Article

Monitoring Outstanding Universal Value: An Analysis of the Status of Natural World Heritage Sites in India

Journal of Heritage Management
7(1) 37–62, 2022

DOI: 10.1177/24559296221091470
journals.sagepub.com/home/hmj

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Abstract

The United Nations Educational, Scientific and Cultural Organization (UNESCO's) World Heritage Convention, adopted in 1972, encourages to identify and conserve unique and invaluable sites of global significance. These sites are recognized by their outstanding universal value (OUV). This article adapts takes up a detailed qualitative analysis on the status, trend and challenges of keeping intact the key OUV of five natural WHSs of India using a questionnaire survey, and respondents were forest frontline staff and community representatives. The Statement of OUV of each site was broken into more understandable components, and the important issues affecting these components were then assessed for their current condition and trend. Subsequently, strengths, weaknesses, opportunities and threats (SWOT) analysis was also carried out for each of the studied WHSs. The attributes of three out of five study sites are stable with a strong law and enforcement regime; they also have some concerns regarding limited manpower, anthropogenic disturbance and public engagement opportunities. For the remaining two sites, the current threats are a matter of concern and require continued and enhanced management strategies. We also recommend that the site-specific detailed management requirements of OUV need fine-tuning in the sites' existing management plans. Finally, the outcome of the present assessment was compared with the IUCN World Heritage Outlook Report 2020.

Keywords

Natural heritage, protected area, OUV, management challenges, SWOT

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Introduction

The United Nations Educational, Scientific and Cultural Organization (UNESCO) seeks to promote the identification, protection and conservation of cultural and natural heritage worldwide, considering outstanding values to humanity. Hence, an international treaty called the Convention concerning the Protection of the World Cultural and Natural Heritage, known as the World Heritage Convention (WHC), was adopted in 1972 (Rao, 2010). Ever since World War II, the world heritage movement has extensively boosted the capacity and monitoring of world heritage values and played a particularly prominent role in defining the Outstanding Universal Value (OUV), reinforcing the process of evaluation, and strengthening the legitimacy of world heritage by endorsing scientific standards and techniques (Schmutz & Elliott, 2017). Apart from that, the OUV is fundamental in inscribing World Heritage Sites.

Natural World Heritage Sites are invaluable treasures because of their uniqueness. Proper monitoring and management can guarantee their protection from multiple threats (Wang & Du, 2018). In recent years, natural heritage conservation in Asia and the Pacific region has been facing many challenges due to extreme pressure exerted on natural ecosystems. These pressures result from high population density, risk of catastrophic disasters, constant economic growth and persistent poverty (Al-Tokhais & Thapa, 2019; White & Carman, 2007). According to the 2nd Cycle of Periodic Reporting (2012), conducted by the UNESCO World Heritage Centre on the state of conservation (SOC) of World Heritage properties in Asia and the Pacific, capacity building for World Heritage conservation and management remains a key priority in the region. India has 40 World Heritage Sites that include 32 cultural sites, seven natural and one mixed site (whc.unesco.org/en/list/). The natural/mixed World Heritage Sites represent varied biogeographic zones, ranging from the Himalayas to the Western Ghats and coastal zones. The natural and mixed World Heritage Sites are as follows: Kaziranga National Park and Manas Wildlife Sanctuary—Assam, Keoladeo National Park—Rajasthan, Sundarbans National Park—West Bengal, Nanda Devi and Valley of Flowers National Park—Uttarakhand, Great Himalayan Conservation Area—Himachal Pradesh, Western Ghats (39 components) serial sites—Maharashtra, Karnataka, Tamil Nadu and Kerala, and Khangchendzonga National Park—Sikkim.

OUV is the central concept of the WHC. The term OUV is the fundamental cornerstone for many aspects of World Heritage including nominations, periodic reporting, etc (Tarte & Day, 2021). OUV has been defined in the 'Operational Guidelines for Implementation of the World Heritage Convention' paragraph 49, as 'cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity' (UNESCO, 2019b).

Each word of the phrase OUV is important to understanding the concept behind it (UNESCO, 2012). IUCN has noted that the World Heritage Convention sets out to define the geography of the superlative: *outstanding* (the most outstanding natural and cultural places on Earth) *universal* (the scope of the Convention is global in relation to the significance of properties). By definition, properties cannot be considered for OUV from a national or regional perspective, *value* (what makes a property outstanding and universal is its 'value,' which implies clearly defining the worth of a property, and ranking its importance based on clear and consistent standards, including the recognition and assessment of its integrity).

The significance of OUV is evident from the fact that it is used more than 90 times in the guidelines and is central to the credibility of the World Heritage system (Day, 2012). To be deemed to be of OUV, the property must suitably stand on the three pillars of fulfilling any one or more of the 10 world heritage

criteria, meeting the conditions of integrity and/or authenticity (in case of cultural sites only) and must have an adequate protection and management system to ensure its safeguarding.

OUV hence forms the basis for the inscription, reporting and monitoring of World Heritage Sites. As such, the long-lasting protection of a heritage is of the highest significance to the international community. Each World Heritage property has a Statement of OUV (SoOUV) addressing three pillars: 'relevant WH criteria, integrity (and/or authenticity), protection and management.' An SoOUV aims to provide a clear, shared understanding of the reasons for natural World Heritage inscription and of what needs managing in order to sustain OUV in the long term (UNESCO, 2012).

The focus on OUV has raised new perspectives on how we monitor and report under the three pillars mentioned above. From the criteria, the lack of knowledge of certain values within OUV and their condition and trend can be determined; for integrity, the focus can be most on threats to the integrity and use of spatial analyses of values and threats to examine integrity across the property, and the overall management of the site.

According to the WHC, a specific assessment of the condition, trends, threats and prospects of the OUV should be carried out for inscribed properties. The OUV is also a benchmark against which the state of conservation of a site is measured and should therefore be at the heart of the management system. Subsequent to the property's inscription, site managers and local authorities continuously need to work towards managing, monitoring and preserving the World Heritage properties. World Heritage Sites' monitoring and reporting requirements serve purposes of preventive action, resolving problems, tracking trends, filling information gaps, etc. There are several means of monitoring and reporting, viz., State of Conservation Report (SOC), Reactive Monitoring, Periodic Reporting and World Heritage Outlook.

The Category 2 Centre for World Natural Heritage Management and Training for Asia and the Pacific Region under the auspices of UNESCO was established in the Wildlife Institute of India (WII), Dehradun, India, in 2014 (http://www.wii.gov.in/unesco_category2_centre). The Centre's mission is to strengthen the WHC's implementation by building the capacity of professionals and institutions involved with world natural heritage site inscription, protection, conservation and management in Asia and the Pacific region through training, research, dissemination of information and network building. In this context, WII Category 2 Centre (WII-C2C henceforth) has conducted a series of workshops entitled 'Monitoring of OUV of Natural World Heritage Sites' from 2017 to 2019. The workshops aimed to build capacity and sensitize World Heritage Site frontline staff and stakeholders working at the grass-root level (Eco-Development Committees [EDCs] and Non-Government Organizations) and subsequently gather field information on the (a) condition and trend of the site's OUV in the present time, benchmarked against the date the WH site was inscribed and (b) identification of key challenges faced by, and management actions taken in the respective WH sites. Furthermore, the SOC for the WHS was reviewed along with the addressed issues by the stakeholders of respective sites. The present article documents the current status of OUV analyses the outcome in terms of the status of and recommendations for upholding the sites' OUV.

Methods

Systematic workshops were carried out in five Natural World Heritage Sites in India (Table 1), including the Great Himalayan National Park Conservation Area (GHNPCA), Nanda Devi and Valley of Flowers National Park, Manas Wildlife Sanctuary, Kaziranga National Park and the Western Ghats during 2017–2019. These workshops were organized in collaboration with site managers (i.e., forest department) to build the capacity of forest frontline staff and the community representatives on the importance of World Heritage Sites. Forest frontline staff from representative ranges were invited for the workshops to get the

overall view of the respective inscribed property. The workshops provided basic information on the OUVs of the sites. This was followed by site managers from each of the sites presenting the current status of their property. The results of the workshops were then analyzed.

The analysis of OUVs was carried out in a two-step process. Knowledge gaps and trends of each OUV were analyzed based on the approach developed by Day (2012), and Tarte and Day (2019). Every site has an SoOUV addressing the relevant World Heritage criteria, integrity, protection and management requirements. This approach attempts to further break down the SoOUV into smaller, more understandable components by highlighting key issues from the statement. Each of these issues is then assessed for their current condition and trends. The conditions are then classified into four grades: (a) very good: all elements necessary to maintain the OUV are essentially intact, and their overall condition is stable or improving, available evidence indicates only minor if any, disturbance to this element of OUV; (b) good: some loss or alteration of the elements necessary to maintain the OUV has occurred, but their overall condition is not causing persistent or substantial effects on this element of OUV; (c) poor: loss or alteration of many elements necessary to maintain OUV has occurred, which is leading to a significant reduction in this element of the OUV and (d) very poor: loss or alteration most elements necessary to maintain the OUV has occurred and has caused a major loss of the OUV. Subsequently, to assess the current trends of the condition, we used arrows as such improving (↑), deteriorating (↓) and stable (↔). Additionally, we also noted the confidence level at which the condition and trend level were addressed at three different levels: adequate high quality evidence and high level of consensus (●), limited evidence or limited consensus (◘), very limited evidence and assessment based on anecdotal information (○).

We identified key examples of values/attributes and the factors affecting those values and prioritized the most critical threats. The participants (Front-line staff: Forest department and community representatives) were grouped according to their respective Park Range Office area operations. Invited NGO representatives were attached to each of the participant groups to act as facilitators. Worksheets (Appendix A) on the OUV statement were provided to all the groups to discuss and comment on the current status of specific criteria and the management and protection strategies' effectiveness. Furthermore, we carried out a strengths, weaknesses, opportunities and threats (SWOT) analysis for each site to identify the SWOT related to the specific sites. Second, we reviewed the SOC reports prepared by site managers for each of the sites and compared these with the site-level information gathered on the field from the present survey. Eight workshops were held, and ~240 people participated; in each site four to six groups were formed to collect the datasets. Since the Western Ghats is nominated under serial sites, having seven sub-clusters and 39 sites, four

Table 1. Profile of the Studied Natural World Heritage Sites in India

World Heritage Sites	Date of Inscription	Criteria			Area (sq. km)		IUCN Heritage Outlook, 2020
		vii	ix	x	Core	Buffer	
Manas Wildlife Sanctuary	1985	*	*	*	391		Significant concern
Kaziranga National Park	1985		*	*	429.96		Good with some concerns
Nanda Devi and Valley of Flowers National Park	1988	*		*	717.83	5142.8	Good with some concerns
Great Himalayan National Park Conservation Area	2014			*	905.4	265.6	Good with some concerns
Western Ghats	2012		*	*	7953.15		Significant concerns

Source: UNESCO World Heritage Centre, 'World Heritage List' (https://whc.unesco.org/en/list/) and IUCN (2020).
Note: * Indicates World Heritage Sites belongs to the particular criteria.

workshops were conducted at different zones viz., Periyar (Kerala), Parambikulam and Anaimalai (Tamil Nadu) and Kudremukh (Karnataka).

Analysis

The capacity-building activity in the respective sites showed a moderate understanding among the frontline staff and other grassroots-level stakeholders (local community) on the World Heritage perspective. The group discussions were summarized in the three sections: criteria, integrity and protection and management. The condition and trend of each study site's criteria, integrity and protection and management are summarized in Table 2. The details of the SWOT analysis are given in Table 3. The brief highlights the status of each site discussed in the following sections.

Manas Wildlife Sanctuary (MWS)

Manas Wildlife Sanctuary, located in Assam, Northeast India, was inscribed as a Natural World Heritage Site in 1985 under the criteria vii, ix and x. Covering an area of 39,100 hectares, it spans the Manas River and is bounded to the north by the forests of Bhutan. The vegetation types found in Manas are represented by semi-evergreen forests, mixed moist and dry deciduous forests and wet alluvial grasslands, with characteristics of ongoing succession from dry deciduous to moist deciduous to semi-evergreen climax forests. However, there is a marked change in the vegetation dynamics with the increasing spread of woodland and invasive species in the grassland areas. The change in the river course of Beki–Manas has resulted in erosion and siltation, particularly in its southern bank. Vegetation regeneration continues to be thick and dense, as is evident in the post-monsoon period when tall grassland proliferation is high and controlled burning is facilitated in key patches (UNESCO, 2021a).

Large mammal populations such as tiger (*Panthera tigris*), leopard (*Panthera pardus*), elephant (*Elephas maximus*), gaur (*Bos gaurus*), buffalo (*Bubalus arnee*) and sambar (*Rusa unicolor*) are increasing according to the field-level observation by the forest officials. Regular monitoring of tigers, co-predators and prey under the All India Tiger Estimation Exercise confirms their steady population increase (Jhala et al., 2020). Greater one-horned rhino (*Rhinoceros unicornis*) was re-introduced into the PA after the original rhino population had become locally extinct due to poaching (Barman et al., 2014; Ghosh & Ramesh, 2020). Likewise, after decades of no sighting, swamp deer gradually appeared in camera traps and direct sightings in recent years (Borah et al., 2013). To further strengthen the current population, a total of 36 swamp deer (*Rucervus duvaucelii*) were also translocated from Kaziranga and released in the wild through the 'soft-release' method in two phases (Ghosh & Mathur, 2020).

Other species like sloth bear (*Melursus ursinus*) and Himalayan black bear, the respondents were not certain as sighting was not very common. However, there were some rescue records of Himalayan black bear in the area, thereby confirming its presence in the trans-boundary Indo-Bhutan Manas landscape. Among the endemic species, pygmy hog and hispid hare are considered to have low but stable populations. Golden langur (*Trachypithecus geei*) is found only in the Western (Panbari) range, while Capped langur (*Trachypithecus pileatus*) is commonly visible. Regarding avian species, no exclusive bird count has been conducted in recent times. However, Bengal florican (*Houbaropsis bengalensis*) is being monitored at regular intervals. Swamp francolin (*Francolinus gularis*), great hornbill (*Buceros bicornis*), greater adjutant (*Leptoptilos dubius*), lesser adjutant (*Leptoptilos javanicus*), black-breasted parrotbill (*Paradoxornis flavirostris*), bristled grassbird (*Chaetornis striata*), among others are sighted at various

locations, which forms part of the Manas National Park Important Bird Area (IBA) (BirdLife International, 2021). It needs to be mentioned that the Manas IBA has been recently split up into two separate areas, *viz*., Manas National Park IBA and Manas Reserve Forest IBA, in order to accommodate its rich biodiversity (BirdLife International, 2021). White-bellied heron (*Ardea insignis*) and slender-billed vulture (*Gyps tenuirostris*), among others were reported in the Kachugaon Forest Division of the Manas Reserve Forest IBA in the Indo-Bhutan border area. The analysis of SOC reports (29 years) has shown the successful removal of the property from the List of World Heritage in Danger and the efforts to address critical conservation issues. The improvements can be seen in communication, funding and trans-boundary cooperation to conserve and manage the site. Continuous monitoring and support to the site can reduce the threats and improve conservation efforts for the property. The recent SoC report observed that factors such as civil unrest, wildlife poaching, timber logging, illegal cultivation, slow release of funds, uncontrolled infrastructure development by local tourism groups, invasive and alien terrestrial species spread, military training and water infrastructure are affecting the property. These are similar to the previously identified factors in the report. There were no reports of rhino poaching on the property since April 2016 due to the intensified anti-poaching efforts. However, one tiger was killed outside the property in July 2017, followed by the arrest of poachers and confiscation of the animal's body parts (IUCN, 2020). The establishment of EDCs, which provide livelihood support to local villagers and intensification of patrolling, have helped prevent poaching. However, there is a persistent issue of illegal encroachment in the Bhuyanpara range, and the proliferation of invasive plant species, like *Chromolaena odorata* and *Mikania micrantha* is of utmost concern (UNESCO, 2019a). Trans-boundary cooperation has also been intensified, and funding for the property had been increased and diversified. However, the State Party of Bhutan had also not provided any information on the status of the proposed Mangde Chhu hydro-electric project to the WH Committee yet, given that this hydropower project could severely affect the OUV of the property (UNESCO, 2019a).

The evaluation of IUCN World Heritage Outlook (IUCN, 2020) on the heritage site revealed that despite spending 19 years on the List of World Heritage in Danger, its wildlife populations are recovering. Through active protection strategies, and involving local community support, the administration has ensured the establishment of a new rhino population, which is on the rise. Local, national and international stakeholders have supported the continued efforts in improving site management. However, factors such as agricultural encroachment, impact from upstream hydroelectric projects in Bhutan, improper grasslands management, invasive plants and poaching still threaten the World Heritage property. Hence, sustained and proactive endeavours in protection and management are required to retain the site's OUV and to evade returning to the state of rebellion and insecurity that existed in the past. Manas WHS's overall picture reveals that the World Heritage inscription has had a significant positive impact on recognition, conservation, management effectiveness, research and monitoring, institutional coordination, international cooperation and legal and policy framework to protect the natural heritage site.

Great Himalayan National Park Conservation Area (GHNPCA)

This site was inscribed in 2014 under criteria x, and is located in the western part of the Himalayan Mountains in Himachal Pradesh. The 90,540 hectares property is characterized by high alpine peaks, alpine meadows and riverine forests, and includes the upper mountain glacial and snow melt water sources of several rivers, and the catchments of water supplies that are vital to millions of downstream users (UNESCO, 2021b).

As per the evaluation of forest officials, it was revealed that the snow leopard (*Panthera uncia*), Himalayan musk deer (*Moschus leucogaster*), Himalayan goral (*Naemorhedus goral*) and Himalayan

black bear (*Ursus thibetanus laniger*) sightings are stable with a minor increase in common leopard conflict incidents in the eco-sensitive zones, with a high degree of consensus, it was found that the OUVs (in terms of population, habitat and protection) are essentially intact, and their overall condition is stable or improving. However, it was also mentioned that most of these species require much more robust monitoring design and implementation to get a better understanding of the current population status. On the other hand, the status of threatened avifauna *viz*., western tragopan (*Tragopan melanocephalus*), snow partridge (*Lerwa lerwa*), cheer pheasant (*Catreus wallichii*) and Himalayan monal (*Lophophorus impejanus*) was reported to be good since their habitat is intact and there is a very low level of disturbance in the core zone of GHNPCA. However, the *L. lerwa* population was not assessed in previous years, since the terrain is difficult and the forest department has a shortage of manpower to carry out surveys in a larger area. Henceforth, it is highly recommended to focus studies on the status and habitat association of this species, since this species can be one of the good examples to carry forward the work on the impact of climate change in the upper Himalayas. Hunting is one of the direct threats to these species, and in a few instances, poaching of *L. impejanus* was reported. For the lower vertebrate taxa, no specific study has been carried out after the inscription of the site into the WH List. It was also reported that plant species such as Semru (*Rhododendron campanulatum*), Buransh (*Rhododendron arboreum*), Oak, Kharshu (*Quercus semecarpifolia*) and Oak, Banjh (*Quercus leucotrichophora*) are stable, and a particular increase in Oak species has been observed in the eco-sensitive zones due to the accomplishment of plantation programs.

Factors affecting the property reported by the World Heritage Committee are indigenous hunting, cattle grazing, collection of medicinal plants and hydroelectric development downstream of the property and inadequacy of staff members for patrolling high-altitude terrain. Furthermore, there are rights issues concerning local communities and indigenous people of Sainj and Tirthan Sanctuaries. However, the state party reaffirms its commitment to comprehend the vision of a significantly enlarged World Heritage property by including the national parks of Pin Valley and Khirganga, as well as the wildlife sanctuaries of Rupi Bhaba and Kanawar, which would roughly triple the current surface area of the property. The proposed addition of the property would create an encouraging step towards decreasing the property's vulnerability to numerous threats, comprising climate change and extend the representativeness of ecosystem diversity within the property. The World Heritage Committee has also advised the same on the major boundary modification.

According to the IUCN World Heritage Outlook (IUCN, 2020), GHNPCA is of international importance for the conservation of Western Himalayan biodiversity. The site enjoys efficient protection and management efforts and its size, remoteness and tough terrain add to its success. However, emerging threats like the potential increase in illegal plant collection and a proposed electricity transmission line may endanger the site. Unsustainable resource use within Sainj Wildlife Sanctuary and the adjoining Ecozone and impacts of climate change could also pose a threat to the site. It is recommended that conservation efforts should include sensibly resolving the rights issue and providing alternate livelihood to the locals' dependent on Tirthan Wildlife Sanctuary. Continued protection and management strategies, robust and technically sound monitoring, of key species populations and studies to understand the effects of climate change and other threats on the OUV of the property are some other recommendations.

Western Ghats (WG)

Older than the Himalaya Mountains, the mountain chain of the Western Ghats, inscribed as a UNESCO World Heritage Site in 2012, under criteria ix and x, represents geomorphic features of immense importance with unique biophysical and ecological processes. This property is made up of 39 component parts grouped into seven sub-clusters. Minimal loss or alteration of the elements necessary to maintain

the OUVs of this serial site has occurred. However, the overall condition is not causing persistent or substantial effects on the elements of OUV in all the three clusters (need to mention the clusters) evaluated. Species new to science have been described from the property in recent years. No significant geographical or geomorphological changes have occurred since the inscription of the property. Moreover, the property is being successfully monitored and managed by the forest department. Recent management strategies, like habitat and watershed management practices, along with upgraded law and enforcement activities, maintain the OUVs of these sites (UNESCO, 2021c).

As per the respondents, the population threatened species such as Asian Elephant (*E. maximus*), tiger (*P. tigris*), gaur (*B. gaurus*), lion-tailed macaque (*Macaca silenus*), Nilgiri langur (*Semnopithecus johnii*), Malabar giant squirrel (*Ratufa indica*) and grizzled giant squirrel (*Ratufa macroura*) was regularly monitored within the distribution limit of these three sub-clusters. With the high degree of consensus, it was concluded that the OUVs (in terms of population, habitat and protection) are essentially intact, and their overall condition is stable or improving. Available evidence indicates only minor conflicts with elephants in the fringe areas of Periyar Tiger Reserve. However, the Nilgiri tahr (*Nilgiritragus hylocrius*) population outside protected area ranges and associated threats need to be evaluated. On the other hand, species such as Nilgiri marten (*Martes gwatkinsii*), brown palm civet (*Paradoxurus jerdoni*), slender loris (*Loris lydekkerianus*), Salim Ali's fruit bat (*Latidens salimalii*), cane turtle (*Vijayachelys silvatica*) and Travancore tortoise (*Indotestudo travancorica*) require species-specific surveys to evaluate their current population status. The threatened habitats such as unique seasonally mass-flowering wildflower meadows, Shola forests and *Myristica* swamps are well protected, and specifically mentioned management strategies have already been adopted in the Tiger Conservation Plan (TCP) of the sites. However, there is a very limited understanding among the forest officials regarding the threatened species of trees found in the heritage site. Additionally, *Coscinium fenestratum* was reported to be under the unsustainable collection. Several indigenous community groups live within and at fringes of the serial property sites under Western Ghats WHS, and the area is under increasing population and followed by developmental pressure (Baskaran, 2013). Owing to a large extend, vast areas and different clusters make it hard for the site managers to maintain integrity. The stress from human populations has led to several man-animal conflicts (mostly due to Asian elephants and common leopard) in the surroundings of World Heritage Sites (Baskaran, 2013; Sidhu et al., 2017). In the future, there is a high chance that pressure from an increasing population may lead to the loss of forest in the corridors, which maintains the integrity of the site.

The IUCN World Heritage Outlook (IUCN, 2020) recommends that this serial site must be managed as an interconnected entity, which includes corridors to ensure habitat connectivity. The site represents a biodiversity hotspot and has the potential of leading the way of serial sites conservation model. However, growing urban and rural populations and the resultant developmental pressures, encroachment, forest loss, habitat degradation by invasive vegetation and land use changes threaten the OUV of the property. It needs the continued willingness of the state party and the various stakeholders to convert the motivation into proactive protection and management policies for the property. However, more elaborate and recent information is required on the strategies of protection and management regime of the site for a better understanding of its status.

Kaziranga National Park (KNP)

Kaziranga (covers 42,996 hectares in Assam's Brahmaputra floodplains) is one of the best examples of significant on-going ecological and biological processes in the development of terrestrial and freshwater ecosystem supports unique and threatened species, representing criteria ix and x. The park's contribution to saving the greater one horned rhinoceros (*Rhinoceros unicornis*) from the brink of extinction at the turn of the twentieth century to harboring the single largest population of this species is a spectacular

conservation achievement. The property also harbors significant populations of other threatened species, including *P. tigris*, *E. maximus*, water buffalo (*B. arnee*), *M. ursinus* and aquatic species, including the Ganges river dolphin (*Platanista gangetica*). Riverbank erosion, sedimentation, new islands and succession between grasslands and woodlands are continuous processes. Wet alluvial grasslands occupy nearly two-thirds of the park, and are maintained by annual flooding and burning, and no major loss has been observed since the inscription of this site in 1985. These natural processes create complexes of habitats responsible for a diverse range of predator/prey relationships (UNESCO, 2021d).

As per the respondents, the populations of grassland obligatory species such as swamp deer, hog deer and one-horned rhinoceros were found to have increased in recent years. Species monitoring programs are systematic, and forest department carries out the census for most of the threatened species, including waterfowl census regularly. As per the respondent, the sighting of a greater adjutant stork has declined in recent years. Besides, *P. gangetica* get the highest protection in the northern stretch of Kaziranga and are frequently sighted.

According to the most recent SOC report, poaching is mostly under control, and the property shelters healthy, increasing populations of rhinos, elephants and tigers, among others. The park authorities have increased efforts to prevent poaching, intensive patrolling, recruitment of additional forest guards, procurement of new communication equipment, counter operations against poachers and informants from local communities to apprehend transgressors. The reports received by IUCN note that the spread of invasive species, particularly Mimosa, remains a concern and that the efficacy of the efforts undertaken, including manual uprooting and controlled burning, has yet to be assessed. The World Heritage Centre and IUCN consider a monitoring and management system to be developed to address this threat. The state government has established a committee of relevant stakeholders, including the district administration, to evaluate and strictly control the high number of tourism developments in the park and avoid adverse impacts on the property's OUV. The World Heritage Centre and IUCN emphasized that the state party should inform the World Heritage Centre of any plans of developments that could impact the property's OUV and submit Environmental Impact Assessments of such plans to the World Heritage Centre prior to taking a final decision. Factors such as the slow release of financial resources, human pressures including NH-37 traffic, illegal grazing by livestock, collection of grass and poaching still threaten the integrity of the property (UNESCO, 2011).

According to the IUCN World Heritage Outlook (IUCN, 2020), Kaziranga National Park is considered one of the better-managed protected areas in the country and elsewhere, owing to its enabling framework and demonstrable success in conservation. Its OUV has sustained over the years, since its inscription, and the natural attributes are expected to maintain their positive trend, at least in the short term. However, pressure from unplanned tourism infrastructure, highway traffic, land encroachment, invasive species as well as impacts from monsoon floods are increasing. Furthermore, rhino poaching is still a matter of concern. Likewise, potential ecological threats to the site which may pose a challenge include the changing demographics and landscape profile. Nevertheless, the overall protection and management of the park remain effective. However, the property needs to apply adaptive management strategies to prevent the escalating threats in order to continue to attain its conservation goals.

Nanda Devi and Valley of Flowers National Park (NVFN)

The Nanda Devi National Park is well known for its spectacular mountains, glaciers and alpine meadows. The spectacular landscape is supported by Valley of Flowers National Park which is renowned for its beautiful meadows of alpine flowers. This site covers an area of 71,210 hectares and was inscribed in 1988, with an extension in 2005, under the criteria vii and x. The site is intact, and very low to no change has been observed in terms of scenic beauty since the time of inscription. The

Table 2. Trend of Criteria, Integrity and Protection and Management in the Studied Natural World Heritage Site on the Basis of Current OUV Analysis Carried Out at Different Site

						Confidence	
Natural Sites	Criteria	Very Good	Good	Poor	Very Poor	Condition	Trend
Manas Wildlife	vii		↔			●	●
Sanctuary	ix		↓			●	◘
	x		↑			●	◘
	Integrity		↓			◘	◘
	Protection and management		↔			●	●
Kaziranga National	ix		↔			●	◘
Park	x	↑				●	●
	Integrity		↔			●	●
	Protection and management		↑			●	●
Great Himalayan	ix		↔			◘	◘
National Park	x		↔			◘	◘
Conservation Area	Integrity		↔			◘	◘
	Protection and management		↔			◘	◘
Nanda Devi and	vii	↔				●	●
Valley of Flowers	x		↔			◘	◘
National Park	Integrity	↔				●	●
	Protection and management		↔			◘	◘
Western Ghats	ix	↔				◘	◘
	x		↔			●	●
	Integrity		↓			◘	◘
	Protection and management		↔			●	●

Source: The authors.
Note: ↑: Improving; ↓: deteriorating; ↔: stable; ●: high quality evidence; ◘: limited evidence; ○: very limited evidence.

Nanda Devi and Valley of Flowers National Park are naturally well protected due to remoteness and limited access (UNESCO, 2021e). Scientific monitoring is undertaken roughly every 10 years through expedition mode by the forest department along with other research institutes. The populations of threatened species like snow leopard (*Panthera uncia*) and musk deer (*Moschus sp.*) are thought to be stable, which requires further systematic monitoring (Ilyas, 2015). A World Bank eco-development project on solid waste management was carried out in the fringe villages of its buffer zone along with which women welfare groups work on solid-waste management. The Forest Department and EDC are also encouraging local youths to train in eco-tourism and mountaineering skills.

The respondents mentioned that the poaching has decreased, but there is a steady increase in pilgrim tourism and extraction of medicinal plant has increased over the years in the buffer zone of the property. Kumar (2017) reported that people inhibits from Tolma, Lata and Reni villages have resorted to harvesting medicinal plants, such as *Arnebia benthamii*, *Allium humile*, *Angelica glauca* and *Allium stracheyi*, from the alpine meadows in the Nanda Devi National Park. Climate change thought to be potential threat for both flora and fauna of the region (Devi et al., 2018). While concerns about the impact of livestock grazing on the floral diversity led to the establishment of the Valley of Flowers National Park, prohibition of grazing since 1982 has led to the proliferation of virtual monocultures of

Table 3. Compilation of SWOT (Strength, Weakness, Opportunity and Threat) Analysis from the Natural World Heritage Sites of India

Strength	MWS	KNP	GHNP	WG	NVFN
Aesthetic beauty of the park	*				*
Adequate anti-poaching camps	*	*			
Trained young staffs of the park	*				
Shared vision among park authority and local communities	*				
Proper road network inside the park	*				
High value in terms cultural and religious faith			*		
Strong law and enforcement		*		*	
Involvement of local community in PA management				*	
Diversity of endemic flora and fauna			*	*	
Weakness					
Degradation of grassland habitat	*				
Socio-political instability	*				
Limited manpower			*	*	*
Insufficient arms with forest staffs	*				
Complex terrain and poor road connectivity			*		
Lack of coordination among different department				*	
Limited anti-poaching camp and logistic support					*
Opportunities					
Public awareness programme	*				
Community-based tourism/alternative livelihood opportunity	*			*	
Research on grassland management	*				
Fencing facilities to overcome conflicts from wild animal	*				
Involvement of people in ecotourism activities and enforcement of cultural tourism along with nature and wildlife			*		
Capacity building programme for forest officials	*		*		*
Policy for sustainable tourism			*		
Threats					
Increase of invasive species	*			*	*
Change in the course of the river	*				
Hydro-electric project impacting integrity of the site	*				
Grazing of domestic animals	*		*		
Poaching and hunting	*	*	*		
Human wildlife conflict	*		*		
Uncontrolled tourism development on the riverbanks			*		
Uncontrolled pilgrimage activity				*	
Uncontrolled forest fire				*	*

Source: The authors.
Note: * Indicates the specific SWOT measures mention by the forest front-line staffs of the WHSs.

Polygonum polystachyum in areas where livestock would congregate in the past. The impact of livestock grazing, or its removal, on alpine meadows continues to be a subject of much uncertainty among ecologists. While there is plenty of good evidence that overgrazing and accumulation of nutrients at sites where livestock congregate is detrimental to floral diversity, extensive grazing by livestock may also enhance the diversity of herbaceous plants (Rawat & Rodgers, 1988). It is recommended, therefore, that research on the aspects mentioned be undertaken, followed by long-term monitoring of the key attributes related to OUVs.

According to the IUCN World Heritage Outlook (IUCN, 2020), the area has been effectively managed, with a need for continuous vigil since the area is large and the terrain is difficult. There is a need for enhancement in human resources for site management. The site shelters considerable populations of key wildlife species of which are periodically monitored. Although poaching has decreased, pilgrim tourism and medicinal plants extraction in the buffer zone are emerging threats. Above all, the cumulative impacts of development projects, such as roads, tourism infrastructure and hydropower, are alarming and need proper planning. Moreover, climate change and melting of glaciers in the Himalayas are resulting in disasters, shifting phenology, changes in the tree line across altitudinal gradients and range expansion of alien invasive species are a cause of global concern.

Discussion

The current state of the OUV of properties in the region is sustained at a high level since all the Natural World Heritage Sites in India are protected under the Indian Wildlife Protection Act 1972. At present, study sites have updated management plans, and the sites which are also Tiger Reserves as in the case of Manas and Kaziranga have updated TCPs. However, site-specific detailed management requirements of OUVs need fine-tuning in the sites' existing management plans.

The workshops carried out in the present study brought together forest officials, EDCs (local community representatives) and representatives from NGOs working in the World Heritage Sites and gave them a platform to share their experience on various issues pertaining to the sites. The sites were evaluated based on the ground knowledge of the field staff and other associated stakeholders; discussion on general policies, financial and human resources for conservation and management of the World Heritage Sites was also facilitated. It was observed that the frontline staff and the local communities have limited understanding of the importance of the 'World Heritage' tag of their respective sites and an equally low level of understanding of the importance of OUVs. Therefore, the workshop, followed by group discussion, has helped the ground staff to understand World Heritage and the elements of OUV. The ongoing research programmes are mostly directed towards species and habitat conservation, which fulfills the criteria x of most of the World Heritage Sites. However, the site managers also need to develop strategies to uphold the integrity of the sites since most of the sites are prone to developmental pressures. Among the studied sites, Western Ghats (cluster sites) found to be highly fragile and facing tremendous pressure in maintaining integrity. It was estimated that over 50 million people are living in the Western Ghats region. Recent evidences suggested that forest loss, habitat fragmentation, habitat degradation by invasive species and developmental activities continue to affect the property (Ravisankar et al., 2019). Though challenges are high, but at the same time, both government and non-governmental agencies are actively working to ensure the conservation of the property.

The SWOT analysis clearly showed several weaknesses and threats that need to be addressed by the site managers are as follows: insufficient manpower, socio-political instability, degradation of habitat due to grazing followed by an increase in invasive species and few instances hunting and extraction of minor forest produce (MFP) were also mentioned. Impacts of tourism were reported to affect the sites having pilgrimage practices (e.g., Periyar, Western Ghats). All these pilgrimage practices are seasonal; however, solid waste disposal has long-term negative impacts affecting the property. In many cases, tourism leads to overcrowding along with the overdevelopment of facilities and infrastructure, which can have adverse physical impacts on the property. GHNPCA participants have addressed the issue of rapid developmental activities in the river banks of the River Tirthan. Few studies highlighted that the religious tourists do not require permit and even entry fee is not payable, has resulted severe tourism pressure in the Himalayan region (Dobriyal et al., 2017; Tiwari, 2019). Although the heritage sites encompass huge area in the Himalayan eco-region, studies already documented that the high volume mass tourism leads to erosion of trails, creates pathways for non-native plants (Huddart & Stott, 2020).

Community involvement was considered to be one of the key priorities in conserving the WHS. The participants also emphasized that communities along with tourism industries need to be involved in the management of properties, monitoring and decision-making processes. To improve the involvement of different stakeholders, awareness building, training and better benefit sharing is required at the site level. Better benefit sharing with local communities would improve the sense of ownership of World Heritage properties by them, which would encourage better involvement of local communities in the management of heritage. The cluster site of Periyar is one of the good examples of coordination of EDCs and forest department; this has minimized adverse impacts on the site and also generated alternative livelihood opportunities for the communities.

Sites such as Manas, Kaziranga and the Western Ghats are under high pressure of invasion by alien species such as *Lantana camara*, *Chromolaena odorata*, *Mikania micrantha*, *Mimosa pudica* (Lahkar et al., 2011; Muniappan & Viraktamath, 1993; Nath et al., 2019); few wild species living in these natural sites are highly threatened and critically endangered due to habitat degradation by these alien plant species, for example, pygmy hog (*Porcula salvania*). The forest department has taken several initiatives to control the spread of these noxious weeds; however, further research is required on the extent and impact of these invasive species on the specific OUVs and control mechanisms to be adapted. Illegal activities, including poaching, logging and unsustainable harvest of resources, were more frequent in the Himalayan sites than in other study sites. The forest frontline staff were also concerned about climate change and its impact; however, no abrupt solutions can be found quite often. It is advised to monitor key indicator species that are an integral part of the OUVs of the site.

At present, there is a strict legal framework for the protection and management of natural heritage, as well as a robust institutional framework for effective implementation of the Indian Forest Act, 1927, and Indian Wildlife Protection Act (WLP), 1972. The shortage of manpower and logistic support in difficult terrain needs to be addressed by the site managers in synchronization with the state forest division. Workshop and training should be incessantly provided to upturn capacity in awareness education, risk preparedness, visitor management and community participation. Additionally, the respective sites need to engage and encourage ownership and stewardship of communities to improve the participation of communities for better awareness building, training and benefit-sharing. Management activities generally have a positive impact on the properties, and local communities should be more involved in the management and the decision-making process of properties. Management plans should be further developed to better address the management needs of properties, and they should be actively and effectively implemented in all World Heritage properties considering monitoring of OUV, visitor management and factors affecting the properties.

The IUCN World Heritage Outlook assessment showed that almost all categories face anthropogenic threats that are occurring in an increasing number of natural World Heritage Sites of Asia and Pacific region. Furthermore, IUCN World Heritage Outlook assessment and on ground status report of the present study almost has the similar findings except for Western Ghats. This is because, as mentioned, the cluster sites of Western Ghats are spread across four States/Provinces within the country and located in human-dominated landscape with its associated pressures. The threats identified in IUCN Outlook reflect the larger landscape level issues including population pressure, corridor connectivity, management variations, etc. which are beyond the jurisdiction of individual sites and sectoral departments. The results from the OUV analysis with respondents being frontline staff indicate that the feedback is more limited to individual sites which are generally positive in nature. Hence, the apparent difference in the assessments between the Outlook and field-level OUV analysis.

Conclusion

Monitoring of OUVs by considering its most important attributes or features through a break-down of the SOUV components clearly enables a more effective examination of the condition of the three pillars,

viz. criteria, integrity and protection and management, that define the basis of a World Heritage Site. It offers a practical opportunity to assess the operationalization of OUV by providing a better understanding of its identified features and their interrelationships. Employing this method, in conjunction with a consultative process with primary stakeholders associated with a World Heritage Site significantly strengthens the credibility of the information on the SOC of the site. The interactive workshop mode of this assessment further serves to enhance the awareness of OUVs among the frontline personnel, local communities and civil society. The participatory and inclusive approach is also likely to reinforce their stake in the conservation and management of their sites. The process of consultation intrinsic to this monitoring method can play an important role in complementing the existing reporting and monitoring processes for World Heritage Sites, in particular, the UNESCO Periodic Reporting and the IUCN Conservation Outlook. It provides a useful mechanism for linking results from primary site-level consultative monitoring to wider national, regional and global-level analyses. The method is suitably replicable across sites and can be undertaken at convenient intervals. In sum, identifying and assessing the attributes or features of OUV while engaging with diverse stakeholders on-site, offers a more comprehensive perspective of the actual condition and trend in the conservation status of World Heritage properties in relation to the values at the time of inscription.

Acknowledgements

We would like to acknowledge Director, Wildlife Institute of India, Dehradun, for facilitating the study. We also like to thank the forest department of Assam, Himachal Pradesh, Uttarakhand, Tamil Nadu, Karnataka and Kerala for their support in organizing the workshops. Finally, we thank all the staff members of WII-C2C for their participation. We are thankful to Anuranjan Roy (WII-C2C) for his comments on the previous version of the manuscript.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The authors disclosed receipt of the following financial support for the research, authorship and/or publication of this article: This work was supported by the WII-C2C, Wildlife Institute of India, Dehradun, Uttarakhand.

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Appendix A

Great Himalayan National Park Conservation Area Outstanding Universal Value Brief Synthesis

The Great Himalayan National Park Conservation Area (GHNPCA) is located in the western part of the Himalayan Mountains in the northern Indian State of Himachal Pradesh. The 90,540 ha property includes the upper mountain glacial and snow melt water source origins of the westerly flowing Jiwa Nal, Sainj and Tirthan Rivers and the north-westerly flowing Parvati River which are all headwater tributaries to the River Beas and subsequently, the Indus River. The property includes an elevational range from high alpine peaks of over 6,000 meter above sea level (m a.s.l.) to riverine forest at altitudes below 2,000 m a.s.l. The GHNPCA encompasses the catchments of water supplies which are vital to millions of downstream users.

The property lies within the ecologically distinct Western Himalayas at the junction between two of the world's major biogeographic realms, the Palearctic and Indomalayan realms. Displaying biotic elements from both these realms, the GHNPCA protects the monsoon affected forests and alpine meadows of the Himalayan front ranges which sustain a unique biota comprised of many distinct altitude-sensitive ecosystems. The property is home to many plants and animals endemic to the region. The GHNPCA displays distinct broadleaf and conifer forest types forming mosaics of habitat across steep valley side landscapes. It is a compact, natural and biodiverse protected area system that includes 25 forest types and an associated rich assemblage of fauna species.

The GHNPCA is at the core of a larger area of surrounding protected areas which form an island of undisturbed environments in the greater Western Himalayan landscape. The diversity of species present is rich; however, it is the abundance and health of individual species' populations supported by healthy ecosystem processes where the GHNPCA demonstrates its outstanding significance for biodiversity conservation.

Criterion (x): The GHNPCA is located within the globally significant 'Western Himalayan Temperate Forests' ecoregion. The property also protects part of Conservation International's Himalaya 'biodiversity hot spot' and is part of the BirdLife International's Western Himalaya Endemic Bird Area. The GHNPCA is home to 805 vascular plant species, 192 species of lichen, 12 species of liverworts and 25 species of mosses. Some 58% of its angiosperms are endemic to the Western Himalayas. The property also protects some 31 species of mammals, 209 birds, nine amphibians, 12 reptiles and 125 insects. The GHNPCA provides habitat for four globally threatened mammals, three globally threatened birds and a large number of medicinal plants. The protection of lower altitude valleys provides for more complete protection and management of important habitats and endangered species like the western tragopan and the musk deer.

Integrity

The property is of a sufficient size to ensure the natural functioning of ecological processes. Its rugged topography and inaccessibility together with its location within a much larger ecological complex of protected areas ensures its integrity. The altitudinal range within the property together with its diversity of habitat types provide a buffer to climate change impacts and the needs of altitude sensitive plants and animals to find refuge from climate variability.

A 26,560 ha buffer zone known as an Ecozone is defined along the south-western side of the property. This buffer zone coincides with the areas of greatest human pressure and is managed in sympathy with the core values of the GHNPCA. The property is further buffered by high mountain systems to the north-west which include several national parks and wildlife sanctuaries. These areas also offer scope to progressively increase the size of the World Heritage property.

Human settlement related threats pose the greatest concern and include agriculture, localized poaching, traditional grazing, human-wildlife conflicts and hydropower development. Tourism impact is minimal and trekking routes are closely regulated.

Protection and Management Requirements

The property is subject to sound legal protection; however, this needs to be strengthened to ensure consistent high level protection across all areas. This pertains to the transition of some areas from wildlife sanctuary to national park status. Tirthan and Sainj Wildlife Sanctuaries are designated in recognition of their ecological and zoological significance and are subject to wildlife management objectives, and a higher level of strict protection is provided to Great Himalayan National Park which is a national park. National parks under the Wildlife Protection Act, 1972 provide for strict protection without human disturbance.

The property's boundaries are considered appropriate and an effective management regime is in place including an overall management plan and adequate resourcing. The property has a buffer zone along its south-western side which corresponds to the 26,560 ha Ecozone, the area of greatest human population pressure. Continued attention is required to manage sensitive community development issues in this buffer zone and in some parts of the property itself.

The sensitive resolution of access and use rights by communities is needed to bolster protection as is fostering alternative livelihoods which are sympathetic to the conservation of the area. Local communities are engaged in management decisions; however, more work is needed to fully empower communities and continue to build a strong sense of support and stewardship for the GHNPCA.

Included within the property is the Sainj Wildlife Sanctuary with 120 inhabitants and the Tirthan Wildlife Sanctuary, which is uninhabited but currently subject to traditional grazing. The inclusion of these two Wildlife Sanctuaries supports the integrity of the nomination; however, it opens up concerns regarding the impacts of grazing and human settlements. Both these aspects are being actively managed, a process that will need to be maintained. The extent and impacts of high pasture grazing in the Tirthan area of the property needs to be assessed and grazing phased out as soon as practicable. Other impacts arising from small human settlements within the Sainj area of the property also need to be addressed as soon as practicable.

Notes for monitoring of OUVs.

Assessment Grade				Area			
				Tubbataha Reefs Natural Park			
Very Good Condition	Good Condition	Poor Condition	Very Poor Condition	Trend Since 1993		Confidence	
All elements necessary to maintain the OUV are essentially intact, and their overall condition is stable or improving. Available evidence indicates only minor, if any, disturbance to this element of OUV	Some loss or alteration of the elements necessary to maintain the OUV has occurred, but their overall condition is not causing persistent or substantial effects on this element of OUV	Loss or alteration of many elements necessary to maintain OUV has occurred, which is leading to a significant reduction in this element of the OUV	Loss or alteration most elements necessary to maintain the OUV has occurred and has caused a major loss of the OUV	↑ Improving ↓ Deteriorating	Grade 1	Trend 1	Adequate high-quality evidence and high level of consensus
				↔ Stable	½	½	Limited evidence or limited consensus
				↑↓ No clear trend	0	0	Very limited evidence, assessment based on anecdotal information

Source: Adapted from a presentation by Jon C. Day, PhD candidate, ARC Centre of Excellence for Coral Reef Studies, James Cook University.

In applying this subjective assessment approach, the following principles should be considered:

- The wording of the *grading statements* is based on a grading system used by IUCN to assess natural WH sites.
- OUV should be considered as being distributed *throughout the whole of the WH property*, rather than being found at discrete locations unevenly distributed throughout the property.

- To provide the most effective assessment of the elements of the SoOUV, the grade reflects a grade for the entire element (this is easier to assess for some elements than others). Each assessment is therefore a 'grade of best fit' for that element across the whole property and all matters relating to the element.
- To be deemed to be of OUV, 'a property must also meet the conditions of integrity … and must have an adequate protection and management system … ' (Section 78 of the Guidelines). Consequently, this assessment considers the four criteria and integrity.

What Is Now Required for the Worksheets on the Following Five Pages?

1. First, noting the excerpt from the Statement of OUV, write a 1–2 sentences in the second column about the *current condition* of that SoOUV excerpt.
2. Second, assess the *grade* against the four colour-coded grading statements and chose the grade of best-fit today based on the best available evidence *(not just what you think or want)*, that is, is the current grade good, or poor… or what? If helpful, copy and paste the relevant column colour into the relevant 'cell' to indicate the grade.
3. Third, insert a *trend arrow* into the same 'cell' as the coloured grading statement; the trend arrow should indicate *the trend today compared to the benchmark of the date of inscription* (i.e., 1993). If helpful, copy and paste the arrows from the example below.
4. Finally *(not essential but useful)*, indicate your confidence in both the grade and trend arrow by inserting either 0, ½ or 1.

Worksheet for GHNPCA

Synthesis (as this wording is not covered elsewhere by wording in any of the criteria below)

								Confidence	
Sl. No.	Excerpt from Statement of OUV	Comments on Current Condition c.f. SoOUV Excerpt	Very Good	Good	Poor	Very Poor	Condition	Trend
1	Encompasses the catchments of water supplies which are vital to millions of downstream users							
2	Protects the monsoon affected forests and alpine meadows of the Himalayan front ranges which sustain a unique biota comprised of many distinct altitude-sensitive ecosystems							
3	Includes 25 forest types and an associated rich assemblage of fauna species							

Criterion x: '… contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation'

(Table continued)

(Table continued)

Sl. No.	Excerpt from Statement of OUV	Comments on Current Condition c.f. SoOUV Excerpt	Very Good	Good	Poor	Very Poor	Confidence: Condition	Confidence: Trend
1	Home to 805 vascular plant species, 192 species of lichen, 12 species of liverworts and 25 species of mosses. *Rhododendron campanulatum* (semru) *Rhododendron arboretum* (buransh) *Quercus semecarpifolia* (oak, kharshu) *Quercus leucotrichophora* (oak, banjh)							
2	31 Species of mammals Snow leopard (*Panthera uncia*) Common leopard (*Panthera pardus*) Musk deer (*Moschus chrysogaster*) Goral (*Nemorhaedus goral)* Himalayan black bear (*Ursus thibetanus*)							
3	209 Birds species Western tragopan (*Tragopan melanocephalus*) Snow partridge (*Lerwa lerwa*) Cheer pheasant (*Catreus wallichii*) Himalayan monal (*Lophophorus impejanus*)							
4	9 Amphibian, 12 reptiles and 125 insects							
5	*Habitat* for 4 globally threatened mammals, 3 globally threatened birds and a large number of medicinal plants							
6	Protection of lower altitude valleys provides for more complete protection and management of important habitats and endangered species like the western tragopan and the musk deer							

Integrity: 'a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes'.

Examining the conditions of integrity requires assessing the extent to which the property:

1. includes all elements necessary to express its OUV;

(Table continued)

(Table continued)

2. is of adequate size to ensure the complete representation of the features and processes which convey the property's significance; and
3. suffers from adverse effects of development and/or neglect.

Sl. No.	Excerpt from Statement of OUV	Comments on Current Condition c.f. SoOUV Excerpt	Very Good	Good	Poor	Very Poor	Confidence: Condition	Confidence: Trend
1	Property is of a sufficient size to ensure the natural functioning of ecological processes Its rugged topography and inaccessibility together with its location within a much larger ecological complex of protected areas ensures its integrity							
2	Altitudinal range within the property together with its diversity of habitat types provide a buffer to climate change impacts and the needs of altitude sensitive plants and animals to find refuge from climate variability							
3	26,560 ha buffer zone known as an Ecozone							
4	Buffer zone coincides with the areas of greatest human pressure and is managed in sympathy with the core values of the Great Himalayan National Park Conservation Area							
5	Buffered by high mountain systems to the north-west which include several national parks and wildlife sanctuaries							
6	Areas also offer scope to progressively increase the size of the World Heritage property							
7	Human settlement related threats pose the greatest concern and include agriculture, localized poaching, traditional grazing, human-wildlife conflicts and hydropower development							
8	Tourism impact is minimal and trekking routes are closely regulated							

(Table continued)

(Table continued)

Management and protection requirements

Sl. No.	Excerpt from Statement of OUV	Comments on Current Condition c.f. SoOUV Excerpt	Very Good	Good	Poor	Very Poor	Confidence Condition	Confidence Trend
1	National parks under the Wildlife Protection Act, 1972, provide for strict protection without human disturbance							
2	The property's boundaries are considered appropriate and an effective management regime is in place including an overall management plan and adequate resourcing							
3	Continued attention is required to manage sensitive community development issues in this buffer zone and in some parts of the property itself							
4	The sensitive resolution of access and use rights by communities is needed to bolster protection as is fostering alternative livelihoods which are sympathetic to the conservation of the area							
5	Local communities are engaged in management decisions							
6	More work is needed to fully empower communities and continue to build a strong sense of support and stewardship for the Great Himalayan National Park Conservation Area							
7	The inclusion of these two Wildlife Sanctuaries supports the integrity of the nomination; however, it opens up concerns regarding the impacts of grazing and human settlements							
8	Extent and impacts of high pasture grazing in the Tirthan area of the property needs to be assessed and grazing phased out as soon as practicable							

(Table continued)

(Table continued)

Sl. No.	Excerpt from Statement of OUV	Comments on Current Condition c.f. SoOUV Excerpt	Very Good	Good	Poor	Very Poor	Confidence Condition	Confidence Trend
9	Other impacts arising from small human settlements within the Sainj area of the property also need to be addressed as soon as practicable							
10	Infrastructure facility such as offices, buildings, roads and patrolling vehicles							
11	Manpower with adequate numbers and skills							
12	Research and monitoring							
13	Tourism facility and visitor management services							
14	Coordination with government line departments and NGOs							

Anthropogenic Influences on GHNPCA

Sl. No.	Excerpt from Statement of OUV	Comments on Current Condition c.f. SoOUV Excerpt	Severity Very Low	Low	High	Very High	Confidence Condition	Confidence Trend
1	Trash materials (plastics, etc.)							
2	Grazing/livestock presence							
3	Exotic species							
4	Poaching							
5	Illegal logging							
6	NWFP extraction							
7	NTFP and fuel wood extraction							
8	Deforestation							
9	Encroachment							
10	Boundary fencing breached							
11	Forest fire							
12	Human wildlife conflict							
13	Pollution (water/land/air)							
14	Commercial activities (mining, food stalls, hotels, etc.)							
15	Illegal wildlife trade							
16	Immigration of people							
17	Rights issues with respect to local communities and indigenous peoples in the Tirthan and Sainj Wildlife Sanctuaries							

(Table continued)

(Table continued)

Sl. No.	Excerpt from Statement of OUV	Comments on Current Condition c.f. SoOUV Excerpt	Severity				Confidence	
			Very Low	Low	High	Very High	Condition	Trend
18	Hydroelectric developments downstream of the property							

Sl. No.	Other Management Requests Following Recent WHC Decisions	Comments on Current Condition Against WHC Request	Very Good	Good	Poor	Very Poor	Confidence	
							Condition	Trend
1	The Park administration is making efforts to involve the villagers of three villages in Sainj Wildlife Sanctuary in Park management activities and phasing grazing out in the Tirthan Wildlife Sanctuary							
2	In providing examples of intact or near-intact lower-altitude temperate forest, as well as extensive areas of alpine meadows, rich in medicinal plants, GHNPCA presents a unique example of a full altitude sequence for the Western Himalayas, possibly the only one available for several of the forest types represented							

Sl. No.	Other Management Requests Like DRR and CCA	Comments on Current Condition Against WHC Request	Very Good	Good	Poor	Very Poor	Confidence	
							Condition	Trend
1	The Park is vulnerable to climate change and instances of natural hazards, such as floods, landslides and cloud bursts, have been recorded and mitigating measures taken into account in the District Disaster Risk Management Plan							

(Table continued)

(Table continued)

		Confidence
2	The Park helps in mitigating disasters as it provides an uninhabited treescape in the upper catchment of several rivers, thereby preventing soiled erosion in the watershed	

Other significant values of national, regional or local significance?

Sl. No.	Significant Values of National, Regional or Local Significance	Comments on Current Condition c.f. Value at Time of Park Declaration	Very Good	Good	Poor	Very Poor	Confidence: Condition	Confidence: Trend
1	Indigenous/traditional values?							
2	Local community values?							
3	Sites of local significance?							

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Sonali Ghosh is an Indian Forest Service officer with over 23 years of work experience and specialization in wildlife. Serve as a field manager in famed PAs - Kaziranga, and Manas. Experience of higher education (PhD) in the UK and stints at UNESCO C2C on World Natural Heritage center at Wildlife Institute of India. Serve as Director Swachh Bharat Mission and achieve the dream of ODF-India using behavior change approaches in the world's largest people's movement. Currently as Deputy Inspector General of Forests, Central Zoo Authority with additional charges as assigned in NTCA and Wildlife Div, MoEFCC.

Gautam Talukdar obtained his PhD from the Indian Institute of Remote Sensing (IIRS). He has been in the field of Geoinformatics for about 2 decades. He has worked in several national and international level projects like Landscape dynamics and its impact on ecosystem composition, Biodiversity characterization at the landscape level, Natural Resources Census (NRCENSUS), Biodiversity Conservation and Rural Livelihood

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