IUCN Conservation Outlook Assessment 2014 **(archived)**
Finalised on 27 May 2014

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

Great Smoky Mountains National Park

SITE INFORMATION

Country:
United States of America (USA)
Inscribed in: 1983
Criteria:
(vii) (viii) (ix) (x)

Site description:

Stretching over more than 200,000 ha, this exceptionally beautiful park is home to more than 3,500 plant species, including almost as many trees (130 natural species) as in all of Europe. Many endangered animal species are also found there, including what is probably the greatest variety of salamanders in the world. Since the park is relatively untouched, it gives an idea of temperate flora before the influence of humankind. © UNESCO

SUMMARY

2014 Conservation Outlook

Good with some concerns

The park is well managed despite a number of major challenges and threats that will continue to require attention. External threats, i.e., exotic species, air pollution, long term global warming, and future fiscal funding are hard to predict, but would still seem to pose the biggest risk to the Outstanding Universal Value of the site. Some scenic values have been impacted by Hemlock die off as a result of Hemlock Woolly Adelgid and some areas have suffered from very high visitation. Generally speaking however, biodiversity remains high. Strong research and monitoring programs and close partnerships with a range of government and non-government organizations will help park managers understand and mitigate existing and potential threats.

Current state and trend of VALUES

Low Concern
Trend: Stable

Except for the exotic insects that have cause large scale destruction to the Hemlock stands throughout the park that are not accessible by roads, the assessment is generally positive at the present time. Looking toward the future, fiscal funding, exotic species, air pollution and the on-going climate change pose the most serious threats to the OUV of the park.

Overall THREATS

High Threat

Overall the park resources are effectively managed and protected. However, there are a significant number of current threats that fall into the high threat category. These threats originated or currently come from outside the park, including air pollution and numerous plant and animal invasives (insects, trout, wild pigs etc.).

Based on the history of tree mortality in other states, the potential threat of the Emerald Ash Borer (insect) is rated as high. Data is insufficient to rate the threat of Didymo at this time.

Overall PROTECTION and MANAGEMENT

Mostly Effective

Very effective at present. The park has strong relationships with non-profit and volunteer organizations. The park also has very well-developed research and monitoring programs, and good educational and interpretive programs. A large area of the park is managed as wilderness though not yet federally designated as such. The park has successfully responded to air quality issues and worked to address the threat of North Shore Road, which has now been resolved (the new road will not be constructed). However, there is a real threat that budget cuts will interfere with the effectiveness of park resources in the future, including education programs.

FULL ASSESSMENT

Description of values

Values

World Heritage values

► **Exceptional natural beauty**
Criterion:(vii)

The site is of exceptional natural beauty with scenic vistas of characteristic mist-shrouded (“smoky”) mountains, vast stretches of virgin timber, and clear running streams (WHC website). Great Smoky Mountains National Park is one of the most pristine natural areas in the eastern U.S., offering park visitors breathtaking mountain scenery, including panoramic views of misty peaks, clear flowing mountain streams, and mature hardwood forests stretching to the horizon. The Park encompasses 800 square miles of pristine natural areas with peaks that range from elevations of 875 feet to 6,643 feet.

► **Outstanding example of the diverse Arcto-Tertiary geoflora era**
Criterion:(viii)

Great Smoky Mountains National Park is of world importance as the outstanding example of the diverse Arcto-Tertiary geoflora era, providing an indication of what the late Pleistocene flora looked like before recent human impacts (WHC website). The Great Smoky Mountains are believed to be 200-300 million years; making them among the oldest mountains in the world. During the last (Pleistocene) ice age, about 10,000 years ago, the glaciers that scoured much of North America allowed for the migration of species into the Smoky Mountains and because of the unique northeast to southeast orientation of the mountains the glaciers did not invade the Smoky Mountains. This created not only unique mountain features, but also a vast

diversity of flora and fauna that we see today. (IUCN 1982)

► Significant example of continuing biological evolution

Criterion:(ix)

Great Smoky Mountains National Park is one of the largest remaining remnants of the diverse Arcto-Tertiary geoflora era in the world, providing a good indication of the appearance of late Pleistocene flora. The Park is large enough to be a significant example of continuing biological evolution of this natural system and is of the one of the most ecologically rich and diverse temperate zone protected areas in the world (WHC website).

► Diversity of Flora and Fauna

Criterion:(x)

The Great Smoky Mountains National Park is one of the most biologically diverse parks in a temperate climate (WH website).
Animals: Research indicates that there are 65 species of mammals, over 200 varieties of birds, 50 native fish species, and more than 80 types of reptiles and amphibians in the Park. The Park is also home to the world’s greatest diversity of salamander species (31) - an important indicator of overall ecosystem health - and is the center of diversity for lungless salamanders, with 24 species.Within the boundaries of the Park there are a large number of threatened or endangered species; including 2 mammals, 1 bird, 4 fish, 1 arthropod. In addition, there are 15 animal species listed as Federal Species of Concern found in the Park. (GSMP 2012)
Plants: An average of 85” of rainfall annually, the variations in elevation, temperature, and geology provide ideal habitat for over 1,600 species of flowering plants, including 100 native tree species and over 100 native shrub species - a level of floristic diversity that rivals or exceeds other temperate zone protected areas of similar size In addition the park has a vast number of non-flowering plants, including 450 bryophytes-mosses, liverworts, and a few hornworts. Non-flowering species also include some 50 ferns and fern allies and at least one horsetail. There are three federally listed threatened and endangered plant species, and in addition over 300 species of native vascular plants are considered rare. (GSMP 2012)

Assessment information

Threats

Current Threats

High Threat

Overall the park resources are effectively managed and protected. However, there are a significant number of current threats that fall into the high threat category.

► Marine/ Freshwater Aquaculture

Low Threat
Inside site

Rainbow and Brown Trout, introduced from outside the park are competing with native Brook Trout. (Moore et al. 2005)

► Other Biological Resource Use

Low Threat
Inside site

Visitation of 9-10 million annually cause impacts to trails, campgrounds, roads, and other park facilities. Current funding does not allow the proper level of protection personnel to adequately address both frontcountry and backcountry resource and visitor protection issues. (http://www.nps.gov/grsm/parkmgmt/statistics.htm, NPCA 2004)

► Fire/ Fire Suppression

Very High Threat
Inside site
Outside site

The invasive Hemlock Woolly Adelgids, first identified to be in the park in 2002, have killed a large portion of the Eastern Hemlock trees in the park. About 80% of the Hemlock trees in Shenandoah NP and Blue Ridge Parkway

have been killed since the adelgids were first discovered there in the late 1980's, and without successful intervention the Hemlock forests of the Smokies are in danger of going the same route. It is unknown at the present time how this reduction in forest canopy will affect park streams, fire ecology, and the ecosystem as a whole. (NPCA 2004, NPS Briefing Statement 2004)

► Other

Very High Threat

The balsam woolly adelgids were first discovered in the Smokies in the early 1960's, between then and 1990 the park lost over 90% of its mature fir forest from these insects. The park began a study on the surviving trees in 1990 on 36 high elevation peaks to determine the condition and the effects of the adelgids these remaining trees.
http://www.nps.gov/grsm/naturescience/dff109-pest.htm

► Other

High Threat

The high population of wild hogs in the park creates resource damage, competition with native animals for food, introduces diseases, and creates a potential threat to public safety. (NPCA 2004, NPS 2003)

► Invasive Non-Native/ Alien Species

Very High Threat

There are over 380 non-native plant species in the park, 35 of those are aggressive and pose a threat to the park's ecosystems. At least 9 of these species are prolific in the park (Kudzu, Japanese Grass, Privet, Multiflora Rose, Japanese Honeysuckle, Mimosa Garlic Mustard, Oriental Bittersweet, Musk Thistle), and present a significant threat to the ecosystem. (NPCA 2004)

► Air Pollution

High Threat

Air pollutants from power plants, industry, and automobiles outside the park are causing impacts for scenic views, degrading high elevation streams and

soils, damaging plants, and causing human health risk (NPCA 2011, 2004).

Potential Threats

High Threat

Based on the history of tree mortality in other states, the potential threat of the Emerald Ash Borer is rated as high. Data is insufficient to rate the threat of Didymo at this time.

▶ Other

Data Deficient

Didymosphenia geminata, commonly known as Didymo or “rock snot” is an alga that grows in many North American freshwater streams. Once established in streams it forms extensive mats on stream beds, and chokes out other aquatic life. Didymo is not presently known to be in the Smokies, but is found in all tailwater streams in eastern Tennessee. The alga easily attaches to the felt soles of fisherman’s wading shoes and is readily introduced into other streams.
http://www.nps.gov/grsm/naturescience/didymo.htm

▶ Other

High Threat

Emerald Ash Borer, an invasive insect that creates large scale mortality to all species of Ash, and has killed millions of Ash trees in several other states, has recently been found to be present in the Great Smoky Mountains NP.
http://www.nps.gov/grsm/parknews/eab-found.htm.

Protection and management

Assessing Protection and Management

▶ Integration into regional and national planning systems

Highly Effective

Park management has extensive partnerships and close working

relationships with County, State and Federal agencies beyond the National Park Service (NPS 2008).

► Management system

Highly Effective

Existing Park management system is highly effective.

► Relationships with local people

Highly Effective

Key stakeholders, the Friends of the Smokies, Great Smoky Mountain Association, are very supportive of the park. The Smokies has one of the highest number of volunteers of any National Park area, 2,625 volunteers donated 150,308 hours in Fiscal Year 2013. http://www.nps.gov/grsm/parkmgmt/statistics.htm

► Legal framework and enforcement

Some Concern

The legal framework under which the park operates is highly effective. The existing law enforcement effort is also effective, but current and anticipated budget reductions limit the park’s ability to patrol and enforce laws and regulations, and to protect park resources and visitors. (NPCA 2004)

► Management effectiveness

Highly Effective

Park management is highly effective. Park has a large and very active Science and Resource Management Division with active programs in vegetation, wildlife, fisheries, insect, air quality, fire ecology and fire management. Other active programs include All Taxa Biodiversity Inventory, endangered species research and management, invasive species research and management, and re-introduction programs including the successful re-introductions of river otter, Elk, Peregrine Falcon, and three species of small fish. In addition, the Park also operates the Appalachian Highlands Science Learning Center at Purchase Knob for the promotion of scientific research and education (NPCA 2004, NPS 2008).

► Implementation of Committee decisions and recommendations

Highly Effective

Very effective. The State Party was commended for its responsiveness with respect to air quality issues (WHC-02/CONF.202/17) as well as for its work to address the threat North Shore Road (WHC-06/30.COM/7B), and issue that has now been resolved.

► Boundaries

Some Concern

Park Boundaries are well established; even though some sections of the boundary may need re-posting there do not appear to be any immediate issues with boundary issues. Keeping boundary lines cleared and posted takes a considerable amount of time, current funding and staffing does not allow for a lot of time to maintain park boundaries.

► Sustainable finance

Some Concern

Annual budgets rise and fall with different administrations. In the past several years, with the assistance of excellent partners, the Park has generally been able to sufficiently maintain the site’s values. As the federal government seeks to balance its budget, this may become increasingly difficult.
However, the ever shrinking Park budget continues to create management challenges, causing some programs remain underfunded. Being able to utilize funding from park entrance fees would be a major help, however, legislation stipulated by the State of Tennessee in the 1930’s prohibits the park from charging and collecting entrance fees.
(NPCA 2004, NPS 2008)

► Staff training and development

Some Concern

Funding does not allow adequate training needed to train personnel in all elements of their job; especially where lodging and per diem is required.

(NPCA 2004)

► Sustainable use

Mostly Effective

Tourism and the programs designed to facilitate it is largest the sustainable use in the park and the surrounding counties. However, lack of funding threatens some of the programs, i.e., education, protection, and resource management, and without the present level of support from partner organizations these programs would be threatened for further reduction. (NPS 2008)

► Education and interpretation programs

Mostly Effective

As described above, federal funding does not adequately support education and interpretive programs.

► Tourism and interpretation

Mostly Effective

The surrounding areas of the park consider tourism to be the number one source of economic income; education/interpretive programs in the park are designed to support the economic development. Since the park is prohibited from collecting entrance fees, only a portion of fee money from other parks comes to the Smokies.

► Monitoring

Mostly Effective

The park has numerous monitoring programs ongoing. They are effective but funding may impact some programs in the future (NPS 2008)

► Research

Mostly Effective

There is a vibrant research program in the park with numerous research permits issued annually.

Overall assessment of protection and management

Mostly Effective

Very effective at present. The park has strong relationships with non-profit and volunteer organizations. The park also has very well-developed research and monitoring programs, and good educational and interpretive programs. A large area of the park is managed as wilderness though not yet federally designated as such. The park has successfully responded to air quality issues and worked to address the threat of North Shore Road, which has now been resolved (the new road will not be constructed). However, there is a real threat that budget cuts will interfere with the effectiveness of park resources in the future, including education programs.

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

Some Concern

Assessment of the threats is generally effective, but there are many legal and fiscal restraints that limit the extent of mitigation.

▶ Best practice examples

There are numerous examples of best management practices in the park. Examples are the Elk Re-introduction program, Restoration of native Brook Trout, forest fire management, wild hog reduction program, bear management, education and interpretive programs, and resource and visitor protection programs.

State and trend of values

Assessing the current state and trend of values

World Heritage values

► Exceptional natural beauty

High Concern
Trend:Improving

Scenic values are currently being heavily impacted by heavy mortality of Hemlock trees caused by the exotic insect Hemlock Woolly Aldelgid, and from air pollution caused by fossil fuel plants and automobiles outside the park. Other possible future threats include exotic insects, such as, Emerald Ash Borer. However, steps are being taken to address pollution from sources outside the park, and the Tennessee Valley Authority will be phasing out some of the higher emission power plants in the region (NPCA 2011).

► Outstanding example of the diverse Arcto-Tertiary geoflora era

Good
Trend:Stable

Except for occasional rock slides, usually during thawing and rainy periods, these values appear stable.

► Significant example of continuing biological evolution

Low Concern
Trend:Stable

The 390,500 acres that Congress recommended be officially designated as Wilderness have not yet been designated by law, but are nonetheless managed in much the same way as an officially designated Wilderness Area. Now that the North Shore Road issue is resolved it is more likely that official Wilderness designation could be revisited. Again, however, budget is a threat in this category. With the high visitation in the front country the backcountry/”wilderness” areas will most likely take a back seat in management priorities. Nonetheless, and despite a range of threats, the Park benefits from a high degree of intactness.

► Diversity of Flora and Fauna

High Concern
Trend:Stable

There is a loss of some native species from poaching (Ginseng, Trillium, and other flowering and medicinal plants), and exotic pests (especially Hemlock

Woolly Aldelgid) and other introduced insect pest that may threaten in the future pose a major threat. (NPCA 2004) but biodiversity remains very high in the park.

Summary of the Values

▶ **Assessment of the current state and trend of World Heritage values**
Low Concern
Trend: Stable

Except for the exotic insects that have cause large scale destruction to the Hemlock stands throughout the park that are not accessible by roads, the assessment is generally positive at the present time. Looking toward the future, fiscal funding, exotic species, air pollution and the on-going climate change pose the most serious threats to the OUV of the park.

Additional information

Key conservation issues

▶ **Exotic Insect Invasion**
Regional

Currently exotic insects, i.e., Hemlock Woolly Adelgid and other pest pose the largest threat to park resources and ecosystems.

▶ **Exotic Plant Invasion**
Regional

There are currently over 380 non-native plant species in the park, 35 of those are aggressive and pose a threat to the park’s ecosystems.

▶ **Air pollution**
Regional

Air pollution caused by fossil fuels from power plants, and automobiles from

outside the park pose a threat to the park ecosystems and visitors.

▶ Exotic Hog Control

Local

Wild hogs are now found throughout the park. Park managers are most concerned about the hog's destructive effects on natural ecosystems and competition with native species.

▶ Plant Poaching

Regional

Commercial poaching of plants, i.e., Ginseng and other medicinal plants, and the illegal collection of flowering plants and shrubs pose a threat.

▶ Climate Change Impacts

Global

Long term climate change, especially in light of the current heavy mortality of trees from exotic pests, could be the biggest threat to the park OUV in the future.

Benefits

Understanding Benefits

▶ Outdoor recreation and tourism

This is the most visited National Park area in the Nation, and is the key economic stimulus for the local communities.

▶ Contribution to education

Education is a key component of the park values, from in-park education/interpretive programs, to higher education and research programs for colleges and universities. In addition, the Great Smoky Mountain Institute at Tremont Institute, a non-profit organization that provides education programs to promote the ecological, cultural, and stewardship of the GSMNP.

► Outdoor recreation and tourism

With about 10 million visitors annually the Smoky Mountains is the most visited National Park in the NPS, it directly and indirectly generates and supports millions of dollars and thousands of jobs for the local and regional economy.

► Importance for research

The park serves as a benchmark for contrasting the character of largely pristine environments and disturbed areas outside the park boundaries, as well as monitoring long term effects, such as air and water quality, exotic pests and climate change.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	Park staff		Park Superintendent
2	Park staff		Chief, Science and Resource Management: Division chief, manages all projects concerning science and resource management in the park.
3	Park staff		Chief, Resource Education: Division chief, manages all resource education programs in the park.
4	Park staff		Chief, Resource and Visitor Protection: Division chief, manages all resource and visitor protection issues in the park.

Compilation of potential site needs

№	Site need title	Brief description of potential site needs	Support needed for following years
1	N.A.	Park research needs are listed on the park web page www.nps.gov/grsm/naturescience/science_needs.htm	

REFERENCES

№	References
1	All Taxa Biodiversity Inventory (ATBI) (2012), Discover Life In America. Accessed March 2013 http://www.dlia.org/park-species
2	Great Smoky Mountains National Park (GSMP) (2012), Nature and Science. National Park Service. http://www.nps.gov/grsm/naturescience/index.htm
3	Great Smoky Mountains National Park Pest and Disease Monitoring. http://www.nps.gov/grsm/naturescience/dff109-pest.htm
4	Great Smoky Mountains National Park Pest and Disease Monitoring. http://www.nps.gov/grsm/naturescience/dff109-pest.htm
5	IUCN (1982) IUCN Technical Review, Great Smoky Mountains National Park. IUCN, Switzerland. http://whc.unesco.org/archive/advisory_body_evaluation/259…
6	National Park Service (2008). Strategic Plan for Great Smoky Mountains National Park October 1, 2008 – September 30, 2012. http://www.nps.gov/grsm/parkmgmt/upload/2008strategicplanpm…
7	National Park Service Briefing Statement, Great Smoky Mountains National Park, Non-native wild hog control (2003) http://www.nps.gov/grsm/parkmgmt/upload/wildhog.pdf
8	National Park Service Briefing Statement, Great Smoky Mountains National Park, Non-native wild hog control (2003) http://www.nps.gov/grsm/parkmgmt/upload/wildhog.pdf
9	National Park Service Briefing Statement, Response to Exotic Hemlock Woolly Adelgid Infestation, Great Smoky Mountains National Park January 28, 2004 http://www.nps.gov/grsm/parkmgmt/upload/HWA-04.pdf
10	National Park Service Briefing Statement, Response to Exotic Hemlock Woolly Adelgid Infestation, Great Smoky Mountains National Park January 28, 2004 http://www.nps.gov/grsm/parkmgmt/upload/HWA-04.pdf
11	Stephen E. Moore, Matt A. Kulp, John Hammonds, and Bruce Rosenlund (2005) Restoration of Sam’s Creek and an Assessment of Brook Trout Restoration Methods, Great Smoky Mountains National Park. National Park Service U.S. Department of the Interior Water Resources Division, Natural Resource Program Center. Technical Report NPS/NRWRD/NRTR-2005/342 http://www.nature.nps.gov/water/fisheries/assets/reports/gr…

№	References
12	UNESCO (2012) Description of the Great Smoky Mountains National Park, http://whc.unesco.org/en/list/259/.
13	WHC-02/CONF.202/17 (Review State of Conservation Reports) http://whc.unesco.org/archive/2002/whc-02-conf202-17reve.pdf
14	WHC-06/30.COM/7B http://whc.unesco.org/archive/2006/whc06-30com-7bE.pdf