Conserving the Grand Canyon Watershed
A Proposal for National Monument Designation

Photo: Marbleview, Kaibab Plateau, north rim of the Grand Canyon, Arizona ©2010 GCWC

CENTER FOR BIOLOGICAL DIVERSITY

GRAND CANYON WILDLANDS COUNCIL

THE WILDERNESS SOCIETY

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EXECUTIVE SUMMARY

A Unique Landscape

Ranging from the arid Sonoran and Great Basin Deserts to lush, boreal Rocky Mountain forests, the proposed Grand Canyon Watershed National Monument is an ecological wonder. The proposed Monument embraces one of the most spectacular American landscapes—the Grand Canyon—and encompasses a wild, rugged array of towering cliffs, deeply incised tributary canyons, grasslands, and numerous springs that flow into the Colorado River in Grand Canyon. Unique geologic formations contribute substantially to the proposed Monument's spectacular biological diversity, with escarpments and canyons dating back millions of years. At least twenty-two sensitive species call the landscape home, including the endangered California condor and the rare northern goshawk.

Five distinctive and diverse geographic areas comprise the proposed Monument: the Kaibab Plateau, the Kaibab-Paunsagunt Wildlife Corridor, Kanab Creek Watershed, House Rock Valley, and the South Rim Headwaters—all encompassing much of the watershed of the Colorado River around Grand Canyon National Park, which provides water for millions of people in Arizona, Nevada, and California. These lands include the uranium withdrawal areas south of the Grand Canyon and west of Kanab Creek.

A 12,000-year Human Record

The proposed Monument holds lands of great significance to the Kaibab Paiute tribe, as well as Hopi, Zuni, Hualapi, Havasupai, and Navajo tribes, and was home to the Clovis, Basketmaker, and Puebloan peoples. More than three thousand ancient Native American archaeological sites have been documented in the region, representing just a fraction of the human history of the area. Ranging from settlements or habitations, to temporary camps, granaries and caches, and rock art, some of the sites date from as far back as the Paleo-Indian period—11,000 BCE.

Kanab Creek falls within the traditional territory of the Kaibab Band of the Paiute, as does the entire Kaibab Plateau. The Paiutes called the Plateau Kai Awvahv, the "mountain lying down," and its people Kai'vahv Eetseng. Springs with evocative names like Moonshine Spring, Wa'akarerempa or Yellowstone Spring, and Tinkanivac or Antelope Spring, are significant to the tribe—and are also important wildlife water sources.

"Certain [lands] of the forest reserves should also be made preserves for the wild forest creatures."—Theodore Roosevelt, 1901

Ecological Threats to proposed Monument lands:

- Logging of ancient trees—which ultimately affects native wildlife diversity as well as the resiliency and ecological integrity of the landscape.
- High density of primitive roads—which causes soil loss and vegetation damage, affecting archeological sites, water sources, increasing poaching and creating habitat fragmentation and barriers for wildlife.
- Loss of landscape connectivity for wildlife—between Grand Canyon National Park and Grand Staircase-Escalante National Monument—which becomes critical as the climate becomes warmer and drier.
- Inappropriate grazing—which has led to habitat degradation, shrub invasion, and soil erosion.
- Uranium mining—the potential for uranium mining continues to threaten water quality, wildlife, and intact habitat of the Grand Canyon watershed.

The Proposed Monument by the Numbers

Total number of acres — 1.7 million

Number of acres privately held — ~7,000

Number of years of human history (from Ice Age hunters to ancient farmers) — 11,000

Tribes for whom the land holds great significance — Kaibab Paiute, Hopi, Zuni, Hualapi, Havasupai, and Navajo

Number of archeological sites — more than 3,000

Number of acres containing ancient trees or old-growth forest — approximately 300,000

Number of different plant species — 300-400

Number of wildlife species on the federal Endangered Species list — 4

Number of wildlife species on the Arizona Species of Greatest Conservation Need list — 22

Number of creeks, springs and seeps — more than 125

The Havasupai believe that the Grand Canyon and the surrounding plateau, including the South Rim Headwaters, and all the plants and animals, were given to them to care for—and that these lands are sacred. Hualapai, Navajo, Hopi and Zuni people consider the area part of their extensive traditional territories.

As the Southwest faces climate change and increasing probability of drought, preservation of remaining intact ecosystems is critical not only for wildlife, but for humans as well.

An Endangered Ecosystem

The proposed Monument contains the most intact, largely unprotected old-growth forest in the Southwest, including old growth ponderosa pine forests—which constitute one of America's most endangered ecosystems. Together with the adjacent House Rock Valley, the Kaibab-Paunsagunt Wildlife Corridor, the Kanab Creek Watershed, and the South Rim Headwaters, the proposed monument includes areas of critical and significant biological diversity, providing crucial habitat and wildlife movement corridors for a host of distinctive species, including the Kaibab squirrel, northern goshawk, the Kaibab-Paunsagunt mule deer herd, mountain lion, and the iconic and endangered California condor.

The Solution: National Monument Status

National monument designation protects and reserves landmarks, structures, and other objects of historic or scientific interest as authorized by the Antiquities Act of 1906. National monument designation allows for continued public access, rights of way, sightseeing, hiking, wildlife observation, birding, hunting, fishing, and many other activities, including traditional tribal access and uses. Only lands owned by the federal government can be declared national monuments, by the President or by Congress.

Each national monument proclamation is specific to its location. National monument designation for the Grand Canyon Watershed would:

- Permanently protect old-growth forests.
- Protect native wildlife habitat and wildlife corridors.
- Protect archeological sites and traditional tribal access.
- Reduce road density.
- Provide for voluntary retirement of grazing permits.
- Prevent new uranium mines.

Our goal is to conserve, protect, and restore old growth forests and grasslands, important archaeological sites, native wildlife, springs and wetlands, and wildlife migration routes. If we preserve the region's natural and cultural values, residents and visitors will reap its benefits for years to come.

Conservation Benefits Everyone

- Wild landscapes protect our water supplies
- Conserving wild places protects our wildlife
- Protected public lands provide hands-on learning for citizens, especially children
- Conservation of wild places offers us places for spiritual renewal
- Protected landscapes nurture a human connection to Arizona's heritage past

. . . and Supports the Local Economy

Headwaters Economics, an independent, nonprofit research group, recently studied the impact of national monument designation on communities in Arizona. Research shows that the areas neighboring Vermilion Cliffs National Monument and Grand Canyon-Parashant experienced job growth of 24% and 44% respectively after designation. And the Grand Canyon, which draws visitors from across the country, generates $687 million for the economy in northern Arizona each year—while supporting 12,000 jobs.

Proposal partners, including The Wilderness Society, Sierra Club, and Center for Biological Diversity are spearheading a strategy to reach a wide range of constituents, including local government, tribe, and community representatives. Representatives are working with federal agencies in Washington, DC, as well as members of the conservation community, with the expected goal of fostering a groundswell of support for conservation.

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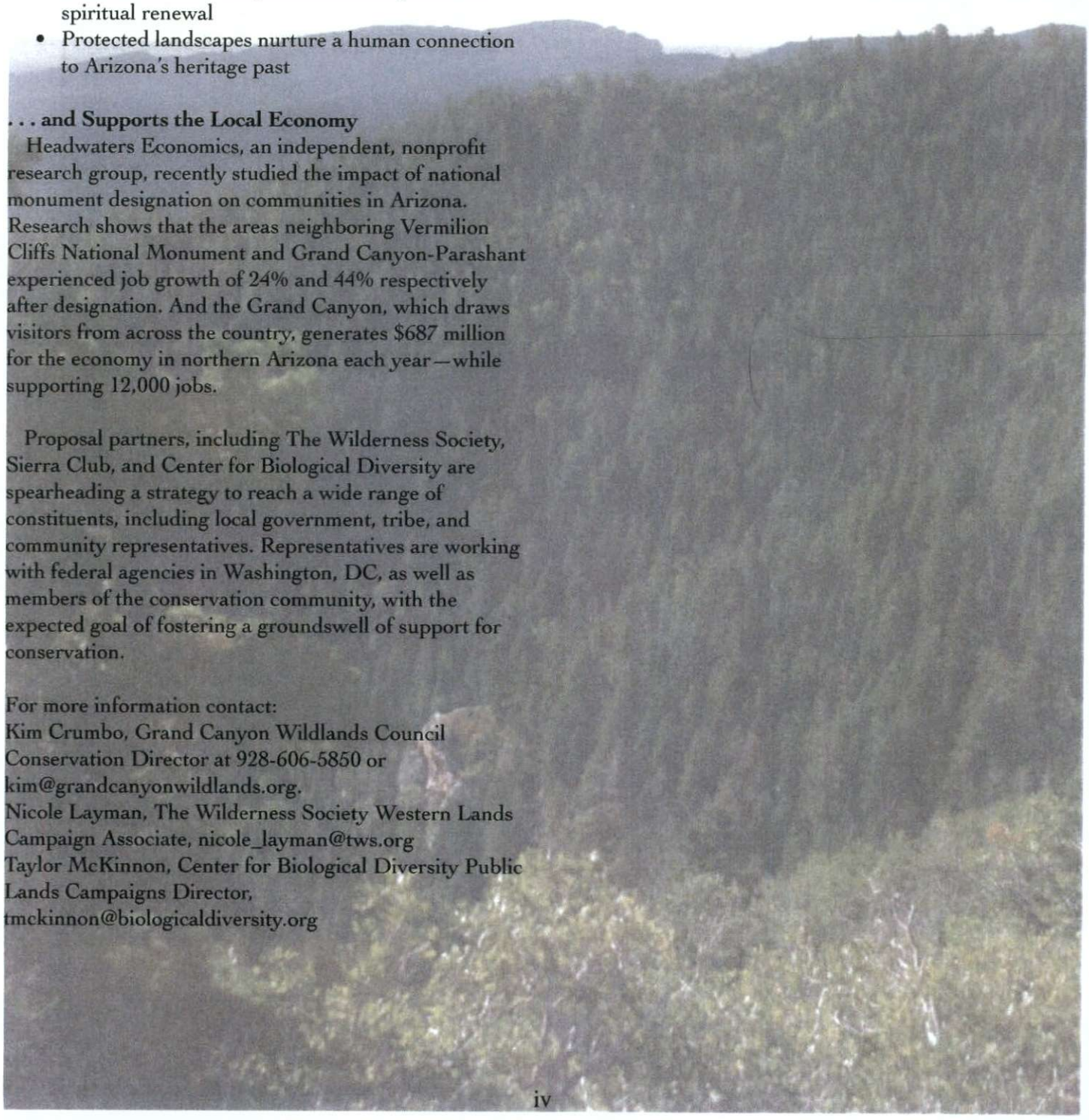
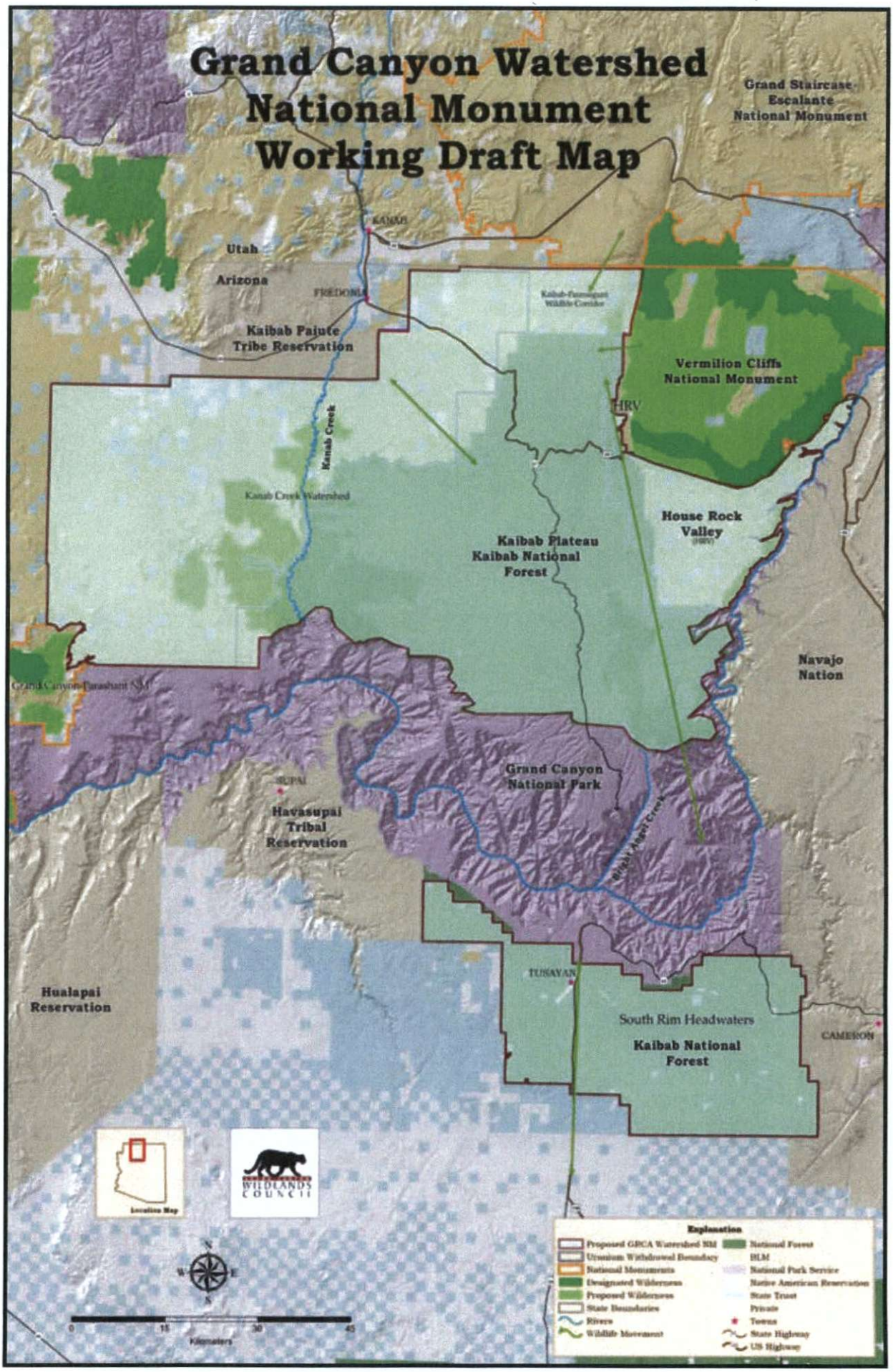



Grand Canyon Watershed
National Monument
Working Draft Map
Grand Staircase
Escalante
National Monument
KANAB
Utah
Arizona
FREDONIA
Kaibab-Paiute
Wildlife Corridor
Kaibab Paiute
Tribe Reservation
Vermilion Cliffs
National Monument
HRV
Kanab Creek
Kanab Creek Watershed
House Rock
Valley
(HRV)
Kaibab Plateau
Kaibab National
Forest
Navajo
Nation
Grand Canyon-Parashant NM
SUPAI
Havasupai
Tribal
Reservation
Grand Canyon
National Park
Bright Angel Creek
TUSAYAN
Hualapai
Reservation
South Rim Headwaters
Kaibab National
Forest
CAMERON
Location Map
WILDLANDS
COUNCIL
N
W
E
S
0
15
30
45
Kilometers
Explanation
Proposed GRCA Watershed NM
Uranium Withdrawal Boundary
National Monuments
Designated Wilderness
Proposed Wilderness
State Boundaries
Rivers
Wildlife Movement
National Forest
BLM
National Park Service
Native American Reservation
State Trust
Private
Towns
State Highway
US Highway

OVERVIEW

Geographic Components: Cultural and Ecological Significance

The proposed 1.7 million-acre Grand Canyon National Monument consists of five geographic regions (see proposal map, previous page). At its heart lies the ***Kaibab Plateau***, the mountain through which the Colorado River carves the Grand Canyon, rising over nine thousand feet above sea level. Aspen stands, ancient pine and fir forests, and montane meadows cover much of the higher elevations of its 750,000 acres. Vast areas of ponderosa pine surround this enormous, lush "sky island," as well as desert grass and shrub at lower elevations. The Paiutes called it Kai Awvahv, the "mountain lying down," and its people Kai'vahv Eetseng (Martineau 1992:154,190). Clarence Dutton, a seasoned explorer and geologist, described the mountain in 1880 as "the most enchanting region it has ever been our privilege to visit." The Kaibab Plateau presents a rare example of a fundamentally intact mature forest retaining a high density of ancient pines—part of the largest southwestern ponderosa pine forest in the US outside of unprotected areas.

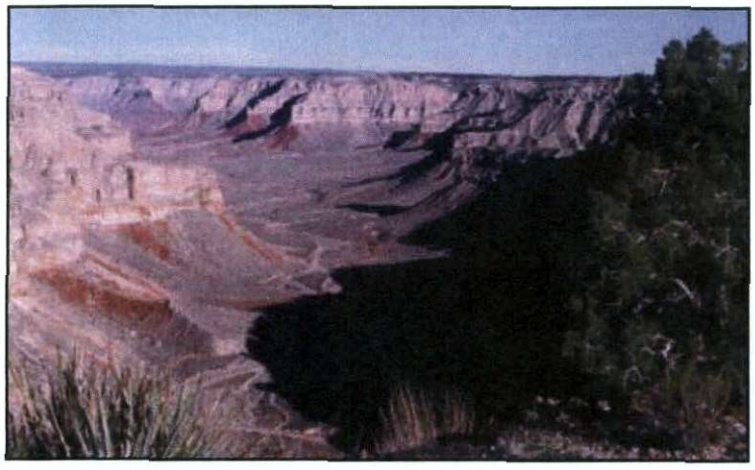
House Rock Valley, called Aesak or "basket-like" by the Paiute (Austin et al. 2005:57), consists of approximately 150,000 acres of desert grass and shrublands lying between the Kaibab Plateau and Grand Canyon National Park. Paiute bands traditionally utilized the valley's plants and animals, and depended on springs including Oarinkanivac and Pagampiaganti (Kelly 1964:10–12). Early explorers described the valley's extensive grasslands, although these soon became damaged through overgrazing by livestock (Rasmussen 1941:267). The Nature Conservancy classifies most of the area as "at risk" grasslands with less than five percent perennial

native grass cover and/or severe soil erosion (Schussman and Gori 2004:21). House Rock Valley has the potential to be restored back to functioning grassland communities if grazing pressure is significantly reduced (Schussman and Gori 2004:45).

The Kanab Creek Watershed encompasses Kanab Creek, which flows south from the Pink Cliffs of the Paunsagunt Plateau to its confluence in Grand Canyon. The Paiute's traditional "entrance" into that vast canyon, Kanab Creek falls within the traditional territory of the Kaibab Band of the Paiute, who farmed along the creek and utilized the various available plant and animal resources. Kanab Creek was also an important north-south trade route and served as a refuge for Paiutes during European-American encroachment.

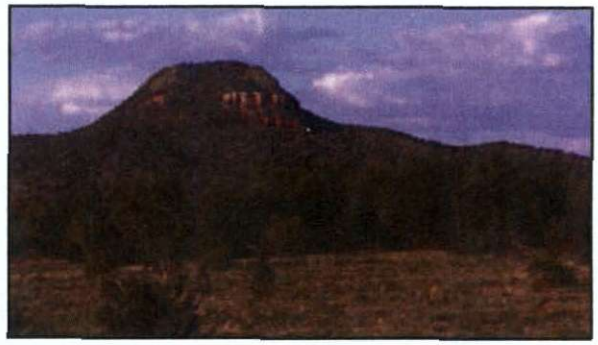
The Kaibab-Paunsagunt Wildlife Corridor comprises a crucial wildlife linkage between Arizona's Kaibab National Forest and the Vermilion Cliffs National Monument, leading to Utah's Grand Staircase-Escalante National Monument and the Paunsagunt Plateau—the Bryce Canyon National Park region. The area's corridor function is well documented by Arizona and Utah state wildlife agencies (Carrel et al. 1999).

As winter approaches, Utah's mule deer migrate off the high Paunsagunt Plateau (Bryce Canyon National Park region) south to lower elevation winter range—as do their primary predator, mountain lions. In the spring, the deer return to the higher, cooler summer range of the Paunsagunt Plateau. While the Grand Staircase-Escalante National Monument protects much of this important winter habitat, a significant portion lies outside



any protected area. Including Arizona's portion of the corridor within the proposed monument would preserve the region's wildlife connectivity and protect important wildlife and rare plant habitat.

The 325,425-acre ***South Rim Headwaters*** consists of the Kaibab National Forest Tusayan Ranger District, encompassing not only the Cataract/Havasupai Creek headwaters, but also other drainages of the Grand Scenic Divide, the western Little Colorado River, as well as the source for Grand Canyon springs of the Esplanade and the Tonto Platforms beneath the South Rim. The District's ponderosa pine and woodlands are integral to the Grand Canyon National Park's South Rim, providing habitat for numerous wildlife species that often utilize both park and National Forest. The Havasupai believe that the Grand Canyon, the surrounding plateau including South Rim Headwaters, and all the plants and



animals, were given to them to care for, and that these lands are sacred. Hualapai, Navajo, Hopi and Zuni people consider the area part of their extensive traditional territories.

Wildlife Species and Rare Plants

The proposed Monument area offers a compelling diversity of wildlife, including mountain lions, bobcats, long-tailed weasels, and healthy and abundant populations of mule deer. A lucky visitor might catch a glimpse an occasional black bear roaming the forest once haunted by gray wolves, jaguars, and the mighty grizzly bear. Desert bighorn sheep dwell in the canyons and cliffs, while pronghorn antelope, badgers, black-tailed jackrabbits, and coyotes live in the valleys and grasslands. The House Rock Valley chisel-toothed kangaroo rat, a Category 2 federal candidate under the Endangered Species Act, is found only in House Rock Valley.

The distinctive and vulnerable endemic Kaibab squirrel dwells exclusively within the Kaibab Plateau's the ponderosa pine forest, while red squirrels inhabit the Plateau's mixed conifer forests. Climatic disruption, along with recent large-scale high intensity fires, threatens both species and their isolated habitat.

The great thunderbird, the endangered California condor, forages the

biodiversity. This resilience includes regeneration after fire, resistance to and recovery from pests and diseases and adaptation to changes in radiation, temperature and water availability including those resulting from global climate change. Conservation of naturally evolving old growth forests requires protection and restoration of biotic components including native species, forest structure and function as well as abiotic processes especially natural fire regimes.

2. Protect Cultural and Archaeological Sites

The proposed Monument holds lands of great significance to the Kaibab Paiute tribe, as well as Hopi, Zuni, Hualapi, Havasupai, and Navajo tribes, and historically was home to the Clovis, Basketmaker, and Puebloan peoples. Monument designation recognizes and retains traditional tribal access and uses, and protects significant archaeological sites, some dating from 11,000 BCE. Appropriate primitive road closures and reduction of logging will help to preserve these values.

3. Manage for Native Wildlife and Wildlife Migration Routes

The proposed National Monument harbors significant wildlife populations including numerous bird species and rare, endemic plants all of which are discussed throughout this document. National monument designation would provide critical wildlife connections between Grand Canyon National Park, and Grand Staircase-Escalante and Vermilion Cliffs national monuments. Providing safe haven for these species requires evaluating, forecasting and acting to support their resilience in the context of climate change.

National monument designation can explicitly emphasize protection and restoration of viable and ecologically effective native wildlife populations by calling on both the Secretary of Agriculture and Secretary of the Interior to expeditiously authorize a scientifically credible analysis of the current and projected status of keystone species including the Kaibab squirrel, goshawks and mountain lions, as well as an analysis regarding recovery of extirpated wildlife such as bears and wolves. National monument administration will continue to rely on effective interagency cooperation based on existing jurisdiction of the State and Federal agencies with respect to fish and wildlife management. Management of the House Rock Valley Wildlife Area will continue under current legal agreements between the USFS and AZGFD.

4. Reduce Road Density

A high density of primitive roads causes soil loss and vegetation damage, affecting archeological sites, water sources, increasing poaching and creating habitat fragmentation and barriers for wildlife. Open□road density, including primitive or gravel based/dirt roads, is a good predictor of habitat suitability for large mammals, with habitat effectiveness and population viability declining as road density increases. The extent of roads within the proposed national monument should not exceed a density based on credible scientific standards.

5. Provide for voluntary retirement of grazing permits

Inappropriate grazing has led to habitat degradation, shrub invasion, and soil erosion. Precedent exists within other national monuments for voluntary retirement of grazing permits. While existing authorized permits or leases may continue, we propose allowing for voluntary permanent retirement of grazing permits should the Monument be designated.

6. Prevent New Uranium Mines

On January 9, 2012, the Department of the Interior announced a 20-year ban on new hard rock mineral leasing and mining on one million acres surrounding the Grand Canyon. National Monument designation would make this withdrawal permanent, forever protecting Colorado River water quality, wildlife habitat, and the scenic wonder of the area.

RECREATION AND ECONOMIC IMPACT OF NATIONAL MONUMENT DESIGNATION

National monument designation allows for continued public access, rights of way, sightseeing, hiking, wildlife observation, birding, hunting, fishing, and many other activities, including traditional tribal access and uses. The desire to experience the natural beauty of the Grand Canyon draws visitors from across the country, generating $687 million for the economy in northern Arizona each year—and supporting 12,000 jobs.

Headwaters Economics, an independent, nonprofit research group, recently studied the impact of national monument designation on communities in the West.

mountain's diverse landscapes, and the Plateau also shelters one of the highest concentrations of the uncommon northern goshawks known in North America. Other important bird species include golden eagles, rough-legged hawks, ferruginous hawks, northern harriers, western burrowing owls, and the threatened Mexican spotted owl.

North Canyon Creek within the Saddle Mountain Wilderness is a significant center of fresh water biodiversity, and is home to the threatened Apache trout. Other large mammals include mountain lions, and bighorn sheep. Small mammals occur such as bobcat, badger, porcupine, red squirrels, desert cottontail, black-tail jackrabbit, cliff chipmunk, white-tailed antelope squirrel, coyote, gray fox, spotted skunk, three species of pocket mice and the two kangaroo rats (O'Farrell 1995:9). Reptiles include the Great Basin rattlesnake, gopher snake, and eastern collared lizard (AGFD 2005).

Rare, sensitive plants include the endangered Brady pincushion cactus, the threatened Siler pincushion cactus, the candidate species Fickeisen plains cactus, Paradine (Kaibab) Plains cactus, the Grand Canyon Rose, and the Paria Plateau fishhook cactus, as well as the Tusayan flameflower, and the Arizona leatherflower.

Ecological Threats to proposed Monument lands:

- Logging of ancient trees—which ultimately affects native wildlife diversity as well as the resiliency and ecological integrity of the landscape.
- High density of primitive roads—which causes soil loss and vegetation damage, affecting archeological sites, water sources, increasing poaching and creating habitat fragmentation and barriers for wildlife.
- Loss of landscape connectivity for wildlife—between Grand Canyon National Park and Grand Staircase-Escalante National Monument—which becomes critical as the climate becomes warmer and drier.
- Inappropriate grazing—which has led to habitat degradation, shrub invasion, and soil erosion.
- Uranium mining—the potential for uranium mining continues to threaten the water quality, wildlife, and intact habitat of the Grand Canyon watershed.

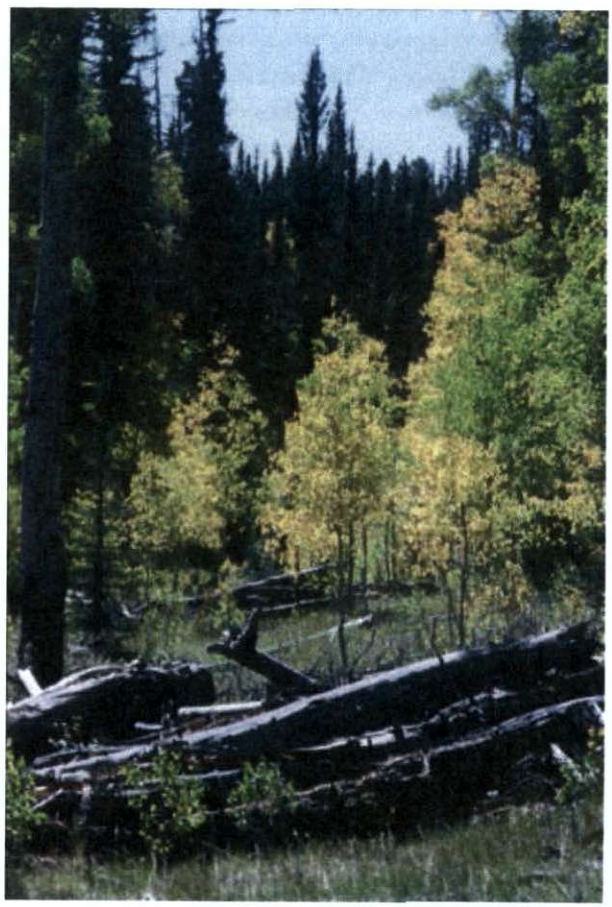
CONSERVATION PRIORITIES AND ACTIONS

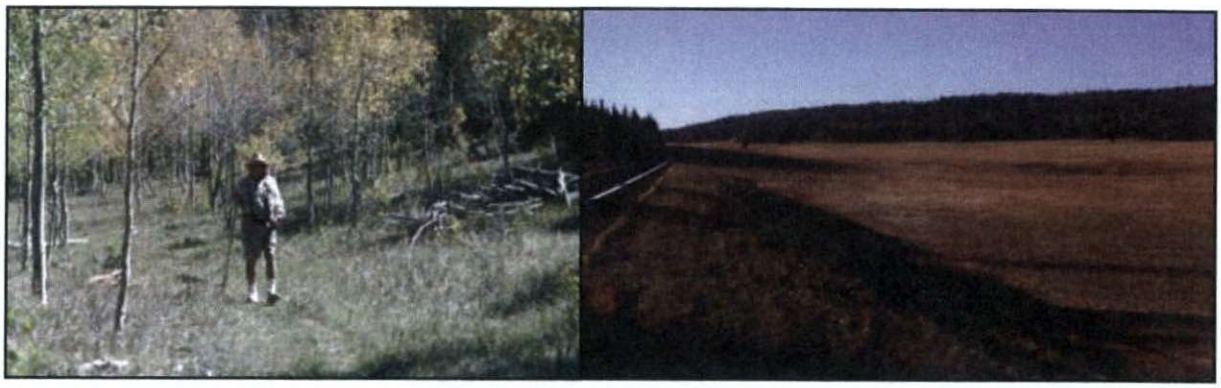
1. Stop Old-Growth Logging

Ecologists have determined that old growth ponderosa pine forests constitute one of America's most endangered ecosystems. Old-growth ponderosa pine has suffered an estimated 85-98 percent area loss due to destruction, conversion to other uses, and significant degradation in structure, function, and composition. The proposed Monument's forested areas offer a unique opportunity to restore southwest old- growth forests at the landscape level. The Kaibab Plateau sustains a rare example of a fundamentally intact, mature southwestern ponderosa pine forest retaining the highest density of ancient trees outside of protected areas. Such trees once dominated the country's largest contiguous ponderosa pine forest (Forest Service 2009:6).

Mature, natural forests are resilient to disturbances because of their genetic, taxonomic and functional

The preservation of these stands, and restoration of degraded habitat, is of regional, national, and global significance.





Research shows that communities adjacent to Vermilion Cliffs National Monument and Grand Staircase Escalante experienced job growth, and that conserving public lands provides amenities that draw new residents, tourists, recreation uses, and businesses.

The North Kaibab, as the gateway to the North Rim of Grand Canyon National Park, annually receives around 290,000 visitors. While the North Kaibab's two paved highways offer pleasant forest surroundings and spectacular vistas of adjacent wildlands, the forest's non-motorized trails, two wilderness and four roadless areas, and an extensive network of montane meadows affords ample quiet recreational opportunities complementing the adjacent Grand Canyon National Park's unspoiled wilderness. Most visitors (56 percent) to the Kaibab National Forest's three ranger districts enjoy viewing natural features, while 46 percent engage in viewing wildlife and 36 percent indicate that relaxation is part of their experience. Nearly 50 percent of visitors engage in hiking and walking (Forest Service 2006, 2010b).

The Outdoor Industry Foundation (OIF) reports that well over one million Arizonans, or twenty-seven percent of the state's population, participate in hiking, trail running, bicycling and rock climbing. Twenty-four percent (1,098,000) enjoy bird watching and other wildlife watching (OIF 2010). In Utah, the OIF reports similar findings with 43 percent of the state's population (714,000) engaging in hiking, backpacking, rock climbing and trail running (OIF 2010a). Thirty-two percent enjoy bird and other wildlife watching. About five percent of visitors to the Kaibab National Forest listed hunting as a primary activity. The OIF reports that ten percent of Utahns, and three percent of Arizonians, hunt (OIF 2010; 2010a).

Active outdoor recreation supports about 82,000 jobs and produces almost $5 billion annually in retail sales and services across Arizona (OIF 2010). In Utah, it contributes $5.8 billion annually to Utah's economy by supporting 65,000 jobs and producing $4 billion annually in retail sales and services (OIF 2010a). Active outdoor recreation generates almost $350 million annually in Arizona ($300 million in Utah) state tax revenues (OIF 2010;OIF 2010a).

Off-road vehicle (ORV) use on the Kaibab National Forest accounts for less than four percent of recreation on the forest with less than two percent indicating this activity as their primary activity (Forest Service 2009a:18). This figure is nearly identical with ORV recreational activities on other National Forests (Forest Service 2010b:14).

CONSERVATION HISTORY AND BACKGROUND

History of Protection

U.S. Presidents from Benjamin Harrison to Theodore Roosevelt and Lyndon B. Johnson, who all recognized the North Kaibab's uniqueness and importance, included the Kaibab Plateau in sweeping designations of forest and game preserves and a smaller national landmark.

Concerns over degradation of the northern Arizona Kaibab Plateau forest's values led to the establishment in 1893 of a forest reserve surrounding Grand Canyon. In fact, between 1882 and 1886, Senator (later President) Benjamin Harrison introduced three Grand Canyon National Park bills that evidently included the North Kaibab (Morehouse 1996:39).

By 1905, Congress and President Theodore Roosevelt recognized that forests like the Kaibab should be set aside "for the wild forest creatures" ...[to] afford perpetual protection to the native fauna and flora" (U.S. Congress 1905). In 1906, and in accordance with earlier Congressional authorization, Theodore Roosevelt established the Grand Canyon National Game Preserve for "the protection of game animals... recognized as a breeding place therefore..."1 That designation, while still on the books, has proven ineffective in preserving the full spectrum of native species and their habitat, especially large carnivores and the Plateau's old growth forests and grasslands. In 1908, Roosevelt, making good use of the recently passed Antiquities Act, proclaimed a Grand Canyon National Monument better protecting the Canyon proper but leaving out most of the forested Kaibab Plateau (Morehouse 1996:37).

Efforts to protect the lands surrounding Grand Canyon continued with recommendations for an enlarged, five million-acre national monument including not only the North Kaibab and Tusayan Ranger Districts adjacent to Grand Canyon, but portions of Utah's Dixie National Forest (Morehouse 1996:40). Two decades after Roosevelt's gesture, "Ding" Darling, the head of the U.S. Biological Survey, proposed creating a vast wildlife area on the Arizona Strip. At least one rancher, Preston Nutter, expressed enthusiasm for the idea (Price and Darby 1964:251). However, loggers and other ranchers blocked these conservation efforts (Morehouse 1996).

Cultural and Historic Values

The proposed Monument holds lands of great signifi-

cance to the Kaibab Paiute tribe, as well as Hopi, Zuni, Hualapi, Havasupai, and Navajo tribes, and historically was home to the Clovis, Basketmaker, and Puebloan peoples. Three thousand ancient Native American archaeological sites have been documented in the region, some dating from as far back as the Paleo-Indian period—11,000 BCE.

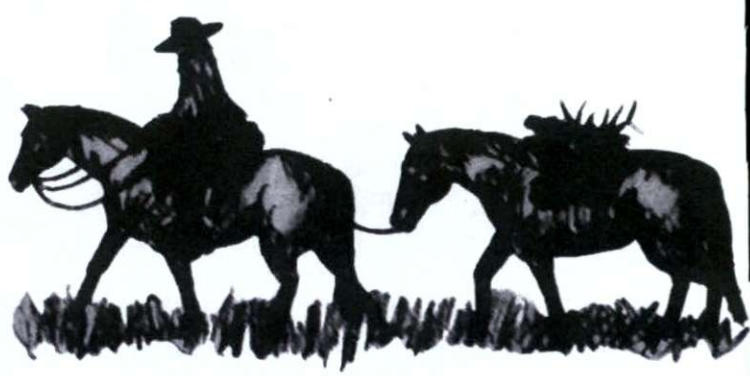
During the first 12,000 years of human presence in the northern Southwest, men and women pursued a mobile hunting and gathering lifestyle, focusing their efforts on those species that were most readily available and provided the greatest return for the least amount of effort. Between 10,000-9000 BCE, the focus was on large game species, such as mammoth and mastodons. As large herbivores became rare, and many extinct, Pleistocene hunters switched to smaller species: first bison, then deer, sheep, rabbits and rodents.

By 7000 BCE, humans in the Southwest had diversified their hunting and gathering strategies considerably. Small family bands moved seasonally between high and low elevation zones, possibly competing with wildlife for scarce resources, such as roots, seeds, fruits and nuts, as each food source ripened in turn (Fairley 2004).

For at least the past 2500 years, cultivated foods supplemented, if not fully sustained, people in this semi-arid region. By 700 CE, virtually everyone living on the southern Colorado Plateau followed a semi-sedentary lifestyle and depended on cultivated products for much of their daily diet. Between 1050 and 1200 CE, scattered farming plots were abundant, extending across the Arizona Strip including the Kaibab Plateau and North Rim of the Grand Canyon (Fairley 2004).

Hundreds, if not thousands of prehistoric dwellings, storage cists, and agricultural features cover the Kaibab Plateau and adjacent lands proposed for permanent protection. Subsistence hunting for mule deer on the Kaibab, as the Southern Paiutes call the Plateau, or "Buckskin Mountain," as early settlers sometimes referred to it, had long been an important, productive endeavor of the Paiutes and later Navajo as well as the early Mormon settlers (Anderson 1998:134).

The Monument's colorful, modern historic period includes expeditions of the Spanish missionaries Dominguez and Escalante, and government explorers including John Wesley Powell and Clarence Dutton. Its history is replete with accounts of settlers such as the "Buckskin Apostle" Jacob Hamblin and the infamous

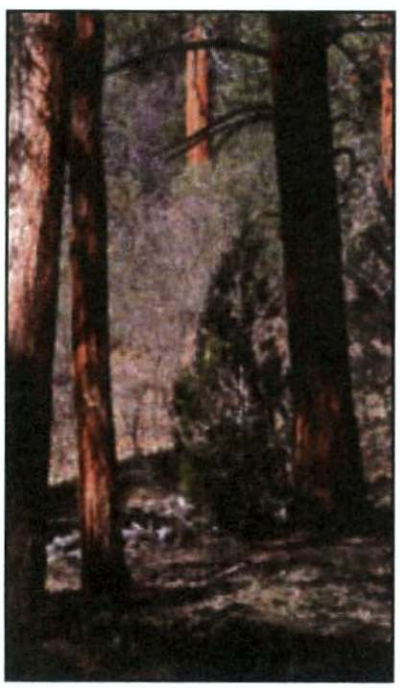


John D. Lee, the latter best known for establishing the ferry now bearing his name. President Theodore Roosevelt and novelist Zane Grey popularized the region, as cowboys and herders plied their ecologically damaging trades, trading stories and exchanging threats during brief episodes of their traditional, simmering range war (Rider 1985). Early settlers, miners, newly wed or weathered Mormon "Saints," and sinners of all callings used the Honeymoon Trail, a relatively direct route across the proposed Monument.

Today, many of the descendants of the early prehistoric people, and Native American tribes that arrived later, dwell in the Grand Canyon region. Across the area early settlers named places—Le Fevre Canyon, Cram Ranch, Johnson Wash, and Jacob Lake—names familiar to us today.

Old Growth Forests

A colossal green crescent blanketing the high plateaus and mountains from west central New Mexico through northern Arizona and southern Utah constitutes the world's largest ponderosa pine forest (Friederici 2003; Covington 2003). Ancient large trees that often reached an age of a several centuries or more once dominated this old growth forest (Forest Service 2008; Suckling 1996). These resilient forests, replete with the full spectrum of native species, persisted for the past 10,000 years and evolved through a long history of climatic variation (Noss and Cooperrider 1994:189; Covington 2003:28). Human activity within the past 120 years has dramatically changed these relatively stable environments to imperiled and relatively impoverished ecosystems (Covington 2003).



At an earlier time, a natural regime of fires produced a diverse mosaic of forest and grasslands. Frequent, low intensity ground fires generally cleared smaller trees and shrubs, leaving stands of generally open forest of fire-resistant ancient trees surrounded by thriving grasses and forbs, and inhabited by abundant wildlife including black and grizzly bears, and wolves. Although subjected to extensive timber harvest during the past half century, the area was never systematically railroad-logged. However, past and on-going impacts including logging, overgrazing, and a high density of superfluous primitive roads adversely affect watershed, forest and wildlife alike.

Old growth usually refers to older seral stages of natural forests (Noss and Cooperrider 1994:189) and includes features such as vertical layering, horizontal patchiness, live trees with decay or southwestern dwarf mistletoe brooms, and hardwood species that increase vertical structural diversity and support more species than forests with simpler structure (Hunter 1999, Chambers and Germaine 2003). These values are significant, given that more than 200 years are required to develop old growth structure in southwestern ponderosa pine forests (Reynolds et al. 1992; 2006:308).

Springs, Seeps and Wetlands

Springs and other riparian areas are of special concern due to their great biological significance. Arizona has the second highest density of springs in the United States (Forest Service 2008:51). The Mogollon Rim and the Kaibab plateaus have the highest density of springs in Arizona (Forest Service 2008:51). These include, to name but a few, Crystal, Tater Canyon, Timp, Big, and Warm springs. The Kaibab Plateau also contains numerous wetlands, such as Lookout, Deer, Crane, Cougar, and Indian lakes. Frank's Lake contains a free-floating bog, a rarity in the arid southwest (Forest Service 2009:6).

Some research suggests water quality may be as important as water availability (Bright 1999:14). Most of the springs and wetlands of the proposed Monument are in poor or fair condition due primarily to livestock and native ungulate use, and recreational impacts (Forest Service 2008:51). The recent migration of non-native bison hybrids (cattalo) on to the Plateau presents additional challenges regarding wetlands protection (Larsen et al. 2009). In addition, many wetlands have been modified to capture additional water that, in turn, affects natural flow regimes and water availability to aquatic and other native species.

Native Wildlife

The proposed National Monument harbors significant wildlife populations and also comprises critical wildlife connections between Grand Canyon National Park, and

Grand Staircase-Escalante and Vermilion Cliffs national monuments, which have been discussed throughout this document. Of special importance is the mule deer population on the the Kaibab Plateau, one of the few coniferous ecosystems in the Southwest without significant elk presence. Consequently, the Forest Service considers the mule deer population as "healthy and abundant" (Forest Service 2009:6). Pronghorn antelope, while now marginally present, were once common in the grasslands adjoining the Kaibab Plateau (Rasmussen 1941:238). Black Bear once inhabited the North Kaibab, as did grizzly bear and gray wolves (Rasmussen 1941; Hoffmeister 1986).

In 1965, the Secretary of the Interior Stewart Udall recognized that the Kaibab squirrel, found only on the Kaibab Plateau, represents "a classical example of the process of evolution through geographic isolation." Udall also recognized the squirrel's dependency on the Plateau's forest resources, "one of the largest and best examples of a climax [old growth] community," and established the 200,000-acre Kaibab Squirrel National Natural Landmark (NPS 1993). The Kaibab subspecies is considered to be vulnerable to extinction based on the geographical isolation of the sub-species (Bratland 2008:89; NatureServe). Unfortunately, protection of the landmark's values is only voluntary. A significant portion of old growth has been logged and the future of both the Kaibab squirrel and its old growth habitat remain problematic.

Livestock Grazing

By 1891, an estimated 1.5 million cattle, sheep, horses and goats grazed the Kaibab Plateau. (Foreman 2004). Overgrazing by domestic cattle and sheep is considered to be one of the leading causes of watershed, stream and grassland degradation in western North America (Belsky et al. 1999, Fleischner 1994, Donahue 1999). Today, it is reasonable to assume that livestock grazing has affected virtually every acre of the proposed Monument.

Historically, livestock grazing in southwestern ponderosa pine forests reduced grass and sedge abundance, allowed dense recruitment of seedling pines, and altered fire regimes (Belsky and Blumenthal 1997). Inappropriate grazing continues to contribute to degradation of forest ecosystems, including resultant higher tree density in piñon-juniper woodlands, ponderosa pine and mixed conifer forests, which contributes to destructive high intensity fires (Forest Service 2009:48; Covington 2003).

Inappropriate grazing is the leading cause of the disturbance that led to the regional shift of perennial bunch grasses and open stands of sagebrush to dense sagebrush and harmful exotics such as cheatgrass (Bromus tectorum), as well as increased shrub density and juniper encroachment in sagebrush scrubland (Noss and Cooperrider 1994; Donahue 1999; Forest Service 2008:49,50).

Springs and other riparian areas are of special concern due to their great biological significance and the well-documented negative impacts of inappropriate grazing on these areas, which may include loss of native species diversity (Forest Service 2009:51). Overgrazing adversely affects native reptiles, and songbirds, especially those that nest or forage on or near the ground (Finch et al. 1997), may alter bird community composition (Schulz and Leininger 1991), and may ultimately decrease the abundance and diversity of native herbivores (Donahue 1999). Carnivore numbers may decline as prey availability decreases (Brown 1992; Mech 1995) and as they are eliminated by the government at the request of the livestock industry (Robinson 2005).

Reduction or cessation of livestock grazing would appreciably improve native vegetation surrounding water sources, increasing survival of pronghorn fawns, and improving habitat for small mammals including the House Rock Valley chisel-toothed kangaroo rat (USDA

and USDI 2000:45,47; O'Farrell 1997:20). Rare plants such as the Kaibab pincushion cactus and the endangered Brady pincushion cactus would also benefit from removing or reducing the number of cattle (USDA and USDI 2000:30,39,43).

A 2000 interagency Environmental Assessment concluded that a significant portion of the North Kaibab Ranger District, specifically the Kane Ranch Allotment (Kaibab Plateau and House Rock Valley), exhibited "poor to very poor" range conditions (USDI and USDA 2000). The agencies concluded that ecosystems benefiting from a reduction or cessation of livestock grazing include sagebrush/shrublands, ponderosa pine and mixed conifer and their aspen communities, piñon-juniper woodland, grassland, shrubland, montane/subalpine grassland, Colorado Plateau/Great Basin grassland, spruce-fir forests, and semi-desert grasslands (Forest Service 2008:88,89).

Road Density

Open road density, including primitive or gravel-based/dirt roads 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 mule deer, 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 will use roadside habitat less extensively, effectively reducing total habitat area (Garland and Bradley 1984, Kozel and Fleharty 1979, Fox 1989, Lyon 1979, Mclellan and Shackleton 1988, Van Dyke et al. 1986).

In fact, high road densities are a known cause of extirpation of wildlife species. For example, 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 et al. 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). The Kaibab National Forest has acknowledged these many significant negative impacts to wildlife and habitat suitability (Forest Service 2010: 20-22).

National Monument designation should result in a road density standard less than the recommended maximum of one mile per square mile. Reducing road density to restore wildlife habitat and native biological diversity significantly reduces soil erosion, helps mitigate non-native species invasions, helps mitigate air quality impacts (especially to Class 1 airsheds; e.g., Grand Canyon NP) and comprises a key management strategy to maintain and restore resiliency to Forests and their watershed function. The most practical and economical long-term mitigation of these problems lies with closure and revegetation (Forest Service 2001: 22; Moll 1996).

CONSERVATION OPTIONS

The Forest Plan Revision Process, in theory, provides an opportunity to develop and implement wildlife conservation management objectives implementing ecologically effective populations of critical native species by protecting core habitats and facilitating wildlife movements across the landscape. As the history of the North Kaibab amply demonstrates, forest plans and administrative designations fail to provide long-term protection and restoration of old growth forest ecosystems, including its full native diversity of life. Although the Forest Service currently manages four congressionally designated national monuments (Williams 2003), congressional designation remains problematic

during the current and foreseeable Congress.

The President has the authority under the Antiquities Act to protect an endangered, ecologically critical landscape by designating an expansive Grand Canyon Watershed National Monument. National Monument designation would provide new management direction reflecting modern conservation biology precepts build the original, 100 year-old Congressional intent to "afford perpetual protection to the native fauna and flora [and] safe havens of refuge to our rapidly diminishing wild animals... [emphasis added]."

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