Puerto-Princesa Subterranean River National Park

2020 Conservation Outlook Assessment

SITE INFORMATION

Country: Philippines  
Inscribed in: 1999  
Criteria: (vii) (x)

This park features a spectacular limestone karst landscape with an underground river. One of the river’s distinguishing features is that it emerges directly into the sea, and its lower portion is subject to tidal influences. The area also represents a significant habitat for biodiversity conservation. The site contains a full ‘mountain-to-sea’ ecosystem and has some of the most important forests in Asia. © UNESCO

SUMMARY

2020 Conservation Outlook  
Finalised on 02 Dec 2020

GOOD WITH SOME CONCERNS

The spectacular cave system of the site and the natural phenomena of the interface between the sea and the underground river are well preserved although experiencing increasing impacts from the increase in visitors and tourism developments. Some degradation of the site’s biodiversity values by tourism pressure, illegal activities and exploitation by the local community is recognized but the extent of the impacts of these threats is unknown given the lack of monitoring data and research. The protection and effective management of the site is hampered by a complex legal framework and some confusion as to what is actually the World Heritage site, and the donation of land areas within its boundaries to accommodate the residents. Resolution of the zoning of the site as well as ongoing land claims and control of tourism development are all key to ensure effective management and planning in the future.
FULL ASSESSMENT

Description of values

Values

World Heritage values

► Globally significant habitat for biodiversity conservation
   Criterion:(x)
   The Puerto-Princesa Subterranean River National Park World Heritage site includes a full mountain-to-
   sea ecosystem, protecting the most significant forest area within the Palawan Biogeographic Province. It
   includes eight intact forest formations: forest on ultramafic soil, forest on limestone soil, montane forest,
   freshwater swamp forest, lowland evergreen tropical rainforest, riverine forest, beach forest, and
   mangrove forest (World Heritage Committee, 2012).

► High level of biodiversity
   Criterion:(x)
   The World Heritage site contains outstanding biodiversity, with the Palawan Moist Forest recognized by
   the WWF’s Global 200 Report as containing the richest tree flora, with high levels of regional and local
   endemism, and as being the largest and most valuable limestone forest in Asia (World Heritage
   Committee, 2012). The natural forest is dominated by Dipterocarpus grandiflora (apitong), Intsia bijuga
   (ipil), and other hardwood species. The extensive rainforest is the habitat for a diverse range of endemic
   and endangered species of flora and fauna with the site being home to a large number of birds,
   mammals, reptiles, amphibians and plant species. Endemic mammal species found within the site
   include the Palawan binturong (Arcticits binturong), Palawan porcupine (Hystrix pumila), Palawan stink
   badger (Mydaus marchei), Palawan tree shrew (Tupaia palawanensis), Palawan or Philippine pangolin
   (Manis culionensis), Palawan Bearded Pig (Sus ahoenobarbus), Palawan Flying Squirrel (Hylopetes
   nigripes) and several species of bats. Dugongs have also been recorded in the marine component of the
   site. Cave inhabiting reptiles, birds and mammals are found within the extensive cave system formed by
   the underground river. The reptiles present include snakes, monitor lizards, Philippine crocodiles and
   sea turtles (IUCN, 1999).

► Rare and threatened birds.
   Criterion:(x)
   The World Heritage site is home to a large number of bird species, including a number of rare and
   threatened endemic species such as the Philippine cockatoo (Cacatua haematuropygia), White bellied
   sea eagle (Haliaeetus leucogaster), Gray imperial pigeon (Ducula piceringii) and the Blue-naped parrot
   (Tangynathis lucionensis) (IUCN, 2015). The Palawan Peacock Pheasant (Polypectron napoleonis) has
   also been recorded in this site and is recognized as an internationally threatened species (IUCN, 1999).

► Spectacular landscape
   Criterion:(vii)
   Puerto-Princesa Subterranean River National Park includes a variety of landforms, the most impressive
   of which is the karst mountain landscape of the Saint Paul Mountain Range. The topography varies from
   flat plains to rolling hinterlands and hills to mountain peaks. Much of the site comprises sharp, karst
   limestone ridges. The limestone mountains have extensive karst features, both surface karst (pinnacles,
   shafts, dolines and limestone cliffs) in addition to an extensive underground river system (IUCN, 1999;
   World Heritage Committee, 2012).

► Underground river
   Criterion:(vii)
   The spectacular karst landscape contains an 8.2km long subterranean river that flows directly to the
   sea, which introduces a tidal influence to the lower half of the river. The cave system through which the
   river flows contains dramatic speleothems and several large chambers of as much as 120m wide and
   60m high. Its accessibility and navigability up to 4.5km inland allows it to be experienced by the general
public on a river cruise unequalled by similar experiences elsewhere in the world (World Heritage Committee, 2012).

Assessment information

Threats

Current Threats

The integrity of the World Heritage site is dependent upon activities that occur anywhere within the catchment area of the subterranean river and for many of the identified current threats there is a need for more effective control of such activities. Some of the ongoing land use and tourism development activities undertaken within the catchment are inconsistent with conservation of biodiversity values and are causing measurable damage. Related to these changes are issues with land claims and illegal land sales and development. The dramatic increase in visitation over the last decade is also having significant impacts both within the boundaries of the site and in adjacent areas, and close monitoring is required to see whether the new management responses are sufficient. Assessing and indeed effectively addressing the threats to the World Heritage site is difficult as the management plan is yet to be updated, including the recommended zoning of the site. Clear zonation is key for protecting water quality and quantity and ensuring the long-term viability of the site's Outstanding Universal Value. Progress has been made in regards to a number of the identified threats, including reports of illegal logging, assessment of protected area occupants, as well as tourism and carrying capacity. However, the issue of housing and resort developments within the site boundaries, encroachment into forest areas and poaching needs increased management attention so as to avoid this becoming a significant threat.

Logging/ Wood Harvesting

(Logging)

Logging, road widening and conversion to agricultural land appear to be the main causes of deforestation with additional impacts from illegal developments for tourism (IUCN, 2015). Reports of illegal logging and commercial plantations inside the Puerto Princesa Subterranean River National Park (PPSRNP) appear to be limited to agricultural activities of resident indigenous peoples and developments outside the boundaries of the World Heritage site respectively. These issues do not pose a significant threat to either the superlative beauty of the site or its biodiversity values but require effective management to ensure the impact and threat posed from these issues do not increase. However, in recent years there has been some backlash in efforts to tackle illegal logging, with a PPSRNP ranger being shot and wounded by illegal loggers trying to haul logs within the park boundaries in 2020 (Fabro, 2020b). In 2019 illegal logging was undertaken to open an unauthorized access road leading to PPSRNP, which would expose the park to illegal activities. Active law enforcement led to the park management and other environmental authorities filing administrative charges against the illegal cutting and construction (Ibañez, 2019).

Tourism/ visitors/ recreation

(Increasing tourism and visitation)

The tourism management system in place for the World Heritage site at the time of its inscription and subsequent declaration as one of the “New 7 Wonders of Nature” in 2007 did not have the capacity to accommodate the increasing influx of tourists resulting from these declarations and in particular the latter. The system was unable to deal with the increasing number of tourists and in particular their concentration of visits in the morning for short periods of time. This also led to an increase in traffic on the one road that provides access to the main tourism area. Noise and pollution are reported from tourist vans and the motorized boats (bancas) that bring visitors back and forth from the cave to Sabang (Agnelli et al., 2018). Ecological problems in the cave are mainly related to the diurnal resting of bats, which are disturbed by noise and light generated by the exponential growth in tourism. Swallows and bats are the base for life and food webs in this cave and their conservation need to be a priority (Agnelli et al., 2018). In 2014, the Protected Area Management Board increased the allowable number...
of visitors to a maximum of 1200 per day, based on a study of the tourism carrying capacity of the site. However, this study failed to accommodate for the concentration of visits in the morning to enable an early start to the tour of the underground river cave system. Surpassing 300,000 visitors per year since 2015, an integrated tourism management plan and a new approach for tourism were needed in order to avoid inevitable future damage to the subterranean river and cave ecosystem. To address the issue, the project “Support for Sustainable Eco-Tourism in the Puerto Princesa Underground River” was undertaken in 2015-2017, funded through the Philippines-Italy Debt for Development Swap Program, specifically looking for alternative destinations or additional caves for diverting tourists (Agnelli et al., 2018; Acero, 2020). The collaboration led to the adoption of a series of prescriptions to minimize the anthropic impact, including opening and closing hours, distance boats can travel in the cave, the use of light sources and audio-guides. Although it was deemed that the current annual limit of 350,000 visitors / year is within carrying capacity considering the underground climate, it was stressed that further increases (in visitor numbers as well as opening hours and number of boats entering the cave) must absolutely be avoided in order to not affect bats, swallows and the cave ecosystem (De Vivio et al., 2020).

Hunting and trapping

( Illegal wildlife trade )

Illegal wildlife trade has been noted as a relatively recently emerging threat to the site and its biodiversity and is a general issue and threat across the island of Palawan. Several alarming reports regarding illegal trafficking of the Philippine Pangolin (Manis culionensis), which is only found on Palawan, have recently been published (Gomez and Sy, 2018; PCSD, 2019), including accounts of poaching in both the Puerto Princesa Subterranean River National Park (PPSRNP) and other protected areas on the island (Abano, 2019). A new report published by TRAFFIC found a worrying increase in Philippine Pangolins confiscated from the illegal trade in the Philippines in just the last two years (Sy and Krishnasamy, 2020), although it is not known if any of these were poached in the PPSRNP. It is estimated that Philippine Pangolins have declined up to 95% in the last 40 years and it continues to face pressure (Alberts, 2020; PCSD, 2020). However, some Philippine Pangolins confiscated from the illegal trade have been released back in PPSRNP, as it is seen as one of the safest areas for Pangolins on Palawan (PCSD, 2020; IUCN Consultation, 2020b). The Palawan Council for Sustainable Development also report on large confiscations of marine species, such as turtles and sharks from around the island (Estoya et al., 2017). Despite the lack of reports of illegal wildlife trade impacting species within the World Heritage site, there is increasing concern for a number of species including the Philippine Cockatoo (Cacatua haematopus) and the Palawan Forest Turtle (Siebenrockiella leytensis), which are found within the site, after an increase in the number of confiscations involving these critically endangered species. During the Covid-19 pandemic, park rangers have continued to monitor the site, as there is a perceived risk that the lack of income from tourism might drive an increase in illegal poaching, logging and destructive fishing practices (Fabro, 2020a; Miranda, 2020). However, decades of marine conservation in PPSRNP is now helping to provide locals with abundant fish harvests, and to support to the recovery plan of the community, PPSRNP has been distributing relief goods including moringa seedlings, which also helps wildlife conservation as it is an important food source, particularly for the Katala bird (Ganancial and Sandig, 2000).

In conclusion, for the World Heritage site specifically, the illegal wildlife trade is currently seen as a low threat given that the majority of the trade and illegal collection is happening in the broader Palawan.

Water Pollution, Household Sewage/ Urban Waste Water, Agricultural effluents

(Pollution of the underground river)

Reports continue to identify the threat of river pollution due to both legal and illegal activities in the catchment of the underground river. There is a need for the issue to be dealt with in the updated management plan, as well as a need to provide regular community awareness campaigns and to establish an integrated land use plan to ensure long-term conservation of the natural values of the site (UNEP-WCMC, 2011). In addition to ongoing programmes promoting sustainable farming, environmental compliance with water and solid waste management among the growing community and tourism related establishments will be dealt with in new strategic management plan, which is about to be
finalised, as part of the attempt to address pollution issues (IUCN Consultation, 2020b).

**Crops, Forestry/ Wood production, Livestock Farming / Grazing**

(Land use change and illegal activities)

The park administration, which took up office in 2013, has been implementing a number of measures to combat illegal activities (UNESCO, 2014; UNESCO, 2015). In response to serious issues with land claims and illegal land sales, agricultural expansion and development, a new cadastral survey was initiated, and a Survey and Registration of Protected Area Occupants (SRPAO) was conducted in April 2014 (UNESCO, 2014; IUCN, 2015; UNESCO, 2015). To further clarify land use, delineation of zones within the World Heritage site is currently underway, and assessments of socioeconomic indicators using SEAMS (Economic Assessment Monitoring System) have been updated in the four barangays/villages within the site to determine the extent of users and utilization of resources within the site (IUCN Consultation, 2020b). However, it has been reported that areas continue to be titled to corporations and that in 2020, residents and land speculators have started to encroach on the forest areas (LGA report, 2020).

**Potential Threats**

The dramatic increase in tourism and visitation is already noticeable from direct and indirect impacts on the site. A recent project on management of visitation has resulted in some improvements but the development of a new wharf along with the yet to be finalised updated management plan, including a detailed tourism plan, means the potential for direct and indirect impacts form the growing number of tourists remains a key concern for the site. With increasing population pressure in surrounding areas, agricultural expansion could also become a more serious problem for the site if not correctly managed now.

**Tourism/ visitors/ recreation**

(Ongoing increases in tourism and visitation)

The dramatic increase in visitation since the declaration of the site as one of the “7 New Wonders of Nature” has been noticeable and previous management efforts might not be sufficient to mitigate the negative impacts of ever increasing visitation. Indirectly such increases are likely to lead to further uncontrolled development within the site as well as adjacent to its boundaries. In turn, this will have impacts on water quality, deforestation, road traffic and a number of other potential issues, which if not controlled could impact directly on the values of the site. However, under the “Support for Sustainable Eco-Tourism in the Puerto Princesa Underground River” project undertaken in 2015-2017, new restrictions to decrease visitor impacts, especially from boats entering the cave, noise and light, were adopted (Agnelli et al., 2018; De Vivio et al., 2020). The Urban and Biodiversity Research, Development and Extension Center (UBRDEC) of the Ecosystems Research Bureau (ERDB-DENR) also has an on-going project to update the carrying capacity of the underground river cave (IUCN Consultation, 2020b).

**Crops, Livestock Farming / Grazing**

(Agricultural expansion at the edges of the site)

Agricultural expansion is already occurring at the edge of the site. With increasing population pressure in surrounding areas, agricultural expansion could become a more serious problem for the site if not correctly managed now. Land conversion for agricultural expansion may cause an increasing rate of forest and habitat loss, impacting on the biodiversity values while also affecting the spectacular landscape for which the site is known. It may also lead to increases in agro-chemical loadings into the catchment of the underground river ultimately impacting water quality. Ambiguity regarding zones of different use within the World Heritage site has led to agricultural expansion and encroaching on the site. Re-zonation is currently underway, which is urgently needed to establish and implement strict rules regarding allowable activities within the protected area (CCIPH, 2020).
Overall assessment of threats

Assessing the threats to the World Heritage site in the past has been difficult given the confusion as to what exactly constitutes the World Heritage site and particularly in regards to its boundaries and those of the buffer zone of Puerto Princesa Subterranean River National Park. Although most threats are currently perceived as low, protection of the entire catchment area of the underground river is key to protecting water quality and quantity and ensuring the long-term viability of the site’s Outstanding Universal Value. The integrity of the site is dependent upon activities within the catchment and there is a need for more effective control of such activities, many of which are not consistent with conservation of biodiversity values and are causing measurable damage. Of particular concern are issues with land claims and illegal land sales, as well as dramatically increasing levels of visitation. A lack of baseline data on species presence and abundance hampers efforts to monitor the impact from threats to the biodiversity. Close monitoring of tourism is also required to see whether the management responses are sufficient to cope with the levels of increasing visitation.

Protection and management

Assessing Protection and Management

Management system

The World Heritage site is managed by the City Government of Puerto Princesa through the Protected Area Superintendent (PASu) and staff, who report to the City Government and the Protected Area Management Board (PAMB). The role of the PAMB, is to advise on the management of the site and issues related to public participation in protected area management. The PASu and the members of the PAMB hold primary responsibility for reporting to the City Mayor and for implementation of the management plan for the site, along with other key responsibilities for the day-to-day management including tourism and approval of development proposals (Acero, 2020). The 15-member PAMB includes representatives of national agencies, local communities, conservation NGOs and indigenous peoples’ groups (Mallari et al., 2013). A general management plan for the site was drafted in 1999. Attempts to update the plan was first done in 2002, this however was not formally adopted by the PAMB. It is currently undergoing review and further updating by the new park administration that took up office in 2013. The new management plan being developed for the site for 2020-2030 is expected to be completed by December 2020, and will also include a tourism development master plan, disaster risk reduction and resilience policies, and monitoring and evaluation protocols (UNESCO, 2014; IUCN, 2015; IUCN Consultation, 2020b). A thorough analysis of the land cover change from 2009-2019 has been undertaken recently and the information is considered by the PAMB and the PA staff when drafting the new management plan (IUCN Consultation, 2020a; CCIPH, 2020).

Effectiveness of management system

A number of ongoing and emerging issues threatening the World Heritage site remain, although the new management plan for 2020-2030 (predicted to be completed by December 2020) is attempting to address a number of these including through the development of an updated Tourism Management Plan (UNESCO, 2015; IUCN Consultation, 2020b). Ineffective management is perhaps the most serious threat to the site. While there has been a clear and significant improvement in management of the site since the new park administration took up office in 2013, a lack of resources and an all be it necessary focus on management of tourists takes up the majority of the limited resources, rather than overall site management. Subsequently this means management effectiveness remains an issue for the site. The growing numbers of visitors to the site and the resulting infrastructure to accommodate them remain key management challenges. However, initiatives have been taken by the park management and the PAMB to balance biodiversity conservation/protection and tourism inside the site with a project recently completed to address visitor impacts on the cave ecosystem (Agnelli et al., 2018; De Vivio et al., 2020; IUCN Consultation, 2020b), as well as projects empowering indigenous peoples and promoting active
community participation in park activities (Maclang, 2018).

**Boundaries**

Mostly Effective

The current demarcated boundaries of the World Heritage site, aligned with the GPS co-ordinates of the Presidential Proclamation No. 212, s. 1999 of 12 November 1999, includes the entire catchment area of the subterranean river and are adequate to maintain the site’s Outstanding Universal Value. The area demarcated results in a site of 21,826ha. Based on the history of confusion around the boundaries and a number of the current threats to the site, both Decision 38 COM 7B.70 and 39 COM 7B.16 (World Heritage Committee, 2014, 2015) recommended the development of a zonation plan to further clarify the components of the site within the boundaries, in particular those considered as a buffer zone by the management authority. In addition, a zonation plan is also needed to establish strict implementation of governing rules and policies regarding allowable activities within the protected area, and to clearly indicate areas for community development and other tourism operations (CCIPH, 2020). The existing management zoning of Puerto-Princesa Subterranean River National Park (PPSRNP) is creating conflicts between the park management, community settlers and developers. Currently, Multiple Use Zones do not coincide with the Alienable and Disposable Land (A&D) of 1994, which has led to agricultural expansion, housing development and settlements encroaching on the Core Zone World Heritage site. A collaborative effort between park management staff, PAMB, the local community and other partners/stakeholders is currently underway to prepare a re-zonation proposal for PPSRNP (IUCN Consultation, 2020a; CCIPH, 2020). The demarcation of the buffer zone is part of the new 10 year strategic management plan (IUCN Consultation, 2020b).

**Integration into regional and national planning systems**

Some Concern

Palawan is covered by an Integrated Conservation and Development Plan, which includes a Forestry Protection Programme, however, there is currently insufficient data available to comment on the effectiveness of this plan, its regional integration and the position of the World Heritage site within this system. The site is largely managed at a provincial (city) level by virtue of the Memorandum of Agreement for Devolution, between the City Government and the National Government, and so appears to be lacking in terms of integration with national planning systems. The City Mayor has full responsibility over the World Heritage site and all management decisions are made by the Mayor in consultation with the Protected Areas Management Board (PAMB). While this arrangement appears to have worked effectively to date there is some concern that changes in management perspectives may occur with changes in the holder of that Office. In addition, the devolution to the local level may limit integration and oversight at a national level. The PAMB and park management has recently drafted a Bill for submission to the congress and senate for approval so that plantilla positions could be installed and address the MoA for Devolution concerns of the national government to city government. The full management and transfer of management into the city government of Puerto Princesa would be addressed in this proposed Bill (Cetenta, 2020; IUCN Consultation, 2020b).

**Relationships with local people**

Some Concern

The World Heritage site includes land within the boundaries of three Barangays (local administrative units: Cabayugan, Marufinas, Tagabinet) within the City of Puerto Princesa (IUCN, 2015). The site and its surroundings are the ancestral lands of the Batak and Tagbanua peoples (Mallari et al., 2013). Presence of Indigenous Cultural Communities within PPSRNP has greatly contributed to local conservation initiatives and community-based tourism management (CCIPH, 2020). Management of the World Heritage site recognizes the traditional rights and emerging economic opportunities for local communities. Relations with local residents have greatly improved with a more consultative style of management employed by park management, although more remains to be done. Management of the site includes a Protected Area Management Board (PAMB), with representatives from local communities, the tourism sector and other stakeholders. Despite these improvements, concerns remain around clarification of land tenure including Certificate of Ancestral Domain Claims (CADC) that stem from issues originating from before inscription of the site on the World Heritage list. However, three ancestral domain claims (Cabayugan, Marufinas, and Kayasan) are now in the process of titling once their Ancestral Domain Sustainable Development and Protection Plans are completed and synchronized with
the management objectives and conservation agenda of the World Heritage site (IUCN Consultation, 2020a; CCIPH, 2020). A local Community Liason Officer is employed as a member of the park staff to work with occupants within the boundaries of the site, to encourage alternative, sustainable livelihoods and support local communities. Local communities, both within the boundaries of the site and in surrounding areas are being increasingly involved in its protection through outreach programmes that raise awareness of the threats to and values of the site. The National Park serves as a source of employment, both directly as park staff and through Community Based Sustainable Tourism (CBST) associations established within the site. The PAMB Aid/Grant generated from entrance fees has also provided the communities with eco-friendly and sustainable enterprises livelihoods, which in turn has fostered a sense of ownership of the area (Acero, 2020).

▶ Legal framework
Mostly Effective

The World Heritage site appears to have adequate legal protection in place. The Presidential Proclamation No. 212, s. 1999 declared the National Park under the National Integrated Protected Area System Act of 1992 (NIPAS) to encompass the entire catchment area and maintain long-term conservation of the site. The legal owner of the site is the City Government of Puerto Princesa. Responsibility for the management and the protection of the site is provided at a local, or provincial, rather than a national level through a Memorandum of Agreement (MoA) for Devolution that places local ownership of the site, and hence management responsibility, with the City Government of Puerto Princesa. While management responsibility is placed with the local authority, the site is also covered by the NIPAS, providing national level legal protection of the World Heritage site. While the NIPAS has not significantly changed since inscription of the site and the legal framework in general is considered adequate, inconsistencies and overlaps between the NIPAS Act and other related laws create confusion regarding the powers and responsibilities of particular institutions.

▶ Law enforcement
Some Concern

The Protected Area Superintendent (PASu) appears to hold the primary responsibility for implementation of the management plan for the World Heritage site, along with other key responsibilities including enforcement of the management and legal framework. The site itself is home to a number of permanent residents and land use varies across the site depending on land tenure. There have been numerous reports of illegal activities including logging and other resource extraction but it is difficult to confirm the extent of these activities, especially given the lack of clarity of zones within the site and the areas of disputed land tenure. Poaching of wildlife has been identified by NGOs and project staff working in the area as a high threat to the wildlife and reports of poaching have been made by staff. The resources and capacity to effectively address these threats and provide the necessary enforcement actions are most likely lacking, with the management agency reliant on project specific funding for training and support and staff efforts focused on tourism management. To strengthen and ensure the protection of the PPSRNPs’s ecological integrity, ranger stations have been established in areas identified as “hotspots” for illegal or harmful practices within the park (Maclang, 2018).

▶ Implementation of Committee decisions and recommendations
Mostly Effective

Committee decisions so far have included 38 COM 7B.70, and 39 COM 7B.16 (World Heritage Committee, 2014, 2015). These decisions have both been in relation to issues of concern raised in regards to current threats to the World Heritage site, namely issues around tourism, boundaries and occupants within the site. The first of these, 38 COM 7B.70 also requested both an IUCN reactive monitoring mission and a State of Conservation report. Both of these requests as well as other specific actions included in Decision 38 COM 7B.70 were implemented. Actions outlined in 39 COM 7B.16, many of which resulted from the IUCN reactive monitoring mission appear to be ongoing but are difficult to assess. A number of key actions with the Committee decision appears to remain outstanding including submission of the EIA on the development of the Sabang Wharf and clear zonation of the site. However, the preparation of the recommended development of a zonation plan is underway and currently sits with the park management (CCIPH, 2020).
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- **Sustainable use**
  Some Concern
  The site is home to a number of occupants and residents who were present prior to the designation of the National Park and World Heritage site. Efforts appear to be ongoing in regards to a survey of all residents. The forest within the buffer zone may be utilised for subsistence and livelihood purposes, however the level to which this is allowed and indeed monitored is unclear as is the zonation of the buffer zone. Threats from both legal and illegal resource extraction remain high throughout the forest, with potential impact on the Outstanding Universal Value of the site itself. It is currently not known the degree to which illegal extractive activities may be occurring within the site, and monitoring capacity and resources are currently not sufficient for fully effective monitoring of illegal activities such as illegal logging, slash and burn agriculture, conversion of forest to agriculture and other resource extraction. Increased monitoring capacity and resources are required if fully effective law enforcement is to take place to successfully manage the site.

- **Sustainable finance**
  Some Concern
  Sustainable financing remains a key issue for the effective management of the site. A limited annual budget, determined solely by tourism numbers, means that despite increasing levels of tourism, annual budgets for management remain small and insufficient. The Puerto-Princesa Subterranean River National Park has been fully self-sustaining since 2008, meaning the entire budget for operational expenses including staff salaries are generated from entrance fees, with no subsidies from national, international or local government (IUCN Consultation, 2020b). However, at current income and staffing levels, park authorities have insufficient human and financial resources to effectively combat the issues affecting the site as well as managing the large number of tourists and the associated impact. Amidst the global Covid-19 pandemic, the accumulated savings from previous entrance fee revenues will sustain the salaries and entire operation of the park for 2020 (April to December) and is projected to sustain the salaries of 220 staff and basic operational expenses in the year 2021 (Miranda, 2020; IUCN Consultation, 2020b).

- **Staff capacity, training, and development**
  Some Concern
  The previous management plan as well as other relevant documents submitted to the World Heritage Committee, notes that in the face of increasing visitor numbers more staff training in park planning and management is required to ensure effective management of the World Heritage site. However, the draft updated management plan notes that there is currently no training program for staff apart from some training for cave guides. Unfortunately, the plan is incomplete and does not address training for staff in other areas beyond tourism and there is limited information available in this regard. The lack of training and development is further complicated by the contractual nature of staff appointments with no permanent positions and all staff on short-term contracts. Acero (2020) reports that the number of park rangers was increased from 11 in 2013 to 47 in 2019, with 6 serving as Protection and Conservation Component Heads. Regular foot patrolling is conducted by the park rangers within the park’s boundaries and 4, 9, 20 and 8 rangers are assigned to the villages of New Panggangan, Marufinas, Cabayugan and Tagabinet respectively. A marine biologist and environmentalist are employed to monitor the condition of the subterranean river. Motorboats and other vehicles have also been provided by the management for rapid mobilization of rangers and other staff to monitor activities in the area (Acero, 2020).

- **Education and interpretation programs**
  Some Concern
  While the issues of education and interpretation of the site are addressed in the management plan, there is no indication that any of the proposed actions have been implemented. The appointed Community Liaison Officer assists with awareness of the site and its values among local communities and residents and plans for development of the Sabang Wharf including detailed interpretation programmes. However, current activities are restricted by budget and capacity and remain limited to short-term projects and activities. The Puerto-Princesa Subterranean River National Park has been serving as a destination for both national and international educational field trips, and through the Integrated Support to Indigenous People and other programmes, the management has provided trainings and seminars to Community Based Sustainable Tourism (CBST) associations and educational
opportunities for Indigenous People in the area, including free education to improve literacy rate. The installation of an information kiosk and mini-museum is also planned for Sabang Wharf to display the culture and biodiversity of the area (Acero, 2020).

**Tourism and visitation management**

Tourism, identified as a potential threat, adversely impacting the natural values of the site, is being addressed through tourism management objectives set out in the management plan. However, as tourist numbers continue to increase, more staff training in park planning and management is required to ensure effective management of tourism activities. The site’s tourism program aims to enhance visitor’s experience with nature while protecting the natural values. The threats posed by uncontrolled access from outside developments remain present and difficult to control despite limitation of the number of visitors per day. The tourism management system in place at the time of the World Heritage site’s declaration as one of the “New 7 Wonders of Nature” did not have the capacity to accommodate the resulting influx of tourists. In particular, it was unable to deal with the concentration of visits in the morning, and the increase in general traffic on the one road that provides access to the main tourism area. To avoid and mitigate negative impacts on the site, tourism management requires improvement and completion of the integrated management plan for tourism. Some measures have been taken recently to address pressures from tourism, such as the 2015-2017 collaboration with the Italian association La Venta Esplorazioni Geografiche, which led to new restrictions on boats, noise and lights inside the cave (Agnelli et al., 2018; De Vivio et al., 2020). The research arm of the Ecosystems Research and Development Bureau (ERDB-DENR) also has an on-going project to update the tourism carrying capacity of the underground river cave (IUCN Consultation, 2020b).

**Monitoring**

Some monitoring of visitor statistics is maintained, but not readily available, as is the quality of water in the river. According to the Palawan State of the Environment 2009 Updates, the water quality was classified as suitable for agricultural and industrial purposes. However, the most recent data on water quality monitoring is not available for assessment of the current health of the river. Although, Acero (2020) note that a marine biologist and environmentalist are employed to monitor the condition of the subterranean river, undertaking quarterly water analysis, and forest cover assessments are carried out through satellite imaging. In addition, monitoring of the biodiversity of the site is limited and only recently have ongoing monitoring programmes been established. This includes recording of sea turtles and regular monitoring of the bat numbers within the underground river cave system, the latter initiated after concerns about noise and light disturbance from increasing tourist numbers. Data is lacking in terms of monitoring of other species within the site.

**Research**

The addition of a resident park biologist and work to update the species list for the site are concrete indications of research activities, but there is limited data available regarding plans to continue such work on an annual basis or to conduct recurrent targeted research. The exception to this is the newly established regular monitoring of the bat species inhabiting the cave system, initiated after concerns about the impacts from the high number of tourist boats entering the cave system. As part of the efforts to solidify the strategic management plan, a High Conservation Value Areas Assessment was undertaken, including biodiversity assessments conducted in January-February 2020 (CCIPH, 2020). Some other recent research developments were carried out under the PAMB and TagBalay Foundation – La Venta Esplorazioni Geografiche association of Italy partnership that ended in May 2017. The partnership led to the “Support for Sustainable Eco-Tourism in the Puerto Princesa Underground River” project funded by the Italian Government through the Philippines-Italy Debt for Development Swap Program. It resulted in a number of recommendations to address pressures from tourism on the cave ecosystem (Agnelli et al., 2018; De Vivio et al., 2020). An Index Map of the various caves explored was also generated by Laventa, which could guide the park management in planning additional tour destinations. In addition, two new troglobitic species, a cave-dwelling huntsman spider (Heteropoda simoneallmannae sp. nov.) (Jäger, 2018) and a scorpion (Chaerilus agnellivanniorum sp. n.) (Lourenço and Rossi, 2019) were described following this research project and expeditions to the Puerto Princesa
Overall assessment of protection and management

The protection and effective management of the site is hampered by a complex legal framework and management arrangement, alongside confusion as to what is actually the World Heritage site and what the component zones within its boundaries are. This leads to a lack of clarity regarding which activities are permitted inside the site and where they are permitted in regards to core habitat for biodiversity and subsequently hampers management efforts. In light of the fact that the majority of pressures on the site originate from tourism activities in key areas and from developed areas within and adjacent to its current boundaries, and considering the unfavourable socio-economic status of many communities both occupying and surrounding the site, the development of a management zoning plan is essential to effective protection and management of the site. Core areas of habitat to maintain the biodiversity within the site need to be identified and provided with increased levels of protection, while ensuring that the entire site is protected against undue developments within and adjacent to its boundaries. In the absence of such information and plans, effective protection and management will remain challenging. This is also important in light of the ongoing ancestral domain land claims, which overlap with the boundaries of the site. Although much delayed, a new draft management plan for 2020-2030 is expected to be ready in December 2020.

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

Protection and management of the World Heritage site is provided at a local rather than a national level, through agreements that place legal ownership with the City Government of Puerto Princesa. The site is also covered by the National Integrated Protected Area System (NIPAS) Act of 1992, which provides legal protection for protected areas in the Philippines. This arrangement means that management decisions for the site are made in consultation with the Protected Areas Management Board (PAMB) and the City Council and these decisions are made at the local level. While this arrangement provides for adequate legal protection, numerous challenges remain in regards to the effective implementation of protection and on the ground management of the site to address threats, particularly those from outside. While the boundaries of the site cover the entire catchment area of the underground river, thus enabling protection of the water quality and quantity and ensuring the long-term viability of the outstanding natural values contained within the site, this does not assist with efforts to address impacts from outside the site. Increasing levels of tourism development adjacent to the park boundaries are starting to affect the site and without a clear zoning, these are also starting to encroach on the site itself. While the legal framework is in place to provide the necessary protection to the site from threats within its boundaries, the effectiveness of implementation and the ability to protect it against threats from outside are considered to be inadequate, despite improvements in management effectiveness in recent years.

State and trend of values

Assessing the current state and trend of values

World Heritage values

Globally significant habitat for biodiversity conservation

There is evidence that biodiversity values are being impacted by increasing levels of tourism both within and around the World Heritage site, illegal activities including land clearing and developments and inadequate protection. In 2012 a GEF project noted that ‘illegal logging, illegal quarrying, slash and burn agriculture, conversion of forest to agricultural lands and road widening are causing serious damage to
Although measures, such as developing sustainable alternative livelihoods, have been taken to address some of these issues, there are still reports on illegal logging, road construction, as well as possible poaching and illegal wildlife trade (Abano, 2019; Ibañez, 2019; Fabro, 2020b). Habitat loss, forest fragmentation, land-use change and excessive resource extraction still remain as major threats to biodiversity and it is clear that the existing management regime needs to be refined (CCIPH, 2020). Most of the threatened species in Puerto-Princesa Subterranean River National Park (PPSRNP) are known to occur in forest areas below 1000m, which are areas designated as either Buffer zone, Controlled Use Zone or Multiple-use Zone where timber extraction, and agricultural and commercial development are permitted (Mallari et al., 2011). The mismatch in PPSRNP's zonation system needs to be addressed to optimize the benefits to biodiversity and the local people living in and around the protected area. Forest-cover change analysis from 2009 to 2019 revealed a negative net loss of forest areas of about 89ha. The forest loss poses a threat to critical ecosystems that serve as a refuge to rare, threatened and endemic species. In addition, predictive models of suitable habitats (survival envelopes) showed high species congruence within PPSRNP, but also a substantial reduction of suitable habitats over the last 20 years, increasing species vulnerability to further degradation and climate change (IUCN Consultation, 2020a; CCIPH, 2020). The results suggest that upon updating the PPSRNP management plan, revisiting the management zones of the park should create a subzone for forest restoration and rehabilitation, which includes riparian zones, as these areas supply as inlet water towards the underground river (IUCN Consultation, 2020a; CCIPH, 2020).

**High level of biodiversity**

While significant progress has been made regarding a number of previously identified threats, only a limited amount of data from monitoring in regards to specific species and biodiversity of the site is available and this makes it difficult to measure the impacts on the biodiversity values for which the site was inscribed. A High Conservation Value Assessment of the PPSRNP World Heritage site has recently been undertaken (CCIPH, 2020), which noted that most of the endemic and threatened species of mammals were observed at higher elevation. Anthropogenic activities and threats might be one of the reasons for the migration of lowland endemics (such as the Palawan or Philippine Pangolin, Manis culionensis) to higher elevations. It further concluded that most of the species of amphibians and reptiles in Palawan are still understudied. A lack of connectivity between key habitat areas within the site has also been identified as a threat to the conservation of some species.

**Rare and threatened birds.**

As with the overall biodiversity values of the site, there is limited data available to assess the current state and trend of rare and threatened bird species. The exact number of bird species recorded within the site varies between sources (Manalo et al., 2016; PPSRNP, 2016; CCIPH, 2020), but include a number of rare and threatened endemic species such as the Philippine cockatoo (Cacatua haematopuspygia) and the Palawan Peacock Pheasant (Polypectron napoleonis). The Philippine cockatoo is under significant threat from illegal wildlife trade but there is no data available in regards to its status in the site. Most of the threatened and endemic birds of Palawan are associated with primary forests. However, anthropogenic pressures (such as slash and burn, trapping, logging, etc.) in the lowland forest might have negatively affected many species and driven them to higher elevations where the forests are more intact (CCIPH, 2020).

**Spectacular landscape**

The nature of the karst landscape that dominates the site provides spectacular landscapes and an impressive backdrop to the underground river. It encompasses a range of landscapes and topographies varying from flat plains to rolling hinterlands and hills to mountain peaks. Much of the site comprises sharp, karst limestone ridges, which are unlikely to be diminished by visitation. However, threats from land use change and developments have the potential to impact on the landscape, particularly through deforestation and the removal of limestone in areas adjacent to the site's boundaries. These issues and
threats are worrisome but currently considered of low concern to this particular World Heritage value.

**Underground river**

The underground river flows directly to the sea through an underground system that includes caves with chambers as much as 120m wide and 60m high. This provides opportunity for the general public to visit the caves on a river cruise unequalled by similar experiences elsewhere in the world and is a hardy resource unlikely to be diminished by visitor use even when such use is excessive in number. Although the spectacular karst cave system through which the river flows remains in a good state, issues of siltation and pollution of the underground river are worrisome and need future monitoring and management. Programmes and collaborations with farmers are underway to promote organic and sustainable farming, preventing construction of dams and to raise awareness of wastewater discharge flowing down in the underground cave.

**Summary of the Values**

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

The current condition of the ‘outstanding natural phenomena’ including the underground river and the karst landscape, remains good and overall the trend remains stable despite the threats faced by the site, specifically those from increasing visitation. However, the biodiversity values of the site are under increasing threat due to the impacts resulting from increasing tourism and visitation, illegal activities including poaching and logging, land clearing and developments, alongside an expanding local population, which is gradually eroding the integrity of the habitats and the biodiversity they support within and around the site.

**Additional information**

**Benefits**

**Understanding Benefits**

The site provides an outstanding opportunity for education and awareness for local, national and international communities in terms of its biodiversity as well as the underground river and karst landscape. It also provides an important site for research as it represents and includes one of the world’s most impressive cave systems, featuring spectacular limestone karst landscapes, pristine natural beauty, and intact old-growth forests and distinctive wildlife. It includes a full mountain-to-sea ecosystem, protecting the most significant forest area within the Palawan Biogeographic Province and is home to a number of endemic species.

Factors negatively affecting provision of this benefit:
- Climate change: Impact level - Low, Trend - Increasing
- Pollution: Impact level - Low, Trend - Increasing
- Overexploitation: Impact level - Moderate, Trend - Increasing
- Invasive species: Impact level - Low, Trend - Increasing
- Habitat change: Impact level - Moderate, Trend - Increasing
IUCN World Heritage Outlook: https://worldheritageoutlook.iucn.org/
Puerto-Princesa Subterranean River National Park - 2020 Conservation Outlook Assessment

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

The site offers tourism activities that are significant to local, regional and international communities. Tourism is increasing in the area with local and regional tourists contributing to this increase and provides an opportunity for recreation and time in nature.

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

In terms of this benefit over exploitation relates to over use as well as extraction of natural resources.

► History and tradition, Cultural identity and sense of belonging

The site is home to a number of local communities, many of which have inhabited the area for many generations. These communities were present prior to the designation of the National Park and the World Heritage site, with numerous Ancestral Domain Claims covering areas of the site.

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

► Carbon sequestration, Soil stabilisation, Coastal protection, Water provision (importance for water quantity and quality), Pollination

The majority of the site is forest covered with the boundaries covering the entire catchment for the subterranean river. It includes a marine component with the property encompassing the coastal area and including a number of mangrove forested sections. A number of local communities live within the boundaries of the site with the intact forest providing a number of ecosystem services not only for these communities but the wider Palawan population.

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

► Tourism-related income, Provision of jobs

The number of visitors and tourism levels continues to increase and with high numbers of visitors many of the services to support them are provided by local communities both within the property and through tourism related activities adjacent to the area. Boat tours within the underground river cave system are provided by local community members and many of the jobs associated with the site provide employment opportunities. Visitors to the underground river also visit other tourist destinations across
Puerto-Princesa Subterranean River National Park - 2020 Conservation Outlook Assessment

Palawan having an impact to the economy beyond the immediate area of the site.

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

Summary of benefits

The benefits from the PPSRNP are largely in the conservation value of the ecosystem, including the extensive cave system and the unique biodiversity it contains. The forest that covers the catchment of the river provides habitat for a number of species of global conservation concern, as well as in mitigating accelerating climate change impacts through carbon storage, and protection of local infrastructure and populations from extreme weather events, the frequency of which may increase under climate change. There are also economic benefits in terms of job creation and tourism with the included marine area also potentially aiding in local fisheries.

Projects

Compilation of active conservation projects

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<td>Palawan Conservation Corps</td>
<td>Community Based Environmental Restoration and Conservation of Damaged Areas of Puerto Princesa Subterranean River National Park.</td>
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