IUCN Conservation Outlook Assessment 2014 **(archived)**
Finalised on 08 September 2014

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

Manas Wildlife Sanctuary

SITE INFORMATION

Country:
India
Inscribed in: 1985
Criteria:
(vii) (ix) (x)

Site description:
On a gentle slope in the foothills of the Himalayas, where wooded hills give way to alluvial grasslands and tropical forests, the Manas sanctuary is home to a great variety of wildlife, including many endangered species, such as the tiger, pygmy hog, Indian rhinoceros and Indian elephant. © UNESCO

SUMMARY

2014 Conservation Outlook

Significant concern

The Manas Wildlife Sanctuary World Heritage Site has been the focus of long term conservation concern and action. The property inscribed in 1985 was, seven years later, added to the World Heritage In Danger List in response to concerns linked to civil unrest and the degradation of natural values. Most alarming was the disappearance of Greater one-horned rhino from the property over a short 13 year period (1988-2001). The site spent a total of 19 years on the In Danger List during which time recovery efforts have seen rhino numbers increase to currently (February 2014) 26 including the birth of new rhinos within the property. Other species are subject to recovery action and, whilst the site remains fragile and population trend data limited, it appears that populations are generally recovering. Management actions have also been slowly improved through the sustained efforts of the State Party backed by significant international expertise including 44 Committee Decisions and 6 IUCN/UNESCO Missions. Nevertheless there remain threats such as those from recurring insurgencies, poaching and encroachment, as well as the impact from existing and proposed upstream hydro-electric projects in Bhutan. The site was only removed from the Danger List in 2011. Continued management effort will be required to avoid a return to the situation of insurgence and insecurity that prevailed in the early 1990s and led to the site’s inscription on the Danger List. If security at the site can be effectively restored the conservation outlook for this property may well improve rapidly.

Current state and trend of VALUES

High Concern
Trend: Data Deficient

The operationalization of the Manas Tiger Conservation Foundation (MTCF), the re-introduction of the Greater One-horned Rhino, the implementation of an integrated ecosystem-based monitoring system and the imminent

implementation of the Eastern Swamp Deer Translocation Protocol are positive steps in ensuring the retention of the property's Outstanding Universal Value. Though badly affected during the ethnic agitation and associated insurgency, the site is recovering. The possible expansion of the site both within India and potentially in collaboration between the adjoining States Parties of India and Bhutan is also a positive initiative in bolstering the ecological resilience of this site to maintain its World Heritage values. The future impact of increasing tourism numbers and activities may negatively affect the fragile and recovering OUV of the site. The newly completed tourism strategy is welcome however needs effective implementation and monitoring to ensure overall numbers of tourists are capped to prevent damage in key areas. The apparent lack of an environmental impact assessment (EIA) for the proposed Mangdechhu hydro-electric project in neighbouring Bhutan means that the potential impacts on OUV and potential cumulative impacts in relation to the existing Kurichu dam are unclear, unpredictable and likely not yet addressed through any mitigation measures.

Overall THREATS

High Threat

Manas Wildlife Sanctuary has in many ways been a model for the sustained use of the Convention's Danger listing processes which has seen a slow yet steady recovery of core values within the site to the point where it has allowed Manas to be removed from the Danger List in 2011. Nevertheless a range of threats persist for the site, especially those linked to the recurring insurgencies and the significant potential impacts arising from hydro-electric development in neighbouring Bhutan. It is the planned hydro-electric development that poses the greatest potential threat to the site as the development is occurring in neighbouring Bhutan and thus predicted direct and indirect negative impacts on the site's values and integrity are outside the control of the State Party.

Overall PROTECTION and MANAGEMENT

Some Concern

In 2011 the World Heritage Committee decided to remove Manas Wildlife Sanctuary from the List of World Heritage in Danger. This was due to the State Party implementing corrective measures to restore the OUV of the site, which had been badly compromised during the time of political unrest. These included

setting up an ecosystem-based monitoring system of wildlife populations; developing and putting into place a swamp deer recovery plan; and developing a comprehensive tourism management plan in close cooperation with local communities. The recent recurrence of insurgent groups inside the site threatens to compromise these successes, and is a significant cause of concern.

Further progress has been made in providing funding since the Manas Tiger Conservation Foundation (MTCF) became operational and started to receive funds from ecotourism activities. The MTCF is expected to play an important role in ensuring adequate availability and flow of funds to park management and so support essential management needs.

Managing Manas in an integrated fashion requires a rationalization of the boundaries to both better align them with formal protected areas and ensure all areas of the OUV are included within the inscribed property. Equally, effective protection and management requires close cooperation with the neighbouring State Party of Bhutan.

FULL ASSESSMENT

Description of values

Values

World Heritage values

- **Wilderness area of exceptional natural beauty**
  Criterion:(vii)

  Manas Wildlife Sanctuary is recognized for its spectacular scenery and natural landscape. It is located at the foothills of the Eastern Himalayas and the northern boundary of the site is contiguous to the international border of Bhutan where the Bhutan Hills provide an imposing scenic backdrop. The tumultuous river swirling down the rugged mountains against the backdrop of forested hills coupled with the serenity of the alluvial grasslands and tropical evergreen forests offers a unique wilderness experience. (adapted from SoOUV, 2011)

- **Dynamic ecological processes supporting a rich diversity of ecosystems**
  Criterion:(ix)

  The Manas-Beki system is the major river system flowing through the site and joins the Brahmaputra River further downstream. Heavy rainfall, the fragility of the rocks and the steep gradients of the catchments are responsible for an enormous amount of silt and rock being deposited to form alluvial terraces. The monsoon and river system at the site form four principal geological habitats: Bhabar savannah, Terai tract, marshlands and riverine tracts. Manas has exceptional importance within the Indian sub-continent’s protected areas, as one of the most significant remaining natural areas in the region, where sizeable populations of a large number of

threatened species continue to survive. The three types of vegetation dominant at the site are semi-evergreen forests, mixed moist deciduous forests and alluvial grasslands. The vegetation of Manas has tremendous regenerating and self-sustaining capabilities due to its high fertility and response to natural grazing by herbivorous animals. (adapted from SoOUV, 2011).

► High plant and animal diversity

Criterion:(x)

The range of habitats and vegetation within the site supports impressive levels of high plant diversity that includes 89 tree species, 49 shrubs, 37 undershrubs, 172 herbs and 36 climbers. There are also fifteen species of orchids, 18 species of fern and 43 species of grasses that provide vital forage to a range of ungulate species. Manas also provides habitat for 42 reptile species, 7 amphibians and 500 species of birds, a number of which are globally threatened. This includes the critically endangered Bengal florican (Houbaropsis bengalensis). (adapted from SoOUV, 2011)

► Threatened species of mammals

Criterion:(x)

The Manas Wildlife Sanctuary provides habitat for 23 of India’s most threatened species of mammals. There are 60 mammal species recorded at the site. These include the elephant (Elephas maximus), tiger (Panthera tigris), greater one-horned rhino (Rhinoceros unicornis), clouded leopard (Neofelis nebulosa), hog deer (Axis porcinus) and sloth bear (Melursus ursiuns). The wild buffalo (Bubalus arnee) population is possibly the only pure strain of this species still found in India. The site also has endemic species like pygmy hog (Porcula salvania), hispid hare (Caprolagus hispidus) and golden langur (Trachypithecus geei) (adapted from SoOUV, 2011).

Other important biodiversity values

► Alliance for Zero Extinction (AZE) site

Alliance for Zero Extinction (AZE) recognized for Porcula salvania-pygmy hog

Mammalia (AZE) http://www.zeroextinction.org

▶ **National tiger habitat value**

National Tiger Reserve (core) (SoOUV, 2011)

▶ **National elephant habitat**

National Elephant Reserve (core) (SoOUV, 2011)

▶ **National biological integrity values**

Biosphere Reserves of India (SoOUV, 2011).

▶ **Important Bird Area**

Home to 500 species of birds including the critically endangered Bengal florican (IBA,2004) (Chan et al, 2011)

▶ **National Park**

In 1990, the 391 square kilometre Manas Wildlife Sanctuary was upgraded to a 500 square kilometre national park. The site has been managed as a national park ever since, however these changes were not reflected in the World Heritage Site (IUCN/UNESCO Mission Report, 2011), which currently (March 2014) remains at 391 square kilometres.

Assessment information

Threats

Current Threats

High Threat

Unsustainable, illegal logging now only poses a low threat due to the

monitoring operations of staff throughout the site. Manas was inscribed onto the List of World Heritage In Danger in 1992 and removed from the list 19 years later in 2011. Commendable and sustained efforts from the State Party along with international partners has seen many of the threats to the site ameliorated. However, in recent years the level of poaching in the site has again increased, linked to increasing insurgencies in the area. The current limitations of forest guards to respond to this threat effectively and insufficient law enforcement (IUCN Consultation, 2014) are a further cause for concern. The translocation of rhinos under the IRV2020 program has been kept on hold for the time being as the security and protection levels in the park are not found to be up to the desired levels. The Rhino Task Force set up by the Government of Assam will review the situation before allowing any further translocations to Manas (IUCN Consultation, 2014).
The existing Kurichu hydro-electric project in neighbouring Bhutan requires collaboration between India and Bhutan to minimize seriously damaging impacts on the site whenever there is water released. The initiatives of the States Parties of India and Bhutan in considering an extension of the site, to include a transboundary extension would be a positive step in lessening this threat.

▶ Commercial hunting, Subsistence hunting

High Threat
Inside site

The entire population of one-horned rhinos decreased from around 100 at the time of the inscription of the property in 1985 to zero in 2001 due mainly to poaching during a time of political unrest. A programme to re-introduce the rhino back into Manas began in 2006 with one individual and increased each year. (SP Report, 2011). As of early 2014 successful wild-to-wild re-introduction of rhino had culminated in 18 reintroduced animals within the site, in addition to six rescued and rehabilitated rhinos and nine rhino births. (State Party report, 2014). Since 2011, seven rhinos have been lost to poaching (State Party report, 2014). Recent poaching has been linked to increasing insurgencies in the area, and includes poaching of deer and buffalo for their meat (Various media reports, 2014), although further investigation is needed to confirm such links.
The Eastern Swamp Deer population dwindled to about 10 individuals, during the time of political unrest. This small population, which is little understood,

requires a targeted plan for its protection and conservation (IUCN consultation, 2014). A translocation protocal has been formulated and was last updated in August 2013. It is anticipated that its implementation will start in 2014, pending final verification by the Government of India. The protocol includes a proposal to re-introduce 20-30 swamp deer from Kaziranga National Park in the first restocking exercise (SP Report, 2014).Officials of Forest protection and surveillance unit, Bhutan, confiscated a tiger skin and bones at Gelephu in September 2013. Based on the data base of available and known tigers of the Manas Landscape, the individual was identified as TM4M in the transboundary report ‘tigers across borders’ (Borah et al 2012).

► Other

High Threat
Inside site

Recent cases of rhino poaching have been linked to increasing activity by insurgent groups in the area. These groups are reported to use the site as a refuge, particularly the riparian area of the Manas-Beki system, the Panbari Range and the Bhuyanpara Range. These insurgent groups are also reported to poach other species, notably deer and buffalo, for their meat.
The insurgent groups are well armed with automatic AK-47s, and the forest guards are not adequately equipped nor trained to confront them. (IUCN consultation, 2014)

► Invasive Non-Native/ Alien Species

Low Threat
Inside site

Grassland invasion by weed species has been a problem since 2000. The most problematic invasive species are Chromaelana odorata, Leea asiatica, and Bombax ceiba (IUCN Consultation, 2014). Mikania micrantha is also reported to be a problem. Although more data is required, the threat from invasive species currently appears to be relatively low (IUCN Consultation, 2014).

► Logging/ Wood Harvesting

Low Threat
Inside site

Outside site

In 1984 the buffer zone was being managed under a ‘multiple use’ basis where selective forestry and firewood collection was allowed. This resulted in non-sustainable over-logging of the forests (IUCN Evaluation, 1984). Levels of illegal logging inside the site are now low due to the operations of the Range Office and 20 other anti-poaching camps in the Bhuyanpara Range. (IUCN/UNESCO Mission Report , 2011) (SP Report, 2011). Continued efforts are needed to ensure this threat remains low, especially as illegal logging in Panbari Range, mostly outside the site, remains problematic (IUCN Consultation,2014).

► Dams/ Water Management or Use

High Threat
Inside site
Outside site

In 2004 excess water was released from the Kurichu dam (part of the Kurichu hydro-electric project in neighboring Bhutan) resulting in an unprecedented flood in the Manas-Beki river system, washing away parts of the site and killing a large number of wild animals. The release of water from the Kurichu dam has occurred on several occasions in the last six years and is reported to have caused floods in the wider Manas Biosphere Reserve, of which the site forms an integral part (WHC 36COM Decision, 2012).

Potential Threats

High Threat

The proposal to build the Mangdechhu hydro–electric plant in the neighbouring country, Bhutan, which will be twelve times bigger than the existing Kurichu hydro-electric dam, and the apparent lack of an environmental assessment for the proposal, poses a serious potential threat upon the site. The inclusion of the Royal Manas National Park on Bhutan’s Tentative List, and the possibility of a future nomination by the State Party of Bhutan would enable the two sites to be managed more harmoniously in a way that would better protect OUV.
The potential for the development of an ecotourism industry needs to be planned for and managed in order to ensure that such a development, whilst being beneficial to the local community, does not adversely impact the site’s fragile and recovering values. The tourism strategy within the 2013-2023 Tiger

Conservation Plan for Manas Tiger Reserve is a positive development that is expected to help managing any potential negative impacts from tourism.

► Dams/ Water Management or Use

High Threat
Inside site
Outside site

In addition to the existing Kurichu dam, there is a proposal for a new hydro-electric project, the Mangdechhu dam to be developed in Bhutan. This is likely to negatively affect the forests and water bodies of the site, thus reducing the ecosystems' ability to support wildlife. The impact of water released from the Kurichu hydro-electric project since 2004 is an indicator of the impact that this could have. It is not clear if an environmental impact assessment has been undertaken by Bhutan for the proposed Mangdechhu project and the dam will be 12 times larger than the Kurichu dam. (WHC 36COM Decision, 2012)

► Tourism/ visitors/ recreation

Low Threat
Inside site
Outside site

The State Party has advised that a tourism strategy was developed as part of the 2013-2023 Tiger Conservation Plan for Manas Tiger Reserve, of which the property forms the core zone. The strategy includes provisions for the maximum allowable number of visitors and the type of activities permitted (SP Report, 2014). The site is not ready to accommodate large numbers of visitors. The strategy is critical in order to ensure that the fragile and recovering Outstanding Universal Value of the site is not negatively affected (IUCN/UNESCO SOC, 2012).

Protection and management

Assessing Protection and Management

► Boundaries

Some Concern

There is some confusion over the boundaries of the site, which is often referred to as ‘Manas National Park’. The area that was inscribed on the list of World Heritage in 1985 was the 39,100 ha Manas Wildlife Sanctuary. The Wildlife Sanctuary was expanded to 50,000 ha and designated a National Park in 1990. As this extension was never submitted to the World Heritage Committee for consideration the boundaries and the name of the property remain unchanged. The site is completely included in the National Park and the distinction between the property and the National Park is known among the park management and others working in the area. However, both are treated as one entity thus making the distinction in management difficult (IUCN/UNESCO Mission Report, 2011).
It is proposed to progressively expand the site in three stages: – align the inscribed property to MNP; add an area of 36,000ha proposed by the BTC which is deemed for addition to MNP; and explore the possibilities of a transnational extension into neighbouring Bhutan (WHC 35COM Decision, 2011). Any such extension should be based on a clear understanding of OUV, including the conditions of integrity.

► Relationships with local people

Mostly Effective

Whilst there are no direct management roles played by resident locals, programmes have been initiated by some local communities, in particular those in the 61 villages along the southern boundary. These are targeted at seeking community participation in the protection of the flora and fauna of the property and sustainable livelihoods. The level of community involvement is impressive, with the formation of thirteen local NGOs initiated by the local people and supported by the Bodoland Territorial Council (BTC). These NGOs are involved in various activities, such as animal rescue, patrolling, wildlife monitoring (e.g. Bengal florican), public awareness raising and most prominently ecotourism (UNESCO Periodic Report, 2011).

► Legal framework and enforcement

Some Concern

The site is protected legally under the provisions of the national Wildlife (Protection) Act 1972, however the State Party considers that implementation of the legislation at the site and in the buffer zones and

surrounding areas remains inadequate (UNESCO Periodic Report, 2011). Efforts have however, been successful in rebuilding damaged park management infrastructure, filling vacant staff positions and undertaking law enforcement to address illegal logging and poaching (IUCN/UNESCO Mission Report, 2011) (SOC report, 2011). The authorities have responded to recent increases in rhino poaching by hiring more enforcement personnel and intensifying patrolling (State Party report, 2014), and SMART patrolling is being implemented which is expected to improve planning and implementation of protection regimes (IUCN Consultation, 2014). However lack of adequate equipment and training of forest guards to confront insurgent groups is impeding effective enforcement (IUCN Consultation, 2014). Encroachment remains a problem in the Panbari Range of the national park, however this falls just outside the World Heritage Site (IUCN/UNESCO Mission Report, 2011) (SOC report, 2011). Recent reports of new encroachment in Bhuyanpara Range, inside the World Heritage Site, are a cause for concern (IUCN Consultation Form, 2014).

► Integration into regional and national planning systems

Highly Effective

The Manas Tiger Conservation Landscape (MTCL), extends to the east and west into Assam, along the Indo-Bhutanese border, and also deep into Bhutan. There is strong collaboration and cooperation in the management of the Indo-Bhutan MTCL by the States Parties of India and Bhutan. Indian and Bhutanese park management staff from the adjoining Manas (India) and Royal Manas (Bhutan) National Parks regularly visit each other to exchange information (IUCN/UNESCO Mission Report, 2011). Transboundary cooperation has evolved further since the formalization of the Transboundary Manas Conservation Area (TraMCA), which is perceived to be a crucial initiative to address a number of conservation challenges (State Party report, 2014).

► Management system

Mostly Effective

As a National Park, Manas is granted high levels of national protection and is owned and managed by the State of Assam. Manas is unique in that it is located in the autonomous Bodoland Territory. Under the 2003 agreement

which created it, the BTC has executive, administrative and financial powers for the management of forests, and has been a very important provider of funds and resources for the management of Manas National Park (IUCN/UNESCO Mission Report, 2011). The site has suffered in the past from a lack of management planning (IUCN/UNESCO Mission, 2008). Since 2008 management planning has been improved. The site is subject to a range of management planning instruments due to overlapping jurisdictions, however the Management Plan of Manas National Park 2008-09 to 2015-2016 is the most relevant for the World Heritage Site. (IUCN/UNESCO Mission Report, 2011). A comprehensive tourism strategy has been developed as part of the 2013-2023 Tiger Conservation Plan for Manas Tiger Reserve, which includes guidelines for the maximum number of tourists allowed to enter the site at any given time (State Party report, 2014).

► Management effectiveness

Mostly Effective

The implementation of the Integrated Ecosystem Based Monitoring System should improve the quality of management at the site by allowing property wide analysis of key values and the conservation status of populations of flagship species (IUCN SOC, 2012). Manas, as one of a number of reserves across the tiger range states, will benefit from a current project, Conservation Assured Tiger Standards (CA|TS), to improve the management effectiveness of protected areas which are central to tiger survival (Equilibrium Research, WWF CA|TS Project, 2012).

► Implementation of Committee decisions and recommendations

Highly Effective

The Committee’s recommendation of an integrated ecosystem-based monitoring system and an Eastern Swamp Deer recovery plan is being implemented by the site authorities including baseline surveys of wildlife populations (UNESCO Periodic Report, 2011). The State Party notes an improved fund release, in particular since 2013 (State Party report, 2014). Progress is being made in relation to the States Parties of India and Bhutan in considering an extension of the site, including a transboundary extension. The State Party of Bhutan has to date (March 2014) not submitted a copy of the environmental impact assessment (EIA) for the proposed Mangdechhu

hydro-electric project, which would potentially have impacts on the OUV of the site (IUCN SOC, 2012).
The site has been the subject of considerable Committee deliberation (some 44 Committee Decisions have been taken with regards to the site). The process of addressing threats to the site has been protracted; however the State Party has responded positively to Committee decisions and the various missions to the site. Significant international assistance has also been provided to the property (IUCN SOC, 2012).

► Sustainable finance

Some Concern

The State Party reports that 53% of funding comes from national level government; 40% from regional government; 3% from International donations; 2% from visitor charges and 1% from both in-country donations and commercial operations. (UNESCO Periodic Report, 2011).
International Assistance of USD 165,000 has been received from the World Heritage Fund since 2008 for purchase of equipment, rehabilitation of infrastructure and community activities.
The operationalization of the Manas Tiger Conservation Foundation (MTCF) has resulted in some funds being received from ecotourism activities. The slow release of funding to the site has hampered its recovery (WHC 36COM Decision, 2012), however, the State Party noted progress in resolving this issue, including the MTCF’s ability to request loans to expedite management activities pending the release of funds (State Party report, 2014). Whether or not the issue of timely availability of funds has been resolved will require further assessment in years to come.

► Staff training and development

Some Concern

The BTC has made commendable efforts to fill the vacant staff positions since the 2008 joint UNESCO/IUCN reactive monitoring mission. The 2011 mission noted 372 permanent forest staff and 322 other positions filled by different categories of manpower (IUCN/UNESCO Mission Report, 2011). 100% of staff are full-time employees, with 85% of those employed on a permanent basis. Whilst the staff levels for conservation, administration and law enforcement are reported by the State Party as good, other disciplines

such as tourism are lacking in adequate staff. Despite these commendable efforts, the reported inadequate training and equipment of forest guards to confront insurgent groups that take refuge in the site is cause for concern (IUCN Consultation, 2014).
There is still a dependence on technical work being carried out by external experts (UNESCO Periodic Report, 2011).

► Sustainable use

Mostly Effective

The State Party reports the potential negative impact of subsistence wild plant collecting and fishing in the site by indigenous people. At present there is no resource use posing a threat to the conservation of the site.
(UNESCO Periodic Report, 2011) (State Party report, 2014).

► Education and interpretation programs

Some Concern

There are limited education programmes in place at the site and inadequate interpretative material available, hence very little information disseminated on the OUV of the site to either the general public or the local people. There appears to be no awareness programmes or information given out regarding the adequate use of the site’s natural resources. (UNESCO Periodic Report, 2011).

► Tourism and interpretation

Some Concern

Visitor numbers are slightly increasing each year but the State Party reports that there is inadequate understanding of the site’s OUV and as a result little or no promotion of it to visitors through the tourism industry. Very little revenue collected by the operators is channelled back into the site’s resources
(UNESCO Periodic Report, 2011). Although the Manas Tiger Conservation Foundation (MTCF) also channels tourism revenue directly into park management (State Party report, 2014), it is not clear how much funding this involves.
The tourism strategy within the 2013-2023 Tiger Conservation Plan for Manas Tiger Reserve, which includes guidelines for visitor numbers based on an

analysis of carrying capacity (State Party report, 2014), is a positive development.

► Monitoring

Mostly Effective

In March 2011 a draft framework for ecosystem-based monitoring in the site was submitted by the State Party. It reported that the implementation had begun including the preparation of spatial maps, research on drivers of habitat change, and monitoring of vegetation, including invasive species (WHC 36COM Decision, 2012). In February 2014 the State Party reported on a number of monitoring activities carried out in Manas National Park, including wildlife monitoring, tiger and prey surveys, invasive species monitoring, vegetation sampling, and ecological studies (State Party report, 2014). Baselines for tiger and co-predators have been established (IUCN Consultation, 2014).

► Research

Data Deficient

The State Party reports that there are research projects being undertaken but there appears to be little data available to document this. (UNESCO Periodic Report, 2011).

Overall assessment of protection and management

Some Concern

In 2011 the World Heritage Committee decided to remove Manas Wildlife Sanctuary from the List of World Heritage in Danger. This was due to the State Party implementing corrective measures to restore the OUV of the site, which had been badly compromised during the time of political unrest. These included setting up an ecosystem-based monitoring system of wildlife populations; developing and putting into place a swamp deer recovery plan; and developing a comprehensive tourism management plan in close cooperation with local communities. The recent recurrence of insurgent groups inside the site threatens to compromise these successes, and is a significant cause of concern.
Further progress has been made in providing funding since the Manas Tiger

Conservation Foundation (MTCF) became operational and started to receive funds from ecotourism activities. The MTCF is expected to play an important role in ensuring adequate availability and flow of funds to park management and so support essential management needs.
Managing Manas in an integrated fashion requires a rationalization of the boundaries to both better align them with formal protected areas and ensure all areas of the OUV are included within the inscribed property. Equally, effective protection and management requires close cooperation with the neighbouring State Party of Bhutan.

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

Some Concern

The joint initiatives of the States Parties of India and Bhutan for transboundary cooperation, and the inclusion of the Royal Manas National Park on the Tentative List of the State Party of Bhutan is a positive step in improving the protection of the site as the boundaries of the site are contiguous with Bhutan.
The greatest potential threat to the site from factors outside is the proposed Mangdechhu hydro-electric project. There is a lack of clarity about whether or not an environmental impact assessment (EIA) for the proposal has been carried out. To assess the impact of the proposal on the site the State Party of Bhutan has been requested to provide to the World Heritage Centre a copy of the EIA for the Mangdechhu development including an assessment of potential impacts on the site’s OUV and potential cumulative impacts in relation to the existing Kurichu dam. (WHC 36COM Decision, 2012)

► Best practice examples

The sustained use of the Convention’s World Heritage in Danger processes, whilst protracted, has resulted in the successful recovery of the site’s OUV, though it remains fragile. The commendable efforts of the State Party and the management authorities to protect and restore the site will need to be sustained to ensure the long term conservation of its OUV.

State and trend of values

Assessing the current state and trend of values

World Heritage values

► Wilderness area of exceptional natural beauty

High Concern
Trend:Data Deficient

The existing Kurichu hydro-electric project (60 MW) and the proposed Mangdechhu project (720 MW) both in neighbouring Bhutan, are likely to negatively affect the forests and water bodies of the property thus impacting on the aesthetics of the property. Both the Kurichu and the Mangdechhu rivers contribute to the flow of the Manas-Beki river system, which considerably sustains the property. In 2004 the Kurichu dam released excess water causing extensive flooding in the Manas-Beki river system, washing away parts of the site and resulting in a blockage of one channel of the Manas-Beki river system, significantly reducing water flow. On several occasions the release of water from the Kurichu dam is reported to have caused floods in the wider Manas Biosphere Reserve, of which the property forms an integral part (WHC 36COM Decision, 2012).

► Dynamic ecological processes supporting a rich diversity of ecosystems

Low Concern
Trend:Stable

As above the threats associated with periodic flooding from uncontrolled upstream water release impact also on ecological function. Tourism use whilst currently minimal could increase under pressure from local communities to exploit ecotourism opportunities. This needs to be carefully managed through the newly created tourism strategy and monitoring of overall tourist numbers and locations. On balance the commendable long term efforts to restore and manage critical habitat and to ensure ecological systems are functional has paid dividends and the site’s values are considered stable. Initiatives to increase the size of the property will significantly improve the ecological viability.

► High plant and animal diversity

Data Deficient
Trend:Data Deficient

In 2011 the implementation of a draft framework for ecosystem-based monitoring in the site commenced. This includes monitoring of the conservation status of recovering populations of endangered species as well as other key components of the ecological makeup of the property. Invasive species are also being monitored (State Party report, 2014). That said it is still too early to confidently assess the status of property wide conservation.

► Threatened species of mammals

Data Deficient
Trend:Data Deficient

Factors outlined above also play an important part in maintaining habitat values and the protection of flagship species. In 1988 Manas was affected by insurgencies with invasion by militants. As a result of the encroachment on the site by the militants, considerable damage was done to the OUV of the property. Since the reintroduction of Greater One-horned Rhino since 2006 and the setting up of the Manas Tiger Conservation Foundation in 2011, the recovery of biodiversity is progressing slowly (IUCN/UNESCO Mission Report, 2011). The imminent implementation of the Eastern Swamp Deer Translocation Protocol is expected to again further this recovery (State Party report, 2014). As of February 2014, nine rhino calves were born in the site (State Party report, 2014). Despite these encouraging measures of success it is still too early to confidently assess the status of property wide conservation in such a fragile system as Manas. The poaching of seven rhinos between 2011 and 2013 is a stark reminder of this fragility.

Other important biodiversity values

► Alliance for Zero Extinction (AZE) site

Alliance for Zero Extinction (AZE) recognized for Porcula salvania-pygmy hog Mammalia (AZE) http://www.zeroextinction.org

► National tiger habitat value

National Tiger Reserve (core) (SoOUV, 2011)

► National elephant habitat

National Elephant Reserve (core) (SoOUV, 2011)

► National biological integrity values

Biosphere Reserves of India (SoOUV, 2011).

► Important Bird Area

Home to 500 species of birds including the critically endangered Bengal florican (IBA,2004) (Chan et al, 2011)

► National Park

In 1990, the 391 square kilometre Manas Wildlife Sanctuary was upgraded to a 500 square kilometre national park. The site has been managed as a national park ever since, however these changes were not reflected in the World Heritage Site (IUCN/UNESCO Mission Report, 2011), which currently (March 2014) remains at 391 square kilometres.

Summary of the Values

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

High Concern

Trend: Data Deficient

The operationalization of the Manas Tiger Conservation Foundation (MTCF), the re-introduction of the Greater One-horned Rhino, the implementation of an integrated ecosystem-based monitoring system and the imminent implementation of the Eastern Swamp Deer Translocation Protocol are positive steps in ensuring the retention of the property’s Outstanding Universal Value. Though badly affected during the ethnic agitation and

associated insurgency, the site is recovering. The possible expansion of the site both within India and potentially in collaboration between the adjoining States Parties of India and Bhutan is also a positive initiative in bolstering the ecological resilience of this site to maintain its World Heritage values. The future impact of increasing tourism numbers and activities may negatively affect the fragile and recovering OUV of the site. The newly completed tourism strategy is welcome however needs effective implementation and monitoring to ensure overall numbers of tourists are capped to prevent damage in key areas. The apparent lack of an environmental impact assessment (EIA) for the proposed Mangdechhu hydro-electric project in neighbouring Bhutan means that the potential impacts on OUV and potential cumulative impacts in relation to the existing Kurichu dam are unclear, unpredictable and likely not yet addressed through any mitigation measures.

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

Data Deficient

Trend: Data Deficient

In 2004, Manas National Park (MNP) was declared an Important Bird Area as there are 500 species of birds registered at the site, including the critically endangered Bengal florican (Birdlife International, 2004).

Additional information

Key conservation issues

▶ **Recovery of endangered species**

Local

Signs are encouraging that key populations are stable or increasing, however, continued management effort is needed. The Ecosystem based monitoring system is a positive step but will need time to assemble property wide results. The imminent implementation of the Eastern Swamp Deer Translocation Protocol will be another positive step towards the recovery of Manas’

endangered mammals.

▶ Recurring insurgencies

Local

The recent recurrence of insurgencies in and around the site is a significant cause for concern, and has a very real potential of limiting or even undoing recent conservation successes. It is already showing impacts on the re-introduced rhino population through poaching, and is also likely to reduce the viability of an Eastern Swamp Deer translocation programme. There are indications that new encroachment in the Bhuyanpara Range inside the site may also be linked to the insurgencies. This situation requires an urgent resolution to avoid a return to the situation that prevailed at the time of the site's inscription on the List of World Heritage in Danger.

▶ Hydro-electric projects

National

There is a proposal for a new hydro-electric project, the Mangdechhu (12 times larger than that of the existing Kurichu hydro-electric project) to be developed in Bhutan. This is likely to negatively affect the forests and water bodies of the site, thus reducing the ecosystems' ability to support wildlife. No environmental impact assessment appears to have been undertaken by the State Party of Bhutan for the proposed Mangdechhu project. (WHC 36COM Decision, 2012)

Benefits

Understanding Benefits

▶ Outdoor recreation and tourism

The site has the potential to become an important area for ecotourism. Over the last five years there has been a steady increase in the number of visitors to the site. The welcome completion of a comprehensive tourism strategy will help to plan and manage visitation to the site and to determine how benefits are shared in future years. The strategy is expected to regulate the number of visitors to the site and the activities undertaken. The opportunity to establish a thriving ecotourism industry has the potential to involve many of

the locals thus providing work and income for them as well as enabling them to become engaged with the day to day running of the site. At the same time the development of relevant education programmes and interpretive programmes would impart information to visitors to the site, but also be an opportunity to help protect the OUV of the site through formal and informal dissemination of information.

► **Is the protected area valued for its nature conservation?**

If the property is extended into Bhutan, it would include a much higher altitudinal gradient than it does currently. This would likely significantly increase the site's resilience to climate change.

Summary of benefits

The site is a globally renowned example of conservation recovery linked to iconic species. Whilst ecological recovery is paramount there are opportunities to promote this conservation success story and ensure that benefits flow to local people. In so doing a sense of stewardship can be engendered among stakeholders.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	Durrell Wildlife Conservation Trust		Pygmy Hog (Porcula salvania) breeding centre at Basistha, Guwahati.
2	Unified Forest Conservation Network		Forest protection Services

№	Organization/ individuals	Project duration	Brief description of Active Projects
3	Aaranyak		Baseline survey of population of Panthera tigris (tiger) and its prey and ongoing monitoring; Monitoring and control of invasive species in the grassland ecosystem of Manas NP; Monitoring and mitigation of Human-elephant conflict around Manas National Park. Empowering women Self-help groups from fringe villages of Manas NP through diversified livelihood options like fishery, food processing, weaving etc.
4	Assam Forest Department/ WWF/IRF/USFWS/BTC		Indian Rhino Vision 2020 – among other objectives, the reintroduction of Greater One-horned Rhino into various protected areas in Assam, including Manas. Manas was the first site selected for reintroduction under this program, 18 rhinos translocated successfully after supporting the rebuilding of the park for security of the rhinos.
5	WWF/IUCN		Conservation Assured Tiger Standards – aiming at lifting management effectiveness and standards in tiger reserves across the tiger range states.
6	Assam Forest Department/ Manas Tiger Project/WWF/ Aaranyak/ATREE		Baseline survey of population of Panthera tigris (tiger) and ongoing monitoring

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