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Point 7 de l'Ordre du jour provisoire: Etat de conservation de biens inscrits sur la Liste du patrimoine mondial et/ou sur la Liste du patrimoine mondial en péril

MISSION REPORT / RAPPORT DE MISSION

Tropical Rainforest Heritage of Sumatra (Indonesia) (N1167)
Patrimoine des forêts tropicales ombrophiles de Sumatra (Indonésie) (N1167)

5 - 16 April 2018
5 - 16 avril 2018

IUCN

Reactive Monitoring Mission

Tropical Rainforest Heritage of Sumatra World Heritage Site, Indonesia

5 - 16 April 2018



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Cover Photo: SOS message in an oil palm plantation from the conservation NGO, Yayasan Orangutan Sumatera Lestari – Orangutan Information Centre (YOSL-OIC), which is cutting down illegal oil palm plantations within Gunung Leuser National Park before restoring natural forest. ©IUCN/Peter Howard.

Acronyms and Abbreviations

BBSNP	Bukit Barisan Selatan National Park
DSOCR	Desired state of conservation for the removal of the property from the List of World Heritage in Danger
EIA	Environmental Impact Assessment
FFI	Fauna and Flora International
FKL	Forum Konservasi Leuser (Leuser Conservation Forum)
GEF	Global Environment Facility
GLNP	Gunung Leuser National Park
HAKA	Yayasan Hutan Alam dan Lingkungan Aceh (Forest, Nature and Environment of Aceh)
IUCN	International Union for Conservation Nature
KfW	Kreditanstalt für Wiederaufbau (German Development Bank)
KSNP	Kerinci Seblat National Park
NGO	Non-governmental organisation
OUV	Outstanding Universal Value
SEA	Strategic Environmental Assessment
SOC	State of conservation report (compiled by the World Heritage Centre and IUCN)
SOCP	Sumatran Orangutan Conservation Program
TRHS	Tropical Rainforest Heritage of Sumatra
TWNC	Tambling Wildlife Nature Conservation
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USAID	United States Agency for International Development
WCS	Wildlife Conservation Society
YABI	Yayasan Badak Indonesia (Indonesian Rhino Foundation)
YEL	Yayasan Ekosistem Lestari (Sustainable Ecosystem Foundation)
YOSL-OIC	Yayasan Orangutan Sumatera Lestari – Orangutan Information Centre

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The mission is particularly grateful to the UNESCO-Jakarta office for facilitating the coordination of the mission and participating for the full duration of the field visit.

Executive Summary and List of Recommendations

Background

The Tropical Rainforest Heritage of Sumatra (TRHS) consists of the three largest national parks (NPs) on the island of Sumatra (Gunung Leuser NP (GLNP; 862,975 ha), Kerinci Seblat NP (KSNP; 1,375,349 ha) and Bukit Barisan Selatan NP (BBSNP; 356,800 ha)). The property was inscribed on the World Heritage List in 2004, under criteria (vii), (ix) and (x). In 2011, in response to continuing concerns about a range of threats, the World Heritage Committee (the Committee) inscribed the property on the List of World Heritage in Danger (Decision 35 COM 7B.16). A Reactive Monitoring mission later visited Jakarta in October 2013 to finalise the Desired state of conservation for the removal of the property from the List of World Heritage in Danger (DSOCR), and agree on a set of Corrective Measures.

The present mission visited Indonesia from 5 to 16 April 2018, at the invitation of the State Party, and in accordance with Decision 41 COM 7A.18, Annex 1. The objective of this Reactive Monitoring mission was to assess the state of conservation of the property and progress with implementation of activities to achieve the DSO CR, and the associated Corrective Measures. The mission was conducted by Mizuki Murai from the IUCN World Heritage Programme and Peter Howard, IUCN consultant. The mission visited all three of the parks and met with representatives from a wide range of government institutions, as well as representatives from UNESCO and a number of prominent non-governmental organisations (NGOs) with activities in or adjacent to the property.

Key Findings

The mission focused particularly on the issues and threats identified previously, especially those impacting the DSO CR. Whilst significant progress has been made in addressing many of these threats, others continue to impact the property's Outstanding Universal Value (OUV) in significant ways. The main current threats are:

Encroachment: this remains the most serious long-term threat, affecting an estimated 390,000 ha (15%) of the property. Encroachment is continuing in many areas, and although some NGO-supported projects have successfully worked with local community members to restore some (small) areas of forest, there is a need to increase the area and scope of such efforts considerably.

Boundary definition and demarcation: there seem to be some inconsistencies between different versions of boundary maps, and many parts of the boundary are no longer properly demarcated. This is partly because old boundary pillars have been broken or removed by encroachers, while very limited boundary reconstruction has been achieved since the property was added to the List of World Heritage in Danger.

Road development: numerous road development proposals have been made which would traverse parts of the property, most of which have been rejected. Two notable exceptions involve upgrading of the Sungai Penuh–Tapan road (KSNP) and the Karo–Langkat road (GLNP) where development work has been authorised without following proper Environmental Impact Assessment (EIA) procedures and without informing the Committee.

Poaching and illegal wildlife trade: the management authorities with their NGO partners have made very significant progress in increasing patrol and law enforcement efforts in all three parks, with resulting increases in tiger (and other species) populations in Intensive Protection Zones and core monitoring zones within the parks. A significant number of wildlife crimes have been successfully prosecuted. Nevertheless, poaching is likely to be continuing in large areas of each park where patrol effort is less intense and there is a need to extend law enforcement efforts to these areas.

Mining and geothermal energy development: mining and geothermal development plans within the property have now been cancelled, so this threat has been satisfactorily mitigated (although some work remains to be done to legislate against possible future developments).

Management of the wider landscape: opportunities to protect primary forest and natural habitats in areas bordering the property (which help sustain its OUV) should be seized before land-use and development pressures become too intense. There is a need to identify buffer zone areas around each component park, and (preferably) extend the property to include parts of the Leuser Ecosystem that are not already inscribed within the GLNP component.

Desired state of conservation for the removal of the property from the List of World Heritage in Danger (DSOCR)

The mission reviewed progress against the seven indicators established in 2013 and adopted by the Committee in 2014, and considers that these should be retained, with some modification to the indicators for Forest Cover (Indicator 1) and Population Trend Data for Key Species of Fauna (Indicator 2). It is anticipated that the timeframe of five to ten years from 2013 can still be achieved if the necessary political will to deal with the encroachment issue, and adequate resources are forthcoming. The revised (and carried-over) indicators for DSOCR are as follows:

Indicator 1. Forest Cover: *The remaining area of forest in the property is maintained at least at its current level. There is no further loss of primary forest cover and no net loss of secondary forest cover in the property, as assessed against 2018 baseline data¹. At least 70% of the area that has been subject to past or present encroachment has been reclaimed from encroachers, active cultivation has been stopped in reclaimed areas and they are undergoing restoration. Forest restoration work is targeted specifically at ecological corridors and roadsides to ensure that no active encroachment remains within 1km of any road, footpath or track that traverses any part of the property.*

Indicator 2. Population trend data for key species of fauna: *The populations of four key species (Sumatran Elephant, Tiger, Rhino and Orangutan) in the property show a sustained positive trend in range occupancy as parts of the property are progressively rendered free of poaching and encroachment.*

Indicator 3. Road Development: *There are no new road developments or road development proposals within the property. In addition, any changes/adjustments to existing roads (including widening and paving) within the property or in adjacent areas only take place if it is demonstrated that they will not negatively impact on the Outstanding Universal Value of the property.*

Indicator 4. Mining: *There are no mining concessions or mining exploration permits overlapping with the property. Mines in adjacent areas where mining could have negative impacts on the property's OUV are subject to appropriate mitigation and other management measures to limit those impacts to a minimum. Illegal small-scale mines inside the property are closed and are being rehabilitated.*

Indicator 5. Boundary Demarcation: *The entire boundary of the property is adequately and accurately demarcated on the ground, at all three component national parks.*

Indicator 6. Law Enforcement: *The property's law enforcement agencies (park authorities) are spending at least 50% of each month on patrol, and implementing strategic patrol plans that respond to identified priorities. Patrols are managed using MIST/SMART and MIST/SMART data are provided*

¹ The 2018 data was not available at the time of writing, and it should therefore be specified by the State Party as soon as such data becomes available.

regularly to all stakeholders. The number of prosecutions and resulting convictions as a proportion of arrests is significantly increased in relation to the 2013 baseline.

Indicator 7. Management of the Wider Landscape: *The National Strategic Area for the Gunung Leuser area regulates development and sustains critical habitat for key species (particularly tiger, rhino, elephant and orangutan) in the Leuser Ecosystem. Wildlife corridors connecting these areas with each other and the property are also maintained.*

Corrective Measures

The overall conclusion of the mission is that significant progress has been made in addressing most of the threats facing the TRHS, but this has not yet been sufficient to allow for removal of the property from the List of World Heritage in Danger. The main outstanding issue is the continuing encroachment and the associated work that is still required to re-establish and demarcate the park boundaries. The mission recommends that the Committee adopts the following revised version of the Corrective Measures, based on those originally adopted in its Decision 38 COM 7A.28.

1. Strengthen efforts to remove all encroachers from the property and carry out necessary forest restoration work to ensure that encroachment does not recur. Ensure that forest restoration is focused initially on degraded areas in key ecological corridors and along roads, paths and tracks that traverse the property, and that key restored wildlife corridors are designated as a core zone. Review any historical land rights claims within the property and take necessary action to resolve such claims whilst maintaining the Outstanding Universal Values of the property.
2. Clarify in law the boundaries of each component national park within the property, in consultation with Provincial governments, local communities and all other stakeholders and complete the demarcation of these boundaries on the ground.
3. Further enhance law enforcement capacity and the geographic reach and intensity of patrols throughout the property in collaboration with conservation NGOs, local communities and other partners. Ensure that forest crimes are effectively detected and prosecuted.
4. Establish standardised monitoring protocols and data formats to track progress in the implementation of all activities towards the DSOCR within each park, so that these can be readily consolidated for regular reporting on progress for the property as a whole. Ensure that new baseline data on the extent of forest cover are derived from recent satellite imagery in a manner that can be repeated at regular intervals.
5. Strengthen property-wide monitoring of key species, including Sumatran Elephant, Tiger, Rhino and Orangutan, by:
 - a. continuing collaboration among Government, NGO and university stakeholders;
 - b. agreeing a common methodological framework for monitoring each species;
 - c. expanding monitoring efforts to address geographical gaps in monitoring activities;
 - d. ensuring that simple GPS-referenced presence/absence data for key species are collected as part of routine SMART patrols, so that changes in range occupancy can be detected and monitored;
 - e. synchronising data analyses for all key species to facilitate progress reporting;
6. Strengthen species recovery efforts by implementing habitat improvement and ecosystem restoration programmes, as required, including the control of invasive species;
7. Maintain the policy that prohibits the construction of new roads in national parks, and implement the strategies and recommendations of the 2017 Strategic Environmental Assessment for the road

network in the Bukit Barisan Mountain Range and the additional requests made by the Committee, in order to minimise the impact of road networks on the property's Outstanding Universal Value;

8. Ensure that rigorous Environmental Impact Assessments are carried out for all proposed developments within the property (e.g. road improvement projects) and its vicinity (e.g. roads, mining, geothermal and hydro dam projects), with particular attention to the Leuser Ecosystem National Strategic Area, to ensure that these do not have a negative impact on the Outstanding Universal Value of the property.
9. Complete the process of closing and rehabilitating all mines within the property, further investigate the existence of any mining concessions and exploration permits that may still overlap with the property, and revoke any overlapping concessions and/or permits that are identified.
10. Ensure that all provinces, districts and sub-districts that include parts of the property recognise its World Heritage status and avoid the designation of development zones within its boundaries;
11. Ensure that the World Heritage Working Group under the Coordinating Ministry of Human Development and Culture is taking an active role in promoting effective coordination between different ministries in the protection and management of the property especially concerning difficult issues related to encroachment and boundary reconstruction;
12. Review the buffer zones around each park comprising the property, and revise them where necessary and appropriate based on ecological criteria, to protect critical wildlife habitats bordering the property and ensure that land use in the wider landscapes around each park contributes to sustaining all aspects of the property's Outstanding Universal Value, including animal migration corridors and parts of each species natural range that are essential to maintaining viable populations in the long term.

In addition to these corrective measures, the mission makes the following recommendations:

Recommendation 1: Following clarification of the boundaries of each component of the property and their agreement among all stakeholders, submit a boundary modification request to the Committee through the applicable procedures as outlined in the *Operational Guidelines* in case the clarification of boundaries has resulted in any changes to the property boundaries since approval by the Committee at the time of inscription. Any changes made should strengthen the protection of OUV.

Recommendation 2: The State Party is strongly encouraged to extend the boundary of the property to include adjoining areas of the Leuser Ecosystem to better represent its Outstanding Universal Value.

1. Background to the mission

1.1 Inscription history and inscription criteria

The Tropical Rainforest Heritage of Sumatra World Heritage property (hereafter referred to as “the property”), comprising three of the largest national parks on Sumatra – Gunung Leuser National Park (GLNP; 862,975 ha), Kerinci Seblat National Park (KSNP; 1,375,350 ha) and Bukit Barisan Selatan National Park (BBSNP; 356,800 ha) – was inscribed on the World Heritage List in 2004, under criteria (vii), (ix) and (x)².

Although at the time of inscription, IUCN recommended that the property be simultaneously inscribed on the List of World Heritage in Danger on the basis of the ascertained danger it was not until 2011 that the property was inscribed on the Danger List due to road construction, mining, illegal logging and agricultural encroachment into the property. The indicators for the Desired state of conservation for the removal of the property from the List of World Heritage in Danger (DSOCR) was developed by the 2013 mission and subsequently adopted by the UNESCO World Heritage Committee (hereafter referred to as “the Committee”) in 2014 (Decision 38 COM 7A.28).

1.2 Integrity issues at the time of inscription

During IUCN’s evaluation of the property in 2004, it noted that much of the critically important habitat for Sumatran orangutan is located outside of GLNP in the surrounding Leuser Ecosystem. It also noted that much of the Sumatran elephant migration in the region takes place outside GLNP.

The IUCN’s evaluation report also pointed to the rapid development occurring on land adjoining KSNP and BBSNP, and emphasised the importance of these habitats for the protection of some of the iconic mammals, as future additions to the national parks, or as managed buffer zones.

1.3 Examination of the State of Conservation by the World Heritage Committee

Since the inscription of the property on the World Heritage List, its state of conservation has been examined annually by the Committee (2005 – 2017). Since the adoption of the DSOCR in 2014, the Committee has annually requested and examined the progress achieved towards reaching the indicators.

In addition to the DSOCR indicators, the Committee has also taken decisions pertaining to the formal boundaries and buffer zones of the property, which are critical to the long term protection of its Outstanding Universal Value (OUV). In 2009 (Decision 33 COM 7B.15), the Committee recommended that the State Party in cooperation with the World Heritage Centre and IUCN submit a proposal for a significant boundary modification to reflect the OUV of the property. In the same year the Committee also requested the State Party to consider establishing an appropriate buffer zone to secure the conservation of the property. Then in 2016 (Decision 40 COM 7A.48), the Committee once again encouraged the State Party to seek the advice of the World Heritage Centre and IUCN to identify the key areas in the Leuser Ecosystem that are crucially important for the integrity of the property, and which should be formally designated as a buffer zone along with the ecological corridors connecting the national parks.

1.4 Justification for the mission

At its 41st session (Decision 41 COM 7A.18), the Committee requested that the State Party of Indonesia invite an IUCN Reactive Monitoring mission to “*provide advice on any proposed geothermal development and its likely impacts on the OUV of the property and assess progress made with the*

² Statement of Outstanding Universal Value: <http://whc.unesco.org/en/list/1167/>

implementation of corrective measures towards achieving the Desired state of conservation for the removal of the property from the List of World Heritage in Danger”.

The mission comprised Peter Howard and Mizuki Murai representing IUCN. The terms of reference of the mission, its itinerary and programme and list of individuals met can be found in the annexes.

2. National policy for the preservation and management of the World Heritage property

2.1 Protected area legislation

In addition to those listed in the 2013 Reactive Monitoring mission report, there are a few important legislations that have been adopted in recent years that concern the property:

- GLNP boundary modification: Forestry Minister Decree no. 6589/Menhut-VII/2014 and 4039/Menhut-VII/2014 for the national park in the Aceh and North Sumatra provinces, respectively;
- BBSNP boundary modification: Minister of Environment and Forestry no. SK.4703/Menlhk-PKTL/KUH/2015 and Minister of Forestry no. 489/KPTS-II/1999 for the national park in the Lampung and Bengkulu provinces, respectively;
- Aceh Government extension of moratorium on palm oil plantation, Governor Decree no. 04/INSTR/2017;
- Aceh Government extension of moratorium on mining, Governor Decree no. 05/INSTR/2017.

2.2 Institutional framework

The three National Parks are currently managed by the Directorate General of Forestry within the Ministry of Environment and Forestry (previously the Ministry of Forestry until it merged with the Ministry of Environment in 2014). There is one exception for the management of the southern tip of BBSNP covering 43,153 ha – the Tambling Wildlife Nature Conservation (TWNC) – where a collaborative management agreement exists between the National Park and a private company, PT. Adhiniaga Kreasinusa.

2.3 Management structure

The management of the national parks is based on a Resort-Based Management approach, with two to three rangers positioned within each resort. Through the support of the German Development Bank (KfW) and a number of NGOs, the National Parks have also developed partnerships with local people, who are recruited to work alongside rangers to undertake regular patrols.

The management of each of the National Parks is based on a zonation system, which describes the purpose and the activities legally permitted within the different spatial zones. Clear definitions for each of the zones were not provided in writing to the mission, but a verbal summary was given by the national park staff. A summary of the definitions of these zones and the percentages of the park area designated under each zone are presented in Annex 6.5.

2.4 Other international designations and programmes

GLNP and KSNP were designated as ASEAN Heritage Parks in 2003. GLNP has also been designated as a UNESCO Man and Biosphere Reserve as part of a larger area since 1981.

3. Identification and assessment of issues/threats

The mission focused particularly on the issues and threats identified previously, especially those impacting the DSOCR. Whilst significant progress has been made in addressing many of these threats, others continue to impact the property's OUV in significant ways.

3.1 Encroachment

Encroachment remains the most significant threat to the property. The mission was able to assess its impact first-hand through its programme of field visits to all three parks including: (1) an over-flight of parts of GLNP; (2) visits to 'Role Model' forest restoration sites in GLNP and KSNP; (3) a visit to a long-term NGO-supported forest restoration site in BBSNP; (4) observation of encroachment areas from roads used by the mission; and (5) use of satellite imagery (Google Earth).

The most complete forest loss estimates for all three national parks for the period since 2011 has been conducted by an NGO consortium using satellite imagery³. According to the analyses, an area of 6,799 ha of forest was lost from GLNP since the property was inscribed on the List of World Heritage in Danger, while 21,570 ha was lost over the same period at KSNP and 2,448 ha at BBSNP (Table 1). If these figures are used to calculate an annual rate of loss for 2011 to 2017 and thereby annual losses for the period from 2013-2017, and are added to those reported from earlier periods (Mission Report, 2013) an estimate of total forest loss can be derived. On this basis the total area of the property affected by encroachment is about 390,502 ha (117,246 ha in GLNP; 210,569 ha in KSNP; and 62,686 ha in BBSNP), accounting for 15% of the property.

Table 1. Alternative estimates of forest loss within TRHS.

Source	Park	Period	Forest Loss (ha)	Total loss %	Annual loss %
State Party report on the state of conservation of the property, 2018	GLNP	2016-17	390	0.07	0.07
Presentation to mission by park officials	GLNP	1990-2016	8,888	1.0	0.06
	BBSNP	2011-15	5,895	1.9	0.47
		1972-2002		18.6	0.62
NGO consortium	GLNP	2011-17	6,799	0.8	0.13
	KSNP	2011-17	21,570	1.8	0.30
	BBSNP	2011-17	2,448	1.0	0.17

The mission notes with particular concern that encroachment occurs at the margins of the property affecting its lower-lying areas. From an ecological viewpoint this lowland forest is particularly valuable and increasingly rare, being especially diverse and productive, and contributing far more to the property's OUV than would be implied by simple surface area considerations. A recent survey for example, demonstrated the decreasing orangutan population density with increasing elevation in the

³ Hansen M.C., Potapov P.V., Moore R, Hancher M, Turubanova S.A., Tyukavina A, Thau D, Stehman S.V., Goetz S.J., Loveland T.R., Kommareddy A, Egorov A, Chini L, Justice C.O., Townshend J.R.G. (2013). High-resolution global maps of 21st-Century forest cover change. *Science*, 342:850-853.

Leuser Ecosystem⁴. The mission was also concerned to observe that encroachment is affecting several key ecological corridors, potentially fragmenting the property so that areas of key habitat for particular species (e.g. elephant, rhino) may remain unoccupied because animals are unwilling to cross an encroachment barrier. The mission's over-flight of the upper Alas Valley (GLNP – see map in Annex 6.6) was especially useful in the mission's assessment of this issue, revealing extensive active encroachment, freshly cut trees and service roads penetrating into key wildlife habitat throughout this corridor. This level of human activity could potentially stop the movement of large mammals such as elephant and rhino between the western and eastern portions of the park. Satellite imagery reveals similar problems in critical wildlife corridors in each of the other parks and shows that encroachment in all three component parks is active and ongoing, with many freshly cleared areas visible.

The mission identified a number of factors which are preventing a timely resolution of the encroachment problem:

- The nature of encroachment varies in different areas and each area therefore requires a specific solution. Encroachment can be broadly categorised as: (1) 'commercial opportunism' involving people who may be living at some distance from the park using hired local labour to cultivate 'free' land within a park; (2) small-scale farming undertaken by immigrant farmers with varying periods of residency; and (3) farming carried out by longer-term resident farmers with land claims pre-dating the establishment of the parks. Those in the latter two categories present particular difficulties in respect of compensation and relocation needs, as well as related human rights issues.
- The park boundaries are not clearly defined and demarcated on the ground. Over the years since the parks were first established they have been subject to a number of officially sanctioned changes and boundary demarcation and maintenance has been incomplete and irregular. Many boundary markers have been deliberately removed by encroachers.
- The political will to address the encroachment issue at all levels of government has been insufficient to enable park managers to implement park protection policy effectively.
- There has been insufficient allocation of funds and personnel to implement forest restoration programmes.
- Administrative arrangements and the division of responsibilities within different Directorates of the Ministry of Environment and Forestry, and other government agencies may be hindering effective implementation of different aspects of the encroachment issue.
- Some areas that were previously cleared of encroachers have been re-occupied.

Despite these difficulties, however, some significant progress has been made in reclaiming and restoring degraded areas, and valuable experience has been gained, especially through:

- Reclamation of an extensive area of forest degraded by logging in the Betung area adjoining the SW boundary of GLNP about 20 years ago;
- A large scale government-funded restoration programme (Rehabilitasi Hutan Kawasan – RHK), mostly implemented from 2010 to 2013, during which 25,140 ha of BBSNP was cleared of encroachers and replanted with trees by community members (who were paid under the

⁴ Wich, S.A., Singleton, I., Nowak, M.G., Atmoko, S.S.U., Nisam, G., Arif, S.M., Putra, R.H., Ardi, R., Fredriksson, G., Usher, G., Gaveau, D.L.A., & Kühl, H.S. (2016) Land-cover changes predict steep declines for the Sumatran orangutan (*Pongo abelii*). *Science Advances*, 2(3): e1500789.

scheme for two years). Although some of these areas have subsequently been re-occupied, others have been successfully reclaimed. Satellite imagery suggests that tree planting was carried out in a limited way while natural regeneration was allowed to take its course (quite successfully) elsewhere.

- Several examples of successful restoration of encroached areas on a small-scale 'pilot' basis with NGO support. The mission notes that this approach may be difficult to replicate at a significantly larger scale due to very high costs. For example, a 60ha restoration site in BBSNP, supported by WWF and visited by the mission, has involved employment of community members (formerly encroachers) over a period of seven years at a total cost exceeding US\$ 100,000.
- A new government-sponsored 'Role Model' approach that is to be implemented on a small-scale pilot basis in two or three selected areas in each park. This will involve community sensitisation and participation in tree planting during a transition period while cultivation is phased out.

3.2 Boundary modifications

The mission noted some inconsistencies in boundary maps and understands that there have been some official boundary changes since the TRHS was inscribed on the WH List in 2004 (see section 2.1). As far as the mission can ascertain these new boundaries imply a 4% reduction in the area of GLNP and a 12% reduction at BBSNP compared with the areas inscribed on the World Heritage List⁵. The mission notes that any proposed changes to the boundary from what is inscribed on the World Heritage List must be approved by the Committee, but these boundary changes made between 2014 and 2015 have only very recently been mentioned in the 2018 State Party report on the state of conservation of the property.

Further confusion arises from the nomination dossier itself which includes different versions of boundary maps. The mission notes that the maps available on the World Heritage Centre's website, extracted from the nomination dossier, show a version prior to some significant excisions (the post-excision boundary maps also appear in the dossier), but more recent modifications have not been notified or approved by the Committee.

3.3 Boundary demarcation

The mission understands that boundary demarcation of KSNP and BBSNP was completed in the 1990s, together with the North Sumatra section of GLNP and some parts of GLNP within Aceh Province. Other sections of GLNP (in Aceh Province) have not been demarcated where they border protected forest on steep hillsides, for practical reasons. Demarcation was carried out with numbered concrete and wooden pillars erected at frequent intervals. The mission team made significant efforts in the field to locate as many of these pillars as possible, with rather limited success, and it is thought that many have been destroyed or deliberately removed by encroachers. At BBSNP the mission was able to review a detailed boundary map showing the locations of 7,599 numbered pillars, and was informed that SMART patrol teams had only been able to locate (and register GPS coordinates for) 206 of these (including 17 that had fallen, 12 broken and 12 without clear numbering). Furthermore, satellite imagery (Google Earth) shows areas of forest loss inside the property, and the boundaries of the

⁵ GLNP: An area of 862,975 ha was inscribed on the World Heritage List in 2004 but the boundary modification in 2014 reduced the area to 828,279.47 ha. BBSNP: 356,800 ha was inscribed on the World Heritage List but the boundary modification in 2015 reduced the area to 313,572.48 ha.

national parks are difficult to distinguish in certain areas due to heavy encroachment. The present state of boundary demarcation is clearly a significant constraint on the management authorities' efforts to enforce the law and maintain the integrity of the property.

3.4 Roads

There have been a significant number of proposals for road development inside and outside of each of the parks, including new road construction and upgrading of existing roads and tracks (which are generally made by local government to promote economic development, provide market access and allow for emergency evacuation in the event of earthquakes and volcanic activity). However, the State Party has made notable efforts to comply with the Committee requests to prevent the majority of these proposed developments inside the property, which is commendable. For those road upgrades that were approved, the mission made particular effort to assess some of them in the field and understand the present and likely long-term impact of road developments on the integrity of the property.

Two proposed road upgrades inside the property raise particular concerns as follows.

The first concerns widening and upgrading of the main trunk road between Sungai Penuh and Tapan, which traverses KSNP (see map in Annex 6.6), and is subject to frequent landslides and closures. The mission travelled along about 4 km of this road at its eastern end, and was able to witness a recent landslide and a couple of sections where major earth works are underway as part of the upgrade project (see photos in Annex). The mission notes that the work was given exceptional authorisation by the Directorate-General of Conservation of Natural Resources and Ecosystems and clearly has strong justification on various development grounds. However, it was only subject to Environmental Impact Assessment (EIA) processes at a very late stage of decision making and the EIA was completed only after the upgrade work had commenced. Furthermore the EIA was carried out by the Directorate-General of Public Works (rather than an independent body) with very limited stakeholder consultation and participation. The mission understands that no special measures are envisaged to mitigate the potential impact of the project on wildlife or other aspects of the property's OUV. The mission noted that a detailed EIA on such a major project should have been submitted to the World Heritage Centre for review and comment prior to approval, in accordance with paragraph 172 of the Operational Guidelines.

The second road development project that has been approved is the upgrading of a (5.3 km) dirt patrol route to asphalt-surfaced road through part of GLNP between Karo and Langkat, for use by local communities as an evacuation route. This road will potentially isolate a narrow section of the park, impacting the long-term viability and OUV of this section. The park authorities have proposed strict regulation over the use of this road after its upgrade, but further details were not available to the mission and the team was unable to visit the site.

In terms of existing roads, the mission flew over the entire length of the road which traverses a critical wildlife corridor in the upper Alas Valley (GLNP), as well as travelling by car on the road crossing a saddle between Mount Kerinci and Lake Gunung Tujuh (KSNP) and one road across the southern part of BBSNP between Sanggi and Bengkunt. The mission was concerned by the extensive, active, and ongoing cultivation, tree cutting and development of access tracks on both sides of the Alas Valley and the Mount Kerinci/Lake Gunung Tujuh saddle. These areas illustrate vividly the potential impact of

any road development through the property and re-affirm the need to maintain the strictest possible moratorium on road developments.

There have been several welcome developments in relation to roads through the property. As noted in the 2017 State of Conservation (SOC) report and Committee Decision 41 COM 7A.18, a Strategic Environmental Assessment (SEA) of the cumulative effects of road development on the property was commissioned by the State Party and completed in March 2017. This concluded that road developments under consideration 'would unacceptably conflict with several populations of threatened species – e.g. the Sumatran elephant, rhinoceros, tiger and orangutan, amongst others – and lead to an unacceptable loss of habitat'. An earlier study has investigated the potential for wildlife underpasses, bridges and other measures to facilitate animal movements across busy roads through BBSNP, although none of these measures have yet been implemented. The need for such structures and other measures to protect wildlife has been highlighted in a recent WCS study⁶ of traffic volumes, road kill statistics and wildlife habitat characteristics along/adjacent to two main roads that traverse BBSNP (Sanggi-Bengkunat and Krui-Liwa).

As well as the proposed road developments inside the property, it is also critical to carefully consider any developments in adjacent areas that may negatively impact the OUV of the property by disrupting wildlife corridors and landscape connectivity with the surrounding ecosystem. This is particularly important in GLNP, where the range of key species extends beyond the property boundaries into the wider Leuser Ecosystem. The mission did not examine this issue in detail but notes that the 2017 SEA report on road developments shows some existing and proposed roads in the wider Leuser Ecosystem, and it is important to emphasise that these should only be permitted if it can be demonstrated that they will not negatively impact the OUV of the property.

3.5 Poaching/illegal wildlife trade

The mission received conflicting reports on the extent of poaching and its impact on wildlife populations. In some remote parts of GLNP it may not be a problem, but in more accessible areas poaching is carried out to: (1) provide bushmeat for domestic consumption; (2) capture birds for the (mainly domestic) live bird trade; and (3) obtain whole or parts of animals for illegal wildlife trade to the international market.

In response to the poaching threat the management authorities have made a highly commendable effort to increase law enforcement (Table 2). Over the five-year period 2013-17 the distance covered by patrols in GLNP and BBSNP using GPS-based SMART monitoring has increased 20-fold and the number of poaching incidents detected as well as the number of poachers apprehended has increased 10-fold. In KSNP (where comparable data were not available to the mission) an indication of success in apprehending those involved in wildlife crime is demonstrated by the successful prosecution of five cases, involving tiger parts (4 cases) and pangolins.

⁶ Referenced in the presentation by the Chief of BBSNP.

Table 2. Summary statistics on Law Enforcement Effort and the Incidence of Poaching in the GLNP and BBSNP components of the TRHS (compiled from Annex 1 of State Party report on the state of conservation of the property, 2018).

Year	Patrol Effort (km)			Poaching Incidents Detected			Poachers Apprehended (warned/arrested)**		
	GLNP	BBSNP	TOTAL	GLNP	BBSNP	TOTAL	GLNP	BBSNP	TOTAL
2013	23	963	986	15	26	41	1	3	4
2014	1,205	724	1,929	277	16	293	7	0	7
2015	5,329	3,360	8,689	464	25	489	33	4	37
2016	5,203	11,407	16,610	332	135	467	35	7	42
2017	9,351	9,734	19,085	370	113	483	21	12	33

** N.B. In GLNP, 24/97 (25%) of those apprehended were arrested; in BBSNP 7/26 (27%) were arrested.

A recent paper (Pusparini *et al.*, 2018)⁷ highlighted the dramatic recovery of tigers in the 1,000 km² Intensive Protection Zone of BBSNP, partially attributed to the recovery of prey species in the area as a result of increased protection. However the paper also notes that camera trap results indicate that poachers operate mainly at night, whereas patrol teams are active during the day.

3.6 Mining

The mission was informed that no mining exploration or exploitation is permitted within the property. One small-scale artisanal gold mining operation in KSNP remains. A long-standing commercial gold mining concession held by PT. Natarang Mining which previously overlapped the Ulu Belu portion of BBSNP was amended in 2013 to exclude the portion within the property.

3.7 Management of the wider landscape

From a conservation management perspective the spatial configuration of the three parks that make up the TRHS is far from optimal, running along the westerly spine of the island of Sumatra (known as the Bukit Barisan Mountain Range) with very high exposure to ‘edge effects’. Deforestation, settlement and land conversion in lands adjacent to the parks is proceeding at such a rapid pace that any opportunity for wider landscape management and integration of conservation areas beyond the present park boundaries is becoming increasingly unlikely. The mission observed areas of officially-designated ‘protected forest’ adjacent to BBSNP that were occupied with many permanent homesteads and extensive cultivation, a situation that seems (from satellite imagery) to be widespread. For example an area of conservation forest to the east of Ulu Belu (BBSNP) which used to support a population of elephants in recent years, appears to be too degraded to function properly as an ‘ecological buffer zone’ for BBSNP.

The last significant opportunity for wider landscape integration exists in the Leuser Ecosystem, where primary forest extends over an area almost three times the size of GLNP. The forest adjoining GLNP contributes directly to the maintenance of the property’s OUV, helping sustain viable populations of key species (orangutan, tiger, elephant and rhino) that would be much more vulnerable to extinction if they were restricted to the area of GLNP alone. The wider landscape is already subject to significant

⁷ Pusparini, W., Batubara, T., Surahmat, F., Ardiantiono, Sugiharti, T., Muslich, M., Marthy, W. & Andayani, N. (2018) A pathway to recovery: The Critically Endangered Sumatran tiger *Panthera tigris sumatrae* in an ‘in danger’ UNESCO World Heritage Site. *Oryx*, 52(1), 25-34. doi:10.1017/S0030605317001144

pressures, including planned road developments, dams and hydropower schemes, logging and land conversion. It is estimated that 8,520 ha (2.3%) of forest has been lost from the wider Leuser Ecosystem over the period 2011-17, a rate that is significantly higher than the TRHS and illustrates the urgency for enhanced conservation measures across the wider landscape. The mission welcomes the commitment of the Vice Governor of Aceh (in his address to the mission) to prioritise the prevention of further deforestation and forest degradation in the Aceh part of the entire Leuser Ecosystem.

3.8 Geothermal energy development

Indonesia has ambitious plans for energy development and aims to increase the proportion of new and renewable energy sources from its present 7.7% of total output to 31% by 2050. It considers geothermal energy development to be an environmental service (according to a 2016 Ministerial Decree P.46/Menlhk/Setjen/Kum.1/5/2016), helping to meet Indonesia's international commitments to CO₂ reduction and climate change mitigation.

There have been long-standing proposals to develop geothermal power generation at a number of sites within and adjacent to the property, with a particularly controversial scheme proposed for the Kappi Plateau in the core area of GLNP. A firm commitment has now been made by government at national and provincial level to not develop the Kappi Plateau site, although this has not yet been backed by legislation (as requested by the Committee, 41 COM 7A.18). The mission team overflowed the Kappi Plateau site and noted the critical importance of this pristine habitat to some of the highly endangered species (especially elephant and rhino), and its strategic location above the upper Alas Valley, a crucial (yet degraded) wildlife corridor.

The mission understands that there are no current proposals for geothermal development within the property and notes that any such development is likely to be incompatible with the area's World Heritage status.

3.9 Invasive species

The mission observed some sections of forest in the southern parts of BBSNP where the invasive vine *Merremia peltata* is smothering trees and secondary re-growth in a way that is likely to impact on the ecological integrity and OUV of the property (see photo in Annex). This is reported to be a widespread and significant problem in the lowland southern sections of this park. The mission understands that some research and assessment work is being undertaken by an Indonesian research body to evaluate the potential impact of the invasive, smothering nature of this (native) plant. The mission also noted that the WWF-supported restoration site visited by the mission in the southern section of BBSNP (near Bengkumat) was extensively colonized by the invasive alien plant, *Lantana camara*. The mission notes that it would be helpful to carry out more extensive surveys of invasive alien species within the property, their potential impact on the property's OUV and the efficacy of any possible control methods.

4. Assessment of the state of conservation of the property

The mission was able to visit all three component parks and meet with a wide range of stakeholders including government officials, NGOs and local community members, according to the itinerary

provided in Annex 6.3. A central focus of the mission was to evaluate progress in satisfying each of the DSOCR indicators and a summary of the mission's observations is provided in Table 3. For each indicator the mission considered all available information and reached the following overall assessment of progress and the suitability of each indicator as a measure of DSOCR following five years of implementation.

Table 3. Mission's observations against the DSOCR indicators.

DSOCR indicator ⁸	Mission observations
<p>1. Forest Cover</p> <p>The remaining area of forest in the property is maintained at least at its current level. There is no further loss of primary forest cover and no net loss of secondary forest cover in the property, as assessed against 2011 baseline data.</p>	<ul style="list-style-type: none"> • There is general recognition that the rate of forest loss has been reduced but not stopped; • Some limited success has been made in developing 'Role Model' restoration examples, which are at a very early stage; • Strong partnerships between the State Party and the NGOs have been demonstrated with pilot solutions; • Some useful historical experience and success of large scale restoration ('rehabilitasi hutan kawasan' - RHK) are noted; • No consolidated forest cover data is available for the whole property; • There remain very substantial, ongoing encroachments, and they threaten landscape connectivity and the OUV of the property; • The nature of encroachments varies in different areas (long term land claims, commercial opportunisms etc.), and many encroachments are currently active and expanding; • Solutions will require a strong political commitment at all levels and corresponding finance and personnel.
<p>2. Population trend data for key species of fauna</p> <p>The population of four key species (Sumatran Elephant, Tiger, Rhino and Orangutan) in the property show a sustained positive trend in occupancy data, in addition to the following property-wide population growth rates:</p> <ul style="list-style-type: none"> • For Sumatran Elephant: 3% total growth by 2017, measured against the 2007 baseline; • For Sumatran Rhino: at least 3% annual growth rate by 2020 at the latest; • For Sumatran Tiger: 100% total growth by 2022, measured against the 2010 baseline. 	<ul style="list-style-type: none"> • There are limited reliable baseline data; • There is a need for more systematic data collection and replicable census methods; • Data collection is very limited in area and not stratified by forest type; • There is a requirement for coordination at the property level for consistent monitoring methods and replicable protocols across all three national parks; • Through partnerships with the State Party, NGOs have played a key role in the monitoring of species to date; • Tigers seem to be increasing in localised areas, where camera traps are placed; • Orangutans in a small monitoring site recorded an increase in 2017 due to movement from other areas but the species appears to be in decline overall in correlation with (lowland) forest loss; • Elephants are in decline due to habitat loss in the wider landscape, especially adjoining lowlands and migration corridors; • Rhinos seem to be in decline (appear to have disappeared from KSNP around 2006; small population in BBSNP is declining; population in GLNP is possibly stable);

⁸ As recommended by the 2013 IUCN Reactive Monitoring mission and adopted by the Committee in 2014 in its Decision 38 COM 7A.28.

	<ul style="list-style-type: none"> • Key causes of declines are habitat loss, wildlife crime, hunting prey (of tigers) for local consumption, and live bird trade.
<p>3. Road development</p> <p>There are no new road developments or road development proposals within the property.</p> <p>In addition, any changes/adjustments to existing roads (including widening and paving) within the property or in adjacent areas only take place if it is demonstrated that they will not negatively impact on the OUV of the property.</p>	<ul style="list-style-type: none"> • The mission welcomes that no new roads have been constructed inside the property; • Most proposed road developments have been rejected; • A large number of informal roads and tracks have been developed inside the national parks for illegal land use, facilitating access by encroachers, poachers etc.; • No special road use provisions have been implemented for roads, especially the national roads, that exist within the property (e.g. speed controls, wildlife underpasses, night time closures); • Upgrading of one main national road connecting Sungai Penuh to Tapan (BBSNP) has been started without adequate public consultation and/or environmental mitigation measures, contrary to Committee decisions and requirement for DSOCR; • Karo-Langkat (GLNP) road development is contrary to the requirement for DSOCR and will negatively impact the OUV of the property.
<p>4. Mining</p> <p>There are no mining concessions or mining exploration permits overlapping with the property.</p> <p>Mines in adjacent areas where mining could have negative impacts on the property's OUV are subject to appropriate mitigation and other management measures to limit those impacts to a minimum.</p> <p>Illegal small-scale mines inside the property are closed and are being rehabilitated.</p>	<ul style="list-style-type: none"> • The mission welcomes that there has been no mining inside the property; • It is also welcomed that a mining concession in BBSNP was revised to relocate it to outside the property boundaries; • Kappi Plateau is a crucial core habitat in GLNP, and commitments to cancel the geothermal energy⁹ development concession by the Aceh Government, Ministry of Energy and Mines, and the Ministry of Environment and Forestry, are welcomed.
<p>5. Boundary demarcation</p> <p>The entire boundary of the property is adequately and accurately demarcated on the ground, at all three component national parks.</p>	<ul style="list-style-type: none"> • Various versions of the boundary maps are confusing; • Boundary demarcation on the ground is very limited e.g. the total number of boundary markers found by the park patrol teams in BBSNP is 206 out of 7,599 (2.7%); • In a few cases (e.g. in GLNP) demarcation of the national park boundary may be impractical and it may be preferable to rely on demarcation of a wider recognised conservation area; • Google Earth imagery, overflight and field verification visits suggest boundaries are largely not respected; • It appears to be widely recognised that markers have been deliberately removed by encroachers.
<p>6. Law enforcement</p> <p>The property's law enforcement agencies (park authorities) are spending at least 50% of each month on patrol, and</p>	<ul style="list-style-type: none"> • The substantial increase in patrolling since 2011 is commendable; • SMART monitoring has been introduced over a wide area in all three national parks;

⁹ As noted in section 3.8, a 2016 Ministerial Decree classified geothermal energy as an environmental service.

<p>implementing strategic patrol plans that respond to identified priorities. Patrols are managed using MIST/SMART and MIST/SMART data are provided regularly to all stakeholders.</p> <p>The number of prosecutions and resulting convictions as a proportion of arrests is significantly increased in relation to the 2013 baseline.</p>	<ul style="list-style-type: none"> • There has been a significant number of successful prosecutions for illegal logging, encroachment and wildlife crime offences; • Tiger camera trap data and monitoring of the BBSNP Intensive Protection Zone suggest that intensive patrols have had substantial beneficial results on tiger (and prey) populations; • Law enforcement remains inadequate in deterring encroachment, and the impact of patrolling on poaching and wildlife populations in most areas of the property remains unclear.
<p>7. Management of the wider landscape</p> <p>The National Strategic Area for the Gunung Leuser area regulates development and sustains critical habitat for key species (particularly tiger, rhino, elephant and orangutan) in the Leuser Ecosystem. Wildlife corridors connecting these areas with each other and the property are also maintained.</p>	<ul style="list-style-type: none"> • The main opportunities for wider landscape integration remain in GLNP; • The mission recognises that the designation of the Gunung Leuser area as a National Strategic Area is a significant conservation achievement; • The mission also recognises the much higher threat, higher biodiversity conservation value and relatively small remaining area of lowland forest where most forest loss is taking place; • Most of the protected forest adjoining KSNP and BBSNP has already been severely degraded.

Indicator 1: Forest Cover

The mission was presented with a variety of estimates of forest loss over different periods (see Table 1 and section 3.1 for discussion), but these did not include any reliable, definitive, consolidated data showing the extent of forest loss across the entire property for the period under review (2011-17). There seems to be a general consensus that forest continues to be lost from the property each year, although the rate of loss is being significantly reduced through greater law enforcement effort. The best available estimate of overall loss over the five-year period since the property was inscribed on the Danger List (Table 1) suggests an area of around 30,000 ha (1.2% of the total property area) has been lost since 2011. Most of this loss has occurred in the more valuable species-rich lowland areas and has impacted several key wildlife corridors.

The mission concluded that the indicator has not been fully satisfied during the review period, although new forest loss within the property in the most recent years of the review period may be relatively small. However the assessment is not based on reliable data and there is clearly a need to improve the monitoring of this key indicator. A large area of important habitat has been deforested already, and given the World Heritage status of the property, the mission considers that all three national parks should be given the highest protection. Further forest loss therefore should not be acceptable and the mission therefore concludes that the current wording of no further primary forest loss should be retained. Recognising the considerable effort the State Party and its Partners have put in to address illegal logging and habitat conversion, it seems appropriate to revise the indicator by re-setting the baseline date to 2018 (from 2013), while also introducing some additional targets to

measure progress with restoration, thereby compensating (to some extent) for new forest loss since the DSOCR was introduced.

Indicator 2: Population Trend Data for Key Species of Fauna

Distribution and census data for the four key species have been collected in focal areas of each park, but no systematic survey and census data, using standard replicable methods, have been collected more widely to enable a property-wide analysis of population status. The mission has therefore been unable to determine, in a definitive way, progress towards this DSOCR indicator.

To date, species monitoring has been carried out primarily by NGO partners using multiple camera traps set on a number of transect grids, allowing individual recognition of animals in each area and analysis based on Spatially-Explicit Capture-Recapture (SECR) methods. This has provided useful data on Sumatran tiger and important insights on the status of elephant and rhino. However the camera trap grids have been rather limited spatially, with two sites in the western side of GLNP (and others in the wider Leuser Ecosystem outside the property; see map in Annex), one site in KSNP (a Core Area, 1,391 km²) and two sites in BBSNP (within the Intensive Protection Zone, 1,000 km²; and the Tambling Concession Area, approx. 500 km²). At each of these sites tiger populations appear to have increased significantly in response to more intensive protection of these limited areas and (presumably) a corresponding increase in prey species.

For elephants and rhinos camera trap results are less reliable because of the small number of encounters/ images taken and small remaining populations of these species. There appears to be a stable population of 23 elephants in the Sikunder area of GLNP and a similar number in BBSNP (with a small increase over the 21 individuals present in 2014; State Party report on the state of conservation of the property, 2018). For rhinos, camera trap data and expert opinion suggests a possible increase in population in the western side of GLNP, while the identification of rhino traces (footprints, dung etc.) in BBSNP seems to indicate a significant decline in the study area (perhaps due to the movement of animals elsewhere). For KSNP, expert opinion suggests that rhinos became locally extinct around 2006.

For Sumatran orangutans (which only occur in the GLNP component of the property and the surrounding Leuser Ecosystem) line transect census techniques have been used to establish baseline population densities for different forest/vegetation types and expert opinion suggests that this species exists at each habitat's carrying capacity across the whole of GLNP. If this assumption is valid, orangutan populations would have suffered a 7% decline over the 2011-17 period, corresponding with rates of forest loss, especially in the orangutan's favoured lowland areas (NGO consortium presentation, Medan). The mission understands that much of the key orangutan habitat exists in the lowland forest outside the property in the wider Leuser Ecosystem.

The mission recognizes the extreme difficulty of species monitoring across such a vast area and such a wide range of habitat/forest types, and considers that the present indicator would require a level of precision that may not be practically achievable. Furthermore the mission considers that the limited animal census data that have been collected may not be representative of the property as a whole because they are associated with intensive protection efforts in specific study areas while much of the property remains vulnerable to poaching and other forest crimes because of much lower levels of law enforcement effort across most of the property.

Indicator 3: Road Development

The mission understands that no new roads have been constructed inside the property and most proposed road developments have been rejected. However, in respect of the two road developments that have been approved (see Section 3.4 above), the mission notes that these are contrary to Committee decisions and the requirements for achieving the DSOCR. The mission concludes that this indicator should remain unchanged and the State Party should continue to reject any new road developments within the property except where upgrades are absolutely necessary. In such cases, an EIA in line with IUCN's World Heritage Advice Note on Environmental Assessment should be undertaken prior to any works, and submitted to the World Heritage Centre in accordance with paragraph 172 of the *Operational Guidelines*.

For any proposed road developments outside the property that may negatively impact its OUV and/or conditions of integrity, an EIA should also be conducted with a specific assessment of possible impacts on the property's OUVs.

Indicator 4: Mining (and geothermal development)

The mission was informed that there has been no mining inside the property during the review period, and a mining concession in BBSNP was revised to eliminate part of the concession area that was within the park. Commitments have been made to cancel the geothermal energy development concession on the Kappi Plateau (inside GLNP) by the Aceh Government, Ministry of Energy and Mines, and the Ministry of Environment and Forestry. The mission considers this indicator for achieving the DSOCR is appropriate and necessary, and suggests that the authorities should continue to monitor closely any proposed mines or geothermal developments in areas adjacent to the property, particularly the wider Leuser Ecosystem. Any proposed mining or geothermal developments close to the property that might impact its OUV should be subject to EIA procedures in line with IUCN's World Heritage Advice Note on Environmental Assessment.

Indicator 5: Boundary Demarcation

As noted above (Sections 3.2 and 3.3) there are significant challenges in respect of park boundaries, many of which are no longer effectively demarcated. The issues related to forest loss, encroachment and boundary demarcation are closely inter-linked and the mission considers that boundary demarcation is a necessary pre-requisite to solving the encroachment problem. As explained in the State Party Report on the state of conservation of the property (2018) the administrative responsibility for 'boundary reconstruction' lies with the Office for the Management of Forest Areas (BPKH) under the Directorate-General of Forestry and Environmental Planning (DJ PKTL), whereas management of the property lies with the Directorate General of Natural Resources and Ecosystem Conservation. This administrative arrangement may be hindering the timely implementation of necessary boundary reconstruction and maintenance work. In any case, the mission was concerned by the limited extent of clearly demarcated boundaries, and notes that little progress seems to have been made over the review period towards the implementation of this DSOCR indicator.

Furthermore the mission has noted (Section 3.2) inconsistencies in different versions of park boundary maps following excisions and re-alignments at various times and observes that any changes to the

property boundaries require the Committee's approval in the form of either a Minor Boundary Modification or a Significant Boundary Modification.

The mission concludes that the proper definition of park boundaries and clear on-the-ground demarcation is fundamental to maintaining the property's OUV and the requirements of this indicator need to be fully satisfied as a key contribution in achieving the DSOCR.

Indicator 6: Law Enforcement

Law enforcement efforts have been increased very significantly since the introduction of the DSOCR with a number of conservation NGOs supporting/adopting specific patrol teams and operational areas. GPS-based SMART patrolling procedures have been introduced progressively over wider areas of each park and patrol teams are conducting extended multi-day patrols involving 10-12 day periods away from their base. The mission commends this very significant progress, which broadly satisfies the first part of the requirements under this indicator.

The mission team did not have enough time in the field to assess fully the technical aspects of SMART patrol implementation, but notes from presentations at each park that: (1) whilst SMART patrol coverage at BBSNP has extended to most areas, comparatively little of KSNP and GLNP has been covered so far; (2) a lot of patrol effort seems to have been concentrated along park boundaries, encroachment areas and two Intensive Protection /Core Monitoring Zones (in BBSNP and KSNP respectively), while large areas in the interior of each park have not yet benefitted from SMART patrols; and (3) it is not clear whether SMART patrol personnel are monitoring signs of wildlife, especially range occupancy by the four key conservation species.

In respect of arrests and prosecutions (i.e. the second aspect of the indicator), the mission was informed of six successful prosecutions for wildlife crimes at KSNP in 2017, mainly for the illegal trade of tiger and pangolin parts. Nine successful prosecutions have been made at BBSNP over the period 2014-16 involving illegal logging (5 cases), encroachment (3 cases) and attempted trapping of tiger (1 case). Whilst these prosecutions are welcome indications of a determination to prosecute wildlife crimes it is not clear that they fully satisfy the requirements of the indicator for DSOCR. Furthermore, the mission notes that a comparatively small proportion of poaching incidents detected by patrols in GLNP and BBSNP results in a poacher being apprehended (4/41 (10%) in 2013, falling to 33/483 (7%) in 2017, see Table 2 above) and only about a quarter of the poachers who are apprehended are subject to arrest (while three quarters are released with a warning). The mission was unable to determine a rate of actual prosecution and conviction in these cases.

In respect of indicator 6 the mission concludes that substantial progress has been made with law enforcement and this now needs to be extended to cover the entire property, especially reaching more remote parts of GLNP and KSNP. The establishment of Intensive Protection Zones in KSNP and BBSNP has demonstrated the value of effective law enforcement in protecting tigers and their prey (as well as other components of OUV) within a limited area. This should serve as a law enforcement 'role model' and encourage a further increase in patrol personnel and intensity in other parts of the property. This will require a major commitment of additional resources which may need to come from a variety of government and NGO sources. In addition the mission understands that the Tambling conservation area in the southern part of BBSNP has achieved notable success in tiger conservation (and wider conservation goals), according to discussions with BBSNP authorities, and the data

presented in the 2018 State Party report on the state of conservation of the property, and as a result may serve as a useful model for replication elsewhere as a means of mobilizing private finance for conservation. At the same time, tiger populations are extremely difficult to monitor accurately in dense tropical rainforests and further ongoing censuses are required.

Indicator 7: Management of the wider landscape

The designation of the wider Leuser Ecosystem as a National Strategic Area (NSA) recognizes the importance of the remaining primary forest outside GLNP for conservation and the maintenance of the property's OUV. However, the wider Leuser Ecosystem is under significant threat despite its NSA status. Some estimates provided to the mission suggest that as much as 51,000 ha of forest within the wider Leuser Ecosystem has been lost since 2011, resulting in a possible decline of 15% in elephant populations through loss of habitat, as well as a 14% reduction in tigers and 17% loss of orangutans. The long-term threats to the wider landscape include nine major new proposed roads (totalling 412 km) which would lead to unsustainable levels of habitat loss and fragmentation, with serious consequences for the maintenance of key components of the property's OUV. In addition there are proposals for three major new hydro-power dams (at Lesten, Kluet and Jambo Aye) which would flood important lowland forest habitat and sever key elephant migration routes. Previous reports and Committee decisions have emphasized the protection of forests in the wider Leuser Ecosystem and called on the State Party to establish buffer zones around each park, possibly using the NSA process.

One other significant factor affecting conservation of the Leuser Ecosystem is the Aceh Spatial Plan. The mission was unable to review this plan but understands that it has significant shortcomings, as it fails to recognize the legal status of the Leuser Ecosystem as a NSA, thus potentially allowing for highly damaging activities such as logging, mining, hydro dams and oil palm developments in the forest surrounding GLNP. On a more positive note, the Governor of Aceh has instituted in December 2017, six-month extensions to the moratoria on all oil palm plantations and mining, thereby eliminating these threats in the short term. The State Party should however be encouraged to extend these further to ensure that important wildlife habitats and corridors in the Leuser Ecosystem are protected against these damaging developments.

The mission concludes that the extensive areas of primary forest remaining in the wider landscape of the Leuser Ecosystem, as well as areas of important wildlife habitat adjoining KSNP and BBSNP should be formally recognized within a designated buffer zone and/or considered as an extension to the property. Any proposed developments within these areas (such as road and hydropower dam construction, mining and geothermal development) should at least be subject to rigorous EIA procedures and should not be permitted to proceed in case of any potentially harmful impacts on the property.

5. Conclusions and recommendations

The overall conclusion of the mission is that significant progress has been made in addressing most of the threats facing the property, but this has not yet been sufficient to allow for removal of the property from the List of World Heritage in Danger. The main outstanding issue is the continuing encroachment and the associated work that is still required to re-establish and demarcate the park boundaries.

With the benefit of five years' experience in implementing necessary corrective measures towards the DSOCR it is clear that some minor changes to two of the seven indicators of DSOCR would be beneficial. These proposed changes: (1) recognise that primary forest has been lost within the property since 2011 so it is no longer possible to achieve the target established in 2013 under Indicator 1 (concerning Forest Cover); and (2) that wildlife population census data for the four key species is unlikely to achieve the level of precision required to determine the specified rates of population growth under Indicator 2. Whilst these proposed changes represent a relaxation of the original targets, the mission considers that it is necessary to strengthen the requirements for solving the encroachment problem and therefore proposes the addition of a new clause under Indicator 1 (concerning Forest Cover). The revised indicators proposed by the mission are:

Indicator 1. Forest Cover:

The remaining area of forest in the property is maintained at least at its current level. There is no further loss of primary forest cover and no net loss of secondary forest cover in the property, as assessed against 2018 baseline data¹⁰.

At least 70% of the area that has been subject to past or present encroachment has been reclaimed from encroachers, active cultivation has been stopped in these areas and they are undergoing restoration. Forest restoration work is targeted specifically at ecological corridors and roadsides to ensure that no active encroachment remains within 1km of any road, footpath or track that traverses any part of the property.

Indicator 2. Population trend data for key species of fauna:

The populations of four key species (Sumatran Elephant, Tiger, Rhino and Orangutan) in the property show a sustained positive trend in range occupancy as parts of the property are progressively rendered free of poaching and encroachment.

The mission considers that the other Indicators should remain in place and any remaining work to fully satisfy the specified targets should be implemented. The mission also considers that the remaining work to achieve the DSOCR can still be accomplished within the five to ten year framework established in 2013, but this will require strong political support at all levels of government and a substantial commitment of additional funds, personnel and other resources. The mission proposes to the State Party and the Committee, the following revisions to the Corrective Measures based on those originally adopted in its Decision 38 COM 7A.28.

TRHS Corrective Measures

1. Strengthen efforts to remove all encroachers from the property and carry out necessary forest restoration work to ensure that encroachment does not recur. Ensure that forest restoration is focused initially on degraded areas in key ecological corridors and along roads, paths and tracks that traverse the property, and that key restored wildlife corridors are designated as core zone.

¹⁰ The 2018 data was not available at the time of writing, and it should therefore be specified by the State Party as soon as such data becomes available.

Review any historical land rights claims within the property and take necessary action to resolve such claims whilst maintaining the Outstanding Universal Values of the property.

2. Clarify in law the boundaries of each component national park within the property, in consultation with Provincial governments, local communities and all other stakeholders and complete the demarcation of these boundaries on the ground.
3. Further enhance law enforcement capacity and the geographic reach and intensity of patrols throughout the property in collaboration with conservation NGOs, local communities and other partners. Ensure that forest crimes are effectively detected and prosecuted.
4. Establish standardised monitoring protocols and data formats to track progress in the implementation of all activities towards the DSOCR within each park, so that these can be readily consolidated for regular reporting on progress for the property as a whole. Ensure that new baseline data on the extent of forest cover are derived from recent satellite imagery in a manner that can be repeated at regular intervals.
5. Strengthen property-wide monitoring of key species, including Sumatran Elephant, Tiger, Rhino and Orangutan, by:
 - a. continuing collaboration among Government, NGO and university stakeholders;
 - b. agreeing a common methodological framework for monitoring each species;
 - c. expanding monitoring efforts to address geographical gaps in monitoring activities;
 - d. ensuring that simple GPS-referenced presence/absence data for key species are collected as part of routine SMART patrols, so that changes in range occupancy can be detected and monitored;
 - e. synchronising data analyses for all key species to facilitate progress reporting;
6. Strengthen species recovery efforts by implementing habitat improvement and ecosystem restoration programmes, as required, including the control of invasive species;
7. Maintain the policy that prohibits the construction of new roads in national parks, and implement the strategies and recommendations of the 2017 Strategic Environmental Assessment for the road network in the Bukit Barisan Mountain Range and the additional requests made by the Committee, in order to minimise the impact of road networks on the property's Outstanding Universal Value;
8. Ensure that rigorous Environmental Impact Assessments are carried out for all proposed developments within the property (e.g. road improvement projects) and its vicinity (e.g. roads, mining, geothermal and hydro dam projects), with particular attention to the Leuser Ecosystem National Strategic Area, to ensure that these do not have a negative impact on the Outstanding Universal Value of the property;
9. Complete the process of closing and rehabilitating all mines within the property, further investigate the existence of any mining concessions and exploration permits that may still overlap with the property, and revoke any overlapping concessions and/or permits that are identified;
10. Ensure that all provinces, districts and sub-districts that include parts of the property recognise its World Heritage status and avoid the designation of development zones within its boundaries;

11. Ensure that the World Heritage Working Group under the Coordinating Ministry of Human Development and Culture is taking an active role in promoting effective coordination between different ministries in the protection and management of the property especially concerning difficult issues related to encroachment and boundary reconstruction;
12. Review the buffer zones around each park comprising the property, and revise them where necessary and appropriate based on ecological criteria, to protect critical wildlife habitats bordering the property and ensure that land use in the wider landscapes around each park contributes to sustaining all aspects of the property's Outstanding Universal Value, including animal migration corridors and parts of each species natural range that are essential to maintaining viable populations in the long term.

In addition to these corrective measures, the mission makes the following recommendations:

Recommendation 1: Following clarification of the boundaries of each component of the property and their agreement among all stakeholders, submit a boundary modification request to the Committee through the applicable procedures as outlined in the *Operational Guidelines* in case the clarification of boundaries has resulted in any changes to the property boundaries since approval by the Committee at the time of inscription. Any changes made should strengthen the protection of OUV.

Recommendation 2: The State Party is strongly encouraged to extend the boundary of the property to include adjoining parts of the Leuser Ecosystem to better represent its Outstanding Universal Value.

6. Annexes

6.1 Terms of Reference

IUCN Reactive Monitoring Mission: Tropical Rainforest Heritage of Sumatra (Indonesia) 5 – 16 April 2018

At its 41st session (Krakow, 2017), the World Heritage Committee requested the State Party of Indonesia to invite an IUCN Reactive Monitoring mission to the Tropical Rainforest Heritage of Sumatra World Heritage property (**Decision 41 COM 7A.18**, Annex 1). The objective of the monitoring mission is to assess the state of conservation of the property, including progress made with the implementation of the Desired State of Conservation for the removal of the property from the List of World Heritage in Danger, and to provide advice on proposed geothermal development and its impacts on the Outstanding Universal Value of the property. The mission will be conducted by Peter Howard and Mizuki Murai representing IUCN.

In particular the mission should undertake the following:

1. Discuss the potential impacts of proposed geothermal development at Kappi Plateau on the Outstanding Universal Value (OUV) of the property, taking into account the Committee's request to the State Party to *"ensure that any development of geothermal energy within the property remains prohibited by law"* (Decision **38 COM 7A.28**);
2. Assess progress achieved by the State Party in the implementation of the Desired State of Conservation for the removal of the property from the List of World Heritage in Danger (DSOCR) and the Corrective Measures (included in the 2013 IUCN Reactive Monitoring mission report and adopted by the Committee in its Decision **38 COM 7A.28**), and where appropriate and/or necessary, review the DSOCR indicators and Corrective Measures, as well as their timeframe for implementation;
3. In line with paragraph 173 of the *Operational Guidelines*, assess any other relevant issues that may negatively impact on the OUV of the property, including its conditions of integrity and protection and management.

The State Party will facilitate necessary field visits to key locations, including to areas where geothermal developments have been proposed, and areas that demonstrate where progress has been made with the implementation of the DSOCR and Corrective Measures, and where challenges remain. It is recommended that an overflight of Gunung Leuser National Park (GLNP) is organised (possibly with support from other partners) to enable the mission to get a good impression of the situation, including the following locations:

- The Kappi Plateau in the core zone of GLNP (proposed geothermal development)
- Sikundur/Sekoci (encroachment)
- Tamiang and Alas Valley forest restoration sites, and Bengkung Trumon Mega-Fauna Sanctuary
- Kluet Swamp and Kluet Valley (encroachment and road development, and proposed hydropower dam)

In addition, and depending on the availability and schedule of flights, it is suggested that the mission should visit the following areas:

- Renah Pemetik in Kerinci Seblat National Park (encroachment)
- The road to Sungai Penuh through Kerinci Seblat National Park
- The northern part of Bukit Barisan Selatan National Park (reported to be increasingly fragmented)

In order to enable preparation for the mission, the State Party should provide the following items in appropriate format, including web links, to the World Heritage Centre and IUCN as soon as possible and preferably no later than one month prior to the mission:

- a) Detailed information on the current status of any ongoing and planned geothermal developments or other energy projects (e.g. hydropower) within the property or in its vicinity, and EIAs for such projects, including specific assessment of their potential impacts on the OUV of the property, in line with IUCN's Advice Note of Environmental Assessment;
- b) The most recent data (collated for the whole serial property) on forest cover and forest cover change, and on population status and trends of the key species of the property (i.e. Sumatran Tiger, Sumatran Elephant, Sumatran Rhino, and Sumatran Orangutan);
- c) Any other supporting documentation to demonstrate progress in the implementation of the Corrective Measures and towards achieving each of the indicators of the DSOCR;

The mission will hold consultations with the relevant authorities of the Republic of Indonesia, particularly the Ministry of Forestry and the Environment, the Ministry of Energy and Mineral Resources, and the Coordinating Ministry for Human Development and Culture, as well as the management authorities of Gunung Leuser, Kerinci Seblat, and Bukit Barisan Selatan National Parks, and representatives from local governments. In addition, the mission will hold consultations with a range of relevant stakeholders, including: representatives of the geothermal energy sector; non-governmental organizations (NGOs), relevant scientists, researchers and experts.

Based on the results of the above-mentioned reviews, assessments and discussions with the State Party representatives, authorities and stakeholders, the mission will prepare a concise report on the findings and recommendations within six weeks following the site visit, following the attached reactive monitoring mission report format (Annex 3). The mission's recommendations to the Government of the Republic of Indonesia and the World Heritage Committee will have the objective of providing guidance to the State Party that will ensure the ongoing conservation of the property's OUV. It should be noted that recommendations will be provided within the mission report and not during the mission implementation.

6.2 Itinerary and Programme

Day/Date	Location	Time	Agenda
Day 1 Thursday, 05/04/2018	Coordinating Ministry for Human Development & Cultural Affairs Office, Jakarta	10.00 - 12.00	Entry Briefing
		12.00 - 13.00	Break/Lunch
		13.00 - 14.00	Field Briefing
	Depart to Jakarta Airport	15.00 -16.00	
	Flight to Banda Aceh with Garuda Indonesia	17.50 – 20.40	
	Banda Aceh -Kyriad Muraya Hotel		Dinner, check in and rest
Day 2 Friday, 06/04/2018	BKSDA Aceh Office	08.00 – 12.00	Presentation from KSDA Aceh and discussion
	GLNP Office	13.00 – 14.00	Lunch break
	GLNP Office	14.00 – 18.00	Meeting with Local Government and GLNP Management
	Return to hotel	19.00	Dinner and Rest
Day 3 Saturday, 07/04/2018	Depart to Banda Aceh Airport	04.00	
	Flight to Medan with Lion Air	06.00 – 07.05	
	Medan airport	07:30 – 10:30	Discussions on flight options due to eruption of Sinabung Volcano
	Drive to Kutacane	11:00 – 19:00	
	Kutacane	19:00 – 20:00	Planning discussion
Day 4 Sunday, 08/04/2018	Breakfast and planning	08:00	
	Drive to Alu Banning	08:30 – 10:30	
	Flyover from Kutacane to Medan	11:00 – 13:00	Overflight of GLNP
	Road journey and lunch	13:00 – 15:30	
	Hotel	15:30 – 18:00	Meeting with NGOs
Day 5 Monday, 09/04/2018	Depart to Medan Airport	08.00	
	Flight to Jambi via Jakarta with Garuda Indonesia	10.00 – 12.35 15.20 – 16.45	Medan – Jakarta Jakarta - Jambi
	Overnight in Jambi		
Day 6 Tuesday, 10/04/2018	Depart to Jambi Airport	06.30	
	Flight to Sungai Penuh with Wings Air	08.50 – 10.40	Jambi – Sungai Penuh
	KSNP Office	11:30 – 13:00	Meeting with KSNP, FFI, KfW
	Lunch	13:00 – 14:00	
	Road trip	14:00 – 18:00	Drive to Sungai Penuh-Tapan road
	Hotel in Sungai Penuh		Rest
Day 7 Wednesday 11/04/2018	Road trip to KSNP	08:00 – 10:30	Drive to KSNP resort and discussions
		10:30 – 14:00	Visit Role Model site
		14:00 – 15:00	Lunch
		15:00 – 18:00	Drive through road through NP
		19:00	Dinner
	Hotel in Sungai Penuh		Rest
Day 8 Thursday, 12/04/2018	Depart to Sungai Penuh Airport	09.00	
	Flight to Jambi with Wings Air	11.00 – 12.50	Sungai Penuh – Jambi
	Flight to Jakarta with Garuda Indonesia	17.40 – 19.00	Jambi – Jakarta
	Stopover in Jakarta (hotel around Jakarta airport)		
Day 9 Friday, 13/04/2018	Depart to Jakarta airport	07.00	
	Depart to Bandar Lampung with Garuda Indonesia	09.05 – 10.00	Jakarta – Bandar Lampung

Day/Date	Location	Time	Agenda
	Road trip from B. Lampung to Kota Agung	10.30 – 13.00	Lampung – Kota Agung
	Kota Agung	13.00 – 14.00	Lunch
	BBSNP Office	14.00 – 19.00	Meeting with Bukit Barisan Selatan NP
	Hotel in Kota Agung	19.00 -	Dinner, rest
Day 10 Saturday, 14/04/2018	Field visit and return to Bandar Lampung	07.00 – 21.00	
	Hotel Bandar Lampung	21.00 -	
Day 11 Sunday, 15/04/2018	Depart to B. Lampung Airport	08.30	
	Flight to Jakarta with Garuda Indonesia	10.45 – 11.40	Bandar Lampung Jakarta
	Hotel in Jakarta		Prepare exit briefing
Day 12 Monday, 16/04/2018	Meeting at the office of Indonesian National Commission for UNESCO (KNIU) in Ministry of Education.	09.30 – 12.00	Exit Briefing

6.3 List of Participants

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Jum'at, 6 April 2018

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







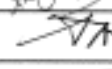
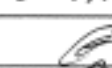





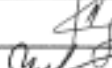
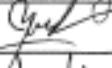
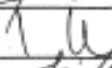
LIST of ATTENDANCE
Meeting with NDC
05. April 2016

1/2

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					13.

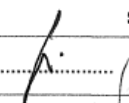
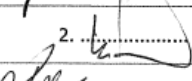

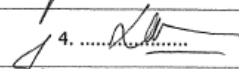
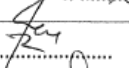
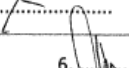
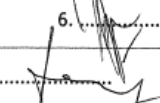
TANGGAL 10 April 2018

11 (MST) 10/4/18

NO	NAMA	JABATAN	TANDA TANGAN
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8	ARMIASTHO A.S.	Diro KLT	
9	Ism Budin	FP2/KPN	
10	Arif Wibisono	staf program	
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13	Ansi Fernandes	Pemimpin	
14	MAELINE S	Polhut	
15	Alex S	PEH	
16	Ramona	Polhut	
17	Tony Wijaya	Dir. PIKA	
18	Wido R. Albert	FFI-IP	

DAFTAR HADIR

Hari : Jum'at
 Tanggal : 13 April 2018
 Waktu : Pukul 14.00 WIB s/d selesai
 Tempat : Ruang Rapat Kantor Balai Besar TNBBS
 Jl. Ir. H. Juanda No. 19 Kotaagung - Tanggamus
 Acara : Pertemuan dengan IUCN Reactive Monitoring Mission untuk meninjau Tropical Rainforest Heritage of Sumatra (TRHS)

No	Name	Institution	Signature
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5	Siti Rachmania	UNESCO	5. 
6	Nawan Eviganto	BBTNBBS	6. 
7	Marleni Hasan	Dir KK KLT	7. 

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11.	Ritka Aryanie Surya	BBNTBS	11.
12.	Jonfa Alhuda	BBTBBS	12.
13.	Tonny Wuryanto	Dit PIKA, KSDAE	13.
14.	Munifur Hamid	YABI	14.
15.	Fahrul Amama	WCS - IP	15.
16.	BATHARA	RPU - YABI	16.
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	Maryanto	Divisi I Sereleq	20.
21.	Beno f. S.	WWF	21.
22.	Pembry Arianto	WWF	22.

Tanggal : 16 April 2018
 Tempat : Ruang Rapat KNIU
 Agenda : Rapat Exit Briefing Tim Reactive Monitoring Mission IUCN - UNESCO

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6.4 Activities of NGOs and other partners

The following NGOs and other partners (amongst others) are providing valuable contributions to the conservation of the property and its surrounding ecosystems.

Fauna and Flora International (FFI): FFI is supporting camera trap monitoring of Sumatran tiger and other wildlife, as well as law enforcement activities, wildlife crime interventions and habitat conservation in KSNP.

Forest, Nature and Environment of Aceh (HAKA): HAKA focuses on empowering civil society to protect the environment through advocacy, legal action and on-the-ground work protecting wildlife and restoring forest in GLNP.

German Development Bank (KfW): KfW is providing Euro 18 million in support over 7 years (2016-22) for biodiversity, watershed management and climate change mitigation. The project includes components to re-demarcate boundaries, restore encroachment areas, support wildlife monitoring and biodiversity surveys, increase law enforcement patrols and support buffer zone community development.

Global Environment Facility (GEF)/ United Nations Development Programme (UNDP): The 'Transforming Effectiveness of Biodiversity Conservation in Priority Sumatran Landscapes' project is a GEF grant project through UNDP. This 2016-2020 project aims to enhance biodiversity conservation in the priority landscape of Sumatra through the adoption of best management practices in conservation areas and adjacent production landscapes, using tiger population recovery as a key indicator of project success. GLNP, KSNP and BBSNP are three of the four national parks in which the project is being implemented.

Indonesian Rhino Foundation (YABI): YABI supports Sumatran rhino conservation in BBSNP and GLNP, and semi-captive breeding of the species at the Sumatran Rhino Sanctuary. At BBSNP it supports the work of 11 protection teams (each comprising 1 member of park staff and 3 local community members) focussing on the park's Intensive Protection Zone.

Indonesian Scorpion Foundation (YSI): An NGO focusing on illegal wildlife trade in Indonesia by monitoring and investigating illegal wildlife petting, and supporting law enforcement efforts.

Leuser Conservation Forum (FKL): FKL focuses on local community engagement and public advocacy in the Leuser Ecosystem, particularly the reclamation and restoration of illegal oil palm plantations

Sumatran Orangutan Conservation Program (SOCP): SOCP focuses on Sumatran orangutan conservation, including rescue, quarantine and reintroduction of illegal pet orangutans to form new, genetically viable and self-sustaining wild populations; survey and monitoring of wild and reintroduced populations; research on conservation and behavioural ecology of wild orangutans; habitat conservation; conservation education; and general awareness raising.

Sumatran Orangutan Society (SOS): SOS supports and enables work on the ground in Sumatra through developing conservation programmes and partnerships, capacity building, fundraising and advocating globally for changes to government policy and corporate practise.

Orangutan Information Centre (YOSL-OIC): YOSL-OIC is a local NGO which focuses on the conservation of Sumatran Orangutan and their habitat through involvement of local communities, tackling human-orangutan conflict problems, combating forest crimes through community patrol, planting of trees to restore degraded forest, and increasing the capacity of local community to improve their livelihood.

Sustainable Ecosystem Foundation (YEL): YEL focuses on protecting the Leuser Ecosystem and promotes nature conservation in Indonesia, working with local communities to enhance environmental awareness, improve protected area management, develop ecotourism and provide humanitarian aid.

Tropical Forest Conservation Action Project: This is based on the use of US debt swop funds held in trust and managed as a sinking fund at the discretion of seven local trustees (including YABI and Conservation International). An initial capital amount of US\$28 million was available in 2007 and a further US\$ 11million added in 2013. The project aims to support local forest restoration activities across 13 landscapes in Sumatra, providing grants (up to US\$ 500,000 each) to NGOs. More than 50 NGOs have so far benefitted from the project.

Wildlife Asia (WA): WA is an Australian-based partnership of conservation organisations which operates in the Leuser Ecosystem, through local partners.

Wildlife Conservation Society (WCS): WCS works in four protected areas in Sumatra, including GLNP and BBSNP, to monitor wildlife populations, improve protected area management and reduce forest loss and wildlife poaching.

WWF: WWF has been supporting BBSNP since 2000 through strengthening collaborative management of the park with governments, local authorities and local communities, undertaking rhino survey and monitoring, supporting five law enforcement patrol teams, assisting with 120 ha of forest restoration and conducting biodiversity surveys

6.5 Zoning system

Zonation	Definition	GLNP	KSNP	BBSNP
Core	An undisturbed, natural area to protect the biodiversity within the national park. No construction is permitted and the use of footpaths for research and tourism are highly regulated.	75%	53%	45%
Forest	A buffer area to protect the biodiversity in the core zone from the utilisation zone. Roads and permanent infrastructures are not permitted.	16%	35%	31%
Utilisation	Zone mainly utilised for nature tourism and other environmental services.	2%	2%	2%
Traditional	Traditional use area for local communities who are dependent on natural resources.	0.5%	0.9%	0.7%
Rehabilitation	Zone where restoration activities are needed due to illegal logging and road construction ¹¹ .	7%	8%	21%
Special use	Zone to accommodate public facilities and infrastructure e.g. telecommunication towers, roads and electricity installations, due to the existence of infrastructure facilities and community groups before the designation of the area as a national park.	0.2%	0.8%	0.05%

¹¹ Park authorities however, also described Rehabilitation Zones to be areas inside the national park where cultivation occurs, and hence most of the rehabilitation zones visited by the mission had active agricultural cultivation.

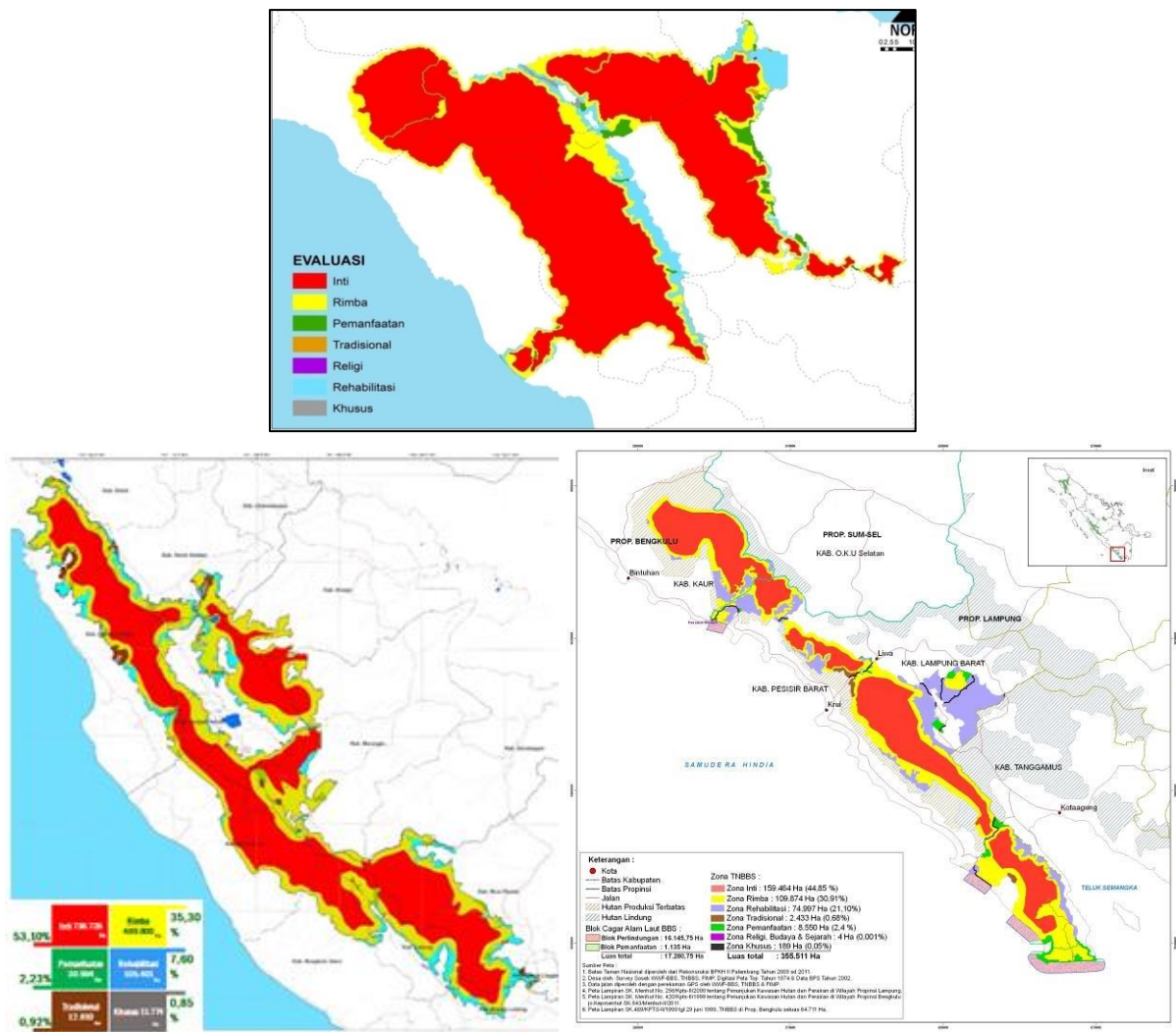


Figure 1. Zonation of GLNP (top), KSNP (bottom left) and BBSNP (bottom right). Source: Presentation from Chief of the national parks.

6.6 Maps



Figure 2. Map of GLNP (boundary in purple) showing the approximate flight path (white lines) the mission took on its flyover, starting at the Alas Leuser Airport in Kutacane, finishing in Medan.

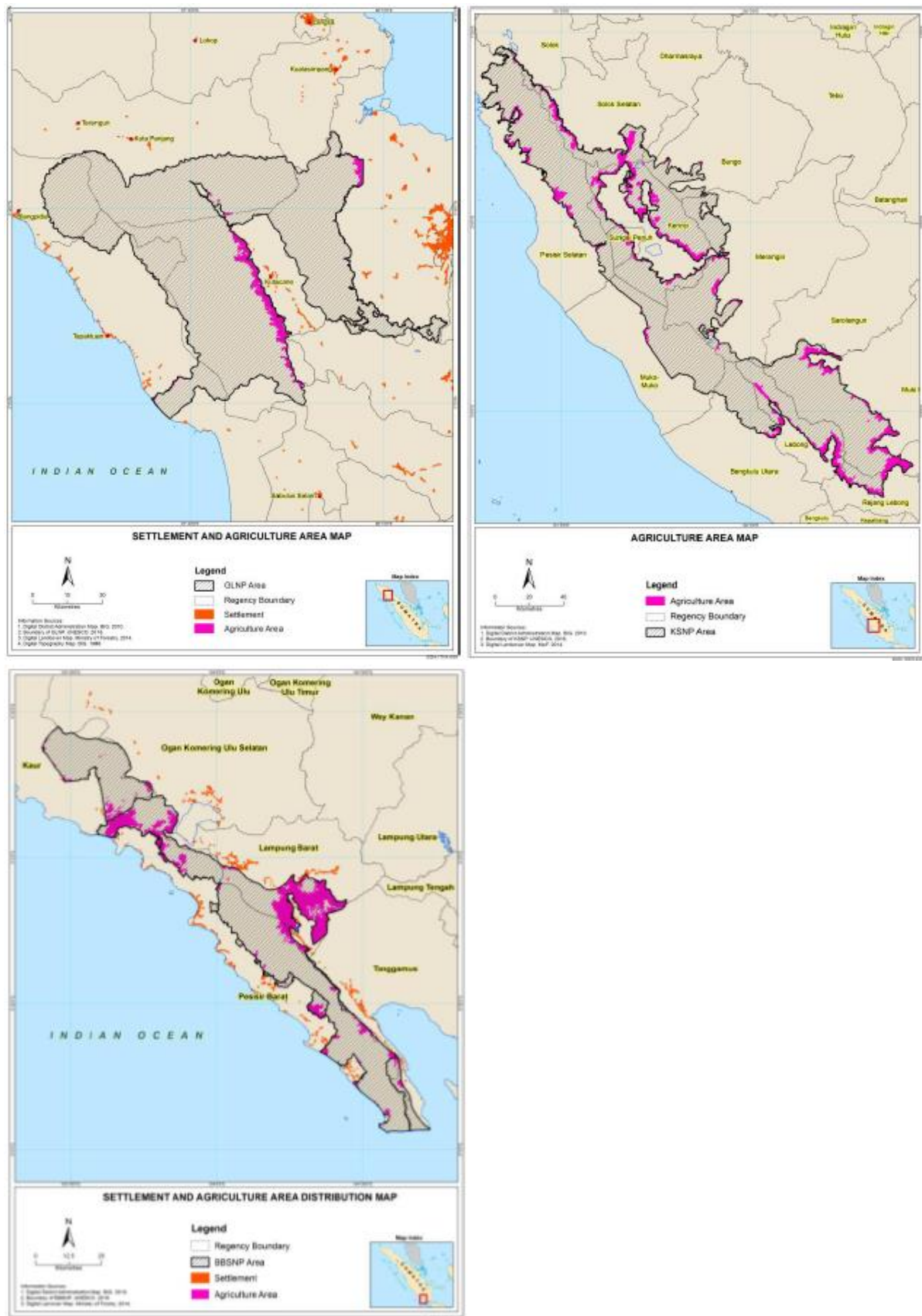


Figure 3. Locations and extent of agricultural encroachment in GLNP (top left), KSNP (top right) and BBSNP (bottom left). Source: SEA 2017.

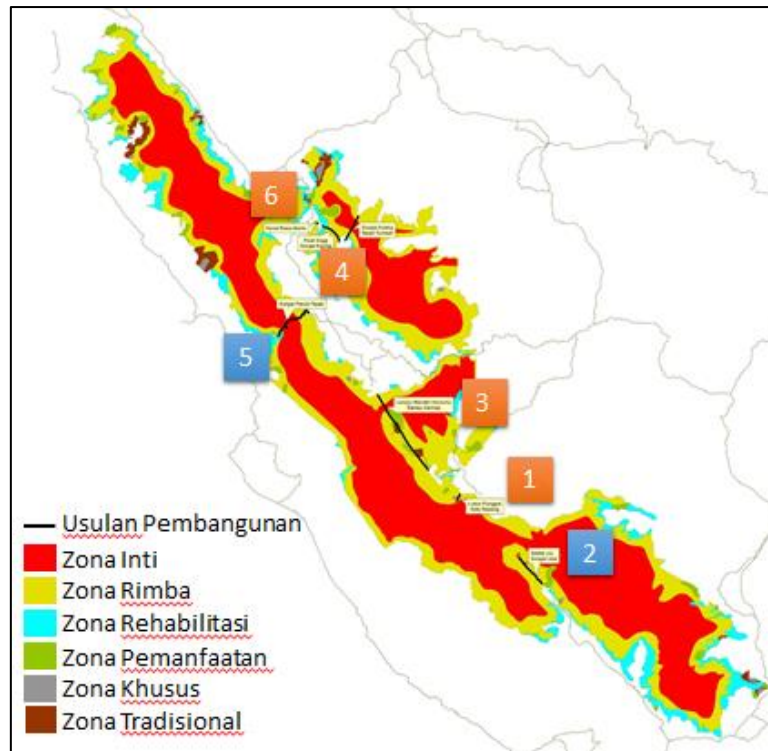


Figure 4. Proposed road developments in KSNP, of which road numbers 2 and 5 (Sungai Penuh-Tapan) have been approved, and the rest rejected. Source: Presentation by Chief of KSNP.

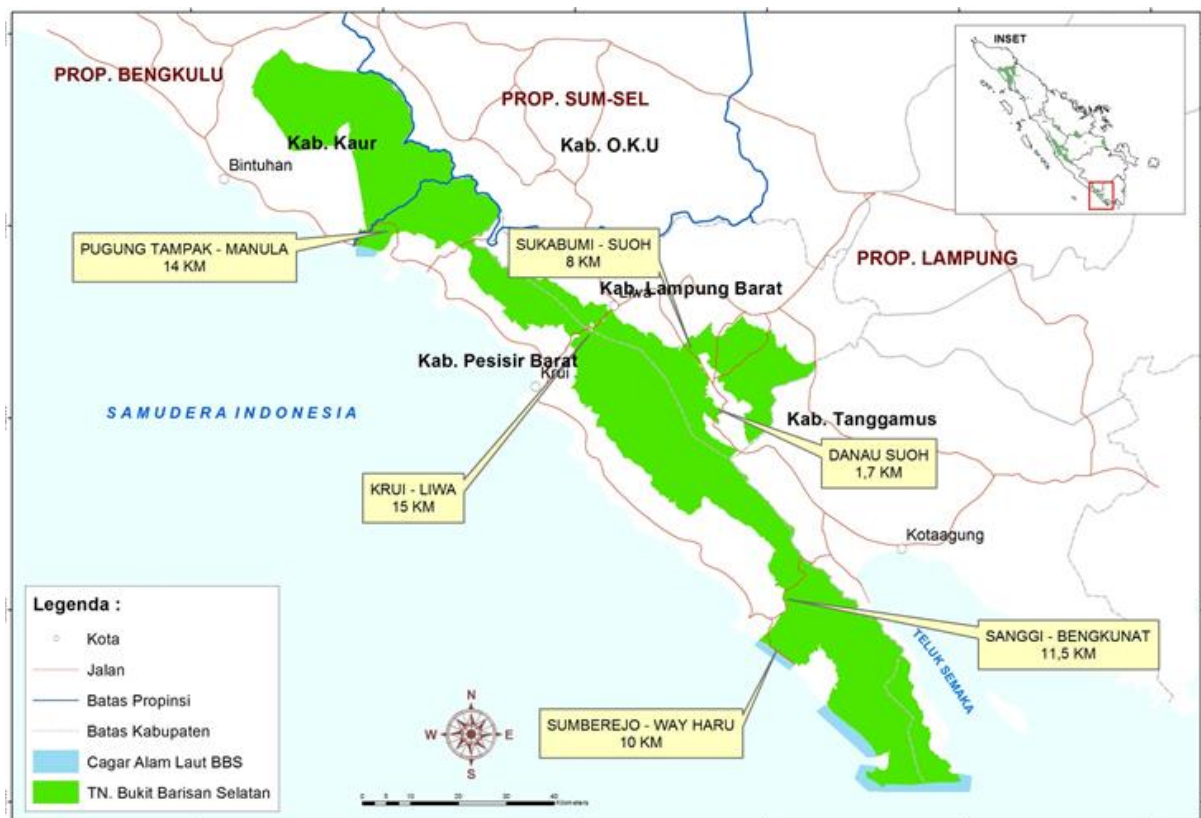


Figure 5. Proposed road developments in BBSNP. Source: Presentation by Chief of BBSNP.

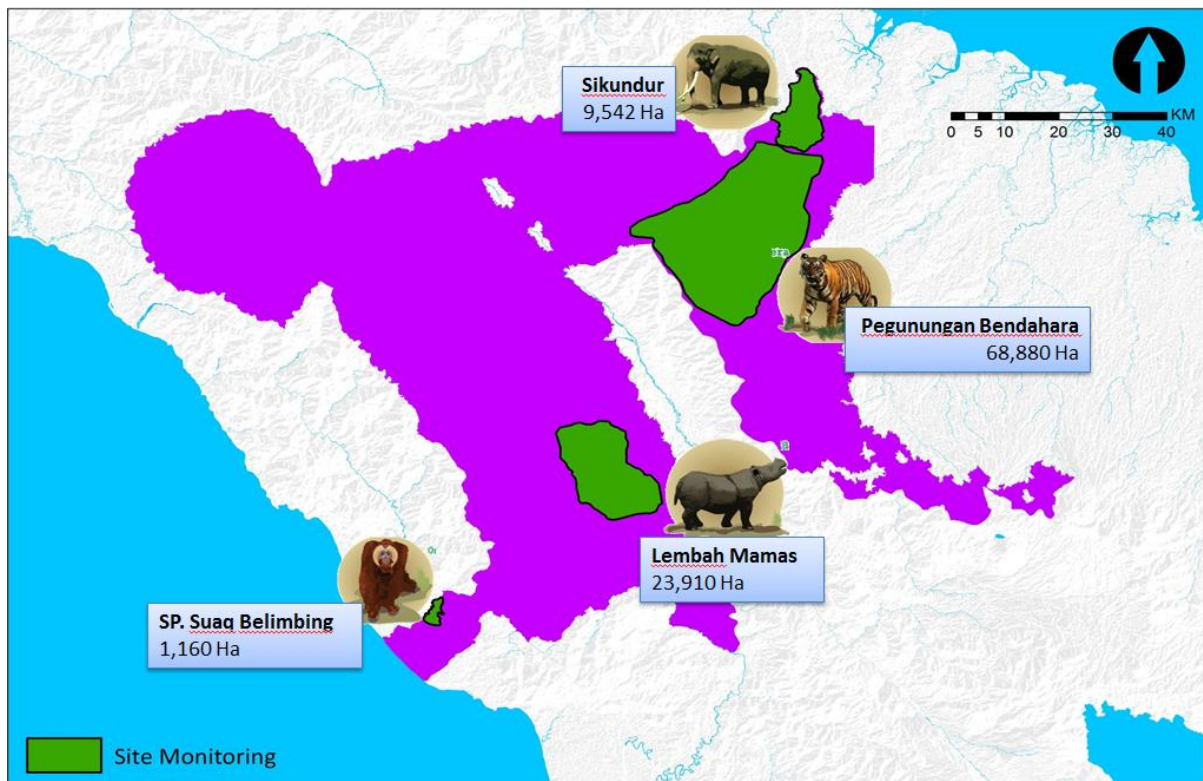


Figure 6. Location and size of large mammal monitoring sites in GLNP. Source: Presentation by Chief of GLNP.

6.7 Photographs

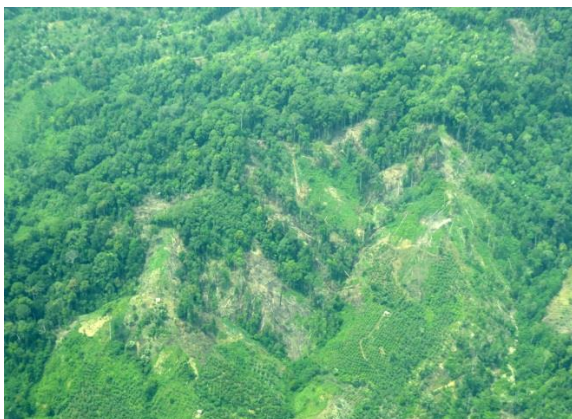


Photo 1. Encroachment inside GLNP.
©IUCN/Peter Howard.



Photo 2. Kappi Plateau in GLNP where geothermal energy project has been proposed. ©IUCN/Mizuki Murai.



Photo 3. Restoration area inside GLNP. ©IUCN/Mizuki Murai.



Photo 4. Role Model site at Alur Baning in GLNP. ©IUCN/Peter Howard.



Photo 5. A recent landslide along the Sengai Penuh-Tapan road. ©IUCN/Peter Howard.



Photo 6. A section of the Sengai Penuh-Tapan road where improvement work has already commenced. ©IUCN/Peter Howard.



Photo 7. Kerinci volcano with encroachment areas visible on the slopes. ©IUCN/Mizuki Murai.



Photo 8. Active cultivation in the Rehabilitation Zone inside KSNP. ©IUCN/Mizuki Murai.



Photo 9. Coffee plantation inside KSNP.
©IUCN/Peter Howard.



Photo 10. Lake Gunung Tujuh in KSNP.
©IUCN/Peter Howard.



Photo 11. Boundary marker at KSNP.
©IUCN/Mizuki Murai.



Photo 12. Boundary marker at BBSNP.
©IUCN/Peter Howard.



Photo 13. Rafflesia bud at BBSNP.
©IUCN/Mizuki Murai.



Photo 14. Park rangers in BBSNP. ©IUCN/Peter Howard.



Photo 15. Road side warning signs inside BBSNP for wildlife crossing. ©IUCN/Mizuki Murai.



Photo 16. Mitred leaf monkey in BBSNP. ©IUCN/Mizuki Murai.



Photo 17. Invasive plant *Merremia peltata* suffocating the forest in BBSNP. ©IUCN/Peter Howard.



Photo 18. Elephant lookout tower in a forest restoration site in BBSNP. ©IUCN/Peter Howard.



Photo 19. Mission with the Vice Governor of Aceh (second from left). ©UNESCO/Siti Rachmania.



Photo 20. Mission in KSNP office. ©Ir. M. Arief Toengkagie.