Sagarmatha National Park

2020 Conservation Outlook Assessment

SITE INFORMATION

Country: Nepal
Inscribed in: 1979
Criteria: (vii)

Sagarmatha is an exceptional area with dramatic mountains, glaciers and deep valleys, dominated by Mount Everest, the highest peak in the world (8,848 m). Several rare species, such as the snow leopard and the lesser panda, are found in the park. The presence of the Sherpas, with their unique culture, adds further interest to this site. © UNESCO

SUMMARY

2020 Conservation Outlook

Finalised on 02 Dec 2020

Sagarmatha National Park was one of the earlier sites to be inscribed onto the World Heritage List and remains a globally iconic place of scenically arresting grandeur. The property has become an increasingly popular tourism destination especially among trekkers and mountaineers who today take advantage of the improved access afforded by aircraft. The property is suffering from a suite of long-standing and growing threats related to tourism impact (uncontrolled development, pollution, waste management, energy demand, introduction of donkeys for transport and intrusive aircrafts), deforestation, unsustainable resource extraction, poaching and disruption to Sherpa social structures. Climate change impacts are poorly understood but known to be affecting fire frequency and severity, as well as glacier melting expanding glacial lakes, which heightens the risk from glacial lake outburst flooding (GLOFs). Management responses to the problems are commendable, but failing to keep pace with the pressures on the Park. The latest Management Plan covering the period 2016 to 2020 was not presented for consideration by the World Heritage Committee until 2018 and although it proposes to investigate limits of acceptable change, it does not begin to address the urgent need to suppress the alarming increase in visitation. The questionable construction, without an assessment of its operation on the property, of the Kongde View Tourist Resort in 2005 gave an impression that tourism was not being effectively planned and managed, and the failure of the current plan to anticipate a projected increase in visitation maintains that impression.
FULL ASSESSMENT

Description of values

Values

World Heritage values

- **Dramatic high mountain scenery and superlative natural phenomena including the planet's highest mountain**
  
  Sagarmatha National Park is an exceptional area of natural beauty with superb natural phenomena that includes dramatic mountains, glaciers and deep valleys. The area contains Mount Sagarmatha (Everest), which is the highest peak in the world (8,848 m above sea level), and seven other peaks over 7,000 m (World Heritage Committee, 2014).

- **Geological features of outstanding scenic value**
  
  The site represents a major stage of the Earth’s evolutionary history and is one of the most geologically interesting regions in the world with high, geologically young mountains and glaciers creating awe-inspiring landscapes and scenery dominated by the high peaks and corresponding deeply-incised valleys (World Heritage Committee, 2014).

Other important biodiversity values

- **Rare species**
  
  Sagarmatha National Park (SNP) is home to several rare species including the snow leopard, the musk deer and the red panda, as well as containing the world’s highest ecologically characteristic flora and fauna (World Heritage Committee, 2014).

- **Intricate linkages of the Sherpa culture with the area**
  
  SNP has ten villages housing over 3000 Sherpas who have inhabited the region for the last five centuries. There has been a continuation of Sherpa traditional practices both cultural and religious, which includes the restriction of animal hunting and slaughtering, as well as the protection of many sacred forests and other sacred natural sites, and traditional management of community forests and grazing areas. The entire national park is regarded by Sherpas as a sacred valley (beyul), in which all wildlife is protected. These practices strongly contribute to the successful conservation of SNP (World Heritage Committee, 2014).

Assessment information

Threats

**Current Threats**

It must be acknowledged that there is no serious threat to the core World Heritage value – an example of superlative and exceptional natural beauty, which is embedded in the vivid mountains, glaciers, deep valleys and majestic peaks including the world’s highest peak. However, tourism numbers have increased alarmingly with resultant significant impacts from peak-season overcrowding, developments and waste disposal, including litter and human waste. Coupled with increasing tourism is the increasing use of helicopter access, which impact on the property’s natural quiet system, the sense of remoteness and its
scenic value. The property also has associated biodiversity values and the intricate linkages of the Sherpa culture with the ecosystem form the basis for the sustainable conservation of the natural resources, which in turn contributes to the wellbeing of the local Sherpa communities. These associated values are under threat by the very dramatic increase in tourism. The legal dispute over the operation of the Kongde View Resort within the property has been legally resolved, but its continued operation and increasing environmental impacts sets a poor precedent for tourism management within the site. Importantly, the 2016 IUCN Advisory Mission realized that the access track that services the resort bisects an extremely sensitive and ecologically intact and biodiversity rich part of the property. The use of donkeys for transport and the unsustainable use of Park resources for infrastructure adds to the increasing concerns. The Management Plan acknowledges these threats and provides a broad range of proposed actions required to mitigate against impacts of tourism, but the property's management capacity to effectively undertake these actions in view of the alarming increase in visitation is yet to be tested.

**Tourism/ Recreation Areas**

*High Threat*

*Inside site, scattered (5-15%)*

The operation of two commercial lodges/resorts (the Kongde Hotels), which were believed to be within the property, and the protracted legal process concerning their future has been a concern since their construction in 2005. The legal proceedings within the Supreme Court of Nepal were finalized in 2019 with the court finding in favour of the resort owners (State Party of Nepal, 2019; Sapkota, 2019). The 2016 IUCN Advisory Mission noted that some stakeholders believed that documentation used to prove ownership of the area had been obtained illegally, while another report published online present the view that while such documentation may be legal they were the result of a corrupt process (IUCN, 2016; UNESCO, 2018; Sapkota, 2019). The operation of this facility at 4,200 m above sea level within the property is inappropriate and creates an unfortunate precedent for other tourism operators (UNESCO, 2014). Further inappropriateness is evidenced by the observation by the 2016 mission that the trail to access and service the hotels bisects an extremely sensitive and ecologically intact biodiversity rich part of the property. The mission report concludes that the trail has more impact on the property’s Outstanding Universal Value (OUV) than the two hotels (IUCN, 2016; UNESCO, 2018), and operation of the hotels seems to be a significant element if there is increased helicopter operations affecting the aesthetic amenity of the property.

**Mining/ Quarrying**

*Rock extraction*

*Low Threat*

*Inside site, localised (<5%)*

*Outside site*

Whilst the original park management plan advocated as a condition of rock extraction that rehabilitation and restoration planting be part of the approval process, it appears that this has largely not been undertaken (IUCN Consultation, 2014) and the 2016 IUCN Advisory Mission notes significant impacts from quarrying activities within the property (IUCN, 2016). The mission accepted that the utilisation of local rock for construction purposes is unavoidable and justifiable, but took the position that rock should be sourced from outside the property where feasible, and that no rock extraction for commercial or industrial purposes should take place within the property. It further notes that there are significant areas of disturbance, which should be subject to site restoration and rehabilitation measures. Site restoration would be a reasonable condition when approval for rock extraction is given, and this should be supported by some form of financial bond to ensure that all of the conditions of permits are observed. The mission recommended that the State Party include in the 2016-2020 Management Plan a specific section on quarrying, which details the conditions for quarrying both within (where unavoidable) and outside the property and specifies a restoration and site rehabilitation standard (IUCN, 2016). However, neither the Management Plan nor the two subsequent State Party’s State of Conservation reports have addressed the issue of quarrying or the recommendations of the 2016 IUCN Advisory Mission (State Party of Nepal, 2017; 2019).

**Logging/ Wood Harvesting**

*Firewood collection*

*Very Low Threat*

*Inside site, localised (<5%)*

*Outside site*

Whilst it has been reported that there has been some decline in firewood collection, some of the highest forests closest to Mount Sagarmatha (Mt Everest) are reported to still be under severe threat from
tourism development and village firewood use. The forests on the left bank of the Imja Khola (river) supply the major village of Pangboche and all of the alpine hotels en route to Everest Base Camp (IUCN Consultation, 2014). The State Party reports that the growing number of tourists puts pressure on the need for fuel wood for both cooking and heating and this may have a direct impact on existing forests (State Party of Nepal, 2014). Consequently in 2016, the World Heritage Committee expressed concern that firewood collection is not comprehensively addressed in the draft Management Plan other than promoting alternative energy and an Advisory Mission was tasked with investigating the issue. The 2016 IUCN mission noted that the availability of reticulated power within the property and buffer zone had significantly reduced the use of firewood and the 2018 State of Conservation report notes that the Buffer Zone Management Committee has totally banned firewood collection in the Namche area and that enforcement patrols had not detected any illegal activity (State Party of Nepal, 2017).

Flight Paths

(Increased use of aircraft)

There has been an increase in the use of aircrafts, in particular helicopters, due to an increase in the numbers of tourist who require access to the site (IUCN Consultation, 2014). Increased use of aircrafts impact the visitor amenity of the site. The 2016 IUCN Advisory Mission observed that helicopter flights to various locations within the property commenced as early as 6 am and continued almost unabated for more than ten hours on some days. Between four and seven helicopters operating is the norm. The report further notes marketing and promotion for a wide range of helicopter-supported activities within the property include skydiving, rescue operations, medical evacuations, sightseeing, general cargo activities and a “taxi service” between a variety of locations within the property (IUCN, 2016). Considering that the property was inscribed on the World Heritage list under criterion (vii) to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance, the mission considered that the “aesthetic importance” component of the property’s OUV is compromised by the unrelenting noise and visual impacts directly caused by uncontrolled and unregulated helicopter use (IUCN, 2016). While some helicopter use is justified, particularly in relation to emergency situations, it is conservatively estimated that as much as 70% of the helicopter traffic within the property (as opposed to the buffer zone) is for sightseeing, shifting freight and tourism-related commercial use. Weary trekkers with the right type of insurance also use helicopters to get back to the airport. There are even reports of climbing expeditions at the Everest Base Camp dispatching helicopters to fetch ice-cream from Kathmandu. While this may be just an ‘urban myth’ there is clearly a perception among stakeholders that there is improper use of helicopters within the property. A search of the internet reveals several tour operators promoting helicopter tours varying from one to four hour sight-seeing tours through to multi-day trek-in/fly out options. Despite these reports and observations, the State Party reported in 2017 and reiterates in 2019 that: “Helicopters are used for rescue and relief works. There are random checks of rescue operations [...] to validate that the helicopter flights are a real rescue flight. DNPWC and SNP Authority conducted the meeting regularly for regulating the helicopter flights”. While the property’s management authority appears to be reluctant to address the problem there is clearly a significant issue with the impact of helicopters on aesthetic values, but there has been no consideration of the potential impact on significant wildlife, particularly on snow leopards.

Temperature extremes

(Increase in temperatures)

The State Party reports that climate change has resulted in an increase in the number of days without precipitation and coincides with an increase in forest fires particularly in the pine forests (State Party of Nepal, 2014). The property’s mid and lower altitudes are comprised of several fire-dependent ecosystems, which are beginning to be better understood, yet it is considered that changes in the natural fire regime within the property could have a significant impact on most of conservation values. The 2016 IUCN Advisory Mission considered that the use of helicopters and associated fire-fighting equipment is required to address threats to the property from increased fire frequency or intensity. The mission therefore made recommendations to the State Party to investigate the possibility of using helicopters for fire-fighting purposes and to ensure that the new Management Plan takes account of the contemporary fire ecology principles and management and capacity building for both helicopter pilots and on the ground staff (IUCN, 2016). While the Management Plan does not specifically include the use
of helicopters in the suppression of forest-fires, it does provide appropriate strategies for the prevention and suppression of forest-fires.

- **Solid Waste**
  
  (Tourism related litter)

  The large increase in trekkers and mountaineers has created a need for more efficient means of human waste disposal, however, there is a lack of funding to meet this increasing need. The local NGO, Sagarmatha Pollution Control Committee (SPCC) is the body responsible for monitoring waste management by mountaineering expeditions and supporting base camp clean-up campaigns. It also has responsibility for waste management programs and environmental education programs for the local villages (IUCN Consultation, 2014; UNESCO, 2014). The 2016 IUCN Advisory Mission concluded that, apart from the management of human waste, the efforts being made by the SPCC are adequate, although it did not address the issue of funding for this important management issue. The mission recommended that the State Party support, in both policy and financial terms, SPCC’s efforts to develop sustainable waste management strategies and facilities (IUCN, 2016). The State Party has noted that SPCC constructed solid waste containers along trekking routes and that 10,000 kg of garbage were collected from the Everest region in 2018 for further disposal. The State Party further notes that it has been providing technical, financial and legal assistance to SPCC as required to effectively implement waste management in the property and its buffer zone (State Party of Nepal, 2019). Third party sources indicate that the 10,000 kg reported above was in fact the result of one specific rubbish removal expedition in 2018 to remove historical rubbish and that a further 35,000 kg still on the mountain is targeted for removal in 2020. The State Party is proposing, in the face of strong opposition from the Sherpa population, to use the Army for the task. The Sherpas believe that the army does not have the skills to tackle the problem (Radio New Zealand, 2020). It is critical to note here that the 2016 IUCN Advisory Mission assessment was based on the SPCC dealing with an average annual visitation level of 30,000 (2014-2016), whereas the average visitation for the years 2018 and 2019 was 57,000: an increase of almost 100% in just three years. This level of visitation increase exerts enormous strains on every aspect of visitor management, particularly waste management in remote areas. Of notable importance is the notation that the State Party is reportedly asking for a US$400 deposit, which is returned if climbers bring their waste back with them (Radio New Zealand, 2020). Whilt the creation of a network of litter collection bins along the Everest Base Camp trail is positive, the major problem is open pits or landfills that are often hidden from the visitors, but everything dumped there are burned without separating recyclable and materials containing toxic chemicals. Positive changes have however also been made such as removal of open defecation areas, bottles are banned, and most importantly, trails are in much better condition than before. This shows that the local communities are doing the best they can, but removing these recyclable and hazardous materials from the SNP is also a costly job. Optimism is also high because the newly empowered Khumbu Pasang Lhamu Rural Municipality has much needed resources as well as clear mandate to address solid waste, along with the basic services such as education, health, tourism, agriculture, and public safety at the level proportionate to the SNP.

- **Identity/social cohesion/ changes in local population and community that result in negative impact**
  
  (Changes in local population and community)

  With a dramatic increase in tourism has come a change in the demographic profile of the traditional Sherpa residents of the Park, with many people relocating to Kathmandu as they have become wealthier from servicing tourism. This appears to have resulted in the remaining Sherpa population tending to be made up of older and younger people with fewer in the middle-aged bracket (IUCN Consultation, 2014). The 2016 IUCN Advisory Mission noted a transition from families offering basic food/lodging to trekkers to the present day lodges with deluxe to super deluxe suites. Basic facilities and services have been replaced by Wi-Fi internet, room service, laundering, hot shower, restaurant, bar services and bakeries (IUCN, 2016; Mu et al., 2018). During the peak seasons (Oct/Nov and Mar/Apr) the demand for accommodation exceed the supply. The mission further noted that there were some 600 lodges within the property and lodge owners compete for business by offering accommodation at little or no cost on the condition that guests purchase their meals at the place where they are staying. This unsustainable business practice contributes to environmental degradation because lodge operators then have to cut
corners in terms of solid waste disposal, garbage, etc. Another concern is the increase in owners of land within the buffer zone who build lodges and then lease them to “non-residents”. These arrangements are generally made with people who have come from outside the area with little sensitivity to cultural or environmental values, and need to generate significant revenue to pay the owner, purchase fuel and food, and pay service staff. The mission recommended that the State Party provide information on the number and capacity of lodges located within the property and its buffer zone, and note whether they are operated by the owners or are leased (IUCN, 2016). The State Party has not responded in either the 2017 or 2019 State of Conservation reports.

**Water Pollution, Household Sewage/ Urban Waste Water**

*Increasing human waste and inappropriate treatment practice*

The management of human waste was a concern raised in the 2016 IUCN Advisory Mission, i.e. sealed containers of human waste are transported to Lobuche (about one day’s walk from the base camp) and disposed of in an open pit. The potential for the pit to leach contaminants and untreated waste into adjacent watercourses is very real (Nicholson et al., 2018). The mission recommended that the State Party instigate a feasibility assessment on options for dealing with the treatment and disposal of human waste in the upper part of the property (IUCN, 2016). The Management Plan notes that the pollution problem is now no longer confined to solid waste. The water sources along the major trails are being contaminated from improper effluent discharge, human waste, and garbage dumping (Nicholson et al., 2018). Sewerage and toilet waste can be found piped into the nearby streams and rivers. It provides for the Park authority to actively participate in controlling various forms of pollution, and will attempt to make the control system more sustainable by involving the local people with support from the other stakeholders. Similarly, it will focus on reducing waste generation and proper disposal systems. Noting that these comments and strategies to address the problem was based on a visitation of 30,000 per year (the Management Plan provides no projection of increased visitor numbers for planning period), the dramatic increase in visitation from 2016 to 2019 is a very serious concern for human waste management. While it is noted by the 2016 IUCN Advisory Mission that human waste in the villages and lodges is treated in septic tanks, the extreme variance in the pressure on these systems (70% in just 16 to 20 weeks of the year during peak-season) combined with a 100% increase in visitation in just three years, indicates an urgent need to assess the capacity of the existing septic tanks to effectively treat the load being imposed on them.

**Other Ecosystem Modifications**

*Increased use of donkeys for transport into the property*

From around 2011, donkeys have been increasingly used to transport freight (building materials and tourism supplies) into the property, causing damage to local trails and creating intensive grazing pressure on native flora in some areas. Photographs on the internet show donkeys as far up as the Everest Base Camp. The 2016 IUCN Advisory Mission notes that there were about 500 registered donkeys, plus as many as 500 unregistered donkeys, operating within the property and its buffer zone. Groups of up to 60 donkeys are commonly encountered along trails in the property resulting in delays of up to one hour for visitors to traverse narrow sections of the trail. The mission report further notes that as well as causing congestion for visitor movement the donkeys excrete a significant amount of dung, which attracts flies and emits an unpleasant odour (IUCN, 2016). The mission recommends that the State Party collaborate with the Buffer Zone User Committees to formulate and implement measures to better manage the use of donkeys. The State Party’s subsequent reports are silent in regard to the Advisory Mission concerns about impact by donkeys.

**Tourism/ visitors/ recreation**

*Very high rate of increased tourism use *

Visitation has grown from around 4,000 in the 1970’s to an estimated 35,000 visitors in 2014/15 (IUCN, 2016). Following the 2015 earthquake this dropped to 25,000 in 2016, but rebounded to a reported 58,000 in 2019 (State Party of Nepal, 2019). Assessing the potential impact of such dramatic growth is made more difficult by the complex nature of visitation to Sagarmatha National Park.

i) - As visitors stay for around 12 days on average the number of ‘visitor impact days’ (in 2014/15) was
ii) - Further complexity comes from the number of non-tourist support crew in the form of guides, porters, cooks etc. who also impact on the property. It is generally accepted that each organised tour visitor is supported by a support crew of three, while visitors that organise their own trek usually hire the services of two porter/guides. Based on a formula provided by the Nepal Mountaineering Association, the Advisory Mission estimated that the number of total user days (tourists plus support crew) for 2014/15 would be have been 1,735,000 (2,871,000 in 2019).

iii) - 70% or more of the visitor pressure is concentrated during two 8-10-week periods (the autumn and spring seasons) when visitors experience overcrowding.

It is not yet known how this alarming increase in the number of users and their impact on garbage disposal, human waste management, general sanitation, trail erosion, overcrowding at monasteries and religious sites, congestion on trails and bridges and excessive noise are affecting the natural ecosystem.

The 2016 IUCN Advisory Mission recommends that the State Party establish an appropriate carrying capacity, particularly for peak periods, and to implement an objective analysis of a wide range of protected area management considerations (IUCN, 2016). The Management Plan provides a broad range of objectives and well considered strategic actions to address the threat of the increasing tourism on the property. While it does not directly address the recommendation to establish a 'carrying capacity' for the property, it does propose to study the impact of tourism on ecological aspects to determine the Limits of Acceptable Change to help in devising a site-specific method for regulating tourism.

Habitat Shifting/ Alteration
(Increasing temperatures are leading to accelerated melting of glaciers)

The melting glaciers issue is highlighted in the Management Plan, which notes that the impact of climate change on the property is related to avalanches, debris-flow, glacial lake outburst floods, glacial fluctuations and glacial surge. If appropriate measures are not taken to minimize the risk, the impact of climate change could have devastating impact upon the flora and fauna of the property and the melting of glaciers is affecting its outstanding scenic value. The Management Plan recommends the establishment of monitoring and early warning systems and the artificial draining of glacial-lakes to help avoid disasters (DNPWC, 2016).

Hunting and trapping, Collection of non-timber forest products (NTFPs)
(Wildlife poaching)

The Management Plan notes that while killing of wildlife species by the local people is not common practice, crop depredation by Himalayan Tahr and livestock killing by Snow Leopard are frequently reported and retaliatory killing of Tahr and Leopards is a concern. The Plan also notes that poaching continues to be a threat as market value for illegal wildlife parts exists; poaching of musk deer for illegal trade of its musk pod is one of the major challenges for management. The Plan provides for substantial input to patrolling and monitoring to suppress this threat which, compounded by the impacts of tourism and climate change, poses a serious threat to important wildlife species of the property (DNPWC, 2016).

Collection of non-timber forest products (NTFPs)
(Livestock grazing and collection of NTFPs)

The area of the property between 3,500 m and 5,000 m altitudes are dominated by shrubs and grass cover, which are used for livestock grazing and collecting fodder, wild foods, medicinal and aromatic plants. Despite rangelands’ understood significance, there is inadequate information on their present management status. It has been reported that the rangelands in and around the property have come under increased pressure of human interventions and irregular grazing in the recent years. While settlement of grazing rights in the Himalayan Parks often leads to conflicts and controversies, it is not possible to achieve a complete ban on livestock grazing in the Himalayan protected areas. The major issues are: (i) inadequate research related to high elevation rangelands; (ii) unmanaged livestock grazing, leading to wildlife vs livestock competition; and (iii) the risk of transferring disease from the livestock to the wild animals and vice versa. The Management Plan for the site notes the need for health
monitoring and surveillance for the wild animal diseases to be done regularly (DNPWC, 2016).

**Water Pollution, Household Sewage/Urban Waste Water**

*(Pollution of the highland lakes by increased human incursion)*

Conservation of high mountain wetlands has become an increasingly significant global issue in recent years, especially given that these wetlands function as water towers for the world. They are important resting sites and habitats for a significant number of migratory and some resident water birds. The high-altitude flora and fauna are important for global biological diversity as there are very few other places where life exists at such unique high altitudes. In Nepal, very limited studies and research have been conducted focusing on high mountain wetlands. There is paucity of information, therefore, making it difficult to get a clear idea on their status especially with regards to the threats and their management. The wetlands of the Sagarmatha National Park, listed as a Ramsar site in 2007, cover an area of 7,700 ha. Out of the cluster of six lakes, Gokyo is the most important wetland, and is believed to be the abode of snake-god, and is, therefore, culturally important. The local people are also dependent on the site for ecotourism, which is the main economic activity of the people living there. The major threats to the wetlands are garbage and sewage left by visitors because of unregulated tourism, water pollution, over-grazing of pastures, unsustainable harvest of natural resources and impact of climate change. They are compounded by an inadequate understanding of the wetland systems and multiple ownership with poor institutional mechanisms to coordinate management (DNPWC, 2016). The Management Plan proposes to prepare an inventory of wetlands and conduct assessment and monitoring of the lakes to keep them free from pollution and to strengthen awareness programs for conservation of the wetlands. The rapid increase in tourism would be increasing the impact of garbage and sewage pollution beyond the capacity of management to implement effective intervention measures.

**Potential Threats**

*Climate change impacts on the high mountain ecosystems of the property remain poorly understood but a growing body of literature on the SNP clearly suggests that the property faces some emerging challenges posed by glacier recession, glacial outburst floods (both glacial lake outburst flood as well as other floods related to glacier melting). The site Management Plan should actively consider these threats and risks along with (potentially) changing fire regime. The increasing use of donkeys and the risk of introducing invasive plant species through their feed must be addressed as a matter of priority. The financial success of some locals through the tourism business is bringing about cultural change as local Sherpas are being replaced, voluntarily it must be noted, by people whose cultural beliefs and notion of the landscape may not mirror those of the Sherpas. Poaching may become more prevalent, particularly so because this new community, entirely dependent on the tourism economy for its survival, may turn to poaching of wildlife in order to survive the economic fallout in case of significant disruption of tourism. Covid-19 will lead to a dramatic fall in tourist numbers, which will have some benefits on the ecosystem but on the other will economically harm many locals who have become all but entirely dependent of tourism.*

*Storms/Flooding*  

*(Threat of glacial lake outburst floods)*

The threat of glacial lake outburst floods exists, particularly in the Imja Tso (lake) on the Imja Glacier and the subsequent threat of flooding to downstream Sherpa communities (UNESCO, 2014; Watson and King, 2018). The World Heritage Committee has noted the coordination between the National Park authorities and the UNDP-funded “Community Based Flood and Glacial Lake Outburst Risk Reduction” project, and has asked the State Party to monitor compliance with environmental measures and to involve local communities to ensure respect for their cultural and spiritual values throughout the project cycle. In response, the State Party advises that the Department of National Parks and Wildlife Conservation coordinated and closely monitored the project activities. Environmental auditing was conducted by independent consultants to ensure environmental compliance. The project has been completed and the Park Management authority regularly observes and monitors the environmental issues of the lake. The project's documents have been handed over to the local community, which is
engaged in monitoring downstream from the property (State Party of Nepal, 2019).

► **Invasive Non-Native/ Alien Species**  
*Data Deficient*  
*Inside site, extent of threat not known*

(Feed for donkeys may contain seeds from potentially invasive species of plants)

The use of an uncertain but large number of donkeys to carry goods into the property is a recent and non-traditional form of transport. There is an immediate and very important need to assess and mitigate against the risk of the feed being supplied to the donkeys containing seeds of plants that will potentially introduce invasive alien species of plants to the property.

► **Other Activities**  
*Data Deficient*  
*Inside site, extent of threat not known*

(Unregulated and illegal use of resources )

The 2016 IUCN Advisory Mission noted evidence that unregulated resource use and poaching continues as a threat to the property (IUCN, 2016). Although wildlife hunting was not seen as a major issue as almost all the local residents had strong cultural beliefs, which precluded harming other living beings. However, an increasing percentage of new local residents (porters, service staff and lessees of Sherpa owned commercial ventures) do not share these cultural beliefs. The mission was informed of instances of the Nepal Army protection units locating and removing traps that had been set to capture Musk Deer. Another issue of concern is the use of juniper for cultural practices such as burning it each morning outside local houses as well as during special ceremonies. It is well recorded that large amounts of juniper are burned during Puja ceremonies to protect both Sherpas and expedition members at Everest Base Camp. Significant amounts of this slow-growing high altitude species are consumed annually for these events. The mission’s recommendation that the State Party formulate methods to collect data on the use of living natural resources from the property, including but not limited to the use of juniper for local cultural practices, has not been addressed.

► **Changes in traditional ways of life and knowledge systems that result in negative impact**  
*Data Deficient*  
*Inside site, extent of threat not known*

(Total dependence on tourism economy)

A very real threat to protected areas is that of the local community becoming completely, or almost completely, dependent on tourism revenue. Significant disruption to the flow of tourism revenue places severe strain on tourism dependent communities and this becomes an even bigger problem when elements of the community do not have traditional ties to the property.

The economic success of the local Sherpa people has resulted in parts of the property being occupied by people who do not share the Sherpas link with the environment and their economic well-being is based entirely on tourism. Such impoverished communities often find themselves with no option other than exploiting local biodiversity resources to sustain themselves, either by hunting for food or hunting to sell (IUCN Consultation, 2020). In 2020 (and likely in the coming years as well) Covid-19 will produce a dramatic fall in tourist numbers, which will have some benefits on the ecosystem but on the other will be very hard economically for many communities that have become all but entirely dependent of tourism. A return to subsistent hunting/gathering for survival should not be overlooked. This dip in tourism related income may affect not only the traditional Sherpa communities, but particularly the new arrivals from outside the buffer zone who may not have other means of living (IUCN Consultation, 2020).

► **Crops, Livestock Farming / Grazing**  
*Very Low Threat*  
*Inside site, extent of threat not known*

(Conflict between humans and wildlife)

Coupled with the needs of subsistence populations in and around the property and the increasing tourism demand, human-wildlife interactions and conflicts should be considered during the next revision of the Management Plan. A priority consideration is related to the invasion of agricultural land by Himalayan Tahr (Hemitragus jemlahicus). The 2016 IUCN Advisory Mission observed significant numbers of Tahr occupying agricultural fields, suggesting that research related to grazing competition between livestock and Himalayan Tahr is needed. The mission recommends that the State Party evaluate levels of conflict between communities and wildlife, including the invasion of agricultural land by Himalayan
Tahr, and to include measures to address this issue in the Management Plan (IUCN, 2016).

**Overall assessment of threats**

The vast majority of the various long-standing, increasing and potential threats to the values of the property are those arising from increasing tourism, which is being inadequately addressed by the State Party. The contentious development of a sizable tourism resort within the Park has been legally resolved, but urgent work is required to understand the impacts of the track used to service the resort, which bisects an important ecosystem. Further consideration needs to be given to the disturbance and other impacts of helicopter use on important wildlife populations, and particularly so if mitigation of impact by the aforementioned track includes the increased use of helicopters to refurbish the resorts' supplies. The threat of rivers, wetlands and water sources along the major trails being contaminated from improper effluent discharge, untreated human waste and garbage dumping is very high. Other threats such as localized quarrying, cultural use of forest resources of unknown sustainability and increased risk forest fire require some management intervention. The Management Plan 2016-2020 is a comprehensive document, which provides a range of strategic directions to mitigate against the negative impacts of tourism but it has a number of shortfalls that need to be addressed when the Plan is revised. The demonstrated doubling of tourist numbers before the end of the planning period raises very serious concerns in regard to the capacity of the property’s management to effectively implement strategies devised in the Management Plan to mitigate against the actual and potential impacts of this unpredicted and open-ended growth in tourism.

**Protection and management**

**Assessing Protection and Management**

**Management system**

The property is managed by the National Park and Wildlife Conservation Office of the Department of National Parks and Wildlife Conservation (DNP) within the Nepalese Ministry of Forests. The 2007-2012 Management Plan was formally updated in the 2016-2020 Management Plan. A perceived weakness in the current management plan is the absence of a projected growth in tourist numbers when impacts by tourism is acknowledged as a very serious threat to the property. The 2016 IUCN Advisory Mission noted that the complex geographic, administrative, socio-economic and cultural realities of the property strongly indicate the need for an integrated, cohesive management structure and noted that numerous organisations have an administrative/management role within the property (IUCN, 2016). While it is not unprecedented that a diverse matrix of organisations have responsibilities for activities within a protected area, it is fundamental that each stakeholder contributes to the effective management of the property. The Management Plan also acknowledges the functional role of a diverse range of stakeholders and includes a clear vision, developed in consultation with stakeholders, and details the broad array of strategies to achieve that vision. It details which activities are assigned to the various buffer zone user committees, but apart from the role of the Sagarmatha Pollution Control Committee (SPCC) there is no discussion about the functional role of other agencies within the property itself. There is no discussion in regard to the Advisory Mission’s concern that management of the property was hampered by over-lapping direct involvement by multiple agencies in management of the property. Overall, the Management Plan is well structured and comprehensive in providing a series of actions required to overcome the identified hindrances to meeting the objectives required to achieve the vision for the property. How effectively and timely those actions are to be completed is yet to be assessed.

**Effectiveness of management system**

While there is inadequate information available to assess management effectiveness, some concern is derived from the time lag in the preparation of the management plan and the lack of forward projection in the current plan. Although there had been a 2014-2018 revised management plan pending, it appears
to have not materialised and the 2007-2012 plan was not revised until the 2016–2020 Management Plan eventuated, and that was not presented to the World Heritage Committee until 2018. The State of Conservation reports submitted by the State Party in 2017 and 2019 provide details of management achievements in regard to requests by the World Heritage Committee, but there is no reference about what has been achieved in terms of addressing the provisions of the Management Plan. The effectiveness of the management planning process is that the Management Plan was developed on an assessment of what was, not what will likely be at the conclusion of the planning period. In consequence, the concerns and actions described in the Management Plan are geared towards visitation numbers of around 30,000 when it could, based on the growth experienced from 2014/15 average of 30,000 to the 2018/19 average of 58,000, have been around 70,000 by the end of the planning period (if not for the Covid-19 pandemic). Given that: 1) the Management Plan was not actually presented to the World Heritage Committee until half way through its lifetime in 2018; 2) funding of actions under the Plan are highly dependent on tourism revenue (which will likely drop sharply due to the Covid-19 pandemic); and 3) neither of the State Party’s State of Conservation reports presented subsequent to the Plan provide any indication of progress against the Plan; it is difficult to assess the effectiveness of the management system. An effectiveness audit would determine the extent to which the management of this highly complex property is protecting World Heritage values and achieving the biodiversity conservation, social, and economic goals and objectives.

**Boundaries**

Mostly Effective

The property’s boundaries are clearly defined by national borders and physical divisions encompassing discrete physical entities. There is a buffer zone, which was designated in 2002, but it is not yet part of the inscribed property (World Heritage Committee, 2014). The World Heritage Centre and IUCN recommended the submission of a minor boundary modification to formally recognize the existing buffer zone of Sagarmatha National Park (SNP) as a buffer zone to the property consistent with the Operational Guidelines (UNESCO, 2014). However, the State Party has addressed this issue in its 2019 State of Conservation report, advising that after extensive consultation with local communities there is no support for the proposal. Ecological connectivity is afforded through the establishment of the Makalu Barun National Park (1998) in the eastern region of the property and Gauri Shankar Conservation Area (2010) in the west. These additional sites, combined with the attachment of SNP’s northern region with Qomolongma Nature Reserve in the Tibetan Autonomous Region of the People’s Republic of China have added further protection to the values of the property (UNESCO, 2014). Ongoing and enhanced trans-boundary cooperation is an important feature of the 2016-2020 Management Plan. It is important to note that Nepal is currently enacting and implementing three levels of government structures: federal, provincial, and local/municipal. In this structure, local municipality has the mandate to regulate and manage all the major services and natural resources at the local level, which includes education, health, agriculture, natural resources, solid waste management, and so on. This means, the SNP boundaries fall within the Khumbu Pasang Lhamu Rural Municipality and it will govern all aspect of the SNP which will have major bearing on how the SNP will be managed as a World Heritage site. These municipalities would have more resources and decentralized power to manage the SNP more efficiently.

**Integration into regional and national planning systems**

Data Deficient

There is inadequate information available to assess the degree to which planning for the site is embedded within broader planning systems. The international popularity of the property for trekkers and mountaineers makes it a noteworthy asset for Nepal’s national economy factoring it into national economic planning. The Management Plan provides no significant data regarding the integration of planning for management of the property with regional and national planning systems.

**Relationships with local people**

Highly Effective

At the time of inscription, there were approximately 2,500 Sherpas living in the Park and another 7,500 people living in the buffer zone. Their lands within Sagarmatha National Park were excluded from the Park by legal definition (IUCN, 1979). Since that time, there has been ongoing involvement and support of local communities in the field of conservation and management. A Park Advisory Committee was established in 1982 (UNESCO, 2014), but has not been active since the 1980s. The 2007-2012
Management Plan recommended re-establishing the Advisory Committee, but it appears not to have happened and while the 2016-2020 Management Plan does not mention such a body, it does include details of community participation in management of the buffer zone and preparation of the current management plan. Sherpa culture (including Buddhist values, traditions of protecting the region as a sacred valley, and still active community forest and pasture management systems) contributes strongly to nature conservation (Mu et al., 2018). The importance of tourism in the local economy has also encouraged Sherpas to help to protect the area. Men elected by village assemblies continue to take on the duties of coordinating the seasonal migration of livestock, preventing green wood cutting, protecting plantations and reporting poaching. They are authorized to prosecute and collect limited penalties from violators of the forest protection rules and to use the fines for community purposes (WCMC, 2011). Concerns however remain regarding the impact of tourism on social cohesion and cultural practices among Sherpas and other ethnic groups (IUCN Consultation, 2014; Mu et al., 2018). In addition to the basic function of the buffer zone in enhancing protection of the property’s OUV, the objective of the buffer zone management is cited in the Management Plan as garnering the support of local people and involving them in nature conservation. Accordingly, a Buffer Zone Management Committee (BZMC) overseeing three Buffer Zone User Committees (BZUCs) and 28 Buffer Zone User Groups (BZUGs), has been established and up to 50% of the Park revenue is channeled to the communities for the implementation of conservation and community development programmes aimed at institutional development, alternative natural resource development, capacity building, financial management, conservation education and awareness. The Management Plan notes that the buffer zone programme is a benefit sharing mechanism, which involves sustainable development, tourism promotion and reconciliation of the park-people interface. The programme has been very successful with regard to forest resource development, habitat protection in the buffer zone and community participation in conservation.

Legal framework


Law enforcement

There appears to be a lack of cohesion between the content of recent State of Conservation reports by the State Party and details provided in the Management Plan. In the State of Conservation reports it is noted there have been a number of law enforcement activities undertaken in close collaboration with local communities and Nepali Army and that there is no reporting of any illegal activities in the Park. The Management Plan however, notes that poaching continues to be a threat as market value for illegal wildlife parts exists and that there were several legal cases filed in the Sagarmatha National Park (SNP) based on the information provided by local volunteers. It notes that regular patrolling effort from the nine security posts established in the Park is the major activity to ensure the protection of SNP. A company of the Nepal Army is deployed in the Park to protect the wildlife species and their habitats in SNP and its buffer zone. The return of the Snow Leopard to SNP after almost four decades is an indicator of effective park protection, although poaching of musk deer for illegal trade of its musk pod has remained one of the major challenges for management. The Management Plan provides for strengthening the park protection system through establishing an additional five security posts supported by effective communication facilities and dedicated staff for regular patrolling. It proposes to initiate the use of cutting-edge technologies such as a Conservation Drone to monitor key species and their habitat and to initiate real time SMART (Spatial Monitoring and Reporting Tool) patrolling. It further proposes to form an anti-poaching unit supported by a volunteer intelligence network.
Implementation of Committee decisions and recommendations

In recent years, the World Heritage Committee has expressed concerns and asked the State Party to address a range of conservation issues and threats, which are impacting the property. These included firewood collection, tourism management, management of solid and liquid waste, unregulated/poorly controlled helicopter use, a large resort recently established under questionable circumstances, monitoring of compliance with environmental measures throughout projects being undertaken within the property, introducing zonation as a management instrument and a proposal for minor boundary modification to formally establish a buffer zone. While these issues have all been addressed in the 2017 and 2019 State of Conservation Reports of the State Party, there is some question regarding how effectively they have been addressed. Although it is apparent that the State Party has been willing, and generally able, to comply with the Committee’s requests there are a number of concerns. In the face of evidence to the contrary, the State Party maintains that helicopter use within the property is for rescue purpose only. The boundary modification also remains in limbo on the basis of community objections. Furthermore, tourism management concerns have not been effectively addressed as planning has made no consideration for the increase in visitor numbers and waste management and pollution continue to be a major threat to the property.

Sustainable use

Sustainable use of the property’s natural resources is an important aspect of the relationship between the property and the population living within it and its buffer zone. The 2016 IUCN Advisory Mission commented on the impact of quarrying within the property and its buffer zone and recommended that the Management Plan include a specific section on quarrying, which should encourage rocks to be sourced from outside the property where feasible and prohibit commercial or industrial extraction of rock from within the property (IUCN, 2016). The Management Plan should detail the conditions for quarrying both within (where unavoidable) and outside the property and specify restoration and site rehabilitation standards. Despite this, the only reference to quarrying is found in a specific action in the section of the Management Plan, which deals with coping with the impact of the 2015 earthquake which states: “provide construction materials such as timber, stone, sand, and gravel from appropriate sites to reconstruct private buildings in SNP and its BZ” (DNPWC, 2016). The Advisory Mission also noted concern and made recommendations about the use of Juniper and also noted an anecdotal report that while grazing by traditional domestic animals within the property was deceasing, the grazing pressure by as many as 1,000 newly arrived donkeys was an increasing concern, which needs to be addressed. Neither the Juniper nor the donkeys are addressed in the Management Plan which does, however, note some concern in regard to the sustainable use of the property's resources as follows:
- The selective harvesting of large trees for timber has made the forests increasingly younger;
- Much of the upper elevation landscapes used primarily for livestock grazing and collecting fodder, wild foods, and medicinal and aromatic plants are also becoming increasingly important for tourism;
- The traditional herding camps being developed in some tourist villages are leading to pressure on the alpine vegetation resources;
- Unmanaged grazing by the domesticated cattle in the Park poses serious threat to Snow Leopard habitat;
- The population of Red Panda faces threats from livestock grazing and other human-induced activities such as collection of fuel-wood, timber, mushrooms and other non-timber forest products (NTFPs) by the local herders, hotel operators and pilgrims;
- Musk deer are threatened by habitat degradation and competition from grazing by domestic livestock. While The Plan provides a range of actions to address these issues, the sustainability of the use of the property’s natural resources requires careful monitoring and regular reassessment.

Sustainable finance

The 2016-2020 Management Plan acknowledges that the earlier plan could not be fully implemented due to budget constraints, which clearly suggests a lack of financial sustainability. The Plan indicates a budget requirement of US$6.5 million, including US$1.8 million for the buffer zone management.
requirements, and, while it notes that up to 50% of revenue generated by the Park can be applied to conservation and socio-economic development of the buffer zone, it is not possible to determine the anticipated source of the US$6.5 million (DNPWC, 2016). Funding of actions under the Management Plan are highly dependent on tourism revenue, which are expected to drop sharply due to the Covid-19 pandemic (IUCN Consultation, 2020).

**Staff capacity, training, and development**

In 2003, the total staff for the Park was 38. At that time, it was recognized that the staffing and training was inadequate (UNEP-WCMC, 2011). In addition, 250 soldiers from the Nepalese Army has been deployed for protection and law enforcement purposes (UNESCO, 2014). IUCN has received reports that staff turnover is high, and staff numbers are inadequate (IUCN Consultation, 2014). There is a need for recruitment of Sherpa staff. As of 2013, only one park staff member was Sherpa. While there is no up to date data to comment on the turnover of staff or the adequacy of staff numbers or their cultural composition, the Management Plan notes that current staff number is 67, mostly Game-scouts dispersed to ten Ranger Posts in the property. The company of the Nepalese Army is still based in the area to protect the property and buffer zone. Although the capacity of staff remains a question, it is noted that staff training and capacity building is a very high priority in almost every aspect of the Management Plan.

**Education and interpretation programs**

The 2016 IUCN Advisory Mission noted that the earthquake damaged the Visitor Center and was impressed at the number of visitors taking time to visit the interpretive displays, but noted a need to upgrade both the building itself and the style and content of the interpretive display. The Management Plan notes the importance of site interpretation and education programmes for tourists and for local people and includes provision to rebuild the current Visitor Center, to enhance the interpretive display and to provide appropriate training opportunity for nature guides working in the Park to enhance their knowledge and presentation skills. It will be important monitor the satisfactory implementation of this often overlooked aspect of protected area management. The Management Plan includes a provision to establish a “Tourism and Conservation Education Unit” with dedicated staff to look after tourism and interpretation-related activities. Noting the concerns expressed by the World Heritage Committee regarding tourism, it is surprising that recent reports by the State Party make no reference to having progressed this relatively simply action.

**Tourism and visitation management**

The State Party has previously reported that the Department of National Parks and Wildlife Conservation is ‘working for the enhancement of tourism’ (State Party of Nepal, 2014). However, tourism, including tourism related waste such as non-biodegradable litter and human waste disposal, a reported increase in the number of trekkers and mountaineers, overcrowding during peak-seasons, increasing use of helicopter access, and unsustainable use of park resources in infrastructure construction, continue to be of major concern. Related to tourism use are also a range of social, cultural and livelihood impacts on Sherpa communities and other ethnic groups (UNESCO, 2014; Mu et al., 2018). The rate of visitation has grown alarmingly from 30,000 (average for 2014 -2016) to 58,000 in 2019 (State Party of Nepal, 2019). Although the Management Plan comments on the need to enhance tourism management capacity, there is great cause for concern that the impact mitigation measures required under the Management Plan have been geared towards visitor numbers only half those of 2019. Tourism can be expected to drop sharply due to the Covid-19 pandemic and the impacts of this remain to be seen (IUCN Consultation, 2020).

**Monitoring**

Monitoring is routinely undertaken on habitat, endangered species, conservation education, buffer zone management, tourist arrivals and other aspects of protected area management. A weakness may be seen in the effectiveness of monitoring to predict the increase in visitation as well as a weakness in identifying and monitoring the impacts of growing visitation. However, the enhancement of monitoring activities across all aspects of management is a high priority of the 2016-2020 Management Plan, which
Research

Extensive research in various fields has been undertaken for many years, but the 2016-2020 Management Plan notes that while the property has received more attention from researchers compared to other mountain Protected Areas in Nepal, most of the research results are scattered and results of many research works are not even known to the Park Manager. The research areas have mostly been determined by the interest of the individual researchers and there is a need for the property’s manager to set research priorities to get the information needed for the effective management of the property and its buffer zone. The Management Plan proposes to establish a research unit within the park structure to be responsible for coordinating the ongoing research activities, planning, prioritizing and carrying out research activities.

Overall assessment of protection and management

Sagarmatha National Park’s high mountain ecosystems are shaped by micro-environmental conditions, highly fragile and vulnerable to irreversible degradation. Concerns relating to tourism planning and development, as well as management of increasing tourist numbers and their impacts, are all taxing management capacity. Significant research and international attention has been focused on SNP, however, a holistic approach to addressing the suite of threats in relation to World Heritage values is needed. Sustainable use issues need to be addressed as there is insufficient understanding of the impacts of grazing by domestic livestock compounded by the introduction of donkeys, resource use, the expansion of tourism into the high pasture areas and by climate change. Management effectiveness needs to be enhanced particularly in the area of timely development of planning documents. While these issues do not directly threaten the specific values for which the property was inscribed, there are sufficient causes for concern to warrant the level of concern, particularly with regard to the capacity to effectively deal with the impacts of tourism, from 'some' to 'serious'. The 2016-2020 Management Plan seems to be well-structured and comprehensive, but it is noted that the majority of the life span of the Plan has lapsed with no indication of progress towards achieving its provisions.

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

The main external threats relate to increasing tourism, climate change and use pressures from local communities within the property and in the buffer zone. Tourism pressure arises from the site’s iconic status and increasing popularity among international trekkers and mountaineers. Tourism is vital to support local livelihoods and is essential for the property, but the current planning and management need strengthening to deal with the growing tourism pressure. The pressures from tourism development and poorly understood climate change impacts represent significant external threats that management is struggling to cope with.

State and trend of values

Assessing the current state and trend of values

World Heritage values

Dramatic high mountain scenery and superlative natural phenomena including the planet’s highest mountain

The property is inscribed for its scenic grandeur of its spectacular high mountain landscape, which includes the world’s highest mountain peak. Associated values include the habitat for several rare
wildlife species such as Snow Leopard, Musk Deer and Red Panda, as well as containing the world’s highest ecologically characteristic flora and fauna (World Heritage Committee, 2014). These World Heritage and other values remain intact, but are compromised through tourism-driven impacts and climate change. The melting of glaciers is affecting the appearance of the site and potentially destroying the micro-environmental conditions of these fragile and vulnerable high mountain ecosystems (DNPWC; 2016; Daconto, 2007). The threat of glacial lake outburst floods (GLOF) to local communities is very high particularly in regard to Imja Lake, the largest and perceived to be most dangerous of the glacial lakes in the the Khumbu region of the property (Watson and King, 2018). However, a recent study notes that community concern in regard GLOFs had been alleviated by a project (2016) to lower the level of Imja lake by 3.5 m (Sherpa et al., 2019). The State Party reports an increase in forest fires and reduced snow cover, which they attribute to a rise in temperature (UNESCO, 2014).

**Geological features of outstanding scenic value**

The site is one of the most geologically interesting regions in the world with high, geologically young mountains and glaciers creating awe inspiring landscapes and scenery dominated by the high peaks and corresponding deeply-incised valleys (World Heritage Committee, 2014). While there is not a serious threat to the outstanding scenic value of the mountain landscape from the perspective of the mountains themselves, the associated glaciers are being impacted by increasing retreat due to global warming. Warmer air temperatures in the past 50 years have lead to a 30% decrease in the snow and ice cover and turned one 4,000 m high glacier into a lake while glaciers at higher elevations are melting at an increased rate (2016 -2020 Management Plan). Increasing visitor numbers result in significant impacts from peak-season overcrowding, developments and waste disposal, including litter and human waste, and coupled with excessive helicopter operations, these are affecting the property’s natural quiet system, the sense of remoteness and its scenic value.

**Summary of the Values**

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

The property was inscribed for the outstanding scenic values of its spectacular high mountain landscape, which remain intact, but is compromised by over development of tourism. Uncontrolled growth in visitor numbers leading to water pollution, solid waste impacts and the intrusion of helicopters for recreational use, are combining to degrade the natural setting and values of the property. The controversial development of a resort facility at 4,200m above sea level was inappropriate and creates an unfortunate precedent for other tourism operators. Climate change, which is demonstrably impacting the glaciers within the property, is an unknown variable that is challenging the already stretched management capacity. The threat to human life by glacial lake outburst floods is being mitigated by management intervention and monitoring, although there is no practical management intervention to halt the process of glacial retreat.

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

Associated values include the habitat for several rare wildlife species such as Snow Leopard, Musk Deer and Red Panda, as well as containing the world’s highest ecologically characteristic flora and fauna. The Management Plan notes that poaching continues to be a problem, particularly for Musk Deer, the main prey of the Snow Leopard, and provides for the establishment of an anti-poaching unit as part of the management structure. Revenge killing of both Snow Leopards and Himalayan Tahr in the buffer zone is noted to be an ongoing problem. Some conflict has been noted between the grazing needs of wildlife and domestic animals and the recent introduction of donkeys adds further grazing pressure. Other significant issues affecting biodiversity values include harvesting of non-timber forest products and the potential impact on wildlife, particularly Red Pandas, and the
bisection of the highland ecosystem by the service track supplying the questionable resort. Climate change impacts, including the increased frequency and intensity of forest fires, on biodiversity values require investigation. A proposal to (re?) introduce a population of Blue Sheep to the property (to provide prey for Snow Leopards) needs careful evaluation.

Additional information

Benefits

Understanding Benefits

- **History and tradition,**
  - Wilderness and iconic features,
  - Cultural identity and sense of belonging

The Park is of major religious and cultural significance in Nepal as it abounds in holy places such as the Thyangboche Monastery and is also the homeland of the Sherpas, whose way of life is unique compared with other high-altitude dwellers. The intricate linkages of the Sherpa culture with the ecosystem are a major highlight of the Park and they form the basis for the sustainable protection and management of the Park for the benefit of the local communities. There are many sacred mountains, forests, and other natural sites and other cultural sites within the National Park, and the entire region is considered to be a sacred valley (beyul) by the Sherpa people (Mu et al., 2018).

Factors negatively affecting provision of this benefit:
- Overexploitation: Impact level - Moderate, Trend - Increasing

The shift from agro-pastoralist system to commercial tourism has very high potential to change the cultural and spiritual link between the Sherpa culture and the ecosystem of the property and as various reports note, many of the Sherpa people have taken on the value of tourism entrepreneurship. This can lead to the young generation of Sherpas to move away from the property while outsiders move in to exploit the tourism opportunity.

- **Collection of medicinal resources for local use,**
  - Outdoor recreation and tourism,
  - Natural beauty and scenery

The site is an important source of medicinal and cultural use plants for local people. It includes the highest point of the Earth's surface, the 8,848m Mount Sagarmatha (Everest) and seven other peaks over 7,000m, which combine to provide one of the most spectacular scenic vistas in the World. It covers an area of 124,400 hectares and is a well-known destination for mountain tourism, which has increased from 3,600 visitors in 1979 to over 25,000 in 2010 and 58,000 in 2019.

Factors negatively affecting provision of this benefit:
- Climate change: Impact level - Low, Trend - Increasing
- Pollution: Impact level - High, Trend - Increasing
- Overexploitation: Impact level - Low, Trend - Increasing

There have been questions over the sustainability of Juniper harvesting for cultural use and further questions about the collection of NTFPs on habitat for red pandas, but these are yet to quantified. A trend towards new tourism products based on Sherpa culture in some of the alpine villages may also lead to exploitation of NTFPs, but most significant is the environmental, physical and noise pollution being generated by the dramatic increase in tourism.

- **Direct employment,**
  - Tourism-related income,
  - Provision of jobs

The property directly employs 66 people for on-going management and a further 250 soldiers are
permanently engaged in protection of the property and its buffer zone. The implementation of the 2016-2020 Management Plan will provide an estimated 285,800 working days for people in the region and tourism activities provides works for an unknown number of guides, porters, cooks and other trekking support staff. A simple estimate based on data available is that 58,000 visitors in 2019 stayed for a total of some 700,000 days (12 days for each person) and on each of these days employed on average 2.5 local people, then trekkers provided about 1.7 million work days. Add to that the revenue collected by accommodation providers, bars, cafes (helicopter tour operators as well) and the total contribution to the local (and national) economy is substantial.

Factors negatively affecting provision of this benefit:
- Climate change: Impact level - Low, Trend - Increasing
- Pollution: Impact level - High, Trend - Increasing
- Overexploitation: Impact level - High, Trend - Increasing
- Habitat change: Impact level - Moderate, Trend - Increasing

Successful tourism endeavors by the local Sherpa people is leading to cultural change and land use change. Grazing by traditional livestock is being offset by grazing by newly introduced donkeys, but impacts are yet to be assessed.
Pollution resulting from large numbers of tourists is yet to be properly addressed.
There is some cause for concern that NTFPs are being over-exploited and this concern grows as new tourism products are evolving in the alpine villages.

Summary of benefits
Sagarmatha National Park includes the highest point on the Earth’s Surface; Mount Sagarmatha (Everest; 8,848 m). The Park covers an area of 124,400 hectares in the Solu-Khumbu district of Nepal. It is without question a globally revered site, largely inaccessible yet of enormous economic benefit to the Sherpa people and Nepal as a country. The site’s benefits derive from the intimate links between nature, cultural and spiritual values set within a spectacular mountain landscape.

Projects

Compilation of active conservation projects

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<th>№</th>
<th>Organization</th>
<th>Brief description of Active Projects</th>
<th>Website</th>
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<tr>
<td>1</td>
<td>Sagarmatha Pollution Control Committee</td>
<td>Trail and base-camp clean-up, recycling, village waste management, environmental education, tourism education</td>
<td><a href="http://www.spcc.org.np">http://www.spcc.org.np</a></td>
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<tr>
<td>2</td>
<td>Khumbu Sherpa Culture Conservation Society</td>
<td>Programs to promote strengthening of linkages between culture and conservation, including traditional protection of sacred forests and other sacred natural sites and management of community forests and grazing areas. This includes emphasis on youth programs and inter-generational dialogues.</td>
<td><a href="http://khumbusherpa.com">http://khumbusherpa.com</a></td>
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## REFERENCES

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