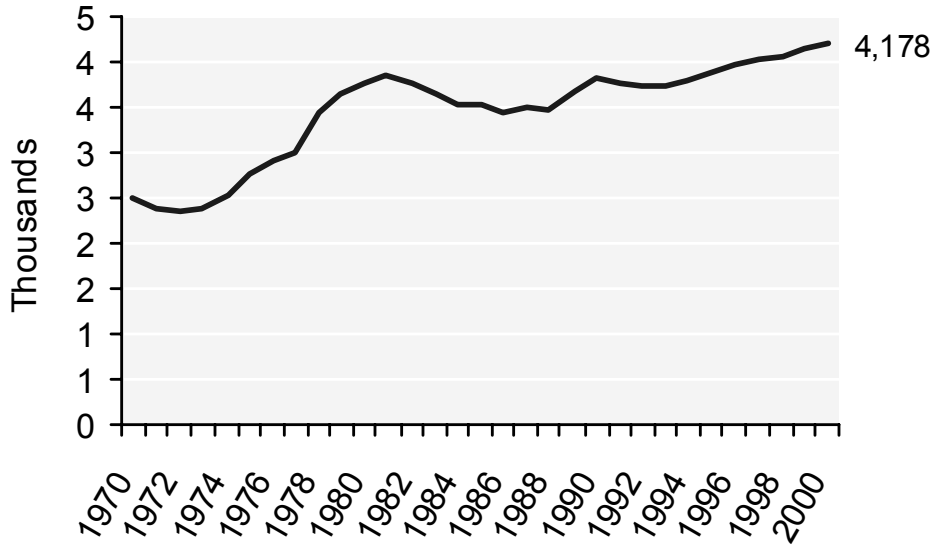
in the nation. In 1990, the population was 1,871, which grew by a phenomenal 401.8 percent by 2000, reaching a population of 9,389.

In 2000, Mesquite had a civilian labor force of 3,990, an unemployment rate of 6.6 percent, and per capita income was $20,191. The largest group of workers, 42 percent, was employed in service occupations, followed by 23.6 percent working in sales and office occupations. As can be expected for a resort and retirement community, the arts, entertainment, recreation, accommodation, and food services employs half of the workforce (50.3 percent), and is by far the dominant industry. The second largest industry is retail trade, employing only 10 percent of the workforce. The majority of the workforce worked in town, taking an average of only 12.1 minutes for their daily commute.

Lincoln County, Nevada

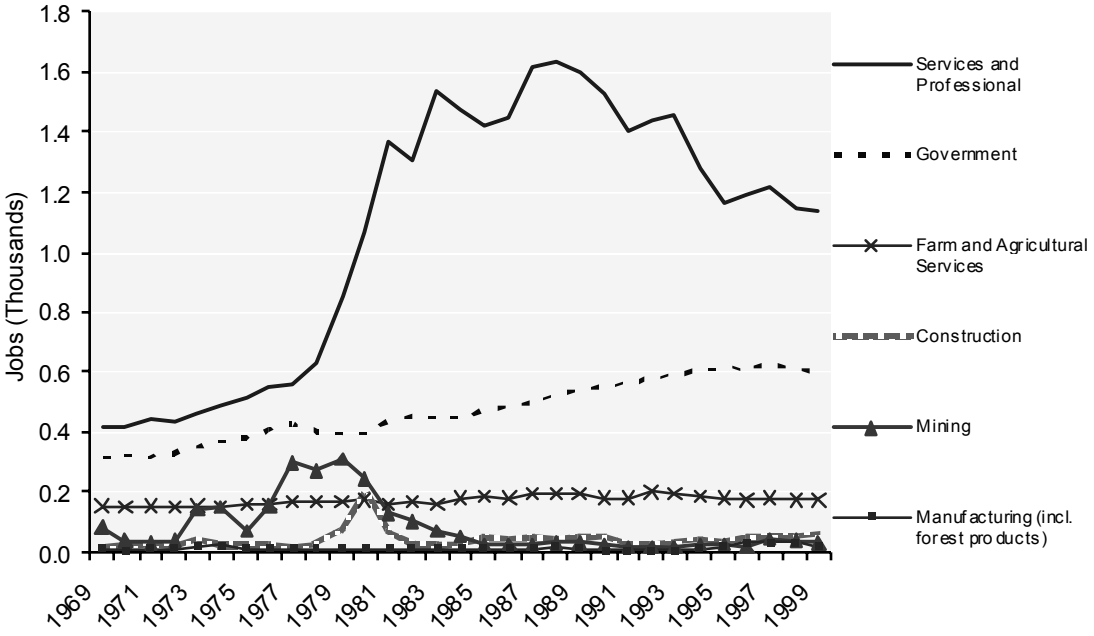
Lincoln County is immediately adjacent to the northwestern corner of the Planning Area. As a whole, the county is sparsely populated, with only 4,178 people in 2000. Figure 16 illustrates the relatively slow growth rate within the county between 1970 and 2000. With a growth rate of 10.3 percent from 1990 to 2000, Lincoln County is also the slowest growing county in the Planning Area, considerably slower when compared to neighboring Clark County. Based on current projections, Lincoln County is expected to grow even slower during the 10-year period between 2000 and 2010, at only 2.7 percent. However, passage of the Lincoln County Land Act could provide thousands of acres to be developed north of Mesquite and adjacent to the Planning Area within the next 20 years.

Figure 16. Population Growth in Lincoln County, Nevada, 1970-2000. (Sonoran Institute 2003)



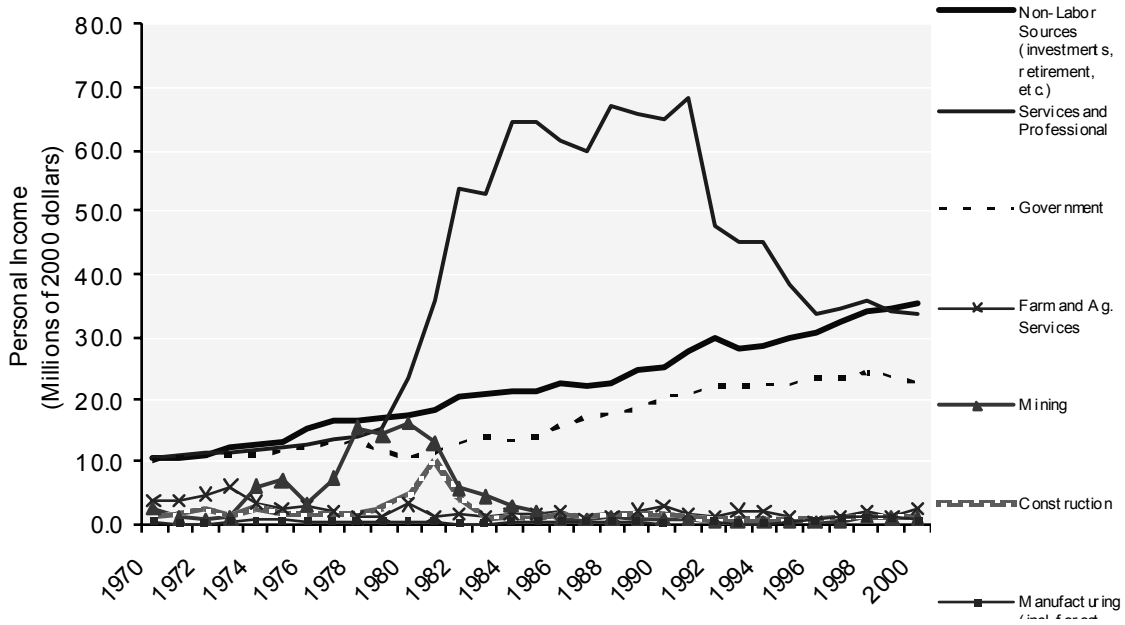
There are currently no communities in Lincoln County that are within close proximity of the Planning Area, the closest being over 100 miles away. In 2000, the county's civilian labor force was only 1,538, with an unemployment rate of 5.2 percent and a per capita income of $17,326. The majority of Lincoln's County's workforce is divided into three occupations: sales and office occupations at 25.4 percent; management, professional, and related occupations at 25.2 percent; and service occupations at 20.2 percent. No single industry dominated the workforce, with educational, health, and social services being the largest and employing 21.5 percent of the workforce, followed by retail sales, which employed 14.6 percent of the workforce. As a whole, however, the service and professional industry has dominated personal income in the County, although its dominance has been unstable and in decline since the late 1980s. This is illustrated in Figure 17.

Figure 17. Employment by Industry in Lincoln County, Nevada, 1970-2000 (Sonoran Institute).



Services and professional occupations had also dominated the source of personal income for persons living in Lincoln County, but experienced a dramatic decline beginning in the early 1900s. In 2000, non-labor sources of personal income accounted for a greater proportion of personal income than service and professional sources. This is illustrated in Figure 18.

Figure 18. Personal Income by Type in Lincoln County, Nevada, 1970-2000 (Sonoran Institute).



APPENDIX 4.A

NATIONAL PARK SERVICE (NPS) MANAGEMENT POLICIES

National Park Service Management Policies (2001)

Throughout this plan, there are a number of statements, actions, and goals that apply specifically to National Park Service (NPS) lands. Often, these statements are prefaced with "Consistent with NPS policies." The following selected NPS policies are listed here as references to those sections. The complete set of NPS Management Policies can be found online at www.nps.gov/policy/mp/policies.html.

4.1.5 Restoration of Natural Systems

The Service will re-establish natural functions and processes in human-disturbed components of natural systems in parks unless otherwise directed by Congress. Landscapes disturbed by natural phenomena, such as landslides, earthquakes, floods, hurricanes, tornadoes, and fires, will be allowed to recover naturally unless manipulation is necessary to protect park developments or visitor safety. Impacts to natural systems resulting from human disturbances include the introduction of exotic species; the contamination of air, water, and soil; changes to hydrologic patterns and sediment transport; the acceleration of erosion and sedimentation; and the disruption of natural processes. The Service will seek to return human-disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated.

The Service will use the best available technology, within available resources, to restore the biological and physical components of these systems, accelerating both their recovery and the recovery of landscape and biological-community structure and function. Efforts may include, for example:

- Removal of exotic species;
- Removal of contaminants and non-historic structures or facilities;
- Restoration of abandoned mineral lands, abandoned or unauthorized roads, areas over-grazed by domestic animals, or disrupted natural waterways and/or shoreline processes;
- Restoration of areas disturbed by NPS administrative, management, or development activities (such as hazard tree removal, construction, or sand and gravel extraction) or by public use;
- Restoration of natural soundscapes; and
- Restoration of native plants and animals.

When park development is damaged or destroyed and replacement is necessary, the development will be replaced or relocated so as to promote the restoration of natural resources and processes.

4.4.2.4 Management of Natural Landscapes

Landscapes disturbed by natural phenomena, such as landslides, earthquakes, floods, hurricanes, tornadoes, and fires, will be allowed to recover naturally unless manipulation is necessary to

mitigate for excessive disturbance caused by past human effects, or to protect park developments or the safety of people using those developments. Landscape and vegetation conditions altered by human activity may be manipulated where the park management plan provides for restoring the lands to a natural condition. Management activities to restore human-altered landscapes may include, but are not restricted to:

- Removing constructed features, restoring natural topographic gradients, and revegetating with native park species on acquired inholdings and on sites from which previous development is being removed;
- Restoring natural processes and conditions to areas disturbed by human activities such as fire suppression;
- Rehabilitating areas disturbed by visitor use or by the removal of hazard trees; and
- Maintaining open areas and meadows in situations in which they were formerly maintained by natural processes that now are altered by human activities.

Landscape revegetation efforts will use seeds, cuttings, or transplants representing species and gene pools native to the ecological portion of the park in which the restoration project is occurring. Where a natural area has become so degraded that restoration with gene pools native to the park has proven unsuccessful, improved varieties or closely related native species may be used.

Landscape restoration efforts will use geological materials and soils obtained in accordance with geological and soil resource management policies. Landscape restoration efforts may use, on a temporary basis, appropriate soil fertilizers or other soil amendments so long as that use does not unacceptably alter the physical, chemical, or biological characteristics of the soil and biological community, and does not degrade surface or ground waters.

4.4.4.1 Introduction or Maintenance of Exotic Species

In general, new exotic species will not be introduced into parks. In rare situations, an exotic species may be introduced or maintained to meet specific, identified management needs when all feasible and prudent measures to minimize the risk of harm have been taken, and it is:

- A closely related race, subspecies, or hybrid of an extirpated native species; or
- An improved variety of a native species in situations in which the natural variety cannot survive current, human altered environmental conditions; or
- Used to control another, already-established exotic species; or
- Needed to meet the desired condition of a historic resource, but only where it is prevented from being invasive by such means as cultivating (for plants), or tethering, herding, or pasturing (for animals). In such cases, the exotic species used must be known to be historically significant, to have existed in the park during the park's period of historical significance, or to have been commonly used in the local area at that time; or
- An agricultural crop used to maintain the character of a cultural landscape; or

- Necessary to provide for intensive visitor use in developed areas, and both of the following conditions exist:
  - Available native species will not meet park management objectives; and
  - The exotic species is managed so it will not spread or become a pest on park or adjacent lands; or
- A sterile, non-invasive plant that is used temporarily for erosion control; or
- Directed by law or expressed legislative intent.

Domestic livestock such as cattle, sheep, goats, horses, mules, burros, reindeer, and llamas are exotic species that are maintained in some parks for purposes of commercial herding, pasturing, grazing, or trailing; for recreational use; or for administrative use for maintaining the historic scene or supporting park operations. The policies applicable to the grazing of commercial domestic livestock are discussed in chapter 8, section 8.6.8. The Service will phase out the commercial grazing of livestock whenever possible, and will manage recreational and administrative uses of livestock to prevent those uses from unacceptably impacting park natural resources.

8.6.8 Domestic and Feral Livestock

8.6.8.1 General

The NPS will allow livestock use only when the use is consistent with the criteria listed in section 8.2, and the use is either:

- Specifically authorized by a park's enabling legislation;
- Required under a reserved right of use arising from the acquisition of a tract of land;
- Required in order to maintain a historic scene; or
- Conducted as a necessary and an integral part of a recreational activity appropriate to a park.
- Where livestock use (including cattle, sheep, goats, horses, mules, burros, reindeer, llamas, and alpacas) occurs in parks, it will be categorized as

  a) livestock operations,
  b) recreational stock,
  c) trespass animals, or
  d) feral herds.

No livestock use or activity, regardless of how authorized, will be allowed that would cause unacceptable impacts to a park's resources, values, or purposes. In particular, livestock use that depletes or degrades non-renewable resources, or whose effects cannot be satisfactorily mitigated, will not be allowed.

8.6.8.2 Managing the Use

Where domestic or feral livestock use occurs, the National Park Service will foster "best management practices" that protect vegetation, and wildlife and its habitat; safeguard sensitive species; control proliferation of exotic species; conserve soil; protect riparian areas and ground water; avoid toxic contamination; and preserve cultural sites. Integrated pest management methods and pesticide use on and around livestock must comply with NPS pest management policy in section 4.4.11. Livestock may be used as part of an integrated program to control exotic plants.

The National Park Service must manage its resources in a manner that conserves them for future generations. Park uses, including domestic and feral livestock, which may jeopardize the sustainability of a park's natural and cultural resources must be evaluated continuously. Livestock, including trail stock, will be kept within the carrying capacity of the area to be used.

Managers must regulate livestock so that ecosystem dynamics, and the composition, condition, and distribution of native plants and animal communities, are not significantly altered or otherwise threatened, and cultural values are protected. Conflicts with public use and enjoyment must be kept to a minimum.

The use of pack-in feed, preferably pellets, is encouraged for all recreational stock while on the trail, and is required whenever grazing would have unacceptable impacts on a park's resources.

When not being actively used for recreation in a park, livestock will either be removed from the park or be confined within an appropriate corral or other structure, and it will be fed pelletized feed or hay that is free of weed seeds.

Livestock activities must be discontinued whenever they would be disallowed by the criteria listed in section 8.2.

In parks with legislation that states that livestock use is administered by another agency, the superintendent will work closely with the other agency to manage the amounts and types of use, and to ensure that the best management practices are followed. Administration by another agency does not release the NPS from its responsibility to ensure that the activity is managed in compliance with the NPS mission and all applicable laws and policies.

8.6.8.3 Management Plans

Each park that allows domestic or feral livestock, including parks where the livestock use is administered by another agency, will prepare a livestock management plan designed to sustain and protect park resources and values. Restrictions will be placed on the amount and type of use to protect resources and values, and to minimize conflicts with visitors.

Particular attention will be given to protecting wetland and riparian areas, sensitive species and their habitats, water quality, and cultural resources. Natural and cultural resource protection will be given first priority when determining livestock management priorities. A monitoring program must be implemented, and will be used to detect change and adjust management to protect resources.

Plans will include an evaluation of impacts as directed by NEPA and NHPA. Benefits and impacts must be carefully weighed. A rigorous assessment is especially important for areas with unique natural and cultural resources, low precipitation, limited vegetation cover, water quality concerns, highly erodible soils, or sensitive species. Areas that have been continuously grazed for long periods, or that are in poor ecological health, will require special emphasis in the plan.

Until a plan is completed for livestock operations or recreational stock, environmental impact analysis will be done when the permitting document is issued or renewed.

8.6.8.4 Permitting Instruments

Livestock activities by parties other than the NPS will be conducted only pursuant to the terms and conditions of a special use permit, lease, concession contract, or commercial use authorization. The use of a lease (versus some other instrument) is appropriate only when (1) specifically authorized by the park's enabling legislation; or (2) it is part of an historic preservation program authorized by 16 USC 470h-3; or (3) the livestock use is associated with a building that is leased pursuant to 16 USC 1a-2(k).

In addition to any other penalty provisions, violation of the terms and conditions of the permitting instrument may result in revocation of the livestock use privilege. In parks where the NPS shares livestock allotment management with another government agency, or where another government agency, through legislation, administers the use, a general agreement between agencies is necessary to describe the relationship and responsibilities.

8.6.8.5 Structures

No structures except those specifically authorized by law or approved by the National Park Service will be allowed in parks to increase livestock numbers, sustain livestock in areas in which they cannot otherwise be sustained, or introduce livestock into areas that previously have not been open to livestock. The Service will not expend funds to construct or maintain livestock structures unless there is a direct benefit to the protection of park resources. The permittee may be required to remove structures when livestock activities are no longer authorized.

APPENDIX 4.B

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO FOR OIL AND GAS ON THE ARIZONA STRIP

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO FOR OIL AND GAS ON THE ARIZONA STRIP

I. Summary

For the Arizona Strip District Office (Arizona Strip DO), on average, one Application for Permit to Drill (APD) is received per year. It is predicted this level of activity will continue for the next 20 years. Historically, approximately seven acres (including wells, roads, infrastructure) is disturbed per well by oil and gas drilling operations.

This Reasonably Foreseeable Development (RFD) Scenario for Oil and Gas contemplates that oil and gas exploration will be the only activity undertaken and if an economic occurrence is developed additional analysis will be needed. Consequently, reclamation would take place immediately following drilling. Complete reclamation normally takes a maximum of 10 years, given this scenario the greatest area disturbed at any one time by oil and gas exploration would be 70 acres.

II. Introduction

The policy for RFD was updated by WO IM No. 2004-089 to incorporate revised guidance for preparing RFD scenarios in support of land use planning and National Environmental Policy Act (NEPA) analysis.

The Arizona Strip District of the Bureau of Land Management (BLM) is currently in the process of preparing Resource Management Plans for the Grand Canyon-Parashant National Monument (Parashant), the Vermilion Cliffs National Monument (Vermilion) and the Arizona Strip DO. This RFD will consider events that may occur on the Arizona Strip DO, as the National Monuments are closed to mineral leasing, subject to valid existing rights, and no leases are currently issued within the Parashant and Vermilion.

This assessment is based on a review of both published and unpublished literature and information on the geology, structure, economic geology and oil and gas occurrences of the Arizona Strip DO that are available to the author. Consideration was also given to the plate tectonic and regional paleogeographic setting of the Arizona Strip DO within the central Cordillera and the resulting implications on oil and gas resource potential. This report was prepared with information available up until July 2004.

III. Description of Geology

The Arizona Strip DO lies within the Basin and Range, and Colorado Plateau physiographic provinces (Hayes, 1969). The Basin and Range province extends to the west from the Grand

Wash Cliffs fault zone to the Nevada border and is characterized by narrow northerly trending mountain ranges separating sediment filled basins created during a complex history of thrusting and folding, followed by rifting, volcanism and block faulting. The Colorado Plateau province occupies the area east of the Grand Wash Cliffs fault zone and is characterized by predominantly horizontal stratified sedimentary rocks eroded into a highly dissected landscape comprised of broad, high plateaus and mesas and intervening steep-walled canyons.

The Basin and Range mountains are tilted and sometimes deformed blocks of Precambrian, Paleozoic, Mesozoic and Cenozoic rocks. The mountain ranges are bounded by steeply dipping faults and often expose Precambrian crystalline core complexes. The Paleozoic rocks are predominantly marine limestones, shales and sandstones that were deposited on a shallow marine shelf in the Early Paleozoic and deeper basins in the Late Paleozoic. Mesozoic rocks are poorly exposed nonmarine sediments and have been mostly eroded away. Cenozoic rocks consist of volcanic, nonmarine fluvial and lacustrine sediments. The intervening basins have subsided thousands of feet and are filled with Cenozoic volcanics, alluvium and lacustrine sediments.

Precambrian crystalline rocks are exposed on the Colorado Plateau in the bottom of the Grand Canyon. Proterozoic rocks on the Colorado Plateau are dominantly clastic sedimentary rocks with minor amounts of limestone and basaltic lavas that were deposited in shallow marine waters and near shore terrestrial environments (Shride, 1967). Paleozoic rocks above the great unconformity, which marks the boundary between the Precambrian and Cambrian periods, consist of shallow marine and continental sediments deposited in the Rocky Mountain geosyncline during periods of repeated transgressions and regressions. During the Mesozoic, that portion of the Arizona Strip DO lying in the Colorado Plateau remained relatively low and stable. Mesozoic rocks are predominantly nonmarine red beds deposited in lacustrine, fluvial, distal fluvial/playa and eolian environments. During the Cenozoic tectonism reactivated northerly trending faults and produced igneous activity that resulted in pyroclastic deposits and extensive basalt flows.

On the Colorado Plateau structural features are typified by broad areas of flat-lying to gently tilted strata bounded by monoclines and (or) high-angle faults. The combined thickness of upper Proterozoic through Mesozoic rocks is in excess of 12,000 ft. (Hintze, 1973). The thickness of these formations increases to the northwest near the Paleozoic hingeline and Rocky Mountain geosyncline. Potential source rocks for hydrocarbons include the Proterozoic Chuar Group in the eastern portion of the Arizona Strip DO (Reynolds and others, 1988). Good oil and gas source rocks in the Paleozoic section appear to be sparse in the Colorado Plateau province of Arizona (Ryder, 1983). Paleozoic source rocks of secondary importance possibly include Pennsylvanian-Permian Supai dolomites and evaporites (Ryder, 1983). Oil and gas accumulations on the Arizona Strip DO could be the result of migration from as far west as the Paleozoic hingeline. On the Arizona Strip DO first-order structural features include the Echo Cliffs and Kaibab uplifts (Ryder, 1983). Oil and gas resources that may underlie the Arizona Strip DO will probably occur in structural or stratigraphic traps within rocks of upper Proterozoic through Triassic age.

Cenozoic erosion, however, tends to lower the potential for hydrocarbon accumulations occurring in the southern portion of this area due to possible ground water flushing.

The U.S. Geological Survey (USGS) includes the Arizona Strip DO in the northern Arizona petroleum province. No Known Geologic Structures or Known Leasing Areas exist in the Arizona Strip DO and no USGS or other play descriptions have been assessed.

IV. Past and Present Oil and Gas Exploration Activity

A records search for geophysical exploration activity in the Arizona Strip DO from central files and from the BLM national database LR2000 showed some seismic and gravity surveys were conducted during the late 1970s and early 1980s. Presently in the Arizona Strip DO, thirty-one oil and gas leases are authorized by the BLM that encompass approximately 83,000 acres.

Hydrocarbon surface seeps confirm the existence in the subsurface of organic-rich rocks capable of generating oil and gas. Rauzi (2001) lists seven surface occurrences of oil seeps and petroliferous rocks in the Arizona Strip Field office.

To date, no economic occurrences of oil and gas have been encountered in wells drilled in the Arizona Strip DO. The Arizona Strip DO has been only lightly explored for these resources with 55 wells having been drilled on the Arizona Strip to date. Most of the wells in the Arizona Strip DO are relatively shallow with only 30 wells drilled more than 1000 feet and the deepest being 7070 feet. Oil and gas shows have been reported from many of the wells, primarily from rocks of Permian age, but also from rocks as old as Devonian. Only 3 of the wells were drilled in the Basin and Range province the rest were drilled in the Colorado Plateau province.

V. Past and Present Oil and Gas Development Activity

To date, there has been no oil and gas development activity in the Arizona Strip DO. Approximately 15 miles north of the Arizona-Utah border, oil production had been established in the now-abandoned Virgin field. Production was from the Timpoweap Member of the Triassic Moenkopi Formation. The average depth of the field is 580 feet (Pierce and others, 1970). Approximately 50 miles north of the Arizona-Utah border, strata equivalent to the Kaibab Formation (Permian) produced more than 20 million barrels of oil in south-central Utah from the Upper Valley field (Rauzi, 2001)

VI. Oil and Gas Occurrence Potential

Ryder (1983) rated the oil and gas potential of Arizona. Within the Arizona Strip DO a moderate potential for these resources was assigned to the north central and extreme western portions of the area. This rating was based on numerous oil shows reported from wells and the location of the tracts in relation to the Paleozoic hingeline. In the north central portion of the Arizona Strip

DO, consideration was also given to that areas location in relation to the Virgin oil field in southwest Utah. In both areas, Ryder speculated that any hydrocarbons present would have migrated into the area from the Rocky Mountain Geosyncline lying to the west. Heylmun (1987) rated the Arizona Strip as having a good potential for oil accumulations in northwest striking anticlinal folds and other structural traps located away from major fault zones. Good potential was also assigned to the Shnabkaib Member of the Moenkopi Formation and the Toroweap Formation where stratigraphic traps may exist. Rauzi (2001) rated the Arizona Strip as having fair to good potential for trapped hydrocarbons based on a combination of surface seeps, petroliferous rocks, and shows of oil and gas in numerous wells in north-western Arizona, plus oil production from equivalent units in southwestern and south-central Utah. Thus, it would appear the many thousands of feet of deep marine basin sediment that lie in and west of the Arizona Strip DO provide at least a moderate potential for the origination and possible migration of hydrocarbons into the area. Reynolds and others (1988) have recently recognized the Proterozoic Chuar Group as a potential source rock in northern Arizona.

Those areas identified by Ryder (1983) as having moderate potential for hydrocarbon accumulations have been carried forth here (See Map 3.29). Oil and gas accumulations that may underlie the Arizona Strip DO will probably occur in structural or stratigraphic traps within rocks of upper Proterozoic through upper Paleozoic age. The certainty that oil and gas exists in this area is supported by direct evidence in the form of hydrocarbon surface seeps, and oil and gas shows in wells. The evidence is, however quantitatively minimal to support or refute the existence of a mineral resource. Cenozoic erosion along the major drainages crossing the Arizona Strip would tend to lower the potential for the preservation of hydrocarbon accumulations due to probable ground water flushing. Thus, most of the southern and eastern portion of the Arizona Strip DO is rated as having a low potential on this basis. The certainty that oil and gas resources do not exist in this area is supported only by indirect evidence.

VII. Oil and Gas Development Potential

Oil and gas activities in the Arizona Strip DO are sporadic and limited to exploration only. No problems are expected with development of any oil and gas resources found and no trends in exploration have arisen.

VIII. RFD Baseline Scenario Assumptions and Discussion

The Arizona Strip DO encompasses approximately 3,323,091 acres including lands under different ownerships (Federal, State, and private). Of this approximately 206,809 acres (6%) are under State ownership and approximately 139,612 acres (4%) belong to private owners. Of the 55 well that were drilled four were located on private surface and one of the four was on non-federal subsurface; five were drilled on State lands and one of the five was drilled on federal subsurface.

Areas designated as closed to leasing by law, regulation or executive order, include wilderness areas and national monuments, and comprise approximately 1,422,724 acres (about 43%) of the lands administered by the Arizona Strip DO. The present Resource Management Plan identifies approximately 98,375 acres (about 3%) as open to leasing with no surface occupancy, and approximately 185,807 acres (about 5%) open to leasing subject to seasonal restrictions or special terms and conditions. The remaining approximately 1,616,106 acres (about 49%) are open to lease under standard lease terms and conditions. Only one of the exploration wells was drilled in an area that is now closed to leasing and two wells were drilling in areas now subject to seasonal restrictions or special terms and conditions. The rest of the oil and gas wells were drilled in areas open to lease under standard lease terms and conditions.

Exploration operations have taken place sporadically over the years with increased activity during the 1950s, 1960s and 1980s. Since the 1980s, 22 exploration oil and gas wells have been drilled on the Arizona Strip and it seems reasonable to assume this level of activity (approximately 1 well per year) can be anticipated for the future.

IX. Surface Disturbance Due to Oil and Gas Activity On All Lands

About 55 oil and gas exploration wells have been drilled on the Arizona Strip beginning with the first well in 1909. None of these wells have produced oil or gas in paying quantities, though oil and gas shows have been reported from a many of the wells. Disturbance caused by each well, including access, typically ranges between five and ten acres. Assuming an average of seven acres disturbed per well, approximately 385 acres have been disturbed because of oil and gas exploration. Typical well drilling operations last up to four months, though deeper wells may take longer. Since no oil or gas has been produced from this area, all disturbances have been reclaimed immediately following exploration. Complete reclamation of the disturbance requires from five to ten years.

Presently, there is one ongoing oil and gas well drilling operation that is not reclaimed. The operation is sporadically active and bonded to ensure reclamation. Approximately, five acres is disturbed by roads and the drill pad for the current oil and gas drilling operation. Reclamation of this operation probably will commence in the next six months.

Given the assumption that, on average, one APD will be received per year for the next 20 years and approximately seven acres will be disturbed per well by oil and gas drilling operations, the total area of related disturbance during this time period would be 140 acres. Lacking substantive data on oil and gas resources that may underlie the Arizona Strip, it is difficult to assess the potential for discovering an economic occurrence of oil and gas. However, for this RFD and planning purposes the assumption is made that exploration will be the only activity undertaken and reclamation will be done immediately following drilling. If complete reclamation takes 10 years, the maximum area disturbed at any one time would be 70 acres.

X. References

Hayes, P.T., 1969, Geology and Topography in Mineral and Water Resources of Arizona: Arizona Bureau of Mines Bulletin 180, 35-58 p.

Heylmun, E.B., 1987, Shallow Oil Potential Seen in NW Arizona in Oil and Gas Journal, Sept. 14, 1987, p. 77-80.

Hintze, L.F., 1973, Geologic History of Utah: Brigham Young University Geology Studies, v. 20, pt. 3, 131 p.

Pierce, W.H., Keith, S.B., and Wilt, J.C., 1970, Coal, Oil, Natural Gas, Helium and Uranium in Arizona: Arizona Bureau of Mines Bulletin 182, 289 p.

Rauzi, S.L., 2001, Arizona has Oil & Gas Potential: Arizona Geological Survey, Circular 29, 40 p.

Reynolds, M.W., Palacos, J.G., and Elston, D.P., 1988, Potential Petroleum Source Rocks in the Late Proterozoic Chuar Group, Grand Canyon, Arizona: U. S. Geological Survey Circular 1025, p. 49-50.

Ryder, R.T., 1983, Petroleum Potential of Wilderness Lands in Arizona in Miller, B. M., ed., Petroleum Potential of Wilderness Lands in the Western United States: U.S. Geological Survey Circular 902 A-P p. C1-C22

Shride, A.F., 1967, Younger Precambrian Geology in Southern Arizona: U.S. Geological Survey Professional Paper 566, 89 p.

XI. Statement of Qualifications

The author,
Rody P. Cox Jr., has a Masters of Science degree in Earth Sciences from Case Western Reserve University in Cleveland, Ohio and is a licensed Profession Geologist with the State of Utah, License No. 5207898-2250. His geological experience spans more than 20 years with private industry and the US Federal government.

July 28, 2004

APPENDIX 4.C

NATIONAL PARK SERVICE IMPAIRMENT ANALYSIS

NATIONAL PARK SERVICE IMPAIRMENT ANALYSIS

As noted earlier in this Draft Plan/DEIS, impairment analysis is required only for the National Park Service (NPS) portion of the Parashant. While the BLM is mandated by the national monument proclamations to protect objects in the Monuments and thus avoid any adverse impacts that would otherwise "impair" such objects, the agency is not required to conduct impairment analysis.

In the sections which follow, the legal framework which mandates that the NPS conduct impairment analysis is first outlined. Applicable federal statutes and NPS policies which bear on this issue are listed and a discussion of how this approach is linked to the NEPA process is presented. That discussion is followed by an overview of accepted general approaches that may be applied to impairment analysis and the factors that must be considered in determinations of resource impairment. These sections are taken almost directly from the NPS Interim Technical Guidance on Assessing Impacts and Impairment to Natural Resources (2003) and, not surprisingly, apply largely to natural resources. A short section follows that covers the consideration of impairment of cultural resources. Finally, the results of impairment analyses of proposed management programs under the various alternatives on cultural and natural resources within the NPS portion of the Parashant are presented.

FRAMEWORK FOR DECISION-MAKING

Legal Framework

The National Park Service Organic Act of 1916 states that the NPS:

> "…shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified…by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations (emphasis added)."

Congress reaffirmed this mandate in 1978 when it directed the following:

> "The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress."

In addition to avoiding impairment, NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. Nonetheless, these laws do give the NPS the management discretion to allow certain impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values.

The no-impairment mandate of the Organic Act is one of many legal requirements managers must consider and comply with when authorizing activities in parks. In some cases, requirements of other environmental laws and regulations might prohibit certain impacts on natural resources or values, whether or not "impairment" might result. In other cases, impacts technically allowed under other laws might be prohibited in a park because they would be considered impairment. In general, the most stringent test should be applied prior to approving an activity.

The Wilderness Act of 1964 (16 U.S.C. 1131, et seq.) defines wilderness as:

> "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain . . . an area of undeveloped Federal Land retaining its primeval character and influence . . . which is protected and managed so as to preserve its natural conditions" (16 U.S.C. 1131(c)).

In many cases the specific language of the Wilderness Act may prohibit activities before an impairment determination must be made, thereby making an impairment decision unnecessary. In other cases, the Wilderness Act may provide supporting legal context which makes it easier for managers to arrive at an impairment determination.

NPS Management Policies

NPS Management Policies 2001 leave determinations of impairment to the responsible park manager and direct that an action should be considered to constitute impairment only if, in the manager's professional judgment, the action "would harm the integrity of the park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values." NPS policies (Section 1.4.5) further state that whether an impact meets this definition (i.e., would harm the integrity of the park resources or values) depends on:

1) the particular resources and values that would be affected;
2) the severity, duration, and timing of the impact;
3) the direct and indirect effects of the impact; and
4) the cumulative effects of the impact in question along with other existing impacts.

The current management policies do not state what would be acceptable or not acceptable (i.e., to constitute impairment) under any of these factors. It is left to the manager to assess information on each of these factors, weigh that information, and use professional judgment to decide if the integrity of the park resources or values will be harmed by the action.

An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is

1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park,
2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
3) identified as a specific goal in the park's general management plan or other relevant NPS planning documents.

An impact would be less likely to constitute impairment to the extent that it is an unavoidable result, which cannot reasonably be further mitigated, of an action necessary to preserve or restore the integrity of park resources or values.

Impairment may occur from visitor activities, NPS activities in the course of managing a park, or activities undertaken by concessionaires, contractors, and others operating in the park as well as from external actions. Impairment can occur from inaction as well as action. For example, failure to prevent the spread of a seriously disruptive alien species may impair park resources.

Linkage to NEPA

The National Environmental Policy Act (NEPA) of 1969 requires agencies, including NPS, to assess the impact of proposals on the quality of the human environment. NPS makes an impairment determination through the environmental planning and assessment process. NPS Director's Order #12 states that environmental documents will evaluate and describe impacts that may constitute an impairment of park resources or values. In addition, the Record of Decision will summarize impacts and whether or not such impacts may constitute an impairment of park resources or values. The NPS NEPA Handbook (January 2001) provides additional guidance on how projected impacts are to be described and characterized based on their magnitude, context, duration, and intensity. NPS Management Policies direct decision-makers to "consider any environmental assessments or environmental impact statements required by NEPA; relevant scientific studies and other sources of information; and public comments" in making impairment determinations. The NEPA Handbook indicates that the impact assessment should lay out a methodology for assessing each impact topic, including the criteria or thresholds used to draw a conclusion on the context, intensity, and duration of the impact. Based on these assessments, impacts may be characterized as "negligible," "minor," "moderate," or "major." These impact characterizations, in turn, provide a foundation for assessing whether the impact is likely or not likely to result in an impairment of park resources or values.

Not all major or significant impacts under a NEPA analysis are impairments. Nonetheless, all impairments to NPS resources and values would constitute a major or significant impact under NEPA. If an impact would result in impairment, the action should be modified to lessen the

impact level. If the impairment cannot be avoided by modifying the proposed action, that action cannot be selected for implementation.

Impact levels (also referred to as impact thresholds in Director's Order #12) are used to identify the impacts of the action to resources and may assist in making either resource specific or overall impairment determinations. These impacts need to be placed into context (e.g., the park's enabling legislation, specific laws governing endangered species, publicly reviewed planning documents, or other considerations) to make a decision
as to whether or not the impacts are acceptable or unacceptable.

Determinations of whether an impact constitutes impairment are a management decision. Thus, conclusions in NEPA documents that there would be impairment to a specific resource type should only be made in consultation with the park manager or other decision-maker. Staff members and technical experts should be encouraged to offer their expertise and opinions, but staff members are not always aware of all the facts of a situation or the full context in which a decision must be made. Ultimately, park managers will need to determine whether or not the impact is the unavoidable result, which cannot reasonably be further mitigated, of an action necessary to preserve or restore the integrity of park resources or values.

NPS Management Policies also direct the NPS to demonstrate environmental leadership in all aspects of park planning. In this, the NPS is required to seek opportunities for achieving the highest standards for environmental protection and for implementing sustainable practices. Park managers should consider impacts and the potential for impairment against these benchmarks. Moreover, the environmental leadership management policy directs the NPS to comply with both the letter and the spirit of NEPA.

GENERAL APPROACHES TO IMPAIRMENT

Management Context

Impairment decisions also need to be put into context. This means considering the action within the context of the purposes for which the park was established, the management objectives, and desired future conditions. One should also consider existing conditions in the park, the relative impacts from activities within and outside the park, and the incremental and cumulative effect of potential impacts from a proposed or ongoing activity. When deciding whether impacts might constitute impairment, park managers should remain cognizant of the effect such decisions might have on their ability to protect park resources and values from impacts caused by activities outside park boundaries. Neighboring land managers and land owners, as well as private entities farther upwind or upstream, may want the NPS to judge the acceptability of the impacts they cause within parks the same way we judge our own activities.

Lack of Information and Risk Assessment

Managers and decision-makers must have adequate information upon which to base their analysis and decisions regarding potential impacts or impairment. The appropriate level of detail needed is related to three factors commonly used in risk assessments to describe probability or likelihood of an impact: the magnitude of the action, the probability of making a wrong decision, and the consequences of the action.

Magnitude of the action: Large or complex projects require more information to inform impact assessments than small simple projects.

Probability of a wrong decision: There is always a possibility that a wrong decision will be made and negative unintended impacts or consequences will result. However, the better the information used for decision-making, the less likely it is that unintended or unanticipated impacts will occur.

Consequences of the action: The potential impact of an activity on one or more resources may also drive the amount of information needed for analysis and decision-making. If the potential consequences of an action are irreversible, then the amount of information needed might greatly increase, because the risk would be higher.

These three factors interact in a manner that influences the amount of information needed for an impact assessment or impairment determination. For example, a small project with minimal long-term consequences may not require a lot of information, even if there is a high likelihood that we will make the wrong decision. Conversely, an action where impacts are highly predictable and the action is likely to go as planned may require much more information if that action is irreversible or has serious consequences such as potentially extirpating a species.

Professional Judgment

Professional judgment of the decision-maker and staff is a critical tool in assessing impact and impairment. It is impractical to expect to have independently gathered monitoring data and analyses on every resource issue. Judgments must be made using the combined education and work experiences of professional staff. However, these judgments need to be documented so that decisions can be revisited in the future as more information is acquired or as conditions change.

Impairment Determination Considerations

Some, but not all, major impacts to natural resources may be an impairment, depending on the severity, duration, and timing of the direct, indirect, and cumulative impacts and on the park purpose, management objectives and context. Impacts determined to be negligible, minor, or moderate are not as likely to lead to impairment, but may do so in rare cases (e.g., the integrity of a park's spectacularly dark night skies might be considered harmed by a relatively small increase

in artificial illumination). In practice, if a manager concludes there might be or is an impairment from an impact not characterized as "major," she or he should carefully re-examine the impact analysis to see if the impact has been characterized appropriately.

Although there are no canned methodologies that can be applied to determine impairment, there are a number of steps that should be taken in all evaluations:

1) Gather sufficient available information to adequately inform decision making (see "Information Needs" in each resource section).
2) Use or develop conceptual, physical or mathematical models of resource and ecosystem relationships to help evaluate or predict potential impacts (particularly for indirect and multiple-resource effects).
3) Conduct a thorough assessment following all potential impacts over time and space to their logical conclusions (e.g. consider all life stages and functions of species, consider whether an action may be irreversible).
4) Quantify the impacts as much as possible (see "Impact Level" tables in each resource section to help determine what should be quantified).
5) Determine if the impacts analyzed in the steps above constitute an impairment of park resources and values by evaluating the context in which each specific resource impact decision will be made (see "Laws Regulations and Policies" in each resource section of this guidance, as well as considering the uniqueness of the impacted resource, and any park specific purposes, management objectives and context).
6) Document the decision and the logic that led to the decision.

Most proposed actions are not expected to have impacts to park resources that would rise to the level of "impairment." The impacts of actions will range from clear instances of no impairment, to obvious impairment, and to in-between situations where it will be difficult to determine impairment or non-impairment. A determination of impairment is not normally a blanket application to all resources within a park. It may be specific to individual resources within the park.

Parks need to consider impairment not only for proposed actions that may occur, but also for on-going management that may result in impairment and the effects of past actions that may already be impairing park resources. Each of these three situations needs to be addressed differently.

Proposed future actions. This is perhaps the easiest situation to address. Proposed actions can be evaluated early in the planning stages to reduce impacts to resources and avoid impairment concerns. The goal of impairment evaluations is to prevent decisions that may impair resources. If impacts are considered early enough in the planning process, resources have not been irretrievably committed and the inertia accompanying most projects does not constrain modifications. Information needed to make an impairment determination may be sparse and speculative.

On-going actions. Current actions are more difficult than future actions to address because decisions have already been made, resources have been committed, and the actions may already have a strong constituency for continuation or to resist modification. Information needed to make an impairment determination may be more abundant and less speculative because actual effects can be observed. The NPS Management Policies address situations where an ongoing activity might have led or be leading to impairment. Park managers must investigate and determine if there is, or will be impairment, preferably as part of a planning process undertaken for this purpose. If impairment is found, appropriate action should be taken, to the extent possible within the Service's authority and available resources, to eliminate the impairment as soon as reasonably possible.

Impairment from past actions. Remediation of past actions that have impaired park resources are very difficult to address. While there may be more information available on the actual effects of the action, the amount of restoration needed to reverse the effects can be very large. Funding required to restore past actions may easily exceed the original costs of the action that caused the impairment. The restoration of past actions presents an additional dilemma; if a project partially restores an area to desired conditions, but does not fully rectify impairment, does the project still impair resources (and thus violate the non-impairment directive)? In almost all cases, the answer is probably "no." However, if the restoration action only partially restores park resources and it precludes future options for full restoration, then it may impair resources.

APPENDIX 5.A

FLYER LOCATIONS ANNOUNCING PUBLIC MEETINGS IN 2002 AND 2003

FLYERS ANNOUNCING PUBLIC MEETINGS IN 2003	
ST. GEORGE, UTAH MEETINGS	
St. George	Public Library; City Offices; BLM Interagency Office; Post Offices; Lin's Market bulletin board; Outdoor Outlet; Motorcycle shops; Lowes and Home Depot; Greenhouses
Ivins	Art Gallery; Post Office; City Offices
Shivwits	Tribal Building
Santa Clara	Post Office; City Offices
Washington	Post Office; City Offices; St. Helen's Restaurant
Hurricane	Lin's Market bulletin board; Chevron; Post Office; Garden Café; Graff Mercantile; Hurst Ace Hardware; Museum
La Verkin	Post Office; Chevron; Sunrise Market; Farmers Market
Virgin	Post Office
Springdale	Post Office; City Offices; Zion NP, and Visitor Center
Toquerville	Post Office
Leeds	Post Office; City Offices
FREDONIA, ARIZONA MEETINGS	
Kanab	Glazier's Groceries; Kanab Texaco; Rocking V Café; Escobars Restaurant; Honey's IGA Store; Willow Creek Books; Kanab Field Office; Grand Staircase-Escalante National Monument Office; City Library; Post Office; Houston's Trails End Restaurant; Vermilion Café
Fredonia	City Offices; Post Office; Forest Service
Outlying Areas	Jacob Lake; Pipe Spring Visitor Center; Kaibab Paiute Tribal -Headquarters
Colorado City	Post Office; Town Hall; Service Stations at Apple Valley and Colorado City
Pipe Spring	Tribal Offices
Moccasin	Court
Page	Post Office; Glen Canyon Visitor's Center; City Offices
BLM Paria Contact Station	
Marble Canyon	
Vermilion Cliffs	
Cliff Dwellers	
MESQUITE, NEVADA MEETINGS	
Beaver Dam	Elementary School; Sheriff's Office; The Dam Market; Post Office
Littlefield	Community College
Mesquite	City Offices; Post office
Bunkerville	Post Office; Courthouse; Community Center

FLYERS ANNOUNCING PUBLIC MEETINGS IN 2002	
ST. GEORGE, UTAH MEETINGS	
St. George	Public Library; City Offices; BLM Interagency Office; Grand Canyon Trust Office; Harmons & Lins Market; Smiths; Albertsons; Post Office; Outdoor Outlet
Ivins	Art Gallery at Kayenta; Post Office; City Office
Shivwits Reservation	Tribal Building
Santa Clara	Post Office; City Offices
Washington	Albertsons; Nissons Foodtown; Nissons Market; Post Office; City Offices
Hurricane	Lin's Market; Chevron; Post Office; Garden Café; Graff Mercantile; Hurst Ace Hardware; Museum
La Verkin	Post Office; Chevron; Sunrise Market; Farmers Market
Virgin	Post Office
Springdale	Post Office; City Office; Zion National Park Visitor Center
Toquerville	Post Office
Leeds	Post Office; City Offices
FREDONIA, ARIZONA MEETINGS	
Kanab	Glazier's Groceries; Kanab Texaco; Rocking V Café; Escobars Restaurant; Honey's IGA Store; Willow Creek Books; Kanab Field Office; Grand Staircase-Escalante National Monument Office; City Library; Post Office; Houston's Trail End Restaurant; Vermilion Café
Fredonia	City Offices; Post Office; Forest Service Office
Outlying Areas	Jacob Lake Café and Gift Shop; Service Station at Pipe Spring; Pipe Spring Visitor Center; Kaibab Paiute Tribal Headquarters
Colorado City	Post Office; Town Hall; Service Stations at Apple Valley; Mohave Community College
Page	Post Office; City Office; Food Stores; Glen Canyon NRA
Big Water	Post Office; City Office
Paria Contact Station (BLM) Marble Canyon	
Vermilion Cliffs & Cliff Dwellers	
MESQUITE, NEVADA MEETINGS	
Beaver Dam	Elementary School; Sheriff's Office; The Dam Market; Post Office
Littlefield	Community College
Mesquite	City Office; Post Office; Smiths
Bunkerville	Post Office; Courthouse; Community Center