



## Foundation Statement





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*Each resource analysis contains these sections*

- *Description*
- *Importance*
- *Current Conditions and Related Trends*
- *Issues and Concerns*
- *Stakeholder Interest*
- *Relevant Laws and Regulations*

*Some analyses may contain one or both of the following*

- *Planning Needs*
- *Information Needs*

This Foundation Statement for Planning and Management provides a base for future planning, as required by the National Park Service<sup>1</sup>, to help guide park management. By identifying what is most important according to Grand Canyon's establishing legislation, purpose and significance statements, primary interpretive themes, and special mandates, this document sets parameters for future planning and provides managers information necessary to make informed decisions critical to park operations, management, and the future.

Although not a decision document or additional plan, this Foundation Statement summarizes fundamental resources and values critical to maintaining Grand Canyon's natural, cultural, and experiential value into the future. Because this Foundation Statement is based on laws and policies that define Grand Canyon National Park and its mission, the Statement should remain relatively unchanging, subject to new legislation, policy, planning updates or new scientific and scholarly information.

## **Part One Legal Requirements**

The following section describes the park purpose, park significance, primary interpretive themes, special mandates, and a summary of legal and policy requirements. A park's purpose, significance, and special mandates are derived from and bounded by law and policy.

### **Grand Canyon National Park Purpose**

- Preserve and protect Grand Canyon's unique geologic, paleontologic, and other natural and cultural features for the benefit and enjoyment of the visiting public
- Provide the public opportunity to experience Grand Canyon's outstanding natural and cultural features, including natural quiet and exceptional scenic vistas
- Protect and interpret Grand Canyon's extraordinary scientific and natural values

### **Grand Canyon National Park Significance**

Grand Canyon is one of the planet's most iconic geologic landscapes. During the last six million years, the Colorado River carved Grand Canyon; these same erosional and tectonic processes continually shape the canyon today. Grand Canyon's exposed layers span more one third of Earth's history, and record tectonic and depositional environments ranging from mountain-building to quiet seas. Taken as a whole, Grand Canyon, with its immense size, dramatic and colorful geologic record exposures, and complex geologic history, is one of our most scenic and scientifically valued landscapes.

The force and flow of the Colorado River along with its numerous and remarkably unaltered tributaries, springs, and seeps provide plants and animals opportunity to flourish in this otherwise arid environment. These vital resources represent transmission of local aquatic recharge from high-elevation rims to the arid inner canyon. There are hundreds of known seeps and springs throughout the park, and probably more to be discovered.

Wilderness landscapes are an important current resource and future preserve. Park boundaries extend beyond canyon walls to include 1,904 square miles (1,218,376 acres) of which 94 percent is managed as wilderness. When combined with additional contiguous public and tribal lands, this area comprises one of the largest U.S. undeveloped areas. Grand Canyon offers outstanding opportunities for visitor experiences including extended solitude, natural quiet, clean air, dark skies, and a sense of freedom from the mechanized world's rigors.

Grand Canyon National Park contains a superlative array of natural resources. Much of this diversity can be attributed to the park's dramatic topographic spectrum. This elevational variety provides microhabitats for natural processes supporting rare and endemic plant and wildlife species. These diverse habitats

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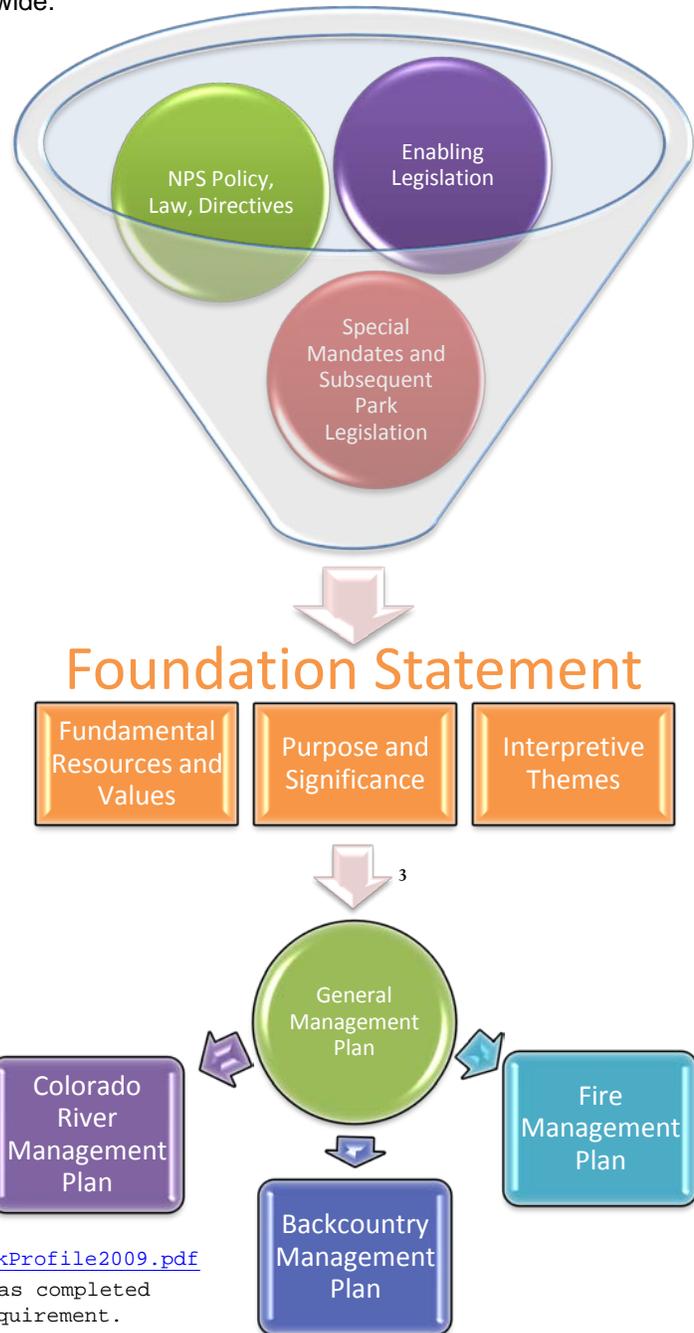
<sup>1</sup> General Management Plan Sourcebook 2008, Chapter 6, Foundation Statements  
[http://planning.nps.gov/GMPSourcebook/pdfs/GMPSrcbk-Mar08\\_Part2-Chpt6.pdf](http://planning.nps.gov/GMPSourcebook/pdfs/GMPSrcbk-Mar08_Part2-Chpt6.pdf)

serve as a living laboratory for scientific research in numerous fields that contribute greatly to our understanding of the relationship between biotic communities and abiotic environments.

The human-Grand Canyon relationship has existed for at least 12,000 years. The canyon is an important homeland for native people and a place of historic Euro-American exploration and discovery. Today that relationship continues; both for ongoing Native American associations and millions of visitors who visit the canyon and its surrounding landscapes.

Grand Canyon's immense and richly colored scenic vistas, enhanced by a natural setting, inspire a variety of emotional, intellectual, artistic, and spiritual impressions. Its unsurpassed natural beauty is a source of profound inspiration for people worldwide.<sup>2</sup>

**Foundation Statement  
Position in Park  
Planning**



<sup>2</sup> A GRCA profile can be found at <http://www.nps.gov/grca/parkmgmt/upload/ParkProfile2009.pdf>

<sup>3</sup> The Grand Canyon General Management Plan was completed in 1995, before the Foundation Statement requirement.

## Grand Canyon National Park Special Mandates and Administrative Commitments

Special mandates are legal requirements and administrative commitments that apply specifically to Grand Canyon, and are mandated by Congress or signed agreements with other entities.

### World Heritage Site

*Authority: United Nations Educational, Scientific, and Cultural Organization World Heritage Committee*

The Secretary of the Interior, through the National Park Service, is responsible for identifying and nominating U.S. sites to the World Heritage List. Proposed U.S. sites must be either Federal property, such as national parks, or sites already designated as national historic landmarks or national natural landmarks. Properties not owned by the Federal government are nominated only if their owners wish to do so and pledge to protect their property in perpetuity.

Most U.S. World Heritage Sites are administered by the National Park Service. The others are managed by states, private foundations, the Commonwealth of Puerto Rico, and an Indian tribe. To see the list, go to <http://www.nps.gov/oia/topics/worldheritage/worldheritage.htm>.

Grand Canyon was inscribed in 1979 as a Natural Site, under Criteria N (1), (ii), (iii) and (iv).

### World Heritage Site Statement of Significance

*The Grand Canyon is among the earth's greatest ongoing geological spectacles. Its vastness is stunning; the evidence it reveals about the earth's history invaluable. The 1.5-kilometer (0.9 mile)-deep gorge ranges in width from 500 m to 30 km (0.3 mile to 18.6 miles). The Canyon twists and turns 445 km (276.5 miles), and was formed during six million years of geologic activity and erosion by the Colorado River on the earth's upraised crust. The Canyon's buttes, spires, mesas, and temples appear as mountains when viewed from the rims. Horizontal strata exposed in the canyon retrace geological history over two billion years and represent the four major geologic eras.*

### Grand Canyon National Historic Landmarks

*Authority: Antiquities Act, Code of Federal Regulations Title 36 Part 65*

National Historic Landmarks (NHLs) are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting U.S. heritage. Today, fewer than 2,500 historic places bear this national distinction. As the highest status awarded to a historic property, NHLs receive the most protection. The following NHL districts and individual landmarks occur in Grand Canyon

#### National Historic Landmark Districts

- Mary Jane Colter Buildings
- Grand Canyon Lodge (North Rim)
- Grand Canyon Village

#### National Historic Landmarks

- El Tovar
- Grand Canyon Depot
- Grand Canyon Park Operations Building
- Grand Canyon Powerhouse

### Arizona National Scenic Trail

*Authority: National Trails System Act of 1968 (Public Law 90-543)*

The National Trails System is the network of scenic, historic, and recreation trails created by the National Trails System Act of 1968. These trails provide for outdoor recreation needs; promote enjoyment, appreciation, and preservation of open-air, outdoor areas and historic resources; and encourage public access and citizen involvement.

The Arizona Trail was designated a National Scenic Trail as part of the Omnibus Public Lands Management Act of 2009. The Arizona National Scenic Trail extends 807 miles across the State of

Arizona from the U.S.—Mexico international border to the Arizona—Utah border. The trail passes through Grand Canyon National Park, entering near South Entrance Station, crossing South Rim, following South and North Kaibab Trails, then crossing North Rim, and exiting near North Entrance Station.

### **Wilderness**

*Authority: Wilderness Act of 1964 (Public Law 88-577; 16 U.S.C. 1131-1136); The Grand Canyon Enlargement Act of 1975 (16 USC § 228a-j, Public Law 93-620-631); Public Law 94-31, June 10, 1975; 1993 Grand Canyon National Park Wilderness Recommendation*

Pursuant to the 1964 Wilderness Act, Grand Canyon National Park was evaluated for wilderness suitability. After the park was enlarged in 1975, Grand Canyon's Wilderness Recommendation was updated following a study of the new park lands. The most recent update of Grand Canyon's Wilderness Recommendation occurred in 1993, but Congress has not acted on a Grand Canyon Wilderness bill.

Grand Canyon National Park proposed Wilderness or proposed potential Wilderness covers 94 percent of the park. In accordance with NPS Management Policies, these areas are managed in the same manner as designated wilderness, and the NPS will take no action to diminish wilderness suitability while awaiting the legislative process.

### **Protection of Downstream Resources from Glen Canyon Dam Operation**

*Authority: Grand Canyon National Park Protection Act of 1992 (Public Law 102-575)*

As part of the Secretary of the Interior's responsibilities for managing water resources held behind Glen Canyon Dam and provisions of the Grand Canyon Protection Act, the Bureau of Reclamation, along with 26 other stakeholders, work cooperatively on the Glen Canyon Dam Adaptive Management Program. This Federal, multi-stakeholder program was initiated in 1996 to comply with provisions of the Grand Canyon Protection Act and the Operation of Glen Canyon Dam Final Environmental Impact Statement. The program's purpose is to provide an organization and process for cooperatively integrating dam operations, downstream resource protection and management, and monitoring and research information.

### **Colorado River Operations**

*Authority: Memorandum of Understanding between Glen Canyon National Recreation Area and Grand Canyon National Park; Memorandum of Understanding between Glen Canyon, Lake Mead; U.S. Coast Guard and Grand Canyon, Memorandum of Understanding between Lake Mead National Recreation Area and Grand Canyon National Park*

Colorado River operations between Lees Ferry and Lake Mead are generally managed by Grand Canyon National Park. However, several memoranda of understanding (MOU) are in place for cooperation and joint management of river operations by neighboring park units and the U.S. Coast Guard. For example, an MOU was signed in 2006 between the NPS and U.S. Coast Guard to oversee recreational boating in Lake Mead National Recreation Area, Glen Canyon National Recreation Area, and Grand Canyon.

Lees Ferry is managed cooperatively by Glen Canyon National Recreation Area and Grand Canyon National Park. For the past 20 years an MOU, updated in 2009, has addressed these joint operations. Similarly, Meadview is managed cooperatively by Lake Mead National Recreation Area and Grand Canyon National Park. Because Meadview is located near the terminus for Colorado River trips through Grand Canyon, GRCA rangers manage river trip operations at this location.

### **Overflights Management**

*Authority: The Grand Canyon National Park Enlargement Act of 1975 (16 USC § 228a-j, Public Law 93-620), National Parks Overflights Act of 1987 (Public Law 100-91), Presidential Memorandum of April 22, 1996 (Federal Register April 25, 1996 (Vol. 61, Number 81, page 18229-18230), National Parks Air Tour Management Act of 2000 (Public Law 106-181, Section 804)*

In April 1996, President Clinton issued a presidential memorandum titled Earth Day Initiative, Parks for Tomorrow, which, among other things, required development of a management plan to complete restoration and maintenance of natural quiet in Grand Canyon, required by the 1987 Overflights Act, not more than 12 years from the date of issuance of the memorandum. While the date was not met, the park continues to work toward resolution.

### **Government-to-Government Consultation**

*Authority: National Historic Preservation Act (16 USC 470; PL 89-665, 96-515), Memorandum on Government-to-Government Relations with Native American Tribal Governments April 29, 1994, 59 FR 22951 [25 USC 450], Executive Order No. 13007 (Indian Sacred Sites) May 24, 1996, 61 FR 26771 [42 USC 1996], Executive Order No. 13175 (Consultation and Coordination with Indian Tribal Governments) November 6, 2000, 65 FR 67249 [25 USC 450], The Grand Canyon Enlargement Act of 1975 (16 USC § 228a-j, Public Law 93-620-631)*

Grand Canyon National Park maintains government-to-government consultative relationships with 11 Federally recognized tribes with significant historical and cultural Grand Canyon connections. Several of these tribes consider Grand Canyon their place of origin, and most of Grand Canyon is considered the ancestral homeland of these people. While nothing specific in the park's enabling legislation speaks to this relationship, it is specifically mandated in a variety of Federal laws and executive orders. The Grand Canyon Enlargement Act in particular encourages the NPS to enter into agreements with interested Indian tribes to protect and interpret Grand Canyon in its entirety.

The 11 Federally recognized associated tribes are Havasupai Tribe, Hopi Tribe, Hualapai Tribe, Kaibab Band of Paiute Indians, Las Vegas Band of Paiute Indians, Moapa Band of Paiute Indians, Navajo Nation, Paiute Indian Tribe of Utah, San Juan Southern Paiute Tribe, Yavapai-Apache Nation, and Zuni Tribe.

### **Individual Agreements with Tribes**

*Authority: The Grand Canyon Enlargement Act of 1975 (16 USC § 228a-j, Public Law 93-620-631), General Agreement between NPS and Havasupai Tribe, Memorandum of Understanding between NPS and Hualapai Tribe*

#### *Havasupai Traditional Use Lands and Long-Term Use of Supai Camp*

Section 7(e) of the Grand Canyon Enlargement Act states *The Secretary, subject to such reasonable regulations as he may prescribe to protect the scenic, natural, and wildlife values thereof, shall permit the tribe (Havasupai) to use lands within the Grand Canyon National Park which are designated as Havasupai Use Lands on the Grand Canyon National Park boundary map described in section 3 of this Act, and consisting of approximately ninety-five thousand three hundred acres of land, for grazing and other traditional purposes.* The traditional use lands are located below South Rim adjacent to the Havasupai Reservation. Within Grand Canyon, grazing is permitted on these lands only.

In 2008, the Havasupai Tribe and NPS entered into a general agreement to recognize the historic use and occupancy of Supai Camp by tribal members, and establish terms and conditions under which use and occupancy may continue. Under terms of the agreement, the Tribe is allowed to use and occupy the Camp for 50 years, beginning June 2, 2008, the date of signature, to June 2, 2058. Upon expiration of this term, the general agreement will automatically renew for an additional 50 years.

#### *Area of Cooperation with Hualapai Tribe*

In October 2000 Grand Canyon National Park, Lake Mead National Recreation Area, and the Hualapai Tribe initiated consultation to address Colorado River management issues and executed a Memorandum of Understanding. The MOU defines an Area of Cooperation as that portion of the Colorado River extending from approximately river mile (RM) 165 (upstream of National Canyon) to RM 277 (the Grand Canyon National Park/Lake Mead National Recreation Area boundary).

The agreement provides a process for mutually developing operational and management protocols for the Area of Cooperation. This process includes quarterly Core Team meetings (made up of the

Superintendents and Deputy Superintendents of Grand Canyon National Park and Lake Mead National Recreation Area, and the Hualapai Tribal Chair and Vice Chair). Core Team participants seek to cooperatively develop protocols and regulations for use of lower Grand Canyon from National Canyon to Lake Mead. The MOU for the Area of Cooperation is in effect, although Core Team meetings were suspended in October 2004; efforts are underway to reinstate meetings in 2010.

### **Kaibab Squirrel National Natural Landmark**

A large segment of Kaibab squirrel habitat north of Grand Canyon was designated a National Natural Landmark (NNL) by the Secretary of the Interior in 1965<sup>4</sup>. Totalling an estimated 220,000 acres<sup>5</sup> of ponderosa pine habitat on the Kaibab Plateau, the Kaibab Squirrel NNL straddles the border between GRCA and the North Kaibab Ranger District of the Kaibab National Forest. Approximately ten percent of the NNL is in GRCA; the remainder is on the Kaibab National Forest.

A National Natural Landmark is a nationally significant natural area that contains one of the best examples of a natural region's characteristic biotic or geologic features. The National Natural Landmarks Program is administered by the NPS and based on the voluntary preservation, by individual landowners, of designated areas. As the NPS does not mandate management of NNL, NPS responsibilities include nomination for initial designation, assistance to landowners on request, periodic evaluation reports, resource condition, and recommendations to the Secretary of the Interior for designation removal if characteristics and values for which the NNL were listed are compromised. Federal agencies are required to consider potential impacts of their actions on NNL.

The 1965 National Registry of Natural Landmarks Handbook states Kaibab Squirrel NNL was designated because it is inhabited by a rare subspecies, the Kaibab squirrel (*Sciurus aberti kaibabensis*), which exists nowhere else. The area illustrates an important principle of biological evolution: allotropic speciation or genetic differentiation in geographically isolated populations. Its closest relative, the Abert's squirrel (*S. a. aberti*), is found in similar habitat on Grand Canyon's South Rim as far south as central Arizona, but not on North Rim. Biologists believe these two subspecies once shared a common ancestor, but the Grand Canyon's geographic barrier isolated the northern population, and over time it developed unique characteristics sufficient to be a separate subspecies. Kaibab Squirrel NNL is also noteworthy as one of the nation's largest and best examples of a ponderosa pine climax community.

According to guidance provided in RM-77, Natural Resource Management, any resource management actions must avoid damage to NNL site integrity, and development should not be permitted unless compatible with resources and necessary for interpretation or educational use of the landmark.

The superintendent is responsible for ensuring integrity of any designated NNL in the park, accounting for NNLs in appropriate park plans, and considered during environmental compliance. Superintendents or their staff may be asked to assist in accomplishing NNL visits to complete the annual status report.

### **Research Natural Areas**

RM-77 defines Research Natural Areas (RNAs) as part of a national network of sites designed to facilitate research and preserve natural features. RNAs are usually established in a typical example of an ecological community type, preferably one having been little disturbed in the past and where natural processes are not unduly impeded. The tract is set aside permanently and managed exclusively for approved nonmanipulative research; i.e., research that measures but does not alter existing conditions. A

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<sup>4</sup> National Registry of Natural Landmarks Handbook. 1965. National Natural Landmarks Program. Washington, D.C.

<sup>5</sup> The 1965 evaluation for NNL designation describes the area as encompassing 200,000 acres in the Kaibab National Forest. GRCA is not included in the description; however, the evaluation does note that a small portion of Kaibab squirrel habitat (described as the climax ponderosa pine formation) does exist in the park. That habitat is considered part of the NNL, bringing the total landmark area to approximately 220,000 acres.

park RNA is designated by the NPS. Federal agencies are required to consider potential impacts of their actions on NNL.<sup>6</sup>

The NPS Organic Act of 1916 and the NPS Omnibus Management Act of 1998 provide authority to establish RNAs. Grand Canyon's RNAs are listed below.<sup>7</sup>

The GMP states that six research natural areas totaling 8,845 acres were officially designated in GRCA in the 1970s. Although not formally designated by the Regional Director, a seventh RNA, Fishtail Mesa, was set aside by a Categorical Exclusion signed by the GRCA Superintendent in 2000.<sup>8</sup>

The superintendent is responsible for approving activities conducted in RNAs, and assigns park staff to coordinate park research, issue collecting permits, and maintain RNA research data files.

Name	Acres	Primary Type	Other Important Types	Elevation	Topography
Great Thumb	960	Pinyon-Juniper	Sedimentary (Paleozoic)	6,100-6,185	Level
Neal Spring	15	Aspen	Caves and caverns (limestone sink-karst) topography Sedimentary (Paleozoic)	7,400-7,650	Mountainous steep
Powell Plateau	5,120	Interior Ponderosa Pine	Sedimentary (Paleozoic)	6,750-7,650	Level Plateau
Swamp Point	1,120	Interior Ponderosa Pine	Sedimentary (Paleozoic)	7,750-7,847	Rolling
Wayside-Tusayan	480	Piñon-Juniper	Sedimentary (Paleozoic)	6,800-7,250	Rolling
Mt Emma	1,150	Interior Ponderosa Pine	Volcanoes and Associated Works (Quaternary) Sedimentary (Paleozoic)	6,750-7,500	Mountainous steep
Fishtail Mesa	1,098	Old growth pinyon and juniper, sagebrush and muttongrass steppe, and a small grassland		5,837-6,161	Rolling

<sup>6</sup> [www.nature.nps.gov/nml/](http://www.nature.nps.gov/nml/)

<sup>7</sup> *A Directory of Research Natural Areas on Federal Lands of the United States of America*. 1968. Compiled by the Federal Committee on Research Natural Areas, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.

<sup>8</sup> Fishtail Mesa Research Natural Area Categorical Exclusion, GRCA-01-0009, November 2000

## Grand Canyon National Park Primary Interpretive Themes

Primary interpretive themes are important ideas and concepts communicated to the public about Grand Canyon. These themes form the core of all interpretive programs and media provided park visitors.

- The immense and colorful Grand Canyon is valued worldwide as one of Earth's most powerful and inspiring scenic landscapes, offering people enriching opportunities to explore and experience its wild beauty in both vast and intimate spaces
- Grand Canyon remains a homeland and sacred place to a number of American Indian cultures, even a point of emergence for some, offering an opportunity to consider powerful and spiritual ties between people and place
- Water is Grand Canyon's lifeblood—a force of erosion, sustainer of scarce riparian habitat in a desert environment, spiritual element for native peoples, provider of recreation, and central factor in exploration, development, and politics of the American West
- The Colorado River and other erosional forces sculpted the Colorado Plateau's southern edge creating Grand Canyon and revealing rock layers in beautiful sequence that serve as windows into time
- Grand Canyon has sustained people materially and spiritually for thousands of years—wider recognition of its value led to its designation as a national park and world heritage site; however, continuing threats to its preservation generate dialogue about our need and responsibility to conserve our local and global environment
- Extreme changes in elevation, exposure, and climate in Grand Canyon support a remarkable range of biotic communities in unusual proximity; a relatively undisturbed ecosystem

## PART TWO Fundamental Resources and Values Analysis

The preeminent responsibility of park managers is to ensure conservation and public enjoyment of those resources and values fundamental to achieving the park’s purpose and maintaining its significance. Through in-depth review of Grand Canyon law and policy, eight fundamental and other important resources and values have been identified that best represent those qualities which embody Grand Canyon National Park. For every resource and value, a basic analysis follows, describing current conditions, potential threats, stakeholder interests, and existing policy guidance. Analysis identifies basic issues needing resolution before management strategies can be established.

Fundamental Resources	Other Important Resources
<p>Fundamental resources and values are Grand Canyon’s most important ideas communicated to the public, warrant primary consideration during planning and management, contribute to significance, are critical to achieving park purpose, and include systems, processes, features, visitor experiences, stories, scenes, and sounds.</p>	<p>Other important resources and values may have particular importance warranting special planning consideration, even though they do not contribute directly to park purpose and significance.</p>
<p><b>Geologic Features and Processes</b></p> <ul style="list-style-type: none"> <li>• Geologic Features</li> <li>• Geologic Processes</li> <li>• Paleontological Resources</li> <li>• Cave Resources</li> </ul> <p><b>Biodiversity and Natural Processes</b></p> <ul style="list-style-type: none"> <li>• Diverse Ecological Communities</li> <li>• Undeveloped Landscape</li> <li>• Connectivity to other Natural Areas</li> <li>• Special Status Species</li> </ul> <p><b>Visitor Experiences in an Outstanding Natural Landscape</b></p> <ul style="list-style-type: none"> <li>• Wide Range of Recreational Opportunities</li> <li>• Natural Soundscapes</li> <li>• Wilderness Character</li> <li>• Scenic Vistas at a landscape scale/vastness</li> <li>• Dark Night Skies</li> <li>• Outstanding Air Quality</li> </ul> <p><b>Water Resources</b></p> <ul style="list-style-type: none"> <li>• Colorado River</li> <li>• Perennial Tributaries</li> <li>• Springs and Seeps</li> </ul> <p><b>Human History</b></p> <ul style="list-style-type: none"> <li>• Indigenous Peoples and Links to the Canyon</li> <li>• Archeological Sites (Paleoindian to Historic)</li> <li>• Historic Built Environment</li> </ul> <p><b>Opportunities for Learning and Understanding</b></p> <ul style="list-style-type: none"> <li>• Interpretation and Resource-based Education</li> <li>• Research and Science Activities</li> <li>• Museum Collection</li> </ul>	<p><b>Sustainable Economic Contributions to the Regional Economy</b></p> <ul style="list-style-type: none"> <li>• Visitor spending</li> <li>• Direct Federal spending</li> <li>• Significant percentage of jobs and income attributed to park and related tourism</li> </ul> <p><b>Park Infrastructure and Assets</b></p> <ul style="list-style-type: none"> <li>• Facilities (roads, trails, buildings, utilities, concessions)</li> <li>• NPS operations (staff, annual operating budget)</li> <li>• Concessions and commercial services</li> <li>• Partners and volunteers</li> </ul>

<b>Geologic Resources</b> <ul style="list-style-type: none"> <li>• Geologic Features</li> <li>• Geologic Processes</li> <li>• Cave Resources</li> <li>• Paleontological Resources</li> </ul>	
<b>Description</b>	<p>Grand Canyon is one of the planet's most iconic geologic landscapes. Grand Canyon National Park preserves a wide range of geologic resources including bedrock geology with exposures of rocks ranging from 1,840 to 270 million years old; diverse paleontological resources; surficial deposits; a complex neotectonic and erosional history; and Pliocene to Holocene volcanic deposits. The Colorado River established its course through Grand Canyon within the last six million years, and likely evolved from pre-existing drainages to its current course. Geologic processes, including erosional processes on hill slopes and in tributaries, and active tectonism continue to shape the canyon today. The geologic record in Grand Canyon is an important scientific chronicle largely responsible for its inspirational scenery.</p>
<b>Importance</b>	<p>Grand Canyon is known worldwide for outstanding exposures of stratified rock creating some of the world's best known scenic vistas and geologic (stratigraphic) columns. Rocks exposed in Grand Canyon range from 1,840 to 270 million years in age and are an important record of more than one third of Earth's history.</p> <p>The Paleozoic section, responsible for much of the canyon's colorful cliff-and-slope scenery, is 3,000 to 4,000 feet thick. One of geology's best known rock records, it includes sedimentary rocks formed in a variety of depositional environments including the classic Cambrian transgressive sequence preserved in the Tonto Group; large assemblages of marine invertebrate fossils, especially in the Redwall Limestone, Surprise Canyon Formation, and Kaibab Limestone; and a diverse fauna of invertebrate and vertebrate trace fossils in the Coconino Sandstone.</p> <p>The Grand Canyon Supergroup, composed of Meso- and Neoproterozoic rocks deposited mostly in rift valleys of the Rodinia supercontinent, has an aggregate thickness of 12,000 feet, and represents one of the few exposures of this age in this part of the continent.</p> <p>The Inner Gorge contains an outstanding exposure of Precambrian igneous and metamorphic basement rocks, known informally as the Vishnu basement rocks. These rocks formed at midcrustal depths before, during, and after continental Paleoproterozoic growth during an orogeny lasting up to 100 million years when volcanic island arcs collided with the older continent.</p> <p>Type sections for most formal lithostratigraphic units exposed in Grand Canyon are in park boundaries; hence Grand Canyon National Park may include more type sections than any other NPS unit.</p> <p>Endemic rocks: the Grand Canyon Supergroup is only exposed in Grand Canyon National Park, and Surprise Canyon Formation is only known in Grand Canyon.</p> <p>The Great Unconformity, first recognized by John Welsey Powell during his pioneering river exploration through Grand Canyon, remains one of the most well-known unconformities in the world's geologic record. Significant unconformities also exist below and above the Grand Canyon Supergroup and in the Meso- and Neoproterozoic and Paleozoic sedimentary sections.</p>

	<p>Geomorphic expression of Grand Canyon's exposed rock record in is responsible for much of the landscape's scenic splendor. Diverse land features range from shear cliffs, soaring buttes and broad plateaus to intimate slot canyons and natural arches.</p> <p>Grand Canyon's fossil record is incredibly diverse, ranging from Precambrian stromatolites to exceedingly well-preserved Pleistocene vertebrate fossils. Rich deposits of well-preserved Quaternary fossils in Grand Canyon dry caves provide a record of climate change since the late Pleistocene, and contain by far the most important Quaternary fossil record on the Colorado Plateau.</p> <p>Grand Canyon is a scientific laboratory for investigations studying development of highly incised landscapes in uplifted terrain in a tectonically active region.</p> <p>Grand Canyon likely contains more caves (1,000+), than any other NPS unit. These caves include unique formations and mineral deposits; important archeological remains; and unique biological systems including bat habitat. Grand Canyon's cave and karst features, especially in the Redwall and Muav Limestones, are an important part of the regional R aquifer hydrological system.</p> <p>The Colorado River's pool-drop system results from rapids formed predominantly by debris-flow deposits at the mouths of tributaries streams. Debris flows produce fan-eddy complexes, the Colorado River's predominant geomorphic feature.</p> <p>Most of the Colorado River's water originates as mountain headwaters snowmelt, while most water in Grand Canyon tributaries results from snowmelt, regional aquifer discharge through seeps and springs, and monsoonal precipitation runoff. This unique disconnect between hydrology of the Colorado River and its tributaries in Grand Canyon has produced Quaternary deposits in the mainstem and tributaries with differing ages and histories of responses to climatic events, in the headwaters and the Grand Canyon region respectively.</p> <p>The Colorado River in Grand Canyon is one of the most studied river systems in the world. Studies include loss of sandbars and beaches, associated sand dune erosion, and impacts on aquatic and terrestrial species. Studies have worldwide significance for understanding impacts in downstream environments of a human-made dam.</p> <p>Grand Canyon Quaternary deposits include Colorado River and tributary alluvial terraces, and travertine deposits that provide essential records of active tectonism and climate change and help geologists unravel the canyon's geologic history.</p> <p>The Unikaret Volcanic Field, which intersects Grand Canyon between River Mile 178 and 188 between the Toroweap and Hurricane Faults, has been active since the Pliocene with the most recent eruption approximately 1000 years before present, and is considered potentially active.</p> <p>Several major faults exist in Grand Canyon including the Grand Wash Fault (the split between the Basin and Range and Colorado Plateau physiographic provinces), and Toroweap Fault (considered the most active Arizona fault).</p> <p>Grand Canyon mineral deposits led to prospecting in the late 1800s and early 1900s. While rich copper and asbestos deposits were found, mining operations were not sustainable largely due to difficulties transporting ore out of the canyon. Large scale uranium mining at Orphan Mine occurred 1953 to 1969, producing some of the richest uranium ore mined in the U.S. Uranium was mined from breccia pipes in the 1980s.</p>
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	<p>Rare minerals, including grandviewite, a recently described mineral known only from mines on Horseshoe Mesa, occur in many Grand Canyon mineralized deposits.</p> <p>Grand Canyon holds a significant place in North American geologic exploration; a number of pioneering expeditions and studies occurred in the canyon including work by preeminent geologists John Strong Newberry, John Wesley Powell, G.K. Gilbert, Clarence Dutton, and Charles Walcott.</p>
<p><b>Current Conditions and Related Trends</b></p>	<p>Geologic research continues in Grand Canyon National Park in many geologic disciplines. Research into Grand Canyon's origin and evolution is a dynamic field, partly as a result of new dating techniques and evolution of other geologic methods. Much Grand Canyon geologic research receives international interest.</p> <p>Several well-known fossil sites receive significant visitation (Ranger-led and independent exploration). Visitor use trends and associated site conditions are unknown.</p> <p>Grand Canyon contains an estimated 1,000 caves, but only a small number have been recorded and documented. Cave resource conditions and trends are unknown.</p> <p>Glen Canyon Dam altered the Colorado River's natural hydrological cycle and cut more than 90 percent of the river's sediment load, leading to erosion of beaches, sandbars, and eolian deposits on river terraces, and reduction of important backwater habitats. A great deal of research on the Colorado River's hydrology and geology occurs each year under the Adaptive Management Program, including a number of high flow experiments and other flow tests. Current trends show high flow events can replenish sediment.</p> <p>Due to the remote and rugged nature of most of the park, soils remain in generally good condition. Areas with high human use have accelerated erosion and impacts to cryptobiotic crusts.</p> <p>Grand Canyon continues to play an important role in geoscience education and geoscience literacy efforts given its well-exposed and scenic geologic resources.</p> <p>Natural processes tend to be intact in Grand Canyon tributaries.</p>
<p><b>Issues and Concerns</b></p>	<p>Glen Canyon Dam has significantly altered natural river processes and will continue to do so without operational modifications.</p> <p>There is ongoing interest in mining mineral resources (especially uranium) from breccia pipes near the park boundary, particularly on the Coconino and Kanab Plateaus. Mining activities may have substantial impacts on park resources, including groundwater.</p> <p>Climatic change may further impact regional water availability and alter existing geologic processes, such as hill slope processes and debris flow initiation.</p> <p>Lack of baseline information concerning cave resource extent, scope, and significance puts these resources at risk; less than ten percent of Grand Canyon's caves are inventoried and mapped.</p> <p>Lack of paleontological resources inventory and monitoring information.</p> <p>Unpermitted visitation to cave formations. Lack of inventory, monitoring, and mitigation protocol.</p>

	<p>Geologic hazards, including seismic activity on faults, potential for renewed volcanism in the Unikaret Volcanic Field, rock falls, and debris flows.</p> <p>Radionuclides are present in water discharged from some springs, and may pose a human-health hazard. It is unknown whether these radionuclides result from natural processes or are a result of historic mining in the Grand Canyon region.</p> <p>The park contains a variety of Abandoned Mineral Lands, mostly consisting of small adits and shafts. While some mines may provide important wildlife habitat, they pose human risks from poor air quality, collapse, and other hazards.</p>
<b>Stakeholder Interest</b>	<p>Recently described mineral grandviewite is only known from Grand Canyon National Park, and collectors have an interest in obtaining specimens of this mineral.</p> <p>Visitors state a primary purpose of their visit is enjoying panoramic views of Grand Canyon's geologic exposures.</p> <p>Scientists, educators and students are interested in access to Grand Canyon as a place of geologic significance for education and research.</p> <p>The caving community is interested in cave management and maintaining/obtaining access to Grand Canyon caves.</p>
<b>Relevant Laws and Regulations</b>	<ul style="list-style-type: none"> <li>• <i>46 Stat. 1043 (1931)</i> Grand Canyon closed to mineral entry. Act provides uniform GRCA administration by DOI, and for other purposes, forbids issuance of permits, licenses, leases or other authorizations for prospecting, development, or using mineral resources in GRCA</li> <li>• <i>Federal Cave Resources Protection Act of 1988</i></li> <li>• <i>Paleontological Resources Preservation Act of 2009</i></li> <li>• <i>Grand Canyon Protection Act of 1992*</i></li> <li>• <i>Amendment to the Federal Water Pollution Control Act (Clean Water Act)*</i> Federal areas subject to state and local water quality regulations (Grand Canyon National Park must meet Arizona State Water Quality Standards)</li> <li>• <i>Park System Resource Protection Act 2007*</i> Allows NPS to seek compensation for injuries to natural and cultural resources and facilities. Recovered funds used to restore, replace, or acquire equivalent resources. Authorizes NPS to monitor these resources</li> <li>• <i>National Parks and Recreation Act 1978*</i> Required parks to prepare General Management Plans</li> <li>• <i>National Environmental Policy Act of 1969*</i> Requires agencies integrate environmental values into decision making by considering environmental impacts of proposed actions and reasonable alternatives to those actions. To meet NEPA requirements agencies prepare an Environmental Impact Statement (EIS) or Environmental Assessment (EA)</li> </ul> <p><i>Secretarial Order 3289 Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources (2009)*</i></p>

	<p><b>National Park Service Policies<sup>9</sup></b></p> <ul style="list-style-type: none"> <li>● <b>NPS-77 Natural Resources Management Guideline (1991)</b> Transition to Reference Manual in progress (2010)*<sup>10</sup></li> <li>● <b>Management Policies (2006)</b> <ul style="list-style-type: none"> <li>● Section 4.8</li> </ul> </li> </ul> <p>*Starred laws apply to all resource and value sections and will not be repeated</p>
<p><b>Available Information</b></p>	<ul style="list-style-type: none"> <li>● Geologic mapping</li> <li>● Grand Canyon Monitoring and Research Center sediment records</li> <li>● Museum Collection</li> <li>● Cave Files</li> <li>● GRCA Resource Database</li> <li>● GRCA Paleontologic Summary Document</li> <li>● Grand Canyon Soils Map (GIS Database)</li> <li>● Grand Canyon Geologic Training Manual</li> <li>● Extensive technical literature related to Grand Canyon geology</li> </ul>
<p><b>Planning Needs</b></p>	<ul style="list-style-type: none"> <li>● Comprehensive plan to address cave and karst resources</li> <li>● Abandoned Mineral Lands Implementation Plan</li> <li>● Paleontological Resources Protection Plan</li> </ul>
<p><b>Information Needs</b></p>	<ul style="list-style-type: none"> <li>● Complete geologic mapping of the greater Grand Canyon region</li> <li>● Better understanding of regional aquifers and how they connect to Grand Canyon seeps and springs</li> <li>● Geologic hazards evaluations</li> <li>● Cave inventory</li> <li>● Paleontological Resources Inventory (in accordance with the Paleontological Resources Preservation Act of 2009)</li> </ul>

<sup>9</sup> NPS Policies available at [www.nature.nps.gov/policiesguidance/index.cfm](http://www.nature.nps.gov/policiesguidance/index.cfm)

<sup>10</sup> NPS-77 available at [www.nature.nps.gov/rm77/](http://www.nature.nps.gov/rm77/)

<b>Biodiversity and Natural Processes</b> <ul style="list-style-type: none"> <li>• Diverse Ecological Communities</li> <li>• Undeveloped Landscape</li> <li>• Connectivity to other Natural Areas</li> <li>• Threatened and Endangered Species</li> </ul>	
<b>Description</b>	<p>Grand Canyon National Park possesses outstanding biological diversity and protects a large, relatively undeveloped 1,218,376 acres. The park's great biological diversity includes three of North America's four deserts, and five of Merriam's seven life zones: from rim to river one encounters the Lower Sonoran, Upper Sonoran, Transition, Canadian and Hudsonian zones, the ecological equivalent of traveling from Mexico to Canada. Extreme elevation and topography contribute to a wide range of habitats. The park is known to host 1,750 vascular plant species, 64 moss species, 195 lichen species, 167 fungi species, 377 bird species, 91 mammal species, 58 reptile and amphibian species, 22 fish species, and a number of Federally listed species (Appendix B). The park is connected to a series of other significant natural areas including national monuments, recreation areas, wilderness areas, national forests, and Bureau of Land Management areas. Natural processes such as drought, flooding, and landslides influence the biota. Fire, as a natural process, was eliminated for most of the 20th Century, but is currently allowed in some park areas under restricted conditions, and in accordance with the 2010 Fire Management Plan.</p>
<b>Importance</b>	<p>Grand Canyon National Park is the single largest National Park Service protected area on the Colorado Plateau, and 94 percent of park land is recommended for wilderness designation. This vast land expanse is managed in a natural condition under the strongest management protections available short of formal wilderness designation.</p> <p>The park serves as an ecological refuge, with relatively undisturbed remnants of dwindling ecosystems such as boreal forest and desert riparian communities, and numerous rare, endemic, or specially protected (threatened/endangered) plant and animal species.</p> <p>Many important ecological tenets developed in part due to experiences in the Grand Canyon region. These include theories about predator-elimination impacts on prey populations and subsequent prey population crashes (Kaibab Plateau 1920s), geographic isolation influence on species evolution as illustrated by the Kaibab Squirrel, and C. Hart Merriam's life zone delineation.</p>
<b>Current Conditions and Trends</b>	<p>Threats of adjacent development such as mining, grazing, timber harvesting, and water withdrawal may degrade native plant communities, destroy wildlife habitat, interrupt migration corridors, and disturb wildlife breeding activities.</p> <p>Glen Canyon Dam operations have long-term adverse impacts on natural and cultural resources along the Colorado River corridor.</p> <p>Factors reducing spatial heterogeneity across the landscape and promoting habitat fragmentation (fire suppression, roads, trails, flight corridors) negatively impact plant and wildlife species.</p> <p>Historic land uses such as ranching, grazing, water construction projects, abandoned mines, and abandoned roads have altered the park's natural environment.</p>

<b>Issues and Concerns</b>	<p>Nonnative bison/cattle hybrids entered the park ca. 2000, and are believed to be impacting North Rim native plant communities. Other nonnatives like Rocky Mountain elk and brown-headed cowbirds are also of concern. Cowbirds, originally associated with Great Plains bison herds, expanded their range in response to agricultural and livestock practices beginning in the late 1800s. Cowbirds were first noted in GRCA in the 1930s.</p> <p>Human wildlife habituation, especially in developed areas, put animal and visitor safety and health at risk.</p> <p>Terrestrial and aquatic systems inventories show invasive species are one of the greatest threats to ecosystem function.</p> <p>Wildlife disturbances, especially of breeding or nesting species, particularly from recreational overuse and development, are poorly understood.</p> <p>Riparian and wetland habitat restoration and protection will protect current communities from decline, and benefit species at risk.</p> <p>Years of fire suppression may have permanently altered park forest communities.</p> <p>Nonnative pests and pathogens pose threats to local biodiversity.</p> <p>Plague, rabies, and hantavirus are known in park wildlife.</p> <p>Poaching threats exist in the park, particularly on North and South Rim boundaries.</p> <p>Increasing South Rim elk populations could become an issue if winter range impacts and adverse human interactions increase.</p> <p>Illegal trails, roads, camping, and other inadequate recreational practices disturb wildlife and destroy native vegetation.</p>
<b>Stakeholder Interest</b>	<p>Other Federal and state agencies are interested in or have responsibilities related to park species and habitat management.</p> <p>Academic institutions and researchers are interested in Grand Canyon for research on biodiversity, habitat, effects of climate change, and natural processes.</p> <p>Conservation organizations, environmental groups, and other advocates are interested in Grand Canyon's protection and related management decisions.</p> <p>Recreational users and visitors are interested in continuing access, viewing, and protecting park vegetation and wildlife.</p>
<b>Relevant Laws and Regulations</b>	<ul style="list-style-type: none"> <li>• <i>The Endangered Species Act of 1973</i> (16 U.S.C. 1531-1544, 87 Stat. 884) Provided conservation of ecosystems on which threatened and endangered species of fish, wildlife, and plants depend. Authorizes species determination and listing as endangered, endangered, and threatened; prohibits unauthorized endangered species taking, possession, sale, and transport; provides authority to acquire land for listed species conservation using land and water conservation funds; authorizes establishment of cooperative agreements and grants-in-aid to states that establish and maintain active and adequate programs for endangered and threatened wildlife and plants; authorizes assessment of civil and criminal penalties for violating Act or regulations; authorizes rewards to anyone furnishing information leading to arrest and conviction for any violation of Act or any regulation issued there under. Section 7</li> </ul>

	<p>requires agencies insure any Federal action authorized, funded, or carried out is not likely to jeopardize continued existence of listed species or modify critical habitat</p> <ul style="list-style-type: none"> <li>• <i>Federal Insecticide, Fungicide and Rodenticide Act</i></li> <li>• <i>National Park Service Concession Management Improvement Act</i></li> <li>• <i>Migratory Bird Treaty Act</i></li> <li>• <i>National Invasive Species Act</i></li> <li>• <i>Wildfire Disaster Recovery Act</i></li> </ul> <p><b>Executive Orders</b><sup>11</sup></p> <ul style="list-style-type: none"> <li>• 11514 <i>Protection and Enhancement of Environmental Quality</i> (1970) The Federal Government shall provide leadership in protecting and enhancing the quality of the Nation's environment to sustain and enrich human life. Federal agencies shall initiate measures needed to direct their policies, plans, and programs to meet national environmental goals</li> <li>• 11990 <i>Protection of Wetlands</i> (1977) Avoid to extent possible long- and short-term adverse impacts associated with wetlands destruction or modification and avoid new construction in wetlands wherever there is a practicable alternative</li> <li>• 12088 <i>Federal Compliance with Pollution Control Standards</i> (1978) Agencies responsible for ensuring all necessary actions are taken for environmental pollution prevention, control, and abatement for Federal facilities and activities</li> <li>• 13112 <i>Invasive Species</i> (1999) Prevent invasive species introduction and provide for their control and to minimize economic, ecological, and human health impacts invasive species cause</li> <li>• 13186 <i>Responsibilities of Federal Agencies to Protect Migratory Birds</i> (2001) Federal agencies taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations must develop and implement, within two years, a MOU with the Fish and Wildlife Service to promote conservation of migratory bird populations</li> </ul> <p><b>National Park Service Policies</b></p> <ul style="list-style-type: none"> <li>• <b>Director's Orders</b><sup>12</sup> <ul style="list-style-type: none"> <li>• 18 Wildland Fire Management (2008)</li> <li>• 77-7 Integrated Pest Management Manual</li> </ul> </li> <li>• <b>Management Policies (2006)</b> <ul style="list-style-type: none"> <li>• 4.4.1.1 Plant and Animal Population Management Principles</li> <li>• 4.4.1.2 Genetic Resource Management Principles</li> <li>• 4.4.2 Management of Native Plants and Animals               <ul style="list-style-type: none"> <li>• 4.4.2.2 Restoration of Native Plant and Animal Species</li> </ul> </li> <li>• 4.5 Fire Management</li> </ul> </li> </ul>
<b>Available Information</b>	<ul style="list-style-type: none"> <li>• Grand Canyon Vegetation Map</li> <li>• Grand Canyon National Park Inventory and Monitoring Data including           <ul style="list-style-type: none"> <li>• Fish monitoring</li> <li>• Land bird monitoring (1998-present on rims, mid-60s-present on river)</li> <li>• Water bird monitoring</li> <li>• Rare plant monitoring, both qualitative and quantitative</li> <li>• Opportunistic and targeted inventories for invasive nonnative species</li> <li>• Scientifically defensible data on Mexican spotted owl monitoring (2000 to present)</li> </ul> </li> </ul>

<sup>11</sup> Executive Orders available at [www.archives.gov/federal-register/codification/executive-order](http://www.archives.gov/federal-register/codification/executive-order)

<sup>12</sup> Director's Orders available at <http://home.nps.gov/applications/npspolicy/dOrders.cfm>

	<ul style="list-style-type: none"> <li>• Water quality monitoring (STORET database has specific-project entries back to 1961. Regular monitoring started in 1994 with installation of U.S. Geological stream gauges, but these provided a very limited subset (South Rim sites only)).</li> <li>• Climate data gathered at three park locations</li> <li>• Air quality data</li> <li>• Fire effects monitoring (1991 to present)</li> <li>• Fire history database (1930-present)</li> <li>• Fire severity mapping (1984-present)</li> <li>• Revegetation and restoration monitoring (1993-present)</li> <li>• Terrestrial ecosystem monitoring (2001-present)</li> <li>• Tributary monitoring (2000-present)</li> <li>• Park Science and Resource Management and Fire Management staff maintain office resource files</li> <li>• Park databases, like the Geographic Information System (GIS) system, contain park resource information</li> <li>• The Museum Collection stores park administrative records and extensive park natural history records</li> <li>• Other agencies and servicewide programs, such as the U.S. Geological Survey, maintain Grand Canyon-related files</li> <li>• Grand Canyon's library contains many natural science resources</li> <li>• U.S. Fish and Wildlife Recovery Plans for Threatened and Endangered Species</li> </ul>
<b>Planning Needs</b>	<ul style="list-style-type: none"> <li>• Vegetation Management Plan</li> <li>• Integrated Pest Management Plan</li> <li>• Nonnative Animal Management Plan</li> <li>• Climate Change Scenario Planning</li> <li>• Resource Stewardship Strategy</li> </ul>

<b>Visitor Experiences in an Outstanding Natural Landscape</b> <ul style="list-style-type: none"> <li>• Wide Range of Recreational Opportunities</li> <li>• Scenic Qualities and Values</li> <li>• Wilderness Character</li> <li>• Natural Soundscapes</li> <li>• Dark Night Skies</li> <li>• Air Quality</li> </ul>	
<b>Description</b>	<p>Grand Canyon's over 4.5 million yearly visitors have opportunity to experience and understand Grand Canyon National Park environmental interrelationships, resources, and values. The majority of park visitors experience Grand Canyon's scenic grandeur from developed South and North Rim areas while other visitors venture to the Inner Canyon backcountry and river for resource-based recreation opportunities and to experience solitude, natural sounds, clean air, and dark night skies.</p>
<b>Importance</b>	<p>Grand Canyon is a world-renowned scenic, spiritual, and recreational destination attracting over 4.5 million visitors yearly.</p> <p>Grand Canyon provides opportunities a range of recreational experiences to a variety of people. Visitors have access a wide range of human ability—from a paved-path walk to a moderate hike, a backcountry expedition, or technical river trip. The park also provides a broad spectrum of activities including rafting, hiking, sightseeing, and bicycling.</p> <p>1.2 million acres or 94 percent of GRCA is managed as wilderness. If combined with over 400,000 acres of contiguous proposed or designated wilderness, this larger area would be one of the largest, primarily desert U.S. wilderness areas.</p> <p>Backcountry visitors have opportunities for a range of recreation experiences with little modern-world influence. Natural sounds, dark skies, clean air, relative solitude, and wilderness character can offer rejuvenating experience. Over one million acres of undeveloped backcountry, hundreds of trail miles, and 277 river miles (containing world-class white-water) provide tremendous opportunity for exploration, personal challenge, discovery, learning, social interaction, and/or solitude.</p> <p>Year-round opportunities, both day and night, allow visitors opportunities to experience an infinite combination of light, color, night skies, natural sounds, smells, weather, seasons, vegetation variations, and wildlife activities.</p> <p>Grand Canyon National Park has some of the cleanest air in country and is a Class I area under Clean Air Act Amendments. Clean air provides high quality scenic viewing of the park and its night skies.</p> <p>Night skies in the Grand Canyon region are some of the darkest, or least impacted by light pollution, in the United States. Many visitors may be experiencing natural night skies for the first time.</p> <p>Numerous Grand Canyon tributaries could qualify for Wild and Scenic River status.</p>
<b>Current Conditions and Related Trends</b>	<p><i>Undeveloped Areas</i></p> <p>Grand Canyon is mandated to manage the 1.2 million acres of recommended wilderness as designated wilderness while awaiting Congressional action on the recommendation.</p>

	<p>Grand Canyon night skies remain some of the darkest in the U.S.</p> <p>Backcountry use is relatively stable due to a well-established permit system. Visitors spend approximately 90,000 user-nights annually in the backcountry; more than half in the Cross-Canyon Corridor: the North and South Kaibab, and Bright Angel Trails.</p> <p>The Colorado River Management Plan (2006) allows year-round river trip opportunities for 24,000 visitors, and oversees sixteen river concessionaires offering motorized and non-motorized trips April through October. Self-guided noncommercial trips are available for groups up to 16 people. Over six months of non-motorized use provide outstanding opportunities to experience river-based solitude, night skies, and natural sounds.</p> <p><i>Developed Areas</i> A recreational opportunity spectrum exists in the park’s developed areas: South Rim, the park’s primary destination; North Rim; Tuweep; and the Cross-Canyon Corridor. Most activities involve day-use canyon viewing supported by park- and concessioner-based visitor services.</p> <p>Yearly Grand Canyon visitation has been relatively stable at over 4.5 million visitors. Visitation fluctuates seasonally. The average Grand Canyon day-visitor spends approximately 7 hours in the park; multi-day visitors spend 2.5 days. Visitation is increasing in shoulder seasons. More visitors are arriving by commercial bus or train.</p> <p>The park is continuing to improve South Rim visitor access with better parking, road and viewpoint upgrades, and increased shuttle bus availability.</p> <p>Natural soundscapes trend toward poorer quality (more noise) in frontcountry and along air tour corridors and higher quality (less noise) in areas devoid of anthropogenic noises.</p> <p>Night skies are generally considered to be of high quality, with some impacts observed associated with developed areas.</p> <p>Air quality monitoring data demonstrates the park has some of the cleanest of air in the U.S. and is a Mandatory Class I airshed.</p>
<p><b>Issues and Concerns</b></p>	<p>Growth of surrounding and regional communities (St. George and Kanab, Utah; Las Vegas, Nevada; Williams, Flagstaff, and Page, Arizona) threatens dark night skies and air quality conditions.</p> <p>Availability or lack of of high-quality visitor services effects visitor experiences.</p> <p>Recreational trends and developing activities (canyoneering, climbing, pack rafts, mountain bikes, geocaching) may not be included in or are inconsistent with current planning documents and park regulations.</p> <p>The Backcountry Management Plan (1988) is outdated, needs review, and a new NEPA process to incorporate NPS Wilderness Policy and address long-standing issues related to commercial use, sensitive resources protection, and backcountry access on tribal and agency boundaries.</p> <p>Glen Canyon Dam altered the Colorado River ecosystem. Dam operations have a profound effect on quantity and quality of camping beaches along the Colorado River, which affect quality of river and backcountry recreational activities and experiences. Although park air remains some of the cleanest in the U.S., air pollution still reaches</p>

	<p>levels high enough to interfere with visitor enjoyment, and damage park resources. Long-term data show Grand Canyon’s clearest days have benefitted from pollution controls, but hazy days have not improved. Average visibility is well below the natural conditions target set by the Clean Air Act. Ozone concentrations and exposure indices are surprisingly high for such a remote area. Concentrations have not yet reached the EPA-established level to protect human health, but have come very close. Long-term monitoring revealed a steady rise in ozone concentrations through the 1990s. This trend leveled out well above natural levels in the early 2000s and has not declined. Wet deposition of nitrates, ammonium, and sulfates has risen; the increase is not statistically significant. Between the 1999 and 2001 growing seasons, a six percent increase in ultraviolet radiation was measured in the park.</p> <p>Air tours provide alternative visitor experience and also are detrimental to noise within park soundscapes.</p> <p>Possible development, including mining, could impact Grand Canyon tributaries (that may otherwise qualify for Wild and Scenic River Designation), night skies, and soundscapes.</p>
<p><b>Stakeholder Interest</b></p>	<p>Visitors come from all over the world with a range of interests, desires, and needs. Park and surrounding community businesses are interested in providing quality services.</p> <p>Conservation organizations, outfitters, and neighboring tribes have varying interests and positions related to park wilderness, and Wild and Scenic River designation.</p> <p>Air tour operators, conservation groups, tribes, and agencies have varying interests and positions related to NPS goals on substantial restoration of natural quiet, especially as it relates to air tours and flight restrictions.</p>
<p><b>Relevant Laws and Policies</b></p>	<ul style="list-style-type: none"> <li>• <i>Americans with Disabilities Act</i></li> <li>• <i>Architectural Barriers Act</i></li> <li>• <i>Rehabilitation Act</i></li> <li>• <i>National Park Service Concessions Management Improvement Act of 1998</i> Governs provision of commercial visitor services, called concessions, in national parks. Replaced original Concessions Policy Act of 1965. States, concessions are limited to those “necessary and appropriate for public use and enjoyment” and “consistent to the highest practicable degree with the preservation and conservation of the resources and values” of the park. Governs NPS contracting for concession services in parks, payments from concessioners to the NPS in return for privilege to do business in an NPS unit, and transfer of concessions contracts or permits.</li> <li>• <i>Wilderness Act of 1964</i> Secretary of the Interior instructed to review all NPS roadless areas of at least 5,000 acres, and submit a report regarding suitability for wilderness classification. Act provided a ten-year review period. Passage of 1975 GRCA Enlargement Act established a new Grand Canyon wilderness emphasis. Not only did the Act expand the park to 1.2 million acres, but also required the Secretary of the Interior submit, within two years, a new wilderness recommendation accommodating enlarged GRCA. Final Wilderness Recommendation (1977) signed by NPS Director. NPS sent Recommendation to legislative counsel in 1977, where it was held pending completion of River Management Plan. When Colorado River Management Plan was completed in 1980, NPS sent a 1980 Wilderness Recommendation to DOI. In 1993, GRCA reviewed and updated the 1980 Wilderness Recommendation. Revisions consistent with original recommendation. 1993 document sent to Director, but not Secretary. As of 2010, the Recommendation still awaits action.</li> </ul>

	<p><b>NPS Policies</b></p> <ul style="list-style-type: none"> <li>• <b>Director's Orders</b> <ul style="list-style-type: none"> <li>• 40 Wilderness Accessibility for Park Visitors Guideline (2000)</li> <li>• 41 Wilderness Preservation and Management Guideline (1999)</li> <li>• 47 Soundscape Preservation and Noise Management (2000)</li> <li>• 48A Concessions Management</li> </ul> </li> <li>• <b>Management Policies (2006)</b> <ul style="list-style-type: none"> <li>• 4.9 Soundscape Management</li> <li>• 4.10 Lightscape Management</li> <li>• 6.4 Wilderness Use Management</li> <li>• 8.2 Visitor Use</li> <li>• 8.6 Special Park Uses</li> <li>• 9.3 Visitor Facilities</li> <li>• 10.1 Commercial Visitor Services</li> </ul> </li> </ul> <p><b>Code of Federal Regulations</b></p> <ul style="list-style-type: none"> <li>• Title 36</li> </ul>
<b>Available Information</b>	<ul style="list-style-type: none"> <li>• Annual park statistics</li> <li>• Numerous visitor studies addressing developed area, backcountry, and river use</li> <li>• Monitoring data and records concerning air quality and soundscape</li> <li>• Extensive administrative records related to overflights and wilderness</li> <li>• Limited dark sky data for developed areas and along river corridor</li> </ul>
<b>Planning Needs</b>	<ul style="list-style-type: none"> <li>• Backcountry Management Plan</li> <li>• Overflights Management Plan</li> <li>• Stock Use Management Plan</li> </ul>
<b>Information Needs</b>	<ul style="list-style-type: none"> <li>• Night sky baseline data</li> <li>• Backcountry soundscape baseline data</li> </ul>

<b>Water Resources</b> <ul style="list-style-type: none"> <li>• Colorado River</li> <li>• Perennial Tributary Flows</li> <li>• Springs and Seeps</li> </ul>	
<b>Description</b>	<p>Though the park is best known for the Colorado River's 277-mile stretch that flows through, and helped create, Grand Canyon, the park also contains many important native waters. Most water sources are born in large spring systems on the canyon's north and south sides. The Inner Canyon exposes many of these water systems to the surface. Important tributary flows include the Paria River, Little Colorado River, Kanab Creek, and Havasu Canyon. These tributary flows influence Colorado River water level and quality in Grand Canyon National Park.</p>
<b>Importance</b>	<p>Grand Canyon tributary flows, seeps, and springs represent some of the least altered water resources in the southwest.</p> <p>Grand Canyon springs and seeps are extremely important ecologically to the park's plants and animals, and nurture a high percentage of the park's ecological diversity.</p> <p>Grand Canyon travertine deposits are responsible for many spectacular waterfalls in tributary streams and along the Colorado River. Springs that produced many major travertine deposits usually discharge groundwater of mixed origins, and include ancient waters derived from deep crustal sources with high CO<sub>2</sub> contents. These springs are important in deciphering Colorado Plateau neotectonic history, and reveal insights into complex regional hydrology.</p> <p>Several Grand Canyon tributary flows are potentially eligible for Wild and Scenic River designation and/or Outstanding Natural Resource Waters designation.</p> <p>Grand Canyon's water resources provide very important habitat for desert fish and other aquatic species.</p> <p>Park water resources are important for hiker safety and human use, and make human travel in Grand Canyon's backcountry possible.</p> <p>Many Grand Canyon water resources have cultural significance for native people.</p> <p>Roaring Springs and the trans-canyon pipeline supply water for residents and visitors.</p> <p>The Colorado River in Grand Canyon provides a unique combination of thrilling whitewater adventure and magnificent vistas of a remarkable landscape. A river trip through Grand Canyon is one of the most sought-after wilderness experiences in the world, offering a 277-mile mix of placid smooth water and turbulent whitewater.</p>
<b>Current Conditions and Related Trends</b>	<p>Glen Canyon Dam has caused tremendous change to the Colorado River system in Grand Canyon. Water below the dam is colder and contains less sediment than the system did historically. Daily fluctuations and artificial release patterns have significantly altered flood and sandbar deposits.</p> <p>Park water resources inventory is incomplete; water quality and hydrologic data is limited or unavailable for most park water resources. The greatest amount of water</p>

	<p>resource data available is for the Colorado River, three small tributaries (Cottonwood, Hermit, and Pumphouse Spring) and the Roaring Springs/Bright Angel Creek system.</p> <p>Fish and other native aquatic species are threatened by changes to Colorado River flows wrought by Glen Canyon Dam, and non-native fish predation and competition. Four of Grand Canyon's eight native fish are extirpated and another is Federally listed as endangered. The park now contains approximately 18 additional introduced fish species (See Appendix B). Several park tributaries contain introduced fish species; the park has reduced trout in tributaries such as Bright Angel and Shinumo Creeks, as well as the Colorado River near the Little Colorado inflow.</p> <p>250 of the park's 373 known bird species are found along the Colorado River. Altered river geomorphology and associated vegetation changes have affected river corridor riparian habitat.</p> <p>Many backcountry campsites and popular hiking areas are adjacent to park water resources; these areas are desirable to hikers as drinking water sources and destinations in the arid desert.</p>
<p><b>Issues and Concerns</b></p>	<p>Park water resources knowledge remains somewhat limited. Spring inventory and monitoring are difficult due to the park's rugged and remote terrain and lack of adequate staffing (one hydrologist).</p> <p>The General Management Plan acknowledges the Colorado River and selected tributaries meet designation criteria under the Wild and Scenic Rivers Act. Prior to designation, a Wild and Scenic River study must be conducted. Under a cooperative agreement, Prescott College completed the eligibility study (2003) for Colorado River tributaries and main stem. Suitable segments are yet to be determined.</p> <p>Human domestic water supply developments inside and outside the park (such as wells) may have a serious impact on park water resources.</p> <p>Mining, particularly for uranium, near the park boundary, has potential to impact water quality inside the park.</p> <p>Former mining developments inside and outside the park have impacted water quality in selected tributaries; other water resources have naturally occurring water quality problems.</p> <p>Glen Canyon Dam has altered the ecosystem. The river system no longer provides all critical habitat components for native species, and some introduced species thrive in the altered environment.</p> <p>Nonnative plant species, such as tamarisk, threaten streams, springs, seeps, and species that depend on them. Tamarisk is of special concern because it threatens backcountry seeps, springs, and Colorado River tributaries—the most pristine watersheds and desert riparian habitats in the lower 48 states. The park has removed tens of thousands of individual tamarisk trees from hundreds of project sites across 63 Colorado River tributaries using manual tree removal, herbicides, and other methods.</p> <p>The park has not fully established water rights, and cannot do so without better water resources quantification.</p>

	<p>The Colorado, Little Colorado, and Paria Rivers and Kanab and Havasu Creeks' drainages originate outside the park; these and other park wetlands may be at risk from a variety of external pollutant sources such as grazing, mining operations, and sewage.</p> <p>Water development projects proposed in areas adjacent to the park to support growing communities (Navajo Reservation; Kanab and St. George, Utah; and Williams and Tusayan, Arizona) may impact park hydrologic resources. Wells and water withdrawals have potential to significantly alter natural hydrological groundwater regimes and their accompanying processes.</p> <p>Internal developments or management actions may impact park water sources and other park resources.</p> <p>Recreational use and developments concentrate near sensitive park water resources. Overall recreational use impact on water resources in many areas is unknown. Many established backcountry campsites are located closer than 200 feet to water in violation of park regulations.</p>
<p><b>Stakeholder Interest</b></p>	<p>Visitors, residents, and adjacent tribal communities are interested in water quality and availability.</p> <p>Native peoples are concerned with treatment of and access to Grand Canyon water resources.</p> <p>Environmental organizations and the public are interested in protection of national park water resources for preservation and protection of water and the diverse species that rely on availability and quality.</p> <p>Recreational users including hikers, fisherman, backpackers, and river runners are interested backcountry water resources.</p>
<p><b>Relevant Laws and Policies</b></p>	<ul style="list-style-type: none"> <li>• <i>Endangered Species Act of 1973</i>                      Provided conservation of ecosystems on which threatened and endangered species of fish, wildlife, and plants depend. Authorizes species determination and listing as endangered, endangered, and threatened; prohibits unauthorized endangered species taking, possession, sale, and transport; provides authority to acquire land for listed species conservation using land and water conservation funds; authorizes establishment of cooperative agreements and grants-in-aid to states that establish and maintain active and adequate programs for endangered and threatened wildlife and plants; authorizes assessment of civil and criminal penalties for violating Act or regulations; authorizes rewards to anyone furnishing information leading to arrest and conviction for any violation of Act or any regulation issued there under. Section 7 requires agencies insure any Federal action authorized, funded, or carried out is not likely to jeopardize continued existence of listed species or modify critical habitat</li> <li>• <i>Federal Insecticide, Fungicide, and Rodenticide Act</i></li> <li>• <i>Amendment to the Federal Water Pollution Control Act (Clean Water Act)</i> Federal areas subject to state and local water quality regulations] Grand Canyon National Park must meet Arizona State Water Quality Standards</li> <li>• <i>Migratory Bird Treaty Act of 1918</i>                      Prohibits pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the</li> </ul>

	<p>terms of this Convention...for the protection of migratory birds...or any part, nest, or egg of any such bird</p> <ul style="list-style-type: none"> <li>• <i>National Environmental Policy Act 1969</i> Requires agencies integrate environmental values into decision making by considering environmental impacts of proposed actions and reasonable alternatives to those actions. To meet NEPA requirements agencies prepare an Environmental Impact Statement (EIS) or Environmental Assessment (EA)</li> <li>• <i>National Invasive Species Act of 1966</i></li> <li>• <i>Water Resource Planning Act of 1965</i> Standards and procedures for Federal agencies in preparing comprehensive regional or river basin plans, and for formulating and evaluating Federal water and related land resources projects</li> <li>• <i>Watershed Protection and Flood Prevention Act of 1954</i> Authorized Natural Resources Conservation Service to cooperate with states and local agencies to carry out works of improvement for soil conservation and other purposes including flood prevention; conservation, development, use and disposal of water; land conservation and proper use</li> <li>• <i>Wild and Scenic Rivers Act of 1968</i> Established national system of Wild and Scenic Rivers; provided for river segment addition through Congressional action or by Secretary of the Interior approval following formal application by Governor of state concerned. Act is strong Congressional directive that rivers designated pursuant to its authority be preserved in their natural, or at least existing, condition, which implies adequate quantity of water, of acceptable quality, necessary to accomplish the purpose of preserving a river's free-flowing conditions</li> <li>• <i>General Authorities Act of 1970 To Improve Administration of National Park System</i> Supplements and clarifies NPS mandate with respect to national park system management. Act reaffirmed, declared, and directed promotion and regulation of the various areas of the national park system . . . be consistent with and founded in the purpose established by [the Organic Act], to the common benefit of all the people of the United States. Authorized Secretary of the Interior to enter into contracts to sell or lease to persons, states, or their political subdivisions, services, resources, or water from a national park if (1) they provide services or accommodations in the immediate vicinity of the park, and (2) there are no reasonable alternatives to these services without these resources or water</li> <li>• <i>Park System Resource Protection Act 2007</i> Allows NPS to seek compensation for injuries to natural and cultural resources and facilities. Recovered funds used to restore, replace, or acquire equivalent resources. Authorizes NPS to monitor these resources</li> <li>• <i>National Parks and Recreation Act 1978</i> Required parks to prepare General Management Plans</li> <li>• <i>Oil Pollution Act of 1990</i> Allows NPS to seek compensation for injuries to natural resources caused by oil discharge or related response actions. Limits NPS recovery for injuries to natural resources and/or natural resource services</li> <li>• <i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i> Also known as Superfund, allows NPS to seek compensation for injuries to natural resources caused by release of hazardous substances. Limits recoveries to injuries to natural resources and natural resource services</li> <li>• <i>National Parks Omnibus Management Act of 1998 Title II National Park System Resource Inventory and Monitoring</i> Legal mandate for research used to guide and support park management</li> </ul> <p><b>Executive Orders</b></p> <ul style="list-style-type: none"> <li>• <i>11514 Protection and Enhancement of Environmental Quality (1970)</i> Federal Government shall provide leadership in protecting and enhancing the quality</li> </ul>
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	<p>of the Nation's environment to sustain and enrich human life. Federal agencies shall initiate measures needed to direct their policies, plans, and programs to meet national environmental goals</p> <ul style="list-style-type: none"> <li>• <i>11988 Floodplain Management (1977)</i> Avoid to extent possible long- and short-term adverse impacts associated with floodplains occupancy and modification and avoid floodplain development wherever there is a practicable alternative</li> <li>• <i>11990 Protection of Wetlands (1977)</i> Avoid to extent possible long- and short-term adverse impacts associated with wetlands destruction or modification and avoid new construction in wetlands wherever there is a practicable alternative</li> <li>• <i>12088 Federal Compliance with Pollution Control Standards (1978)</i> Agencies responsible for ensuring all necessary actions are taken for environmental pollution prevention, control, and abatement for Federal facilities and activities</li> <li>• <i>13112 Invasive Species (1999)</i> Prevent invasive species introduction and provide for their control and to minimize economic, ecological, and human health impacts invasive species cause</li> <li>• <i>13186 Responsibilities of Federal Agencies to Protect Migratory Birds (2001)</i> Federal agencies taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations must develop and implement, within two years, a MOU with the Fish and Wildlife Service to promote conservation of migratory bird populations</li> </ul> <p><b>NPS Policies</b></p> <ul style="list-style-type: none"> <li>• <b>Director's Orders</b> <ul style="list-style-type: none"> <li>• 77-1 Wetland Protection (2002)</li> <li>• 77-1 Wetland Protection Manual (2008)</li> <li>• 77-2 Floodplain Management (2003)</li> </ul> </li> <li>• <b>Management Policies (2006)</b> <ul style="list-style-type: none"> <li>• 2.3.1.9 Wild and Scenic Rivers</li> <li>• 4.3.4 National Wild and Scenic Rivers System</li> <li>• 4.6 Water Resource management</li> <li>• 9.5 Dams and Reservoirs</li> </ul> </li> </ul>
<b>Available Information</b>	<ul style="list-style-type: none"> <li>• Files and research related to park water resources</li> <li>• Historic park water resource information in the Museum Collection</li> <li>• Some park water resource information is available in databases such as the park's Geographic Information System (GIS) and the national STORET database</li> <li>• U.S. Geologic Survey, Northern Arizona University, and other research and academic institutions have conducted Grand Canyon water-related research</li> <li>• Grand Canyon Monitoring and Research and Research Center has research information related to Glen Canyon Dam impacts on the Colorado River in GRCA</li> <li>• Prescott College eligibility study for Wild and Scenic Rivers designation (2003); on file, Division of Science and Resource Management</li> </ul>
<b>Planning Needs</b>	<ul style="list-style-type: none"> <li>• Wetland Preservation Plan</li> <li>• Resource Stewardship Strategy</li> <li>• Resource Management Plan</li> <li>• Backcountry Management Plan</li> </ul>
<b>Information Needs</b>	<ul style="list-style-type: none"> <li>• Studies and surveys for Wild and Scenic River Designation</li> <li>• Watershed Condition Assessment</li> <li>• Water Resources Strategy</li> </ul>

<b>Human History</b>	
<ul style="list-style-type: none"> <li>• Indigenous Peoples and Links to the Canyon</li> <li>• Archeological Sites (Paleoindian to Historic)</li> <li>• Historic Built Environment</li> </ul>	
<b>Description</b>	<p>The Grand Canyon protects an important cultural history. More than 12,000 years of human occupation have resulted in an extensive archeological record. The park preserves thousands of archeological sites many of which remain unknown. Eleven American Indian tribes have known ties to Grand Canyon, and some consider the canyon their original homeland and place of origin. The 11 Federally recognized associated tribes are: Havasupai Tribe, Hopi Tribe, Hualapai Tribe, Kaibab Band of Paiute Indians, Las Vegas Band of Paiute Indians, Moapa Band of Paiute Indians, Navajo Nation, Paiute Indian Tribe of Utah, San Juan Southern Paiute Tribe, Yavapai-Apache Nation, and Zuni Tribe.</p> <p>The park contains more than 4,000 known nationally and internationally significant historic properties (historic and prehistoric period archaeological sites).</p>
<b>Importance</b>	<p><i>Grand Canyon as Native American homeland</i> The park contains archeological and sacred sites ancestral to many contemporary tribes, reflecting an extensive history of cultural diversity. Native people have long been weft and weave of the canyon's human fabric—from tools left 12,000 years ago in what we now call archeological sites to participating in modern park development. Grand Canyon remains home to native peoples, a place of sacred pilgrimage and rare resources. Today, Native peoples return to Grand Canyon, a place of origin for some, to collect culturally important resources and make personally significant connections.</p> <p><i>Grand Canyon as environment for unique human adaptation</i> The great significance of Grand Canyon's cultural heritage lies in its classic example of human adaptation to a severe climatic and physiographic environment. Unique cultural adaptations made by diverse cultural groups over millennia —such as establishing travel routes from river to rim, farming at 8,000 feet, and using varied microenvironments seasonally across the region—nurtured life in the rugged, remote Grand Canyon. These same adaptive strategies are found in neighboring tribes' historic and present-day land use.</p> <p><i>Grand Canyon as a place of mobility in a remote, rugged landscape</i> Prehistoric and historic area movements reflect in trade practices both within and without Grand Canyon, practices key to human survival in this rugged environment. The park and Inner Canyon contain many routes and trails illustrating human mobility; today's trails and routes mirror historic and prehistoric uses.</p> <p><i>Grand Canyon as steward of Native American heritage</i> The park is the primary steward of Native American heritage for 11 tribes with Grand Canyon cultural affiliation including overseeing archaeological and historic sites, traditional cultural properties, and management of culturally important natural resources.</p> <p><i>Grand Canyon as cultural resource</i> The park manages public demands to interact with and learn from cultural resources directly and from afar including scientific study (in-park and remote research), public education (in-park and web-based), and recreation.</p>

	<p><i>Grand Canyon as historic resource</i>                  Grand Canyon contains many significant historic resources, the most well known and visible being the Mary Elizabeth Jane Colter National Landmark District buildings. These buildings, Hopi House, Lookout Studio, Hermits Rest, and Desert View Watchtower illustrate the park’s rustic architecture and NPS style. Significant landscape architecture and park planning are visible in the Grand Canyon Village National Historic Landmark District and the Grand Canyon Lodge National Historic Landmark District. These resources, along with many others, attest to Grand Canyon’s early development as a destination national park.</p> <p>Grand Canyon National Park contains over 500 National Register of Historic Places listed and eligible historic properties.</p> <p>The Grand Canyon area was important in the history of scientific endeavors. Early expeditions such as those of John Wesley Powell (1869/1872) put the region on the map and influenced evolving public perception. These early scientific expeditions influenced development of the sciences of geology, ethnography, and archaeology.</p> <p>The Grand Canyon region saw the transition from exploration and exploitation that eventually led to tourism. From mineral exploration to mineral exploitation of copper, asbestos, bat guano, and uranium, Grand Canyon was a hotbed of mining activity. Early miners soon realized mining tourists’ pockets was easier than mining ore.</p> <p>The Colorado River was a significant locale in nascent recreational river-rafting development, beginning in 1909 with the Stone Expedition. The developing trend continued with the 1938 Nevills Expedition, the first commercial river company. Increasing river use in the 1970s mirrored national outdoor recreation trends. Today, 16 river companies take approximately 18,000 passengers down the river yearly. An additional 7,000 private visitors conduct non-commercial self-guided river trips yearly.</p>
<p><b>Current Conditions and Related Trends</b></p>	<p>Government-to-government consultation with all affiliated tribes ensures integration of tribal perspectives into NPS management.</p> <p>Historic structure preservation is an ongoing program addressing historic fabric deterioration and maintenance.</p> <p>Archeological site data collection is improving: newly discovered sites are continually recorded, condition assessments go on, and an integrated database is being developed.</p> <p>A 50-year agreement (beginning 2008) allows for continued Havasupai use of South Rim’s Supai Camp. Renovations and improvements began in 2010.</p> <p>Increased modern development is directly impacting Grand Canyon’s archaeological sites and historic character.</p> <p>Adjacent land use directly impacts resources in some areas and threatens parkwide cultural resources.</p> <p>The NPS has been successful with mitigation efforts (archaeological excavations and visitor education) to minimize Glen Canyon Dam’s adverse effects on Colorado River significant historic properties.</p> <p>Visitor use is often having a negative effect on archeological site condition especially in backcountry. Technological advances used by park visitors can have a direct impact on</p>

	<p>cultural resources. Examples include GPS, the web, and locator devices (personal trip journal publishing, geocaching).</p> <p>Research syntheses are providing summaries of current conditions and identifying management needs.</p> <p>There is greater visitor understanding and interest in the importance of history and archeology due to increased visitor education and research.</p> <p>Partnerships with Northern Arizona University, Museum of Northern Arizona, and Utah State University and others are helping meet the demand for in-depth analysis and baseline-condition monitoring.</p> <p>Cultural resource program integration with other disciplines is helping meet the ever-increasing demands of complex management issues. For example, fires can directly impact historic park properties. A dedicated fire archaeologist helps manage concerns for preserving archaeological sites while facilitating fire management goals.</p>
<p><b>Issues and Concerns</b></p>	<p>Current archeological inventories only cover approximately five percent of the park, and cave archeological resource knowledge is even more limited. Likewise, ethnographic inventories are incomplete, and most information is gleaned through project consultation. This limited knowledge hampers staff ability to appropriately manage resources and values.</p> <p>Time and staffing is critical to manage resource information (electronic databases and legacy data) track sites, respond to management needs, and provide information for resource interpretation.</p> <p>Historic properties are impacted by Glen Canyon Dam operations, park development, and other external threats.</p> <p>Heavily used historic structures and features, such as trails and buildings, need proper maintenance given their level of use.</p> <p>To maintain original architectural fabric in a stable condition a ruins preservation program is required.</p> <p>Both designated and at-large backcountry campsites impact archeological sites. Additional visitor education is necessary to prevent deterioration.</p> <p>Government-to-government American Indian Tribe consultation needs to be program driven rather than project specific.</p> <p>Climate change may impact historic properties and traditional cultural resources.</p> <p>Balanced development in response to visitation is important to mitigate direct and indirect effects on resources and resource management.</p> <p>Archaeological sites and ethnographic resources are often threatened due to unintended consequences of planned and unplanned wildland fire.</p> <p>Advanced technology used by park visitors can have direct impacts on sensitive cultural resources. Examples include GPS, the web, and locator devices (personal trip-journal publishing, geocaching, commercial businesses).</p>

	<p>Uranium mining and mineral exploration, hunting, off-road vehicle use, and cattle grazing have direct and indirect impacts on cultural resources.</p>
<p><b>Stakeholder Interest</b></p>	<p>Native Americans have had relationships with Grand Canyon region for thousands of years, and today's affiliated tribes are interested in protecting their cultural legacies, histories, and tribal interests in Grand Canyon National Park.</p> <p>Park visitors, especially backcountry and river users, are interested in visiting historic and archeological sites, and learning about the cultural and historical significance of Grand Canyon to the diverse people who have resided in or used Grand Canyon throughout history.</p> <p>The Arizona State Historic Preservation Office reviews actions within Grand Canyon that may affect historic and archeological properties important to Arizona.</p> <p>The scientific community is interested in protection of and access to historically and archeologically significant places in Grand Canyon in support of present and future research, education, and scholarly activities.</p> <p>Historic resource advocacy organizations like the National Trust for Historic Preservation are interested in protection, enhancement, and enjoyment of diverse historic places on behalf of the people to whom those places matter.</p> <p>Professional societies promote and create standards for research, scholarship, and professional behavior in historic preservation and cultural resource management, and provide opportunities for information sharing within those fields.</p> <p>Business and tourism interests are interested in providing access to archeological sites and historic places to develop heritage-tourism economic opportunities.</p> <p>Environmental organizations advocate for protection of park resources they believe important.</p> <p>Grand Canyon area residents live within or near culturally and historically significant places, and are directly impacted by how these places are managed.</p>
<p><b>Relevant Laws and Policies</b></p>	<ul style="list-style-type: none"> <li>• <i>Historic Sites Act of 1935</i> Authorized Secretary of the Interior through the NPS to preserve and maintain objects of national historical or archeological significance, and to establish and maintain museums in connection therewith</li> <li>• <i>American Indian Religious Freedom Act 1978</i> Mandated Federal agencies ...protect and preserve American Indian religious cultural rights and practices. Each agency must consult on its missions, statutes, regulations, and policies with traditional Native American religious leaders</li> <li>• <i>Archeological Resources Protection Act 1979</i> Superseded 1906 Antiquities Act and established, 1) archeological resources on public and Indian lands are protected, 2) permit requirements for resource excavation or removal, 3) civil and criminal penalties for illegal removal of these resources</li> <li>• <i>Indian Self-Determination and Education Assistance Act of 1975</i> Gave tribes authority to contract with the Federal government to operate programs serving their tribal members and other eligible persons and increase tribal participation in the management of Federal Indian programs and help ensure long-term financial stability for tribally-run programs</li> </ul>

	<ul style="list-style-type: none"> <li>• <i>National Historic Preservation Act of 1966</i> Requires all Federal agencies inform the Advisory Council on Historic Preservation of effect of any undertaking on any district, site, building, structure, or object eligible for or included in, the National Register of Historic Places, and to afford the Council a reasonable opportunity to comment</li> <li>• <i>Native American Graves Protection and Repatriation Act of 1990</i> Provides protection of Native American graves, and other purposes</li> <li>• <i>Presidential Memorandum Government-to-Government Relations with Native American Tribal Governments 1994</i> Ensures Federal government operates a government-to-government relationship with Federally-recognized Native American Tribes</li> <li>• <i>Advisory Council on Historic Preservation Implementing Regulations regarding Protection of Historic Properties</i> Section 106 of the National Historic Preservation Act requires Federal agencies to take into account effects of undertakings on historic properties and afford the Council a reasonable opportunity to comment on such undertakings</li> </ul> <p><b>Executive Orders</b></p> <ul style="list-style-type: none"> <li>• <i>11593 Protection and Enhancement of the Cultural Environment (1971)</i> Directs Federal agencies to survey all properties under their administration which might qualify for listing in the National Register of Historic Places, and nominate them to register</li> <li>• <i>13007 Indian Sacred Sites (1996)</i> Agencies shall, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, 1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and 2) avoid adversely affecting physical integrity of such sacred sites. Where appropriate, agencies shall maintain sacred sites confidentiality</li> </ul> <p><b>DOI Policies</b></p> <ul style="list-style-type: none"> <li>• Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</li> </ul> <p><b>NPS Policies</b></p> <ul style="list-style-type: none"> <li>• <b>Director's Orders</b> <ul style="list-style-type: none"> <li>• 18 Wildland Fire Management (2008)</li> <li>• 28 Cultural Resources Management Guideline (1998)</li> <li>• 28A Archaeology</li> <li>• 28B Ethnography</li> <li>• 71A Relationship with American Indian Tribes (2006)</li> <li>• 71B Indian Sacred Sites</li> </ul> </li> <li>• <b>Management Policies (2006)</b> <ul style="list-style-type: none"> <li>• 5.3 Cultural Resource Management Stewardship</li> <li>• 8.10 Natural and Cultural Studies, Research, and Collection Activities</li> </ul> </li> <li>• <b>Service-wide Programmatic Agreement Among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (2008)</b></li> </ul> <p><b>GRCA Programmatic Agreements</b></p> <ul style="list-style-type: none"> <li>• Programmatic Agreement Among Grand Canyon National Park and the Arizona State Historic Preservation Officer regarding GRCA Fire Management Plan (2009)</li> </ul> <p><b>Code of Federal Regulations</b></p> <ul style="list-style-type: none"> <li>• 3 (1971)</li> </ul>
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<b>Available Information</b>	<ul style="list-style-type: none"> <li>• Archeological System Management Information System (ASMIS)</li> <li>• List of Classified Structures</li> <li>• National Register of Historic Places Database</li> <li>• Ethnographic Resource Inventory</li> <li>• Cultural Landscape Inventory (CLI)</li> <li>• Online photo database and archives</li> <li>• Museum Collection Records and Archives</li> <li>• Professional Publications</li> <li>• Libraries and Archives</li> <li>• Office records</li> </ul>
<b>Planning Needs</b>	<ul style="list-style-type: none"> <li>• Backcountry Management Plan</li> <li>• Update National Register of Historic Places documents</li> <li>• Resource Stewardship Strategy</li> </ul>
<b>Information Needs</b>	<ul style="list-style-type: none"> <li>• Baseline inventories</li> <li>• Tribal consultation</li> </ul>

## Other Important Resources and Values

<b>Opportunities for Learning and Understanding</b> <ul style="list-style-type: none"> <li>• Resource Interpretation and Environmental Education</li> <li>• Museum Collection</li> <li>• Research and Science Activities</li> </ul>	
<b>Description</b>	<p>Grand Canyon's interpretive and resource education program is focused on achieving a sense of resource stewardship between visitors and the park via a multi-leveled approach of formal and informal interpretive contacts. Although personal services (i.e., person-to-person) tend to be the most effective tool in achieving these goals, the park also relies on non-personal interpretation using a variety of media. Visitor contacts include: visitor center activities; casual trail interactions; structured, well-researched programs; educational outreach to school children through on- and off-site visits; print publications (including quarterly guides and site bulletins); a variety of internet-based operations (including recorded ranger minute programs; an extensive web-based information system and interactive programs); audio programs (such as podcasts and cell phone tours); and high quality exhibits and waysides.</p> <p>The park operates nine themed visitor contact stations providing staff, exhibits, and publications to visitors</p> <ul style="list-style-type: none"> <li>• <i>Grand Canyon Visitor Center (Canyon View Information Plaza)</i> General park orientation and introduction to major interpretive themes</li> <li>• <i>Headquarters Contact Station</i> Orientation to Grand Canyon and surrounding areas</li> <li>• <i>Verkamps' Visitor Center</i> Overview of modern South Rim human history</li> <li>• <i>Yavapai Observation Station</i> In-depth study of the geologic record</li> <li>• <i>Tusayan Ruin and Museum</i> Overview of Grand Canyon's prehistoric inhabitants</li> <li>• <i>Desert View</i> Park information and bookstore</li> <li>• <i>Indian Garden Contact Station</i> Overview of Inner Canyon wildlife and human history</li> <li>• <i>Phantom Ranch Contact Station</i> Orientation to backcountry hiking</li> <li>• <i>North Rim Visitor Center</i> Overview of North Rim human history and ecology</li> </ul>
<b>Importance</b>	<p>Providing the public with quality information about Grand Canyon resources is critical to meeting the park's purpose and the National Park Service mission.</p> <p><i>Resource Interpretation and Environmental Education</i> Research-based interpretive and educational programs and information connect visitors to Grand Canyon resources and National Park Service ideals, leave them wanting to learn more, and instill a sense of stewardship for Grand Canyon, other national park areas, and resources in their own backyard.</p> <p><i>Research and Science Activities</i> Grand Canyon National Park has long been an important setting for research on archeology, geology, geography, ecology, geomorphology, recreation and visitor experience, soundscapes, air quality, and hydrology, among others.</p>

	<p>Geologic features and processes represented in Grand Canyon's geologic record have made the canyon an outstanding classroom and research facility for worldwide researchers and educators. Students of all ages study Grand Canyon geology in the classroom and park field trips.</p> <p>A high-quality park research program is critical for meeting park goals and objectives. It ensures systematic, current, and fully adequate park information; provides a sound basis for policy, guidelines, and management actions; helps management develop effective strategies, methods, and technologies to restore disturbed resources; and predicts, avoids, or minimizes adverse impacts on natural and cultural resources and visitor-related activities.</p> <p>The park's research program ensures plans and actions reflect contemporary knowledge about cultural landscapes and natural resources with traditional cultural meaning and value to associated peoples; determines causes of natural resource management problems and identifies alternative strategies for potential resolution; and ensures natural-resource issue interpretation reflects current scholarship standards relating to the history, science, and resource condition.</p> <p><i>Museum Collection</i> Museum Collection present and future holdings contribute directly to understanding park purpose, themes, and resources, and include objects the National Park Service is legally mandated to preserve.</p> <p>The Museum Collection houses irreplaceable cultural resources such as artifacts from the Powell Expeditions (John Wesley Powell's pocket watch and Walter Clement Powell's diaries), the pen Woodrow Wilson used to sign the Act creating Grand Canyon National Park in 1919, the Colorado River historic boat collection, Thomas Moran paintings, Archaic split-twig figurines, Ancestral Puebloan pottery, park archives, and historic photos.</p> <p>Important natural history collections include a comprehensive Quaternary collection; endemic species specimens; more than 10,000 herbarium specimens; and type and voucher paleontological, biological, and geologic specimens.</p> <p>Natural and cultural materials and associated records provide baseline data serving as scientific and historical documentation of park resources and purpose.</p> <p>Placing objects and specimens in a broader context through research, analysis, and exhibition provides great public benefit and enjoyment.</p>
<p><b>Current Conditions and Related Trends</b></p>	<p><b><i>Division of Interpretation and Education</i></b> Interpretive staff provide public interpretation of park resources directly through interpretive programs, written materials, and websites, and indirectly, through review and fact-checking outside articles. Interpretive staff gave 7,071 presentations to a total 228,971 visitors on interpretive walks, talks, and programs during 2009.</p> <p>The Environmental Education Program provides teacher education and classroom programs, web ranger programs, Grand Canyon curricula, and hosts class visits. Environmental education staff made 541 presentations to a total 15,632 students, and a total 1,617,031 contacts through formal and informal contacts. The park has expanded formal interpretive opportunities by advertising special programs to the local community, and through night hikes and star programs. Educational outreach has traveled as far as Colorado City, Arizona and Las Vegas, Nevada to connect with student populations.</p>

Visitors receive or have access to a variety of publications at little or no cost including the park's color brochure, seasonal newspapers (The Guide), pre-visit literature, trail guides, and information sheets (site bulletins). General park information is available in German, Spanish, French, Italian, Japanese, Chinese, and English.

The Research Library's primary purpose is to collect, preserve, and make accessible literature and research about Grand Canyon and the Colorado Plateau for the public, staff, and researchers. The Research Library provides access to current research and offers a historical context for interpreting and protecting natural and cultural resources. Park partnerships with organizations such as Grand Canyon Youth, Northern Arizona University, and Grand Canyon Association enhance interpretive staff's ability to reach a broader audience.

All uniformed park staff and partners serve as informal interpreters for park visitors. It is as likely visitors will contact a maintenance employee or a law enforcement ranger as an interpreter. Entrance station, backcountry office, and trail staff regularly provide visitor information. Additionally, park partners, such as Grand Canyon Association, Grand Canyon Field Institute, private tours, and Xanterra regularly answer visitor questions. Through ongoing training in interpretive skills and resource information, all staff are encouraged to answer visitor queries accurately and informatively. Cumulatively, all employees add to the depth of knowledge communicated to the public.

Recent Indian Garden and Phantom Ranch facility expansion allow visitor contact.

#### ***Division of Science and Resource Management***

Staff provide public outreach through special programs, interpretive staff training, and publications and professional presentations to professional peers.

#### ***Research and Science Activities***

Grand Canyon National Park approves 40-50 research projects yearly. Many of these are led by National Park Service staff; however, scientists affiliated with scholarly institutions frequently lead independent studies.

Some studies are designed to provide information for managing the park's resources and visitor services, but others explore a wide range of subjects including geology, paleontology, ecology, and archaeology.

Grand Canyon encourages research that provides the scientific community and public with an understanding of park resources, natural processes, values, and uses. This approach provides a scientific and scholarly basis for park planning, development, operations, management, education, and interpretive activities.

Current-condition summaries from past and ongoing research help identify management needs.

Staff works with the U.S. Geological Survey's Grand Canyon Monitoring and Research Center (GCMRC) scientists to measure effects of Glen Canyon Dam operations on the Colorado River from Glen Canyon Dam through Grand Canyon to Lake Mead.

Staff continues to work with Federal (U.S. Geological Survey, Grand Canyon Monitoring and Research Center, U.S. Fish and Wildlife Service, U.S. Forest Service, Bureau of Reclamation), state (Arizona Department of Environmental Quality), and non-government organization staff (Peregrine Fund), to gather endangered species data and ensure protection.

	<p><i>Museum Collection</i>                  The Museum Collection storage facility (a 6,000 square-foot, climate-controlled facility completed in 1999) houses more than one million items, and counting, from eight disciplines: archeology, art, ethnology, biology, paleontology, geology, archive manuscripts, and history. Staff receive more than 2,000 research requests each year. The Museum Collection is open for study and research to any interested researcher. Because objects are irreplaceable, use is generally restricted to onsite examination for non-consumptive research.</p> <p>Museum Collection tours may be scheduled in advance as staff availability permits.</p> <p>Museum objects may be loaned to qualified institutions for approved purposes provided they meet museum standards for security, handling, and exhibit.</p>
<p><b>Issues and Concerns</b></p>	<p><i>Interpretation and Education</i>                  While over 4.5 million visitors visit the park yearly, only a minority attend formal interpretive activities. In FY09, approximately 35 percent of park visitors visited a park visitor center or contact station. These visitors may have contacted a uniformed ranger or read exhibits. Beginning in 2007, five percent of park visitors participate in formal interpretive programs—a 50 percent increase over the beginning of the decade.</p> <p>Like most national parks, Grand Canyon can improve efforts to reach non-traditional users. Typical visitors tend to be middle-to-upper class, white Americans or Europeans. Close to one third of the visiting public come from outside the U.S, many of whom arrive on guided tours without access to formal interpretation. In recent years, the park has focused on hiring more multi-lingual rangers in an effort to reach these audiences.</p> <p>Visitor demographic studies show the average visitor is much older than the median population. For reasons not yet fully understood, Grand Canyon is a destination for a disproportionate number of senior visitors. Although summer family visits are common, visitor use studies show children are far less represented in the visitor population than in the population at large.</p> <p><i>Museum Collection</i>                  New acquisitions lead to increased backlog.</p> <p>As collections grow, current storage space will become inadequate; controlled storage space for large objects is already limited.</p> <p>Staff and researcher compliance with collection permitting requirements is variable.</p> <p>Staff education about objects, files, and/or documents that should be deposited in the Museum Collection should be ongoing.</p> <p>Staff education about collection protection and preservation during emergencies should be integral.</p> <p>Improvement of exhibit space for museum objects should be initiated.</p> <p><i>Research and Science Activities</i>                  Researcher compliance with park research policies is variable. Documentation, including data and reports are not always made available to the NPS as required by the permit.</p> <p>Research requests are generated by institutions outside the park. As such, they are not</p>

	<p>always consistent with NPS goals, and are not listed in planning documents as priority research needs.</p> <p>Adequate research to support informed planning and compliance with legal requirements should precede final decisions about resource management actions, developments and park operations.</p> <p>Research needs to be updated periodically to reflect changing issues, sources, and methods.</p>
<b>Stakeholder Interest</b>	<p>The general public, academic institutions, nonprofit organizations, school and other educational groups highly value and support Grand Canyon resource education and interpretive programs.</p> <p>Researchers, universities, and academic institutions use the park as an outdoor classroom to study geological features, human history, and biological diversity.</p> <p>Conservation organizations, associated tribes, Federal and state agencies, and recreation groups have varying interests and positions related to Glen Canyon Dam monitoring and research programs.</p> <p>Curators and other museum professionals, local and regional researchers, school groups, visiting academics, and a wide variety of groups interested in the park collection.</p>
<b>Relevant Laws and Policies</b>	<ul style="list-style-type: none"> <li>• <i>Museum Properties Management Act of 1955</i> Authorized Secretary of the Interior through the NPS to acquire collections through donation and purchase, and to loan and exchange collections</li> </ul> <p><b>NPS Policies</b></p> <ul style="list-style-type: none"> <li>• <b>Management Policies (2006)</b> <ul style="list-style-type: none"> <li>• 7.2 Interpretive Planning</li> <li>• 4.2 Studies and Collections</li> <li>• 7.3 Personal and Nonpersonal Services</li> <li>• 9.4.2 Museum Collections</li> </ul> </li> <li>• <b>Directors Orders</b> <ul style="list-style-type: none"> <li>• 6 Interpretation and Education</li> <li>• 24 Museum Collections Management and Handbook</li> <li>• 28 Cultural Resource Management</li> <li>• 28A Archaeology</li> <li>• 28B Ethnography</li> <li>• 52A Communicating the National Park Service Mission</li> <li>• 74 Scientific Research and Collecting</li> <li>• 77 Natural Resources</li> </ul> </li> </ul>
<b>Available Information</b>	<ul style="list-style-type: none"> <li>• Annual Statement for Interpretation</li> <li>• Annual Collections Management Report</li> <li>• Annual Inventory of Controlled Property of Random Artifacts and Accessions</li> <li>• Annual Automated Checklist Program</li> <li>• Museum Collection Cataloging Program</li> <li>• Photo Database</li> </ul>
<b>Planning Needs</b>	<ul style="list-style-type: none"> <li>• Resource Stewardship Strategy</li> <li>• Collections Management Plan</li> <li>• Collections Conditions Survey</li> </ul>

	<ul style="list-style-type: none"><li>• Emergency Operations Plan</li><li>• Museum Collections Housekeeping Plan</li><li>• Integrated Pest Management Plan (museums)</li></ul>
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<b>Sustainable Economic Contributions to the Regional Economy</b>	
<ul style="list-style-type: none"> <li>• Visitor spending</li> <li>• Direct Federal spending</li> <li>• Significant percentage of jobs and income attributed to park and related tourism</li> </ul>	
<b>Description</b>	Grand Canyon is the number one tourist attraction in Arizona, and generates significant economic contributions in the region.
<b>Importance</b>	<p>The park is vital to state and regional economy (\$955 million travel-related spending in Coconino County annually, outside dollars come into the region, direct contracts for park and concessions projects bring jobs and money to the region, etc.)<sup>13</sup></p> <p>Grand Canyon is particularly important to gateway-community economies including Tusayan, Cameron, Williams, Flagstaff, Jacob Lake, Peach Springs, and Marble Canyon, Arizona, and Kanab and Fredonia, Utah.</p>
<b>Current Condition and Related Trends</b>	<p>Grand Canyon visitor spending is estimated to bring in more than \$420 million to local economies yearly and up to \$955 million to the county.<sup>14</sup></p> <p>Regional impacts of visitor spending include support for over 10,000 jobs and over \$168 million in labor income annually.<sup>15</sup></p> <p>Recent years have shown increasing revenue generated per visitor in the park and region (higher spending).<sup>16</sup></p>
<b>Issues and Concerns</b>	<p>Events such as significant changes in weather, widespread illness, or significant changes in economy and unemployment rates could affect tourism.</p> <p>Shrinking Federal budgets could result in limited services, less tourism, greater reliance on partners.</p> <p>Climate change and resultant changes in weather, average temperatures, and precipitation could discourage tourism.</p> <p>Park operating budgets are not sufficient to adequately address basic operations and maintenance.</p> <p>The park relies on user fees, and is looking for more ways for fees to support services.</p>
<b>Stakeholder Interest</b>	The business community (including the park's commercial services) and state and local government are all interested in a healthy park to sustain a healthy economy.

<sup>13</sup>Data collected 1998-2008 and reported in Arizona Travel Impacts Report 1998-2008p, Dean Runyan Associates, June 2009, for Arizona Department of Tourism, Phoenix, Arizona. Can be accessed at [http://www.azot.gov/documents/AZ\\_Travel\\_Impacts\\_2008p\\_final.pdf](http://www.azot.gov/documents/AZ_Travel_Impacts_2008p_final.pdf)

<sup>14</sup>\$420 Million comes from National Park Visitor Spending and Payroll Impacts 2008, Daniel J. Stynes, Department of Community, Agriculture, Recreation and Resource Studies, Michigan State University, East Lansing, Michigan 48824-1222, October 2009. Can be accessed at <http://web4.msue.msu.edu/mgm2/default.htm>. \$955 figure from Depart of Tourism/Runyan 2009 citation above.

<sup>15</sup>Stynes 2009

<sup>16</sup>National Park Visitor Spending and Payroll Impact reports (2001-2008) were compared with Economic Impacts of Grand Canyon National Park Visitor Spending on the Local Economy, 2003 to calculate the increase per visitor. These can all be accessed at <http://web4.msue.msu.edu/mgm2/default.htm>

	<p>Partners are being asked to provide visitor services and protect resources in the park.</p> <p>Visitors are concerned about rising user fees.</p> <p>Visitor spending in the region fluctuates due to changes in U.S. and global economies.</p>
<p><b>Relevant Laws and Regulations</b></p>	<ul style="list-style-type: none"> <li>• <i>Intergovernmental Cooperation Act of 1968</i></li> <li>• <i>National Park Service Concession Improvement Act of 1998</i></li> </ul> <p><b>NPS Policies</b></p> <ul style="list-style-type: none"> <li>• <b>Management Policies</b> <ul style="list-style-type: none"> <li>• 1.10 Partnerships</li> <li>• 10.2 Concessions</li> <li>• 10.3 Commercial Use Authorizations</li> </ul> </li> <li>• <b>Director's Orders</b> <ul style="list-style-type: none"> <li>• 12 Environmental Impact Analysis</li> <li>• 21 Donations and Fundraising</li> <li>• 27 Challenge Cost-share Program</li> <li>• 32 Cooperating Associations</li> </ul> </li> </ul>
<p><b>Available Information</b></p>	<ul style="list-style-type: none"> <li>• Arizona Office of Tourism website (<a href="http://www.azot.gov">www.azot.gov</a>)</li> <li>• Economic Impacts of Grand Canyon National Park Visitor Spending on the Local Economy, 2003</li> <li>• NPS Money Generation Model (<a href="http://web4.msue.msu.edu/mgm2/default.htm">http://web4.msue.msu.edu/mgm2/default.htm</a>)</li> </ul>

<b>Park Infrastructure and Assets</b> <ul style="list-style-type: none"> <li>• Facilities including roads, trails, buildings, utilities, concessions</li> <li>• NPS operations (staff, annual operating budget)</li> <li>• Concessions and commercial services</li> <li>• Partners and volunteers</li> </ul>	
<b>Description</b>	<p>Park infrastructure includes 1,600 assets, over 600 trail miles, 228 road miles, 1,139 lodging units in eight hotels, 544 rim campsites in three campgrounds, and 70 inner canyon campsites in four campgrounds.</p> <p>NPS asset portfolio is valued at approximately \$1.2 billion in 2006 dollars.</p> <p>NPS operations include approximately 567 (2010) positions (permanent, term, and seasonal) from various fund sources.</p> <p>NPS annual appropriated base budget FY10 was almost \$23 million not including project funds. Projected base funding for 2011-2013 ranges from \$22.9 to \$25.6 million.</p> <p>Grand Canyon's funding resources come from ONPS authorized base funding, housing and utilities income, FLREA (Federal Lands Recreation Enhancement Act), franchise fees, and project funding programs.</p> <p>More than 20 concession programs operate in the park and generate nearly \$120 million in revenue annually.</p> <p>Over 400 operators provide bus and van tours, guided backpacking, guided day hikes, outfitting, and horseback rides under other commercial authorizations.</p> <p>Partners provide support to the park, such as the Grand Canyon Association that provides educational opportunities and book sales throughout the park.</p> <p>The 23-mile-long Inner Trans-canyon Pipeline delivers all the park's culinary water from North Rim's Roaring Springs to North and South Rim development and Cross-Corridor Trail campgrounds.</p>
<b>Importance</b>	<p>Park facilities and infrastructure represent a substantial investment by the American people for opportunities to enjoy their parks and protect resources.</p> <p>NPS employees who meet visitors, protect resources, and keep the park running are critical, and highly regarded by the American public.</p> <p>Concessions and commercial services provide essential visitor services, and are NPS partners in serving visitors.</p> <p>Partners and volunteers are becoming an increasingly important part of fulfilling the national park mission. Over 1,225 volunteers donated 63,051 hours to the park in 2009.</p>
<b>Current Conditions and Related Trends</b>	<p>GRCA maintenance backlog was \$262 million in 2006, and is estimated to be over \$300 million and growing.</p> <p>While GRCA has received some base-budget increases in the last few years, cost-of-living and operating costs are outpacing increases. Flat-to-declining Federal budgets</p>

	<p>are a reality, leading to decreased overall staff numbers and unfilled vacant positions. The park faces funding constraints and insufficient base funding to cover basic operational needs (creates an unhealthy dependence on variable non-base funds, such as franchise fees, and leaves key positions unfunded).</p> <p>Nearly 50 percent of building and housing assets are more than 40 years old. Assuming the entire asset portfolio reflects a similar trend, the park faces waves of expiring systems.</p> <p>Grand Canyon faces huge requirements for deferred maintenance and component renewal (i.e., equipment replacement) and should focus funding on high priority assets.</p> <p>Over 30 percent of the asset portfolio (mostly buildings and housing) is occupied by concessions or park partners.</p> <p>Renewal of major concession contracts is cyclical. With changing visitor-use trends, there is opportunity to evaluate commercial services and potential improvements when developing a new concession prospectus.</p> <p>Current leasehold surrender interest on the largest South Rim concessioner's assets is estimated to be approximately \$218.5 million, making the 2012 contract and all future contracts financially challenging.</p> <p>Several Federal and state agencies manage lands and resources of the greater Grand Canyon region with some common objectives but differing missions, rules, and regulations, causing some challenges.</p>
<p><b>Issues and Concerns</b></p>	<p>Continued flat-to-declining Federal budgets severely affect NPS ability to catch up on the maintenance backlog and maintain current operational and public service levels.</p> <p>Key assets, such as water and wastewater systems, will eventually fail and close.</p> <p>Efforts to force parks to operate like businesses sends profitable tasks to the private sector, and sacrifice of valuable but unprofitable tasks resulting in weakened services.</p>
<p><b>Stakeholder Interest</b></p>	<p>Visitors are interested in having well-maintained facilities and good service.</p> <p>The business community (including concessioners and business permit holders) is interested in opportunities to provide visitor services.</p> <p>NPS staff is extremely dedicated to the NPS mission and the park.</p> <p>Partners have keen interest in visitor services and facilities in good condition, and are becoming an indispensable part of constructing, maintaining, and operating new facilities and assisting in all aspects of park operations.</p> <p>Volunteers are becoming an indispensable part of all park operations.</p> <p>Neighboring land management agencies, (USFS/BLM) are interested in NPS fulfilling a certain portion of the regional visitor opportunity spectrum.</p> <p>Government officials at all levels are interested in well-maintained facilities and quality visitor services.</p>

<b>Relevant Laws and Regulations</b>	<ul style="list-style-type: none"> <li>• <i>Americans with Disabilities Act</i></li> <li>• <i>Architectural Barriers Act</i></li> <li>• <i>National Park Service Concession Management Improvement Act</i></li> <li>• <i>National Park Service Concessions Policy Act</i></li> <li>• <i>Rehabilitation Act</i></li> <li>• <i>Federal Employees and Facilities Act</i></li> </ul> <p><b>Executive Orders</b></p> <ul style="list-style-type: none"> <li>• <i>13327 Federal Real Property Asset Management</i> Promote efficient and economical use of America's real property assets and assure management accountability for implementing Federal real property management reforms. Recognize real property resources importance through increased management attention, establishment of clear goals and objectives, improved policies and accountability, and other appropriate action</li> </ul> <p><b>NPS Policies</b></p> <ul style="list-style-type: none"> <li>• <b>Guiding Principles of Sustainable Design (1993)</b></li> <li>• <b>Director's Orders</b> <ul style="list-style-type: none"> <li>• 36 Housing Management (2009)</li> <li>• 80 Real Property Asset Management (2006)</li> <li>• 48A Concession Management (Undated)</li> </ul> </li> <li>• <b>Management Policies 2006</b> <ul style="list-style-type: none"> <li>• Chapters 9 and 10</li> </ul> </li> </ul>
<b>Available Information</b>	<ul style="list-style-type: none"> <li>• Grand Canyon's 2006 Park Asset Management Plan (PAMP)</li> <li>• Grand Canyon's 2010 Ensuring Sustainable Funding for Park Operations and Asset Protection in the 21<sup>st</sup> Century</li> </ul>

Steve Martin, Superintendent  
April 2010