IUCN Conservation Outlook Assessment 2014 **(archived)**
Finalised on 10 June 2014

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

Yosemite National Park

SITE INFORMATION

Country:
United States of America (USA)
Inscribed in: 1984
Criteria:
(vii) (viii)

Site description:
Yosemite National Park lies in the heart of California. With its 'hanging' valleys, many waterfalls, cirque lakes, polished domes, moraines and U-shaped valleys, it provides an excellent overview of all kinds of granite relief fashioned by glaciation. At 600–4,000 m, a great variety of flora and fauna can also be found here. © UNESCO

SUMMARY

2014 Conservation Outlook

Good with some concerns

All in all, the conservation outlook for Yosemite is good with some concerns. The geological features of the site remain intact. Its scenic values also remain mainly preserved; however, increasing visitor use and development have the potential to impact the exceptional natural beauty of the site. The park has the ability to limit visitor use, but external pressure may make it difficult. Without such limits, degradation will occur. Non-native species will also increase over time, and active management will be necessary to stem the influx. But overall, the protection and management system under implementation is adequate and effective and is likely to essentially maintain the site’s values and integrity over the medium-term. Air pollution and climate change remain the most vexing problems because the solution lies outside the park.

Current state and trend of VALUES

Low Concern
Trend: Stable

The geological features of the site remain intact. Its scenic values also remain mainly preserved; however, increasing visitor use and development have the potential to impact the exceptional natural beauty of the site.

Overall THREATS

Low Threat

The current and potential threats to the ecological integrity of the Yosemite World Heritage site are considered to be low.
Current threats to the integrity of the Yosemite World Heritage site include over-development, unregulated day use, air pollution, and fire suppression. Although 94% of Yosemite is Congressionally designated wilderness, the remaining 6% has serious problems with over-development, especially in Yosemite Valley. This

creates a congested urban environment, which encroaches on the natural beauty of the valley and impacts natural ecosystems and disrupts wildlife habitats and corridors. There are no current limits on the number of people that can enter the park each day. With excessive visitor use, a valued resource, such as a sense of solitude, can diminish or even disappear. High levels of air pollutants are beginning to impact park resources and the visitor experience. Precluding the natural role of fire alters ecosystem function and leads to the inevitable fire that has catastrophic effects.
Potential threats to the integrity of the Yosemite World Heritage site include climate change and invasive species. Fires may also increase as climates warm. Climate-induced decreases in snowpack and the concomitant increase in fire severity suggest that fires may become more frequent and more severe.

Overall PROTECTION and MANAGEMENT

Mostly Effective

The protection and management system under implementation is adequate and effective and is likely to essentially maintain the site’s values and integrity over the medium-term. However, it may be insufficient to maintain the site’s values and integrity over the long-term.

FULL ASSESSMENT

Description of values

Values

World Heritage values

- **Unique and pronounced landform features and a unique example of the effects of glaciation on granitic domes**
  Criterion:(viii)

  Glacial action combined with the granitic bedrock has produced unique and pronounced landform features including distinctive polished dome structures, as well as hanging valleys, tarns, moraines and U-shaped valleys. Granitic landforms such as Half Dome and the vertical walls of El Capitan are classic distinctive reflections of geologic history. No other area portrays the effects of glaciation on underlying granitic domes as well as Yosemite does (Statement of Significance, 2006).

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

  Yosemite has exceptional natural beauty, including 5 of the world's highest waterfalls, a combination of granite domes and walls, deeply incised valleys, three groves of giant sequoia, numerous alpine meadows, lakes, diversity of life zones and variety of species (Statement of Significance, 2006).

Other important biodiversity values

- **Rich terrestrial and aquatic biota**

  The variety of flora is reflected in the existence of six distinct vegetation

zones which are governed by altitudinal variation. Notable are three groves of the giant sequoia tree and extensive alpine meadows. There are 1,200 species of flowering plant along with various other ferns, bryophytes and lichens. There is one endemic and eight threatened or endangered species of plant. The park has 67 mammalian species, of which 32 are rodents, 221 species of bird, 18 reptile, 10 amphibian and 11 fish, of which 6 are endemic. One bird species (bald eagle) is endangered and the peregrine falcon is listed as vulnerable. A few non-native species have been accidentally introduced such as beaver and white-tailed ptarmigan. Bighorn sheep were declared extinct in Yosemite in 1914 but were reintroduced in 1986 (Statement of Significance, 2006).

Assessment information

Threats

Current Threats

Low Threat

Current threats to the integrity of the Yosemite World Heritage site include over-development, unregulated day use, air pollution, and fire suppression. Although 94% of Yosemite is Congressionally designated wilderness, the remaining 6% has serious problems with over-development, especially in Yosemite Valley. This creates a congested urban environment, which encroaches on the natural beauty of the valley and impacts natural ecosystems and disrupts wildlife habitats and corridors. There are no current limits on the number of people that can enter the park each day. With excessive visitor use, a valued resource, such as a sense of solitude, can diminish or even disappear. High levels of air pollutants are beginning to impact park resources and the visitor experience. Precluding the natural role of fire alters ecosystem function and leads to the inevitable fire that has catastrophic effects.

▶

Housing/ Urban Areas, Commercial/ Industrial Areas, Tourism/ Recreation Areas

Low Threat
Inside site

Although 94% of Yosemite is Congressionally designated wilderness, the remaining 6% has serious problems with over-development, especially in Yosemite Valley. There, over a thousand buildings are crowded into one end of the 1,428 ha valley (NPS 2012). There are, for example, 1,504 campsites in 18 camp grounds, 210 picnic sites in 24 picnic areas, 3 visitor centers, 6 museums and major exhibits, 2 amphitheaters, 8 Ranger stations, 6 entrance stations (NPS 2012). This creates a congested urban environment, which encroaches on the natural beauty of the valley and impacts natural ecosystems and disrupts wildlife habitats and corridors.

► Tourism/ visitors/ recreation

Low Threat
Inside site

Overnight use is limited by the number of lodging units, designated campsites, and wilderness permits. There are no current limits on the number of people that can enter the park each day. There were 4,098,648 total visits in 2011 (NPS 2012). Out of the 4 million annual visits to the park, approximately 3 million are day visitors (Blotkamp et al. 2010). Private automobiles were used by 69% of all users, while 30% used rental automobiles. This number of vehicles results in serious gridlock during many summer weekend days. With excessive visitor use, a valued resource, such as a sense of solitude, can diminish or even disappear.

► Air Pollution

High Threat
Inside site
Outside site

Ozone levels are a high threat to the site (Kohut 2007). Yosemite has 8-hour ozone concentrations that are consistently at or above the standard of 75 ppb. The ozone W126 index values at 28 ppm-hours during 2007 (NPS 2009). Yosemite also experiences haze levels well above estimated natural conditions and has a significant degrading trend in ammonium

concentrations. Over 60% of the ponderosa and Jeffrey pine trees in the park show evidence of injury by ozone (Durisco 1987). These levels of air pollutants are beginning to impact park resources and the visitor experience.

▶ Fire/ Fire Suppression

Low Threat
Inside site

Although lightning fires are permitted to burn under prescribed conditions in over 84% of the park, many lightning ignitions are suppressed due to concerns about smoke, preparedness levels, and fire fighter resource availability. For example, in 2012, 8 lightning fires were ignited, but only 1 was allowed to run its course, eventually burning only 700 ha. Managed prescribed fires are not able to make up the difference, and fuels continue to build up. Precluding the natural role of fire alters ecosystem function and leads to the inevitable fire that has catastrophic effects (Miller et al. 2012, van Wagtendonk and Lutz 2007).

Potential Threats

Low Threat

Potential threats to the integrity of the Yosemite World Heritage site include climate change and invasive species. A resurvey of sites first established in the 1920s indicates that climate induced changes to small mammal populations might be occurring. Formerly low-elevation species expanded their ranges and high-elevation species contracted theirs, leading to changed community composition at mid- and high elevations. Fires may also increase as climates warm. Climate-induced decreases in snowpack and the concomitant increase in fire severity suggest that fires may become more frequent and more severe.

▶ Habitat Shifting/ Alteration, Temperature changes

Low Threat

A resurvey of sites first established in the 1920s indicates that climate induced changes to small mammal populations might be occurring. Formerly low-elevation species expanded their ranges and high-elevation species contracted theirs, leading to changed community composition at mid- and high elevations. Elevational replacement among congeners changed because

species' responses were idiosyncratic. Though some high-elevation species are threatened, protection of elevation gradients allows other species to respond via migration (Moritz et al. 2008). Fires may also increase as climates warm. Climate-induced decreases in snowpack and the concomitant increase in fire severity suggest that existing assumptions may be understated – fires may become more frequent and more severe (Lutz et al. 2009).

► Invasive Non-Native/ Alien Species

Low Threat
Inside site

Currently there are only 177 non-native plant species in the park, of which 5 are considered invasive (NPS 2012). Efforts are being taken to mitigate those 5 species, but it is estimated that 10 new non-native plants species occur in the park each year. Efforts are also underway to eliminate the bull frog from park waters, but this effort is not sufficiently reducing frog populations. The wild turkey appears to be spreading into the park, and no efforts are currently underway to stop its spread. There are 9 species of non-native fish in 1,939 km of streams in 2 major river systems and in 245 lakes (NPS 2012).

Protection and management

Assessing Protection and Management

► Relationships with local people

Some Concern

Although key stakeholders have been identified, they are not directly involved in site management. Consultations with local Native-Americans occur on an as-needed basis, but are not considered collaborative. Local communities are primarily concerned about sustaining and increasing visitation to the park because their economies have grown dependent on park visitors. This leads to some conflicts with minimizing the impacts of high visitation rates.

► Legal framework and enforcement

Mostly Effective

The site is governed by federal statutes that established the Yosemite National Park, the Yosemite Wilderness, the Tuolumne Wild and Scenic River, and Merced Wild and Scenic River. Other general federal acts cover establishment of the National Park Service, air quality, water quality, environmental policy, wild and scenic rivers, wilderness, endangered and threatened species, historic preservation, and archeological resources protection. These statutes are generally effective in maintain the outstanding universal values of the site, although enforcement of some requirements of these acts is lacking. Specifically, the requirement of the Wild and Scenic Act to establish carrying capacities has yet to be implemented. In addition, the requirement of the California Wilderness Act to manage Potential Wilderness Additions containing the 5 High Sierra Camps as for as practicable as Wilderness is not being met.

► Integration into regional and national planning systems

Mostly Effective

The park participates in service wide planning for national parks, but is much less active in regional and local planning. The only federal interagency planning at the local level deals with fire management and housing. Regional planning for transportation is in effect, however.

► Management system

Mostly Effective

The management system in place is generally adequate to maintain its outstanding universal values. However, it is beyond the capability of the park to influence off-site air pollution sources.

► Management effectiveness

Mostly Effective

The park has a General Management plan approved in 1980 that needs to be updated. Comprehensive river management plans are being written for the Tuolumne and Merced rivers. A wilderness steward ship is just beginning to

be written. Many action plans are in place, but many more need to be written.

▶ Implementation of Committee decisions and recommendations

Data Deficient

Not applicable

▶ Boundaries

Mostly Effective

The boundary encompasses two nearly complete watersheds. However, there is one stream that enters the park from a developed rural area, and portions of the upper watershed of the South Fork of the Merced are on Forest Service lands that are actively managed for timber harvest. In addition, important habitat for migrating species such as mule deer lied outside the boundaries of the park where the deer are subject to hunting. Winter habitat for great gray owls occurs outside the western boundary, and winter habitat for Sierra Nevada bighorn sheep is outside of the eastern boundary. Private lands within the park and immediately on the boundaries of the park are vulnerable to development.

▶ Sustainable finance

Mostly Effective

The budget for the park in 2011 was 29 million USD, which enabled a work force of 1,123 employees in summer and 743 in winter. Because of the extreme pressure placed on this workforce by the high visitation, this budget is not adequate to maintain the integrity and the values of the site. Additional funding is available though a friends association, and this funding goes toward projects that mitigate impacts.

▶ Staff training and development

Mostly Effective

Training and staff development is mostly effective.

▶ Sustainable use

Some Concern

Although good strides are being made to reduce water consumption and

solid waste, conserve energy, and use sustainable products, most targets are set to be met in future years. Steps have been taken to install solar collectors and a biodiesel fuel station.

▶ Education and interpretation programs

Mostly Effective

Education and interpretive programs are mostly effective.

▶ Tourism and interpretation

Some Concern

Too much promotion of the park continues to fuel the ever-increasing visitation levels. Revenues from tourism support an in-park shuttle system and a construction program to upgrade visitor facilities.

▶ Monitoring

Mostly Effective

A comprehensive monitoring program is in place, but results have yet to be evaluated and actions based on those results have not been implemented.

▶ Research

Mostly Effective

A formal research program does not exist, but ad hoc research needs are identified and funded through cooperative agreements with academic institutes and federal research centers.

Overall assessment of protection and management

Mostly Effective

The protection and management system under implementation is adequate and effective and is likely to essentially maintain the site’s values and integrity over the medium-term. However, it may be insufficient to maintain the site’s values and integrity over the long-term.

▶ Assessment of the effectiveness of protection and management in

addressing threats outside the site
Some Concern

The Park is unable to influence off-site air pollution sources.

▶ **Best practice examples**

Solar collectors at the El Portal Administrative site produce 305 of the Yosemite maintenance facility electrical needs.

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **Unique and pronounced landform features and a unique example of the effects of glaciation on granitic domes**
Good
Trend:Stable

Other than some minor quarrying, the geologic features for which the site was designated remain intact.

▶ **Exceptional natural beauty**
Low Concern
Trend:Stable

Some buildings intrude on the scenic beauty, and crowding and traffic congestion can mar the experience of many visitors. Regional haze from outside the park can obscure vistas as well.

Other important biodiversity values

▶ **Rich terrestrial and aquatic biota**

The variety of flora is reflected in the existence of six distinct vegetation zones which are governed by altitudinal variation. Notable are three groves of the giant sequoia tree and extensive alpine meadows. There are 1,200

species of flowering plant along with various other ferns, bryophytes and lichens. There is one endemic and eight threatened or endangered species of plant. The park has 67 mammalian species, of which 32 are rodents, 221 species of bird, 18 reptile, 10 amphibian and 11 fish, of which 6 are endemic. One bird species (bald eagle) is endangered and the peregrine falcon is listed as vulnerable. A few non-native species have been accidentally introduced such as beaver and white-tailed ptarmigan. Bighorn sheep were declared extinct in Yosemite in 1914 but were reintroduced in 1986 (Statement of Significance, 2006).

Summary of the Values

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

Low Concern

Trend: Stable

The geological features of the site remain intact. Its scenic values also remain mainly preserved; however, increasing visitor use and development have the potential to impact the exceptional natural beauty of the site.

▶ **Assessment of the current state and trend of other important biodiversity values**

Low Concern

Trend: Data Deficient

The terrestrial and aquatic biota is largely intact, but extinctions and endangerment have occurred. Non-native invasive plant and animal species pose a potential threat. Climate change has the potential for greatly altering native biota in both the near term and long term.

Additional information

Key conservation issues

▶ **Air pollution**

Regional

Ozone levels are a high threat to the site. Yosemite has 8-hour ozone concentrations that are consistently at or above the standard of 75 ppb. The ozone W126 index values at 28 ppm-hours during 2007. Yosemite also experiences haze levels well above estimated natural conditions and has a significant degrading trend in ammonium concentrations. Over 60% of the ponderosa and Jeffrey pine trees in the park show evidence of injury by ozone. These levels of air pollutants are beginning to impact park resources and the visitor experience.

► Unlimited day use

Local

Overnight use is limited by the number of lodging units, designated campsites, and wilderness permits. There are no current limits on the number of people that can enter the park each day. Out of the 4 million annual visits to the park, approximately 3 million are day visitors. Private automobiles were used by 69% of all users, while 30% used rental automobiles. This number of vehicles results in serious gridlock during many summer weekend days. With excessive visitor use, a valued resource, such as a sense of solitude, can diminish or even disappear.

► Over development

Local

Although 94% of Yosemite is Congressionally designated wilderness, the remaining 6% has serious problems with over-development, especially in Yosemite Valley. There, over a thousand buildings are crowded into one end of the 1,428 ha valley. This creates a congested urban environment, which encroaches on the natural beauty of the valley and impacts natural ecosystems and disrupts wildlife habitats and corridors.

► Fire suppression

Local

Although lightning fires are permitted to burn under prescribed conditions in over 84% of the park, many lightning ignitions are suppressed due to concerns about smoke, preparedness levels, and fire fighter resource availability. Managed prescribed fires are not able to make up the difference, and fuels continue to build up. Precluding the natural role of fire alters ecosystem

function and leads to the inevitable fire that has catastrophic effects.

▶ Climate change

Global

A resurvey of sites first established in the 1920s indicates that climate induced changes to small mammal populations might be occurring. Formerly low-elevation species expanded their ranges and high-elevation species contracted theirs, leading to changed community composition at mid- and high elevations. Fires may also increase as climates warm. Climate-induced decreases in snowpack and the concomitant increase in fire severity suggest that existing assumptions may be understated – fires may become more frequent and more severe.

▶ Invasive species

Local

Currently there are only 177 non-native plant species in the park, of which 5 are considered invasive. Efforts are being taken to mitigate those 5 species, but it is estimated that 10 new non-native plants species occur in the park each year. Efforts are also underway to eliminate the bull frog from park waters, but this effort is not sufficiently reducing frog populations. The wild turkey appears to be spreading into the park, and no efforts are currently underway to stop its spread.

Benefits

Understanding Benefits

▶ Is the protected area valued for its nature conservation?

Yosemite is one of the most acclaimed icons of the conservation movement, nationally and internationally. It stands as the first example of an area set aside by a national government for nature conservation.

▶ Water provision (importance for water quantity and quality)

The 300,000 ha Park, of which 94% is federally designated wilderness, includes two relatively pristine watersheds. These watersheds make a

significant contribution to the water supplies of the san Francisco Bay area and the cities and irrigation districts of the California's central Valley. Unfortunately, the park is marred by two unnecessary reservoirs that could just as easily meet the water needs if built outside the park.

► History and tradition, Wilderness and iconic features, Sacred natural sites or landscapes

Yosemite has been home to Native Americans for millennia. It encompasses their sacred sites and landscapes and continues to be part of their spiritual heritage. In addition, the park is an outstanding area for contemplative reflection, one of the most important values of a protected area. Yosemite Valley and the Wilderness that surrounds it are among the world's most evocative scenery.

► Outdoor recreation and tourism

As the over 4,000,000 million visitors per year can attest, Yosemite is an extremely important for recreation and tourism. It is a major destination for travelers from California, the US, and the world. And contributes substantially to the local and regional economy, especially of the gateway communities.

► Importance for research

The relatively pristine ecosystems of Yosemite represent an outstanding opportunity societies understanding of ecological processes and functions. The opportunity to study the ecological role of fire in an area where lightning ignitions to burn under prescribed conditions is unequaled in the world. The great exposures of geological formations and land forms make Yosemite a destination for geologist to better understand earth forming processes.

► Carbon sequestration, Water provision (importance for water quantity and quality)

The vast expanses and ranges of elevations in the park make it ideal for climate change mitigation and impact amelioration. The fire program has been successful shifting biomass from smaller tress to larger trees, thereby contributing to carbon sequestration. The large pristine watersheds in the park contribute to filtration, groundwater renewal, and maintenance of

natural flows.

Summary of benefits

The Yosemite World heritage site provides many benefits for local, regional, national, and international communities. These values include nature conservation values, spiritual values, recreational values, and values related to naturally functioning ecosystems. Its international acclaim as the icon of nature conservation is uncontested.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	Yosemite National Park		The purpose of the Invasive Plant Program is to protect Yosemite National Park's natural and cultural resources from displacement by non-native invasive plants. Yosemite's large size, just over three quarters of a million acres, can make surveying for and treating invasive plants logistically difficult. This is especially true in remote wilderness. The threat from invasive species is growing and new invasive plant species and populations are found and treated each year. Limited operational resources for invasive plant control make it critical that treatments are efficient and effective and guided by a strategically sound plan.
2	Yosemite National Park		The Fire Management Program reduces risk to park wildland urban interface communities within six to eight years, and to restore park ecosystems within 15 to 20 years. Some of the work which will be done to reduce the risk of unwanted wildland fire in and adjacent to wildland urban interface communities will involve mechanical methods. The primary methods to reduce wildland fire risk and to restore park ecosystems, however, will be prescribed and wildland fire.
3	Yosemite National Park		The Wawona Meadow Ecological Restoration Project took place September through early November 2010, with more restoration work scheduled for 2011. Project goals are to improve meadow hydrology and restore native plant communities and wildlife habitat. Wawona Meadow provides wetland, riparian and upland habitat for a variety of rare and sensitive plant species and wildlife, including two state endangered birds—the willow flycatcher and great gray owl.

№	Organization/ individuals	Project duration	Brief description of Active Projects
4	Yosemite National Park		Restoration of day use areas at Tenaya Lake was completed in 2011. The visitor experience was enhanced with habitat restoration of the east beach area. The trail from the parking lot to the beach was relocated so it no longer crosses a fragile wetland, and native willows and other wetland plants were re-introduced for better soil protection. The new wheelchair-accessible trail includes educational signage highlighting Tenaya Lake's sensitive ecology, recreational history and trail systems. Picnic areas were restored, and include the addition of long communal tables
5	Sierra Nevada Network		The Sierra Nevada Network Inventory and Monitoring Program is one of 32 National Park Service Inventory & Monitoring networks across the country established to facilitate collaboration, information sharing, and economies of scale in natural resource monitoring. The Sierra Nevada Network comprises Yosemite, Sequoia, and Kings Canyon national parks and Devils Postpile National Monument. Network personnel work closely with each park's natural resources program to develop and implement long-term monitoring and provide sound scientific information to park managers
6	Yosemite National Park		Air Quality Monitoring Program in Yosemite National Park, in cooperation with state and other federal agencies, monitors the damage caused by air pollution with a comprehensive, science-based air resources program. This program targets major air pollutants and impacts potentially affecting Yosemite's visitors and ecology.
7	Yosemite National Park		The High Elevation Aquatic Ecosystem Recovery and Stewardship Plan will guide the next 15 years of NPS management actions to protect and restore the park's high elevation aquatic ecosystems. Management actions will be designed to protect these ecosystems from future threats and will restore the diversity and distribution of species to increase the resiliency of these ecosystems.
8	Yosemite National Park		The park has instituted a program to limit the number of day users to Half dome. With a use limit of 300 people per day, use on the Half Dome Trail is expected to generally provide free-flowing conditions, with a maximum of 36 people at one time on the cables. Descent from the summit to Sub Dome during mass evacuations at maximum use levels is estimated to take 47 minutes. Keeping use limits at 300 would better allow hikers’ to manage their own personal risk than under the no action alternative. Additionally, targeted safety information during the permit process could increase hikers’ knowledge of the risks associated with the Trail as well as strategies to manages those risks
9	Yosemite National Park		In accordance with the Wild and Scenic Rivers Act, the National Park Service is preparing the Tuolumne Wild and Scenic River Plan for the segments of the Tuolumne River corridor within Yosemite National Park. The plan will analyze a range of approaches for managing the visitor experience, facilities, and natural and cultural resources within the wild and scenic river corridor

№	Organization/ individuals	Project duration	Brief description of Active Projects
10	Yosemite National Park		Meadow restoration has taken place in numerous locations throughout Yosemite Valley. Since the early 1990s efforts have been made to remove multiple trails, replace asphalt trails with boardwalks in seasonally flooded areas, eliminate old drainage ditches, and remove old road beds. The actions improved the crucial hydrologic function of the wet meadows. Additionally, park resource managers and volunteers have removed numerous invasive plants, most notably Himalayan blackberry, allowing for resurgence of native plants. The Stoneman Meadow asphalt removal project and the Stoneman Meadow boardwalk building project encompass a total restoration area of 26 acres. The Cook's Meadow project restored 42 acres.
11	Yosemite National Park		The Merced River Plan will provide overarching guidance for river protection within the Merced Wild and Scenic River corridor inside Yosemite National Park and the El Portal Administrative Site. The National Park Service is committed to a collaborative, interdisciplinary planning approach, rooted in public comment. Our planning process is leveraging the best available science and technology to create an implementable comprehensive management plan.

Compilation of potential site needs

№	Site need title	Brief description of potential site needs	Support needed for following years
1	.	Day use limits need to be established for all areas of the park including a means for implementing the limits.	
2	.	Trend information is needed ozone injury, nitrogen deposition, and the role the ecosystem plays in nitrogen sequestration and dynamics.	
3	.	The long term effects of not being able to restore fire to its natural ecosystem role need to be determined.	
4	.	Additional studies need to be conducted on the effects of climate change and the potential for Yosemite to absorb that change.	
5	.	Additional information is need on the potential for invasive species to become established in the park.	

REFERENCES

№	References
1	Blotkamp, A., B. Meldrum, W. Morse, and S.J. Hollenhorst. 2010. Yosemite National Park visitor study , summer 2009 . Park Studies Unit, Visitor Services Project Report 215. University of Idaho, Moscow Idaho, USA.
2	Duriscoe, D.M., 1987. Evaluation of ozone injury to ponderosa and Jeffrey pines in Yosemite National Park, 1985 survey results. National Park Service, Air Quality Division, Denver, Colorado, USA.
3	Kohut, R. 2007. Assessing the risk of foliar injury from ozone on vegetation in parks in the U.S. National Park Service's Vital Signs Network. Environmental Pollution 149: 348-357.
4	Lutz, J. A., J. W. van Wagtendonk, A. E. Thode, J. D. Miller, and J. F. Franklin. 2009. Climate, lightning ignitions, and fire severity in Yosemite National Park, California, USA. International Journal of Wildland Fire 18: 765-774.
5	Miller, J.D., B.M. Collins, J.A. Lutz, S.L. Stephens, J.W. vanWagtendonk, and D.A. Yasuda. 2012. Differences in wildfires among ecoregions and land management agencies in the Sierra Nevada region, California, USA. Ecosphere 3(9): art80.
6	Moritz, C., J.L. Patton, C.J. Conroy, J.L. Parra, G.C. White, and S.R. Beissinger. 2008. Impact of a century of climate change on small-mammal communities in Yosemite National Park, USA. Science 322: 261-264
7	National Park Service. 2009. Air Quality in National Parks 2008 Annual Performance & Progress Report. Natural Resource Report NPS/NRPC/ARD/NRR—2009/151. Natural Resource Program Center, Denver, Colorado, USA.
8	National Park Service. 2012. Yosemite National Park web site. http://www.nps.gov/yose/parkmgmt/statistics.htm. Accessed 12 December 2012.
9	Wiezcorek, G.F., and J.B. Snyder. 2004. Historical Rock Falls in Yosemite National Park, California. US Geological Survey Open-File Report 03-491. US Geological Survey, Reston, Virginia, USA.
10	van Wagtendonk, J. L., and J. A. Lutz. 2007. Fire regime attributes of wildland fires in Yosemite National Park. Fire Ecology 3(2): 34-52.