Sonoran Desert National Monument
Wilderness Proposal

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The Arizona Wilderness Coalition is an organization of groups and individuals working to protect and restore wilderness and other wildlands and waters in Arizona.

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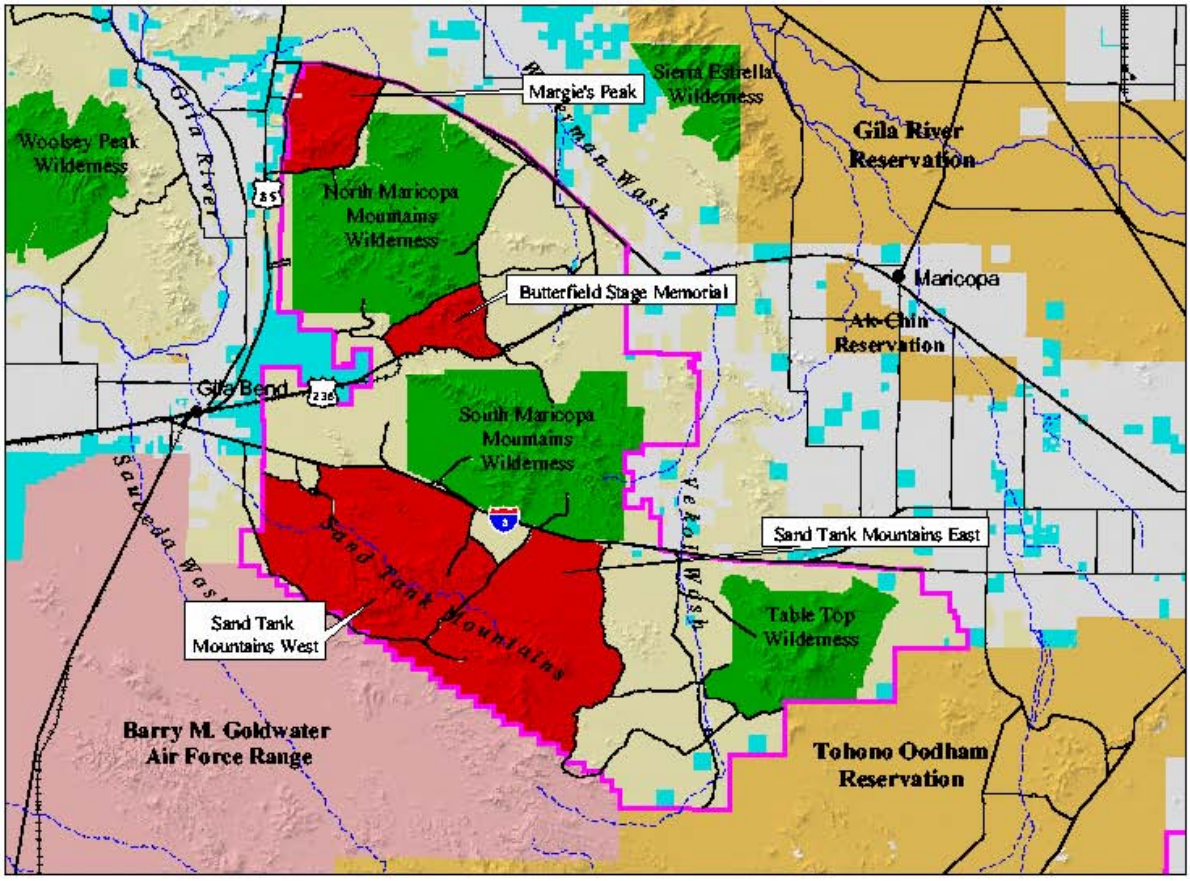
Abstract

This thesis presents justification for protecting the wilderness characteristics of approximately 133,609 acres in four units inside the Sonoran Desert National Monument. The purpose of new wilderness protections in the Sonoran Desert National Monument is presented as a method to halt biodiversity loss by developing a system of connected core areas that can function as a wildland network. The historical roots of wilderness philosophy and law are discussed in great detail to explain the continuing obligations of the Bureau of Land Management to protect lands with wilderness characteristics. The methods for completing citizen's wilderness proposals are presented to enable others to use this process for protecting wilderness quality lands. The historical review of each inventory unit documents that past inventories completed by BLM are inadequate. The inventories were either flawed in application of methods or did not consider lands acquired from the military in the Sand Tank Mountains. Finally, the Discussion and Results section provided the documentation on new and supplemental information that indicates the proposed areas, Butterfield Stage Memorial (9,618 acres), Margie's Peak (14,739 acres), Sand Tank Mountains East (52,648 acres), and Sand Tank Mountains West (56,062 acres), do have wilderness characteristics.

Proposed Wilderness in Sonoran Desert National Monument



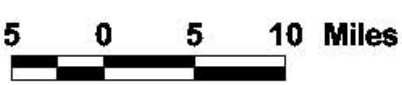


Figure 1

I. Introduction

Arizona's Sonoran Desert is one of the world's most unique deserts. It is home to numerous fascinating plants and animals. It has been identified as a one of the top 200 ecoregions worldwide (Olson and Dinerstein 1998). The Sonoran Desert receives the most precipitation of the North American deserts, with two rainy seasons a year, one in the winter as frontal systems move in from the Pacific ocean and the other in the form of intense summer monsoon rains (Marshall et al 2000). The winter rains bring spring wildflowers that blanket the rocky soils of the desert rivaling the high alpine summer flowers of the Sierra and Rocky Mountains. The summer monsoons bring air masses filled with humidity and sometimes drenching torrents of rain, but more commonly they unleash fierce displays of lightning in the skies above the desert. This bimodal precipitation pattern and the influences of slope aspect, and elevation gradients have worked together over the millennia to create an amazing diversity of plants and animals.

The greater Sonoran Desert that encompasses portions of Southwestern Arizona, Southeastern California, Baja California, and Sonora Mexico is home to at least 3,300 vascular plant species (1,650 endemic) and 478 non-fish vertebrate species (92 endemic), with over 500 species of birds migrating through the region (Marshall et al 2000; Ezcurra et al 2002).

The Sonoran Desert National Monument lies in the heart of this extraordinary desert as a crown jewel of biological and cultural richness that deserves the utmost protection. The Sonoran Desert National Monument has wilderness-quality lands that are integral for protection of the Sonoran Desert Ecosystem in the face of the rapid global,

national, and regional human population explosion. Wilderness is the strongest form of protection available for these pristine and threatened desert lands.

This thesis gives justification for protecting the wilderness characteristics of the Butterfield Stage Memorial (9,618 acres), Margie's Peak (14,739 acres), Sand Tank Mountains East (52,648 acres), and Sand Tank Mountains West (56,062 acres) of the Sonoran Desert National Monument. These units represent the Arizona Wilderness Coalition (AWC) citizen proposals to the Bureau of Land Management (BLM) for consideration in the process of developing a land management plan for the Sonoran Desert National Monument. The main body of this thesis presents new information in the form of a purpose and need for new wilderness protections inside the Sonoran Desert National Monument. The History section gives a detailed review of the concept of wilderness and its evolution through the creation and implementation of the Wilderness Act of 1964 (appendix A). This detailed review of the intricacies of wilderness and why it is necessary for the Sonoran Desert National Monument is completed in the Discussion and Results section of this thesis with the presentation of the individual wilderness proposals for each of the units listed above. These proposals contain descriptions of the units' wilderness characteristics and the recommended boundaries for these units through a detailed route analysis for each unit.

The History section also reviews the Bureau of Land Management's legal obligations to protect lands with wilderness characteristics. These legal obligations have recently been denied by the George W. Bush administration with the issuance of a court Settlement between the State of Utah and the Department of Interior Secretary Gale Norton in April of 2003. This settlement rescinds the BLM's *Wilderness Inventory and*

Study Procedures manual H-6310-1, prohibiting BLM from conducting wilderness inventories and using Wilderness Study Areas (WSAs) to protect lands with wilderness characteristics. The Arizona Wilderness Coalition believes this settlement in contrary to the Federal Land Policy and Management Act (FLPMA) of 1976 and continues to use the *Wilderness Inventory and Study Procedures* manual H-6310-1 to complete citizen wilderness proposals. The History section will provide a detailed review of this settlement and make justification for why BLM still has an obligation to protect wilderness characteristics on lands under its management.

This thesis is a proposal to protect some of the best wildlands left in Arizona with the idea that "we" as citizens and stewards of this earth take actions that embrace what Aldo Leopold (1949, p 224) suggested in his timeless work, A Sand County Almanac

> *quit thinking about decent land-use as solely an economic problem. Examine each question in terms of what is ethically and esthetically right, as well as what is economically expedient. A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.*

This statement asserts that "we" as humans have an ethical responsibility to make land-use decisions in favor of protecting nature over exploiting it for profit. Protecting wilderness quality lands in the Sonoran Desert National Monument will ensure that there are places left when we reach the pinnacle of our civilization in the desert southwest, realizing that there is no greater civilization than one that lives in and protects nature as an irreplaceable part of itself.

II. Purpose and Need

The Sonoran Desert National Monument has wilderness-quality lands that are integral for protection of the Sonoran Desert Ecosystem in the face of the rapid global, national, and regional population explosion. Wilderness is the strongest form of protection available for these pristine and threatened desert lands. Sonoran Desert National Monument wildlands must be protected for the citizens of the United States and Arizona to,

> *[A]ssure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition* [The Wilderness Act of 1964 (P.L. 88-577 § 2(a); 16 U.S.C. § 1131 2(a))].

The following documentation will review the current ecological crisis humans have created. It will explain how wilderness protections can help retain our Arizona wildlands that are vital to the enrichment of our lives and the survival of other beings we share this planet with.

It is time to say *NO* to progress for progress sake and begin the process of rewilding and reacquainting ourselves with the natural communities that surround and sustain us. We must transcend the present paradigm that has haunted our species and western culture since Francis Bacon (1561-1626) and Rene Descartes (1596-1650) developed their theories of humankind's dominance over nature. We must move beyond our ability to use the scientific process to reduce everything to its smallest parts for analysis (reductionist approach), and stop viewing nature as a machine. The Baconian-Cartesian theories were readily accepted by many, because this theory portrayed man as master of the earth and the earth was given to man for his use. These ideas set the stage

for the industrial revolution to occur and be embraced by society; this is the jumping-off point for the beginning of our current ecological crisis (Oelschlaeger 1991). It is important to understand the origins of our current paradigm, not only to find motivation and reason for the preservation of wilderness, but also for developing a new way of thinking and living.

A. The Biodiversity Crisis

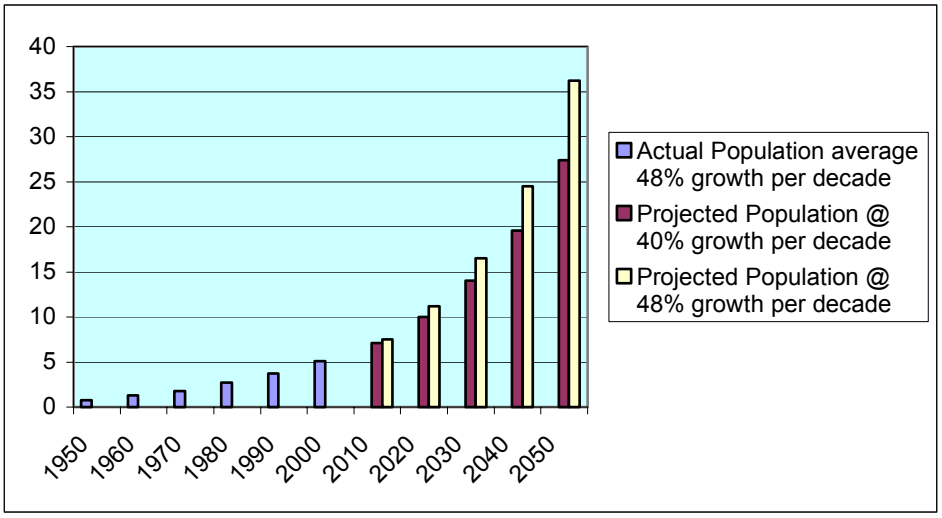
The human population has expanded from 2 billion at the end of the 19th century (just after the industrial revolution began) to over 6 billion in 2002 (Meffe and Carroll 1997). This explosion of human population occurred over less than 100 years in comparison to the millions of years it took to achieve the same rate of expansion since our species first emerged (Grumbine 1992). It is predicted that human populations will plateau between 10-12 billion over the next 100 years (Grumbine 1992; Soulé 1992; Meffe and Carroll 1997). The outlook is bleak for the world's natural systems knowing these statistics. Paul Ehrlich (1968) made predictions about the ability of the earth to sustain this level of growth in his book, The Population Bomb. He presented information concluding there would be catastrophic human starvation in the 1970s that did not occur, but what about the natural world? Ehrlich claims that humans are using their capital of natural resources and not the interest. If humans were able to use only the interest of the world's resources then equilibrium would be reached between population and resources, but before this time the world's natural systems will suffer. Eileen Crist (2003) explains that it is not to say that our human population will not survive or even thrive with a 50 percent reduction in worldwide biodiversity. But what about quality of life? According to the World

Resources Institute of the United Nations (2000-2001) 30 percent of the planet has already been converted to agriculture and urban development, and in less than a century it is predicted that 30 percent more will be cut, plowed, and paved. This will leave only about one-third of the Earth's land area in a natural state by 2100. One-tenth of these natural areas will be in the form of ice located in Greenland, Northern Canada, Antarctica, and other ice-capped regions of the world (Kerasote 2001). This extreme human population expansion and the resources that sustain it is the leading factor in the current biodiversity crisis occurring around the world (Meffe and Carroll 1997; Crist 2003).

The biodiversity crisis is occurring in Arizona as well; currently 71 species of plants and animals are listed as threatened, endangered, or proposed for listing under the Endangered Species Act of 1973 in Arizona (USFWS Website 2003). This long list of imperiled species is a result of the rapid human population growth and accompanying development in Arizona since 1950 and earlier. Human population growth has averaged 48 percent every ten years since 1950 in Arizona (Census Bureau 2000). Table 1 on the following page, shows Arizona's population growth since 1910, clearly showing the trend that will place Arizona's population at around 36 million by 2050 at the average rate of 48 percent every ten years.

Maricopa County, the county Sonoran Desert National Monument is in, grew by 44.8 percent between 1990 and 2000, and its cities of Gilbert, Chandler, and Peoria were in the top five for highest population growth in the nation between 2000 and 2002 (US Census Bureau 2000; US Census Bureau 2003). Gilbert was number one and increased in population by 23 percent, to a total of 135,005. In the 2000 census Gilbert topped the

Table 1: Arizona Population Growth
Produced by: Don Hoffman 2003



charts with showing a 275.8 percent growth from 1990 to 2000. This population growth does not come without costs to the natural environment. According to a now outdated article published in 1995 by High Country News, one acre of pristine desert went under the blade for development per hour in the Phoenix Valley in 1995. A quick search on the Arizona Republic website will quickly reveal that west and south of Phoenix is where most of the new homes will be built in the coming years. One article published in October 2003 makes the following alarming estimates,

> *The once-sleepy town of Buckeye could someday rival Phoenix in size. It has annexed enough land to make it the Valley's second-biggest community geographically, after Phoenix. Nearly, 200,000 homes are planned for Buckeye, and developments such as Sundance and the upscale Verrado community are under way there* (Burrough and Creno 2003).

The Town of Buckeye is 10 miles north of the Sonoran Desert National Monument and about 50 percent of the land on the north side of the monument is private and State Trust Land that will probably be sold for development.

Another Arizona Republic article in March of 2003 claimed that Pinal County, just south and west of Phoenix, would be the next large area close to Phoenix.

> *Last year, El Dorado Ranch in the town of Maricopa opened to buyers. Pinal County could rival the West Valley for new home building during the next decade, said Nate Nathan, a Valley land broker with Nathan & Associates. 'The area has the potential to see as many as 150,000 new residences in the near future,' he said* (Burrough 2003).

The Town of Maricopa is only 16 miles west of the Sonoran Desert National Monument. There is little argument that Arizona and especially the Phoenix Valley is experiencing tremendous growth. Many environmental problems have been created from this rapid growth that make preservation of public land in its most pristine form of wilderness one of the best actions that can be taken to mitigate the alarming rate of habitat destruction, fragmentation, and alteration.

Accompanying this population growth there will also be and has been an alarming increase in recreation on public lands in Arizona. A recent study released by the Arizona State Parks (2003) titled, *Economic Importance of Off-Highway Vehicle Recreation to Arizona,* claims that Off Highway Vehicle (OHV)[2] users spent 13,983,356 user days participating in Off Road Vehicle (ORV) recreation in 2002. This rapid increase in ORV use in Arizona has led the Apache Sitgreaves, Coconino, Kaibab, Prescott, and Tonto National Forests to consider a more restrictive travelway management and ORV policies to limit the destruction that is caused by these vehicles.

[2] It is important to note the use of the terminology "Off Highway Vehicle" or "OHV" is a direct effort by Off Road Vehicle groups and the corporations that produce these machines to try to soften the public's perception of what these vehicles are designed for. In the effort to accurately represent the nature of these vehicles and their advertised use I will use the terminology of "Off Road Vehicle" or "ORV".

Table 2

Recent ATV and Off-Highway Motorcycle Sales

	Arizona New Retail Sales			U. S. New Retail Sales		
	Off-Highway Motorcycles	ATV's	Total	Off-Highway Motorcycles	ATV's	Total
2000	5,407	14,629	20,036	217,188	648,637	865,825
1995	1,605	3,518	5,123	90,679	277,787	368,466
% Change	235.9%	315.8%	291.1%	139.5%	133.5%	135%

Source: *MIC Retail Sales Report*, based on actual sales registrations for Arctic Cat, Bombardier, Honda, Kawasaki, KTM, Polaris, Suzuki, and Yamaha. Off-highway includes dual motorcycles.

Taken from Apache Sitgreaves National Forest Website 2003

An October 2003 Arizona Republic article cited 93,000 units as the total sales for ORVs in Maricopa County alone (Hajek 2003). Table two shows the alarming trends in Off Road Vehicle sales for Arizona and Nationally. This dramatic increase in sales will undoubtedly lead to a significant increase in ORV use on public lands.

Gary Paul Nabhan and Andrew R. Holdsworth (1999) found that Off Road Vehicle use and resulting damage to plants is one of the major threats to the Sonoran Desert along with illegal plant collection and vandalism. In his book No Place Distant, David Havlick (2002) reviews the alarming impacts of roads on wildlife and functioning ecosystems. Roads of all types lead to an increase in wildlife mortality from collisions, air, noise, and water pollution, more resource extraction in the form of logging and mining, recreational impacts, habitat fragmentation and loss, soil erosion, hydrologic cycles, and the introduction of invasive weeds (Havlick 2002). Furthermore, roads have a zone of effect greater than just their footprint. In some cases the zone of effect from a road can range from ¼ to 2 miles wide, making core areas of habitat much smaller than just assessing roadless area size from the physical edge of a road (Hartley et al. 2003).

Kim Crumbo of the Arizona Wilderness Coalition provides a more complete review of the literature on the ecological effects of roads in appendix C.

The Sonoran Desert is under attack by habitat destruction in the form of urban development, habitat fragmentation in the form of road building and invasive species introduced by all the new roads. The public BLM lands become more valuable everyday for wildlife habitat and open space, because the once open spaces on private and state lands are rapidly becoming urbanized. The need to protect our remaining wildlands is clear; these human population numbers, combined with the growth of ORV recreation and other motorized sports puts tremendous pressures on our public wild lands.

B. Mandates for the Protection of Cultural and Natural Objects

The creation of the Sonoran Desert National Monument by the presidential proclamation signed on January 17th 2001 by former President Bill Clinton provides an essential element of added protection to these BLM lands from the increasing impacts associated with Arizona's rapid human population growth. The Sonoran Desert National Monument was created to protect numerous natural and cultural objects. Protection of the lands proposed for wilderness by this proposal will not only adequately protect wildlife habitat and open space, but will greatly assist the BLM in fulfilling their obligation to protect the objects of the monument, which is the sole purpose of the monument.

A review of the presidential proclamation (appendix B) creating the Sonoran Desert National Monument reveals the following objects that the monument was created to protect[2]:

1. **Untrammeled landscape-** The area encompasses a **functioning desert ecosystem** with an extraordinary array of biological, scientific, and historic resources.
2. **Extraordinary Biological Resources-** The most biologically diverse of the North American deserts… includes large saguaro cactus forest communities that provide excellent habitat for a wide range of wildlife species. The monument's biological resources include a spectacular diversity of plant and animal species.
    a. The higher peaks include unique **woodland assemblages**
    b. The dense stands of **leguminous trees** and cacti are dominated by **saguaros, palo-verde trees, ironwood, prickly pear, and cholla**. The washes in the area support a much denser vegetation community than the surrounding desert, including **mesquite, ironwood, palo verde, desert honeysuckle, chuperosa, and desert willow**, as well as a variety of **herbaceous plants**. This vegetation offers the dense cover **bird species** need for successful nesting, foraging, and escape, and birds heavily use the washes during migration.
    c. The lower elevation lands offer one of the most structurally complex examples **of palo verde/mixed cacti association** in the Sonoran Desert.
    d. The most striking aspect of the plant communities within the monument is the abundant **saguaro cactus forests**. The saguaro is a signature plant of the Sonoran Desert. The saguaro cactus forests within the monument are a national treasure, rivaling those within the Saguaro National Park.
    e. The lower elevations and flatter areas of the monument contain the **creosote-bursage plant community**. This plant community thrives in the open expanses between the mountain ranges, and connects the other plant communities together.
    f. Rare patches of **desert grassland** can also be found throughout the monument, especially in the Sand Tank Mountains area.
    g. Relic plants- **Kofa Mountain barberry, Arizona rosewood, and junipers**, remain on higher elevations of north-facing slopes.

[2] The listed text is taken directly from the Sonoran Desert National Monument Presidential Proclamation. Bolded text has been used to identify the specific objects of the monument. Slight word changes have been made for ease of reading.

h. The endangered **acuna pineapple cactus** is also found in the monument.

3. **Extraordinary Wildlife**
    a. Sonoran pronghorn
    b. Desert bighorn sheep
    c. Mule deer, Javelina, Mtn lion, gray fox, bobcat
    d. Bats, lesser long nosed, California leaf-nosed, cave myotis
    e. 200 species of birds
    f. 59 bird species that nest in Vekol valley
    g. Raptors, owls, elf owl, western screech owl
    h. Desert tortoise
    i. Amphibians-Sonoran green toads in Vekol valley and Sand Tank Mountains
4. **Geographic Areas-** The rich diversity, density, and distribution of plants in the **Sand Tank Mountains area** of the monument is especially striking and can be attributed to the management regime in place since the area was withdrawn for military purposes in 1941. In particular, while some public access to the area is allowed, no livestock grazing has occurred for nearly 50 years. To extend the extraordinary diversity and overall ecological health of the Sand Tanks Mountains area, **land adjacent and with biological resources similar to the area** withdrawn for military purposes should be subject to a similar management regime to the fullest extent possible.

5. **Extraordinary Scientific Resources-** The monument contains an abundance of **packrat middens,** allowing for scientific analysis of plant species and climates in past eras. Scientific analysis of the middens shows that the area received far more precipitation 20,000 years ago, and slowly became more arid. Vegetation for the area changed from juniper-oak-pinion pine woodland to the vegetation found today in the Sonoran Desert.

6. **Extraordinary Archeological/Historic Resources-**

    a. Rock art sites, **lithic quarries**, and **scattered artifacts**.
    b. **Vekol Wash** is believed to have been an important **prehistoric travel and trade corridor** between the Hohokam and tribes located in what is now Mexico. **Signs of large villages** and **permanent habitat sites** occur throughout the area, and particularly along the bajadas of the Table Top Mountains. Occupants of these villages were the ancestors of today's O'odham, Quechan, Cocopah, Maricopa, and other tribes.
    c. The monument also contains a much used trail corridor 23 miles long in which are found remnants of several important historic trails, including the **Juan Bautista de Anza National Historic Trail, the Mormon Battalion Trail, and the Butterfield Overland Stage Route.**

The first object listed is the "untrammeled Sonoran desert landscape". The word untrammeled is a specific word that has legal meaning in the Wilderness Act of 1964 (see page 27). The use of the word "untrammeled" provides significant justification for protecting wilderness-quality lands in the Sonoran Desert National Monument because the Wilderness Act was specifically created to protect lands with such character. The words "scientific and historical" also use terminology from the Wilderness Act, but are not as closely associated as the word "untrammeled" is with wilderness protection. The Wilderness Act does provide excellent protection for these objects as well as everything listed above. The purpose of protecting the remaining wildlands in the Sonoran Desert National Monument as wilderness is to provide the highest form of long-term protection for such valuable federal lands and establish part of a system of connected core areas of habitat for wildlife species.

The creation of new congressionally designated wilderness areas in the Sonoran Desert National Monument will be the best way for the Bureau of Land Management to protect the objects identified in the January 17th 2001 Presidential Proclamation. One reason wilderness is often cited as the most protective federal land designation is because it is a congressional decision and not an administrative decision. Administrative decisions can be easily changed with the changing of presidential administrations because the president appoints the Chief of the Forest Service, Director of the Bureau of Land Management, Director of the Park Service, and the Director of the Fish and Wildlife Service, all of whom manage our public lands. These political appointees normally reflect the agenda of the administration and change policies related to mining, logging, and road building that either make it easier or harder for industry to have their way with

public lands. An example is the G.W. Bush administration reversing the Clinton era decision to limit incompatible snowmobile use in Yellowstone National Park. If the snowmobile area in Yellowstone National Park were wilderness there would be no debate, because snowmobiles are not allowed in wilderness.

The congressional designation is the most powerful decision that can be made by the American government and no agency or administration has the power to overturn a decision made by Congress.

The management of designated wilderness was clearly outlined by Congress in Section 4 of the Wilderness Act of 1964 and the Bureau of Land Management, National Park Service, US Fish and Wildlife Service, and US Forest Service must abide by this law, which provides for relatively consistent management for all designated wilderness throughout the four agencies.

There is tremendous value and justification for designating wilderness in national monuments even though monuments already provide added protection to the important natural and cultural resources from mining and logging. The primary added value that wilderness designation provides for monument lands is that it does not allow the use of motorized or mechanical equipment, development of new roads, facilities, or structures as outlined in Section 4(c) of The Wilderness Act of 1964. The Wilderness Act also specifies that only commercial activities related to realizing the recreational or wilderness values may be carried out (see page 30 for more information on the use of wilderness). Once an area becomes wilderness the various administrations have little affect on these areas because Congress has dictated management to the agencies. But general national monument lands can be affected by the whims of agency personnel or an administration

that wants to pave roads, develop visitor centers, and even add new roads and motorized trails that allow people to access more and more remote areas of a monument. The agency still must complete a full environmental analysis for such projects, but it is important to realize that the projects cannot even be proposed in designated wilderness, hence the tremendous added value that wilderness designation provides for national monument lands.

C. Application of Conservation Biology to Sonoran Desert Wildlands

The science of conservation biology strives to understand and protect biodiversity and can greatly assist managers and citizens in developing a network of protected core areas that will function as reserves for native wildlife populations in the face of the rapid human population growth and accompanying development (Grumbine 1992; Meffe and Carroll 1997). As mentioned above, wilderness areas are key components in a wildlands network because they serve as the core areas. It is the mission of the Arizona Wilderness Coalition to advocate for wilderness protection of all remaining wildlands that serve as core areas of habitat in a wildlands network. The Wildlands Project reserve design model can be used to implement this system. The Wildlands Project's mission is "to protect and restore the ecological richness and native biodiversity of North America through the establishment of a system of reserves" (Foreman et. al. 1992, p 3). The process that can be used to achieve the mission of the Wildlands Project is to establish a system of *core* areas that are linked by habitat *corridors* to facilitate the movement of *carnivores* or other species that require large home ranges, commonly referred to as the three C's (Noss

1992; Foreman et. al. 1992; Soulé and Noss 1998). Implementing the reserve design model is a process of "rewilding", which strives to establish the cores, corridors, and carnivores so that "ecological and evolutionary processes reassert themselves across the landscape" (as quoted in Dugelby et. al. 2000, p 18).

The existence of large and mid-size carnivores in ecosystems was traditionally thought to be detrimental to prey species, but the study of ecology has advanced the understanding of how predators play a vital role in regulating herbivore and smaller predator populations (Terborgh et. al. 1999). The herbivore and small predator populations that are unchecked by larger predators experience growth explosions that have dramatic effects on reducing the forage and songbird populations, which upsets the structure, resilience, and diversity of ecosystems (Soulé and Noss 1998). Aldo Leopold first came to grips with this concept in an experience he describes in his 1949 "Thinking Like a Mountain" essay in A Sand County Almanac. In the essay he describes an encounter he had shooting a wolf in the wilds of Eastern Arizona and Western New Mexico,

> *I thought that because fewer wolves meant more deer, that no wolves would mean hunters' paradise. … I have watched the face of many a wolfless mountain, and seen the south-facing slopes wrinkle with a maze of new deer trails. I have seen every edible bush and seedling browsed, first to anemic desuetude, and then to death. I have seen every edible tree defoliated to the height of a saddle horn. ... In the end the starved bones of the hoped for deer herd, dead of its own too-much, bleach with the bones of dead sage, or molder under the high-lined juniper* (p 130)."

Obviously Leopold came to the conclusion that predators were necessary for landscapes and ecosystems to maintain themselves with appropriate structure, resilience, and diversity. Such ecosystems are best achieved by having all the native species, including the predators present, which need large core areas of habitat and connections to other

habitats to facilitate genetic exchange and seasonal migrations. As stated earlier, establishing a system of connected wilderness areas is the best way to achieve the goal of "rewilding".

In the Wildlands Project model, predators and other species are called focal species. Focal species come in various forms, not always large and not always carnivorous. Brian Miller and others (1999) defined six different categories of focal species: Umbrella, Keystone, Flagship, Habitat Quality Indicators, Wilderness Quality Indicators, and Prey.

1. **Umbrella -** species that generally cover large and ecologically diverse areas in their daily or seasonal movements: protection of enough of their habitat to assure a viable population of these organisms would provide habitat and resources to many other species more restricted in range.

2. **Keystone -** species that enrich ecosystem function in a unique and significant manner through their activities, and the effect is disproportionate to their numerical abundance. The extirpation of keystone species often triggers other extirpations and significant changes or loss of habitats.

3. **Flagship -** charismatic animals, such as wolves and eagles, which build popular support for the protected area.

4. **Habitat Quality Indicators -** species that require natural habitat of high ecological integrity and that provide an early warning system of declining ecological conditions because they are sensitive to ecological changes.

5. **Wilderness Quality Indicators -** species that are sensitive or vulnerable to human disturbance and thus require remote, wilderness habitat.

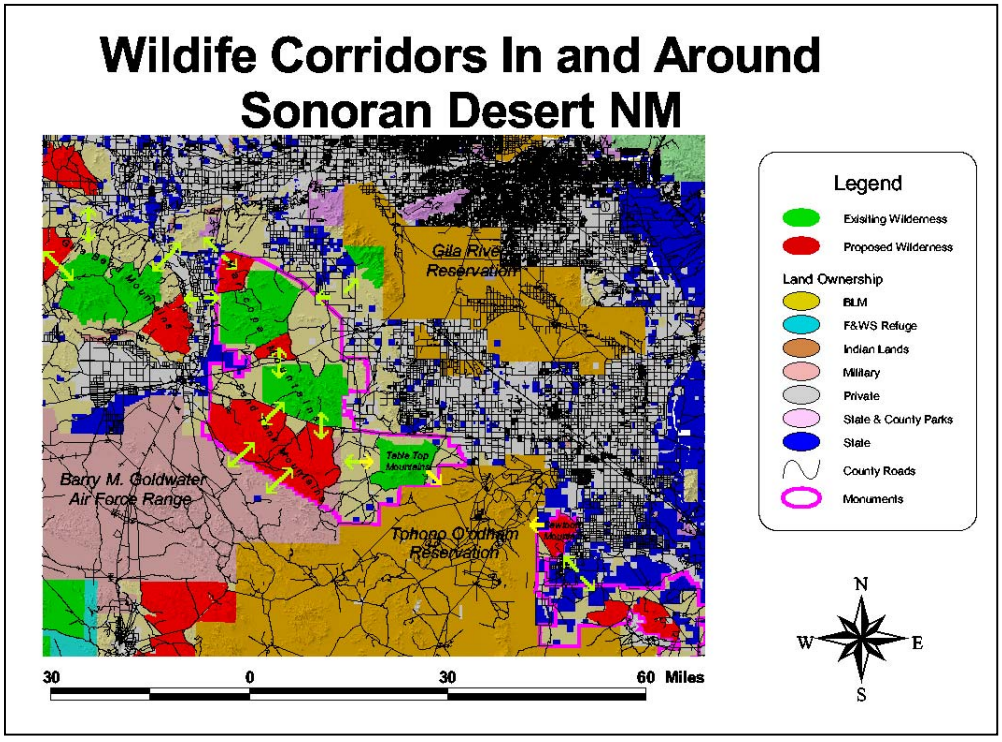
6. **Prey -** key prey species for focal predators in the above categories.

The focal species approach is not single-species management, but management for an array of selected species that depend on various properly functioning parts of an ecosystem for their survival (Miller et al 1999). Choosing focal species that represent various habitats on a variety of scales allows managers to monitor success of wildland

networks by the presence or absence of sustainable populations of a focal species. This thesis and the wilderness proposals contained within uses the focal species concept as a way of evaluating wilderness characteristics and making justifications for the protection of the focal species habitat where it overlaps with units possessing the mandatory wilderness characteristics as described in the methods section of this thesis.

The Sonoran Desert ecosystems have been well-studied over the years, but only recently have scientists and managers begun to consider how best to protect this unique ecological landscape in the face of rapid urbanization. Dale Turner (1999) began to apply the Wildlands Project model in his, "Rewilding the Sonoran Desert, A Conceptual Reserve Design Proposal". In this document Turner made preliminary recommendations on focal species, corridors, and core areas. Turner's recommendations for core areas and corridors are represented in Figure 2. The core areas in Figure 2 match the existing

Figure 2
Map is based on Turner's 1999 recommended core areas and corridors.



(green) and proposed (red) wilderness in the region. The green arrows represent the existing, potential, and threatened corridors for wildlife movement. The mosaic of cores, corridors, and carnivores works based on proper functioning of each part. Establishing the proposed wilderness units in the Sonoran Desert National Monument will greatly assist the network in not only preserving core areas, but also protecting parts of the corridors, and the habitat of the carnivores and other large wildlife species that need undeveloped land to disperse through for mating, and seasonal migrations.

Currently 4.5 million acres or 6 percent of Arizona is protected as Wilderness. Ninety nine percent of the state probably qualified as wilderness Before European settlement. We have not lost that entire ninety nine percent. The Arizona Wilderness Coalition estimates that an additional 6 million acres of public land qualifies for wilderness designation. The time is here to ask whether there is enough left for proper ecosystem functioning? Michael Soulé and John Terborgh (1999) and many others have agreed that functioning ecosystems require much more space than originally thought. Science tells us that wildlife need roadless areas. "Experience on every continent has shown that only in strictly protected areas are the full fauna and flora of a region likely to persist for a long period of time" (Noss et al. 1999, p 99). These strictly protected areas have limited human access, low road densities, and preferably roadlessness (Noss et al. 1999). The most effective tool for protecting these core areas is wilderness designation because of the strict rules it places on motorized access and development. Reed Noss and others (1999) state very clearly that,

> *Conservation strategies that lack meaningful core areas [wilderness areas] are naïve, arrogant, and dangerous. Such approaches assume a level of ecological knowledge and understanding—and a level of generosity and goodwill among those who use and manage public lands—that are simply unfounded.*

In the face of rapid human expansion and settlement the pristine and ecologically important desert lands of the Sonoran Desert National Monument must be protected to sustain the structure, resilience, and diversity of ecosystems for future generations and the wildlife that depends on them. The establishment of protected core areas of habitat as wilderness will greatly assist the BLM in protecting the objects of the Sonoran Desert National Monument by creating and managing a network of connected core areas that will sustain the native carnivores and other large animal populations. As will be explained in the History section of this thesis, accomplishing this goal is not a simple task and has often been met with social and political realities that make protecting the land as wilderness difficult in the least. New wilderness designations in the Sonoran Desert National Monument will pay far greater dividends to the American public and the wildlife that live in these places than any sort of short-sighted management of the land for anything less than its outstanding wilderness characteristics.

III. History

A. The Wilderness Concept

To understand the concept of wilderness it is necessary to explore how the concept originated and became transformed into our modern use and ideas about wilderness. This section explores the ideas of the philosophical wilderness thinkers that gave rise to wilderness as something more than what Aldo Leopold (1949, p 188) referred to in A Sand County Almanac as*, "the raw material out of which man has hammered the artifact called civilization."*

Today wilderness is a land use allocation in most managers' eyes, but it also holds a mystical feel for the general public as it offers solace from our modern hustle-bustle of urban life. John Muir (1901, p56) offered to the civilized world these words on the value of mountains and wilderness,

> *Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you and the storms their energy, while cares will drop off like autumn leaves.*

The plight of our wild places is linked to our desire to acquire wealth and prosperity, to become ever more "civilized" and protected from the perceived danger and glory of the natural world. These past advocates for wilderness experienced the development and settlement of our nation and the ever-increasing separation from nature that was occurring in the name of progress. Over the last one hundred years progress has been made not only in the development of our natural wonders, but also in their protection.

The origins of the concept of wilderness come from individuals such as Henry David Thoreau and John Muir before the beginning of the 20th century. During the mid-to late 1800s, wilderness was viewed as something to be conquered and hammered into a

civilization that serves humans. George Catlin, a lawyer by trade, painter and student of the American Indian by passion, foresaw the extinction of the Buffalo and the American Indian (Nash 1982; Hendee 2002). He was one of the first to realize that during the settlement of the American west we should preserve some of the great frontier because it was "worthy of our preservation and protection" (Nash 1982, p 101). Henry David Thoreau believed that wilderness was the "raw-material of life", that it is essential for human beings as a source of inspiration and strength (Nash 1982, p 88). He didn't mean that it was the only raw material of life to be used for human purposes, but for the good of the human soul. Thoreau espoused these beliefs in 1851 to the Concord Lyceum. Later, in his 1859 journal, Thoreau provided a justification for wilderness and wildness that is still hard for many to accept almost 150 years later. He wrote that some places be kept wild, "for the modesty and reverence's sake, or if only to suggest that earth has higher uses than we put her to" (as quoted in Nash 1982, p 103). Thoreau and Catlin's suggestions for protection were the beginning of an undercurrent for wilderness preservation.

Two years after Thoreau's death, in 1864, Yosemite Valley was given to the State of California by the federal government, "to hold inalienable for all time" (as cited in Hendee and Dawson 2002). This was the first time in history a government had officially put aside a parcel of land for reasons other than extraction of natural resources. Soon after Yosemite was protected, Yellowstone was set aside as the nation's first National Park in 1872 (Oelschlaeger 1991; Hendee and Dawson 2002). The protection of these areas represented an acknowledgement of the idea of federal protection for areas that had outstanding scenic values.

If Henry David Thoreau was the godfather of the wilderness concept, then John Muir is the father. John Muir not only wrote about and traveled in the wilderness of the continental United States and Alaska, but he also strongly advocated for the protection of wild places. In 1892 John Muir and twenty-seven others from Stanford and the University of California at Berkley founded the Sierra Club to promote the enjoyment of the mountains of the Pacific coast, advocate for the values of wild nature, and to protect the Sierra Nevada's forests (Nash 1982; Oelschlaeger 1991). John Muir became the president of the Sierra Club to "be able to do something for wildness and make the mountains glad" (as cited in Nash 1982, p132). This was the first group dedicated to the preservation of nature for its inherent values in and of itself. John Muir inspires the modern-day environmental movement because he traveled in the wilderness, wrote about it, fought for the protection of the wilderness, played a central role in the establishment of numerous National Parks, and set the early stage for wilderness preservation.

In Arizona, John Muir camped on the south rim of the Grand Canyon with Gifford Pinchot in 1896 before they both convinced President Roosevelt to designate this natural wonder of the world as a National Monument in 1908 (Muir 1902; Hughes 1978; Wolfe 1979). There on the south rim of the Grand Canyon they began the debate between preservation and conservation that still goes on today. Gifford Pinchot believed the nation's natural resources should be conserved for the greatest good, for the greatest number, for the longest amount of time (Oelschlaeger 1991). This belief is deeply rooted in the Baconian-Cartesian theory (see page 5). Conservationists believe that the earth and its natural systems should be studied and used to provide for humans needs over all else. Many of the politicians in Washington DC adopted the idea of conservation and used it to

provide justification for the development and wise-use of the west's natural resources (Schulte 2002). The idea of conservation eventually became the champion of science and discarded the ethics that Thoreau, Muir, and Leopold advocated.

Muir believed in preservation of the natural resources for the inherent and intrinsic values that plants, animals, rocks, and water have in and of themselves (Oelschlaeger 1991; Nash 1982). Muir's idea of preservation was that in the natural world, the whole is greater than the sum of its parts (Oelschlaeger 1991). John Muir's beliefs were rooted in what is now called biocentrism or deep ecology, which moves beyond the accepted idea of preservation. Preservation is criticized as being anthropocentric in its values, in that preservation is for human needs above all else. A biocentric perspective, on the other hand believes that all life is valuable (Oelschlaeger 1991; Meffe and Carroll 1997; Hendee and Dawson 2002). John Muir's (1916, p 138) biocentric perspective is best described by a quote from his book A Thousand Mile Walk to the Gulf.

> *Now, it never seems to occur to these farseeing teachers that Nature's object in making animals and plants might possibly be first of all the happiness of each one of them, not the creation of all for the happiness of one. Why should man value himself as more than a small part of the one great unit of creation? And what creature of all that the Lord has taken pains to make is not essential to the completeness of that unit - the cosmos? The universe would be incomplete without man; but it would also be incomplete without the smallest transmicroscopic creature that dwells beyond our conceitful eyes and knowledge.*

In this quote John Muir comes close to developing what Aldo Leopold defined 40 years later as the "Land Ethic". Just like John Muir, Aldo Leopold's words were heard by few compared with the millions who agreed with likes of Gifford Pinchot and the still dominant paradigm of nature as a machine that produces for humans, the pinnacle of creation.

Gifford Pinchot and his following of conservationists became the clear victors in the debate between conservation and preservation when the 1897 Organic Act was passed creating the US Division of Forestry (renamed the US Forest Service in 1905) (Hendee and Dawson 2002; Nash 1982). This important legislation redefined the purposes of Forest Reserves from the original 1891 legislation, to include forest and watershed protection, as well as timber production (USFS Website 2003). The timber production provision made it clear to John Muir that these Forest Reserves were not intended to protect wild nature and he turned his attention to National Parks and Monuments.

B. The Origins of Wilderness Protection

The first calls for official wilderness protection came from Aldo Leopold and Arthur Carhart in the 1920s, both Forest Service employees at the time (Hendee and Dawson 2002). Leopold started his career in the newly created Apache National Forest in Arizona and New Mexico in 1909 as one of the first graduates of Pinchot's Yale School of Forestry. Leopold was cut from the cloth of Pinchot's conservation ethic, but the wild country of the Blue River and the Gila seeped into him like the mountains of the Sierra Nevada did to John Muir. Over the years he spent in the southwest, Leopold developed into the foremost ecological thinker of his time and ours.

Leopold made one of the first official requests for wilderness when he wrote his 1921 article, "Wilderness and Its place in Forest Recreational Policy", in the *Journal of Forestry*.

> *Pinchot's promise of development has been made good. The process must, of course, continue indefinitely. But it has already gone far enough to raise the question of whether the policy of development (construed in the narrower sense of industrial development) should continue to govern in absolutely every instance, or whether the principle of highest use does not itself demand that representative portions of some forests be preserved as wilderness* (As cited in ed. Brown and Carmony 1995, p 146).

This article called for not only the protection of the Gila Wilderness, but a system of wilderness areas in the National Forests. Leopold's proposal was realized in 1924 when the Forest Service set-aside 574,000 acres of the Gila National Forest as a wilderness reserve. His proposal has been further realized today through the creation of the National Wilderness Preservation System.

The Forest Service began its first roadless area inventory in 1926. Roadlessness is a primary characteristic of wilderness. Assessing roadless areas has been a cornerstone of any wilderness inventory, since these first inventories. In this first inventory the forest service only assessed roadless areas of 230,400 acres and found 74 units totaling 55 million acres (Hendee and Dawson 2002). Later, the US Forest Service developed the L-20 regulations in 1929 to protect wilderness-quality lands. These regulations eventually proved inadequate, which lead to the development of the U regulations in 1939 under the direction of Robert Marshall, Chief of the Division of Recreation and Lands in the United States Forest Service (USFS) (Hendee and Dawson 2002). These two policies were created administratively by the Forest Service and could easily be removed

administratively; therefore they did not have statutory regulations prohibiting timber harvesting, road building, and mining activities.

In the meantime individuals such as Robert Marshall and Aldo Leopold formed the Wilderness Society in 1935 (The Wilderness Society 2003). The Wilderness Society was the leading force behind statutory wilderness protection in the long-awaited wilderness act of 1964. Howard Zahniser, Executive Director of The Wilderness Society, drafted the first version of the Wilderness Act in 1955. After 66 drafts and 8 years, President Lyndon B. Johnson signed The Wilderness Act of 1964 on September 3rd 1964. During the drafting and debating of the Wilderness Act Zahniser used these words to justify why wilderness was so important to conservation,

> *Let us try to be done with a wilderness preservation program made up of a sequence of overlapping emergencies, threats, and defense campaigns* (The Wilderness Society Website 2003).

With these words Zahniser made it clear that the administrative protections of the L-20 and U regulations from the US Forest Service would not suffice for protecting America's wild lands. 9.1 million acres in 54 units were initially designated in The 1964 Wilderness Act and today after almost forty years, more than 130 additional wilderness laws have been passed, designating 105,695,176 acres in 662 units in our National Forests, Parks, Wildlife Refuges, and Bureau of Land Management lands (Hendee and Dawson 2002; The Wilderness Society Website 2004). The Wilderness Act of 1964 is one of the most significant preservation laws passed by the United States Congress (see Appendix A for complete text of the law).

To understand the meaning of federal wilderness designation and why it is so significant one needs to comprehend section 2(c) of The Wilderness Act.

> *A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized 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. (P.L. 88-577)*

Scott (2001b) explains that this sentence was carefully crafted by Howard Zahniser to establish the ideal definition of the wilderness character of such areas and create an ideal by which managers and citizen advocates should strive for in the management of designated wilderness. The word "untrammeled" was chosen because it means unrestrained or unhindered, not "untrampled", which has been commonly confused with the meaning of "untrammeled". We must acknowledge that lands previously impacted, disturbed, or even "trammeled" may become part of the Wilderness system, and that the untrammeled wilderness character must be restored and protected after designation (Scott 2001b).

The second sentence in section 2(c) outlines the specific and practical/mandatory wilderness characteristics that each individual unit should contain. It states,

> *An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.* (P.L. 88-577)

Senators Clinton P. Anderson (D-NM), Hubert Humphrey (D-MN), James Murray (D-MT), and Representative John P. Saylor (R-PA) were all leading sponsors of the Wilderness Act and all agreed with Zahniser's wording of the first two sentences of section 2 (c) (Scott 2001a). These two sentences are integral to our concept of

wilderness and our use of the term as a designation. The three mandatory wilderness characteristics as outlined in section 2 (c) are: (1) naturalness, (2) solitude or primitive and unconfined recreation, (3) five-thousand acres or greater. Also in section 2 (c) 4 the fourth and non-mandatory supplemental characteristics of wilderness are described, "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." These supplemental characteristics can include specific habitat for endangered species, a rock-out crop that reveals a piece of geologic history present nowhere else, or a historic trail that was used by native Americans or European explorers. The evaluation and consideration of these supplemental wilderness characteristics, especially the ecological values, can be used as the leading rationale in considering areas for wilderness that may posses less than outstanding mandatory characteristics.

The Wilderness Act allows some uses and prohibits others. Since this statutory protection was created in an imperfect political process some details of what wilderness allows and what it doesn't can be confusing. Table 3, on the following page, is an overview of the major uses and why they may or may not be permitted in designated wilderness. There are a few administrative uses related to wildlife monitoring, relocations/augmentations/re-introductions, and artificial wildlife waters that will be addressed in the Discussion and Results section of this thesis.

TABLE 3
Permitted and Prohibited Activities in Designated Wilderness

Type of Activity	Allowed	Notes
Backpacking/Camping	Yes	Camping is sometimes prohibited in specific places within a wilderness or an entire unit because of its impact on wilderness resources.
Campfires	Yes	Fires are sometimes prohibited to protect vegetation in high use areas or because of fire danger.
Commercial Recreational Guiding and Outfitting	Yes	Section 4(d)(6) permits guiding for realizing the recreational and other wilderness related purposes
Commercial Uses	No	Section 4(c)
Competitive Events	No	Section 4(c)
Dogs	Yes	Dogs are not allowed in most National Parks, which includes any wilderness inside the Parks and in some wilderness areas for protection of sensitive resources, such as limiting disturbance to Bighorn sheep lambing in the Pusch Ridge Wilderness near Tucson, AZ
Grazing	Yes	Section 4 (d) (4) (2) states, Grazing of Livestock is allowed to continue if established prior to designation. Grazing and the continued maintenance and construction of supporting facilities as well as the temporary use of motorized equipment for emergencies and to repair facilities. (H.R. Committee Report 96-617 1980)
Hiking	Yes	
Horseback riding and packing	Yes	Horseback riding is sometimes prohibited in some areas to limit resource damage in sensitive areas or resulting from high use levels
Hunting/Fishing	Yes	Must have valid state hunting license
Commercial Logging	No	Section 4(d)(1) give the secretary of the managing agency authorization to conduct vegetation control for insect infestations, disease, and fire management.
Mining	No/Yes	Section 4(d)(3) addresses mining. Mining may occur on existing claims that were established before the area was designated as wilderness. These claims must be validated and operating plans that ensure minimal disturbance to wilderness characteristics can be approved, but rarely are (Hendee and Dawson 2002).
Mountain Biking	No	Section 4(c) prohibits mechanized travel of any type
Off High Vehicle use or any other motor vehicles	No	Section 4(c) prohibits motorized and mechanized travel of any type
Rock Climbing	Yes	Section 4 (c) prohibits The use of (motorized or mechanized) power drills for placing bolts, and in most areas no new bolts are allowed
Rock collection	Yes	Hobby collecting is allowed, no commercial use.

C. Wilderness and the Bureau of Land Management

The Wilderness Act of 1964 designated wilderness in the National Parks, Wildlife Refuges, and National Forest Lands, but failed to consider 473 million acres of Bureau of Land Management (BLM) lands. In the early 1970s it was estimated that nearly 50-90 million acres of these lands in the lower forty-eight states qualified for wilderness designation (Hendee and Dawson 2002). Many sources say that these were "the forgotten lands" and were not included in the Wilderness Act because they didn't posses wilderness quality. This was partly due to the 1946 BLM establishment mandate to dispose of lands of the public domain and to issue authorizations for grazing and mining (Cooperrider 1995). This mandate made Edward Abbey's 1968 joke about BLM standing for the "Bureau of Livestock and Mining" not that far from the truth in the 1950s and 60s. After some research and discussion I found that wilderness advocates of the day did not think the BLM lands were worthless or of less than wilderness quality, but represented a political and administrative impossibility. In a personal communication from long time wilderness scholar Douglas Scott (July 2003) I found that Howard Zahniser did intend to include all of the BLM lands and even Native American lands in the original 1956 draft of the Wilderness Act by writing that,

> *The System shall also include such units as Congress may designate by statute and such units as may be designated within **any** federally owned or controlled land and/or water by the official or officials authorized to determine the use of the lands and waters involved.* [(S. 4013 June 1956 version of the Wilderness Act) Emphasis Added]

This language was eventually changed because of a combination of two factors. The first was the practicality that no BLM lands had been inventoried for roadlessness or possessed any type of administrative designation recognizing roadlessness or primitive

qualities (Scott 2003, Personal Communication). This fact alone made it impossible to automatically designate wilderness areas on BLM lands at the time of the passage of the Wilderness Act of 1964. Secondly, it was politically difficult at that time to outwardly advocate including any large expanse of BLM lands, which was highly scrutinized by the House Interior and Insular Affairs Committee Chairman, Wayne N. Aspinall (D-Colorado). Furthermore, in 1956 the BLM filed a formal comment letter with the Secretary of Interior's legislative staff that didn't fully disagree with establishing the National Wilderness Preservation System (NWPS), but did raise specific concerns in relation to the BLM's 1946 mandate.

> *We fear, however, that the bill as written, if enacted, would result in an immediate locking up of resources without full consideration of all multiple use principles. …We recognize that there is a national interest in preserving wilderness areas; at the same time, we know that there is a national interest in promoting the development of the natural resources of the country in the national interest. We believe the two national interests have to be adjusted and feel that S. 4013 favors one over the other*. (E-mail communication, Scott 2003)

In the end, after nearly eight years of debate and revisions the Wilderness Act passed the Senate and House of Representatives and was signed by President Lyndon B. Johnson on "September 3rd, 1964" without inclusion of BLM lands.

The history of wilderness legislation and policy described here focuses on the Bureau of Land Management in order to build the context for discussing the findings of my thesis study. Information about the US Forest Service, Park Service, and US Fish and Wildlife Service will be discussed where it provides further detail or explanation. The following historical review of Wilderness on BLM lands is presented to build a foundation for the reader to more fully understand the political realities of wilderness preservation. The Bureau of Land Management (BLM) wilderness history starts with the

passage of the Federal Land Policy and Management Act of 1976 (FLPMA) and is still continuing today with extreme changes in policy occurring due to the agenda of the George W. Bush administration and his political appointments to cabinet level positions.

The discussion of the Wilderness Act prompted House Interior and Insular Affairs Committee Chairman, Congressman Wayne Aspinall to propose the creation of a Public Lands Law Review Commission (PLLRC). On September 19, 1964, President Johnson signed Public Law 88-606 establishing the PLLRC with 19 members and Representative Aspinall as the Chairman (Arizona State University Library 2003). This commission was to make a broad and sweeping review of the public lands, the laws, and policies that they are managed under and make recommendations for future uses (Cooperrider 1995; Arizona State University Library 2003). The PLLRC submitted its final report in 1970 to the President and Congress entitled One Third of the Nation's Land. The report outlined four findings:

1. The public lands are a vital national asset containing a variety of natural resource values.
2. Sound, long-term management of these lands is vital to the maintenance of a livable environment and the well-being of the American people.
3. The national interest will best be realized if the lands and their resources are periodically and systematically inventoried and their present and future use projected through a land use planning process.
4. These lands should be retained in federal ownership (S. Rep. No. 583, 94th Cong., 1st Sess. (1975) as cited in Cooperrider 1995).

These findings led to discussion and subsequent passage of the Federal Land Policy and Management Act of 1976 (FLPMA) giving the BLM a new organic act from which its actions would be mandated (USDI 2003). This law recreated the BLM as a multiple-use agency and mandated that the federal lands be retained in public ownership, inventoried for resource value and use, and undergo land-use planning to fulfill the multiple-use mission, just as the PLLRC suggested (Schlenker-Goodrich 2003a; USDI 2003).

The Federal Land Policy and Management Act of 1976 (FLPMA) is significant not only because it mandated the retention of nearly 262 million acres of federal land for the public good, but it also required that portions of this large public estate be eligible for inclusion in the National Wilderness Preservation System. Section 603(a) of FLPMA gave the initial instruction for BLM to inventory its lands for wilderness characteristics as described in the Wilderness Act of 1964, create Wilderness Study Areas, and report to the President within fifteen years its recommendations for wilderness (P.L. 94-579 § 603(a); 43 U.S.C. § 1782). A Wilderness Study Area (WSA) is an area of roadless federal land or island that has been inventoried and found to contain wilderness characteristics as described in section 2(c) of the Wilderness Act of 1964 (USDI 2001a). Wilderness Study Areas were important in the FLPMA section 603 processes because they provided interim protection for the lands under wilderness study by the BLM. This interim protection was mandated by the "nonimpairment" standard as outlined in section 603(c) of FLPMA,

> *During the period of review of such areas and until Congress has determined otherwise, the Secretary shall continue to manage such lands according to his authority under this Act and other applicable law in a manner so as not to impair the suitability of such areas for preservation as wilderness* (P.L. 94-579 § 603(c); 43 U.S.C. § 1782).

The BLM interpreted this standard to mean that if an area is found to have wilderness characteristics and designated a WSA then BLM must not allow that suitability to be degraded before Congress has a chance to designate or release that land from wilderness consideration. Valid existing rights apply to any mining, grazing or other use occurring before the passage of FLPMA on October 21st 1976. Location of new claims and assessment work were allowed to continue as long as those activities did not impair the wilderness suitability of the area, which made any major mining operation almost impossible (USDI 1995). Those protections were not as strong as actual Wilderness designation, but they created an atmosphere in which everyone, wilderness advocates and predevelopment interests alike wanted a wilderness bill to pass Congress, because under section 603 of FLPMA this was the only way these WSAs could be released for non-wilderness uses (Hoffman 2002, personal communication).

The beginning of the BLM wilderness inventory was also the time when the Forest Service was finishing their second Roadless Area Review and Evaluation (RARE II) to determine what US Forest Service (USFS) lands would be recommended for inclusion in the National Wilderness Preservation System (Hendee and Dawson 2002). The USFS RARE II, National Park Service (NPS), and US Fish and Wildlife Service (USFWS) wilderness review processes were all dictated by The Wilderness Act of 1964. In the late 1970s, about the time these inventories were either initiating or drawing to a close was when the Arizona Wilderness Coalition was in its beginning stages as a volunteer organization. Hendee and Dawson (2002) believe that environmental groups were so busy with the USFS wilderness process that BLM was able to move its process along further and easier than if environmentalists were not distracted by the other agency

processes. This was partly true for the Arizona Wilderness Coalition, but it was really a matter of priority more than distraction, as the USFS lands were going to be and were legislated on much sooner than BLM. It was only natural that more focus be placed on USFS processes.

On BLM lands The Wilderness Act of 1964, National Environmental Policy Act of 1969 (NEPA), and FLPMA all required public participation in the wilderness review processes, which gave concerned citizens, environmental organizations, and industry an opportunity for their opinions to be heard and considered by the federal agencies. The BLM developed a three-phase process of inventory, study, and reporting to carry out the mandate of section 603 in FLPMA (USDI 1987). Within the inventory process BLM completed an Initial Inventory and an Intensive Inventory to determine which areas should become Wilderness Study Areas (WSAs). During each phase of the process BLM provided opportunity for public participation and comment by publishing draft findings and allowing for public comment before publishing decision documents.

Outside of the regular process and on fast-track consideration, there were approximately 34 units totaling 1,934,923 acres in Arizona that had accelerated or special inventories in the following regions:

1. Intermountain Power Project AZ Strip Overthrust Belt oil and gas exploration possibilities
2. Palo Verde Nuclear Plant power lines for Devers and Kyrene California
3. FAA radar facility on Crossman Peak or Harquahala Mountain
4. Coronado NF contiguous inventories
5. Hualapai-Aquarius for a court-ordered grazing EIS

6. Anderson Mine Road

Six Instant Study Areas were created under section 603(a) where the Secretary of the Interior had designated "*natural"* or *"Primitive"* areas previous to November 1st 1975 (P.L. 94-579 § 603(a); 43 U.S.C. § 1782). These Instant Study Areas and some of the units on the AZ Strip (BLM lands north of the Grand Canyon) that were part of the accelerated inventory in the Overthrust Belt (A thought to be highly mineralized formation on the AZ Strip) were quickly reviewed and included in the Arizona Wilderness Act of 1984 and designated wilderness (P.L. 98-406; 16 U.S.C. § 1131).

Instant Study Areas created in Arizona:

1. Aravaipa Canyon Primitive Area
2. Paiute Primitive Area
3. Paria canyon Primitive Area
4. Vermillion Cliffs Natural Area
5. Big Sage Natural Area
6. Gambel-Turbinella Oak Natural Area

The BLM began its regular review process in 1978 with the Initial Inventory, which was designed to eliminate those lands that "clearly and obviously" lacked wilderness characteristics (USDI 1979). The Initial Inventory found that 6,368,500 acres "clearly and obviously" lacked wilderness characteristics out of the total 12.5[3] million acres of BLM land in Arizona (USDI 1979).

[3] Varying sources put the BLM total acreage in Arizona during the 1970s at around 12-13 million the current BLM website gives 12.2 million acres of surface management as its total in AZ as of Dec. 2003

Table 4 provides a quick glance at the acreages and how they changed through the inventory processes. There are some increases in acreage from earlier recommendations to later ones in the table that can only be explained by BLM issuing a modified decision after publishing the final EISs and also the possibility that the accelerated and special inventory units were included in some of the documents and not in others. Table 4 shows Arizona Wilderness Coalition (AWC) submitted proposals totaling 2.1 million acres and that in 1990 Congress designated 133,323 acres over what BLM recommended. This indicates the value of citizen wilderness proposals. A perfect example is the Hassayampa River Canyon Wilderness, which is only 12,300 acres, but it protects perennial water in the eco-tone between the Sonoran Desert and the Central Mountains. BLM did not recommend this unit, and the AWC did. This Wilderness has now been identified as a top priority

Table 4
Facts About the BLM Wilderness Review Process

Initial Inventory 1978	
Acres Dropped From Review	6,368,500
Acres for Intensive Inventory	5,517,400
Number of units Assessed	486
Total Acres Assessed	11,885,900
Intensive Inventory 1979	
WSA acreage	1,941,686
Acres Dropped From Review	2,472,084
Number of Units Assessed	244
Total Acres Assessed	4,413,770
Wilderness Study 1980-1987	
WSA Units Created	81
Acres of WSAs	2,129,140
Units Proposed by BLM	37
Acres Proposed by BLM	977,963
Units Proposed by AWC	70
Acres Proposed by AWC 1987	2,131,411
Current BLM Wilderness	
Units Designated in 1984	9
Acreage Designated in 1984	285,120
Units Designated in 1990	38
Acreage Designated in 1990	1,111,286

conservation site by a 2000 study conducted by the Nature Conservancy (Marshall et. al.).

The process continued in the Intensive inventory, which dropped more units from review and suggested 81 units for designation as WSAs (USDI 1980). Between 1987 and 1989 the BLM published its final Wilderness Environmental Impact Statements recommending 37 units totaling 1,111,286 acres; these recommendations were forwarded to the Secretary of the Interior, the President, and then to Congress, which initiated the Arizona Desert Wilderness Act of 1990 which passed both houses and was signed by the President on January 23rd. The Arizona Desert Wilderness Act of 1990 also designated 1,343,444 acres of Wilderness in Wildlife Refuges (P.L. 101-628; 16 U.S.C. § 1132).

The passage of the Arizona Desert Wilderness Act of 1990 marked the last Wilderness bill to be passed for Arizona. There were six other bills that designated Wilderness in Arizona. Table 5 shows the years, acreage, and number of units designated through these bills. Most areas designated before the Arizona Wilderness Act of 1984 were FS primitive areas or National Park Service lands that had been recommended. As can be seen from Table 5 none of these bills before 1984 designated more than 2 areas, except for the original 1964 Wilderness Act, which only designated those areas that were already primitive areas. The method and the language that was used in the passage of Arizona's

TABLE 5

Wilderness Designation in Arizona		
Year	Units	Acres
1964	5	597,014
1970	2	57,339
1972	2	75,998
1976	2	81,195
1978	2	369,533
1984	35	893,104
1990	42	2,454,730
Total	90	4,528,913
There are 3 Congressionally designated WSAs in Baker Canyon (1990), Cactus Plain (1990) Mount Graham (1984)		

largest Wilderness bills of 1984 and 1990 is representative of the debate that occurred nationally before the 1984 bill was passed. The process that ensued significantly influences the current strategy of wilderness advocacy efforts on all federal lands today.

The original Roadless Area Review and Evaluation (RARE I) was not a direct result of the Wilderness Act of 1964. The Wilderness Act only mandated that previously administratively classified primitive areas and the lands contiguous with these areas undergo inventory, but it did not prohibit such an inventory as is stated in section 3(b) of the Act (Hendee and Dawson 2002).

> *Nothing herein contained shall limit the President in proposing, as part of his recommendations to Congress, the alteration of existing boundaries of primitive areas or recommending the addition of any contiguous area of national forest lands predominantly of wilderness value.* (P.L. 88-577 § 3(b); U.S.C. 16 § 1132 (b))

The Forest Service knew that requests for further inventory and wilderness recommendations would be made by environmentalists under section 3(b), so they decided to be proactive and begin the inventory by initiating the first Roadless Area Review and Evaluation (RARE I) (Hendee and Dawson 2002). The RARE I studies were plagued with accusations of limited public involvement and stringent purity standards that resulted in very little acreage actually qualifying for wilderness protection. When the Forest Service completed the RARE I study they had inventoried 1,449 areas and recommended 274 areas representing 19 percent of the areas inventoried and only 23 percent of the total acreage inventoried (Hendee and Dawson 2002). The dissatisfaction with RARE I was made apparent when Congress, in collaboration with new Forest Service leaders, under President Carter's administration, passed the Endangered American Wilderness Act of 1978. This bill designated some 1.3 million acres created

17 new areas and made additions to many areas that the Forest Service had either ignored in RARE I or recommended against (Roth 1984). The most important thing that came out of the Endangered American Wilderness Act that applies to current issues was House Report (No. 95-540) when it addressed designating the Sandia Mountain Wilderness,

> *The 'sights and sounds' of nearby Albuquerque, formerly considered a bar to wilderness designation by the Forest Service, should, on the contrary, heighten the public's awareness and appreciation of the area's outstanding wilderness values.*

This statement clearly reasserted Congress's intention in using less than an absolutely stringently pure approach to which lands qualify for wilderness protection. This is not the only example of Congress's intent to designate less than absolutely pure areas. In the original Wilderness Act the Shining Rock Wilderness in North Carolina was immediately designated because the Chief of the Forest Service administratively protected this once logged area as a "wild area" in May of 1964, knowing full well that it would be included in the coming wilderness bill (Scott 2001b). Later in 1968 Congress passed a bill (P.L. 90-532) to protect the 3,750-acre Great Swamp Wilderness in New Jersey, which had a paved road splitting it into two units (Scott 2001b). The counties agreed to remove the road and Congress was pleased to designate the area only 30 miles from Times Square in New York City. It can be seen that Congress has demonstrated to the agencies and the public its prerogative to designate areas that have been previously impacted, but (as discussed above) that these areas would be untrammeled and not have any roads after designation. Therefore, the practical criterion is not only based on the physical condition of the land, but on what is needed and wanted by the American public.

Another supporter of the Endangered American Wilderness Act, Robert Cutler (then Assistant Secretary of Agriculture and former director of the Wilderness Society)

also thought RARE I was flawed and initiated a second Roadless Area Review and Evaluation (RARE II). This study inventoried 2,919 roadless areas totaling 62 million acres and was concluded by 1979 (Hendee and Dawson 2002).

In the early 1980s when all of the National Forest RARE II studies were complete Congress was faced with the difficult decision of how to deal with the nearly 60 million acres of forest lands that had been reviewed (Hendee and Dawson 2002). The Forest Service had suggested 15 million acres, while environmental groups believed this was much too low. Industry wanted to see one big omnibus bill that covered all of the RARE II areas with permanent release (hard release) of the areas suggested for non-wilderness. Environmental groups knew that some qualifying areas the FS was not suggesting would not be designated in this type of process and that trying to advocate for these areas in such a large bill would be impossible. Environmentalists advocated for soft release language that would allow areas to be reconsidered in the future. Hard release language would in the end permanently fix the size of Wilderness on National Forest lands, never to be reconsidered again by the agency. Congressional representatives knew that a large omnibus bill would have its problems as well, and they were under intense pressure from constituents to pass a wilderness bill in their home states and districts. It was finally decided that each state would have its delegation bring forth statewide wilderness bills, just as had been done many times in the past with other bills (Hendee and Dawson 2002).

A new problem that arose was a lawsuit filed against the Forest Service in California by Huey Johnson, director of the California Resources Agency. This lawsuit contented that the Forest Service did not meet their NEPA requirements for the RARE II study, as the Forest Service was recommending 2 percent of the Shasta-Trinity NF while

the county's own interdisciplinary committee recommended 48 percent of the Forest for inclusion as Wilderness (Hendee and Dawson 2002). The Forest Service made a fatal flaw by telling the county that they could not and would not follow any county recommendations as the USFS recommendations were based on the larger picture. The court found in favor of the county's claims in the case *California v. Bergland*, and the Forest Service was enjoined from developing the areas under contention until such time as an Environmental Impact Statement (EIS) was written for each of the 46 areas (Roth 1984). This decision prompted national concern that there would be a RARE III, which Congress and environmental groups were not excited about.

The issue now arose that if Congress didn't act and designate lands as well as provide "release" and NEPA "sufficiency" language that prevented further lawsuits based on the RARE II process, wilderness designation and release of the lands not designated would become so difficult that a third RARE process would be necessary (Hendee and Dawson 2002). The problem originated in California and apparently was partly solved in California by a group of congressmen, industry leaders, and environmentalists in preparing the California Wilderness Bill. This group agreed that each statewide bill should have language that proclaimed the RARE II process had sufficiently met the NEPA requirements and that no judicial action could be further taken on this issue.

Interior Secretary James Watt inadvertently solved the issue of hard or soft release language, when he approved mining operations in existing Bob Marshall Wilderness, which prompted public outcry that Congress heard. This protest and the filing of another lawsuit by the Oregon Natural Resources Council claiming RARE II did not meet NEPA guidelines, gave the necessary push for Oregon Senator Mark Hatfield to move his

statewide bill forward in 1984 (Hendee and Dawson 2002). The release language was then worked out between the Chief of the Forest Service and Congress with the compromise of using soft release language that allowed areas to be reconsidered for wilderness, but not until Forest Plan revisions, which occur every 10-15 years (The release Section of the AZ Wilderness Act of 1984 is contained in appendix D). The areas not designated would be open for other types of multiple uses until that time (Hendee and Dawson 2002). This was a victory for both industry and environmentalists because it opened up areas for mineral exploration and logging, but also allowed for wilderness to be revisited in land management planning.

After all of this debate on release language, the 1990 Arizona Desert Wilderness Act and many of the other BLM wilderness bills did not have specific release language that required the BLM to reconsider wilderness in their land management plan revisions. The act did have sufficiency language that prevented any lawsuits claiming that the FLPMA Section 603 wilderness studies were inadequate. Section 102 of the Arizona Desert Wilderness Act also designated two congressional WSAs,

> *[e]xcepting for the Baker Canyon area (AZ-040-070), and the approximately 57,800 acres of public land as generally depicted on a map entitled 'Cactus Plain Wilderness Study Area' dated February, 1990, the Congress hereby finds and directs that all public lands in Arizona, administered by the Bureau of Land Management pursuant to the Federal Land Policy and Management Act of 1976 not designated as wilderness by this title, or previous Acts of Congress, have been adequately studied for wilderness designation pursuant to section 603 of such Act and are no longer subject to the requirement of section 603(c) of such Act pertaining to the management of wilderness study areas in a manner that does not impair the suitability of such areas for preservation as wilderness.* (P.L. 101-628 § 102)

The release language in this section was silent on when and if the released areas could be reconsidered for wilderness in the future. The language did allow the areas not

designated to be released from WSA status and not to be managed for non-impairment under section 603(c) of FLPMA. The assumption of many was that wilderness could be reconsidered in land management plan revisions. The Forest Service Wilderness bills and all of the legislative history has led many, including the BLM, to believe wilderness would be reconsidered either in the form of plan amendments or when the major land management plan revisions occurred.

Rather then rely on assumptions; the BLM and environmental organizations determined that the wilderness question naturally defaults to BLM's Organic Act, FLPMA. FLPMA's section 603(a) states,

> *Within fifteen years after the date of approval of this Act, the Secretary shall review those roadless areas of five thousand acres or more and roadless islands of the public lands, identified during the inventory required by section 201(a) of this Act as having wilderness characteristics described in the Wilderness Act of September 3, 1964 (78 Stat. 890; 16 U.S.C. 1131 et seq.)* ***and shall from time to time report to the President his recommendation as to the suitability or nonsuitability of each such area or island for preservation as wilderness*** (P.L. 94-579 § 603(a); 43 U.S.C. § 1782) (emphasis added).

The clause stating "*from time to time"*, clearly indicates that evaluating wilderness would be done more than once. With the passing of the fifteen-year deadline on October 21st 1991 the BLM's obligation to inventory and protect wilderness character lands using Wilderness Study Areas falls under sections 102, 103, 201, 202, and 302 of FLPMA, as section 603 neither authorizes nor denies further wilderness study after the fifteen-year period. Sections 102 and 103 of FLPMA declare the basic policy by which sections 201, 202, and 302 are to be carried out.

Section 102(a) 8 specifically outlines the policy that,

> *The public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use* (43 U.S.C. § 1701(a)(8)).

This policy statement is consistent with the values for which wilderness is used as outlined in section 4 (c) of the Wilderness Act, and it is reasonable for BLM to interpret this statement by Congress to give BLM authorization to create Wilderness Study Areas in order to assist Congress in meeting its statement of policy under section 102(a) 4 that:

> *The Congress exercise its constitutional authority to withdraw or otherwise designate or dedicate Federal lands for specified purposes and that Congress delineate the extent to which the Executive may withdraw lands without legislative action* (43 U.S.C. § 1701(a)(4)).

This policy statement can be interpreted to mean that congress retains its prerogative to create wilderness areas on BLM lands. It is my opinion that BLM would be failing to meet the intention of the Congress if it does not do everything in its ability to provide the appropriate information to Congress on an area's suitability or non-suitability as wilderness, which is the purpose of Wilderness Study Areas. Furthermore, section 103 (C) provides the definition of the term "Multiple Use" as used in FLPMA.

> *The term "multiple use" means the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and non-renewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various*

> *resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output* (43 U.S.C. § 1702(c)).

This definition of "Multiple Use" constitutes one of the backbones of BLM management philosophies and allows many uses to occur on our public lands. It is important to note that the definition lists "recreation, watershed, wildlife and fish, natural scenic, scientific, and historical values" as resources to manage. Wilderness is a tool that can be used for protection and management of these resource values and fulfills the duty of BLM to "prevent permanent impairment of the productivity of the land and the quality of the environment" as stated in the definition of "Multiple Use" (Schlenker-Goodrich 2003b).

A similar duty of BLM is outlined in section 302(b) of FLPMA "to take any action necessary to prevent unnecessary or undue degradation of the lands" (43 U.S.C. § 1732(b)), once again protection of wilderness-quality lands can help to fulfill this mandate. The balancing of the various multiple uses is the desired outcome of this definition and the fact that only 2.6 percent of BLM land is protected as wilderness makes future wilderness consideration vital to realizing the goals of multiple use management.

Sections 201 and 202 deal more with the implementation of these policy and definition statements that Congress laid out for BLM. Section 201 of FLPMA mandates:

> *The Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values (including, but not limited to, outdoor recreation and scenic values), giving priority to areas of critical environmental concern. This inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values. The preparation and maintenance of such inventory or the identification of such areas shall not, of itself, change or prevent change of the management or use of public lands* (P.L. 94-579, § 201(a); 43 U.S.C. § 1711(a)).

This inventory mandate coupled with the land management planning mandate under Section 202 of FLPMA gave BLM the authority not only to inventory for wilderness characteristics, but also to implement management plan decisions such as creating WSAs to protect wilderness characteristics (Schlenker-Goodrich 2003b). The BLM's 2000 H-1601-1 *Land Use Planning Handbook*, 2001 H-6310-1 *Wilderness Inventory and Study Procedures* manual, and the 1995 H-8550-1 *Interim Management Policy and Guidelines for Lands Under Wilderness Review* were all developed under this well-accepted interpretation of the Federal Land Policy and Management Act. While Section 202 of FLPMA does not specifically mention wilderness, it does direct BLM to, "use and observe the principles of multiple use and sustained yield set forth in this and other applicable law" (P.L. 94-579, § 202(c) 1; 43 U.S.C. § 1712(c) 1). The principles of multiple use and sustained yield do specifically mention wilderness as a resource value and it was determined by BLM that wilderness would be a resource that could be both inventoried for and protected under FLPMA as per the Multiple Use-Sustained Yield Act of 1960 (MUSY) which stated:

> *In the administration of the national forests due consideration shall be given to the relative values of the various resources in particular areas. The establishment and maintenance of areas of wilderness are consistent with the purposes and provisions of this Act* (P.L. 86-517 § 2; 16 U.S.C. § 529).

This act was passed in 1960 and unlike many of the other laws governing land management agencies it is less than two pages long. The original text mentions national forests, but with passage of FLPMA it is meant to include the BLM as well. In 1960 there was no congressionally designated wilderness, so the term used here is meant to imply administrative protection of areas of wilderness, which provides clear direction to

the BLM and its responsibility to administratively protect wilderness characteristics on BLM lands.

D. Arizona Wilderness Coalition, National Monuments, and Land Management Planning

I have discussed the history of wilderness in concept, legislation, and agency interpretation in detail. I have built a solid base of history in order to discuss current issues that are related to the past. Before discussing more agency policy it is important to discuss the Arizona Wilderness Coalition and its strategy, which gives the impetus for the production of this thesis.

As I noted above the Arizona Wilderness Coalition (AWC) was involved in the USFS and BLM wilderness study processes in the 1970s and 80s. During this time the AWC was completely volunteer-based and originally organized as an arm of the Grand Canyon Chapter of the Sierra Club in response to the USFS and BLM planning processes. After the 1990 Arizona Desert Wilderness Act the AWC disbanded because it appeared that wilderness would not be considered again until land management plan revisions were developed. The work the AWC did in the 1980s was amazing! They produced proposals for both National Forest and BLM lands and appeared in front of Congress to advocate for those special places that the Forest Service and BLM were not recommending. The AWC's efforts have had a tremendous effect on wilderness in Arizona.

The AWC reconstituted in December of 2000 with a meeting that was held at the Phoenix Zoo for everyone interested in reforming the Arizona Wilderness Coalition. The force behind this rebirth was a large grant from the Pew Charitable Trust for wilderness efforts in Arizona. The problem was that there was no statewide organization that worked on wilderness in Arizona, except for the disbanded Arizona Wilderness Coalition. At this time, I happened to be making my transformation from wilderness lover and enthusiast to being concerned about the loss of biodiversity and wild places. I found myself doing wilderness inventories on the Prescott National Forest for an independent study with Dr. Paul Sneed at Prescott College and the next thing I knew my mentor and friend Doug Hulmes was suggesting me as a student board member for the AWC.

Over the next year the AWC developed strategy, hired Don Hoffman as our Director and contracted Kim Crumbo at the Grand Canyon Wildlands Council and Matt Skroch with the Sky Island Alliance to advocate for wilderness in those respective regions. The AWC created two graduate fellowship positions at Prescott College to accomplish wilderness inventories and proposals for these RMP processes. I applied for and received one of these fellowships starting in February 2002 to serve as the Central Mountains/Sonoran Regional Coordinator for the AWC. Jay Krienitz was accepted as the other fellow to coordinate efforts in Western Arizona. AWC's strategy was to complete inventories and develop Wilderness Study Area proposals for the 9 BLM Resource Management Plan revisions currently occurring in Arizona. Since its reestablishment the Arizona Wilderness Coalition has made tremendous progress in submitting wilderness proposals for our new national monuments and general BLM

lands, becoming well respected by other non-profits and agency personnel by its mission and actions.

Using the presidential proclamation power given in the Antiquities Act of 1906, (16 U.S.C. § 431-433) in 2001 President Clinton created five new national monuments in Arizona: Agua Fria, Grand Canyon Parashant, Ironwood Forest, Sonoran Desert, and Vermillion Cliffs . The Antiquities Act of 1906 was passed by Congress to give the President power to designate,

> *historic landmarks, historic and prehistoric structures, and other objects of scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be National Monuments, and may reserve as a part there of 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* (16 U.S.C. § 431-433).

Fourteen presidents have used the Antiquities Act over the last 98 years to designate 118 national monuments, 30 of which have been later converted to National Park status by Congress. President Theodore Roosevelt designated Petrified Forest National Monument in 1906 and Grand Canyon National Monument in 1908, which are now expanded and protected as national parks (The Wilderness Society 2002). The presidential power to designate national monuments has provided protection for other national treasures such as Devils Tower (the first national monument), Joshua Tree NP, Saguaro NP, Organ Pipe Cactus NM, Death Valley NP, and Denali NP.

Arizona's new national monuments created in 2001 were all on BLM lands and under the suggestion of Interior Secretary Bruce Babbitt, their management was left in the hands of the BLM. The creation of these monuments and leaving them in BLM hands to manage was done to subtly change the BLM from an agency commonly referred to as the "Bureau of Livestock and Mining", to an agency that protects many of this

nation's natural treasures (Speech given to the AZ Wilderness Coalition at the Phoenix Zoo by Bruce Babbitt March 2002). Three of the monuments created by former President Clinton (Agua Fria, Ironwood Forest, and Sonoran Desert) were located in the Sonoran Desert in Central Arizona. The other two Arizona national monuments were Grand Canyon Parashant and Vermillion Cliffs, both located north of the Grand Canyon. All BLM monuments, wilderness areas, wild and scenic rivers, and national conservation areas are managed as a system of protected lands called the National Landscape Conservation System (NLCS), which was also designed and implemented under Bruce Babbitt's direction to achieve the goal of changing the BLM to a more conservation-oriented agency.

The national monuments and general BLM lands require management plans as mandated by FLPMA section 202, so the BLM began the process of revising their current Resource Management Plans (RMPs) and creating new ones for the national monuments. This prompted the AWC to get things rolling because as mentioned above the opportunity for identifying and protecting wilderness quality lands is in the land management plan revision process. Our main guidance was in the form of the Wilderness Act and the BLM's 2001 H-6310-1 *Wilderness Inventory and Study Procedures* manual. As mentioned above, this manual directed BLM to inventory and consider wilderness in their land management plan revisions. It also directed BLM to consider citizen proposals in section .06 (E) (USDI 2001). Our strategy appeared to be working when in the spring of 2002 the preliminary alternatives for the Agua Fria National Monument recommended three Wilderness Study Areas for the monument.

E. The Bush Administration's Attack on Wilderness

This all changed on April 11th 2003 when Secretary of Interior Gale Norton reached a back-door settlement in a case with the State of Utah, Utah School Institutional Trust Land Administration, and the Utah Association of Counties regarding their 1996 suit claiming the BLM had no authority to re-inventory lands for possible wilderness study (USDI 2003 IM No. 2003-274). Secretary Norton's settlement established new national policy for the BLM that does not allow Wilderness Study Areas to be established through the land management planning process, or wilderness inventory by the BLM, and rescinded the 2001 H-6310-1 *Wilderness Inventory and Study Procedures* manual as well as removed the direction for creating WSAs in the BLM land management planning process from Appendix C page 17 of the 2000 H-1601-1 *Land Use Planning Handbook* (USDI IM No.2003-274). The settlement also disowned the BLM's comprehensive statewide re-inventory of Utah's public lands which recommended 3 million acres of BLM land for WSA status (Schlenker-Goodrich 2003b; Earth Justice 2004). This settlement contradicts Secretary Norton's own policy of "communication, consultation, and cooperation, all in the service of conservation", by not communicating or consulting with concerned parties, such as the Southern Utah Wilderness Alliance (SUWA).

Secretary Norton has never had any intention of conserving federal land for anything but mining, oil drilling, and logging. This should have been obvious to the American public before her appointment to lead the Department of Interior by her previous employment of the Mountain States Legal Foundation (The Wilderness Society 2003). The Mountain States Legal Foundation has been engaged in appeals to the

Supreme Court challenging President Clinton's presidential proclamation of the Grand Staircase-Escalante National Monument since 1996 (Mountain States Legal Foundation 2004). How dedicated could Gale Norton be to protecting our natural wonders, when she was previously in the business of defending the various interests that want federal land privatized and open for extractive uses?

The former Interior Secretary for the Clinton administration, Bruce Babbitt gave an interview with *Sacramento Bee* writer Stuart Leavenworth in July of 2003 and was asked what he thought of the Utah wilderness settlement. He had these words, "It is an unfortunate decision", said Babbitt. He implied that the new policy undercuts efforts to protect and showcase "a fabulous inventory of public lands that have never gotten the attention they deserve."

Secretary Babbitt's comments reflect the views of many wilderness advocates and agree with the Arizona Wilderness Coalition rationale of inventorying BLM lands that were overlooked in past inventories. Some lands have come into BLM ownership through land exchanges and purchases since the FLPMA section 603-wilderness inventories and have never been considered. Almost all the lands in Agua Fria National Monument were not in BLM ownership during previous inventories and 3 units totaling about 35,000 acres were even identified by BLM inventories before the Utah settlement. The 88,000+ acres of the Sand Tank Mountains inside the Sonoran Desert National Monument that were released from the Barry Goldwater Air Force Range in 2001 were also never consider for wilderness suitability.

In response to the Utah settlement, the Arizona Wilderness Coalition and nine other environmental groups represented by Earth Justice have filed papers in Federal District Court in Utah, challenging that the Utah settlement:

1. Unlawfully surrenders BLM's clear authority to inventory for and protect wilderness character lands, as set out in the Federal Land Policy and Management Act of 1976;
2. Violates NEPA, meant to ensure that environmental impacts to wilderness character lands are considered before such lands are degraded;
3. Defies a court order in a federal case in California that required the Interior Department to protect certain areas until BLM decides whether to treat them as wilderness study areas; and
4. Violates the US Constitution by attempting to bind future presidents to an unlawful interpretation of law.

Challenge number one is based on the rationale for BLM's authority to protect wilderness quality lands under sections 102, 103, 201, 202 and 302 of FLPMA. As explained earlier in this section, it is the belief of the AWC that this direction still stands and the AWC will continue to develop wilderness proposals for BLM lands (Schlenker-Goodrich 2003b).

Challenge two makes the case that the settlement violates NEPA in making a decision in any land management plan revision and environmental analysis process that does not consider all reasonable alternatives. Furthermore, NEPA also requires that the agency does not interrupt an environmental analysis process with any decision that may

"prejudice the ultimate decision on the program." [(40 C.F.R. § 1506.1(c); Angell et al 2003)].

The third challenge refers to what has been called the "Watt Drop". The "Watt Drop" describes the actions of Secretary of the Interior James Watt, who, during President Reagan's administration, removed 85 WSAs totaling 1.5 million acres from the FLPMA section 603 study because they had split estate lands, were less than 5,000 acres, or were more than 5,000 acres and received a higher wilderness rating because of adjacent federal lands that had wilderness characteristics (Hendee and Dawson 2002; Zukoski 2003). Split estate lands are lands where the surface ownership is different than the sub-surface or mineral ownership. The Sierra Club sued and in the case *Sierra Club vs. James G. Watt* the federal court in California found in favor of the Sierra Club. The areas were reinstated as 202 WSAs and the Reagan Administration declined to challenge this ruling. This challenge is significant because Secretary Norton's settlement contradicts this case law, and many other instances in cases with the Interior Board of Land Appeals (IBLA) in the early 1980s that found the BLM did have the authority to create WSAs under sections 202 and 302 of the FLPMA (Zukoski 2003).

Challenge four explains that the president's duty to "take Care that the Laws be faithfully executed." (U.S. Const., art. II, § 3) extends to the officers in his cabinet and in this case, Secretary of the Interior Gale Norton has made an illegal interpretation of the FLPMA that binds future administrations unlawfully. In the end, the Arizona Wilderness Coalition believes that once the courts hear this case, that Secretary Norton's settlement with the State of Utah and the policies developed by that settlement will be reversed (Angell et al 2003).

The history of wilderness and its relation to Bureau of Land Management lands is still unfolding and will not be determined by an administration that is focused on economic profits over environmental protection. This background section has covered a wide range of information in relation to wilderness and was intended to give the reader a breadth of knowledge that will be built on throughout other sections of this thesis. The historical roots of wilderness preservation are extremely important to the wilderness community to provide inspiration and even dreams of what it must have been like to walk through places like Yosemite Valley before the rumble and nuisance of automobiles disturbed the peace and tranquility of what John Muir thought of as "God's greatest temple". The legislative struggles and accomplishments of protecting over 100 million acres of wilderness since The Wilderness Act of 1964 remind wilderness advocates that it takes hard work to protect special places, but it can happen with patience. Lastly, the follies and profit-driven agendas of the various administrations remind us that we must be ever vigilant in protecting our wild places.

IV. Methods

The primary methods and criteria used for evaluating potential wilderness in the Sonoran Desert National Monument were adopted from the Wilderness Act of 1964 Section 2(c) (P.L. 88-577 § 2 (c); U.S.C. 16 § 1131 (c)), Bureau of Land Management, Southwest Forest Alliance, Sky Island Alliance, Southern Utah Wilderness Alliance, and senior staff of the Arizona Wilderness Coalition (Walker et al 1997; USDI 2001a; Catlin and Walker No Date). The following information will build on the information presented in the History and Purpose and Need sections and should allow others to duplicate these methods.

The steps used for evaluating wilderness quality lands in the Sonoran Desert National Monument fall into five categories:

1. Identify preliminary units to be inventoried by completing a preliminary historical review of past BLM and citizen (AWC) documents, inventory maps, findings, and recommendations.

2. Field inventory of routes and mandatory wilderness characteristics.

3. Data entry and analysis with Geographic Information Systems (GIS) and develop proposed units and boundaries based on route and mandatory wilderness characteristics inventory.

4. Submission of GIS shapefiles of boundaries to the Arizona State Game and Fish Department Heritage Data Management System (HDMS) for lists of Threatened and Endangered and other special status species for the BLM or AZ Game and Fish Department and research special status species.

5. Display and define boundaries, routes, photos, and photo points using Arcview GIS to display the necessary geographic information for the units and these attributes. Complete historical review, and develop written wilderness proposals that present each unit's mandatory wilderness characteristics, route analysis, and the new and supplemental information including ecological justifications that makes these wilderness proposals significant for the land management planning process. Lastly, write a summary and general justifications section that applies to the entire monument and all wilderness proposals.

The first step is a preliminary review of existing conditions and wilderness areas in comparison to previous BLM and citizen inventories. Kim Crumbo, the Arizona Wilderness Coalition's, Grand Canyon Regional Coordinator, developed the methods for historical review of past BLM documentation. He provided guidance on which BLM and AWC documents should be reviewed to determine potential inventory units (documents listed below). As described in the History section of this thesis, the BLM did its first wilderness inventories as mandated under the FLPMA beginning in 1978. In order to identify units to be inventoried these documents and the accompanying maps were reviewed in comparison with current wilderness and BLM land ownership within the Sonoran Desert National Monument. The Following documents were used in steps 1 and 5 as outlined above.

1. USDI BLM Wilderness Review Arizona Initial Inventory of Public Lands, Decision Report, September 1979 and its accompanying maps

2. USDI BLM Wilderness Review Arizona Intensive Inventory of Public Lands, Proposal Report, May 1980 and its accompanying maps

3. USDI BLM Wilderness Review Arizona Intensive Inventory of Public Lands, Decision Report, November 1980 and its accompanying maps

4. USDI BLM Final Environmental Impact Statement, Proposed Wilderness Program for the Lower Gila South EIS Area, April 1987

5. Arizona Wilderness, A proposal prepared by the Arizona Wilderness Coalition, December 1987

After an initial review of the documentation 12 preliminary units were identified. These preliminary units were identified simply by starting with the *Wilderness Review*

Arizona Initial Inventory of Public Lands, Decision Report, September 1979 large scale maps that identified every potential inventory unit 5,000 acres and greater in the state from existing information. For the purpose of this thesis, I only reviewed lands that are now part of the Sonoran Desert National Monument. I sorted out the units that were already designated wilderness and focused on the BLM lands remaining inside the monument. Next, I reviewed all of the documentation on the identified units in the other documents listed above, in order to glean any specific information that would allow me to sort out any other units. I was looking for details on roads, power lines, communications facilities, mining operations, or any other type of impact to the lands in question that would automatically disqualify them. I found only one detail that led me to believe that the Sand Tank Mountains North (2-167) unit would not qualify due to motorcycle races in the area that had heavily impacted the terrain. I determined that the unit would at least have a field check to confirm this information. Past BLM inventory units that were identified were assigned specific numbers relating to the inventory unit and the BLM Field Office that they existed in. The identified inventory units are listed below with their past inventory unit numbers:

1. Margie's Peak (2-156)
2. Rainbow Valley North (2-158)
3. Rainbow Valley South (2-161)
4. Unnamed unit adjacent to South Maricopa Mountains Wilderness (2-162)
5. Butterfield Stage Memorial (2-164)
6. Sand Tank Mountains North (2-167)
7. Sand Tank Mountains South (2-168)
8. Squaw Tits (2-169), due to this inappropriate name it will only be referred to as unit #2-169
9. Lost horse Tank (2-170)
10. White Hills (2-173)
11. Unnamed unit in Vekol Valley (2-174)
12. 83,554 acres released to the BLM from the Barry M. Goldwater Range (BMGR)

Before the Sonoran Desert National Monument was created the Military Lands Withdrawal Act of 1999 (P.L. 106-65) released approximately 83,554 acres of the Sand Tank Mountains from the Barry M. Goldwater Air Force Range (BMGR) to be managed by the Phoenix Field Office of the BLM. Since this area had never been inventoried by BLM, in 2000 Kim Crumbo (then working with the Southwest Forest Alliance) and many other activists began inventorying this area's routes and wilderness characteristics. In January 2001 when former President Bill Clinton created the Sonoran Desert National Monument this 83,554 acres was included in the monument. When I began my preliminary research in Step 1 in February of 2002 this area was immediately adopted as an inventory unit because it had never been inventoried by BLM.

Of the preliminary inventory units identified in Step 1 only two units moved into the BLM's Intensive Inventory stage: Butterfield Stage Memorial (2-164) and unit 2-169. The Butterfield Stage Memorial (2-164) was the only unit to become a Wilderness Study Area (WSA) and be fully studied for wilderness potential. This unit was not recommended for wilderness by the BLM. In Step 1 the objective was to identify potential inventory units so that field inventories could be focused on specific units in order to collect the most comprehensive field data.

Step 2 involved field inventories of routes and wilderness characteristics of the preliminary units identified in Step 1. Field inventory forms adapted from the Southwest Forest Alliance and the Sky Island Alliance were used to collect data (see appendixes C and D). Materials for the inventory are listed below:

1. USGS 7.5 minute quadrangle 1:24,000 scale maps for each unit, with preliminary unit and monument boundaries highlighted with recent data added showing routes and potential human imprints gathered from current GIS data.

2. USDI Bureau of Land Management 1:100,000 Surface Management Status maps, these maps normally have more recent routes and land ownership status. These maps are very important for preventing the possibility of trespassing on private land, as the 7.5-minute maps do not show land ownership.

3. Digital or regular 35 mm camera, backup or disposable camera.

4. Small dry erase white board 12"x24" for writing photo id number on to be placed in each picture. Numerous dry erase markers.

5. Compass for photo directions

6. GPS unit for photo locations and route mapping.

7. UTM way pointer for marking GPS locations on maps

8. Inventory forms (see Appendix E and F)

The main purpose of the field inventory was to identify roadless units and assess the wilderness character of those units. The Arizona Wilderness Coalition BLM Ground-Truthing Form (Appendix E) was used to collect data on routes and impacts along or associated with those routes. The Arizona Wilderness Coalition Field Photo Sheet (appendix F) was used to record each photo location, description, and direction. Those completing the inventory were directed to take photos of any human impact on the landscape as well as take frequent photos of scenic vistas, examples of apparent naturalness, and opportunities for solitude or primitive and unconfined recreation as outlined in section 2 (c) of the Wilderness Act of 1964. The specific criterion for assessing mandatory wilderness characteristics in the inventory units was obtained from BLM's 2001 *Wilderness Inventory and Study Procedures H-6310-1* manual. This specific criterion was used to determine what questions to answer and how to present the

information to BLM. Examples of how this criterion was applied can be seen in the wilderness proposals contained in the Discussion and Results section of this thesis.

In each identified inventory area every route was traveled by vehicle or foot. During the inventory any route that was encountered in the field that was unmapped or intruded into the inventory unit was mapped and assessed using the inventory form. Preliminary recommendations on closures were made in the field for each route and reviewed later when the data viewed in GIS. One-time vehicle tracks that were encountered were noted as one time cross country travel and photographed, but were not inventoried. The inventory was complete when the entire boundary of the preliminary unit had been traveled and documented using the processes described above.

In Step 3 the inventory data was compiled, reviewed, and decisions were made about which units qualified for wilderness and which ones did not. Further analysis was done to determine what the proposed boundaries for each unit that qualified would be.

In Step 4 I collected the necessary information in relation to threatened and endangered species by submitting the GIS shapefiles for my proposed units to Sabra Schwartz, the Heritage Data Manager for the Arizona Game and Fish Department's Heritage Data Management System. Sabra Schwartz quickly processed my request for all threatened, endangered, and special status species occurring in each proposed unit and provided me with Excel spreadsheets with all pertinent species status information. This information combined with research based on the principles of conservation biology explained in the Purpose and Need section of this thesis and was used to assess how wilderness protection would benefit and further the protection of the various threatened, endangered and special status species of the proposed wilderness unit. This information

became an integral piece of fulfilling the new information requirements in section .06(E) of the BLM's Wilderness *Inventory and Study Procedures H-6310-1* manual and the USDI IM No. 2003-275 pages 4-5, 8.

Step 5 was the final research and analysis that lead to the presentation of the data for the final wilderness proposals contained in the Discussion and Results section of this thesis. The historical documentation was reviewed and in some cases critiqued, highlighting why past BLM inventories were inadequate in identifying and protecting wilderness characteristics. The format for presenting my results was developed using a combination of the BLM's *Wilderness Inventory and Study Procedures H-6310-1* manual guidelines and suggestions from Kim Crumbo. Mandatory wilderness characteristics are thoroughly documented and referenced to the BLM manual guidelines and the Wilderness Act of 1964. ESRI's ArcView GIS was used to create and display all of the unit boundaries, inventoried routes, and photo points. Photos were arranged by route and final route analysis was performed using the photos, completed Arizona Wilderness Coalition BLM Ground-Truthing Forms, and the AWC Field Photo Sheet. For a complete example of the route analysis format see the Discussion and Results section of this thesis. The supplemental and new information was provided for both the individual units in the unit proposals and in the Purpose and Need and History sections, as some of the new and supplemental information is landscape and regionally based applying to all units. Finally, the general justifications were written (see Purpose and Need, and History sections of this thesis) giving a detailed explanation of big-picture legal, social, and scientific justifications for new wilderness in the Sonoran Desert National Monument.

The Discussion and Results section of this thesis will display how these methods have been implemented. The data collected to produce this proposal and others like it by the AWC is currently in the process of being further preserved in electronic format completely within ArcView GIS. This means that all inventoried routes, photo points, and photos along with descriptions on the inventories will be available at the click of a button in the AWC GIS system. This major undertaking will take years to perfect, but will ultimately provide baseline data for all of the inventoried wilderness units in Arizona. This will allow staff and volunteers to re-inventory areas and document further degradation or reclamation due to various land management decisions made for a specific unit.

Ultimately, Congress makes wilderness designations and the information from AWC reports will be provided to Congress so they may make the best decisions on what should and should not be wilderness. This report focuses on providing the BLM accurate information on lands that contain wilderness characteristics in the Resource Management Plan revision process with the hopes that these lands will receive interim protections. The methods for wilderness inventory described here represent the first steps on the trail to new wilderness designations. Identifying what should be wilderness is easy in comparison to building the public support that is needed for the passage of a wilderness bill.

The methods described here can be improved upon or they can be used more loosely by a variety of entities from government agencies, to the single citizen who wants to protect a special place as wilderness. The methods are important so that wilderness advocates have solid research and specific knowledge about the places we are advocating for.

V. Discussion and Results

A. Overall Findings

Seven of the twelve units that were inventoried were found to posses the mandatory wilderness characteristics of 5,000 acres or greater, apparent naturalness, and opportunities for solitude or primitive and unconfined recreation as required by section 2(c) of the Wilderness Act of 1964. Portions of The Sand Tank Mountains South (2-168) unit, unit #2-169, and the west side of the 83,554 acres of released land from the BMGR were grouped together to create the 56,062-acre Sand Tank Mountains West unit. Portions of the Lost Horse Tank (2-170) and the east side of the 83,554 acres of released land from the BMGR were grouped together to create the 52,648-acre Sand Tank Mountains East unit. The 14,739-acre Margie's Peak (2-156) and 9,605-acre Butterfield Stage Memorial (2-164) were retained as individual units (see figure 1). The White Hills Unit (2-173) was not adequately inventoried and will require further review as it is over 12,000 acres and seems to meet the mandatory wilderness characteristics outlined in section 2(c) of the Wilderness Act. Unfortunately, this thesis will not contain the review for the White Hills because of the lack of time to complete the field inventory required to fully assess this unit. In the analysis of the inventory data for the Sonoran Desert National Monument 5 units were dropped from further review:

1. Rainbow Valley North (2-158)
2. Rainbow Valley South (2-161)
3. Unnamed unit adjacent to South Maricopa Mountains Wilderness (2-162)
4. Sand Tank Mountains North (2-167)
5. Unnamed unit in Vekol Valley (2-174)

The field inventory for these units revealed that they were heavily roaded and generally appeared unnatural in character. Numerous livestock improvements and Off Road Vehicle tracks were documented, impacting the naturalness of these units. These findings influenced the decision to drop these units from further study. Photos SDNM-2-25, 54 show examples of the conditions that prevail throughout the dropped units.

SDNM-2-25: Severe impacts from Off Road Vehicle abuses in area that are prevalent throughout the unit.

SDNM-2-54: Severe erosion from Off Road Vehicle abuse and route proliferation

The Presidential proclamation of five new national monuments here in Arizona and numerous others in other states has created a challenge for the BLM. This new challenge is to manage these national monuments for the "proper care and management of the objects to be protected," as named in the January 2001 Presidential Proclamation for Sonoran Desert National Monument, under the authority of the American Antiquities Act of 1906 (16 USC 431-433). Many of the philosophies and techniques of multiple use management will be a great assistance to the BLM in their new responsibilities to protect the objects of the national monument. However, this does not mean that successful management of the monument can be done using multiple use strategies of the past. Acknowledging that not all the multiple uses can or should occur on monument lands and using the more protective strategies of multiple use, such as wilderness protection, will greatly assist BLM in making the right decisions to protect the objects of the monument

The Wilderness Act fulfills an important niche in the scheme of multiple use. It protects those resource values explained in the multiple use definition. This definition also explains that all activities should occur, "without permanent impairment" P.L. 94-579, § 103(C); 43 U.S.C. § 1702(C) (see History section for more detail on multiple use). The obligation of the BLM to facilitate the multiple use of the public lands "without permanent impairment" can best be achieved by protecting areas as wilderness. Wilderness has no permanent improvements and is managed to preserve the natural conditions of the land. The BLM's 2001 *Wilderness Inventory and Study Procedures* manual H-6310-1 sec .06 clearly states, "Wilderness is a resource which fits within the framework of multiple use on the public lands." Furthermore, wilderness protection should not only be used as a management technique to facilitate recreation as it has traditionally been viewed, but used

as a way to, "prevent unnecessary or undue degradation" of the lands in the monument. P.L. 94-579, § 302(B); 43 U.S.C. § 1732 (B).

The BLM must consider the intention of the Wilderness Act in meeting the needs of Americans and Arizonans. Meeting America's "present and future needs", should take into account that population has grown by 40 percent in Arizona since 1990 (US Census Bureau 2000). If Arizona continues to grow at this rate wilderness will become an enduring resource as a place for citizens to seek solitude from the millions of people inhabiting the Phoenix and Tucson areas. The BLM manual H-6310-1 sec .06, addresses the supplemental values of wilderness for people and for protecting other resources such as plants and wildlife, "In addition to its value as setting for primitive recreation or solitude, wilderness can provide a range of benefits to other resource values and uses which are of significance to the American people." In section 2(a) of the Wilderness Act of 1964 congress addressed similar intentions to "secure for the American people of present and future generations the benefits of an enduring resource of wilderness". It was the intention of Congress to protect valuable lands as wilderness in the instance of such population growth Arizona is experiencing. Arizona's Wildlands and especially wildlands within national monuments should be preserved as wilderness to protect the resource values for the expanding population of Arizona.

The AWC believes that the order of operations for management of the Sonoran Desert National Monument starts with the January 17th 2001 proclamation and that any activity or management option should be in full agreement with the protection of the objects identified in the monument proclamation. Multiple use management techniques can be used to manage the Sonoran Desert National Monument, but not all uses can or

should occur within the monument. Furthermore, new wilderness protections as explained here will be one part of the land management mosaic that the BLM should use to protect the objects of the Sonoran Desert National Monument.

Examples of national monuments and parks using wilderness to protect valuable resources abound here in Arizona and the Southwest. The following parks were all national monuments to begin with and are listed below with the percentage of total land as wilderness: Joshua Tree National Park 54%, Saguaro National Park 78%, Petrified Forest National Park 53%, Organ Pipe Cactus National Monument 94%. If the lands proposed for wilderness in this proposal were designated as wilderness then the 498,407 acre Sonoran Desert National Monument would be 58% wilderness with a total of 290,767 acres of wilderness. In many of these parks and monuments previously abused lands have been restored and enhanced to meet wilderness criteria. The various justifications listed here should provide the BLM, with more than adequate justification for considering and using wilderness as a tool to protect the objects of the Sonoran Desert National Monument.

On April 23, 1937 Franklin Roosevelt created The Organ Pipe Cactus National Monument using his Presidential Proclamation power under the Antiquities Act of 1906. Organ Pipe Cactus National Monument is approximately 40 miles south of the Sonoran Desert NM, and was created to protect the rare Organ Pipe Cactus and 26 other cacti species. The uniqueness and importance of the area is in the rarity of the organ pipe cactus, and the even more rare senita cactus, both of which are found nowhere else in the United States. The National Park Service now manages 312,000 acres of Organ Pipe NM as Wilderness, as designated in 1978 (Browning et al 1988). Organ pipe NM is 330,668 acres making it 94 percent wilderness. The objects in both Organ Pipe Cactus NM and Sonoran

Desert NM are very similar and the Organ Pipe Cactus NM sets a good example of how Wilderness can be used to effectively protect the objects of the monument as designated under the Antiquities Act of 1906. At the writing of this thesis Organ Pipe Cactus National Monument and adjacent borderlands are experiencing tremendous impacts associated with undocumented immigration and drug smuggling. Vehicles carrying drugs and immigrants are crossing the international border between the United States and Mexico in remote regions and entering the Wilderness of Organ Pipe Cactus National Monument and Cabeza Prieta National Wildlife Refuge. This problem is currently being addressed at many levels and management of the designated wilderness will be an integral tool to restoring the impacts that have been caused by the illegal crossing of the international border and the efforts to control these crossings.

The remainder of this thesis presents the Arizona Wilderness Coalition Wilderness Proposals for the Sonoran Desert National Monument. It is the recommendation of the Coalition that the Sand Tank Mountains East and West, Butterfield Stage Memorial, and the Margie's Peak units be protected for their wilderness characteristics above all other uses in the creation of the Sonoran Desert National Monument Resource Management Plan.

B. Butterfield Stage Memorial

Unit Description

The Butterfield Stage Memorial proposed wilderness in located in Maricopa County directly south of the existing North Maricopa Mountains Wilderness inside the Sonoran Desert National Monument. It is approximately 12 miles east of the community of Gila Bend and 22 miles west of Maricopa. Elevation in the unit ranges from 2,766 feet atop Estrella Mountain to 1200 feet on the gently sloping western bajada. The primary vegetation communities consist of palo verde/saguaro in the higher mountains with an abundance of cholla cacti. The bajada areas contain saguaros, triangle bursage, and an abundance of creosote (USDI 1987). The washes are lined with thicker stands of palo verde and ironwood trees providing habitat for birds and mammals. The unit also is host to high quality desert tortoise and bighorn sheep habitat. mule deer, gambel's quail, mountain lions, red tail hawks, and numerous species of reptiles also inhabit this unit.

The unit's name comes from the 1858 government contract issued to New Yorker, John Butterfield and his Butterfield Overland Mail Company to complete an overland mail route from St Louis to San Francisco passing through the southern deserts to Fort Yuma (www.discoverseaz.com 2004). This route passes through the Sonoran Desert National Monument and forms the northern boundary of the proposed Butterfield Stage Memorial Wilderness.

Wilderness Characteristics

Size: 9,618 acres

Naturalness

The Butterfield Stage Memorial proposed wilderness "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable" as outlined in section 2(c)(1) of the Wilderness Act of 1964. This unit is made up of the southern end of the North Maricopa Mountains and contains numerous rugged ridges and valleys falling away to the desert bajadas. The vegetation is mostly palo verde/saguaro with cholla, ocotillo, prickly pear, and numerous other species of small and large cacti. The thick stands of saguaros, continuous with the North Maricopa Mountains Wilderness and surrounding areas rivals that of Saguaro National Park. There has been relatively little disturbance of the natural systems in this area due to its rugged character. The few impacts that are present are 2.5 miles of user created routes that are "substantially unnoticeable". These routes will easily return to natural condition with little effort. Maps, complete descriptions, and analysis for these routes are included in the end of this report. There are no range improvements other than fences inside this unit and no AZ Game and Fish water catchments.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation

The Butterfield Stage Memorial proposed wilderness unit possesses both opportunities for solitude and primitive and unconfined recreation. The opportunities for both exist within most of the unit. The BLM's *Wilderness Inventory and Study Procedures* manual H-6310-1.22 section (b)(1) gives direction on the assessment of solitude in inventory units. In this section five features for evaluating solitude are given.

a. **Size and configuration:** The unit meets the 5,000-acre size criteria, and it is not long and narrow or have irregular extensions or "cherry stems".

b. **Topographic screening:** There are many steep ridges and small canyons that surround the highest point of Estrella Mountain that visitors can find solitude on and around. These ridges and canyons provide outstanding isolation and solitude from other visitors as well.

c. **Vegetative screening:** In the mountains and bajadas the vegetative screening is exceptional with stands of saguaro and palo verde. Inside and along washes the vegetative screening increases with mature stands of palo verde and ironwood trees. While the nature of the desert landscape does not provide outstanding screening, it is always surprising how isolated one can feel only short distances from roads or other people.

d. Ability of user to find a secluded spot: It is not difficult to find seclusion in the many washes and small canyons that fan out from Estrella Mountain.

e. **Presence of outside sights and sounds:** The Butterfield Stage Memorial unit is bounded on all four sides by roads, which have little effect on the solitude

that can be experienced inside the unit. The southern boundary is at State Highway 238 and does have some effects on solitude, as this is a paved road and has higher volumes of traffic than the other dirt roads that surround the unit. Outstanding opportunities for solitude can still be easily found in the interior of the unit.

Primitive and Unconfined Recreation

The Butterfield Stage Memorial unit provides for a variety of primitive and unconfined recreational activities. "'A primitive and unconfined type of recreation' refers to those activities that provide dispersed, undeveloped recreation which do not require facilities or motorized equipment" (USDI 2001a [H-6310-1, Section .22(A)(1)(b)(2), page 22]). The Butterfield Stage Memorial unit offers various levels of hiking from flat walking in the bajadas, to rock scrambling on the peaks and ridges. Backpacking, hunting, photography, bird watching, and sightseeing for botanical and zoological features are all possible primitive and unconfined recreational opportunities within the Butterfield Stage Memorial proposed wilderness. Access to all sides of the unit is extremely easy because roads bound the entire unit, offering visitors a wide array of choices in where to access the unit. Opportunities for backpacking are excellent if trips are combined with the North and South Maricopa Mountains Wildernesses. Overnight camping is available on the area's western bajada and eastern canyons.

Supplemental Values and New Information

The Butterfield Stage Memorial unit has numerous supplemental wilderness values that will best be protected through wilderness designation. Section 2(c)(4) of The Wilderness Act clearly explains what supplemental values are, "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value" (P.L. 88-577 § 2(c)(4); 16 U.S.C. § 1131 (c)(4)). The BLM was directed by Congress in the 1976 FLPMA (House Report 94-1163) to consider the full realm of natural values that roadless areas provide:

> *Emphasis should be on multiple natural values of roadless areas as part of an overall multiple use framework for a general area rather than primarily recreational uses. In addition to the public recreational use values, interim protection of the area as a WSA and possible future designation as wilderness should augment multiple use management of adjacent or nearby lands in protecting watershed and water yield, wildlife habitat preservation, preserving natural plant communities and similar natural values.*

Protecting the Butterfield Stage Memorial unit as wilderness will provide protection for an array of natural and cultural resources such as prehistoric cultural sites, historic travel corridors, vast stands of saguaros, and help sustain viable populations of bighorn sheep and Sonoran desert tortoise. The Butterfield Stage Memorial proposed wilderness is completely within the Sonoran Desert National Monument, which was designated to protect the uninterrupted stands of saguaro, populations of bighorn sheep within the Maricopa Mountains, and the historic and prehistoric artifacts that are spread through out the monument (USDI 2001b). The Butterfield Stage Memorial unit contains many of objects identified in the January 2001 Presidential Proclamation creating the monument, which provides significant supplemental values giving justification for protecting this unit as Wilderness.

The various supplemental cultural values range from prehistoric habitation sites and travel corridors to the historical use of Butterfield Pass as a shortcut for the Butterfield Stage route between the Santa Cruz and Gila rivers. The unit contains numerous shell and lithic scatters associated with prehistoric travel (see photos NM-1-19, 20). In 1987 BLM reported that 4,480 acres of this unit were culturally sensitive because they contained evidence of "prehistoric rockshelters, rock rings and habitation sites" (USDI 1987: 78).

The historic Butterfield Stage Route forms the northern boundary, which was first used in 1858 by the Butterfield Overland Mail Company to complete an overland mail route from St. Louis to San Francisco passing through the southern deserts to Fort Yuma (Discover Southeast Arizona 2004). The Spanish explorer, Juan Bautista de Anza, first used the route in his 1775 expedition to take settlers to the Pacific coast to colonize near the San Francisco Bay area. It is also the route used by the Mormon Battalion in 1846 when they marched from Council Bluffs, Iowa, to San Diego California using the route through Butterfield Pass. This 2,000-mile march was the longest in US history (US Mormon Battalion, Inc. 2004). The proposed Butterfield Stage Memorial does not protect the route itself, but it does protect the scenery and landscape that these expeditions experienced during their travels across the desert. The route provides an excellent experience for motorized users as it has interpretive signs along its length telling the tale of the Butterfield Stage and it is a relatively easy route, lending itself to family outings and other motorized users who prefer to initially experience the desert from a vehicle.

Sensitive species are considered a supplemental value that must not be overlooked. Species such as the Sonoran desert tortoise and bighorn sheep can be used as focal species because protection of these species for the long-term will help to ensure healthy ecological processes for their habitat areas (Soulé and Noss 1998). The Butterfield Stage Memorial proposed wilderness would protect these species more fully than leaving the area open for more road building and other developments that could be proposed on other BLM lands within the monument. Below and attached as appendixes are reviews of why these species need wilderness for effective populations to continue in the Sonoran Desert. All species described here are at risk and would be more adequately protected with wilderness designation. Occurrence and status information was determined by submitting GIS shapefiles to be queried in the Arizona Game and Fish Heritage Data Management System (HDMS) in March of 2003.

Sonoran desert tortoise *Gopherus agassizii* (Sonoran population)

The unit contains valuable habitat for the Sonoran desert tortoise, which is considered a species of concern for the US Fish and Wildlife Service and the Arizona Game and Fish Department (HDMS 2003). In the 1987 Wilderness FEIS BLM concluded that the Butterfield Stage Memorial unit contained 2,870 acres of crucial Desert tortoise habitat that supported 220 adult Desert tortoises. Current population estimates are unknown, but with an increase in motorized and non-motorized recreation these numbers have probably declined and would be further protected by wilderness protection. The literature review and documentation included in Kim Crumbo's, *Roads and Desert Tortoise: The Impact of Roads on the Threatened Desert Tortoise* in

Appendix G of this proposal clearly demonstrates that sustainable Desert tortoise populations will be best protected by reducing road densities and limiting access to Tortoise habitat. Wilderness protection clearly offers the most protective and long-term tool available to federal land managers such as the BLM to accomplish these tasks.

desert bighorn sheep *Ovis canadensis mexicana*

The desert bighorn sheep is a charismatic animal that over the millennia has become well adapted to the harsh desert conditions. The desert bighorn sheep is a heavily managed species in the Sonoran Desert, but the historical carrying capacity of its habitat in the many desert mountain ranges is not well known. In the 1987 Wilderness FEIS BLM claimed that there were 6,310 acres of crucial habitat for this species in the Butterfield Stage Memorial unit, and that about 10 adult sheep roamed the area because of its contiguous borders with the North Maricopa Mountains Wilderness. The desert bighorn sheep represents three different types of focal species status: flagship, habitat quality indicator, and wilderness quality indicator (Parsons 2003).

Its status as a flagship species is justified in that permits for hunting this species are typically auctioned off at $125,000 and more at an annual Desert Bighorn Sheep Society fundraiser. Hunters and people who enjoy watching wildlife find viewing or hunting Bighorns a privilege that is far too uncommon. The desert bighorn sheep can be used to promote conservation and habitat protection because if people respect and enjoy this majestic species then they are more likely to want to protect what it needs for survival.

The desert bighorn sheep is a habitat quality indicator because it requires a very specific habitat of steep slopes greater than 55 percent, and free of visual obstructions or

dense vegetation (Krausman et. al. 1999). Many estimates have been made on appropriate population numbers and habitat size requirements. The Butterfield Stage Memorial unit does not represent on its own a large core area of habitat, such as the North and South Maricopa Mountains Wildernesses. However, it is essential connective habitat that is only split by state route 238 and the railroad on the south side from the South Maricopa Mountains, and by the historic 4-wheel drive Butterfield Stage Route on the north from the North Maricopa Mountains Wilderness. Parsons (2003) recommends 48 square miles with 890 acres of suitable lambing habitat for viable sub-populations, which is represented in the North and South Maricopa Mountains Wildernesses. Parsons (2003) and Krausman and Leopold (1986) both warn against overlooking the value of habitat patches of 4 square miles or more near larger habitat areas. These smaller habitat areas, such as Butterfield Stage Memorial, can provide valuable migration and dispersal corridors, and serve as seasonal or part time habitats for individual bighorns (Parsons 2003). Butterfield Stage Memorial unit without a doubt provides habitat for the Maricopa Mountains bighorn populations, but it could also provide valuable dispersal corridor to the South Maricopa Mountains Wilderness. The existence and persistence of desert bighorn sheep in the Butterfield Stage Memorial unit will best be continued by protecting the unit as wilderness and closing the routes recommended by the AWC to protect the bighorn sheep from potential disturbance from motorized recreational activities.

Lastly, desert bighorn sheep are considered wilderness quality indicator species because they inhabit the most beautiful, rugged, and inaccessible terrain that is normally representative of wilderness. Bighorn sheep populations are often more robust in areas

where there is more wilderness and roadless land than any other land allocation, such as the southwestern deserts of Arizona's Cabeza Prieta NWR, Organ Pipe Cactus NM, and Barry M. Goldwater Range. Hopefully the Sonoran Desert NM can continue to be high quality habitat for this species with inclusion of the Butterfield Stage Memorial unit into the National Wilderness Preservation System.

Historical Review: The Arizona BLM Wilderness Inventory (1978-87)

The BLM's initial wilderness inventories were completed under the requirements of section 603 of the Federal Lands Policy and Management Act (FLPMA) of 1976. The BLM started an initial inventory of all public lands under their management in Arizona and sorted out all lands that "clearly and obviously" lacked wilderness characteristics. Through this process the Butterfield Stage Memorial (unit # 2-164) was chosen for further study as an initial inventory area. In the initial inventory process started in 1978 the BLM reported in their *Wilderness Review, Arizona Initial Inventory of Public Lands Administered by Bureau of Land Management Decision Report September 1979* that, "Comments were not specific enough to eliminate the necessity of field work for any portion of this unit. This entire unit will be intensively inventoried" (USDI 1979).

The BLM's *Wilderness Review, Arizona Intensive Inventory of Public Lands Administered by Bureau of Land Management Proposal Report May 1980,* states that, "The unit is essentially natural with man's work substantially unnoticeable" (USDI 1980a). The BLM also recognized the outstanding opportunities for solitude and primitive and unconfined recreation by stating, "The diversity of terrain and vegetation combine to provide an outstanding opportunity for solitude. While opportunities exist for

primitive and unconfined recreation, these are not outstanding because they are limited by the area's small size" (USDI 1980a). These findings are consistent with the direction given to BLM in the *Wilderness Inventory Handbook, Policy, Direction, Procedures, and Guidance for Conducting Wilderness Inventory on the Public Lands September 27, 1978*. The point that is not mentioned in the initial and intensive reviews is the supplemental values of prehistoric, historic, and ecological value for desert bighorn sheep and desert tortoise. The 1978 *Wilderness Inventory Handbook* did direct BLM to include these supplemental values in the intensive review process, but they were left out of the documentation in these phases.

The Butterfield Stage Memorial did become a WSA through the process described above and was further studied through the Wilderness EIS process completed by the BLM in 1987. In BLM's FEIS for the Lower Gila South EIS Area they did not recommend the Butterfield Stage Memorial for inclusion in the National Wilderness Preservation System. The primary reasons for this recommendation were that the unit's small size (9,566 acres) would only provide outstanding opportunities for solitude for a limited number of people and the steep terrain's funneling affect would make visitor contacts more likely (USDI 1987). In the BLM's FEIS they stated, "Opportunities for primitive and unconfined recreation are limited because the WSA's small size precludes extensive backcountry travel" (USDI 1987: p 78).

These rationales are faulty in that the BLM did find that the unit provided outstanding opportunities for solitude, but made a purity judgment on how many people would and could use the unit and experience solitude. The Wilderness Act section 2(c) and the BLM's 1978 *Wilderness Inventory Handbook* interpretation of this section only

requires that the unit posses "outstanding opportunities for solitude **or** a primitive and unconfined type of recreation" (USDI 1978; (P.L. 88-577 § 2(c)(2); U.S.C. 16 § 1131 2(c)(2)) (emphasis added).

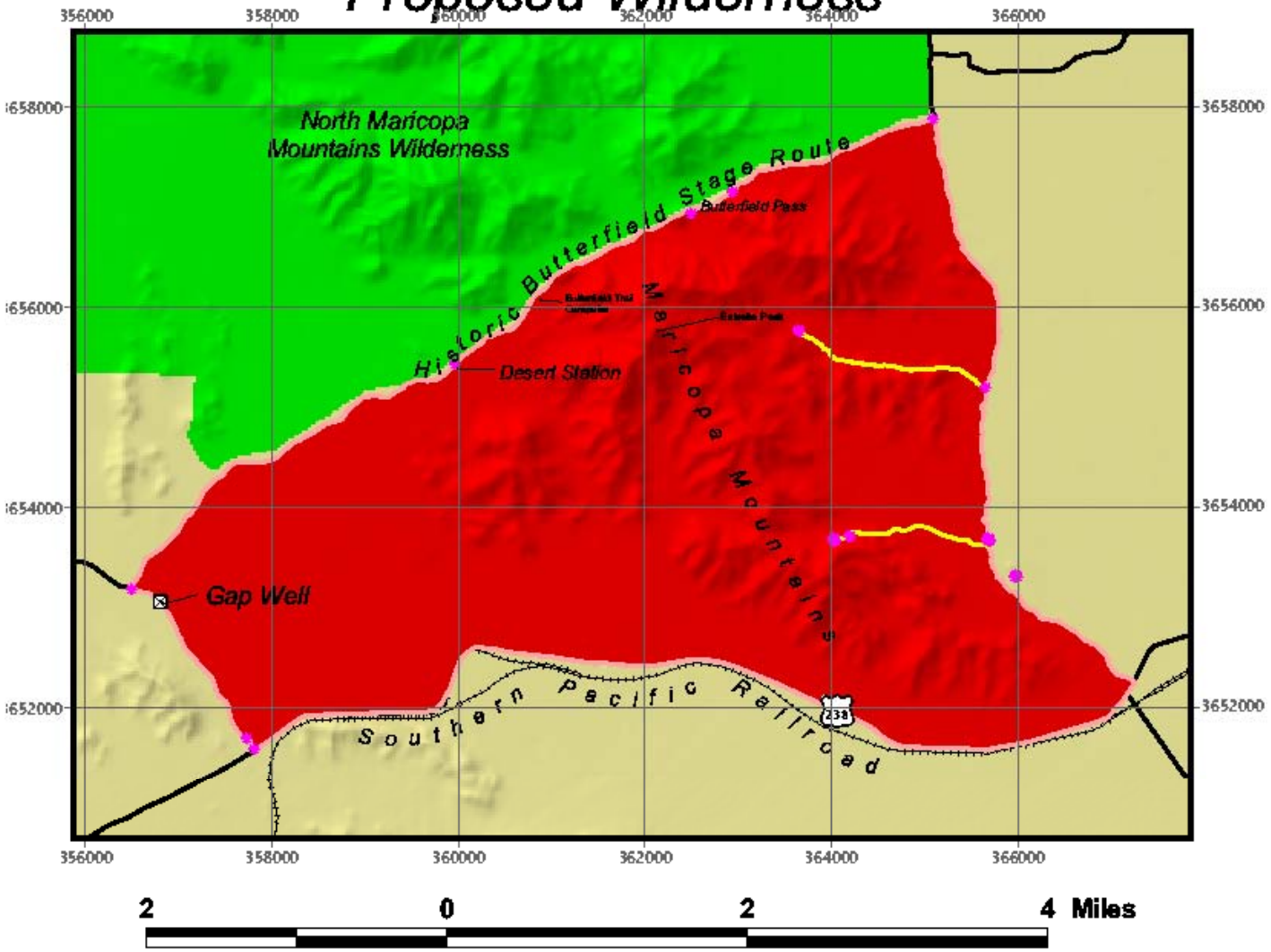
The BLM also incorrectly assessed the opportunities for primitive and unconfined recreation as they only addressed the opportunity for extensive backcountry travel, which is outstanding if considered in relation to the adjacent North Maricopa Mountains. The Butterfield Stage Memorial route only separated the two units. Surely there are opportunities for other types of primitive and unconfined recreation such as day hiking, bird watching, rock hounding, botany, and wildlife viewing in this unit. I have personally hiked in this unit and enjoyed the steep ridges and small canyons. Climbing the ridges to get a view of the surrounding area offers an excellent primitive experience.

The BLM did evaluate the potential impacts to desert tortoise and bighorn sheep in relation to wilderness protection in this unit, but did not evaluate this unit's use and potential as a key corridor for connectivity of bighorn sheep populations between the North and South Maricopa Mountains. The BLM's 1987 FEIS stated, "55 percent of the crucial bighorn sheep habitat and 49 percent of the crucial desert tortoise habitat would be disturbed by mining and recreation activity" (p 144) as a result of non-designation. The BLM also stated that only 3 percent of bighorn sheep habitat and 7 percent of desert tortoise habitat would be disturbed by increased non-motorized recreation with wilderness protection (USDI 1987). Clearly the BLM ignored their own findings in relation to this unit's wilderness values and their multiple use mission to "prevent permanent impairment of the productivity of the land and the quality of the environment" (P.L. 94-579 § 103(c); 43 U.S.C. § 1702(c)).

Conclusion

The Arizona Wilderness Coalition citizen's inventory presented here has documented that the Butterfield Stage Memorial unit still possesses outstanding wilderness characteristics and deserves protection as wilderness. The results of non-designation of this unit will be increased motorized visitation, proliferation of illegal motorized trails, dumping, illegal vegetation cutting for fire wood, and potential poaching because of the proliferation of illegal motorized routes. The human population of nearby Maricopa is about to expand by over 150,000 people (Burrough 2003). The Sonoran Desert National Monument will become these new residents' backyard playground and without restrictive land-use decisions it will likely become devoid of the objects for which it was created, such as bighorn sheep, large stands of saguaros, and the untrammeled landscape. Protecting the Butterfield Stage Memorial unit for its wilderness characteristics will above all other uses, effectively protect these characteristics and in turn protect the objects of the monument.

Butterfield Stage Memorial
Proposed Wilderness



Legend

- Photo Points

Inventoried Routes

- Recommended Closed Routes
- Recommended Open Routes

Land Ownership

- BLM
- Private
- State
- Proposed Wilderness
- Existing Wilderness

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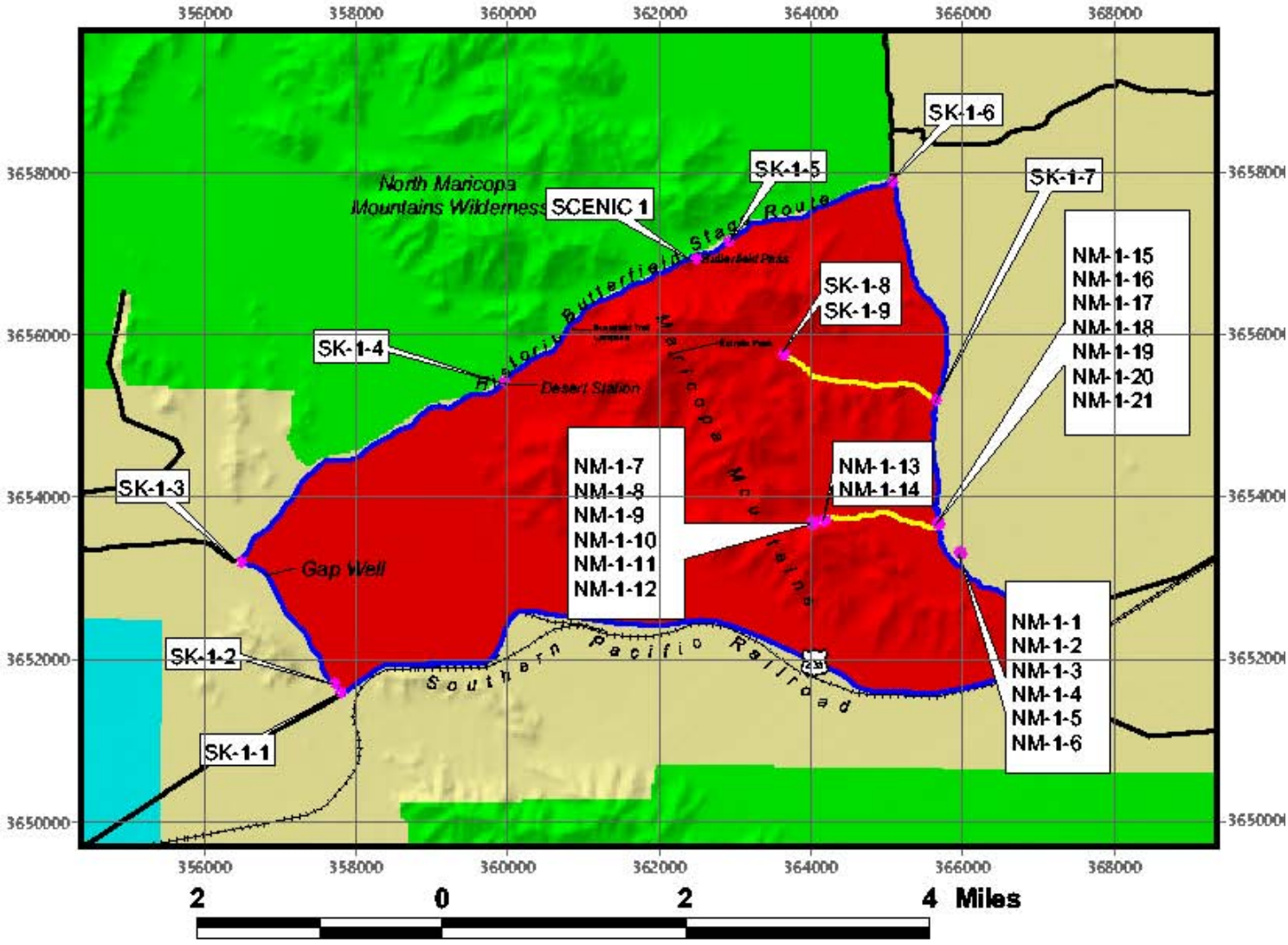
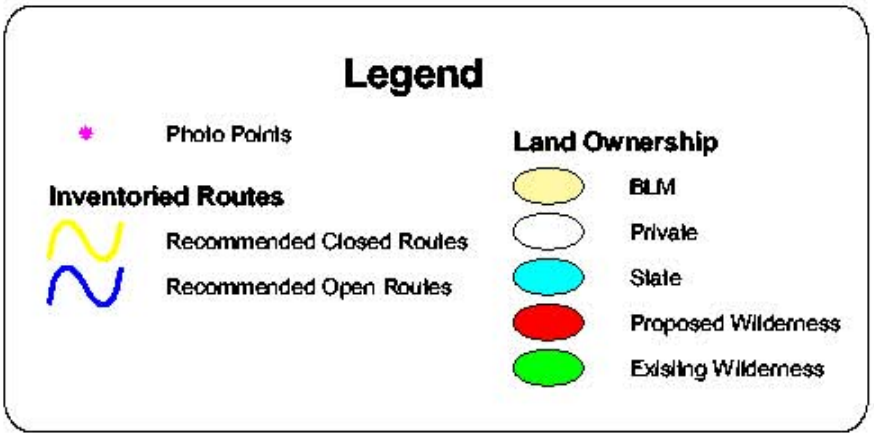
Butterfield Stage Memorial
Inventoried Routes and Photo Points





Route Analysis for Butterfield Pass Unit

Route #: 1
Photos: SK-1-1 thru SK-1-3
Length: 1.44 miles
Construction Type: Bladed and regularly maintained
FLPMA Road Definition: Yes
Campsites: 2
Vehicle Type: 2WD
Erosion: N/A
Vegetation Present: primarily bare soil (bare soil is >50% of surface
Other Impacts: some trash on side of road
Proposed Action: open
Notes: This route is used for access to the Butterfield Pass Stage Line

SK-1-1 Begin Route # 1 west of Butterfield Pass WSA proposal boundary. Direction: NW

SK-1-2 Old road grade appears naturalized surface covered in crypto biotic soil. Direction: NE


SK-1-3 Old fence line at junction on NW corner of proposal area. End route #1 Direction: NW

Route #: 2
Photos: SK-1-3 thru SK-1-6
Length: 6.53 miles
Construction Type: user created/historic stage line route
FLPMA Road Definition: No
Campsites: 1
Vehicle Type: HC 4WD
Erosion: ruts ≥ 12" in depth
Vegetation Present: primarily bare soil (bare soil is >50% of surface
Other Impacts: some vehicles travel in washes, trash along route
Proposed Action: open
Notes: This route is used for access to the Butterfield Pass Stage Line, many wash crossings > 36" width, steep grades, loose sand, excellent access to wilderness, beautiful views of Sonoran Desert plant communities, Wilderness Characteristics abound in this area. North Maricopa Mtn Wilderness borders north side of route. Well-signed wilderness boundary to North. Interpretive signs along route.

SK-1-4 Interpretive sign along Historic Butterfield Stage Line route. Direction: SW

SK-1-5 Gate at Butterfield Pass. Direction: SW

SK-1-6 End Route 2. NE corner of Butterfield Pass WSA proposal. Direction: SW

Route #: 3
Photos: SDNM-2-4, SK-1-7, NM-1-1,2-6
Length: 4.46 miles
Construction Type: User Created
FLPMA Road Definition: No
Campsites: Numerous
Vehicle Type: HC 2WD
Erosion: ruts ≥ 12" in depth
Vegetation Present: primarily bare soil (bare soil is >50% of surface
Other Impacts: vehicle travel in washes, trash along route, ORV use in creosote flats, target shooting, illegal cutting of saguaro, illegal dumping along side route
Proposed Action: open, suggest monitoring use in this area
Notes: This route is used for access to the Butterfield Pass Stage Line, many wash crossings > 36" width, steep grades, loose sand, excellent access to wilderness, beautiful views of Sonoran Desert plant communities, Wilderness Characteristics abound in this area. North Maricopa Mtn Wilderness access is from north end of route.

SDNM-2-4 View to North Begin route # 3. NW Corner of Butterfield Pass WSA proposal Area.


SK-1-7 ORV donuts at route junction of route # 4. Direction: W


NM-1-1 Numerous tracks, target shooting. Damage to creosote, ocotillo, shot-up saguaro. Direction: N


NM-1-2 Spent ammunition shells, destroyed creosote. Direction: W

NM-1-3 Shotgun shells strewn about. Destroyed ocotillo in background. Direction: NE


NM-1-4 No white board. Saguaro has been shot several times Direction: NE

NM-1-5 Target practice. Direction: NW

NM-1-6 Propane canisters, dead ocotillo, trash Direction: E

Route #: 4
Photos: SK-1-7, 8,9
Length: 1.39 miles
Construction Type: User Created
FLPMA Road Definition: No
Campsites: 3
Vehicle Type: HC 2WD
Erosion: negligible
Vegetation Present: primarily grass (<25% bare soil exposed
Other Impacts: vehicle travel in washes, trash along route, ORV use in creosote flats, target shooting, illegal cutting of saguaro, illegal dumping along side route
Proposed Action: close and restore
Notes: This route is used for access to the upper parts of this canyon, camping. Users have pushed this route well beyond what is recorded on the map. The route sees little use. Old camps have been reclaimed and are over grown with vegetation. Much of the route is crowded with vegetation as it winds through and between plants of an east-facing bajada community.

SK-1-7 Begin route # 4 Direction: W

SK-1-8 End route # 4 at campsite Direction: NW

SK-1-9 Average tread conditions route # 4 Direction: E

Route #: 5
Photos: NM-1-7 thru NM-1-21
Length: 1.11 miles
Construction Type: User Created
FLPMA Road Definition: No
Campsites: 2
Vehicle Type: HC 2WD
Erosion: n/a
Vegetation Present: grass/forbes intermittent with bare soil (bare soil is between 25-50%)
Other Impacts: vehicle travel in washes, trash along route, extensive ORV resource damage, target shooting, illegal dumping along side route, and archeological site disturbance
Proposed Action: close and restore to facilitate natural processes.
Notes: This route is used for access to camping at the base of the hills. There is use by target shooters, campers, and extensive ORV and user damage. Vegetation has been damaged along side of route.

NM-1-7 End route # 5. Small fire ring. Direction: SE

NM-1-8 End route # 5

NM-1-9 Wildcat road. Evidence someone has attempted to close it. Direction: W

NM-1-10 Erosion and closure device.
Direction: SE

NM-1-11 ORV/ truck tracks in wash for ¼ mile.
Direction: NW

NM-1-12 Shot-up saguaro.

NM-1-13 Average Conditions route # 5
Direction: NE

NM-1-14 Begin route # 5 at junction of route # 3
Direction: W

NM-1-16 Trashed campsite Direction: SE

NM-1-17 ORV Damage Direction: SW

NM-1-18 ORV Damage Direction: NE

NM-1-19 Archeological site

NM-1-20 Shells

Route #: 6
Photos: n/a
Length: 6.47 miles
Construction Type: Paved/Maintained
FLPMA Road Definition: Yes
Campsites: n/a
Vehicle Type: standard 2WD passenger vehicle
Erosion: n/a
Vegetation Present: n/a
Other Impacts: trash along road
Proposed Action: open, clean up roadside
Notes: This route is Hwy 238.

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C. Margie's Peak

Unit Description

The Margie's Peak proposed wilderness is located on the northwest end of the Maricopa Mountain Range inside the Sonoran Desert National Monument. It is approximately 14 miles northeast from the town of Gila Bend in Maricopa County. The unit's major feature is Margie's Peak, which rises 1,400 feet above the surrounding bajadas to 2,492 feet. There are smaller hills to the north, which in conjunction with Margie's Peak form an isolated basin in the center of this unit. The primary vegetation consists of classic Sonoran Desert representations of palo verde-mixed cacti, which includes saguaros, teddy bear cholla, and barrel cactus on the bajadas and the mountains. The flatter valley areas consist of creosote-bursage community, with dense stands of palo verde and ironwood trees lining the washes. The unit has excellent opportunities for hiking in deeply incised washes on the west side that contain excellent examples of desert tortoise habitat. Bighorn sheep are known to occur on the steep rocky slopes of Margie's Peak. This unit's proximity to the North Maricopa Mountains Wilderness makes it an excellent corridor for wildlife to access the Buckeye Hills and the Gila River.

Wilderness Characteristics

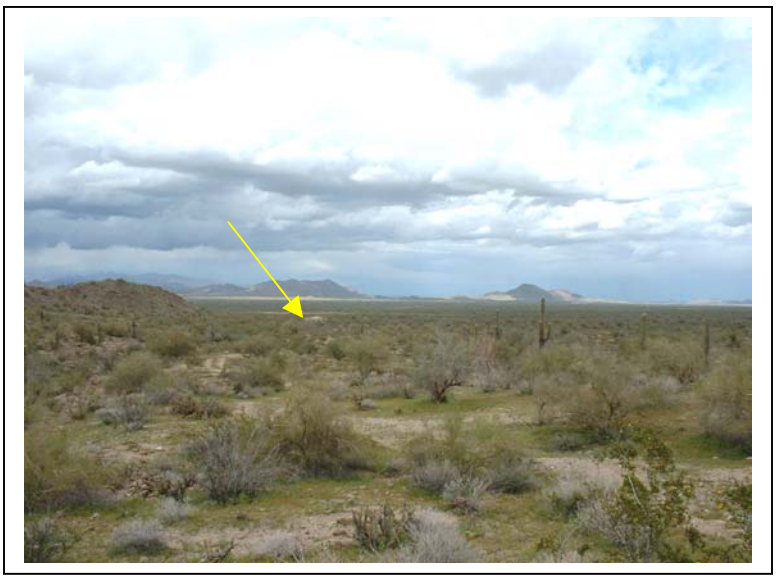
Size: 14,740 acres

Naturalness

Margie's Peak meets the requirements of naturalness under the Wilderness Act of 1964 section 2 (c) "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable". In the BLM's *Wilderness Inventory and Study Procedures* manual H-6310-1 evaluation of naturalness is described as needing to distinguish between natural integrity and apparent naturalness. The manual makes clear that the Wilderness Act of 1964 intended naturalness to be evaluated on apparent naturalness, which is what the average visitor, who is not familiar with the biological composition of the native ecosystems, sees as natural (USDI 2001a [H-6310-1, Section .13(B)(2)(b)(1), page 12]). The manual defines natural integrity as the presence or absence of ecosystems that are untrammeled by humans. Margie's Peak proposed wilderness not only meets the apparent naturalness requirement, but also has the qualities of natural integrity. This natural integrity is demonstrated with the presence of bighorn sheep, mature stands of saguaros, and the unit's connectivity to other wild areas.

SDNM-1-30 Blooming Ironwood, Direction: NW

There are only a few impacts in the Margie's Peak proposed wilderness that require documentation. There are 11.81 miles of routes in 8 segments that have been inventoried inside the unit during the citizen's inventory conducted in the spring of 2002 and 2003. Maps, complete descriptions, and analysis for these routes are included in the Route Analysis section of this report. Seven of these routes are the result of past mining exploration, grazing facilities maintenance, and camping access (routes 2, 3, 5, 8, 10, 11, and 12). Two are for access to Arizona Game and Fish Wildlife Water Catchments (routes 13 and 15). All routes have been evaluated using the definition set forth by the Federal Land Policy and Management Act of 1976 and the accompanying House Report No. 94-1163.



DSCF0062 Old Prospect/rock operation in picture, substantially unnoticeable. Boundary pipeline road can be seen in distance, but is still substantially unnoticeable

> *The word 'roadless' refers to the absence of roads, which have been improved and maintained by mechanical means to insure relatively regular and continuous use. A way maintained solely by the passage of vehicles does not constitute a road. (H.R. Rep. No. 94-1163 at page17 (1976))*

This definition is more fully explained in the BLM manual H-6310-1 Section .13 (A) (2) page 10. The 11.81 miles of routes do not meet the definition of a road as given above. These routes are not substantially noticeable as all of them are in the flats and are well

SDNM-1-17 Margie's Peak in Distance. Direction: NW

hidden by vegetation and topography. The BLM recognizes that the Wilderness Act makes clear that areas may be designated as wilderness…which may contain some imprints of human use, so long as those imprints are 'substantially unnoticeable'" (USDI 2001a [H-6310-1, Section .22(A)(1)(a)(1), page 20]). Furthermore, Congress did not intend for Wilderness consideration to be so stringent and pure that lands with substantial human impacts could not be considered if other wilderness values are present.

Two water catchments exist in the Margie's Peak proposed Wilderness at the end of routes 13 and 15. The BLM manual H-8550-1 *Interim Management Policy for Lands Under Wilderness Review* gives further direction in regards to water catchments/guzzlers in chapter 3, section G (4), "Certain permanent installations may be permitted to maintain or improve conditions for wildlife (USDI 1995)." Also in Chapter 3 section G.(4)(a) The handbook directs that "Guzzlers may be maintained…" This direction given to the BLM does not make the existence of water catchments a factor in determining naturalness if they enhance the wilderness characteristics of the area by maintaining native wildlife populations (USDI 1995). Furthermore, in appendix D. of manual H-8550-1 the BLM interprets the "minimum requirements for the administration of the area" as stated in The

Wilderness Act of 1964 section 4(C). In this appendix direction is given on how range and big game wildlife developments are to be managed under the "Minimum Data Requirements" and the "Maximum Acceptable Impacts" standards (USDI 1995). These standards and the studies to determine how water catchments/guzzlers enhance native wildlife populations would be applied to all existing wildlife waters with designation of the Margie's Peak Wilderness.

There is no doubt that the Margie's Peak proposed Wilderness has natural integrity and apparent naturalness. Protecting this naturalness and fulfilling the requirements of the FLPMA to, "prevent permanent impairment of the productivity of the land and the quality of the environment" (FLPMA 1976 P.L. 94-579) will be best accomplished if the BLM manages Margie's Peak to protect its wilderness characteristics until Congress can designate this beautiful natural area.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation

The Margie's Peak proposed wilderness unit possesses both opportunities for solitude and primitive and unconfined recreation. The opportunities for both exist within most of the unit. The BLM's *Wilderness Inventory and Study Procedures* manual H-6310-1.22 section (b)(1) gives direction on the assessment of solitude in inventory units. In this section five features for evaluating solitude are given.

a) **Size and configuration:** The unit meets the 5,000-acre size criteria, and it is not long and narrow or have irregular extensions or cherry stems.

b) **Topographic screening:** There are many small ridges and hills that surround one primary basin/bajada on the north side of Margie's Peak in the center of the unit that provides outstanding opportunities for solitude. These ridges and hills provide outstanding isolation and solitude from other visitors as well.

c) **Vegetative screening:** In the bajadas just below the rugged mountains the vegetative screening is exceptional with a diversity of vegetation ranging from stands of saguaro and palo verde to expanses of creosote. Inside and along washes in the flat areas vegetative screening increases with mature stands of palo verde and ironwood trees.

d) **Ability of user to find a secluded spot:** It is not difficult to find seclusion in the many washes and small canyons that fan out from Margie's Peak and the surrounding smaller hills. There are also ridgelines and even mountaintops, such as Margie's Peak, that provide outstanding opportunities for solitude as well.

e) **Presence of outside sights and sounds:** Margie's Peak is bounded on two sides by power lines and one can see the light pollution of Phoenix at night, which is a contrast to the untrammeled character of Margie's Peak. The Endangered American Wilderness Act of 1978 addressed the issue of "purity" and how congress did not intend for wilderness designation to be completely isolated from the "sights and sounds" of man (H. R. 95-540). In the house report (No. 95-540) referring to the Sandia Mountain Wilderness in New Mexico as quoted in the BLM manual H-6310-1 states:

> *The "Sights and sounds" of nearby Albuquerque, formerly considered a bar to wilderness designation by the Forest Service, should, on the contrary, heighten the public's awareness and appreciation of the area's outstanding wilderness values.*

This precedent from congress reinforced Section 2 (a) of the original Wilderness Act of 1964,

> *In order to ensure that an increasing population, accompanied by an expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition* [P.L. 88-577; 16 U.S.C. § 1131 section 2 (a)].

New Wilderness, such as the Margie's Peak unit, and the solitude that it can provide in contrast to the city is and will become one of our most valuable natural assets in face of the rapid human population growth and accompanying urban development in Arizona.

Primitive and Unconfined Recreation

Margie's Peak provides for a variety of primitive and unconfined recreational activities. "A primitive and unconfined type of recreation refers to those activities that provide dispersed, undeveloped recreation which do not require facilities or motorized equipment" (USDI 2001a [H-6310-1, Section .22(A)(1)(b)(2), page 22]). Margie's Peak offers various levels of hiking, from flat walking in the bajadas, to rock scrambling on the peaks and ridges. Backpacking, hunting, horseback riding, photography, bird watching, and sightseeing for botanical and zoological features are all possible primitive and unconfined recreational opportunities within the Margie's Peak proposed Wilderness. Overnight camping within the area's basin isolates a visitor from most of the light

pollution of Phoenix and can be used as a great jumping off or ending point for an extended backpacking experience into the North and South Maricopa Wilderness Areas.

Supplemental Values and New Information

Margie's Peak has supplemental wilderness values that will best be protected through wilderness designation. Section 2(c)(4) of The Wilderness Act clearly explains what supplemental values are, "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." (P.L. 88-577). The BLM was directed by congress in the 1976 FLPMA (House Report 94-1163) to consider the full realm of natural values that roadless areas provide:

> *Emphasis should be on multiple natural values of roadless areas as part of an overall multiple use framework for a general area rather than primarily recreational uses. In addition to the public recreational use values, interim protection of the area as a WSA and possible future designation as wilderness should augment multiple use management of adjacent or nearby lands in protecting watershed and water yield, wildlife habitat preservation, preserving natural plant communities and similar natural values.*

Margie's Peak is an excellent example of an area that if designated wilderness would protect ecological processes such as the native Sonoran Desert plant communities, and help sustain viable populations of bighorn sheep and Sonoran desert tortoise. The Margie's Peak proposed wilderness is completely within the Sonoran Desert National Monument, which was designated to protect the uninterrupted stands of saguaro, populations of bighorn sheep within the Maricopa Mountains, and the historic and prehistoric artifacts that are found throughout the monument (USDI 2001b). Margie's Peak contains many of objects identified in the January 2001 Presidential Proclamation

creating the monument, which provides significant supplemental values giving justification for protecting this unit as Wilderness.

Sensitive species are considered a supplemental value that must not be overlooked. Species such as the Sonoran desert tortoise and Bighorn sheep can be used as focal species because protection of these species for the long-term will help to ensure healthy ecological processes for their habitat areas (Soulé and Noss 1998). The Margie's Peak Proposed Wilderness would protect these species more fully than leaving the area open for more road building and other developments that could be proposed on general BLM lands within the monument. Below and attached as appendixes are reviews of how these species need wilderness for genetically effective populations to survive in the Sonoran Desert.

Sonoran desert tortoise *Gopherus agassizii* (Sonoran population)

The unit contains valuable habitat for the Sonoran desert tortoise, which is considered a species of concern for the US Fish and Wildlife Service and the Arizona Game and Fish Department (HDMS 2003). The literature review and documentation included in Kim Crumbo's, *Roads and Desert Tortoise: The Impact of Roads on the Threatened Desert Tortoise* in Appendix G of this proposal clearly demonstrates that sustainable desert tortoise populations will be best protected by reducing road densities and limiting access to tortoise habitat. Wilderness protection clearly offers the most protective and long-term tool available to federal land managers such as the BLM to accomplish these tasks.

desert bighorn sheep *Ovis canadensis mexicana*

The desert bighorn sheep is a charismatic animal that over the millennia has become well adapted to the harsh desert conditions. The desert bighorn sheep represents three different types of focal species status: flagship, habitat quality indicator, and wilderness quality indicator (Parsons 2003).

Its status as a flagship species is justified in that permits for hunting this species can be auctioned off at $125,000 and more. Hunters and people who enjoy watching wildlife find viewing or hunting Bighorns a privilege that is far too uncommon. The desert bighorn sheep can be used to promote conservation and habitat protection because if people respect and enjoy this majestic species then they are more likely to want to protect what it needs for survival.

The Desert bighorn sheep is a habitat quality indicator because it requires a very specific habitat of steep slopes greater than 55 percent, and free of visual obstructions or dense vegetation (Krausman et al 1999). Many estimates have been made on appropriate population numbers and habitat size requirements. Margie's Peak does not represent a large core area of habitat, such as the North and South Maricopa Mountains Wildernesses. However, it is essential connective habitat that is only split by route 14 in the AZ Wilderness Coalition inventory. Route 14 is maintained for high clearance 2 wheel drive use and receives a fair amount of ORV use and camping, which could be a potential disturbance factor for sheep. This route is recommended to remain open in the AZ Wilderness Coalition recommendations. Parsons (2003) recommends 48 square miles with 890 acres of suitable lambing habitat for viable sub-populations, which is represented in the North and South Maricopa Mountains Wildernesses. Parsons (2003)

and Krausman and Leopold (1986) both warn against overlooking the value of habitat patches of 4 square miles or more near larger habitat areas. These smaller habitat areas, such as Margie's Peak, can provide valuable migration and dispersal corridors, and serve as seasonal or part time habitats for individual bighorns (Parsons 2003). Margie's Peak without a doubt provides habitat for the Maricopa Mountains bighorn populations, but it could also provide valuable dispersal corridor to the Buckeye Hills and then west to the Gila Bend Mountains. The existence and persistence of desert bighorn sheep in the Margie's Peak unit will best be continued by protecting the unit as wilderness and closing the routes recommended by the Arizona Wilderness Coalition to protect the bighorn sheep from potential disturbance from motorized recreational activities.

Lastly, desert bighorn sheep are considered wilderness quality indicator species because they inhabit the most beautiful, rugged, and inaccessible terrain that is normally representative of wilderness. Bighorn sheep populations are normally more robust in areas where there is more wilderness and roadless land than any other land allocation, such the southwestern deserts of Arizona's Cabeza Prieta NWR, Organ Pipe Cactus NM, and Barry M. Goldwater Range. Hopefully the Sonoran Desert NM can continue to be high quality habitat for this species with inclusion of the Margie's Peak unit into the National Wilderness Preservation System.

Historical Review: The Arizona BLM Wilderness Inventory (1978-82)

The BLM's initial wilderness inventories were completed under the requirements of section 603 of the FLPMA. The BLM started an initial inventory of all public lands under their management in Arizona and sorted out all lands that "clearly and obviously"

lacked wilderness characteristics. Through this process Margie's Peak (unit # 2-156) was chosen as an initial inventory area. In the initial inventory process started in 1978 the BLM reported in their *Wilderness Review, Arizona Initial Inventory of Public Lands Administered by Bureau of Land Management Decision Report September 1979* that,

> *The unit was originally proposed as 'clearly and obviously' not meeting wilderness criteria. The rational behind this proposal was not questioned. We concluded that this unit will not be intensively inventoried, and is therefore dropped from further review* (USDI 1979).

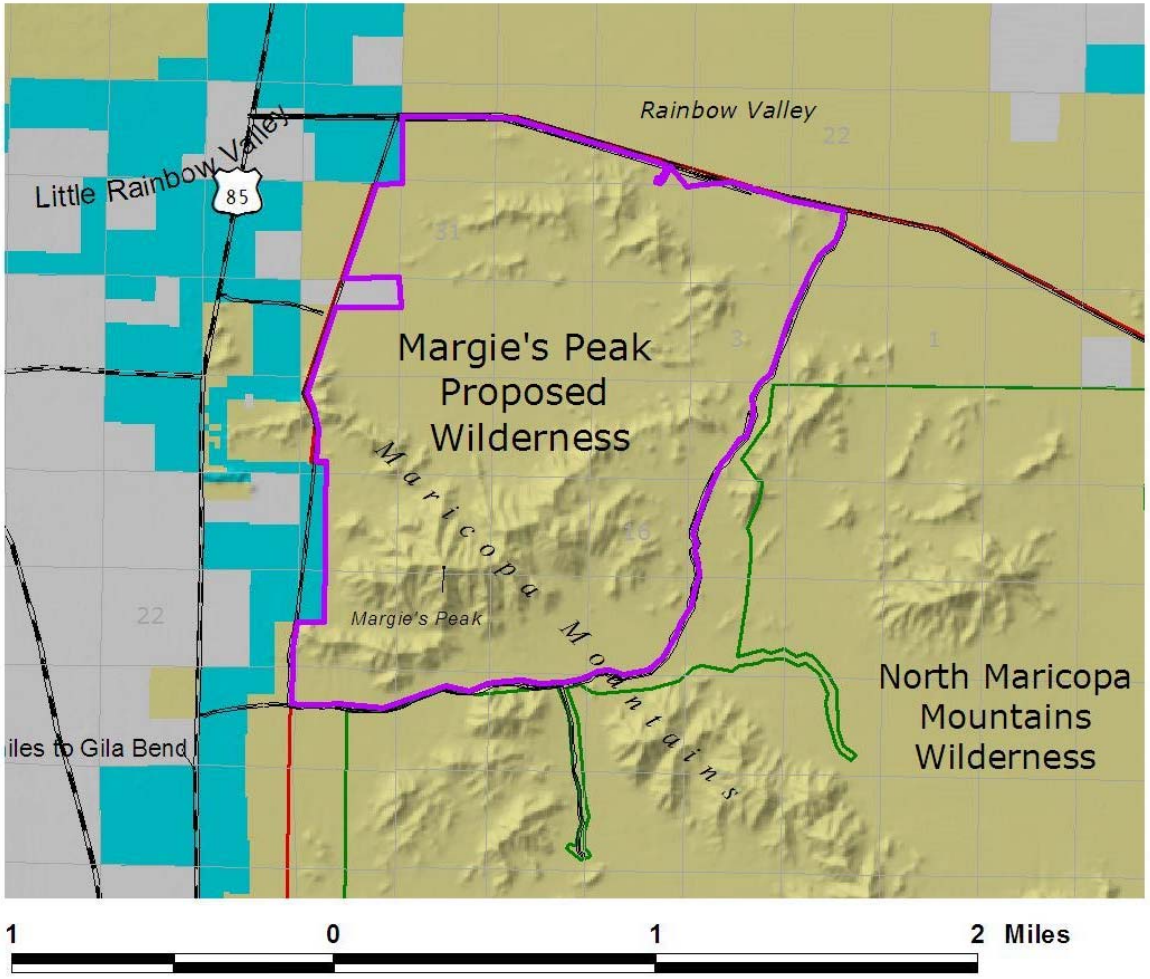
There was one comment received in the process that mentioned supplemental values. The BLM did not respond to this comment or give any further rational for dropping this unit from further study. It has been determined by the Arizona Wilderness Coalition that the BLM's rational and study process was flawed for the Margie's Peak Unit. It was flawed because they did not address this unit's supplemental values or give appropriate rationale in the documentation for why other wilderness characteristics were absent or impacted.

Conclusion

The Arizona Wilderness Coalition citizen's inventory presented here has documented that the Margie's Peak unit possesses outstanding wilderness characteristics and deserves protection as wilderness. The results of non-designation of this unit will be increased motorized visitation, proliferation of illegal motorized trails, dumping, illegal vegetation cutting for fire wood, continued vegetation damage from target shooting, and potential poaching because of the proliferation of illegal motorized routes. The development rate of nearby Buckeye is about to expand by nearly 200,000 homes (Burrough and Creno 2003). This increase in new homes will mean at least 200,000

more people living just north of the Sonoran Desert National Monument. The Sonoran Desert National Monument will become these new residents' backyard playground and without restrictive land-use decisions it will likely become devoid of the objects for which it was created, such as bighorn sheep, large stands of saguaros, and the untrammeled landscape. Margie's Peak unit is a valuable wildlife core area and dispersal corridor that provides habitat links to the Buckeye Hills and possibly to the Gila Bend Mountains. The protection of this unit will allow for successful future efforts to connect and maintain wildlife habitat in the region. Protecting the 14,740 acres of the Margie's Peak unit for its wilderness characteristics will effectively protect the objects of the monument for future generations of Americans and Arizonans.

Margie's Peak
Proposed Wilderness



Legend

- Margie's Peak Boundary
- Citizen's Transportation Plan
- Sonoran Desert NM
- Existing Wilderness

Land Ownership

- Private
- State
- BLM
- No Data

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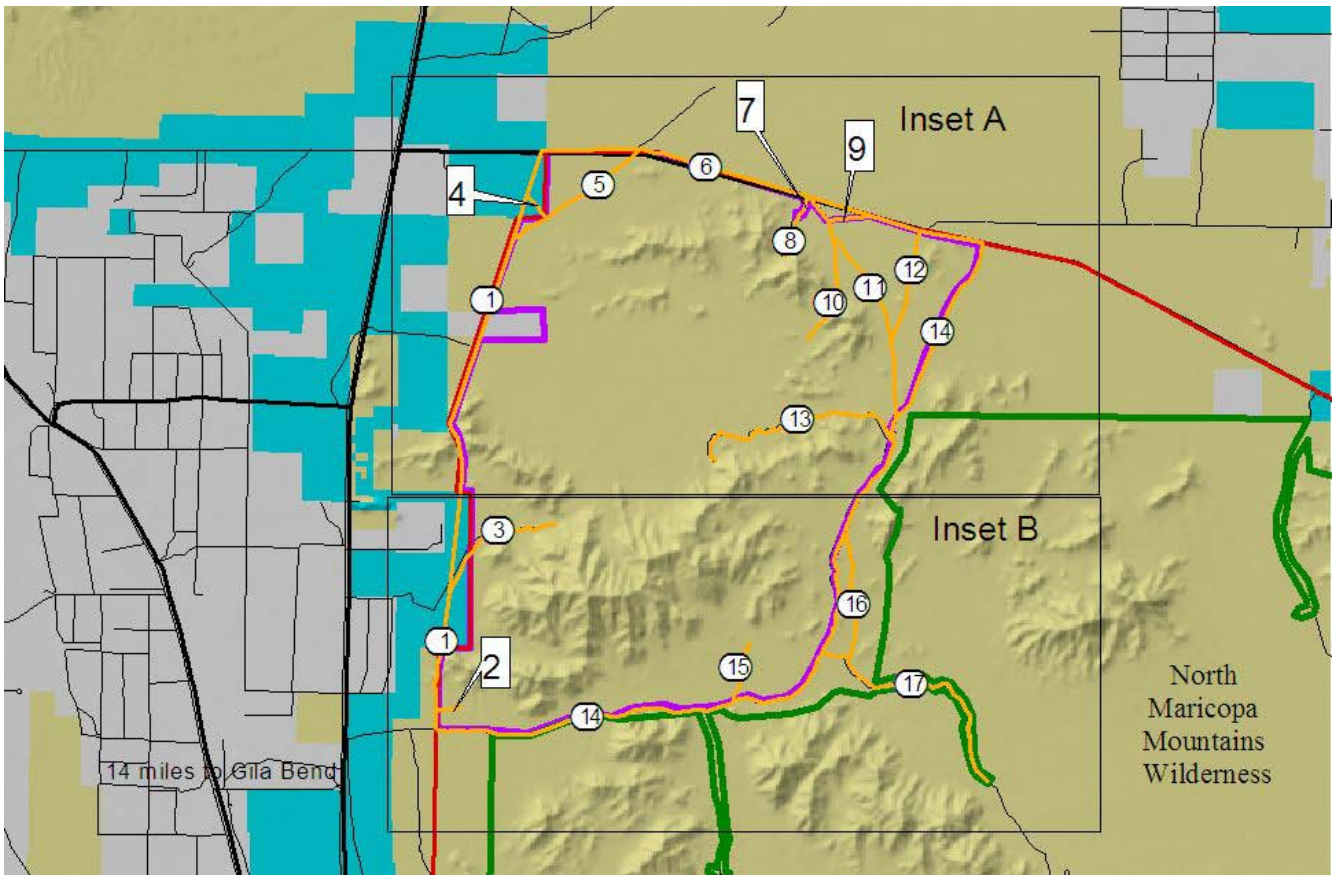
Arizona Wilderness Coalition 2004
Sonoran Desert National Monument Wilderness Proposal
111

Margie's Peak Inventoried Routes



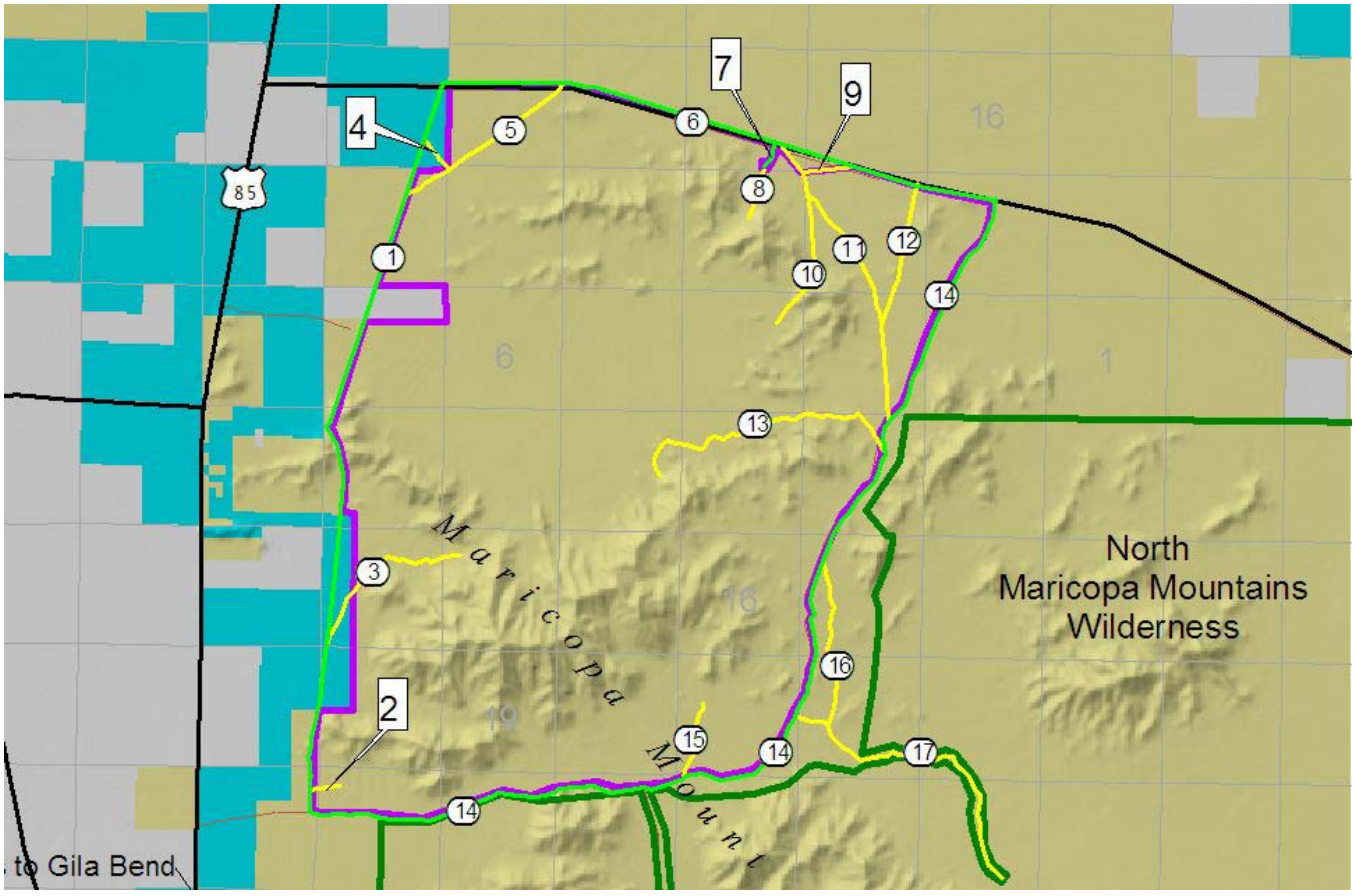
LEGEND

- Inventoried Routes
- Sonoran Desert NM
- Existing Wilderness
- Margie's Peak Boundary
- Maricopa County Roads

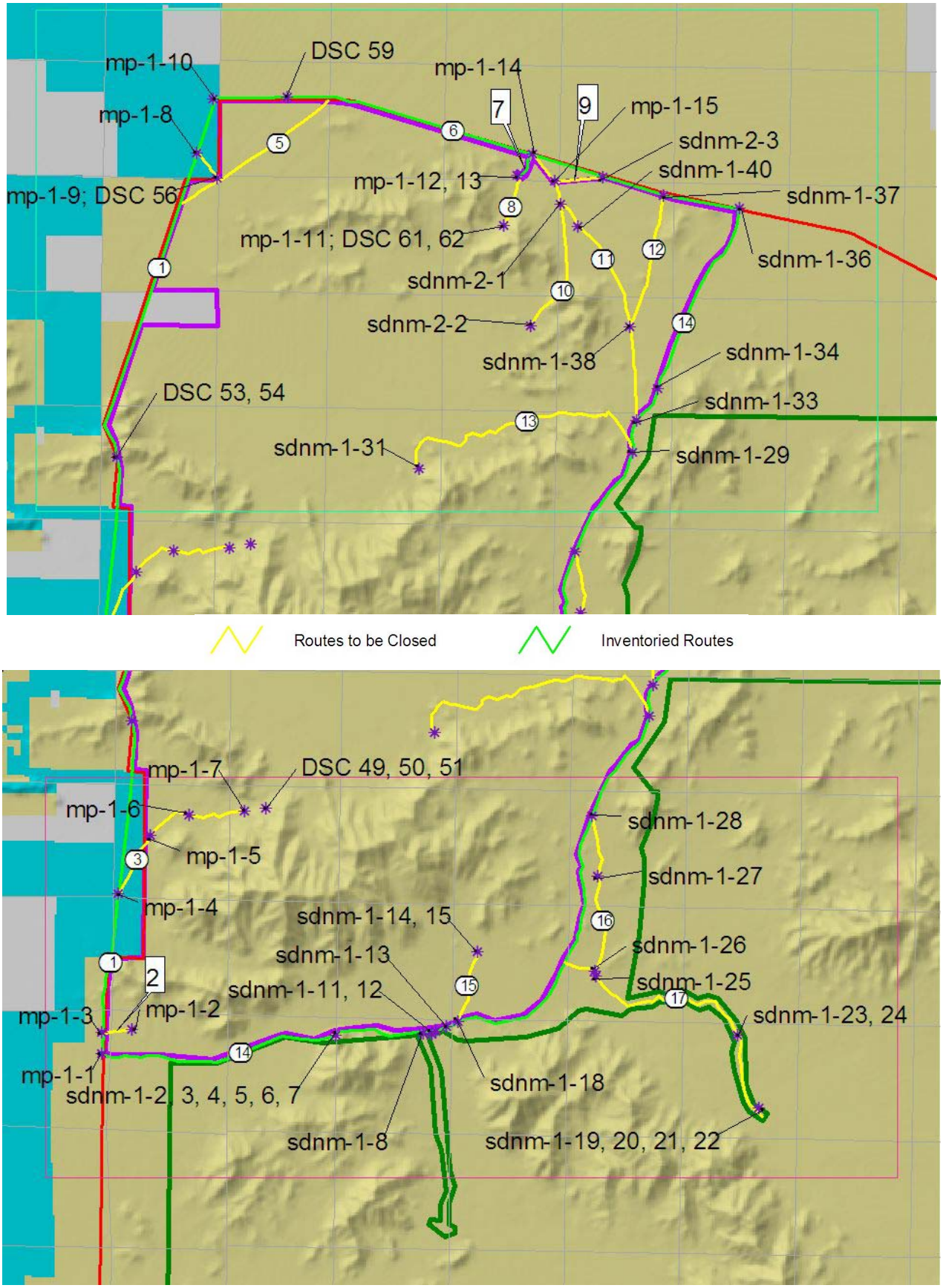
Land Ownership

- Private
- State
- BLM
- No Data

Margie's Peak Recommended Route Closures



Margie's Peak Photo Points



Route Analysis for Margie's Peak Unit

Route #: 1
Photos: mp-1-1; mp-1-4; DSC 53, 54; mp-1-10
Length: 6.20 miles
Construction Type: bladed and maintained
FLPMA Road Definition: yes
Campsites: 0
Vehicle Type: 4WD
Erosion: N/A
Vegetation Present: bare soil >50% of surface
Other Impacts: Power lines impacting view shed
Proposed Action: open
Notes: This route follows the very large power lines.

mp-1-1 Junction routes 1 and 14
Direction: N

mp-1-4 Junction routes 1 and 3
Direction: N

DSC- 53 power lines on route 1
Direction: SE

DSC-54 power lines on route 1
Direction: NW

mp-1-10 Junction route 1 with El paso gasline road
Direction: E

Route #: 2
Photos: mp-1-2, 3
Length: .26 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: 2WD
Erosion: N/A
Vegetation Present: bare soil >50% of surface
Other Impacts: Powerlines impacting viewshed
Proposed Action: close
Notes: This route follows a small leeve and should be closed as users are pushing this route further.

mp-1-2 end route 2
Direction: E

mp-1-3 Junction routes 1 and 2
Direction: E
Route #: 3
Photos: mp-1-4, 5, 6, 7
Length: 1.53 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 1 old
Vehicle Type: 2WD
Erosion: N/A
Vegetation Present: bare soil >50% of surface
Other Impacts: Power lines impacting viewshed some trash present at end of old route
Proposed Action: close
Notes: This route follows a small levee for a 100 yards and then up to a point below a saddle. It would be a great camping spot and deserving a cherry stem but I think people have not used it in recent years because of the power line. Since it does not see any use it should be closed.

mp-1-4 Junction routes 3 and 1
Direction: NW

mp-1-5 Average conditions on route 3
Direction: S

mp-1-6 Average conditions on route 3
Direction: E

mp-1-7 end route 3
Direction: E

Route #: 4
Photos: mp-1-8, 9; DSC 56
Length: .3 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: 4WD
Erosion: 6 inches in vehicle tracks
Vegetation Present: bare soil is between 25-50% of surface
Other Impacts: Powerlines impacting viewshed some trash present at end of route
Proposed Action: close
Notes: This route follows the fence line in this location and appears to fade away. Should be closed as it does not see regular use

mp-1-8 Junction routes 1 and 4
Direction: E


mp-1-9 Average conditions on route 4
Direction: E


DSC 57 trash on route 4

Route #: 5
Photos: N/A
Length: 1.56 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: N/A
Erosion: N/A
Vegetation Present: N/A
Other Impacts: N/A
Proposed Action: close/reclaim
Notes: I could not find this route. I Can only assume that it has been reclaimed. It should be removed form the quadrangle.

Route #: 6
Photos: mp-1-10
Length: 4.71 miles
Construction Type: Bladed and maintained
FLPMA Road Definition: Yes
Campsites: 0
Vehicle Type: 2WD
Erosion: N/A
Vegetation Present: 100% bare soil
Other Impacts: N/A
Proposed Action: open
Notes: This is the El paso gas pipeline road. It froms the northern boundary for the Sonoran Desert NM and the Proposed Margies Peak WSA.


mp-1-10 Average conditions on route 6
Direction:E

Route #: 7
Photos: mp-1-12, 13, 14
Length: .23 miles
Construction Type: may have been created with bulldozer, but no evidence and no maintenance
FLPMA Road Definition: No
Campsites: 1
Vehicle Type: HC 2WD
Erosion: stable
Vegetation Present: Primarily bare soil >50%
Other Impacts: Target shooting at the prospect site
Proposed Action: open for camping
Notes: The old prospect site should be excluded from the WSA and used for camping purposes.

mp-1-12 looking S from top of prospecting site on route 7


mp-1-13 looking north at prospect site

Route #: 8
Photos: mp-1-11; DSC 61, 62
Length: .42 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 1
Vehicle Type: 4WD
Erosion: stable
Vegetation Present: Between 25-50% bare soil
Other Impacts: target shooting and saguaro shooting. DSC 61
Proposed Action: close

Notes: This route is being used to target shoot at a saguaro. It does not provide reasonable access. Close to protect monument objects.

MP-1-11 end route 8, bullet box in picture next to board. Gound littered with used ammunition. Direction: SE


DSC 62 mining prospect in lefthand side of photo Direction: N

DSC 61 Saguaro with holes from shooting! Destruction of monument objects.
Direction: SE

Route #: 9
Photos: mp-1-14, 15; sdnm-2-3
Length: .76 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: 4WD
Erosion: Some in vehicle tracks up to 12+ inches
Vegetation Present: 25-50% bare soil
Other Impacts: Power lines in view-shed
Proposed Action: close
Notes: This route should be closed to administrative use only. It provides access to another unnecessary route and a small portion of power line shown in photo mp-1-14 and mp-1-15. Are these power lines in the correct spot? Is this a trespass?

mp-1-14 Junction routes 6 and 9
Direction: SE

mp-1-15 Junction routes 9 and 10 power line turns and goes back to pipeline road here, following route 9 Direction: S

sdnm-2-3 dusk Junction routes 9 and 6
Direction: SE

Route #: 10
Photos: mp-1-15 (see this page) ; sdnm-2-1
Length: 1.36 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: 4WD
Erosion: N/A
Vegetation Present: N/A
Other Impacts: N/A
Proposed Action: close
Notes: This route was user created and does not serve any purpose. It could have been created by the rancher since there is a gate on it. It fades after sdnm-2-2. Close to protect monument objects and wilderness characteristics

sdnm-2-1 junction routes 10 and 11
Direction: SE

Route #: 11
Photos: sdnm-2-1 (see previous page) sdnm-1-40, 38
Length: 2.08 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: HC 2WD
Erosion:
Vegetation Present: >50% bare soil
Other Impacts: N/A
Proposed Action: close
Notes: this route is extremely redundant with routes 12 and 14. It should be closed as route 14 meets the access needs for the area.

sdnm-1-38 Junction routes 11 and 12
Direction: NW

sdnm-1-40 erosion 8+ inches
Direction: E

Route #: 12
Photos: sdnm-1-38 (see preceding photos) sdnm-1-37
Length: 1.2 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: HC 2WD
Erosion: N/A
Vegetation Present: >50% bare soil
Other Impacts: N/A
Proposed Action: close
Notes: this route is extremely redundant with both routes 1 and 14. It should be closed.

sdnm-1-37 Junction routes 12 and 6
Direction: SW

Route #: 13
Photos: sdnm-1-31, 32, 29
Length: 2.45 miles
Construction Type: No evidence
FLPMA Road Definition: No
Campsites: 1 at guzzler
Vehicle Type: HC 4WD
Erosion: 12+ inches
Vegetation Present: >50% bare soil
Other Impacts: N/A
Proposed Action: close
Notes: this route provides access to the G+F water catchment. It should be closed to administrative use only. A Minimum Requirements Study should be completed to determine the level of maintenance required.

sdnm-1-29 Junction routes 13 and 14
Direction: SW

sdnm-1-31 end route 13 at guzzler
Direction: SE

sdnm-1-32 erosion on route 13
Direction: S

Route #: 14
Photos: sdnm-1-2 thru sdnm-1-7 and sdnm-1-10 thru sdnm-1-13; sdnm-1-18;34;36
Length: 9.5 miles
Construction Type: bladed in some places may receive maintenance
FLPMA Road Definition: Yes
Campsites: Numerous
Vehicle Type: HC 2WD
Erosion: numerous places
Vegetation present: >50% bare soil
Other Impacts: Trash and ORV cross country travel cutting monument objects
Proposed Action: open
Notes: this route provides excellent access to this area and the N. Maricopa Wilderness. It has excellent opportunities for camping that are blocked from the lights of Phoenix by Margie's Peak. It is an excellent through-road for motorized users to experience the monument. Unfortunately it has been severely disturbed from irresponsible use. A ban on campfires in this area is necessary to save the vegetation. Designated campsites are needed to prevent further loss of vegetation. The pictures display an example of the consequences of road access to many areas and the irresponsible use of ORVs, which leave scars that last a lifetime in a matter of seconds. It is hard not to become outraged when inventorying areas like this. This area needs more ranger presence. I actually ran into two rangers in this area during my inventory, which was great to see.


sdnm-1-2 camping area N Maricopa Wilderness across wash. Numerous ORV tracks present.

sdnm-1-3 fire ring on route 14 ironwood cutting destruction of monument objects


sdnm-1-4 large denuded area, staging for ORVs burning very large chunks of dead ironwood
Direction: NW

sdnm-1-5 small numbered stakes in ground to the north of route 14. Archeological survey?

sdnm-1-6 fire ashes and trash on route 14 seashell in this pile. Destruction of monument cultural objects.

sdnm-1-7 saguaro rib cutting on route 14 harvesting of monument objects.


sdnm-1-10 ORV driving in wash
Direction: E


sdnm-1-11 many ORV trails crossing road going cross country destroying the landscape for decades to come.

sdnm-1-12 desert pavement destruction south of route 14. Where is wilderness boundary? Could potentially be inside wilderness Direction: S

sdnm-1-13 Mountain Well on route 14 obviously dry. Fire pit in old water tank trash as well.


sdnm-1-34 erosion on route 14
Direction: SW

sdnm-1-38 Junction routes 14 and 6
Direction: NW

Route #: 15
Photos: sdnm-1-14, 15, 18
Length: .65 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: HC 2WD
Erosion: stable
Vegetation Present: >50% bare soil
Other Impacts: N/A
Proposed Action: close
Notes: this route provides access to a G+F water catchment and should be closed to public use.

sdnm-1-14 fish in guzzler at end of route 15

sdnm-1-15 end route 15 at guzzler
Direction: NE

sdnm-1-18 Junction routes 14 and 15
Direction: N

Route #: 16
Photos: sdnm-1-26, 27, 28
Length: 1.39 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 1
Vehicle Type: HC 4WD
Erosion:
Vegetation Present: >50% bare soil
Other Impacts: route mostly travels in wash
Proposed Action: close
Notes: this route is a user created, redundant route with route 14. It should be closed as route 14 meets the access needs for the area, and wilderness characteristics dominate.

sdnm-1-26 Junction routes 16 and 17
Direction: NW

sdnm-1-27 fire pit in wash on route 16
Direction: N

sdnm-1-28 Junction routes 16 and 14
Direction: S

Route #: 17
Photos: sdnm-1-19 thru sdnm-1-24
Length: 2.69 miles
Construction Type: None evident
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: HC 4WD
Erosion: 8+ inches
Vegetation Present: >50% bare soil
Other Impacts: see photos of hunting blind
Proposed Action: close
Notes: the impacts from hunting at the end of this route are atrocious. This route should be closed to administrative use to prevent such abuses. This kind of use does not fit with the monument proclamation.

sdnm-1-29 hunting blind on the fence at guzzler. The picture says it all. inside wilderness

sdnm-1-20 Beer cases and more shells at the end of route 17 Inside wilderness

SDNM-1-21 End route 17 at guzzler wilderness boundary signs and trailhead

sdnm-1-22 erosion on route 17

Direction: W

SDNM-1-24 average conditions on route 17
Direction: SE

D. Sand Tank Mountains

Unit Description

The Sand Tank Mountains are one of the Sonoran Desert's few remaining crown jewels. Wilderness protection for this area will ensure that it remains in pristine condition for future generations. The Sand Tank Mountains are located about 7 miles southeast of Gila Bend inside the Sonoran Desert National Monument, which is adjacent to the Barry M. Goldwater Air Force Range. The Sand Tank Mountains proposed wilderness includes two units separated by a single four-wheel drive road. Elevation in the Sand Tanks ranges from over 4,000 feet on top of Maricopa Peak to 1,000 feet in Sand Tank Wash. Numerous canyons and deep washes surround the impressive Blue Plateau, while craggy spires top off the Javelina and Sand Tank Mountains.

Sand tanks are tinajas or rock tanks carved out from thousands of years of erosion that become filled with sand when the tail end of a flood carries sufficient sand to fill the

cavity. This sand is saturated with water, which becomes trapped between the pore spaces in the sand grains. The surface dries, but the water remains trapped inside the tank longer than that of a clean tank. The water is only accessible by digging, which cannot be accomplished by ungulates, but coyotes and foxes commonly do dig in these tanks for water.

Petroglyphs in Sand Tank Mountains

This extraordinary area contains dense saguaro forests, herds of bighorn sheep, outstanding recreational opportunities, and a diverse mixture of prehistoric and historic cultural sites. Primary vegetation consists of the Sonoran Desert uplands palo verde/saguaro community on the bajadas and in the mountains, with dense stands of mature ironwood trees in the wash bottoms. The red-backed whiptail lizard, Sonoran desert tortoise, California leaf-nose and cave myotis bats are all species that the US Fish and Wildlife Service consider "species of concern" in this mountain range. Wilderness protection offers the best long-term protection for these species and the outstanding recreational opportunities found in the Sand Tank Mountains.

Wilderness Characteristics

Size
Sand Tank Mountains West: 56,062 Acres
Sand Tank Mountains East: 52,648 Acres
Total: 108,710 acres

Naturalness

The naturalness of the Sand Tank Mountains is outstanding because of its remoteness, ruggedness, and previous management by the Barry M. Goldwater Air Force Range. Grazing has not occurred here for over 50 years and the native vegetation is in excellent condition. Both units in the Sand Tank Mountains, "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable" as outlined in Section 2 (c) of The Wilderness Act of 1964. The Sand Tank Mountains not only appear natural to the average visitor as explained in the *Wilderness Inventory and Study Procedures* manual H-6310-1 in Section .13(B)(2)(b)(1), page 12, but also have been identified as a priority conservation site by The Nature Conservancy in their 2000 report, *An Ecological Analysis of Conservation Priorities in the Sonoran Desert Ecoregion* and their 2001 report, *Conservation Elements of and a Biodiversity Management Framework for the Barry M. Goldwater Range, Arizona* (Marshall et al. 2000; Hall et al. 2001). In this literature it is clear that the Sand Tanks are conservation priorities because they contain excellent representations of relic species as well as native Sonoran Desert flora and fauna.

Scenic natural landscape in the Sand Tank Mountains

The few imprints that do exist consist of old mining claims and travelways that were used for accessing these claims, as well as travel ways that provide access to

Arizona Game and Fish water catchments. Approximately 60 miles of unnecessary, redundant, and ecologically harmful routes exist within the proposed Sand Tank Mountains Wilderness. The end of this unit proposal contains maps, showing the location of the inventoried routes and a complete route analysis with justifications for route closures.

There are approximately six Arizona Game and Fish water catchment/guzzlers in the proposed Sand Tank Mountains Wilderness. The BLM manual H-8550-1 *Interim Management Policy for Lands Under Wilderness Review* gives direction in regards to water catchments/guzzlers in chapter 3, section G.(4), "Certain permanent installations may be permitted to maintain or improve conditions for wildlife" (USDI 1995). Also in Chapter 3 section G.(4)(a) The manual directs that "Guzzlers may be maintained…" This direction given to the BLM does not make the existence of water catchments a factor in determining naturalness if they enhance the wilderness characteristics of the area by maintaining native wildlife populations (USDI 1995). Furthermore, in appendix D. of manual H-8550-1 the BLM interprets the "minimum requirements for the administration of the area" as stated in The Wilderness Act of 1964 section 4(C). In this appendix direction is given on how range and big game wildlife developments are to be managed under the "Minimum Data Requirements" and the "Maximum Acceptable Impacts" standards (USDI 1995). These standards and the studies to determine how water catchments/guzzlers enhance native wildlife populations would be applied to all existing wildlife waters inside both proposed units of the Sand Tank Mountains.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation

The Sand Tank Mountains proposed wilderness units posses both outstanding opportunities for solitude and primitive and unconfined recreation. The opportunities for both exist in essentially the entire proposed area because of the remote, rugged, and difficult access. In BLM's *Management of Wilderness Areas* Manual 8560 section .08 (A) 1. (b),

> *Solitude is defined as (1) the state of being alone or remote from habitations; isolation; (2) a lonely, unfrequented, or secluded place. The emphasis is on the opportunities a person has to avoid the sights, sounds, and evidence of other people within a particular area.*

The importance is placed on factors affecting solitude that occur inside the wilderness area and not that of outside factors, such as cities and highways. The BLM's *Wilderness Inventory and Study Procedures* manual H-6310-1.22 section (b)(1) gives direction on the assessment of solitude in inventory units. In this section five features for evaluating solitude are given.

a) **Size and configuration:** The unit meets the 5,000-acre size criteria, and it is not long and narrow or have irregular extensions or cherry stems.
b) **Topographic screening:** There are many canyons, ridges, basins, washes, and mountainsides and tops where the topography provides outstanding isolation and solitude from other visitors. In some areas in the Sand Tanks unique geologic formations have allowed for the formation of small slot canyons that offer excellent opportunities for solitude and primitive and unconfined recreation.

c) **Vegetative screening**: In the bajadas just below the rugged mountains the vegetative screening is exceptional with a diversity of vegetation ranging from stands of saguaro and palo verde to wide expanses of creosote and bursage. Inside and along washes in the flat areas vegetative screening increases.

d) **Ability of user to find a secluded spot:** seclusion in the many washes and canyons is not difficult. There are also basins, ridgelines, and even mountaintops that provide outstanding opportunities for solitude. In some areas the presence of solitude is increased by vast expanses of creosote that a visitor can wander across and feel the loneliness of the desert in the wide-open vistas.

e) **Presence of outside sights and sounds:** There are three types of outside sights and sounds that affect the proposed Sand Tanks Wilderness. Military over flights, the presence and use of Interstate 8, and low amounts of light pollution from the Phoenix and Tucson areas. Military over flights were addressed in Section 101 (i) of the Arizona Desert Wilderness Act of 1990:

MILITARY ACTIVITIES- nothing in this title shall preclude low level over flights of military aircraft, the designation of new units of special airspace, or the use or establishment of military flight training routes over wilderness areas designated by this title. (P.L. 101-628)

This legislation applies to most of the designated wilderness in southwestern Arizona. The existence of low level over flights is dependent on wilderness lands that have little or no human habitation. It was congressionally accepted in the 1990 Arizona Desert Wilderness Act that military use would continue above the wilderness areas they designated. This can be interpreted similar to that of the Endangered American

Wilderness Act of 1978 in that low level over flights do not affect the eligibility for wilderness protection of the Sand Tank Mountains, just as the outside sights and sounds of cities can actually enhance the value of wilderness to the American public.

The Endangered American Wilderness Act of 1978 addressed the issue of "purity" and how congress did not intend for wilderness designation to be completely isolated from the "sights and sounds" of man (H. R. 95-540). In the house report No. 95-540 referring to the Sandia Mountain Wilderness in New Mexico the report states:

> *"The "Sights and sounds" of nearby Albuquerque, formerly considered a bar to wilderness designation by the Forest Service, should, on the contrary, heighten the public's awareness and appreciation of the area's outstanding wilderness values."*

This standard applies in the case of the Sand Tank Mountains with the existence of the low amounts of light pollution from Phoenix and Tucson and the presence of Interstate 8. The Wilderness Act of 1964 was created

> In order to ensure that an increasing population, accompanied by an expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition [P.L. 88-577; 16 U.S.C. § 1131 section 2 (a)].

The existence of these outside sights and sounds is a reality for our desert wilderness areas, but in no way do these realities make preservation of the Sand Tank Mountains as wilderness less important to the native flora and fauna as well as the citizens of Arizona.

Primitive and Unconfined Recreation

The Sand Tank Mountains allow a variety of outstanding primitive and unconfined recreational activities as addressed in section 2(c)(2) of the Wilderness Act of 1964 and in the BLM's *Wilderness Inventory and Study Procedures* manual H-*6310-1* section .22(A)1(b)2*,* "'A primitive and unconfined type of recreation'" refers to those activities that provide dispersed, undeveloped recreation which do not require facilities or motorized equipment." The Sand Tanks offer various levels of hiking, from walking in the bajadas and washes, to rock scrambling on the nearby peaks and ridges. A short hike in many of the washes offers opportunities to view many species of birds and practice animal tracking, where wildlife depend on washes as travel corridors and places to escape the heat of the day. Backpacking, hunting, horseback riding, photography, bird watching, and sightseeing for botanical, zoological, and especially geological features are all possible primitive and unconfined recreational opportunities within the Sand Tank Mountains. The size and configuration allow for extended desert backpacking trips that can give the visitor an opportunity to experience the rugged and remoteness of this spectacular mountain range. Car-camping possibilities abound at the various access points and along the four-wheel drive route that runs between the East and West Sand Tank Mountains. Many opportunities exist for day hiking at these points as well. There are no developed hiking trails in the Sand Tank Mountains, which gives ample opportunity for the visitor to venture out on their own.

I had a wonderful moonlight hike to the top of Javelina Mountain. I hiked up the south side on a sparsely vegetated ridge that allowed me not to get stuck by anything. At the top I enjoyed what felt like a close up view of the stars and the moon.

Supplemental Values and New Information

There is significant new information associated with the Sand Tank Mountains. The two most significant pieces are the Military Lands Withdrawal Act of 1999 (MLWA) (P.L. 106-65) and the January 17th 2001 Presidential Proclamation creating the Sonoran Desert National Monument, which encompasses the proposed Sand Tank Mountains Wilderness units.

In section 7 (c)(i) of the MLWA management of natural and cultural resources of the 83,554 acres of the Sand Tank Mountains were released to the Department of Interior on November 6th 2001. Section 7 of the MLWA of 1999 also directed the Secretary of the Interior to Study the lands released from the Barry M. Goldwater Air Force Range to determine the best management strategies. The specific direction reads as follows:

> *(7) Study.--(A) The Secretary of the Interior, in coordination with the Secretary of Defense, shall conduct a study of the lands referred to in subparagraph (C) that have important aboriginal, cultural, environmental, or archaeological significance in order to determine the appropriate method to manage and protect such lands following relinquishment of such lands by the Secretary of the Air Force. The study shall consider whether such lands can be better managed by the Federal Government or through conveyance of such lands to another appropriate entity.*
> *(B) In carrying out the study required by subparagraph (A), the Secretary of the Interior shall work with the affected tribes and other Federal and State agencies having experience and knowledge of the matters covered by the study, including all applicable laws relating to the management of the resources referred to in subparagraph (A) on the lands referred to in that subparagraph. (P.L. 106-65 § 7(c)(i))*

This section also gave direction to study these lands under all applicable laws, which would include the FLPMA (P.L. 94-579), which directs BLM to inventory lands under their management to document resource values " (including, but not limited to, outdoor recreation and scenic values)" (P.L. 94-579, § 201 (a)) This direction was further interpreted along with the Wilderness Act of 1964 to create the 2001 U.S. Dept of Interior BLM manual, *Wilderness Inventory and Study Procedures* H-6310-1, which has been rescinded as of April 2003, but was in effect when the Sonoran Desert National Monument was created as well as after the MLWA and should have been implemented to determine the suitability of the Sand Tank Mountains for wilderness study. In the BLM's *Wilderness Inventory and Study Procedures* manual H-6310-1 section .06 (B) states, "Lands acquired other than by exchange, and not specifically acquired for wilderness purposes, could subsequently be inventoried to determine if they contain wilderness characteristics." This information makes it obvious that the BLM should have completed a wilderness inventory on the 83,554 acres of land acquired through the MLWA. Furthermore, when the Sand Tanks management was given to the Bureau of Land Management from the military in 1999, Senator John McCain went on to say:

> *I expect the department of Interior will explore a number of management options for management of the Sand Tank Mountains (and the other parcels) including transfer to Native American peoples,* ***as well as the potential to protect the important natural values of the area through the designation of the qualifying lands as wilderness****, or through the limiting of livestock grazing and mining.*
> Congressional Record, p. S11200 (Sept. 22, 1999) (emphasis added)

The 2001 Sonoran Desert National Monument Presidential Proclamation identified numerous objects to be protected, a few of which are consistent with wilderness preservation. The first sentence uses the wilderness-specific word

"untrammeled". "The Sonoran Desert National Monument is a magnificent example of untrammeled Sonoran Desert Landscape" (USDI 2001b) The proclamation continues specifically highlighting the wonders of the Sand Tank Mountains.

> *Rare patches of desert grassland can also be found throughout the monument, especially in the Sand Tank Mountains area. The washes in the area support a much denser vegetation community than the surrounding desert, including mesquite, ironwood, palo verde, desert honeysuckle, chuperosa, and desert willow, as well as a variety of herbaceous plants. This vegetation offers the dense cover bird species need for successful nesting, foraging, and escape, and birds heavily use the washes during migration.* (USDI 2001b)

The existence of these valuable natural resources would be best protected under wilderness designation instead of open-ended management that would allow new road building and continued ORV use in the area. The proclamation is very specific in that the management for the Sand Tank Mountains should be as restrictive as the former military management guidelines.

> *The rich diversity, density, and distribution of plants in the Sand Tank Mountains area of the monument is especially striking and can be attributed to the management regime in place since the area was withdrawn for military purposes in 1941. In particular, while some public access to the area is allowed, no livestock grazing has occurred for nearly 50 years. To extend the extraordinary diversity and overall ecological health of the Sand Tanks Mountains area, land adjacent and with biological resources similar to the area withdrawn for military purposes should be subject to a similar management regime to the fullest extent possible.* (USDI 2001b)

All of the plant and wildlife values addressed in the proclamation represent new information that not only changes management, but obviously suggests that the area contains wilderness characteristics. The proclamation also withdrew the entire monument from mineral entry, which the Sand Tanks were not open to, but this is significant in that economic interests for minerals is no longer a relevant conflicting use.

The most obvious new information that is true for all wildlands in Arizona is the increasing human population and its associated pressures on our public lands. Arizona's population has increased by 40 percent statewide between 1990 and 2000 (U.S. Census Bureau 2000). In Pinal and Maricopa Counties, which the Sonoran Desert National Monument is located in, has seen 49.6 percent increase in population since 1990 (U.S. Census Bureau 2000). The importance of wilderness is greatest in the face of such human population expansion and development, in section 2(a) of The Wilderness Act of 1964 Congress explained why wilderness is so important to the American people by stating,

> *In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness.*

Protecting the Sonoran Desert for "present and future generations" will require forward thinking in terms of protecting areas like the Sand Tanks as wilderness. Most if not all of the private and state land that surrounds these public wildlands will be developed for housing without aggressive efforts to secure conservation easements, appropriate zoning, and a much easier system of conserving Arizona's State Trust Lands.

The Sonoran Desert Ecoregion is one of the top 200 ecoregions worldwide that deserve special conservation attention (Marshall et al 2000). The Nature Conservancy in their 2000 report *An Ecological Analysis of Conservation Priorities in the Sonoran Desert Ecoregion* identified the 636,196 acre Sand Tank/Sauceda

Mountains complex as a top priority conservation site containing 12 species from a target list of five different taxonomic groups, which is twice the average number of targets identified in the 100 sites. The Sonoran Desert has more public land than private land and will become more valuable for conserving biodiversity as the state and private lands become developed. The public land, if managed in the appropriate manner using wilderness to permanently protect landscapes of natural integrity, will provide valuable ecosystem services such as flood protection, water purification, groundwater recharge, pollination, and nutrient cycling, as well as wildlife habitat for hunting and enjoyment by the people of the southwest and the nation (Marshall et al. 2000).

There are significant supplemental values associated with the wilderness characteristics of the Sand Tank Mountains. Section 2(c)(4) of The Wilderness Act clearly explains what supplemental values are, "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." (P.L. 88-577 § 2(c)(4)) The supplemental values of wilderness were not adequately analyzed in past wilderness inventories completed by the BLM in many areas of the state (see Margie's Peak and Butterfield Pass, "Historical Review") The Arizona Wilderness Coalition believes that wilderness preservation is not only important for human needs, but for the conservation of species as well. The following text represents detailed information about the supplemental wilderness values of Special Status species in the proposed Sand Tank Mountains. All species described here are at risk and would be more adequately protected with wilderness designation. Occurrence and status information was determined by submitting GIS shapefiles to be

queried in the Arizona Game and Fish Heritage Data Management System (HDMS) in March of 2003.

Sonoran desert tortoise *Gopherus agassizii* (Sonoran population)

The units contain valuable habitat for the Sonoran desert tortoise, which is considered a species of concern for the US Fish and Wildlife Service and the Arizona Game and Fish Department (HDMS 2003). The literature review and documentation included in Kim Crumbo's, *Roads and Desert Tortoise: The Impact of Roads on the Threatened Desert Tortoise* in Appendix G of this proposal clearly demonstrates that sustainable desert tortoise populations will be best protected by reducing road densities and limiting access to tortoise habitat. Wilderness protection clearly offers the most protective and long-term tool available to federal land managers such as the BLM to accomplish these tasks. Protecting the wilderness characteristics of the Sand Tank Mountains will help to ensure that this species has habitat to sustain itself with little or no human intervention.

Desert bighorn sheep *Ovis canadensis mexicana*

The desert bighorn sheep is a charismatic animal that over the millennia has become well adapted to the harsh desert conditions. The desert bighorn sheep represents three different types of focal species status: flagship, habitat quality indicator, and wilderness quality indicator (Parsons 2003).

Its status as a flagship species is justified in that permits for hunting this species can be auctioned off at $125,000 and more. Hunters and people who enjoy watching wildlife find viewing or hunting Bighorns a privilege that is far too uncommon. The desert bighorn sheep can be used to promote conservation and habitat protection because

if people respect and enjoy this majestic species then they are more likely to want to protect what it needs for survival.

The Desert bighorn sheep is a habitat quality indicator because it requires a very specific habitat of steep slopes greater than 55 percent, and free of visual obstructions or dense vegetation (Krausman et. al. 1999). Many estimates have been made on appropriate population numbers and habitat size requirements. The Sand Tank Mountains units represent a large core area of habitat that has a healthy population of desert bighorn sheep (Personal communication Dan Uquirdez Arizona Game and Fish Department). Parsons (2003) recommends 48 square miles with 890 acres of suitable lambing habitat for viable sub-populations, which is represented in the Sand Tank Mountains units. The Sand Tank Mountains are essential to dispersing desert bighorn sheep to other mountain ranges in the area, like Table Top Mountain and north across Interstate 8 to the North and South Maricopa Mountains Wilderness Areas The existence and persistence of desert bighorn sheep in the Sand Tank Mountains units will best be continued by protecting the units wilderness characteristics and closing the routes recommended by the Arizona Wilderness Coalition to protect the bighorn sheep from potential disturbance from motorized recreational activities.

Lastly, desert bighorn sheep are considered wilderness quality indicator species because they inhabit the most beautiful, rugged, and inaccessible terrain that is normally representative of wilderness. Bighorn sheep populations are normally more robust in areas where there is more wilderness and roadless land than any other land allocation. Hopefully the Sonoran Desert NM can continue to be high quality habitat for this species

with inclusion of the Sand Tank Mountains units into the National Wilderness Preservation System.

Red-backed whiptail lizard Cnemidophorus *burti xanthonotus*

The US Fish and Wildlife Service have designated the red-backed whiptail lizard as a species of concern. BLM and USFS have listed it as a sensitive species (HDMS 2003). The Pima County Habitat Conservation Plan has developed conservation goals for this species and has determined that 90% its historic range occurs in Pima County. The Sand Tank Mountains occur completely within Maricopa County and the Javelina Mountains, which occur within the greater Sand Tank Mountains, have been found to contain populations of the red-backed whiptail lizard as well (Rosen personal Communication to Scalero 1999; Stebbins 1985; BISON-M 2000 as cited in SDCP 2001). The habitat requirements for this species include high desert mountain scrub and grasslands with junipers or other scrub trees (Lowe 1964; Stebbins 1985; AGFD 1997; BISON-M 2000 as cited in SDCP 2001). The Sonoran Desert Conservation Plan specifically acknowledges that, "Red-backed whiptails are known only from relatively undisturbed canyon areas in wilderness or rangeland" (SDCP 2001). The information presented here for the red-backed whiptail lizard clearly supports wilderness protection as one of the best options for long-term viability of this species.

California leaf-nosed bat *Macrotus californicus*

The Arizona Game and Fish Department considers the California leaf-nosed bat a Wildlife of Special Concern in Arizona; US Fish and Wildlife Service considers it a species of concern and; BLM considers it a sensitive species (HDMS 2003). This bat has become imperiled mostly do to roost disturbances from recreationalists and scientists

(AGFD 2001). The California leaf-nosed bat is extremely unique because of its reproductive methods and adaptations to habitat. Unlike most bats, the female does not preserve sperm over the winter, but becomes fertilized and has an extremely slow gestation period over the winter with a normal 3 ½ month gestation in the spring (Tuttle 1998; AGFD 2001). It does not normally migrate do to its small wings that are more suited for helicopter type flight. It feeds on insects by hovering close to the ground. Roosts consist of rock shelters, old mines, and caves within 80-100 feet of the cave's entrance (AGFD 2001).

The Sand Tank Mountains contain at least 3 old mines that have routes accessing them (AWC inventory 2002). Since the literature cites human disturbance as the number one cause of this species imperiled status closing of all routes in the Sand Tank Mountains that access old mines would limit vehicular access to these sites, reducing the possibility of roost disturbance by recreationists and scientists. Wilderness protection would further help protect this species by not allowing these routes or mines to be reopened in the future. Since permits are required for access to the Sand Tank Mountains, educational materials could be distributed for other users when permits are issued. I have found from personal experience that impacting roost sites is easier than one might think. Almost anyone who has found themselves standing at the edge of a mine shaft wants to drop a rock in and see how deep it is, which is a likely cause of disturbance from recreationalists. This could easily be corrected with proper educational materials.

Cave myotis bat *Myotis velifer*

The cave myotis bat is listed as a species of concern by the US Fish and Wildlife Service and as a sensitive species by the BLM. This species, unlike the California leaf-nose bat hibernates and migrates (AGFD 2002). It feeds on flying ants and moths while flying 3-15 feet above vegetation and normally roosts near water (AGFD 2002). It is found normally between 300-5,000 feet elevation in desert scrub of creosote, brittlebush, palo verde and cacti, roosting in old mines, buildings, and caves. During non-migratory times it requires up to 1600 square kilometers of habitat (AGFD 2002). Urban development and roost disturbance is the leading cause of habitat loss and population decline. The New Mexico Game and Fish Department recognizes that, "Mines which are in close proximity to roads, towns, hiking trails or camp grounds are more susceptible to disturbance than those in remote areas with difficult access (Snow et al., 1975. as quoted in BISON 2002). Closure of all routes leading to mine sites in the Sand Tank Mountains and Wilderness protection will greatly assist BLM in ensuring this species long-term viability.

Harris's hawk *Parabuteo unicinctus*

The Harris's hawk has no special status recognized by the federal land management agencies or AGFD (HDMS 2003). It has experienced reduction in range since the 1960s throughout the southwestern United States. It is primarily found in the Sonoran Desert, nesting in saguaros, palo verdes, and mesquites. Urban encroachment on its habitat will continue to shrink this predator's population. It is protected under the Migratory Bird Treaty Act. Its status and habitat would be protected with additional

wilderness designations in the Sonoran Desert, but more effective urban planning must also be accomplished to protect this species.

California snakewood Colubrina californica

This plant species does not have any status with the state of Arizona or federal agencies. It is ranked G4 by NatureServe, The Nature Conservancy, and the Natural Heritage Network, meaning it is apparently secure, uncommon but not rare and should be monitored for decline due to its global rarity. I found a few individuals during my inventory growing along a lower elevation wash in which there is significant vehicle travel and potential for disturbance of this species.

Historical Review: The Arizona BLM Wilderness Inventory (1978-87)

The BLM's initial wilderness inventories were completed under the requirements of section 603 of the FLPMA. In 1978 The BLM started an initial inventory of all public lands under their management in Arizona and sorted out all lands that "clearly and obviously" lacked wilderness characteristics. Portions of three initial inventory units studied under this process make up the lands outside of Area A in the proposed Sand Tank Mountains Wilderness East and West units: Sand Tank Mountains South (2-168), unit #2-169, and Lost Horse Tank (2-170).

Regarding the Sand Tank Mountains South (2-168) unit the BLM reported in their *Wilderness Review, Arizona Initial Inventory of Public Lands Administered by Bureau of Land Management Decision Report September 1979* that,

> *A field check verified that the western part of the unit is not in natural condition and will be dropped from further consideration. This same field check found that the route separating units 168 and 169 is apparently not a road. Therefore the remainder of the unit will be intensively inventoried as part of a larger unit combined with unit 169* (USDI 1979).

It is difficult to assess the level of reclamation that has occurred in the area that was excluded, but in the AWC inventories a much smaller area was found to be roaded and unnatural in the northwest corner of this unit. It is hard to believe that the area could have been extensively impacted if it now appears natural only 25 years later in a harsh desert environment. Livestock improvements and maintained roads occur in the smaller area that the AWC excluded. It is difficult to know if the BLM's inventory was correct in this realm without more information about why the area was excluded.

The inappropriately named Squaw Tits (2-169) unit (has been referred to as unit # 2-169) was field checked for routes that could not be confirmed by BLM in the initial inventory and was proposed to be intensively inventoried with the addition of the eastern portion of unit (2-168) (USDI 1979).

The Lost Horse Tank (2-170) unit was proposed as "clearly and obviously" not meeting wilderness criteria. Interstate 8 and the Barry M. Goldwater Air Force bound this small 4,700-acre unit. This unit was dropped from further study. At the time this assessment was correct due to the unit's small size.

The enlarged 33,690-acre unit # 2-169 was intensively inventoried and was dropped from further study. In the BLM's *Wilderness Review, Arizona Intensive Inventory of Public Lands Administered by Bureau of Land Management Proposal Report May 1980*, BLM stated that,

> *Opportunities for solitude are severely limited by the unit's lack of topographic diversity, poor vegetative screening, narrow shape, and nearness to the noise of vehicle traffic on interstate 8. Primitive recreation opportunities are also limited by the unit's narrow shape and relatively uniform terrain.* (USDI 1980)

This rationale is flawed not only in actual fact, but also in application of inventory criteria. The lack of topographic diversity in this unit is simply inaccurate. The Squaw Tits formation, the mountains running northwest, and the small canyons and numerous washes in this unit offer outstanding opportunities for solitude and primitive and unconfined recreation. Climbing the Squaw Tits formation offers excellent primitive and unconfined recreation, as it is a class 3 or 4 climb with numerous route-finding challenges. The inventory criteria In the BLM's *Wilderness Inventory Handbook, Policy, Direction, Procedures, and guidance for Conducting Wilderness Inventory on the Public Lands, September 1978* states that in determining solitude*, "consider factors which influence solitude* ***only*** *as they affect a person's opportunity to avoid the sights, sounds, and evidence of other people in the inventory unit."* (USDI 1978: p. 13, emphasis added) The finding that the narrow shape of the unit impacted primitive and unconfined recreation is an absurd finding because the unit was not even twice as long as it was wide.

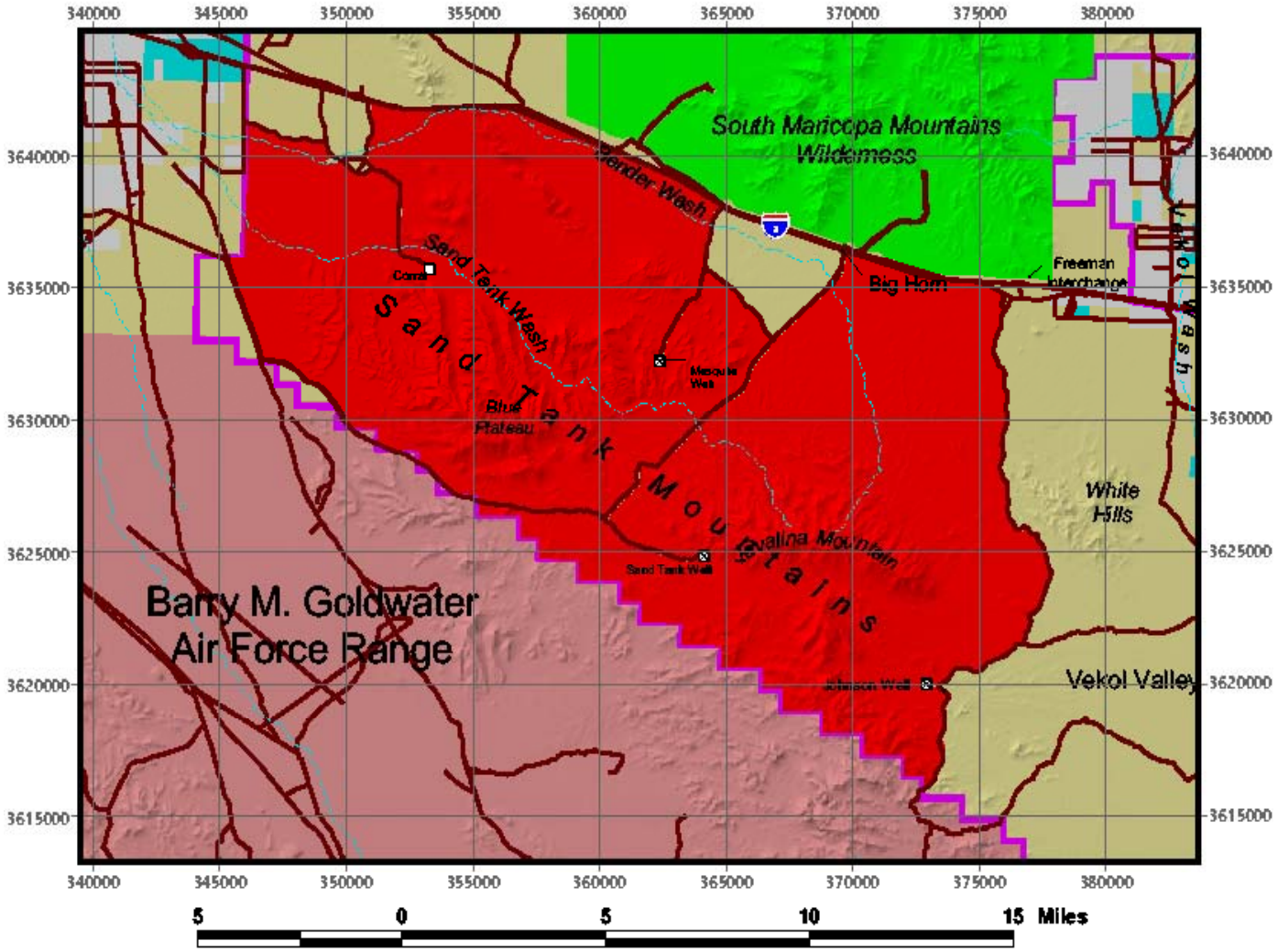
The historical information reviewed here clearly demonstrates BLM's flawed inventory for a unit that is now part of The Sonoran Desert National Monument because of its outstanding untrammeled character and diverse array Sonoran Desert vegetation. Although the FLPMA section 603 process was determined sufficient by the 1990 Arizona Desert Wilderness Act and cannot be legally challenged, local BLM staff should correct their previously flawed inventory by studying and protecting this area for its wilderness characteristics.

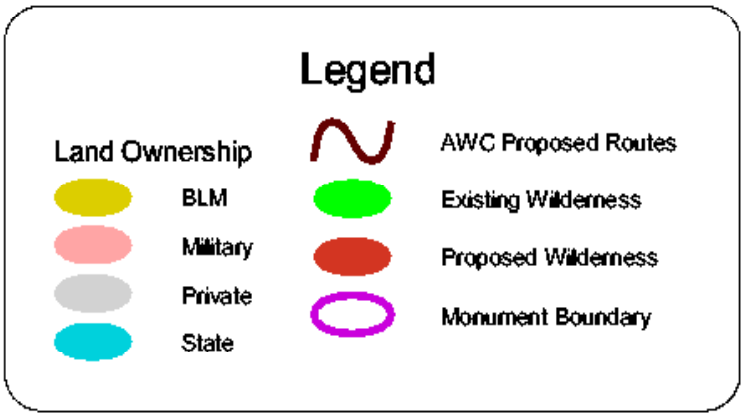
Conclusion

The Arizona Wilderness Coalition citizen's inventory documents that 108,710 acres of the Sand Tank Mountains East and West units possess outstanding wilderness

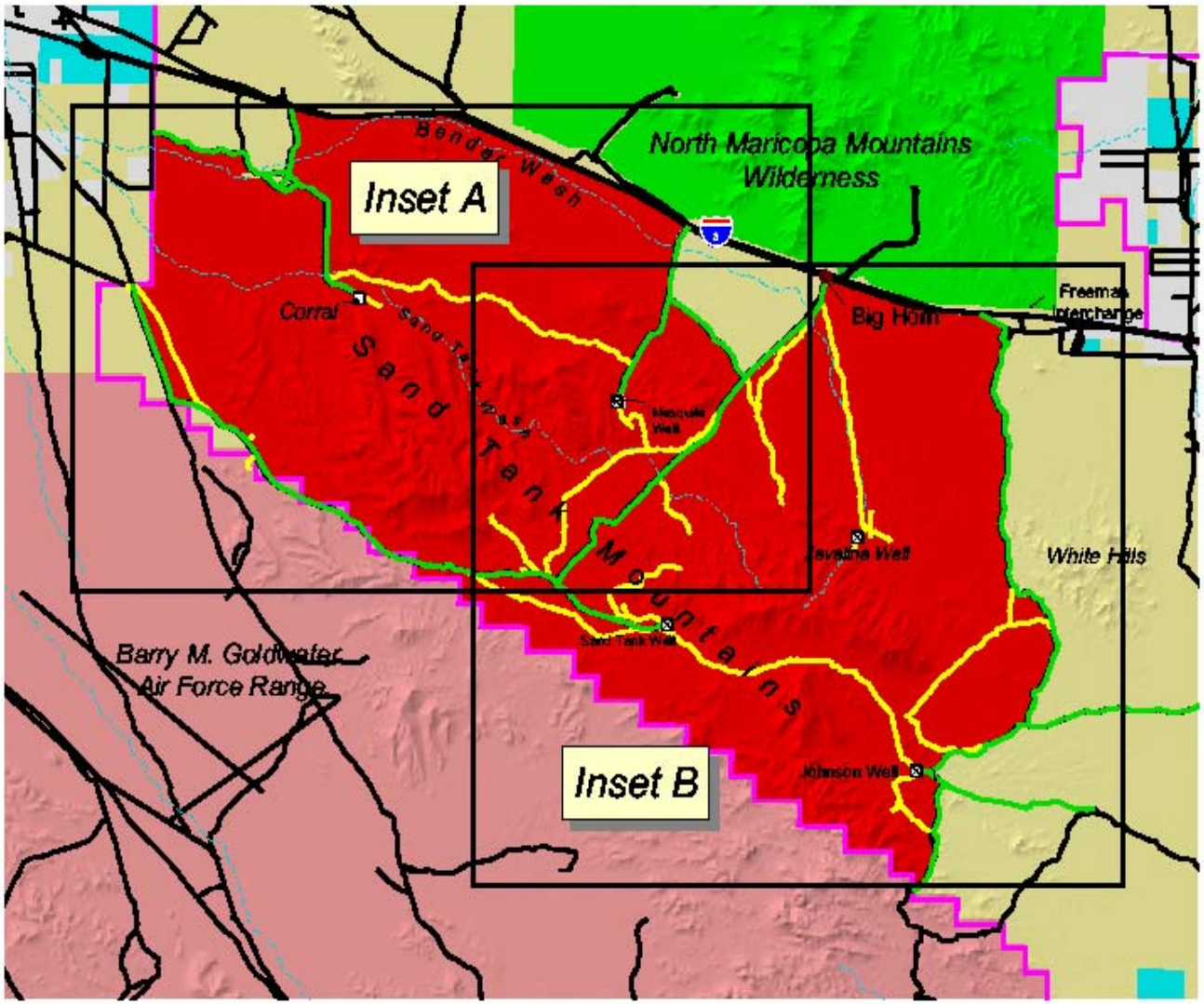
characteristics. The Sand Tank Mountains are extremely rich in biological diversity and need to be protected so that this valuable natural heritage is not lost. The results of non-designation of this unit will be increased motorized visitation, proliferation of illegal motorized trails, dumping, illegal vegetation cutting for fire wood, and potential poaching because of the proliferation of illegal motorized routes. The Sand Tank Mountains are the crown jewel of the Sonoran Desert National Monument. The untrammeled landscape of these mountains allows for nature to be free from human intervention, "where man's imprint is substantially unnoticeable". Protecting the wilderness characteristics of the Sand Tank Mountains will achieve the goal of protecting the objects of the Sonoran Desert National Monument for present and future generations.

Sand Tank Mountains Proposed Wilderness





Inventoried Routes



Legend

- Recommended Open Routes
- Recommended Closed Routes
- Monument Boundary

Land Ownership

- BLM
- Indian Lands
- Military
- Private
- State
- Proposed Wilderness
- Existing Wilderness

5 0 5 10 15 20 Miles

N W E S

Arizona Wilderness Coalition 2004
Sonoran Desert National Monument Wilderness Proposal
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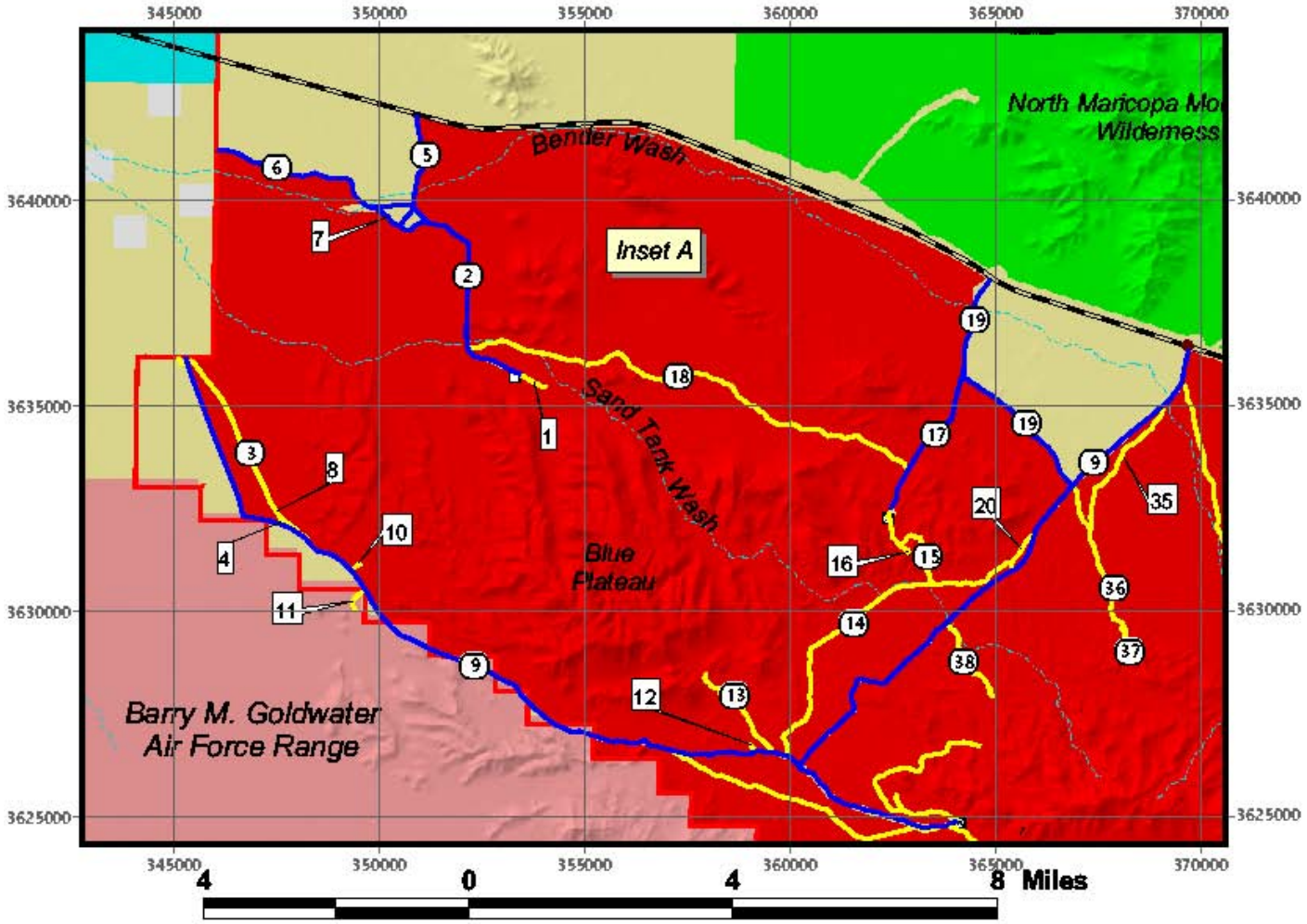
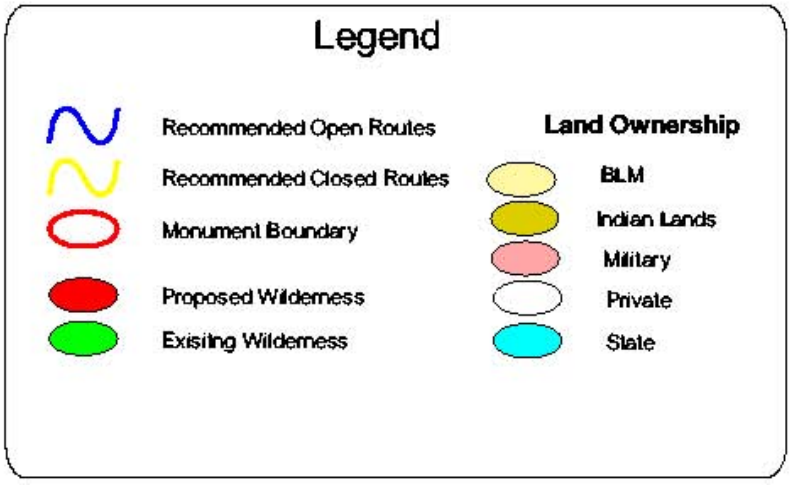
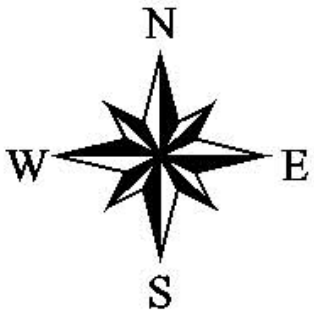
Inventoried Routes
Inset A

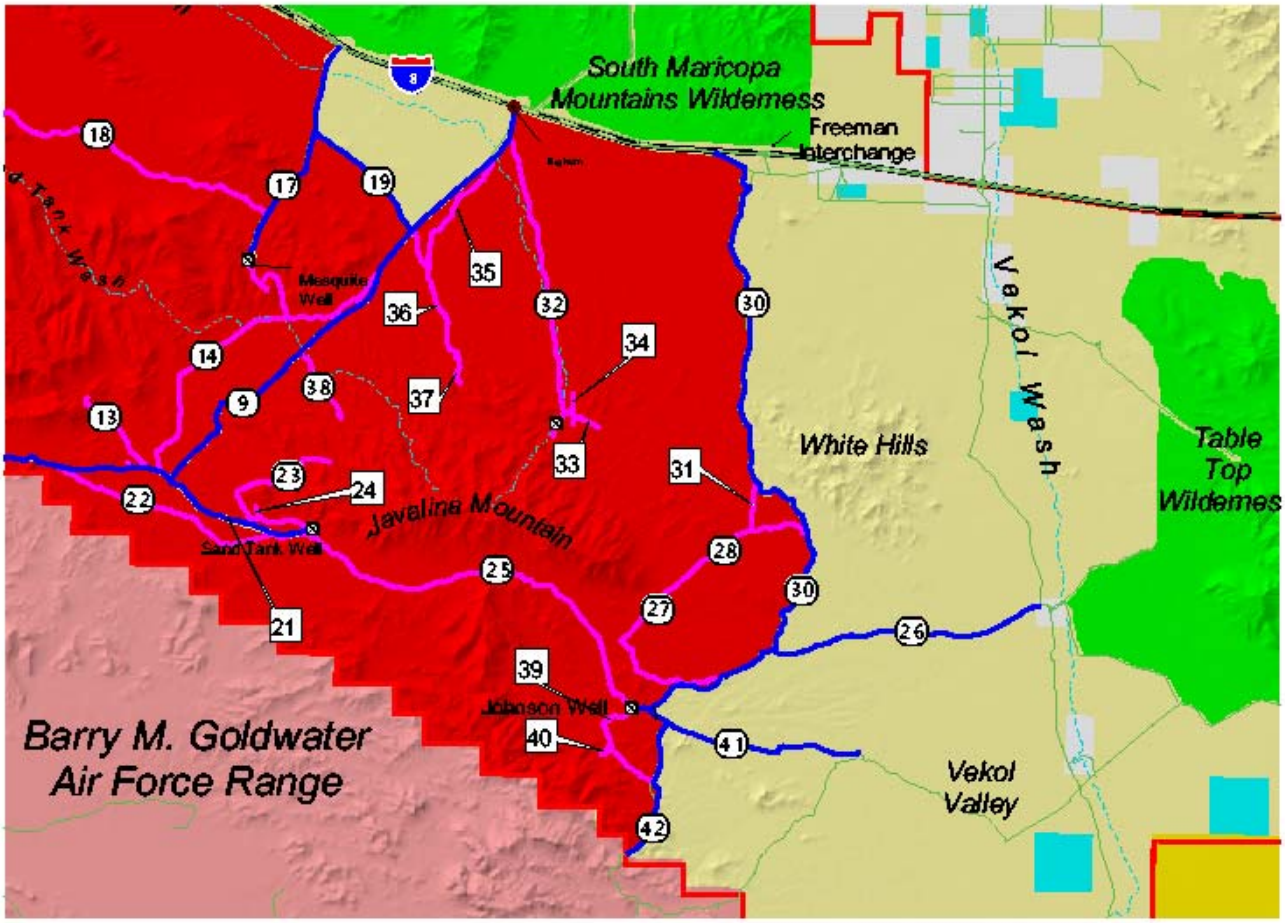






Inventoried Routes

Inset B



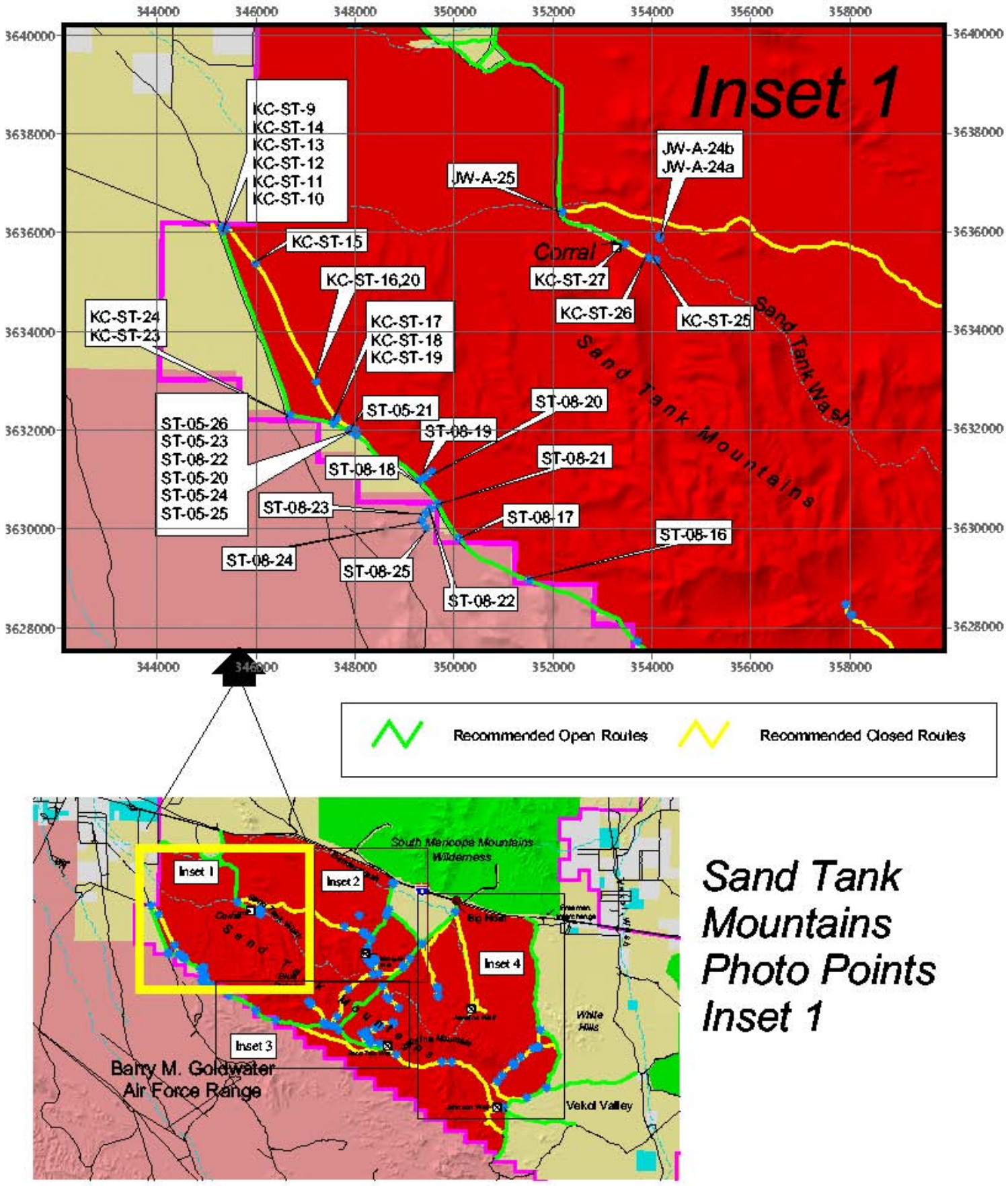
2 0 2 Miles

Legend

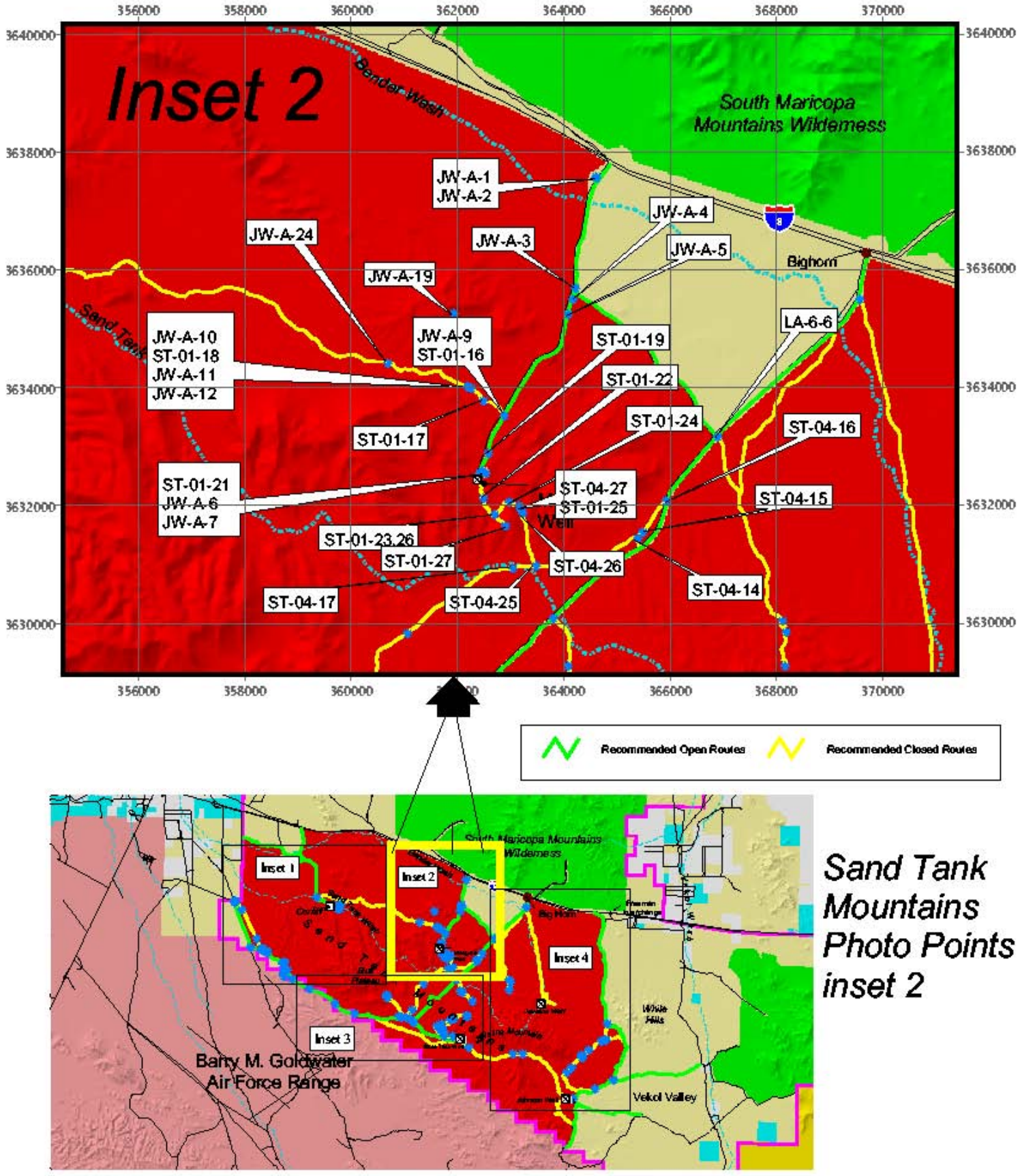
Land Ownership
- BLM
- Indian Lands
- Military
- Private
- State
- Proposed Wilderness
- Exisitng Wilderness

- Recommended Open Routes
- Recommended Closed Routes
- Monument Boundary

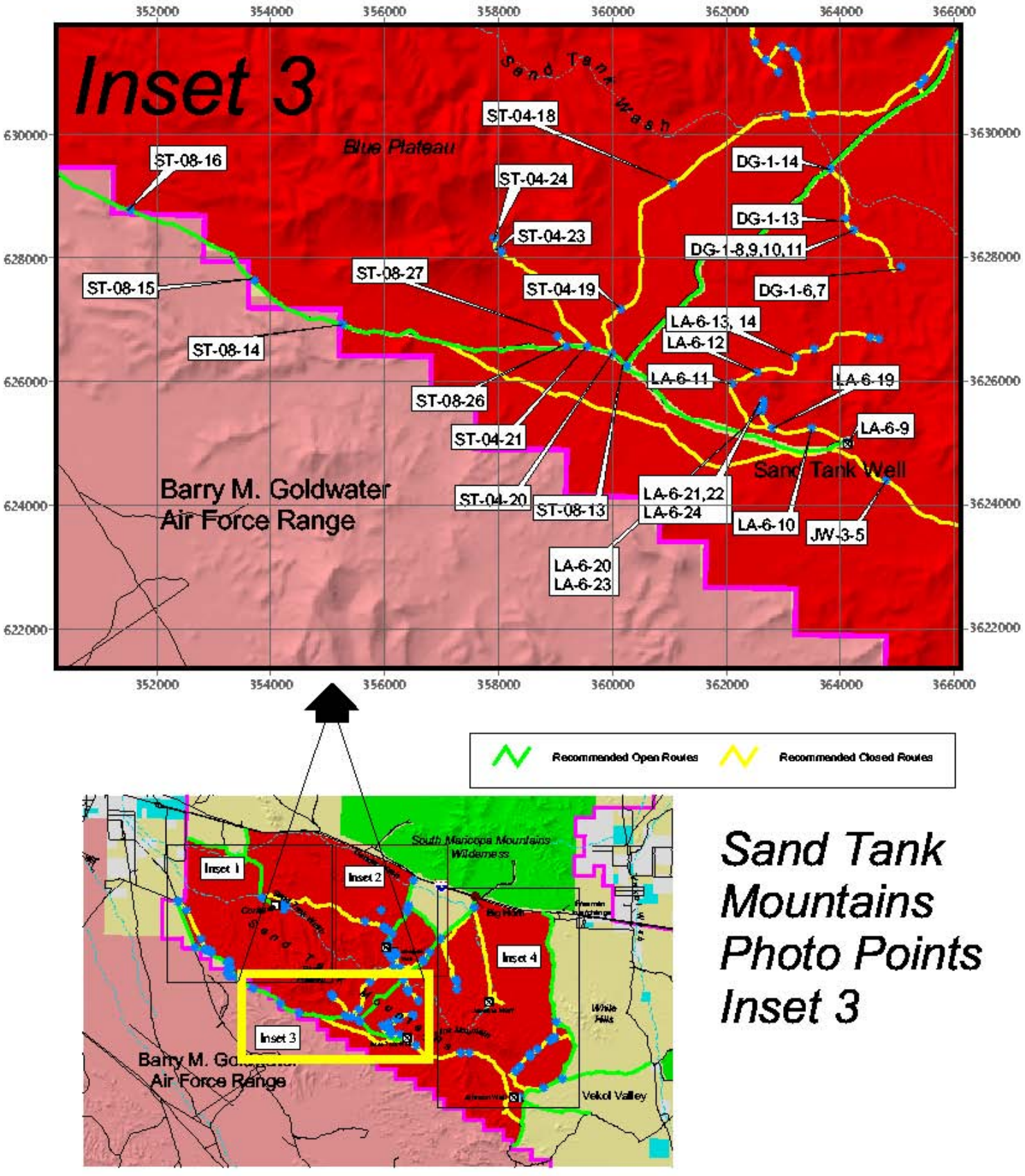
N W E S



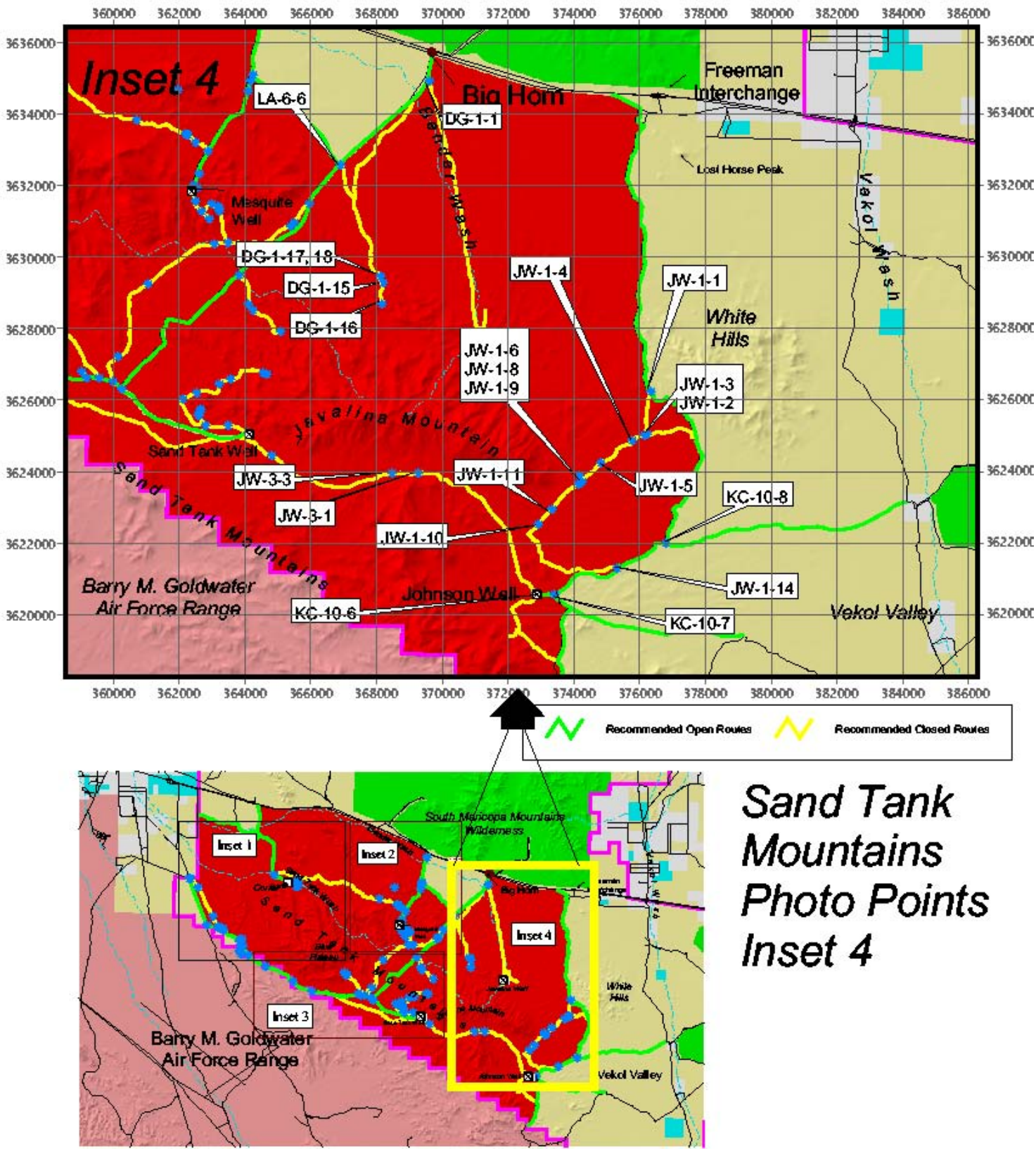
Sand Tank Mountains Photo Points Inset 1



Sand Tank Mountains Photo Points inset 2



Sand Tank Mountains Photo Points Inset 3



Sand Tank Mountains Photo Points Inset 4

Route Inventory and Photographic Documentation
For the
Sand Tank Mountains East and West Units

Route #: 1
Photos: KC-ST-25, 26, 27
Length: .43 miles
Construction Type: Looks as if it has been bladed in the past
FLPMA Road Definition: NO
Campsites: 0
Vehicle Type: HC 4WD
Erosion: 6+ inches in wash
Vegetation Present: bare soil >50% of surface
Other Impacts: ORVs are slowly pushing the end of this route further into the desert
Proposed Action: Close
Notes: This is a short segment that extends past the regularly maintained road surface and serves no purpose. All of the range facilities would still be accessible. Closure for this route will prevent further probing by vehicles.

KC-ST-25 End route 1
Direction: SE

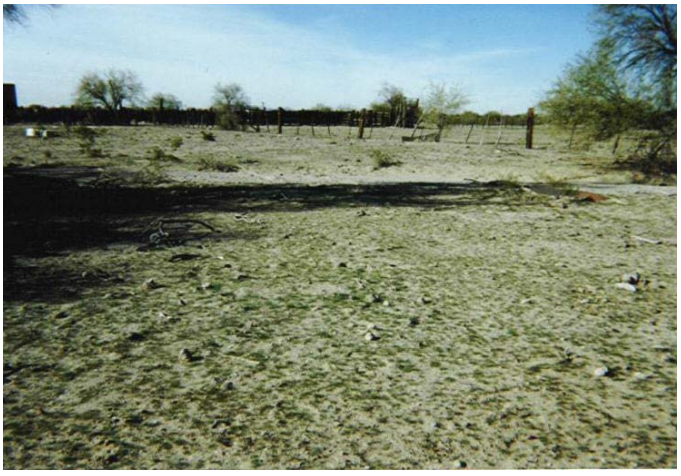
KC-ST-26 Average conditions on route 1
Direction: SE

KC-ST-27 Begin route 1
Direction: E

Route #: 2
Photos: N/A
Length: 3.36 miles
Construction Type: Bladed and Maintained
FLPMA Road Definition: Yes
Campsites: Numerous pullouts
Vehicle Type: 2WD
Erosion: N/A
Vegetation Present: 100% bare soil
Other Impacts:
Proposed Action: Open
Notes: Forms a cherry stem that accesses a corral, water tank, and campsites.

Route #: 3
Photos: KC-ST-9 thru KC-ST-14; KC-ST-16; KC-ST-20
Length: 2.49 miles
Construction Type: Bladed, no evidence of maintenance
FLPMA Road Definition: No
Campsites: N/A
Vehicle Type: 4WD
Erosion: 12 inches of soil loss in some places
Vegetation Present: Bare soil is >50% of surface
Other Impacts: None
Proposed Action: Close
Notes: Does not provide access to anything. Has been closed by the Barry M. Goldwater Air Force Range (BMGR) in the past. Wilderness Characteristics dominate this biologically rich wash area.


KC-ST-9 Corral /Range facilities at Junction of routes 3 and 9 of the Preferred transportation plan


KC-ST-10 Corral /Range facilities at Junction with routes 3 and 9


KC-ST-11 Corral /Range facilities at junction of routes 3 and 9.


KC-ST-12 Junction routes 3 and 9


KC-ST-13 average conditions on route 3 looking towards corral. Direction: W


KC-ST-14 Begin route 3


KC-ST-16 average conditions on route 3
Direction: N


KC-ST-20 old BMGR boundary end route 3
Direction: S

Route #: 4
Photos: KC-ST-17, 18, 19
Length: .09 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: N/A
Vehicle Type: 4WD
Erosion: N/A
Vegetation Present: Bare soil is >50% of surface
Other Impacts: Vegetation damage
Proposed Action: Close
Notes: User created route. Does not provide access to anything. Is redundant even if left open. It is a short cut route. Only needs to be closed from route 9 which will stay open for access to the area.


KC-ST-17 Junction routes 3 and 4
Direction: S


KC-ST-18 Average on route 4
Direction: NE


KC-ST-19 Junction routes 4 and 9
Direction: N

Route #: 5
Photos: N/A
Length: 1.73 miles
Construction Type: Bladed and Maintained
FLPMA Road Definition: Yes
Campsites: numerous pullouts
Vehicle Type: 2WD
Erosion: N/A
Vegetation Present: Bare soil is 100% of surface
Other Impacts: N/A
Proposed Action: Open
Notes: Provides access to range improvements and camping from I-8

Route #: 6
Photos: N/A
Length: 2.7 miles
Construction Type: Bladed and Maintained
FLPMA Road Definition: Yes
Campsites: Some
Vehicle Type: 2WD
Erosion: N/A
Vegetation Present: Bare soil is 100% of surface
Other Impacts: N/A
Proposed Action: Open
Notes: Provides access to range improvements and BGMR. This route forms part of the northern Boundary for the Sand Tank Mountains Proposed Wilderness Study Area.

Route #: 7
Photos: N/A
Length: loop
Construction Type: Bladed and Maintained
FLPMA Road Definition: Yes
Campsites: Some
Vehicle Type: 2WD
Erosion: N/A
Vegetation Present: Bare soil is 100% of surface
Other Impacts: N/A
Proposed Action: Open
Notes: Provides access to range improvements. An important question is how will this be removed and managed when the range operations cease in coming years?

Route #: 8
Photos: KC-ST-20 thru KC-ST-22; ST-08-22
Length: 1.4
Construction Type: None
FLPMA Road Definition: No
Campsites: N/A
Vehicle Type: HC 4WD
Erosion: Some soil loss in tire tracks.
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: Vegetation Damage on route that is reclaiming
Proposed Action: close
Notes: This route is closed at photo point KC-ST-20. It does not provide access to anything. It has been replaced by route 9 that is part of the preferred transportation system. Some ORV cross-country routes are being created near the route closure at above photo point.


KC-ST-20 Old BMGR boundary end route 8 on other side of closure. Direction: S

KC-ST-21 Junction routes 8 and 9

KC-ST-22 Average on route 8
Direction: NW

ST-08-22 Erosion on route 8
Direction: N

Route #: 9
Photos: Many various photos as it is the main route in this area
Length: 21.5 miles
Construction Type: In some places it has been bladed, but not regularly maintained for its whole length
FLPMA Road Definition: No
Campsites: Numerous
Vehicle Type: HC 4WD to travel entire length
Erosion: Numerous spots that have excessive soil loss
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: Some trash and cross country travel tracks
Proposed Action: open
Notes: This route is part of the proposed transportation system. It provides and will continue to provide excellent access to some of the Sonoran Desert's most remote country. Wilderness units on both sides of this unit will further increase the ability of users to have a primitive experience on this route. Numerous camping opportunities exist and hiking opportunities from this route.

ST-05-23 Average Conditions on route 9 west side
Direction: NE

ST-08-17 Average conditions on Route 9
Direction: SE

ST-08-16 Average and Erosion on route 9
Direction: NW

ST-08-15 Average and erosion on route 9
Direction: W

ST-08-14 worst erosion on route 9
Direction: W

ST-08-13 Junction with routes 14, 9, and 21
Direction: W

A-6-5 Average conditions on route 9

Route #: 10
Photos: St-08-18, 19, 20
Length: .19 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: 2WD
Erosion: Stable
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: N/A
Proposed Action: close
Notes: This route is user created and should be closed as it provides no additional access to anything.

ST-08-18 Beginning of route 10
Direction: NE

ST-08-19 average conditions on route 10
Direction: N

ST-08-20 End route 10
Direction: NE

Route #: 11
Photos: St-08-21 thru ST-08-25
Length: .43 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: HC 2WD
Erosion: Greater than >5 inches of soil loss
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: N/A
Proposed Action: close
Notes: This route is user created and should be closed as it provides no additional access.

ST-08-22 Erosion on Route 11
Direction: E


ST-08-23 Worst erosion on route 11
Direction: SW


ST-08-24 Average conditions on route 11
Direction: SW


ST-08-25 End Route 11
Direction: SE

Route #: 12
Photos: St-08-26 and ST-08-27
Length: .14 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: HC 2WD
Erosion: Greater than >5 inches of soil loss
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: N/A
Proposed Action: close
Notes: This route is user created and should be closed as it provides no additional access to anything.


ST-08-26 Junction routes 9 and 12
Direction: E


ST-08-27 End route 12
Direction: NW

Route #: 13
Photos: St-04-21 and ST-04-24
Length: 1.69 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: HC 4WD
Erosion: Greater than >12 inches of soil loss
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: N/A
Proposed Action: close
Notes: This route Provides access to a AZ Game and Fish water catchment. It should be closed to administrative use only. A minimum requirements study should be done


ST-04-21 Junction routes 9 and 13
Direction: E


ST-04-22 Average and scenic on route 13
Direction: SE


ST-04-23 Worst erosion on route 13
Direction: NW


ST-04-24 End route 13 Wildlife water catchment
Direction: NW

Route #: 14
Photos: ST-04-14**;** St-04-17, 18, 19, 20
Length: 5.41 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 2
Vehicle Type: 4WD
Erosion: Greater than >20 inches of soil loss
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: N/A
Proposed Action: close
Notes: This route is user created and should be closed as it provides no additional access to anything. Has a few hunting campsites that can easily be relocated to route 9 less than one mile east.

ST-04-14 Junction with routes 14 and 20
Direction: SW

ST-04-17 Erosion on route 14
Direction: E

ST-04-18 Erosion on route 14
Direction: NE

ST-04-19 Average on route 14
Direction: N

ST-04-20 Junction routes 9 and 14
Direction: N

Route #: 15
Photos: St-04-25, 26, 27 and ST-01-22 thru ST-01-27
Length: 1.72 miles
Construction Type: Cut and Fill
FLPMA Road Definition: No
Campsites: 1
Vehicle Type: HC 4WD
Erosion: Greater than >12 inches of soil loss
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: N/A
Proposed Action: close
Notes: This route was originally created for mining purposes, which have long since ceased. Route should be closed to protect wilderness characteristics. It has one hunting camp on its length.

ST-04-25 Junction routes 14 and 15
Direction: N

ST-01-22 Average conditions on route 15

ST-04-26 Average conditions on route 15
Direction: NW

ST-01-23 Earth dam across road looking east from route 15

ST-04-27 Scenic and average conditions on route 15 Direction: NE

ST-01-24 Worst erosion on route 15
Direction: W

ST-01-25 Average conditions on route 15
Direction: NW

Route #: 16
Photos: ST-01-26; ST-01-27
Length: .19 miles
Construction Type: No evidence
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: HC 4WD
Erosion: N/A
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: N/A
Proposed Action: close
Notes: This route was originally created for mining purposes, which have long since ceased. Route should be closed to protect wilderness characteristics.

ST-01-26 Junction routes 15 and 16

ST-01-27 End route 16
Direction: N

Route #: 17
Photos: St-01-19, 20, 21, JW-A-3 thru JW-A-7, 9
Length: 2.46 miles
Construction Type: Bladed
FLPMA Road Definition: Maybe
Campsites: 1
Vehicle Type: 2WD
Erosion: N/A
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: N/A
Proposed Action: open
Notes: This route provides access to mesquite well and the cabin. There is a gate with a padlock for entering Area A at photo ST-01-19. The padlock was unlocked this time though. This route meets all the access needs in the area. A small kiosk should be placed at its beginning to tell visitors about the area.

JW-A-3 Junction routes 19 and 17 Direction: SE

JW-A-4 Campsite along route 17 Direction: NE

JW-A-5 Campsite in wash along route 17 Direction: E


JW-A-9 Junction routes 17 and 18 Direction: W

ST-01-19 BMGR boundary entering Area A on route 17 Direction: S


ST-01-21 Mesquite Well/ Water Catchment route 17 Direction: S


JW-A-6 Cabin at Mesquite Well end of route 17 Direction: S

JW-A-7 Cabin at Mesquite Well end of route 17
Direction: N

Route #: 18
Photos: St-01-16, 17, 18
Length: 2.32 miles
Construction Type: None
FLPMA Road Definition: None
Campsites: 0
Vehicle Type: HC 2WD
Erosion: 9 inches of soil loss in places
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: Desert tortoise disturbance
Proposed Action: close
Notes: Walked route past photo ST-01-18 down into wash where it continues indefinitely. Route should be closed as it promotes wash driving. Users will likely not stay on the existing route do to the nature of wash routes and the ability to drive into and up most intersecting washes. Washes contain the best habitat for many types of wildlife for escape from the hot daytime temperatures. Most driving in the SDNM happens during the day, which causes the greatest disturbance of wildlife. Photos JW-A-24a and b are an example of potential impacts to wildlife from ORVs using washes. Natural characteristics such as wildlife are considered objects of the national monument. In order to fulfill its mandate to protect the objects of the monument the BLM must not include this route in its transportation plan.

ST-01-16 Junction routes 18 and 17
Direction: W

ST-01-17 Average conditions on route 18
Direction: W

ST-01-18 Erosion on route 18
Direction: E

JW-A-10 worst erosion on route 18
Direction: E

JW-A-11 ORV tracks in tight wash upstream from route 18, easy access from route 18 for this and many other small washes. Direction: W

JW-A-12 Average conditions on route 18 in wash
Direction: E

JW-A-24 Average conditions in wash on route 18
Direction: E


JW-A-24b Dead Desert Tortoise ¼ mile up Sand Tank Wash from route 18 direction: SE


JW-A-24a Dead Desert tortoise with ORV tracks next to it. Direction: NW

JW-A-25 Junc routes 18 and 2 Direction: E

Route #: 19
Photos: N/A
Length: 3.95 miles
Construction Type: Bladed
FLPMA Road Definition: Maybe
Campsites: N/A
Vehicle Type: 2WD
Erosion: N/A
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: N/A
Proposed Action: open
Notes: This route provides access from the Bighorn exit over to Johnson Well. It is the Northern boundary for the West Sand Tank Mountains Wilderness Study Area Proposal. It should be evaluated for closure to expand the Wilderness Area boundary.

JW-A-1 Corral on route 19
Direction: NW

JW-A-2 well and denuded area near corral on route 19 Direction: SW

JW-A-3 Junction routes 19 and 17 route 19 continues to the left/east Direction: SE

Route #: 20
Photos: St-04-14, 15, 16
Length: .55 miles
Construction Type: None
FLPMA Road Definition: Maybe
Campsites: 0
Vehicle Type: 4WD
Erosion: Some erosion up to 5 inches in some places
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: N/A
Proposed Action: closed
Notes: This route is redundant and provides no additional access, close.

ST-04-14 Junction with routes 14 and 20
Direction: SW

ST-04-15 Average Conditions on route 20
Direction: NE

ST-04-16 Junction routes 14 and 9
Direction: NE

Route #: 21
Photos: ST-08-13
Length: 2.75 miles
Construction Type:
FLPMA Road Definition: Maybe
Campsites: some
Vehicle Type: 2WD
Erosion: N/A
Vegetation Present: Bare soil is between 50-100% of surface
Other Impacts: N/A
Proposed Action: open
Notes: This route provides access to Sand Tank Well. This is a popular spot for hunting and camping. It should be studied during the WSA phase.

ST-08-13 Junction with routes 9, and 21
Direction: W

Sand Tank Well

Route #: 22
Photos: N/A
Length: 4.49 miles
Construction Type: N/A
FLPMA Road Definition: No
Campsites: N/A
Vehicle Type: N/A
Erosion: N/A
Vegetation Present: N/A
Other Impacts: N/A
Proposed Action: Close
Notes: This route is redundant with route 21. the two routes should be studied together and the one that has the least impact on the landscape should be chosen for being open only to Sand Tank Well and the other should be closed.

Route #: 23
Photos: LA-6-10 thru LA-6-19
Length: 3.51 miles
Construction Type: Cut and Fill from bulldozer, no maintenance evident.
FLPMA Road Definition: No
Campsites: N/A
Vehicle Type: HC 4WD
Erosion: Exceeding 12 inches in places
Vegetation Present: numerous bushes and branches in route.
Other Impacts: N/A
Proposed Action: Close
Notes: This route was originally created for mining purposes. It is reclaiming in some places and eroding in others. It should be used to prevent further erosion and impacts to the reclamation that is occurring.

LA-6-9 Begin route 23
Direction: W

LA-6-11 Average conditions on route 23
Direction: W

LA-6-12 exposed mineshaft on route 23
Direction: E

LA-6-13 Massive erosion on route 23
Direction: SW

LA-6-14 12+ inches of erosion on route 23
Direction: E

LA-6-15 Cut and fill construction on route 23
Direction: SW

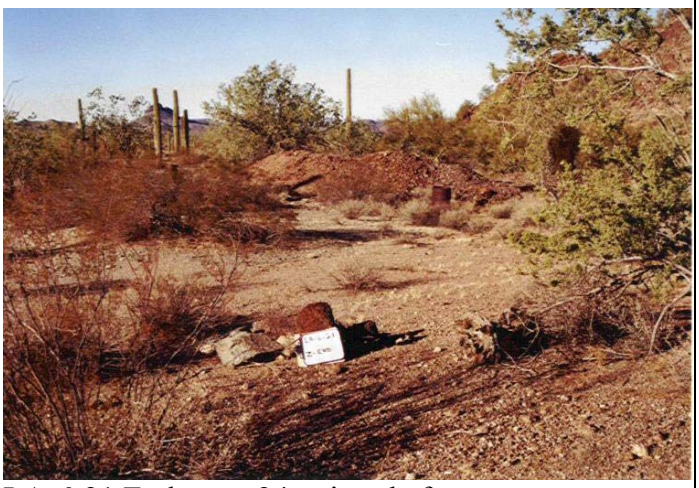
LA-6-17 Cut and Fill construction for about 1/8 mile on route 23 Direction: E

LA-6-18 End route 23 route drops into wash no tracks present Direction: E

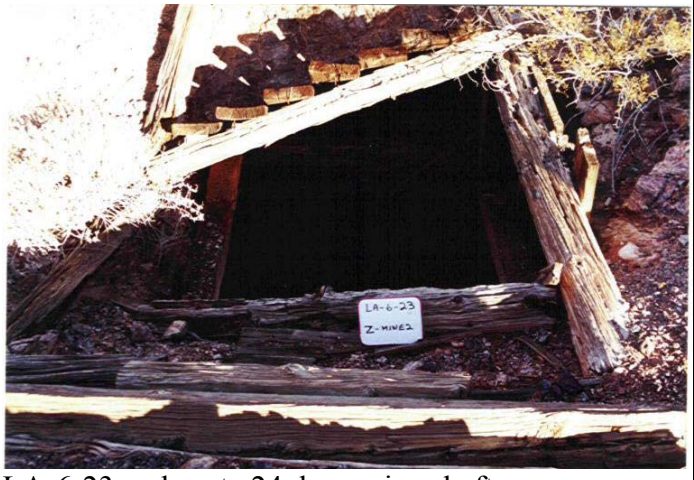
Route #: 24
Photos: LA-6-19 thru LA-6-22
Length: .29 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 1
Vehicle Type: HC 4WD
Erosion: Exceeding 12 inches end of route is washed out.
Vegetation Present: Bare soil is 25-50% of surface
Other Impacts: open mine shafts with no fencing or signage, could be great bat habitat
Proposed Action: Close
Notes: This route was originally created for mining purposes. It is reclaiming in some places and eroding in others. It should be used to prevent further erosion and impacts to the reclamation that is occurring.

LA-6-19 Begin route 24
Direction: NW

LA-6-20 Erosion on route 24 12+ inches
Direction: NE



LA-6-21 End route 24, mine shaft
Direction: W



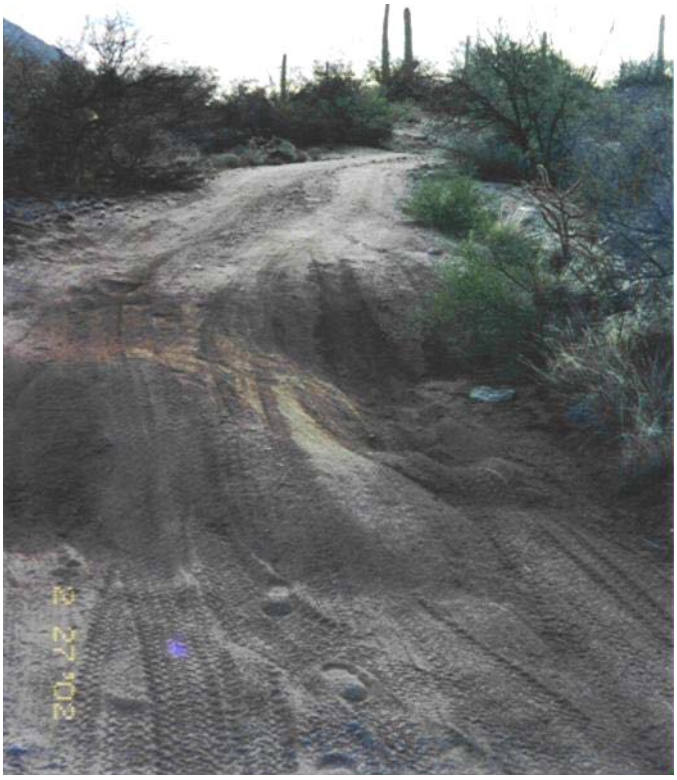
LA-6-23 end route 24 deep mine shaft
Direction: N

LA-6-24 End route 24 open mine shaft
Direction: N

Route #: 25
Photos: JW-3-5; JW-3-3; JW-3-1; KC-10-6
Length: 7.36 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 2+
Vehicle Type: HC 4WD
Erosion: Exceeding 36 inches in numerous places and end of route is washed out.
Vegetation Present: Bare soil is 50-100% of surface
Other Impacts: Wildlife disturbance and wilderness character
Proposed Action: Close
Notes: This route penetrates a large chunk of wild country in the Sand Tank Mountains. It can only be used by High Clearance 4 WD vehicles and driving the length of the route takes numerous hours. Regular monument visitors are unlikely to use this route. It impacts wildlife in the area by traveling in or near the major washes that drain Javelina Mtn. These washes and the saddle that this route goes over are valuable wildlife travel corridors and habitat. The wildlife values combined with the remote and entirely primitive setting allow wilderness characteristics to dominate this area. The presence of such high quality wilderness characteristics warrant protection through closure of this unnecessary route.

JW-3-1 Erosion and average conditions on route 25
Direction: W

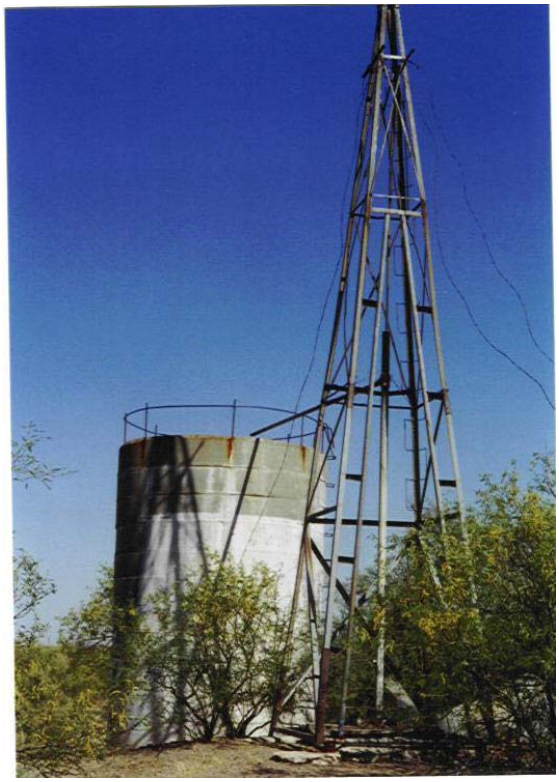

JW-3-5 Severe erosion on route 25
Direction: W


JW-3-3 Erosion on route 25
Direction: E


KC-10-6 Junction routes 25, 26, and 38
Direction: NW

Route #: 26
Photos: KC-10-4, 4a, 7
Length: 7.72 miles
Construction Type: Bladed, maintained ?
FLPMA Road Definition: No
Campsites: N/A
Vehicle Type: 2WD
Erosion: N/A
Vegetation Present: Bare soil is 50-100% of surface
Other Impacts:
Proposed Action: open
Notes: This route provides access to Johnson Well and is part of the suggested transportation network.

KC-10-4 Johnson Well

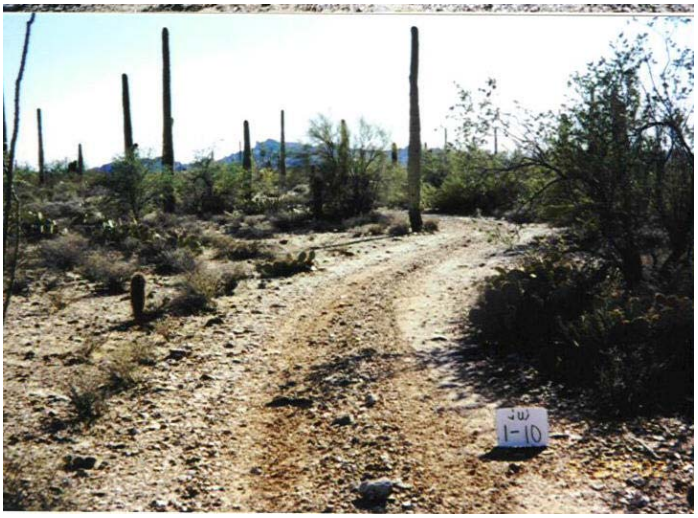


KC-10-4a old broken Windmill at Johnson Well

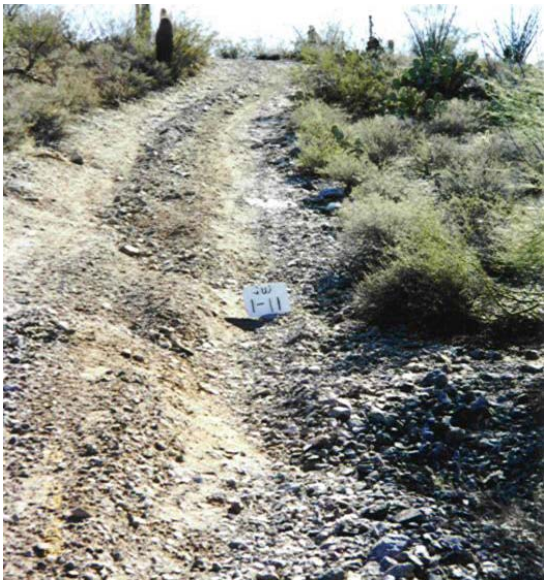
KC-10-7 Junction routes 26 and 30 route 30 is on left Direction: NW

Route #: 27
Photos: JW-1-14; JW-1-9, 10, 11
Length: 2.60 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: 4WD
Erosion: up too 12+ inches of erosion
Vegetation Present: Bare soil is 50-100% of surface
Other Impacts: N/A
Proposed Action: Close
Notes: This route is user created from the end of route 28. It is redundant and serves no purpose. It also provides illegal access to a wash as it intersects with route 26. Close to protect monument objects.

JW-1-9 Junction with short route that drops into wash on route 27 Direction: W



Jw-1-10 average condition of route 27
Direction: SW



JW-1-11 Erosion on route 27
Direction: SW

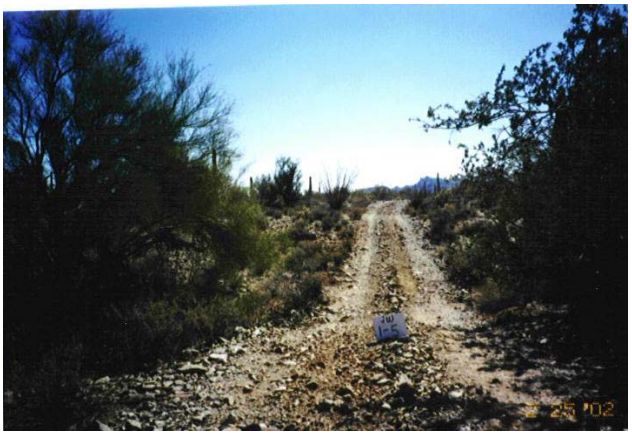
JW-1-14 Junction routes 26 and 27
Direction: S

Route #: 28
Photos: JW-1-2 thru JW-1-9
Length: 2.66 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 3
Vehicle Type: 4WD
Erosion: up to 5 inches of erosion
Vegetation Present: Bare soil is 50-100% of surface
Other Impacts: Some cross country ORV tracks
Proposed Action: Close
Notes: This route provides access to an AZ Game and Fish water catchment. It should be closed to public use. A minimum requirements study should be conducted to determine its value to native wildlife populations.


JW-1-2 Junction routes 28 and 31
Direction: E

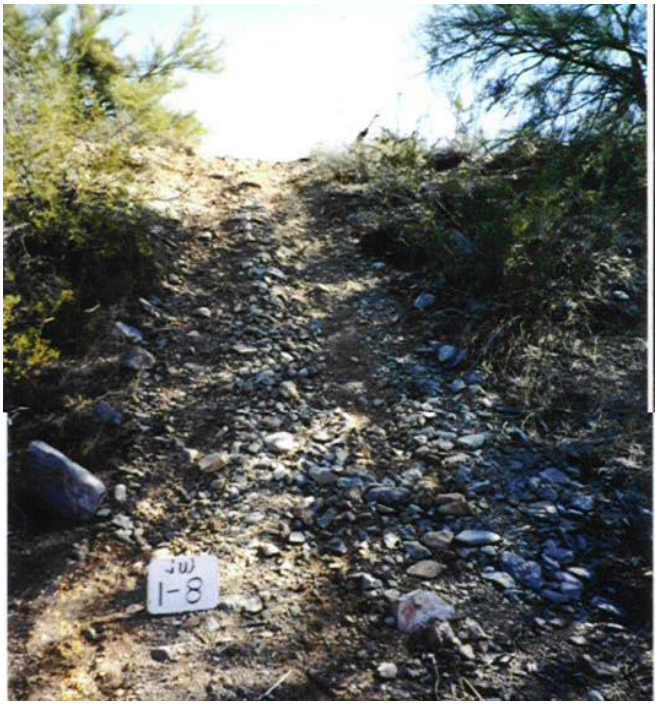
JW-1-3 ORV tracks on desert pavement on route 28
Direction: S


JW-1-4 Old abandoned route off of route 28
Direction: NE



JW-1-5 Average conditions on route 28
Direction: S

JW-1-7 Spur drops into wash
Direction: N



JW-1-8 spur route access to wash same point as JW-1-7 different direction. Direction: S

JW-1-9 Spur route access into wash at guzzler
Direction: W

Route #: 29 and 30 (route 29 was combined with route 30 in the final evaluation)
Photos: KC-10-8; JW-1-1
Length: 10.17 miles
Construction Type: None
FLPMA Road Definition: No
Campsites: 1+
Vehicle Type: 4WD
Erosion: N/A
Vegetation Present: Bare soil is 50-100% of surface
Other Impacts: N/A
Proposed Action: Open
Notes: This route provides access to the area and is heavily traveled by visitors. It should remain open after an evaluation of its impacts on monument objects is completed

KC-10-8 Junction routes 30 and 26
Direction: N


JW-1-1 Junction routes 31 and 30
Direction: S

Route #: 31
Photos: JW-1-1, 2 (See above)
Length: .85 miles
Construction Type: old berms from bulldozer, but no maintenance
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: HC 2WD
Erosion: stable
Vegetation Present: Bare soil is 50-100% of surface
Other Impacts: N/A
Proposed Action: Close
Notes: This route is redundant and unnecessary. It does not fit with a transportation system that protects the objects of the monument.


JW-1-2 Junction routes 31 and 28

Route #: 32, 33, 34 (incomplete inventory, photos are not included with photo point map)
Photos: JW-B-1, 2, 3, 4, 5
Length: 5.32 miles
Construction Type: old berms from bulldozer, but no maintenance
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: HC 4WD
Erosion: Some erosion on small segments leaving this one
Vegetation Present: Bare soil is 50-100% of surface
Other Impacts: N/A
Proposed Action: Close
Notes: The inventory on this route is incomplete. I did not find Javelina well or any AZ Game and Fish guzzlers that I though were there. Route should be entirely closed to the public and guzzler should be studied for its effectiveness and then a minimum requirements study should be completed for administrative access. Route 34 was not found and route 33 is reclaiming, see photo JW-B-5.


JW-B-1 Old Bender place near junction of routes 9 and 32 Direction: E

JW-B-3 Average conditions on route 32
Direction: SE

JW-B-4 End route 32. Route fades out at top of hill.
Direction: S

JW-B-2 South side of route 34, reclaiming
Direction: S

JW-B-5 Average conditions on route 33
Direction: E

Route #: 35
Photos: N/A
Length: 2.32 miles
Construction Type: N/A
FLPMA Road Definition: N/A
Campsites: N/A
Vehicle Type: N/A
Erosion: N/A
Vegetation Present: N/A
Other Impacts: N/A
Proposed Action: Close
Notes: This route is redundant with route 9, it is unnecessary and provides no additional access.

Route #: 36
Photos: DG-1-17, 18
Length: 2.56 miles
Construction Type: Cut and fill at one time.
FLPMA Road Definition: No
Campsites: 0
Vehicle Type: 4 WD
Erosion: N/A
Vegetation Present: N/A
Other Impacts: N/A
Proposed Action: Close
Notes: This route was created for mining access at one point and is no longer needed. Wilderness Characteristics dominate the area.

DG-1-17 looking over mining site at end of route 36
Direction: SE

DG-1-18 Looking over mining site end of route 36
Direction: S

Route #: 37
Photos: DG-1-15, 16
Length: .48 miles
Construction Type: None
FLPMA Road Definition: N0
Campsites: 1 hunting camp
Vehicle Type: 4 WD
Erosion: N/A
Vegetation Present: N/A
Other Impacts: N/A
Proposed Action: Close
Notes: This route is user created and does not see much use. Inventory Data is still incomplete and will be re-inventoried.

DG-1-15 route 37 begins at end of 36
Direction: NW

DG-1-16 End route 37
Direction: N

Route #: 38
Photos: DG-1-1 thru DG-1-14
Length: 1.5 miles
Construction Type: Cut and fill bulldozer, no maintenance
FLPMA Road Definition: N0
Campsites: 0
Vehicle Type: HC 4WD up to DG-1-13 impassable after this?
Erosion: Washed out in some places
Vegetation Present: N/A
Other Impacts: N/A
Proposed Action: Close
Notes: This route was created for grazing purposes and is impassable for most of its length. Should be closed and taken off of map to protect the natural character of the area.

DG-1-1 End route 38 at Raleigh Well
Direction: NW

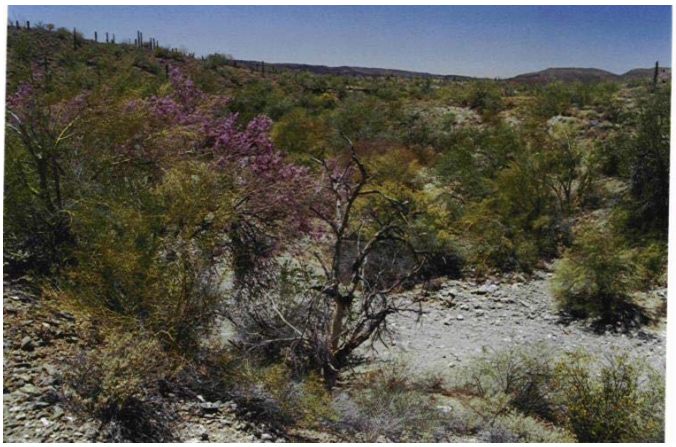
DG-1-6 Raleigh Well route 38
Direction: W

DG-1-7 Raleigh Well and corral
Direction: NW

DG-1-8 Reclaimed on route 38 old cut and fill evidence Direction: NW

DG-1-9 Average conditions reclaiming route mature creosote in middle Direction: SE

DG-1-10 More cut and fill evidence and reclamation on route 38



DG-1-11 Flowering ironwood

DG-1-13 Backfill
Direction: W

DG-1-14 Beginning of route 38
Direction: SE

Route #: 39 and 40
Photos: N/A
Length: 1.89 miles
Construction Type: N/A
FLPMA Road Definition: N/A
Campsites: N/A
Vehicle Type: N/A
Erosion: N/A
Vegetation Present: N/A
Other Impacts: N/A
Proposed Action: Close
Notes: This route provides access to an AZ Game and Fish guzzler and should be closed to administrative use with a minimum requirements study. It is also redundant with Route 42.

Routes 41 and 42 will need to be inventoried and studied further. There are some gaps and other routes that must be re-inventoried in the data presented here. These gaps will be filled in the coming months and years as these units are studied further for their wilderness suitability.

VI. Conclusion

The documentation provided, has presented the justifications for new wilderness protections in the Sonoran Desert National Monument. The need for new wilderness protection in the wake of rapid human population growth and the associated loss of biodiversity was explained. The Purpose of new wilderness protection in the Sonoran Desert National Monument was presented as a method to halt biodiversity loss by developing a system of connected core areas that can function as a wildland network. The historical roots of wilderness philosophy and law were discussed in great detail to explain the continuing obligations of the Bureau of Land Management to protect lands with wilderness characteristics. The methods for completing citizen's wilderness proposals were presented to enable others to use this process for protecting wilderness quality lands. The historical review of each inventory unit, documents that past inventories completed by BLM were inadequate. The inventories were either flawed in application of methods or did not consider lands acquired from the military in the Sand Tank Mountains. Finally, the Discussion and Results section provided the documentation on new and supplemental information that indicates the proposed areas, Butterfield Stage Memorial (9,618 acres), Margie's Peak (14,739 acres), Sand Tank Mountains East (52,648 acres), and Sand Tank Mountains West (56,062 acres), do have wilderness characteristics.

The Sonoran Desert National Monument has wilderness quality lands that are integral for protection of the Sonoran Desert Ecosystem in the face of the rapid global, national, and regional population explosion. Wilderness is the strongest form of protection available for these pristine and threatened desert lands. The Sonoran Desert National Monument was designated because it is unique and biologically important in the landscape of the Sonoran Desert. Protecting areas as wilderness is the ultimate tool for

the people of Arizona to preserve this natural heritage for future generations. A place with extensive roads, ORV trails, and all the abuses that come along with them, will not stand the test of time.

Wallace Stegner put it well in his closing statements of his 1960 "Wilderness Letter".

> *We simply need that wild country available to us, even if we never do more than drive to its edge and look in. For it can be a means of reassuring ourselves of our sanity as creatures, a part of the geography of hope.*

The "geography of hope" is in large part what wilderness provides for the future. Humans would benefit by exercising some restraint in decisions about land-use by setting aside certain areas as wilderness for their intrinsic values. The Arizona Wilderness Coalition wilderness recommendations represent a land-use proposal that embraces a "geography of hope".

In the end, a single proposal, such as this one, does not designate wilderness. It takes many dedicated people advocating to citizens and representatives to create the necessary political support to designate new wilderness. It is important to remember what Edward Abbey said, "The idea of wilderness needs no defense. It only needs more defenders." People can enjoy wilderness and the idea of having wilderness areas, but unless they actually stand up and advocate for its protection, it will be lost.

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Public Law 88-577
88th Congress, S. 4
September 3, 1964

An Act

To establish a National Wilderness Preservation System for the permanent good of the whole people, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Short Title

Section 1. This Act may be cited as the "Wilderness Act".

Wilderness System Established Statement of Policy

Sec. 2. (a) In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. For this purpose there is hereby established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as "wilderness areas", and these shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness; and no Federal lands shall be designated as "wilderness areas" except as provided for in this Act or by a subsequent Act.

(b) The inclusion of an area in the National Wilderness Preservation System notwithstanding, the area shall continue to be managed by the Department and agency having jurisdiction thereover immediately before its inclusion in the National Wilderness Preservation System unless otherwise provided by Act of Congress. No appropriation shall be available for the payment of expenses or salaries for the administration of the National Wilderness Preservation System as a separate unit nor shall any appropriations be available for additional personnel stated as being required solely for the purpose of managing or administering areas solely because they are included within the National Wilderness Preservation System.

Definition of Wilderness

(c) A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized 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 wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for

solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

National Wilderness Preservation System -- Extent of System

Sec. 3. (a) All areas within the national forests classified at least 30 days before the effective date of this Act by the Secretary of Agriculture or the Chief of the Forest Service as "wilderness", "wild", or "canoe" are hereby designated as wilderness areas. The Secretary of Agriculture shall --

> (1) Within one year after the effective date of this Act, file a map and legal description of each wilderness area with the Interior and Insular Affairs Committees of the United States Senate and the House of Representatives, and such descriptions shall have the same force and effect as if included in this Act: Provided, however, That correction of clerical and typographical errors in such legal descriptions and maps may be made.
>
> (2) Maintain, available to the public, records pertaining to said wilderness areas, including maps and legal descriptions, copies of regulations governing them, copies of public notices of, and reports submitted to Congress regarding pending additions, eliminations, or modifications. Maps, legal descriptions, and regulations pertaining to wilderness areas within their respective jurisdictions also shall be available to the public in the offices of regional foresters, national forest supervisors, and forest rangers.

(b) The Secretary of Agriculture shall, within ten years after the enactment of this Act, review, as to its suitability or nonsuitability for preservation as wilderness, each area in the national forests classified on the effective date of this Act by the Secretary of Agriculture or the Chief of the Forest Service as "primitive" and report his findings to the President. The President shall advise the United States Senate and House of Representatives of his recommendations with respect to the designation as "wilderness" or other reclassification of each area on which review has been completed, together with maps and a definition of boundaries. Such advice shall be given with respect to not less than one-third of all the areas now classified as "primitive" within three years after the enactment of this Act, not less than two-thirds within seven years after the enactment of this Act, and the remaining areas within ten years after the enactment of this Act. Each recommendation of the President for designation as "wilderness" shall become effective only if so provided by an Act of Congress. Areas classified as "primitive" on the effective date of this Act shall continue to be administered under the rules and regulations affecting such areas on the effective date of this Act until Congress has determined otherwise. Any such area may be increased in size by the President at the time he submits his recommendation to the Congress by not more than five thousand acres with no more than one thousand two hundred and eighty acres of such increase in any one compact unit; if it is proposed to increase the size of any such area by more than five thousand acres or by more than one thousand two hundred and eighty acres in any one compact unit the increase in size shall not become effective until acted upon by Congress. Nothing herein contained shall limit the President in proposing, as part of his recommendations to Congress, the alteration of existing boundaries of primitive areas or recommending the addition of any contiguous area of national forest lands predominantly of wilderness value. Not withstanding any other provisions of this Act, the Secretary of Agriculture may complete his review and delete such area as may be necessary, but not to exceed seven thousand acres, from the southern tip of the Gore Range-Eagles Nest Primitive Area, Colorado, if the Secretary determines that such action is in the public interest.

(c) Within ten years after the effective date of this Act the Secretary of the Interior shall review every roadless area of five thousand contiguous acres or more in the national parks, monuments and other units of the national park system and every such area of, and every roadless island within, the national wildlife refuges and game ranges, under his jurisdiction on the effective date of this Act and shall report to the President his recommendation as to the suitability or nonsuitability of each such area or island for preservation as wilderness. The President shall advise the President of the Senate and the Speaker of the House of Representatives of his recommendation with respect to the designation as wilderness of each such area or island on which review has been completed, together with a map thereof and a definition of its boundaries. Such advice shall be given with respect to not less than one-third of the areas and islands to be reviewed under this subsection within three years after enactment of this Act, not less than two-thirds within seven years of enactment of this Act, and the remainder within ten years of enactment of this Act. A recommendation of the President for designation as wilderness shall become effective only if so provided by an Act of Congress. Nothing contained herein shall, by implication or otherwise, be construed to lessen the present statutory authority of the Secretary of the Interior with respect to the maintenance of roadless areas within units of the national park system.

(d) (1) The Secretary of Agriculture and the Secretary of the Interior shall, prior to submitting any recommendations to the President with respect to the suitability of any area for preservation as wilderness --

(A) give such public notice of the proposed action as they deem appropriate, including publication in the Federal Register and in a newspaper having general circulation in the area or areas in the vicinity of the affected land;

(B) hold a public hearing or hearings at a location or locations convenient to the area affected. The hearings shall be announced through such means as the respective Secretaries involved deem appropriate, including notices in the Federal Register and in newspapers of general circulation in the area: Provided, That if the lands involved are located in more than one State, at least one hearing shall be held in each State in which a portion of the land lies;

(C) at least thirty days before the date of a hearing advise the Governor of each State and the governing board of each county, or in Alaska the borough, in which the lands are located, and Federal departments and agencies concerned, and invite such officials and Federal agencies to submit their views on the proposed action at the hearing or by not later than thirty days following the date of the hearing.

(d)(2) Any views submitted to the appropriate Secretary under the provisions of (1) of this subsection with respect to any area shall be included with any recommendations to the President and to Congress with respect to such area.

(e) Any modification or adjustment of boundaries of any wilderness area shall be recommended by the appropriate Secretary after public notice of such proposal and public hearing or hearings as provided on subsection (d) of this section. The proposed modification or adjustment shall then be recommended with map and description thereof to the President. The President shall advise the United States Senate and the House of Representatives of his recommendations with respect to such modification or adjustment and such recommendations shall become effective only on the same manner as provided for in subsections (b) and (c) of this section.

Use of Wilderness Areas

Sec. 4. (a) The purposes of this Act are hereby declared to be within and supplemental to the purposes for which national forests and units of the national park and national wildlife refuge systems are established and administered and --

(1) Nothing in this Act shall be deemed to be in interference with the purpose for which national forests are established as set forth in the Act of June 4, 1897 (30 Stat. 11), and the Multiple Use Sustained-Yield Act of June 12, 1960 (74 Stat. 215).

(2) Nothing in this Act shall modify the restrictions and provisions of the Shipstead-Nolan Act (Public Law 539, Seventy-first Congress, July 10, 1930; 46 Stat. 1020),the Thye-Blatnik Act (Public Law 733, Eightieth Congress, June 22, 1948; 62 Stat. 568), and the Humphrey-Thye-Blatnik-Andresen Act (Public Law 607, Eighty-fourth Congress, June 22.1965; 70 Stat. 326), as applying to the Superior National Forest or the regulations of the Secretary of Agriculture.

(3) Nothing in this Act shall modify the statutory authority under which units of the national park system are created. Further, the designation of any area of any park, monument, or other unit of the national park system as a wilderness area pursuant to this Act shall in no manner lower the standards evolved for the use and preservation of such park, monument, or other unit of the national park system in accordance with the Act of August 25, 1916, the statutory authority under which the area was created, or any other Act of Congress which might pertain to or affect such area, including, but not limited to, the Act of June 8, 1906 (34 Stat. 225; 16 U.S.C. 432 et seq.); section 3(2) of the Federal Power Act (16 U.S.C. 796 (2)); and the Act of August 21,1935 (49 Stat. 666; 16 U.S.C. 461 et seq.).

(b) Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

Prohibition of Certain Uses

(c) Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

Special Provisions

(d) The following special provisions are hereby made:

(1) Within wilderness areas designated by this Act the use of aircraft or motorboats, where these uses have already become established, may be permitted to continue subject to such restrictions as the Secretary of Agriculture deems desirable. In addition, such measures may be taken as may be

necessary in the control of fire, insects, and diseases, subject to such conditions as the Secretary deems desirable.

(2) Nothing in this Act shall prevent within national forest wilderness areas any activity, including prospecting, for the purpose of gathering information about mineral or other resources, if such activity is carried on in a manner compatible with the preservation of the wilderness environment. Furthermore, in accordance with such program as the Secretary of the Interior shall develop and conduct in consultation with the Secretary of Agriculture, such areas shall be surveyed on a planned, recurring basis consistent with the concept of wilderness preservation by the Geological Survey and the Bureau of Mines to determine the mineral values , if any, that may be present; and the results of such surveys shall be made available to the public and submitted to the President and Congress.

(3) Not withstanding any other provisions of this Act, until midnight December 31, 1983, the United States mining laws and all laws pertaining to mineral leasing shall, to the extent as applicable prior to the effective date of this Act, extend to those national forest lands designated by this Act as "wilderness areas"; subject, however, to such reasonable regulations governing ingress and egress as may be prescribed by the Secretary of Agriculture consistent with the use of the land for mineral location and development and exploration, drilling, and production, and use of land for transmission lines, waterlines, telephone lines, or facilities necessary in exploring, drilling, producing, mining, and processing operations, including where essential the use of mechanized ground or air equipment and restoration as near as practicable of the surface of the land disturbed in performing prospecting, location, and , in oil and gas leasing, discovery work, exploration, drilling, and production, as soon as they have served their purpose. Mining locations lying within the boundaries of said wilderness areas shall be held and used solely for mining or processing operations and uses reasonably incident thereto; and hereafter, subject to valid existing rights, all patents issued under the mining laws of the United States affecting national forest lands designated by this Act as wilderness areas shall convey title to the mineral deposits within the claim, together with the right to cut and use so much of the mature timber therefrom as may be needed in the extraction, removal, and beneficiation of the mineral deposits, if needed timber is not otherwise reasonably available, and if the timber is cut under sound principles of forest management as defined by the national forest rules and regulations, but each such patent shall reserve to the United States all title in or to the surface of the lands and products thereof, and no use of the surface of the claim or the resources therefrom not reasonably required for carrying on mining or prospecting shall be allowed except as otherwise expressly provided in this Act: Provided, That, unless hereafter specifically authorized, no patent within wilderness areas designated by this Act shall issue after December 31, 1983, except for the valid claims existing on or before December 31, 1983. Mining claims located after the effective date of this Act within the boundaries of wilderness areas designated by this Act shall create no rights in excess of those rights which may be patented under the provisions of this subsection. Mineral leases, permits, and licenses covering lands within national forest wilderness areas designated by this Act shall contain such reasonable stipulations as may be prescribed by the Secretary of Agriculture for the protection of the wilderness character of the land consistent with the use of the land for the purposes for which they are leased, permitted, or licensed. Subject to valid rights then existing, effective January 1,1984, the minerals in lands designated by this Act as wilderness areas are withdrawn from all forms of appropriation under the mining laws and from disposition under all laws pertaining to mineral leasing and all amendments thereto.

(4) Within wilderness areas in the national forests designated by this Act, (1) the President may, within a specific area and in accordance with such regulations as he may deem desirable, authorize prospecting for water resources, the establishment and maintenance of reservoirs, water-conservation works, power projects, transmission lines, and other facilities needed in the public interest, including

the road construction and maintenance essential to development and use thereof, upon his determination that such use or uses in the specific area will better serve the interests of the United States and the people thereof than will its denial; and (2) the grazing of livestock, where established prior to the effective date of this Act, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture.

(5) Other provisions of this Act to the contrary notwithstanding, the management of the Boundary Waters Canoe Area, formerly designated as the Superior, Little Indian Sioux, and Caribou Roadless Areas, in the Superior National Forest, Minnesota, shall be in accordance with the general purpose of maintaining, without unnecessary restrictions on other uses, including that of timber, the primitive character of the area, particularly in the vicinity of lakes, streams,and portages: Provided, That nothing in this Act shall preclude the continuance within the area of any already established use of motorboats.

(6) Commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas.

(7) Nothing in this Act shall constitute an express or implied claim or denial on the part of the Federal Government as to exemption from State water laws.

(8) Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife and fish in the national forests.

State and Private Lands Within Wilderness Areas

Sec. 5. (a) In any case where State-owned of privately owned land is completely surrounded by national forest lands within areas designated by this Act as wilderness, such State or private owner shall be given such rights as may be necessary to assure adequate access to such State-owned or privately owned land by such State or private owner and their successors in interest, or the State-owned land or privately owned land shall be exchanged for federally owned land in the same State of approximately equal value under authorities available to the Secretary of Agriculture: Provided, however, That the United States shall not transfer to a state or private owner any mineral interests unless the State or private owner relinquishes or causes to be relinquished to the United States the mineral interest in the surrounded land.

(b) In any case where valid mining claims or other valid occupancies are wholly within a designated national forest wilderness area, the Secretary of Agriculture shall, by reasonable regulations consistent with the preservation of the area as wilderness, permit ingress and egress to such surrounded areas by means which have been or are being customarily enjoyed with respect to other such areas similarly situated.

(c) Subject to the appropriation of funds by Congress, the Secretary of Agriculture is authorized to acquire privately owned land within the perimeter of any area designated by this Act as wilderness if (1) the owner concurs in such acquisition or (2) the acquisition is specifically authorized by Congress.

Gifts, Bequests, and Contributions

Sec. 6. (a) The Secretary of Agriculture may accept gifts or bequests of land within wilderness areas designated by this Act for preservation as wilderness. The Secretary of Agriculture may also accept gifts or bequests of land adjacent to wilderness areas designated by this Act for preservation as wilderness if he has given sixty days advance notice thereof to the President of the Senate and the Speaker of the House of Representatives. Land accepted by the Secretary of Agriculture under this section shall become part of the wilderness area involved. Regulations with regard to any such land may be in accordance with such agreements, consistent with the policy of this Act, as are made at the time of such gift, or such conditions, consistent with such policy, as may be included in, and accepted with, such bequest.

(b) The Secretary of Agriculture or the Secretary of the Interior is authorized to accept private contributions and gifts to be used to further the purpose of this Act.

Annual Reports

Sec. 7. At the opening of each session of Congress, the Secretaries of Agriculture and Interior shall jointly report to the President for transmission to Congress on the status of the wilderness system, including a list and descriptions of the areas in the system, regulations in effect, and other pertinent information, together with any recommendations they may care to make.

Approved September 3, 1964.

Legislative History

House Reports: No. 1538 accompanying H.R. 9070 (Comm. on Interior & Insular affairs) and No. 1829 (Comm. of Conference).

Senate Report No. 109 (Comm. on Interior & Insular Affairs).

Congressional Record:

Vol. 109 (1963): Apr. 4, 8, considered in Senate. Apr. 9, considered and passed Senate.

Vol. 110 (1964): July 28, considered in House. July 30, considered and passed House, amended, in lieu of H. R. 9070. Aug. 20, House and Senate agreed to conference report.

THE WHITE HOUSE
Office of the Press Secretary
For Immediate Release, January 17, 2001
ESTABLISHMENT OF THE SONORAN DESERT NATIONAL MONUMENT
BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

The Sonoran Desert National Monument is a magnificent example of untrammeled Sonoran desert landscape. The area encompasses a functioning desert ecosystem with an extraordinary array of biological, scientific, and historic resources. The most biologically diverse of the North American deserts, the monument consists of distinct mountain ranges separated by wide valleys, and includes large saguaro cactus forest communities that provide excellent habitat for a wide range of wildlife species.

The monument's biological resources include a spectacular diversity of plant and animal species. The higher peaks include unique woodland assemblages, while the lower elevation lands offer one of the most structurally complex examples of palo verde/mixed cacti association in the Sonoran Desert. The dense stands of leguminous trees and cacti are dominated by saguaros, palo-verde trees, ironwood, prickly pear, and cholla. Important natural water holes, known as tinajas, exist throughout the monument. The endangered acuna pineapple cactus is also found in the monument.

The most striking aspect of the plant communities within the monument are the abundant saguaro cactus forests. The saguaro is a signature plant of the Sonoran Desert. Individual saguaro plants are indeed magnificent, but a forest of these plants, together with the wide variety of trees, shrubs, and herbaceous plants that make up the forest community, is an impressive site to behold. The saguaro cactus forests within the monument are a national treasure, rivaling those within the Saguaro National Park.

The rich diversity, density, and distribution of plants in the Sand Tank Mountains area of the monument is especially striking and can be attributed to the management regime in place since the area was withdrawn for military purposes in 1941. In particular, while some public access to the area is allowed, no livestock grazing has occurred for nearly 50 years. To extend the extraordinary diversity and overall ecological health of the Sand Tanks Mountains area, land adjacent and with biological resources similar to the area withdrawn for military purposes should be subject to a similar management regime to the fullest extent possible.

The monument contains an abundance of packrat middens, allowing for scientific analysis of plant species and climates in past eras. Scientific analysis of the midden shows that the area received far more precipitation 20,000 years ago, and slowly became more arid. Vegetation for the area changed from juniper-oak-pinion pine woodland to the vegetation found today in the Sonoran Desert, although a few plants from the more mesic period, including the Kofa Mountain barberry, Arizona rosewood, and junipers, remain on higher elevations of north-facing slopes.

The lower elevations and flatter areas of the monument contain the creosote-bursage plant community. This plant community thrives in the open expanses between the mountain ranges, and connects the other plant communities together. Rare patches of desert grassland can also be found throughout the monument, especially in the Sand Tank Mountains area. The washes in the area support a much denser vegetation community than the surrounding desert, including mesquite, ironwood, paloverde, desert honeysuckle, chuperosa, and desert willow, as well as a

variety of herbaceous plants. This vegetation offers the dense cover bird species need for successful nesting, foraging, and escape, and birds heavily use the washes during migration.

The diverse plant communities present in the monument support a wide variety of wildlife, including the endangered Sonoran pronghorn, a robust population of desert bighorn sheep, especially in the Maricopa Mountains area, and other mammalian species such as mule deer, javelina, mountain lion, gray fox, and bobcat. Bat species within the monument include the endangered lesser long-nosed bat, the California leaf-nosed bat, and the cave myotis. Over 200 species of birds are found in the monument, including 59 species known to nest in the Vekol Valley area. Numerous species of raptors and owls inhabit the monument, including the elf owl and the western screech owl. The monument also supports a diverse array of reptiles and amphibians, including the Sonoran desert tortoise and the red-backed whiptail. The Bureau of Land Management has designated approximately 25,000 acres of land in the Maricopa Mountains area as critical habitat for the desert tortoise. The Vekol Valley and Sand Tank Mountain areas contain especially diverse and robust populations of amphibians. During summer rainfall events, thousands of Sonoran green toads in the Vekol Valley can be heard moving around and calling out.

The monument also contains many significant archaeological and historic sites, including rock art sites, lithic quarries, and scattered artifacts. Vekol Wash is believed to have been an important prehistoric travel and trade corridor between the Hohokam and tribes located in what is now Mexico. Signs of large villages and permanent habitat sites occur throughout the area, and particularly along the bajadas of the Table Top Mountains. Occupants of these villages were the ancestors of today's O'odham, Quechan, Cocopah, Maricopa, and other tribes. The monument also contains a much used trail corridor 23 miles long in which are found remnants of several important historic trails, including the Juan Bautista de Anza National Historic Trail, the Mormon Battalion Trail, and the Butterfield Overland Stage Route.

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 Sonoran Desert 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 Sonoran Desert National Monument, for the purpose of protecting the objects identified above, all lands and interest in lands owned or controlled by the United States within the boundaries of the area described on the map entitled "Sonoran Desert National Monument" attached to and forming a part of this proclamation. The Federal land and interests in land reserved consist of approximately 486,149 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. Lands and interests in lands within the 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 management 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, pursuant to applicable legal authorities, to implement the purposes of this proclamation. That portion identified as Area A on the map, however, shall be managed under the management arrangement established by section 3 of Public Law No. 99-606, 100 Stat. 3460-61, until November 6, 2001, at which time, pursuant to section 5(a) of Public Law No. 99-606, 100 Stat. 3462-63, the military withdrawal terminates. At that time, the Secretary of the Interior shall assume management responsibility for Area A through the Bureau of Land Management.

The Secretary of the Interior shall prepare a management plan that addresses the actions, including road closures or travel restrictions, necessary to protect the objects identified in this proclamation. 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; provided, however, that grazing permits on Federal lands within the monument south of Interstate Highway 8 shall not be renewed at the end of their current term; and provided further, that grazing on Federal lands north of Interstate 8 shall be allowed to continue only to the extent that the Bureau of Land Management determines that grazing is compatible with the paramount purpose of protecting the objects identified in this proclamation.

Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the national monument shall be the dominant reservation.

Nothing in this proclamation shall preclude low level overflights of military aircraft, the designation of new units of special use airspace, or the use or establishment of military flight training routes over the lands included in this proclamation.

In order to protect the public during operations at the adjacent Barry M. Goldwater Range, and to continue management practices that have resulted in an exceptionally well preserved natural resource, the current procedures for public access to the portion of the monument depicted as Area A on the attached map shall remain in full force and effect, except to the extent that the United States Air Force agrees to different procedures which the Bureau of Land Management determines are compatible with the protection of the objects identified in this proclamation.

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 seventeenth day of January, in the year of our Lord two thousand one, and of the Independence of the United States of America the two hundred and twenty-fifth.

WILLIAM J. CLINTON

Review of the Ecological Impacts of Roads

By: Kim Crumbo

According to the National Research Council (1997), there are approximately four million miles of roadway in the United States. While directly covering about one percent of the conterminous U.S., the negative ecological effects of the "road-effect" are greater, about 18-20 percent (Forman 2000). Other credible interpretations place road effects at about 94 percent, including some national parks (Soule 2000).

Studies demonstrate that higher occurrences of adverse ecological impacts increase with higher road densities. Concern over this ubiquitous encroachment produced a large body of scientific literature describing the negative biological effects of roads, including direct wildlife mortality, changed animal behavior, degraded habitat, habitat fragmentation, and the spread of exotic species (see Environmental Defense Fund 1995:53-54, 58).

Primitive Roads

Roads lead to extensive habitat destruction by providing access for numerous other activities, such as logging, mining, grazing, development, ORV joyriding and poaching of wildlife and archeological sites. Roads and habitat destruction form a positive feedback loop: once in place, roads lead to habitat destroying activities, which when exhausted require new roads to reach ever more remote areas to conduct the same activities (TWS). Roads provide excessive access to ATV's that too often create new, illegal tracks through sensitive habitats (Soule 2000), a process evident in the two Monuments as ORV damage extends beyond established travel ways. For example, citizen surveys discovered ATV off-route damage in the Park Service's proposed Grand Wash Cliffs (AWC's Snap Canyon) Wilderness (photos KC-47-7,24,25; KC-48-1,8), and within Paria Canyon-Vermilion Cliff Wilderness (photos KC-40-16; KC-45-17; KC-46-7,9,10,16; LB-2-1; LB-4-22).

The extensive literature on the importance of intact natural habitats makes a compelling case for the potential role of roadless areas as refugia for native biodiversity and as areas crucial to forest integrity and function (Strittholt and DellaSala 2001:1751). Equally impressive is the mounting body of evidence showing the ecological cost of roads (Strittholt and DellaSala 2001:1751). Suggestions that research on the effects of roads on natural ecosystems is inconclusive (e.g., Heinz Center 1999) is largely unsupported by the literature (Strittholt and DellaSala 2001:1751).

Habitat Quality

Open-road density is a good predictor of habitat suitability for large mammals, with habitat effectiveness and population viability declining as road density increases (Noss and Cooperrider 1994). Because of changes to the environment and danger resulting from roads, many wildlife species have learned to partially or completely avoid roads. For example, grizzlies, elk, mountain lions, small rodents and likely many other animals all show partial or total aversion to roads, to the extent that they either will not cross roads at all, creating a complete dispersal barrier, or use roadside habitat less extensively, effectively reducing total habitat area (Garland and Bradley 1984, Kozel and Fleharty 1979, Lyon 1979, Mclellan and Shackleton 1988, Van Dyke et al. 1986, Wilkins 1982).

In fact, high road densities are a known cause of extirpation of wildlife species. For example, elimination of wolves in Northern Wisconsin by 1960 was correlated with a road density threshold of .94 miles per square mile (Thiel 1985). Similarly, habitat models for elk have shown that road densities higher than one mile per square mile reduces effective habitat to zero (Lyon 1979). In another study, mountain lions avoided improved dirt and hard-surfaced roads and selected home range areas with lower densities of these road types (Van Dyke, Brocke and Shaw 1986). Related studies demonstrated that lions on the Kaibab Plateau and southern Utah avoided logging areas and established home ranges in areas with lower road densities (Van Dyke et al. 1986b).

Fragmentation

The severity of habitat fragmentation precipitating extinction lead two prominent conservation biologists to conclude:

> *Habitat fragmentation is the most serious threat to biological diversity and is the primary cause of the present extinction crisis* (Wilcox and Murphy 1983).

Roads, by destroying habitat and creating dispersal barriers, are a major anthropogenic cause of habitat fragmentation. This, along with wholesale conversion of habitat due to exotic plant invasion, is likely the most devastating impact of roads leading to extirpation or extinction for species that avoid or are unable to cross roads. For such species, a road effectively divides their population in two. More roads divides their population into ever smaller and more isolated groups, each one vulnerable to extinction from all the problems associated with small populations, such as inbreeding, demographic stochasticity (i.e. chance variation in age and sex ratios), environmental stochasticity and anthropogenic habitat loss (REFERENCE).

Larger patches of habitat support a wider spectrum of species, including those requiring large home ranges. They are more secure from human-induced effects and are possibly large enough to allow natural processes such as fire to operate without human interference (Strittholt and Dellasala 2001:1751). Even though roads occupy a small fraction of the landscape in terms of total area, their influence extends far beyond their immediate boundaries. Roads precipitate habitat fragmentation by dissecting otherwise large patches into smaller ones, and in so doing create edge habitat along both sides of the road, potentially at the expense of interior habitat (Trombulak and Frissell 2000; Reed et al.1996).

Roads directly eliminate wildlife habitat by occupying space within the ecosystem and by altering adjacent habitat; a 10 meter-wide road covers 10,000 square meters for every kilometer of its length and a much larger area is influenced by edge-effects (Schonewald-Cox and Buechner 1992). Roadside habitats experience increased temperature extremes and solar input, and pollution from exhaust, herbicides, garbage, dust and noise (Noss 1996, Schonewald-Cox and Buechner 1992, Van Dyke et al. 1986, Yahner 1988). This increases habitat disturbance by a minimum of 500-600 meters on either side of a small rural road and a much larger distance for highways (Van Der Zande et al. 1980). Any exclusion of roads from fragmentation assessments presents an incomplete picture of the effects of one of the most predominate anthropogenic changes of North American forested ecosystems (Strittholt and Dellasala 2001:1751).

Poaching and Hunting

Roads result in frequent and often negative encounters between wildlife and humans (Buckley and Pannell 1990). Wildlife biologists have recognized problems with open roads that expose large mammals such as deer, pronghorn, cougar and bighorn sheep to heavy hunting pressure, poaching, and harassment (Davidson et al. 1996:110; Trombulak and Frissell 2000:24). Other studies indicate that habitats with low road density better protect species sensitive to legal or illegal hunting and persecution (Thiel 1985; Mech et al. 1988; Soule 2000).

Although less visible than habitat destruction, poaching is a serious threat to many wildlife species and would be next to impossible without roads. For example, illegal shooting was found to be the primary cause of death for two small populations of grizzlies in Montana over four years of study, resulting in mortality for five out of 19 radio-collared bears (Knick and Kasworm 1989). Species vulnerable to poaching found within the Arizona Strip include bighorn sheep, mule deer, mountain lions, desert tortoise, raptors and condors.

Interestingly, road closures may result in greater hunting success rates and perceived improved hunting quality (Lyon et al. 1985:7-9; Gratson and Whitman 2000: 308-309; McLaughlin et al. 1989). Increasing the amount of time hunters leave the vehicle and walk probably increases the number of animals seen and the likelihood of a kill (Lyon et al. 1985:7-9). Unroaded areas possibly attract higher-skilled hunters, contributing to greater hunting success (Gratson and Whitman 2000:308). Hunting management through road closures may be appealing to wildlife management agencies and the public because hunting opportunities remains relatively great compared to limiting numbers of hunters by controlled hunts or reducing season length (Gratson and Whitman 2000:309).

Exotic Plants

Roads, including primitive roads, create adverse impacts on natural resources. Possibly the most significant affect on arid and semi-arid biological communities relate to exotic plant invasions along road corridors (see Davidson et al. 1996:111). Disturbed surfaces provide ideal habitat and avenues for exotic plants pathogens and pests to spread, possibly resulting in drastic habitat changes (Trombulak and Frissell 2000; Amor and Stevens 1976). For example, exotic plant species invaded logging roads in Montana forests at all elevations, and ultimately invaded adjacent ponderosa pine and grassland (Forcella and Harvey 1983). In another example, exotic annual plants invaded a pipeline corridor within a woodland, grassland and chaparral reserve in California and persisted as the dominant plants ten years after the disturbance (Zink, Heindl-Tenhunen and Allen 1995).

Exotic plants dominating huge expanses of western land compete with or displace native plants. Exotic plants provide poor habitat for native wildlife generally adapted to utilizing native flora. Regarding native biodiversity, the long-term implication of exotic plant invasion is ominous. For example, studies of Idaho shrub-steppe habitat shows that sites invaded by non-mycorrhizal exotic plants eliminated vesicular-arbuscular mycorrhizae up to ten years (Wicklow-Howard 1994). Without native mycorrhizal-dependent plants, the fungal propagules may not be able to survive, and as a result the reestablishment of native plants is expected to be difficult.

Scientists suggest that exotic weed invasion might be prevented by restricting access on existing roads (Davidson et al. 1996:112). Research also indicates that large roadless areas with low circumference-to-area ratios offer the best protection of arid and semi-arid ecosystems against wholesale conversion, and that maintaining their roadless character offers the most economical strategy for preventing the spread of introduced grasses to relatively undisturbed areas (see Davidson et al. 1996:112). Research also underscores the importance to manage roadless areas

responsibly and restore them where necessary (Stritholt and Dellasala 2001; DellaSalla et al. 1999; Stritholt et al 1999).

Archaeological Impact

Obviously, roads inadvertently or deliberately constructed through archaeological sites severely impair cultural resources. For example, BLM Route 1100, a bladed road in the Vermilion Cliffs, has greatly exacerbated damage to the West Bench Pueblo (photo KC-28-24). Vehicular access provided by primitive roads also facilitates illegal excavation and collecting of archaeological resources. For example, improvement in mine-related roads in the 1980s outside Grand Canyon National Park resulted in increased visitation to the Kanab Plateau and a corresponding increase in vandalism to cultural resources (Huffman 1993). "Inadvertent vandalism," through campsite proliferation and expansion, campfire ring construction, woodcutting, and off road travel comprises a serious threat to archaeological resources (Sullivan et al. in press; see Vermilion Cliffs photos CB-1-22, KC-41-5, LA-3-18, and LA-3-32).

Highway Mortality

Besides poaching, hundreds of thousands of animals are killed on our nations roads by cars every year. Bears, raptors, snakes, deer, small birds, small mammals are all victims of roadkill, resulting in significant population declines. For example, 146,229 white-tailed deer were killed on highways across the U.S. in 1974 and in Pennsylvania alone 26,180 deer and 90 bears were killed by cars in 1985 (Feldhamer et al. 1986). Noss (1996) reports that automobile impacts caused 65% of documented Florida panther mortality since 1972. Considering there are only 20 of these magnificent cats in the wild, road kill is a major threat to their long-term survival, as it is to many other species.

It is clear that roadways, especially if paved, substantially damage snake populations (Rosen and Lowe 1994:1). From the perspective of reptile conservation, heavily used roads, especially high-speed paved roads such as the proposed paved Toroweap road, are clearly inappropriate in designated natural areas such as reserves, parks, monuments, and wildlife refuges where species and ecosystem conservation is a priority (Rosen and Lowe 1994:5-6).

Soil Impacts

In the Southwest, roads and associated activities are the primary cause of extensive arroyo cutting during this century (see Bahre 1991). Vehicular traffic directly destroys biological resources by crushing vegetation and microbiotic crusts. The resulting soil compaction retards revegetation. In addition, adequate maintenance of primitive roads in remote locations imposes significant ecological as well as monetary costs. Poorly located or unmaintained roads often result in serious erosional problems (Moll 1996;

Ketcheson and Megahan 1996). Severe gully formation negatively impacts soils, vegetation, and archaeological resources. The most practical and economical long-term mitigation of these problems lies with closure and revegetation (Moll 1996).

Plant Poaching

Other undesirable consequences of road access include illegal collecting of rare plants and animals (Noss 1995).

Restoration

Vehicular traffic directly destroys biological resources by crushing vegetation and microbiotic crusts and retards revegetation through soil compaction. A review of the literature underscores the importance to conservation of not building new roads in roadless or sparsely roaded areas and of removal or restoration of exising roads to benefit native biota (Trombulak and Frissell 2000:18,26). Sections of the Monument's spectacular and biologically rich areas also contain a network of rough jeep trails that impact natural resources such as desert soils and vegetation, and probably adversely affect wildlife species such as big horn sheep and mountain lion. This problem will certainly accelerate should the area remain open to mechanized access. Closure and active restoration of impacted areas would greatly facilitate ecological recovery (see Stritthолt and Dellasala 2001).

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Arizona Wilderness Act of 1984 Release Language

SEC. 103. (a) The Congress finds that—

(1) the Department of Agriculture has completed the second roadless area review and evaluation program (RARE II);

(2) the Congress has made its own review and examination of national forest system roadless areas in Arizona and of the environmental impacts associated with alternative allocations of such areas.

(b) On the basis of such review, the Congress hereby determines and directs that—

(1) without passing on the question of the legal and factual sufficiency of the RARE II final environmental statement (dated January 1979) with respect to national forest system lands in States other than Arizona, such statement shall not be subject to judicial review with respect to national forest system lands in the State of Arizona;

(2) with respect to the national forest system lands in the State of Arizona which were reviewed by the Department of Agriculture in the second roadless area review and evaluation (RARE II) and those lands referred to in subsection (d), except those lands designated for wilderness study upon enactment of this Act, that review and evaluation or reference shall be deemed for the purposes of the initial land management plans required for such lands by the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976, to be an adequate consideration of the suitability of such lands for inclusion in the National Wilderness Preservation System and the Department of Agriculture shall not be required to review the wilderness option prior to the revisions of the plans, but shall review the wilderness option when the plans are revised, which revisions will ordinarily occur on a ten-year cycle, or at least every fifteen years, unless, prior to such time the Secretary of Agriculture finds that conditions in a unit have significantly changed;

(3) areas in the State of Arizona reviewed in such final environmental statement or referred to in subsection (d) and not designated wilderness or wilderness study upon enactment of this Act shall be managed for multiple use in accordance with land management plans pursuant to section 6 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976: *Provided*, That such areas need not be managed for the purpose of protecting their suitability for wilderness designation prior to or during revision of the initial land management plans;

(4) in the event that revised land management plans in the State of Arizona are implemented pursuant to section 6 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976, and other applicable law, areas not recommended for wilderness designation need not be managed for the purpose of protecting their suitability for wilderness designation prior to or during revision of such plans, and areas recommended for wilderness designation shall be managed for the purpose of protecting their suitability for wilderness designation as may be required by the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976, and other applicable law; and

(5) unless expressly authorized by Congress, the Department of Agriculture shall not conduct any further statewide roadless area review and evaluation of national forest system lands in the State of Arizona for the purpose of determining their suitability for inclusion in the National Wilderness Preservation System.

(c) As used in this section, and as provided in section 6 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976, the term "revision" shall not include an "amendment" to a plan.

(d) The provisions of this section shall also apply to national forest system roadless lands in the State of Arizona which are less than five thousand acres in size.

Arizona Wilderness Coalition Inventory
BLM Travelway Ground-Truthing Form

☐ proofed
☐ entered

1. Unit Name:_____
_____

2. Travelway (TW) ID: _____ (assign each TW an arbritrary route number such as A,B,C . . .) _____
Quad Map Name

3a. Photograph beginning of TW: _____-____-____

4. If the TW is unmapped or mapped incorrectly, map it as best as possible and describe any helpful features marking its beginning and/or end – **if unmapped, please take frequent UTM bearings and photos**.

5. What is the status of this TW segment?
☐ 1. Open ☐ 2. Closed ☐ 3. Restricted

7. What closure devices are in place on this TW or connecting TW segments that affect this TW's closure status?
☐ 0. no device
☐ 1. post and sign
☐ 2. earth berm
☐ 3. posts and rail
☐ 4. steel gate
☐ 5. boulders
☐ 6. slash/deadfall
☐ 7. wood gate w/wire fence
☐ 8. roadbed obliterated/revegetated
☐ 9. multiple closure devices (list #'s/describe):_____
☐ 10. other (describe):
_____

If there is no closure affecting this TW, skip to question 13.

8. Closed to vehicle type (according to FS inventory):
☐ 1. Motorized >50 inches
☐ 2. All vehicles
☐ 3. Closure does not appear in FS inventory
☐ 4. Restricted use; please specify:
_____

9. Closed to vehicle type (according to your survey):
☐ 1. motorized >50 inches
☐ 2. all vehicles
☐ 3. segment is not closed to any vehicle
☐ 4. segment open with gate key or combination

10. Observed status of closure device:
☐ 1. exists and effectively closes road segment to all vehicles
☐ 2. indicated by FS inventory, but no device found in field check
☐ 3. exists but does not effectively close road to some or all vehicles

If #3 above, answer question 11. Otherwise, skip to question 13.

11. Why is closure not effective?
☐ 1. vandalism
☐ 2. unlocked Gate
☐ 3. detour that allows ORVs to bypass closure
☐ 4. open access to anyone with a gate key
☐ 5. detour that allows all motorized vehicles
☐ 6. other:

12. Photograph all closures: _____-_____-_____
Initials - Roll - Frame(s) (e.g. SI-2-4)

13. Total segment length measured by **(1)** odometer, **(2)** map, **(3)** GPS, or **(4)** paced: _____ miles
Circle one

14. Evidence that road/TW was constructed (check all that apply):
☐ 1. no evidence
☐ 2. berms from bulldozer
☐ 3. cut-and-fill
☐ 4. major excavation/blasting
☐ 5. graveled
☐ 6. other_____

15. Evidence that road/TW is maintained (check all that apply):
☐ 1. no evidence
☐ 2. recently bladed
☐ 3. notable vegetation cutting
☐ 4. other_____(culverts cleaned, water bars)

Map + photograph where construction/maintenance status changes
Photo: _____-_____-_____

16. What are people using this TW for? (check **all** that apply):

- □ 1. user created (4WD, dirt bike or ORV)
- □ 2. corral/grazing structure access
- □ 3. mining road
- □ 4. camping
- □ 5. private access road or driveway
- □ 6. logging system road
- □ 7. logging skid trail
- □ 8. powerline access
- □ 9. firewood cutting
- □ 10.other: _____

17. Rate the degree of use on TW (check **all** that apply):

- □ 1. no use evident
- □ 2. game, non-motorized or foot use evident
- □ 3. bare soil evident from tire wear; no distinct tracks
- □ 4. standard vehicle or 4WD tracks visible
- □ 5. ORV tracks visible

18. What motorized vehicles could use the whole segment? (check **all** that apply):

- □ 1. standard 2WD car
- □ 2. high clearance 2WD car/light truck
- □ 3. 4WD truck
- □ 4. dirt bike/ORV

19. Rate the vegetation present on TW surface:

- □ 1. primarily trees (<50% of cover is brush, grass or soil)
- □ 2. primarily brush (<50% of cover is grass or soil)
- □ 3. primarily grass (<25% bare soil exposed)
- □ 4. grass/forbs intermittent with bare soil (bare soil is between 25-50%)
- □ 5. primarily bare soil (bare soil is >50% of surface)

20. Photograph a TW section with average conditions: _____-_____-_____
Initials - Roll - Frame(s) (e.g. SI-2-4)

21. What is the status of the worst erosion on the TW?

- □ 1. erosion negligible, surface stable with no ruts
- □ 2. wheel ruts/gullies 1-5" deep
- □ 3. wheel ruts/gullies >5" deep
- □ 4. live stream channeled down TW
- □ 5 unstabilized slumping of TW cut slopes
- □ 6. unstabilized slumping of TW fill slopes.

Measured depth: _____inches

22. Photograph TW section(s) with the worst erosion: _____-_____-_____
Initials - Roll - Frame(s)

Describe erosion on photo sheet.

23a. How many wet stream crossings are there on TW? _____ **23b.** Dry crossings over 3ft. Wide?

24a. How many small campsites (3 or less fire rings)?_____ **24b.** Large campsites (>3 fire rings)?

25. Evidence of illegal dumping? □ 1. Yes □ 2. No

26. Photograph end of TW:_____-_____-_____
Initials - Roll - Frame(s) (e.g. SI-2-4)

27. Photograph and record on map the location of any development or notable disturbances, including stock tanks, well-used camping areas, mine shafts/tailings, etc.

28. Comments (e.g. evidence of noxious weeds, did you observe anyone using the TW? Who?, What do you recommend for this road?)

Inspected by: _____ Date: / /

Arizona Wilderness Coalition*

Field Photo Sheet

❑ compiled
❑ entered

***Based on Sky Island Alliance Form**

Unit Name(s): _____ Date:_____

Photographer: _____

Record all photo locations on GPS/Map

{PRIVATE }Photo # (e.g. SI-3-17)	Direction (N, SW etc)	On Map? or GPSed? **Record GPS Coordinates**.	Brief Description *Include road number in every photo *Include remarks making photo unique (i.e. "Matt in photo on right")

The Following appendix is included as it was originally written for the Grand Canyon Parashant and Vermillion Cliffs National Monuments and the Arizona Strip RMP revision process. Specific recommendations made for that region were deleted. It provides excellent information into the threats and impacts to desert tortoise populations in both the Mojave and Sonoran ecoregions.

The Impact of Roads on the Threatened Desert Tortoise

Kim Crumbo

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Paved highways, unpaved roads, trails, and tracks have profound impacts on desert tortoise populations and habitat. Desert tortoise are frequently killed or collected on freeways, paved highways and dirt roads, resulting in potentially serious depletion of populations (USDI 1994: D12; see Boarman et al. 1992). In addition to direct mortality due to vehicular crushing, roads provide access to remote areas for collectors, vandals, poachers, and recreationists who ignore vehicle-use regulations. As a result, the Fish and Wildlife Service concludes that desert tortoise do best where access route density is low, traffic is low, and human access is limited (USDI 1994, 1994a).

The density of paved and dirt roads, routes, trails, and ways in desert tortoise habitat directly affects the species. Desert tortoise populations status is directly linked to access which allows people to penetrate remote regions where they may cause or contribute to desert tortoises mortality and habitat loss (Nicholson 1978; Berry 1986, 1992; see USDI 1994: D40,41). Studies have demonstrated that as the mileage of roads, increase, population declines occur at greater rates (Berry 1990, as amended; see USDI 1994: D40).

According to the Fish and Wildlife Service, human activities occurring on or near access routes in remote desert include: take or removal of desert tortoises (predation for food, collection for pets, and commercial trade), vandalism, translocation and release of captive desert tortoises, dumping of trash and other wastes, vehicles kills on and off roads, proliferation of roads and trails, invasion of weedy, non-native plants, fire, harvest of and vandalism to vegetation, and predation by dogs and ravens (USDI 1994: D41). The long list of threats to desert tortoises becomes greater as each individual, vehicle, group, or event enters desert tortoise habitat (USDI 1994: D41). Research reveals a direct correlation between visitor increase and the increased desert tortoise loss (e.g., Berry 1986a; see USDI 1994: D41).

The impacts of roads within desert tortoise habitat extend significantly beyond the obvious tracks. Fewer tortoise signs are found closer to roads, indicating reduced populations (USDI 1994: D12). Research and observation show that desert tortoise populations are depleted up to a mile or more on either side of roads when average daily traffic is greater than 180 vehicles (see USDI 1994: D12; references include Nicholson 1978a, 1978b). Even dirt roads with relatively

low vehicle use can contribute to depressions in local desert tortoise densities (Berry et al. 1986a; see USDI 1994: D12).

While direct effects (mortality from crushing, collection, and vandalism) are immediate, indirect effects (disruption of soil integrity; degradation of annual plants, grasses, and perennial plants; and/or destruction of desert tortoise shelter sites) can be either immediate, delayed, and/or cumulative (soil loss due to erosion, soil compaction and its
effects on annual and perennial plants, water pollution, and litter and refuse) (see USDI 1994a).

ORV

Desert ORV use has increased and proliferated since the 1960s (USDI 1994). The U.S. Fish and Wildlife Service has unequivocally stated that ORV activities are among the most destructive, widespread, and best documented threats to the survival of desert tortoise and other vertebrates, and to the integrity of their habitats (see USDI 1994: D16; Adams et al. 1982a and b; 1984; Berry and Nicholson 1984b; Brattstrom and Bondello 1983; Bury 1987; Bury and Luckenbach 1983, 1986; Bury et al. 1977; Busack and Bury 1974; Luckenbach 1975; Sheridan 1979; Stebbins 1974, 1975; Webb and Wilshire 1983). The agency provides an extensive list of adverse impacts from ORV use including: mortality of desert tortoise on the surface and below ground; collapsing of desert tortoise burrows; damage or destruction of plants used for food, water, and thermoregulation; damage or destruction of the mosaic of cover provided by vegetation; adverse effects to general well-being of desert tortoises through water balance, thermoregulation, and energy requirements; noise pollution; impact damage or destruction of soil crusts, soil erosion; proliferation of weeds; and increased in numbers and locations of wild fires (USDI 1994: D16).).

The agencies' documents provide ample evidence of severe declines in biomass of plants and vertebrates as well as desert tortoise densities in the western and southern Mojave deserts due to ORV-related activities (see USDI 1994: D16-19; Busack and Bury 1974; Bury et al. 1977; Berry and Nicholson 1984b; Berry 1990). ORVs have a significant effect on tortoise abundance and distribution. As noted above, the impacts of roads within desert tortoise habitat extend significantly beyond the obvious tracks leading the U.S. Fish and Wildlife Service to conclude that well-used ORV areas often result in depressed tortoise populations extending beyond the immediate boundaries of the directly disturbed habitat (USDI 1994). Negative effects range from minor habitat alteration to total denudation of extensive areas. Most direct effects, such as mortality from crushing, collection, and vandalism effects are immediate. Indirect effects, including disruption of soil integrity; degradation of annual plants, grasses, and perennial plants; and destruction of desert tortoise shelter sites, are immediate, delayed, and/or cumulative (Fish and Wildlife Service 1994).

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