**Supplementary information**

**Detailed Case Studies**

**Comoe National Park**

Comoe National Park (NP) is a very large protected area (PA) in Côte d'Ivoire / Ivory Coast (West Africa) with high floristic diversity. It was inscribed as a WHS in 1983 for significant ongoing ecological and biological processes in the evolution and development of species of flora and fauna (criterion ix) and the presence of most important natural habitats for in-situ conservation of biological diversity, including threatened species (criterion x), which is represented by the Comoe river ecology and the resultant geomorphology and biodiversity. This resulted in a wide variety of habitats, including savannas, wooded savannas, gallery forests, fluvial forests and riparian grasslands, supporting 620 plant species, 135 species of mammals, 35 amphibian species and 500 bird species. It has an adequate demarcated area to preserve its ecological integrity and falls under the regime of its national legal framework for protection (https://whc.unesco.org/en/list/227/).

The site faced challenges in its protection and management setup and despite being a biodiversity-rich area it was trapped in the grips of relentless poaching in the 1980 and 1990s. With the administration unable to manage the situation and village-like hunting camps established inside the Park, mammals like the African wild dog *Lycaon pictus*, black rhino *Diceros bicornis*, and cheetah *Acinonyx jubatus*, were suspected to be extinct (Fisher, 2004). Armed rebellion broke out in the major cities of Côte d'Ivoire in 2002, along with increased poaching, and infrastructure and monetary losses (Fisher, 2004). During the 27th session of the Committee, the State Party underscored the decline in the site values due to the rebellion and requested to place Comoe on the List of World Heritage in Danger. Expressing its apprehension about the situation and analyzing the State of Conservation (SoC) Report, the Committee inscribed Comoé NP on the Danger List in 2003 (UNESCO, 2021a). It invoked the German Technical Co-operation (GTZ), the European Union (EU) and other non-governmental organizations (NGOs) for their technical and financial support to the site achieve the recommended corrective measures and restore its OUV (https://whc.unesco.org/en/list/227/documents/).

Soon after the conflict eased, which lasted between 2002 through 2022 (Lapuente et al., 2020), the administration gained control of the situation. A proactive management and protection strategy, including steps for the closure of gold mining in and around the Park, advised by the WHC (https://whc.unesco.org/en/soc/1097), was initiated. In its 36th session, the Committee advised the state party to ensure that an effective system of control and patrolling, in collaboration with the armed forces, is in place for the whole property, to invite a WHC/IUCN reactive monitoring mission to evaluate the status of the OUV, devise a rehabilitation project, and also prepare a proposal for the ‘desired state of conservation for the property's removal’ (DSCOR) from the Danger List (https://whc.unesco.org/en/soc/74). The reactive monitoring mission that visited the site in 2013 reported that the Park authorities had established patrolling paths and routines, along with creating awareness about wildlife conservation among the populace, and reduced livestock grazing and other illegal activities in the site. The IUCN advised the state party to conduct an aerial inventory to monitor the impacts of gold mining activities on wildlife populations (whc.unesco.org/en/sessions/37COM/). The WHF and other international organizations granted a total of 147,000 USD to the state party (https://whc.unesco.org/en/soc/3503) for the rehabilitation of the site. Following the execution of the corrective measures, along with financial assistance from the WHF etc., closure of most of the mining projects near the site (https://whc.unesco.org/en/soc/3363), and the achievement of the DSCOR, Comoe NP was said to have restored its OUV and was reinstated as a WHS in 2017 during the 41st session of the WHC (https://whc.unesco.org/en/soc/3503).

**Manas Wildlife Sanctuary**

Manas Wildlife Sanctuary (WLS), a part of a larger Manas National Park and Tiger Reserve, is located in the Indian state of Assam. It was inscribed on the WHL in 1985, for superlative natural phenomena or aesthetic importance (criterion vii), significant ongoing ecological and biological processes in the evolution and development of species of flora and fauna (criterion ix) and the presence of most important natural habitats for in-situ conservation of biological diversity, including threatened species (criterion x). This biodiversity hotspot is known for its scenic Manas River, originating in Bhutan, flowing through a mosaic of bhabar and terai grasslands, wooded evergreens and swampland, at the backdrop of Bhutan hills and hosting the endemic pygmy hog *Porcula salvania*, hispid hare *Caprolagus hispidus* and the golden langur *Trachypithecus geei*, apart from other endangered species of flora and fauna (UNESCO, 2021b).

Manas faced damages caused by a long ethnic uprising of the dominant Bodo community between 1989 and 2003, which resulted in loss of life and property of people of the region, along with exertion of pressure on its natural resources (Goswami and Ganesh, 2014). The IUCN and World Heritage Centre expressed their grave concern about Manas Wildlife Sanctuary being in danger of losing its OUV. Given that the state party had not submitted its SoC Report for three consecutive years and that the Park had suffered losses of about 1.6 million USD, the Committee decided to include Manas as a World Heritage Site in Danger in 1992 (https://whc.unesco.org/archive/repcom92.htm#manas).

Soon after the newly formed Bodoland Territorial Areas Districts (BTAD) gained some stability under the Bodoland Territorial Council (BTC) after 2003, initial pro-conservation collaborations were established among Assam Forest Department, IUCN, Swaminathan Foundation and WWF-India, as facilitated by the World Heritage Centre (https://whc.unesco.org/en/decisions/5426). The WHF and other international organizations granted a total of 165,000 USD to the state party (https://whc.unesco.org/en/soc/283) for the rehabilitation of the site. Awareness programmes, and the World Heritage Biodiversity Programme for India, in collaboration with the then Ministry of Environment and Forest (now Ministry of Environment and Forest and Climate Change – MoEFCC), Wildlife Institute of India (WII), ATREE and UNF helped in gaining local support for conservation activities. Following the ‘nudge’ (the Committee had requested the status and trends of the tiger, rhino, elephant and swamp deer populations in the property - https://whc.unesco.org/en/soc/1107) by the WHC, a re-introduction programme for the then locally extinct Indian rhinos was initiated in the site in 2005, in collaboration with the WWF-India, United States Fish and Wildlife Service (USFWS) and the IRF (Bonal et al., 2009). Re-building of the Park infrastructure and regular patrolling duties were taken up by the authorities; monitoring of certain key species of flora and fauna was jointly done by NGOs like WWF-India, ATREE and Aaranyak. Finally, two monitoring missions by the WHC and IUCN in 2005 and 2011 observed that the recovery of the OUV had advanced well, and therefore, the Committee decided to reinstate Manas WLS to the WHL in 2011 (https://whc.unesco.org/en/decisions/4347).

**Rwenzori Mountains National Park**

Rwenzori Mountains NP, in western Uganda, is a PA in the alpine zone, consisting of glaciers, waterfalls and lakes, contiguous with the Virunga National Park (Congo). It was inscribed in the WHL in 1994, for superlative natural phenomena or aesthetic importance (criterion vii) and the presence of most important natural habitats for in-situ conservation of biological diversity, including threatened species (criterion x). The aesthetic value of the site is due to its fog-covered mountains and its unique alpine flora, like giant heathers *Erica arborea*, groundsels *Dendrosenecio*, and *Lobelias*. Over 217 bird species, the African forest elephant *Loxodonta cyclotis*, eastern chimpanzee *Pan troglodytes schweinfurthii*, l’Hoest’s monkey *Allochrocebus lhoesti* and the endangered Rwenzori black-fronted or red duiker *Cephalophus nigrifrons* make this Park their home. However, the Park faces challenges of high bamboo collection, tourism, population expansion around the property and agricultural infringement (https://whc.unesco.org/en/list/684/).

Not long after achieving World Heritage status, the Rwenzori area was threatened with social instability from 1996 – 2000, initiated by the uprising of the Allied Democratic Forces (ADF), a rebel group which operated to thwart the local government on the Uganda-Congo border, to avenge previous oppressions of the native tribal people by the administration, (William, 2020). Killings, mutilations, abductions and landmine blasts in and around the Rwenzori Mountain caused deterioration of the socio-economic structure of the area, amid feeble attempts by the defence forces of the country to gain control (Titeca & Vlassenroot, 2012). Expressing its growing concern over the lack of conservation efforts and management regime at the Park, the WHC decided to inscribe the Rwenzori Mountains on the Danger List in 1999 and asked IUCN to seek national and international support to help in site management and recover its lost value (UNESCO, 2021c).

The rebellion reduced in intensity with the efforts of the Uganda Police Department Force (UPDF) in 2000, and in 2001 the Uganda Wildlife Authority (UAW) reopened the Park to tourism (https://whc.unesco.org/en/soc/2476). The Committee suggested that a WHC/IUCN mission should visit and assess the ground situation and that a collaboration is necessary between the Park staff and the security forces to achieve the goal of site protection without many casualties. A strong collaboration was initiated with local communities in the Rwenzori Mountains NP, where the authority levied taxes on tourism, which resulted in significant benefits for a variety of stakeholders (Rossler, 2018). Following the recommendations of the Committee, and achieving successful protection and management strategy, Rwenzori Mountains NP saw an annual increase of 20% in visitors from 2003, ensuring adequate funds for the protection of the site (Wang et al., 2015). With international assistance through grants (96,749 USD) (https://whc.unesco.org/en/soc/1369) along with technical and diplomatic support, the finalization and execution of the General Management Plan, the Protected Areas System Plan and the implementation of the Protected Areas Management for Sustainable Use (PAMSU) project, the Rwenzori Mountains NP was reinstated in the WHL in 2004 (https://whc.unesco.org/en/soc/1369).

**Salonga National Park**

Salonga NP is located in the Democratic Republic of Congo (DRC), known for its protection of the pygmy chimpanzee or bonobo *Pan paniscus*, the bush elephant *Loxodonta africana* and the Congo peafowl *Afropavo congensis*, the world’s second-largest intact tropical rainforest PA, managed by the Congolese Institute for Nature Conservation (ICCN) (Debonnet and Hillman-Smith, 2004). Contributing to a carbon sink, this site is composed of large swamplands and a pristine gallery forest, which evolved as an intricate tropical rainforest, being inscribed as a WHS in 1984, for superlative natural phenomena or aesthetic importance (criterion vii) and significant on-going ecological and biological processes in the evolution and development of species of flora and fauna (criterion ix) (UNESCO, 2021d). The area is integral in offering optimal habitat to the plants and animals, along with providing land to native populations inside the Park (http://world-heritage-datasheets.unep-wcmc.org/datasheet/output/site/salonga-national-park/).

Armed civil unrest in the smaller areas, followed by a full-blown war in the whole DRC, disrupted the protection regime, and damage to the biodiversity through poaching, deforestation and encroachment in the site from the early 1990s onwards (Debonnet & Hillman-Smith, 2004). Wildlife trafficking of elephant ivory, violation of the PA boundary and rising atrocities of the government eco-guards against the villagers during law enforcement threatened the integrity of the site (Yabuta, 2011). Because of the deteriorating condition of the site and its OUV, urgent steps needed to be implemented in Salonga, along with the other sites in DRC on the Danger List; thus, it was declared a WHS in Danger in 1999 (https://whc.unesco.org/en/decisions/5705).

The ICCN submitted a report to IUCN in which it gave a set of recommendations to be followed to reduce the threats and restore conservation activities: community education, infrastructure and communication improvements, sustainable tourism in the Bonobo region, and scientific research and management of the site (https://whc.unesco.org/en/decisions/5705). A four-year project on 'Biodiversity Conservation in Armed Conflict: Protecting World Natural Heritage in the Democratic Republic of the Congo' was taken up in 2000, with funding from the United Nations Foundation. There were seven monitoring missions by the World Heritage Centre and IUCN to the site between 2000 and 2020, which observed that the DSCOR had progressed steadily. Emergency assistance provided by international donors through the WHF (719,900 USD - https://whc.unesco.org/en/soc/4048) was used to restore the conservation actions on the site. A co-management agreement between the ICCN and the WWF-DRC implemented the recommended corrective measures towards the conservation of the Park and restricted oil concessions within the Park. The WHC thus decided to reinstate Salonga National Park on the WHL, with a follow-up nudge on ensuring conservation support from the people, control of poaching and facilitating ecological connectivity with its adjacent forests (https://whc.unesco.org/en/decisions/7706).

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