

IUCN Conservation Outlook Assessment 2017 **(archived)**

Finalised on 09 November 2017

Please note: this is an archived Conservation Outlook Assessment for Grand Canyon National Park. To access the most up-to-date Conservation Outlook Assessment for this site, please visit <https://www.worldheritageoutlook.iucn.org>.

Grand Canyon National Park

SITE INFORMATION

Country:

United States of America (USA)

Inscribed in: 1979

Criteria:

(vii) (viii) (ix) (x)

Site description:

Carved out by the Colorado River, the Grand Canyon (nearly 1,500 m deep) is the most spectacular gorge in the world. Located in the state of Arizona, it cuts across the Grand Canyon National Park. Its horizontal strata retrace the geological history of the past 2 billion years. There are also prehistoric traces of human adaptation to a particularly harsh environment. © UNESCO

SUMMARY

2017 Conservation Outlook

Good with some concerns

Overall the state of World Heritage values is stable or declining slightly, with some key areas of concern and potential deterioration in the next decade. These include: increased visitation and uncertain plans to contend with tourism, uranium mining; bison, elk, and non-native fish increases; development in the park at the Little Colorado River area and at Quartermaster Canyon; increases in overflights; reservoir equalization flows between Lake Powell and Lake Mead; management capacity; Grand Canyon Escalade project. Opportunities exist for correction of all of these threats. The populations trends of some species are in decline and are beginning to warrant concern that the park and surrounding areas will not eventually serve the needs of the Park. Key concerns as listed above include external tourism development, internal tourism development, management of the Colorado River, restoration of fire in a drought cycle, potential for mining, bison management, and funding for operations and infrastructure.

Current state and trend of VALUES

Low Concern

Trend: Stable

While there are a number of potentially significant threats to the long-term values of Grand Canyon National Park, the overall status as it relates to the time of inception shows general stability. Some significant resources along the Colorado River have continued to decline, but these values were heavily impacted at the time the park was designated and gained status as a World Heritage Site. Some of the key areas of concern include uranium mining, bison increases, development in the park at the Little Colorado area, increases in overflights, continued high equalization flows between Lake Powell and Lake Mead, lack of funding for staff and infrastructure, and major developments at Tusayan. The populations trends of some species are in decline and are

beginning to warrant concern that the park and surrounding areas will not eventually serve the needs of the Park.

The trend is good, but not without concerns for changing trends over the next 10 years. Uncertainty exists over effects of climate change, invasive species, and drought-caused wildfires of increasing intensity will need future attention. Some concerns exist for vegetation in the face of climate change, deterioration of habitat for some species like humpback chub, and the invasion of Bison on the north rim. The status of more than 85 taxa in the Colorado River corridor has been questioned, with at least 14 vertebrate species extirpated there, as well as several other large wide-ranging vertebrates (including wolves, jaguar, and grizzly bear) from the middle and upper elevations of the Park. The recent increase in visitation, from 4.5 million to 6 million annually, is putting pressures on the park. If this trend continues and no sustainable solution to visitation occurs, park resources could be negatively affected by unregulated and unplanned development. The park will have to have the resources to manage and intervene on key threats to insure the protection of the park into the future.

Overall THREATS

High Threat

Grand Canyon National Park is currently well managed by generally applied standards. The staff is dedicated and the park leadership is good. However, external development threats are significant, and the ability to meet and overcome these challenges is uncertain in the current political and financial environment. Due to funding constraints at the federal level there are insufficient employees in science and resource management. To manage key issues greater staffing and science based programs will be required. These concerns include uranium mining on the park boundary in its watershed, commercial development in the Little Colorado area in the park, development out side of the headquarters area, development, infrastructure and funding issues, operation of Glen Canyon dam, and the need to complete plans for significant resources like caves, backcountry and other resources. Future funding for park operations, research, and facility maintenance is also a concern. Like many areas the concern over climate change and exotic species are important things that will need addressing. Climate change caused drought, reduction in springs and surface water will create degradation of park resources. The restoration of wildfire and the threat of major wildfire are also concerns in the face of climate change and increase temperatures. The park is taking steps to address climate and drought

related concerns but resolution and costs are uncertain. Mining, grazing, timber harvesting and water withdrawal may degrade native plant communities, destroy wildlife habitat, interrupt migration corridors, and disturb wildlife breeding activities. There are significant management threats to the park that could present long-term degradation of this site. Ecological research shows significant impacts on the park from the construction and operation of Glen Canyon Dam. If the drought continues and water demand out of the park remains continued impacts will take place. This is an ongoing threat to the long term health of the canyon ecosystem.

Overall PROTECTION and MANAGEMENT

Mostly Effective

Current management of the park is mostly effective in addressing issues that are of potential impact to the park. Park leadership is strong and staffing is adequate. Key areas of concern deal with future political support for managing threats like the Operation of Glen Canyon Dam, uranium development and development affecting park resources in the Little Colorado area. In addition the need to maintain infrastructure and operational staffing is an issue that will need to be addressed by national level policy makers.

FULL ASSESSMENT

Description of values

Values

World Heritage values

► **One of the world's most visually powerful landscapes**

Criterion:(vii)

Grand Canyon, nearly 1 mile deep, and 277 miles long, is the most spectacular gorge in the world. Located in the state of Arizona, it cuts across the Kaibab Plateau and has been preserved in part by the 1.2 million acre Grand Canyon National Park. Its horizontal strata retrace the geological history of the past 1.8 billion years. Nowhere else on earth is there the clearly exposed geology in such a magnificent landscape. The value of this natural feature is broad encompassing the most casual tourist and the most rigorous scientific interest.

► **Geologic Features and Processes and record of the earths geologic history**

Criterion:(viii)

Grand Canyon National Park preserves an iconic geologic landscape 1,840 to 270 million years old, including diverse paleontological resources; unconsolidated surface deposits; a complex tectonic and erosion history; and Pliocene to Holocene volcanic deposits. Within park boundaries, the geologic record spans all four eras of the earth's evolutionary history, from the Precambrian to the Cenozoic. The Precambrian and Paleozoic portions of this record are particularly well exposed in canyon walls and include a rich fossil assemblage. Numerous caves shelter fossils and animal remains that extend the paleontological record into the Pleistocene (World Heritage Committee,

2006).

► **Superlative scenic beauty of the Colorado River**

Criterion:(vii)

The Colorado River is one of America's greatest rivers (World Heritage Committee, 2006). It 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 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.

► **An exceptional example of biological environments at different elevations**

Criterion:(ix)

Grand Canyon National Park possesses outstanding biological diversity and protects a large, relatively undeveloped 1,218,376 acres. Grand Canyon is an exceptional example of biological environments at different elevations that evolved as the river cut deeper portraying five of North America's seven life zones within canyon walls and rim areas. Flora and fauna species overlap in many of the zones and are found throughout the canyon (World Heritage Committee, 2006). 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 connectivity of species between the park and areas around the park is an important ecological concept and an important function of Grand Canyon National Park. With the perils of climate change looming, Grand Canyon has the attribute to support significant linkages between protected areas.

►

An ecological refuge, with relatively undisturbed remnants of dwindling ecosystems and numerous endemic, rare or endangered species

Criterion:(x)

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 stratigraphic variety provides microhabitats for natural processes supporting rare and endemic plant and wildlife species. These diverse habitats 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 five life zones within the canyon are represented in a remarkably small geographic area. Grand Canyon National Park is an ecological refuge, with relatively undisturbed remnants of dwindling ecosystems (such as boreal forest and desert riparian communities), and numerous endemic, rare or endangered plant and animal species (World Heritage Committee, 2006). 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, more than 10,000 invertebrate species, and a number of Federally listed species. Extirpated species include grizzly bear, black-footed ferret, gray wolf, jaguar, Bear Valley sandwort, Colorado pikeminnow, bonytail and roundtail chub, northern leopard frog, and southwestern river otter. The razorback sucker may be extirpated within park boundaries. Threatened Animals (IUCN Red List of Threatened Species category): California condor (*Gymnogyps californianus*, CR), humpback chub (*Gila cypha*, EN), willow flycatcher (*Empidonax traillii*, LC), spotted owl (*Strix occidentalis*, NT), Kanab ambersnail (*Oxyloma haydeni kanabense*, CR), and desert tortoise (*Gopherus agassizii*, VU). There are over 35 species of special concern and former USFWS Category 2 species. The Park supports populations of numerous endemic faunal taxa, including 1 dragonfly, 4 butterflies, 1 tiger beetle, 3 ground beetles, 1 robberfly, and several other species new to science. Threatened plants: There are no known threatened plant species in the Park, but the sentry milk-vetch (*Astragalus cremnophylax* var. *cremnophylax*) is rare and is federally listed as endangered. Nine species of special concern (formerly category two species) are known, and 25 additional vascular plants are of management concern due to their limited distribution (World Heritage Committee, 2006).

Regionally, old-growth ponderosa pine has suffered an estimated 85-98 percent area loss due to destruction, conversion to other uses, and significant degradation in structure, function, and composition. The National Biological Survey released a report designating the old growth, southwestern ponderosa pine forest best represented in GRCA, as an endangered ecosystem type.

Assessment information

Threats

Current Threats

Low Threat

There are some significant threats to Grand Canyon that are currently being managed, however long term support in policy and financial resources will be required to ensure long term protection of the park.

► Commercial/ Industrial Areas

Low Threat

Inside site, throughout(>50%)

Outside site

Over flights for tourism continue to degrade the natural quiet of the park. A reasonable solution to this problem - managing this use, allowing it to continue and reducing impacts - has been put on hold by congress (R1-R7).

► Invasive Non-Native/ Alien Species

High Threat

Inside site, throughout(>50%)

Outside site

Native species continue to decline and the introduction of non-native species into the river below Glen Canyon Dam places pressure on the existing native species, most importantly the humpback chub. The US National Park Service (NPS) is currently working on additional management tools to address non-

native aquatic species, with a public scoping process anticipated in Nov/Dec 2017, and the final plan scheduled for summer 2018.

In addition to losses of endangered native fish, more than 10 other rare or listed vertebrate species have been extirpated from the Colorado River corridor (e.g. zebra-tailed lizard, southwestern willow flycatcher, Sonoran river otter, and badger).

► **Dams/ Water Management or Use**

High Threat

Inside site, throughout(>50%)

Outside site

Ecological research conducted in the 1970s-1980s showed significant damage to Grand Canyon National Park resources from construction and operation of Glen Canyon Dam. This includes beaches, archeological sites, fisheries, and riparian ecosystem impacts. Prior the completion of Glen Canyon Dam in 1963 (i.e. before inscription of the property in 1979), 8 native fish species were native to the Colorado River in Grand Canyon; since completion of the dam, 3 species have been extirpated, 2 are now listed as threatened and endangered, and 3 species are maintaining adequate populations. Passage of the 1992 Grand Canyon Protection Act (GCPA) was intended to improve resource conditions of the National Park through implementation of an adaptive management program. Over \$150 million of research conducted since 1997 has shown the need for changes to dam operations to improve resource conditions as required by the GCPA. Lack of implementation of the GCPA has resulted in many park resources continuing to deteriorate downstream resources in the National Park. NPS recognizes the need for restorative flows for improving resources within the Park. In December 2016, the Glen Canyon Dam Long-Term Experimental and Management Plan Final Environmental Impact Statement were released (U.S. Department of the Interior, 2016); the goals of which are:

1. Archaeological and Cultural Resources. Maintain the integrity of potentially affected NRHP-eligible or listed historic properties in place, where possible, with preservation methods employed on a site-specific basis.
2. Natural Processes. Restore, to the extent practicable, ecological patterns and processes within their range of natural variability, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems.

3. Humpback Chub. Meet humpback chub (*Gila cypha*) recovery goals, including maintaining a self-sustaining population, spawning habitat, and aggregations in the Colorado River and its tributaries below the Glen Canyon Dam.
 4. Hydropower and Energy. Maintain or increase Glen Canyon Dam electric energy generation, load following capability, and ramp rate capability, and
 5. Other Native Fish. Maintain self-sustaining native fish species populations and their habitats in their natural ranges on the Colorado River and its tributaries.
 6. Recreational Experience. Maintain and improve the quality of recreational experiences for the users of the Colorado River Ecosystem. Recreation includes, but is not limited to, flatwater and whitewater boating, river corridor camping, and angling in Glen Canyon.
 7. Sediment. Increase and retain fine sediment volume, area, and distribution in the Glen, Marble, and Grand Canyon reaches above the elevation of the average base flow for ecological, cultural, and recreational purposes.
 8. Tribal Resources. Maintain the diverse values and resources of traditionally associated Tribes along the Colorado River corridor through Glen, Marble, and Grand Canyons.
 9. Nonnative Invasive Species. Minimize or reduce the presence and expansion of aquatic nonnative invasive species.
 10. Riparian Vegetation. Maintain native vegetation and wildlife habitat, in various stages of maturity, such that they are diverse, healthy, productive, self-sustaining, and ecologically appropriate.
- If these goals are met in the next few years the threat level of this issue could be reduced. Time will tell if this can be accomplished and negative trends can be reversed.

► Other Ecosystem Modifications

High Threat Outside site

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. The closing of the Navajo coal fired power plant adjacent to the park is currently scheduled for 2019. If the plant does close, or is retrofitted to remain open, air quality could improve at the Park over the next few years. However, dust and smoke related to hotter and drier conditions due to a changing climate are continuing to reduce visibility within Grand National Park.

► **Tourism/ Recreation Areas**

High Threat

Inside site, localised(<5%)

Outside site

The Hualapai Tribe on the southwestern corner of Grand Canyon operates a rim development and large helicopter tourism service in lower Grand Canyon. Visitation by air and boat in this reach has increased use intensity and decreased the wilderness values that the Park Service has tried to maintain. At present the development and use in this area is increasing, noise from helicopter traffic is increasingly and adversely affecting natural quiet along the river corridor and into adjacent lands administered by the National Park Service. Impacts from this site could degrade World Heritage site values if use continues to expand in this area. This development is important to the tribal economy so some impacts to the park may be acceptable provided the current level does not significantly increase.

Potential Threats

High Threat

Uranium mining, air pollution, climate change, surrounding development, air tourism, exotic species, infrastructure and operational needs are all future concerns.

► **Droughts**

High Threat

Inside site, extent of threat not known

Outside site

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. With the continued drought, the potential for warming and other regional conditions the restoration of fire is a major challenge. Also, invasion of non-native *Bromus* grasses along the Colorado River has greatly increased fire threats there. Fire was not a prominent process in the pre-dam river, but has become a critical danger in wide reaches.

► **Hyper-Abundant Species**

High Threat

Inside site, scattered(5-15%)

State of Arizona bison management policies have resulted in an estimated 600 bison residing within Grand Canyon National Park. These are non-native bison that also contain significant cattle genes. Impacts to native species and ecologically important springs are increasing and could threaten the park's values on the North Rim. With no solution in the foreseeable future and likely continued rapid growth of the bison population, this is an important emerging issue. The National Park Service is currently conducting an Environmental Assessment for an initial plan to reduce the herd size to fewer than 200 animals. Arizona Congressman Paul Gosar has introduced legislation to allow state-licensed hunters to shoot bison in the national park. Results of any plan to manage the invasive bison within the national park will be unknown for several years, while adverse impacts to natural and cultural resources are apt to continue.

► **Hyper-Abundant Species**

Low Threat

Inside site, localised(<5%)

Outside site

Introduced Rocky Mountain elk are abundant on the South Rim, and exert strong grazing impacts on forest and woodland vegetation, as well as personal and traffic hazards on tourists .

► Invasive Non-Native/ Alien Species

High Threat

Inside site, extent of threat not known

The introduction of 19 non-native fish into the Colorado River poses major, long-lasting impacts on native fish populations. Salmonids, striped bass, catfish, and other taxa consume larval and juvenile native fish, while carp and several other exotic cyprinid species may outcompete native minnows and suckers.

► Mining/ Quarrying

High Threat

Outside site

In 2012, a 20-year uranium mining withdrawal was put in place on 400,000 hectares of Federal lands in the area surrounding the property in order to undertake scientific studies to identify the environmental impacts of mining on the Grand Canyon watershed, which will be used to inform future mining activities (UNESCO, 2016). However, the withdrawal does not cover all lands around the property, and one uranium lease application to the south of the property is located on land that is not included in the withdrawal. There were also 11 uranium mining proposals that were exempt from the withdrawal for the reason that these proposals have valid existing rights under federal law. These raise significant concerns as such mining activities have the potential for considerable direct and cumulative downstream impacts on the property. Furthermore, the current US Administration has suggested minimizing or over-turning the ban on new uranium mining near the Grand Canyon (pers. comms.). It is understood that the federal land managers, environmental groups and indigenous communities all oppose any changes to the withdrawal.

► Other Activities

Very Low Threat

Inside site, localised(<5%)

Outside site

On 31 October 2017, the 23rd Navajo Nation Council voted 16-2 against the proposal to develop the Grand Canyon Escalade project (Navajo Times,

2017). The project proposed to develop a tramway that would descend into the heart of the canyon (UNESCO, 2016). With this Council defeat, this project now poses a very low threat, provided that the proposal is not introduced in another forum.

Protection and management

Assessing Protection and Management

► Relationships with local people

Mostly Effective

The park has a good program for maintaining relations with Native Americans, boundary issues and some conservation programs are not currently resolved and could cause impacts to values.

► Legal framework

Mostly Effective

The legal framework of parks within the National System is very strong, especially for threats within the boundaries of the parks. The NPS Act of 1916 and enabling legislation for the park are strong, as are the regulations found in the Code of Federal Regulations particularly in title 36. Mostly very well managed, key issues are boundaries, implementation of the Grand Canyon Protection Act, abilities to manage aircraft over flights and key external threats.

► Enforcement

Some Concern

Lack of staffing in some areas and political pressures sometimes prevent enforcement of park policies and could diminish values over time.

► Integration into regional and national planning systems

Highly Effective

The planning program for the park is effective and integrated into the

regional and national planning programs.

► **Management system**

Mostly Effective

The park has a General Management Plan, numerous operational plans, is updating a backcountry management plan, is developing a non-native bison management plan, and has a business management plan. The park has a good planning and environmental compliance division that is staffed by professionals and addresses planning and management strategy as needed. Funding and future capacity are potential issues.

► **Management effectiveness**

Mostly Effective

Some areas of controversy like aircraft over flights, management of increasing visitation, bison management, changes in uranium development policy and uncertainty in management support from new government administration, have potential to diminish values, but these concerns are at the effectiveness of decision making at the political level, where congressional intervention on issues of over flights and other operations is always a concern. Site management at the Park Superintendent levels is doing an excellent job.

► **Implementation of Committee decisions and recommendations**

Data Deficient

The Committee examined the property in 2016 and requested an updated state of conservation report from the State Party by 1 December 2017.

► **Boundaries**

Some Concern

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. Mining and commercial tourist development adjacent to park boundaries.

► **Sustainable finance**

Serious Concern

This is a major concern for both staffing and infrastructure.

NPS has recently quantified an annual Operation and Maintenance requirement of \$35 million per year for the facility management operations. The park is only able to fund approximately 30% of this need through ONPS (Operation of the National Park System), reimbursement agreements and project funding, leaving an annual shortfall of approximately \$25 million for FY13. This shortfall is in addition to the \$386 million identified in backlogged deferred maintenance. This lack of funding could threaten historic structures, conservation programs, visitor services and archeological sites in coming years.

► **Staff training and development**

Highly Effective

A good program is in place; GRCA has about 500 employees in an array of conservation and protection fields. Training programs exist at all levels from entry level to management including in law enforcement, interpretation, resource management, cultural resource management, business management and park program management. The park has a reasonable budget for supplies, materials and operations. Continue budget cuts and backlog of facility maintenance could become a concern in future years. Current park leadership is committed to development of employees and developing improvements in organizational effectiveness.

► **Sustainable use**

Mostly Effective

The park has made advancements in sustainability in the last 5 years with good plans and assessments in place.

► **Education and interpretation programs**

Highly Effective

The park has recent quality programs for a variety of opportunities for a

spectrum of visitors.

► **Tourism and visitation management**

Highly Effective

Much improvement has taken place in this area over the past several years.

► **Monitoring**

Mostly Effective

The science and resource division is well managed, the only concerns are future support and funding from DC.

► **Research**

Mostly Effective

A robust research program exists.

Overall assessment of protection and management

Mostly Effective

Current management of the park is mostly effective in addressing issues that are of potential impact to the park. Park leadership is strong and staffing is adequate. Key areas of concern deal with future political support for managing threats like the Operation of Glen Canyon Dam, uranium development and development affecting park resources in the Little Colorado area. In addition the need to maintain infrastructure and operational staffing is an issue that will need to be addressed by national level policy makers.

► **Assessment of the effectiveness of protection and management in addressing threats outside the site**

Some Concern

A number of key external potential threats including Development at the Little Colorado River, Over flights, Uranium Mining, Bison Management, and concerns with management of Glen Canyon Dam as well as problems of water management if drought continues could be difficult to manage. The park has articulated concerns and is addressing all of these issues but support will be needed to overcome threats in future years. The nearly 6

million visitors in 2016 generate approximately \$905 million, and it is anticipated that visitation will stay at the current levels or slightly increase in the future.

State and trend of values

Assessing the current state and trend of values

World Heritage values

► One of the world's most visually powerful landscapes

Low Concern

Trend:Stable

While some concerns exist over development, air quality and other activities, the key resources of the geologic landscape are currently protected.

► Geologic Features and Processes and record of the earths geologic history

High Concern

Trend:Stable

Alteration of the Colorado River and lack of Implementation of significant conservation measures have seen some deterioration of resources since establishment as a World Heritage site but overall these processes remain largely intact. The installation of Glen Canyon Dam outside of the park dramatically altered the Colorado River. Sediment flow as primary geologic and ecological force was reduced severely, changing beaches, and changing the entire riparian system. The temperature of the river was also dramatically altered, extirpating and threatening native fish and leading to a great abundance of exotic fish in its place. Lack of periodic flooding has altered the riparian vegetation. From the geological perspective however, the area affected inside the property is approximately 10,000 acres, and the trend of its condition is relatively stable.

► Superlative scenic beauty of the Colorado River

Good

Trend:Stable

Superlative scenic beauty and unique natural process are generally intact as they were at the time of World Heritage designation.

► **An exceptional example of biological environments at different elevations**

High Concern

Trend:Deteriorating

Some concerns exist for vegetation in the face of climate change, deterioration of habitat for some species like humpback chub, and the invasion of Bison on the north rim. Increased threat of wildfire due to climate change is a concern. The status of more than 85 taxa in the Colorado River corridor has been questioned, with at least 14 vertebrate species extirpated there, as well as several other large wide-ranging vertebrates (including wolves, jaguar, and grizzly bear) from the middle and upper elevations of the Park. The park will have to have the resources to manage and intervene on key threats to insure the protection of the park into the future.

► **An ecological refuge, with relatively undisturbed remnants of dwindling ecosystems and numerous endemic, rare or endangered species**

High Concern

Trend:Stable

The health of life cycle processes varies among sensitive species (e.g. recent loss of breeding endangered southwestern willow flycatchers from the Park). Life zone distribution and responses to climate change require more active monitoring. Many relict and unique assemblages occur within the large altitudinal gradient of the Park, and many are not adequately monitored.

Summary of the Values

► **Assessment of the current state and trend of World Heritage values**

Low Concern

Trend: Stable

While there are a number of potentially significant threats to the long-term values of Grand Canyon National Park, the overall status as it relates to the

time of inception shows general stability. Some significant resources along the Colorado River have continued to decline, but these values were heavily impacted at the time the park was designated and gained status as a World Heritage Site. Some of the key areas of concern include uranium mining, bison increases, development in the park at the Little Colorado area, increases in overflights, continued high equalization flows between Lake Powell and Lake Mead, lack of funding for staff and infrastructure, and major developments at Tusayan. The populations trends of some species are in decline and are beginning to warrant concern that the park and surrounding areas will not eventually serve the needs of the Park.

The trend is good, but not without concerns for changing trends over the next 10 years. Uncertainty exists over effects of climate change, invasive species, and drought-caused wildfires of increasing intensity will need future attention. Some concerns exist for vegetation in the face of climate change, deterioration of habitat for some species like humpback chub, and the invasion of Bison on the north rim. The status of more than 85 taxa in the Colorado River corridor has been questioned, with at least 14 vertebrate species extirpated there, as well as several other large wide-ranging vertebrates (including wolves, jaguar, and grizzly bear) from the middle and upper elevations of the Park. The recent increase in visitation, from 4.5 million to 6 million annually, is putting pressures on the park. If this trend continues and no sustainable solution to visitation occurs, park resources could be negatively affected by unregulated and unplanned development. The park will have to have the resources to manage and intervene on key threats to insure the protection of the park into the future.

Additional information

Benefits

Understanding Benefits

► Sacred natural sites or landscapes

Outstanding natural values including natural sounds, dark skies, clean air,

relative solitude, and wilderness character . 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.

► **History and tradition**

The preservation of the National Parks scientific, natural and wilderness values are significant to contemporary relationship with 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.

► **Outdoor recreation and tourism**

The approximately 6 million visitors to Grand Canyon spent around \$648 million in communities near the park. This spending support 9,779 jobs in the local area and had a cumulative benefit to the local economy of ca. \$905 million (NPS, 2017).

► **Sacred natural sites or landscapes**

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 undeveloped areas in the U.S. 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.

Summary of benefits

Grand Canyon 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 almost exclusively for natural and cultural values. When combined with additional contiguous public and tribal lands, this area comprises one of the largest undeveloped areas in solitude, natural quiet, clean air, dark skies, and a sense of freedom from the mechanized world's rigors. It also offers a refuge and preserved landscape that protects unique scientific values, incredible natural history and geologic landform and unique educational opportunities. It is a unique place for inspiration and connection with World Heritage values. The U.S. Grand Canyon offers outstanding opportunities for visitor experiences including hundreds of trail miles, and 277 river miles.. The regional economic benefits are great and tourism is steady or increasing slightly. The 4.5 million visitors generate an estimate \$750 million in total regional sales and close to 100 million in local sales.

Projects

Compilation of active conservation projects

No	Organization/ individuals	Project duration	Brief description of Active Projects
1	Grand Canyon Trust		Park policy support
2	Grand Canyon River Guides		Sandbar monitoring; interpretation of Park values to the public
3	NPS and partners in water resources and watershed		Water Resources Plan, potential hazards from uranium mining adjacent to park, development of water resources strategy
4	Park Facilities management, concessioners and cooperators		Develop facility management strategy with potential funding remedies
5	Grand Canyon Wildlands Council		Inventory of springs, biota, and management project success

Compilation of potential site needs

No	Site need title	Brief description of potential site needs	Support needed for following years
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1	NPS and cooperators in visitor management	Backcountry Management Plan Overflights Management Plan Stock Use Management Plan
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2	NPS and cooperators in Biodiversity and Climate change	Integrated Pest Management Plan Nonnative Animal Management Plan Climate Change Scenario planning and resource stewardship strategy
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