ACHIEVEMENT REPORT
2011 - 2022

Desired State of Conservation for removal framework, Tropical Rainforest Heritage of Sumatra (Indonesia)

How was the draft DSOCR developed?

Following the request of the Indonesian Directorate General of Forest Protection and Nature Conservation at the IUCN World Conservation Congress in Jeju, Korea, IUCN, in consultation with the Species Survival Commission, has developed a draft Desired State of Conservation for removal framework (DSOCR) for the Tropical Rainforest Heritage of Sumatra (Indonesia). This initial draft is provided to the Directorate General of Forest Protection and Nature Conservation for its consideration and will be discussed and reviewed during a series of workshops on site, as well as a final workshop on the adoption of the Emergency Action Plan in Jakarta, Indonesia. This DSOCR framework is intended to link into a property-wide mechanism for monitoring the Outstanding Universal Value of the property, including for Sumatran Rhino and other key species, as requested by the World Heritage Committee in Decision **36COM 7A.13.**

Proposed timeframe for implementation

A timeframe of 5 to 10 years is proposed. This time frame is needed in order to record increases in population sizes of slow-breeding species, as well as other fundamental positive changes in each of the three components of the property, as outlined in the indicators and their rationale below.

Summary

The Tropical Rainforest Heritage of Sumatra (TRHS) consists of three largest national parks on the island of Sumatra (Gunung Leuser NP, Kerinci Seblat NP and Bukit Barisan Selatan NP). 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 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 finalize 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. There are seven indicators of DSOCR established in 2013 and adopted by the Committee in 2014: 1) Forest Cover; 2) Population trend data for key species of fauna; 3) Road Development; 4) Mining; 5) Boundary Demarcation; 6) Law Enforcement; 7) Management of the Wider Landscape.

Since the inscription of the property on the World Heritage List, the State Party has submitted an annual state of conservation report including the progress achievement of DSOCR to be examined annually by the Committee (2005 – 2017). 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 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". A central focus of the mission was to evaluate progress in satisfying each of the DSOCR indicators. 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). These proposed changes: (1) recognize 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.

Related to the matter above, and as part of the efforts to remove the property from the list of world heritage in danger, the Government of Indonesia together with the relevant stakeholders, has taken measures to implement DSOCR. The Government of Indonesia reiterates its commitment to ensure the sustainability of the TRHS and restore it to such a state that the property may be removed from the list of world heritage in danger.

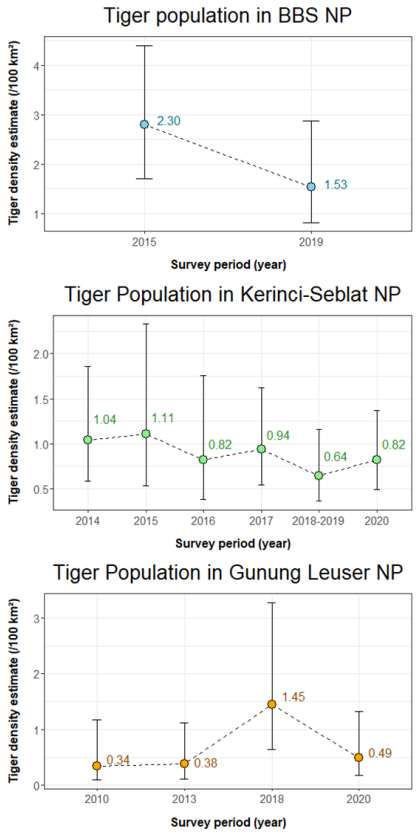
In summary, the Indonesian Government has shown its commitment with positive results to achieve the DSOCR, particularly maintaining forest cover with no significant loss after 2011, improving protected area management, regular and consistent population monitoring of key species that shows a relatively stable population trend, and enacting policies that will assure the persistence of the Outstanding Universal Value of the Tropical Rainforest Heritage of Sumatra.

For this purpose, the Government of Indonesia has taken inter alia the following measure: 1) strengthened efforts to remove all encroachers from the property and carried out forest restoration work to ensure the encroachment does not recur; 2) adopted and implemented SMART PATROL; 3) completing the document of Strategic Environmental Assessment of road development plans in the TRHS; 4) developed Wildlife Monitoring Module; 5) strengthened property-wide monitoring of key species including Sumatra Elephant, Tiger, Rhino and Orangutan by continuing collaboration among Government, NGO and university, agreeing a common methodological framework for monitoring each species, expanding monitoring efforts, ensuring that simple GPS-referenced presence/absence data for key species are collected as part of routine SMART patrols, synchronizing data analyses for all key species; 6) conducted boundary maintenance, reconstruction and socialization; 7) controlled and handled illegal activities; 8) strengthened species recovery efforts by implementing habitat improvement and ecosystem restoration programmes including the control of invasive alien species; 9) the Government of Indonesia is also committed to not granting any concession or permits with regard to exploration of geothermal energy and construction of new roads within the property; 10) to strengthen the management of the three national parks within the property, the Government of Indonesia initiated a Ministerial Decree on Coordination Team of TRHS Management that will provide direct management support from the central government to these three national parks in conserving the OUV. The draft decree is planned to be legalized by the Minister of Forestry and Environment Republic of Indonesia, in Q2 2023.

Achievement of DSOCR in detail are shown in the table as follows:

	No	INDICATOR FOR REMOVAL OF THE PROPERTY FROM THE LIST IN DANGER	METHOD OF VERIFICATION	ACHIEVEMENT
ATTRIBUTES	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 2011 baseline data, summarized in the table below: Proposed changes by IUCN Reactive Monitoring Mission 2018: The remaining area of forest in the property is maintained at least at its current level. There is no further loss of	Periodical analyses (2-3 years) of satellite imagery by UNESCO in coordination with the Ministry of Forestry (including the Directorate General of Forestry Planning), including monitoring of the boundaries of agricultural areas. Ground truthing done by National Park authorities	The property consisted of three national parks (Gunung Leuser National Park -GLNP, Kerinci Seblat National Park-KSNP, and Bukit Barisan Selatan National Park - BBSNP). The forest cover analysis examined land cover changes over a period of four to five years for the 2000-2017 data, which were updated in 2019, 2020, and 2021. To improve the quality of the images, pre-processing was carried out in the form of radiometric calibration and cloud masking. Supervised classification was then performed using the maximum likelihood classification method for the 2000-2017 data and machine learning with random forest algorithms for the 2019, 2020, and 2021 data to convert pixels into land cover classes. Several post-processing steps were taken to improve accuracy, including applying majority filters, boundary cleaning, data synchronization, and visual interpretation and vector editing. To calculate net forest change, both "forest to other classes" and "other classes to forest" changes were considered. The change rate was expressed as a percentage per year to ensure accurate comparisons between periods and management units, such as resort units. Finally, the percentage of forest cover was obtained by dividing the total area of forest cover by the total area of the national park. methodology which includes ground truthing. Overall, examining the forest cover changes from 2011 up to 2021 indicated that forest cover has relatively stabilized (*see* Annexes). In 2011 the forest cover in the GLNP was 95% of the total area and since 2015 the percentage has stabilized at 93% of the total national park area. Similar trend also occurred in the KSNP with 88.52% forest cover in

		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.		2011 and from the year 2018 until 2021 stabilized at 85-86%; and in the BBSNP with 81% forest cover in 2011 and from 2015 until 2020 stabilized at 78-79%. For these results, the Government of Indonesia has taken serious efforts to prevent and respond to the causes of deforestation and forest loss by improving forest cover. These efforts include a moratorium on the issuance of new concessions in areas of primary forest and peatlands since 2011 to the present, resolving land-use conflicts, law enforcement, and restoring ecosystems. In addition, a new paradigm for community engagement has been put in place to encourage inclusive participation. The new approach in TRHS is established through partnerships with multiple stakeholders, especially local communities dwelling in or at the fringe of the national park area. Local communities who were once considered as 'encroachers' are now engaged as partners in ecosystem restoration. They act as key participants in conservation efforts, working together to promote local culture, strengthen cooperation across various actors, and employ scientific-based decision support systems. To rehabilitate degraded areas, the Government of Indonesia has rehabilitated and restored more than 12,000 hectares of areas within the TRHS over the past 10 years and is committed to continuing this project. To note that the non-forest cover area includes those natural non forest areas and forest cover loss due to anthropogenic factors (e.g. encroachment, illegal logging). For the forest cover loss due to the anthropogenic factors (known as open area (the government has developed an ecosystem recovery plan (2019-2023) for each of the national parks within the property. Two strategies being implemented on this open area, the first one is to collaborate with the communities to restore back the forest cover through participatory ecosystem recovery or natural ecosystem recovery.

	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 occupancy data, in addition to the following property-wide population growth rates: ● 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. Proposed changes by IUCN Reactive Monitoring Mission 2018: 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	Systematic survey to establish baseline data for all key species, in all national parks where they occur[1]. Systematic surveys of key wildlife species (Tigers, Sumatran Rhinos, Sumatran Elephants, and Sumatran Orangutans) using peer-reviewed methods[2] conducted every 2-4 years	Four key species have been monitored regularly in this property using international standardized methodology. **Tiger.** The tiger population in the property has been regularly monitored using standardized camera trap survey methodology and with robust methodology to produce density estimates of tigers in the monitoring area (e.g. Linkie et al. 2010; Pusparini et al. 2018; Ash et al. 2021). Overall, the tiger population in the property is relatively stable, as shown in the figure below (Figure 2.1). .  **Figure 2.1.** Density estimates of tiger in the three national parks within the property

[1] Already in place for elephants and tigers (occupancy & abundance) in BBSNP; partly in place for elephants in GLNP and KSNP (occupancy).

[2] Camera traps and capture-recapture methods for Sumatran Tiger; fecal DNA and capture-recapture methods for Sumatran Elephant and Sumatran Rhino; standard occupancy surveys and permanent monitoring plots for all 3 species plus Sumatran Orangutan.

		the property are progressively rendered free of poaching and encroachment.		The overlapping confidence interval between density estimates from different survey periods indicated no significant difference hence indicatively a stable situation. Furthermore, the inherent tiger population dynamic may play influence in the fluctuation of the tiger density estimates as had been shown from other studies (Karanth & Nichols 1998; Duangchantrasiri et al. 2016). **Elephant** The monitoring of Sumatran elephants is mainly done through dung counts and fecal DNA surveys, as stated in the CITES MIKE protocol. Among the three national parks, only Bukit Barisan Selatan NP has comprehensive figures for both methods. Based on two series of occupancy surveys conducted in 2009 and 2019 for the three national parks, we calculated the proportion of area occupied (PAO) by Sumatran elephants. In Gunung Leuser NP, two pockets of population were found in Langkat-Sekundur, Trumon-Kapassesak-Subulussalam. In Kerinci Seblat, one population was found in Renah Pemetik-Muara Hemat-Sipurak Hook, while the other was found in the KSNP landscape, which is mostly outside the KNSP area in Seblat-Air Teramang-Air Rami and Air Dikit area. In Bukit Barisan Selatan NP, the largest pocket was found in the Pemerihan-Sukaraja area, followed by the Kedarai complex area. The overall trend in area occupied (probability of occupancy) by elephants in BBSNP and GLNP is decreasing but not significant, as the confidence interval still overlaps (Figure 2.2). Due to low detection rates, the elephant population in KSNP cannot be accurately analyzed. However, based on naive occupancy, it is estimated that elephants occupied only 2% of the area (2 grids out of 85) and 9% (8 grids out of 89) in 2019-2020.

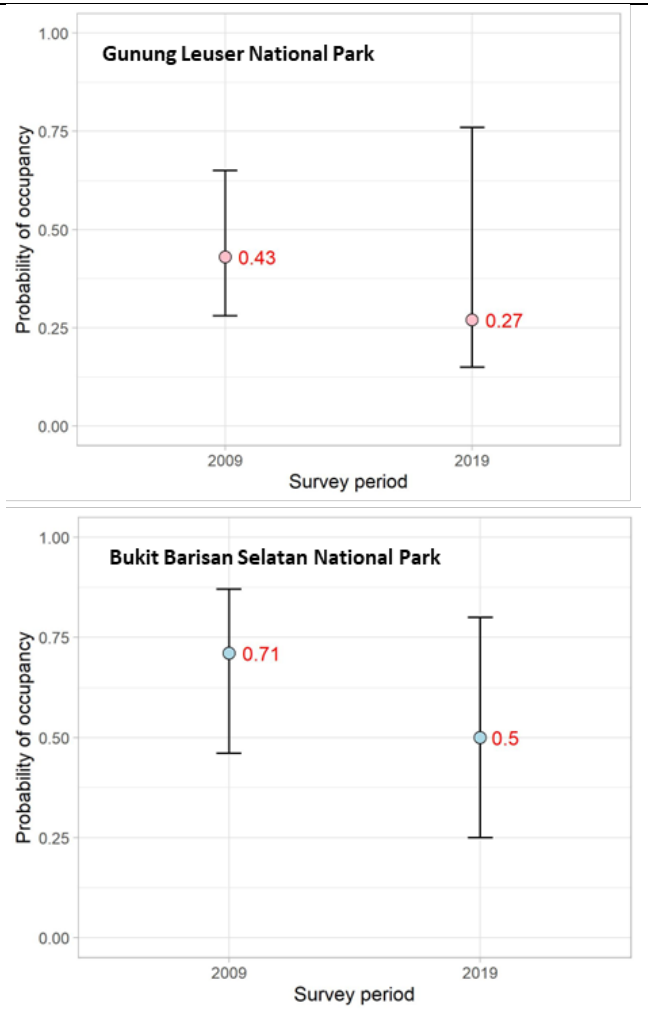


Figure 2.2. Comparison of proportion of area occupied (2009 VS 2019) for elephant in the Bukit Barisan Selatan and Gunung Leuser National Park

				Orangutan The orangutan population monitoring is conducted in the GLNP site monitoring (1,160 ha) and it is estimated to have approximately 107 individuals. In 2021-2022 a population survey of Sumatra orangutans was carried out, and the result will be analyzed in 2023. **Sumatran Rhino** Monitoring of the Sumatran rhino population is carried out by deploying camera traps in GLNP monitoring sites (20 camera traps annually) and in BBSNP (250 camera traps from 2018 to 2019). Additionally, on-foot surveys are conducted to monitor the remaining cryptic population in both parks. To support in situ efforts, the Government of Indonesia is enhancing the capacity of semi-in situ conservation efforts and operating the Sumatran Rhino Sanctuary (SRS) in Way Kambas NP, Lampung. Furthermore, efforts are underway to establish a second SRS in Aceh and Kelian East Kalimantan, as part of Indonesia's strategy to save the species through Assisted Reproductive Technology and Bio Bank
INTEGRI	**3**	**Road development:** There are no new road developments or road development proposals within the property.	Monitoring of the existing road network and proposals for new roads within and around the property including through remote sensing and other appropriate methods.	The Government of Indonesia remains committed to its pledge of not issuing permits for any new road proposals within the protected areas. Instead, the government is currently focused on mitigating the effects of existing road developments, such as the Karo Langkat Road in Gunung Leuser NP, Bukit Tapan Road in Kerinci Seblat NP, and Sanggi Bengkunat Road in Bukit Barisan Selatan NP, by conducting intensive patrols around the national road lanes and conducting studies to evaluate the impact of road developments on wildlife mobility and the necessity of wildlife corridors or canopy bridges.

T Y		In addition, any changes/adjustments to existing roads (including widening and paving) within the property or in adjacent areas can only take place if it is demonstrated that they will not negatively impact on the Outstanding Universal Value of the property.	Environmental Impact Assessments of road improvement projects.	In this regard, the Government of Indonesia emphasizes the importance of conducting an Environmental Impact Assessment (EIA) process to evaluate any potential impact of a development project on the Outstanding Universal Value (OUV). The government has also adopted National Regulation Number P.23/MENLHK/SETJEN/KUM.1/5/2019, which regulates how to mitigate negative impacts from road development on forest ecosystems. Article 7 of the regulation states that the concept of strategic road alignment in an area of international status that has been designated as a world natural heritage site must consult with the institutions in charge.
	4	**Mining:** There are no mining concessions nor 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.	Existing mining concessions are revoked where they overlap with the property. No new mining concessions or exploration permits overlapping with the property are issued. Environmental Impact Assessments of new mining proposals adjacent to the property. Monitoring and enforcement of implementation of mitigation measures at mines in adjacent areas where mining could have negative impacts on the property's OUV.	There are no mining concessions or mining exploration permits within the area of TRHS. Illegal small-scale mines inside the property are being closed since 2014 and the mining sites have been rehabilitated.
	5	**Boundary demarcation:** The entire boundary of the property is adequately and accurately demarcated on the ground, at all three component national parks.	Monitoring of property boundaries demarcation to ensure boundary demarcation is not removed.	Concerning the boundary management of TRHS, the Government of Indonesia continues conducted various activities and measures as follows: **1. Boundary maintenance** Boundary maintenance is a routine annual activity undertaken by each park manager to maintain the boundary condition. This activity is also a significant action to strengthen the spatial legal basis of the area particularly in the field.

				2. Boundary Reconstruction Based on data and maps from boundary maintenance activities, MoFE executes the boundary reconstruction in the national park. This activity aims to strengthen and reinforce the legal basis of national park boundaries. In general, boundary reconstruction is carried out by restoring any misplaced boundary markers to their original position as shown in the official map issued by MoEF and replacing the missing boundary markers with the new ones. **3. Dissemination/awareness raising** This activity is aimed to disseminate information about the existence of the property and its boundaries. Moreover, dissemination is also important in order to deliver programs and activities of the national park management to surrounding local communities and also to other relevant stakeholders (local government, NGOs, etc.). Therefore, dissemination becomes a routine activity in raising people's awareness of conservation programs.

	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 regularly to all stakeholders.[3] The number of prosecutions and resulting convictions as a proportion of arrests is significantly increased in relation to the 2013 baseline.	MIST/SMART data and data on elephant carcasses and law enforcement effort through CITES/MIKE Strategic Patrolling Plans developed for each resort Response of park authorities to reports of fires, human–wildlife conflict, illegal activities, etc. (i.e. do they respond and how quickly) Reports of regular patrols conducted by the Natural Resources Conservation Agency as well as the national park authorities Analysis of court records	The implementation of MIST/SMART in 2014 in the property has continued to be strengthened over the years. This system has allowed the national park authorities to systematically record the results from patrolling activities and manage them in a database, enabling further analysis that can be used to direct patrolling plans. Figure 6.1 shows the patrol effort over several years in the three national parks within the property. Although the patrol effort has fluctuated, it has generally increased significantly compared to the early years (2014 or 2015). Correspondingly, the number of threats and snares recorded by the patrol teams has also fluctuated over time but tends to show a decreasing pattern. The government has continued to support the implementation of SMART (Spatial Monitoring and Reporting Tool) based patrolling as a means to systematically monitor, protect (using patrolling as a deterrent of illegal activities), and better understand the field situation. This will assist in refining the effective patrolling strategy.

[3] The ASEAN Regional Centre for Biodiversity Conservation publication "*Competence Standards for Protected Area Jobs in South East Asia*" (Appleton *et al.*, 2003) should be seen as minimum guidance. The publication is available at http://old.aseanbiodiversity.org/index.php?option=com_docman&task=doc_details&gid=10&Itemid=130

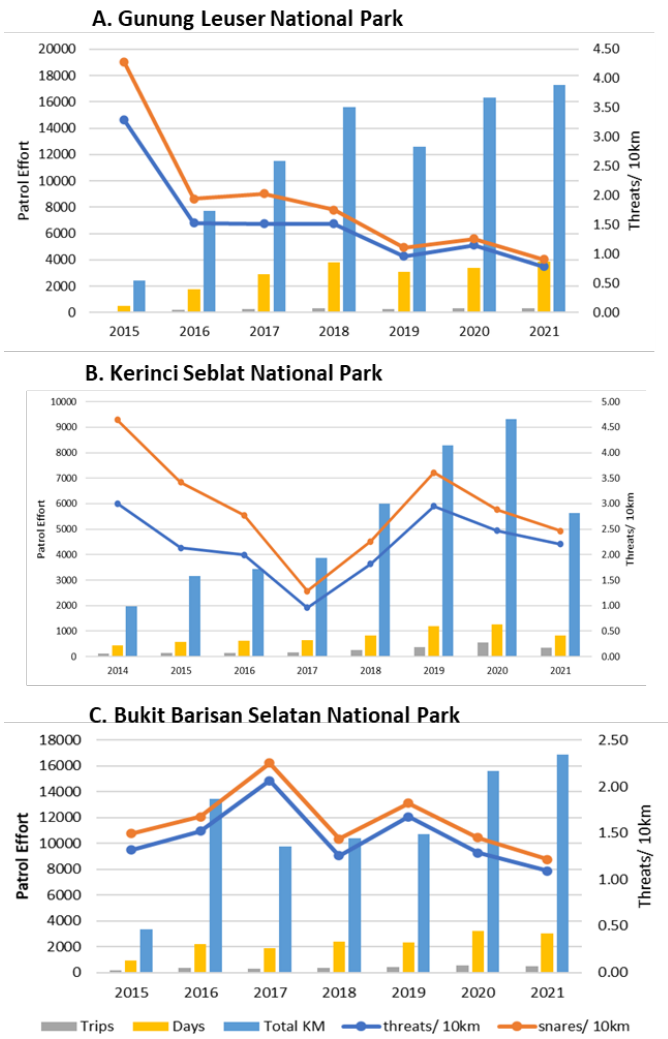
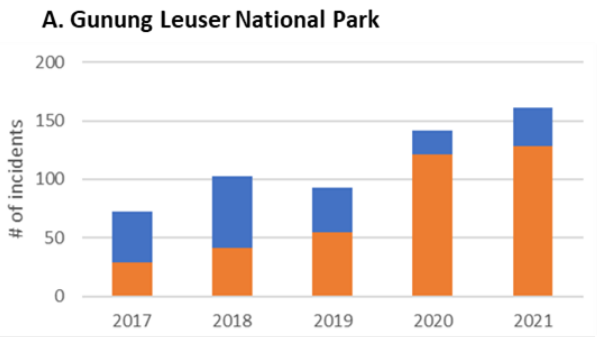


Figure 6.1. SMART patrol effort and the number of illegal activities recorded/10 km in the three national parks (A. Gunung Leuser; B. Kerinci Seblat; C. Bukit Barisan Selatan) within the property over years (up to 2021).

				Human Wildlife Conflict Human-wildlife conflicts are a common occurrence faced by the villagers living near the three national parks within the property. The rangers of GLNP, KSNP, and BBSNP have worked with communities to mitigate negative interactions between humans and wildlife. This includes responding to conflicts, increasing community awareness and resilience, and engaging local governments and the private sector. Figure 6.2 shows the number of human-wildlife conflict incidents in the three national parks within the property over the last six years. In total, there have been 1,042 HWC incidents responded to (571 incidents in GLNP, 49 in KSNP, and 422 in BBSNP) in approximately 397 villages around the property. Additionally, to minimize livestock predation by tigers, the community has taken action by building 220 units of Tiger Proof Enclosures (TPE) to protect their livestock. To further integrate human-wildlife conflict mitigation and adaptation into village communities, Resilient Village Models have been established within the past five years. Through mentoring sessions conducted by field staff from the Ministry of Environment and Forestry (MoEF), these villages have gained the capacity to independently respond to and find innovative solutions for human-wildlife conflict situations.



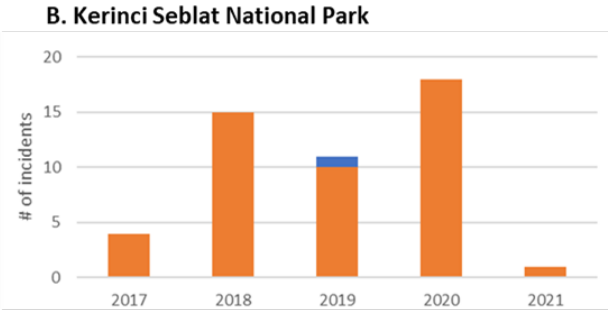


Figure 6.2. Human wildlife conflict incidents (HTC= Human-tiger conflict; HEC= Human elephant conflict) in the three national parks (A. Gunung Leuser; B. Kerinci Seblat; C. Bukit Barisan Selatan) within the property .

	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.	Periodical analyses (2-3 years) of satellite images of the entire Leuser Ecosystem, including monitoring of the boundaries of agricultural zones. Presidential Decree establishing the National Strategic Area for Gunung Leuser.	The Government of Indonesia remains committed to protecting and conserving the Leuser Ecosystem (KEL). Some of the efforts that have been undertaken include designating KEL as an area with an environmental interest focus. The KEL covers around 2.6 million hectares and is located in Aceh and North Sumatra provinces. KEL has several important values, which is why the Government of Indonesia considers it necessary to establish a spatial plan for its management. The spatial plan is currently being developed with the aim of realizing and conserving KEL as a means of preventing environmental degradation, ensuring the existence of flora and fauna within their natural habitats, and supporting sustainable human life without disturbing the protective function. To achieve these goals, there are two policies for managing KEL. The first policy is the preservation of KEL to prevent environmental degradation, ensuring the existence of flora and fauna within their natural habitats, and the second is improving the welfare of the community to support KEL conservation without disrupting the protective function. Furthermore, in the context of landscape management that integrates the management of functions within the area as a whole and as a complete ecosystem, the Indonesian government proposed the Leuser Ecosystem as a biosphere reserve, with the Leuser National Park as its core area (Gunung Leuser National Park Biosphere Reserve, designated in 1981). The application of the biosphere reserve concept in area management has a mission to balance seemingly conflicting objectives between the conservation of natural resources and the environment with social economic development and the preservation of the noble cultural values of a nation, supported by science and technology. In brief, the development of biosphere reserves in Indonesia is to promote and demonstrate the balance between social economic interests and ecological interests through a bioregional approach and support of science and technology. The management of biosphere reserves in Indonesia is carried out through multi-stakeholder involvement in the biosphere reserve area, through coordination and cooperation by integrating development programs to achieve the goals of biosphere reserve development, namely conservation of biological resources and their ecosystems, sustainable economic development, and logistical support in the form of research, monitoring, and human resources development in the area.

Jakarta, March 2023.
Acting Director General of
Conservation on Natural Resources and Ecosystem
Ministry of Environment and Forestry – Republic of Indonesia

BAMBANG HENDROYONO

References

Ash, E., Kaszta, Ż., Noochdumrong, A., Redford, T., Chanteap, P., Hallam, C., ... & Macdonald, D. W. (2021). Opportunity for Thailand's forgotten tigers: assessment of the Indochinese tiger Panthera tigris corbetti and its prey with camera-trap surveys. Oryx, 55(2), 204-211.

Duangchantrasiri S, Umponjan M, Simcharoen S, Pattanavibool A, Chaiwattana S, Maneerat S, Kumar NS, Jathanna D, Srivathsa A, Karanth KU. 2016. Dynamics of a low-density tiger population in Southeast Asia in the context of improved law enforcement. Conservation Biology 30:639–648.

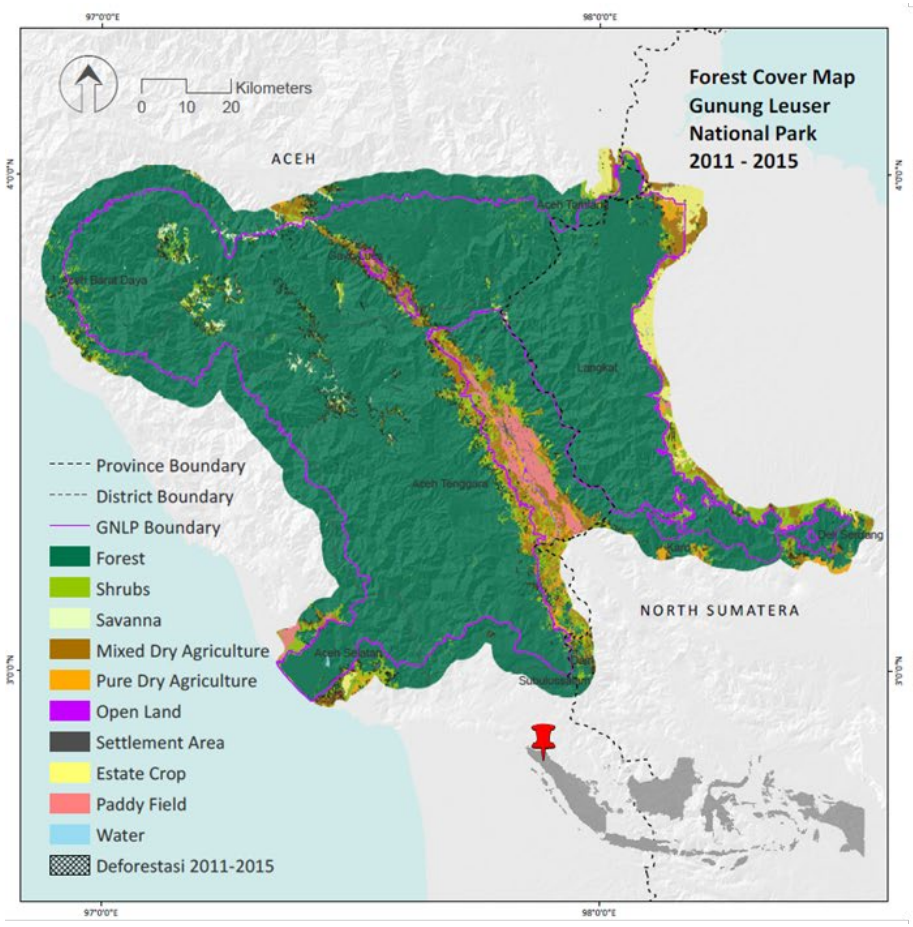
Fauna & Flora International 's Indonesia Program. 2021. RENJANA SANG RIMAU, Pembelajaran Sumatran Tiger Project di Taman Nasional Kerinci Seblat. Direktorat Konservasi Keanekaragaman Hayati, Direktorat Jenderal Konservasi Sumber Daya Alam, Kementerian Lingkungan Hidup dan Kehutanan, United Nations Development Programme - Global Environment Facility (UNDP/GEF). Jakarta)

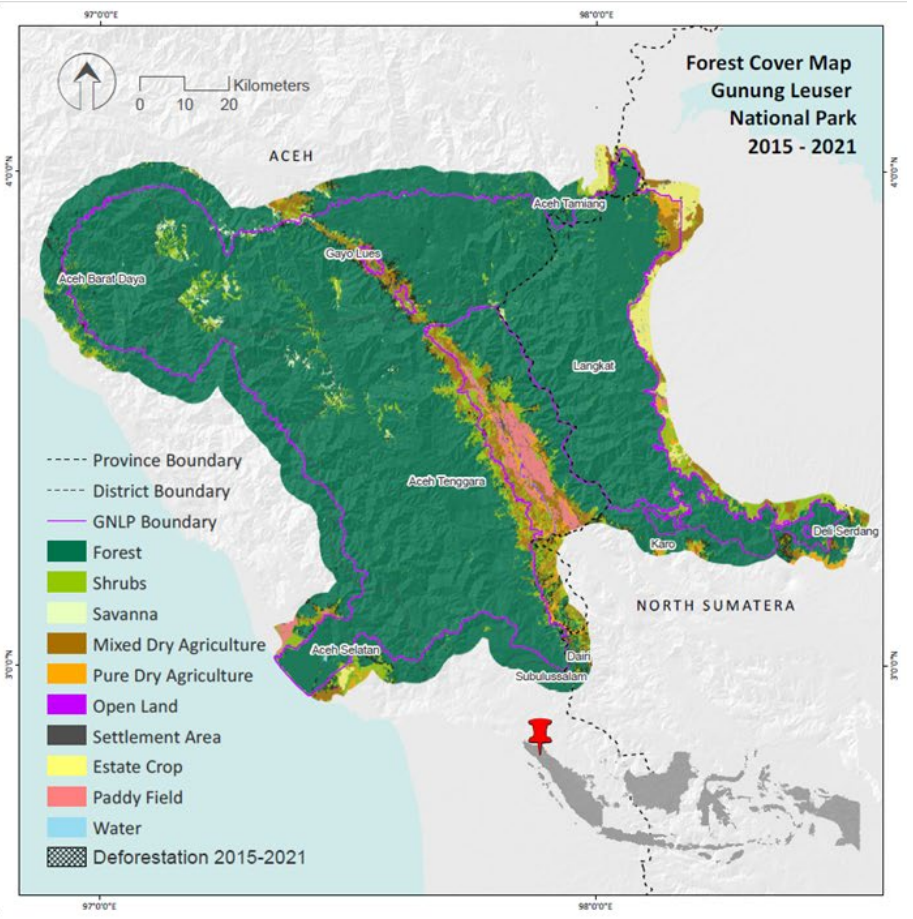
Karanth KU, Nichols JD. (1998). Estimation of tiger densities in India using photographic captures and recaptures. Ecology 79:2852–2862.

Linkie, Matthew, Gurutzeta GUILLERA-ARROITA, Joseph Smith, and D. Mark Rayan. (2010). Monitoring tigers with confidence, Integrative Zoology 5, no. 4 (2010): 342-350.

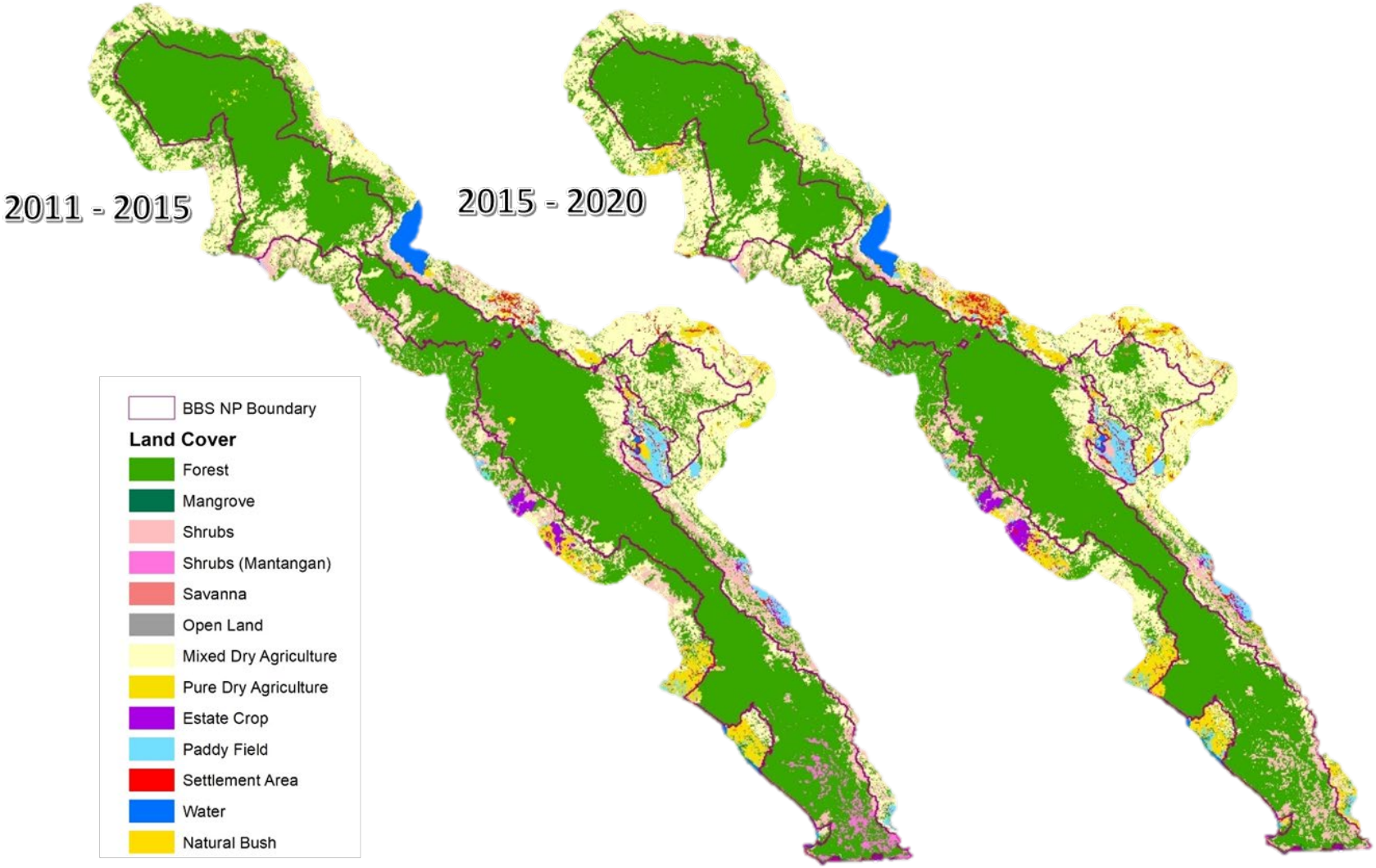
Pusparini, W., Batubara, T., Surahmat, F., Sugiharti, T., Muslich, M., Amama, F., ... & Andayani, N. (2018). A pathway to recovery: the Critically Endangered Sumatran tiger Panthera tigris sumatrae in an 'in danger'UNESCO World Heritage Site. Oryx, 52(1), 25-34.

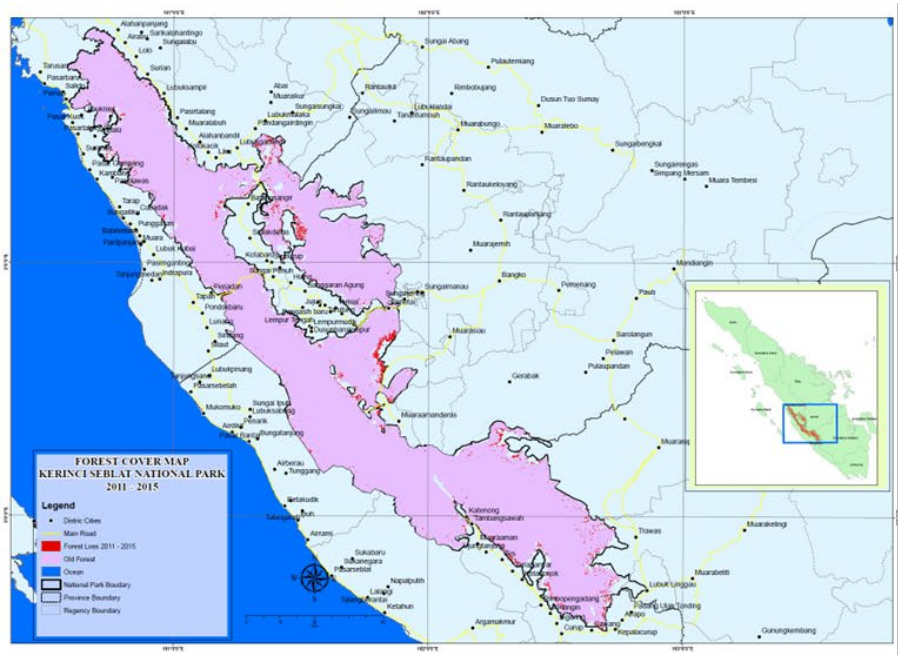
Annexes

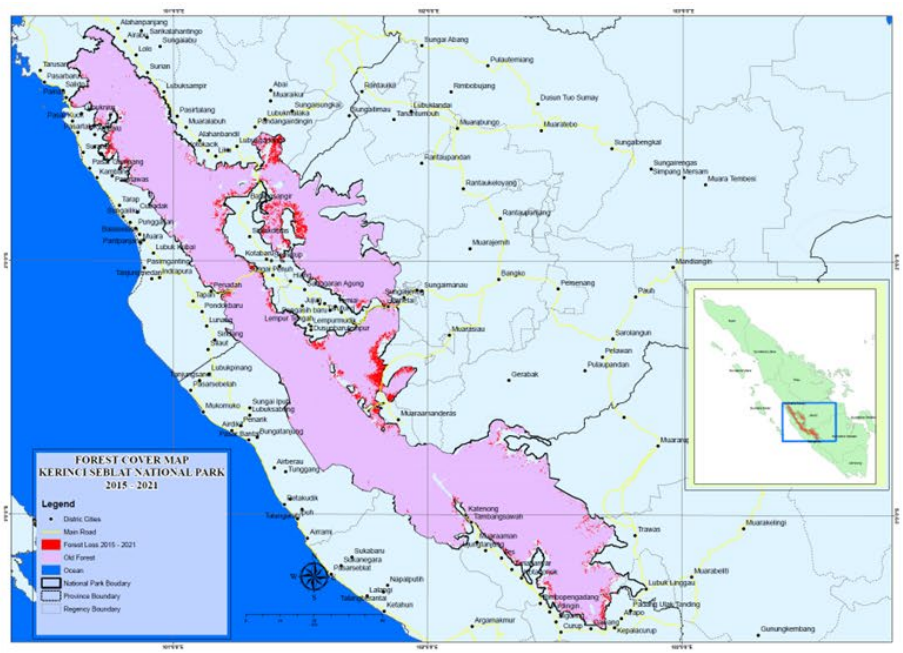

Forest Cover Map
Gunung Leuser
National Park
2011 - 2015
Kilometers
0 10 20
ACEH
NORTH SUMATERA
Province Boundary
District Boundary
GNLP Boundary
Forest
Shrubs
Savanna
Mixed Dry Agriculture
Pure Dry Agriculture
Open Land
Settlement Area
Estate Crop
Paddy Field
Water
Deforestasi 2011-2015

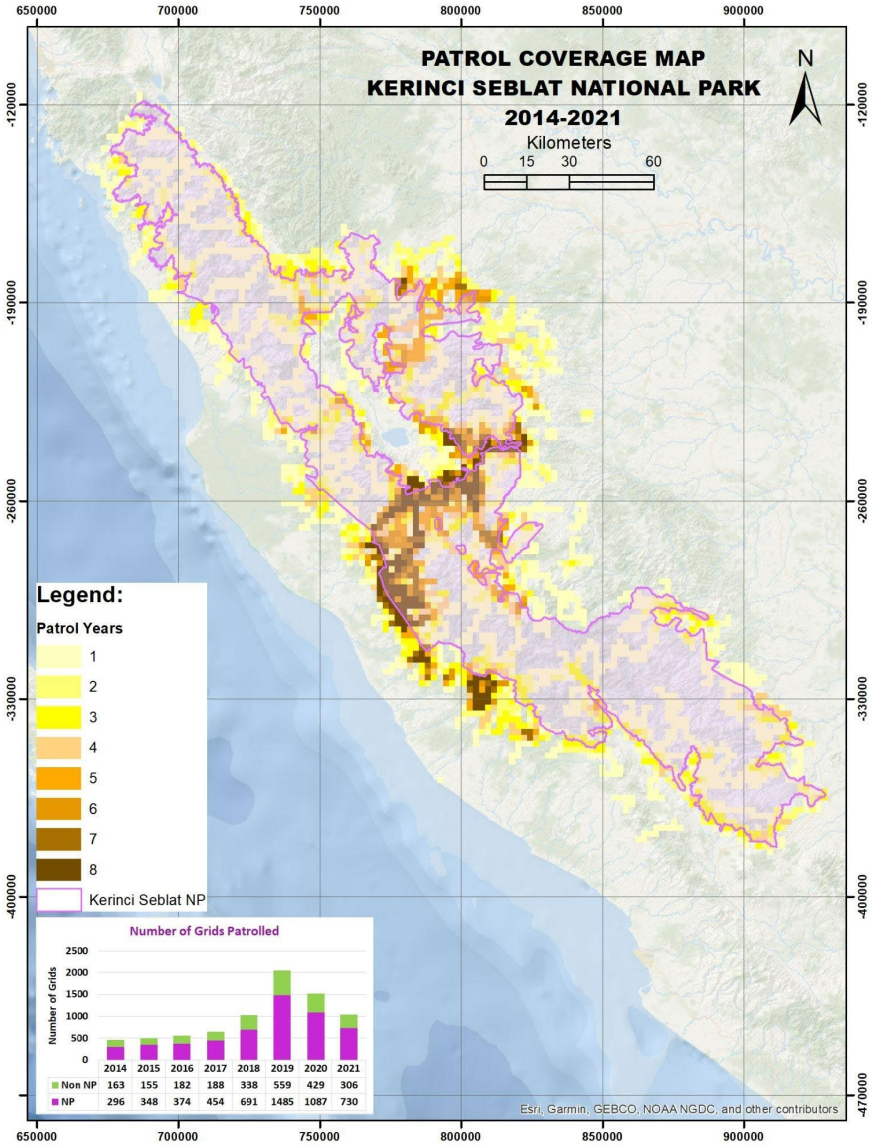

Forest Cover Map
Gunung Leuser
National Park
2015 - 2021
Kilometers
0 10 20
ACEH
Aceh Tamiang
Gayo Lues
Aceh Barat Daya
Langkat
Aceh Tenggara
Deli Serdang
Karo
NORTH SUMATERA
Aceh Selatan
Dairi
Subulussalam
Province Boundary
District Boundary
GNLP Boundary
Forest
Shrubs
Savanna
Mixed Dry Agriculture
Pure Dry Agriculture
Open Land
Settlement Area
Estate Crop
Paddy Field
Water
Deforestation 2015-2021

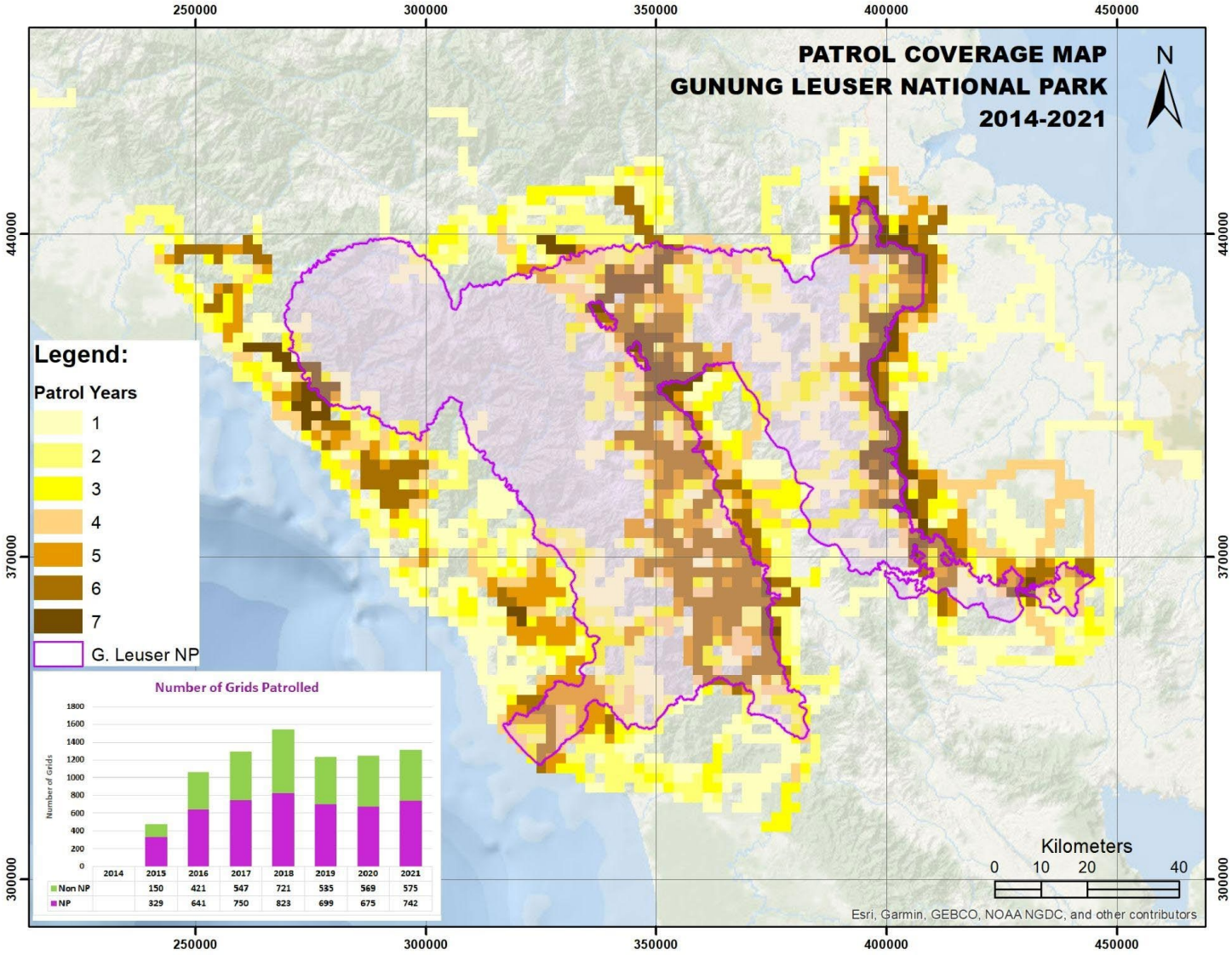
FOREST COVER MAP
BUKIT BARISAN SELATAN NP

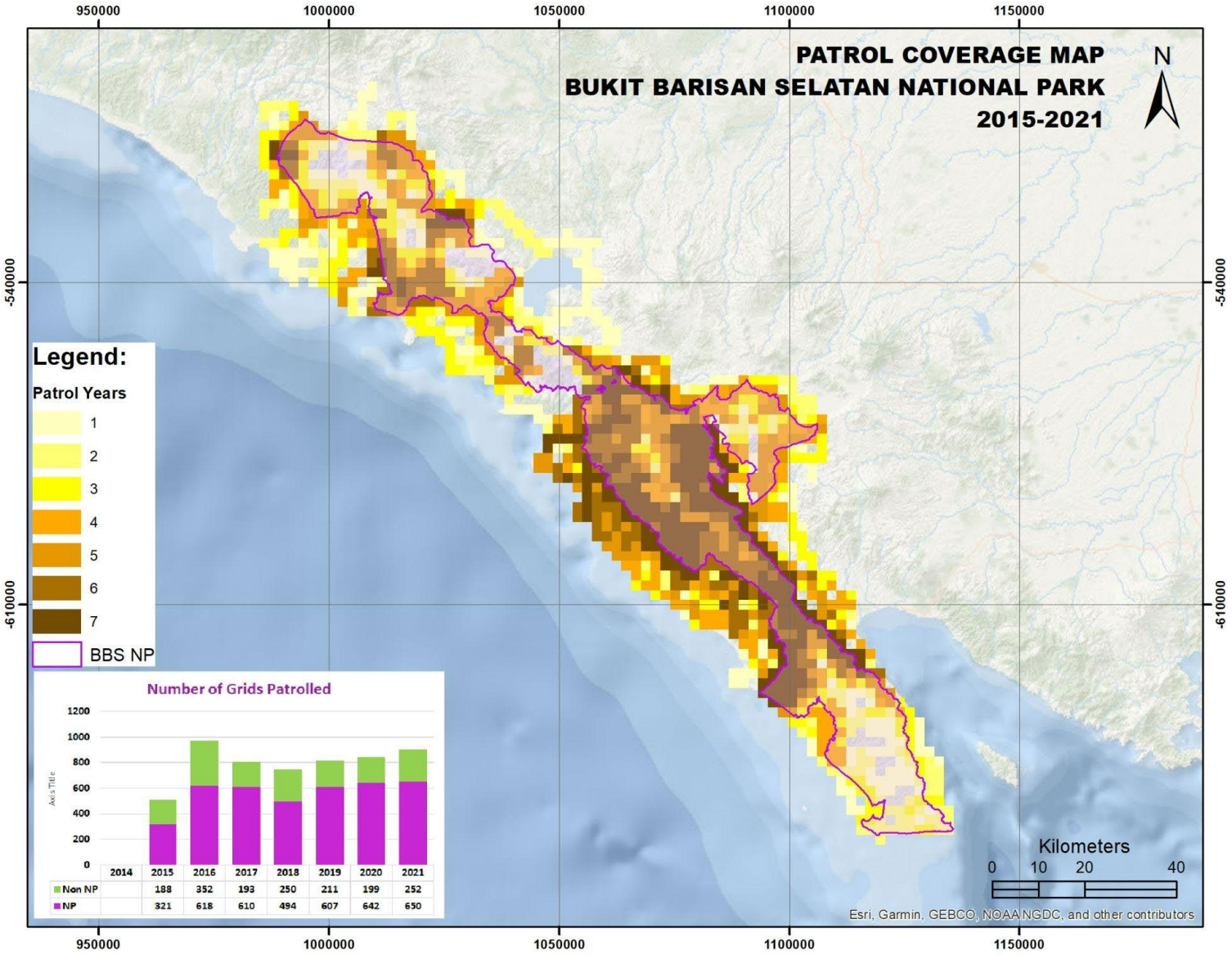


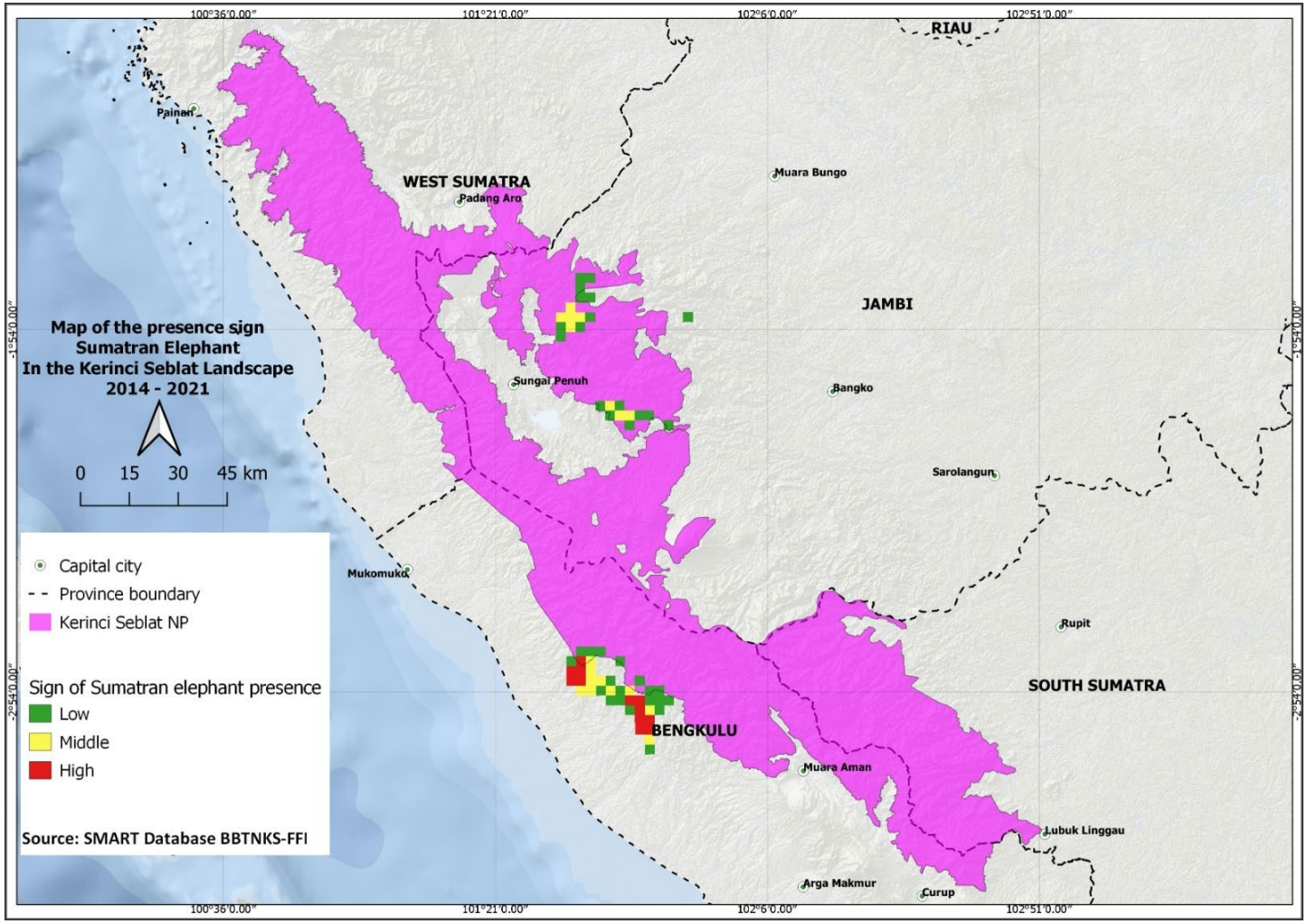

FOREST COVER MAP
KERINCI SEBLAT NATIONAL PARK
2011 - 2015
Legend
Distric Cities
Main Road
Forest Loss 2011 - 2015
Old Forest
Ocean
National Park Boudary
Province Boundary
Regency Boundary


FOREST COVER MAP
KERINCI SEBLAT NATIONAL PARK
2015 - 2021
Legend
Distric Cities
Main Road
Forest Loss 2015 - 2021
Old Forest
Ocean
National Park Boudary
Province Boundary
Regency Boundary


PATROL COVERAGE MAP
KERINCI SEBLAT NATIONAL PARK
2014-2021
Kilometers
0 15 30 60
N
650000
700000
750000
800000
850000
900000
-120000
-190000
-260000
-330000
-400000
-470000
Legend:
Patrol Years
1
2
3
4
5
6
7
8
Kerinci Seblat NP
Number of Grids Patrolled
Number of Grids
2500
2000
1500
1000
500
0
2014 2015 2016 2017 2018 2019 2020 2021
Non NP 163 155 182 188 338 559 429 306
NP 296 348 374 454 691 1485 1087 730
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors


PATROL COVERAGE MAP
GUNUNG LEUSER NATIONAL PARK
2014-2021
N
250000
300000
350000
400000
450000
440000
370000
300000
Legend:
Patrol Years
1
2
3
4
5
6
7
G. Leuser NP
Number of Grids Patrolled
1800
1600
1400
1200
1000
800
600
400
200
0
Number of Grids
2014 2015 2016 2017 2018 2019 2020 2021
Non NP 150 421 547 721 535 569 575
NP 329 641 750 823 699 675 742
Kilometers
0 10 20 40
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors


PATROL COVERAGE MAP
BUKIT BARISAN SELATAN NATIONAL PARK
2015-2021
N
950000
1000000
1050000
1100000
1150000
-540000
-610000
Legend:
Patrol Years
1
2
3
4
5
6
7
BBS NP
Number of Grids Patrolled
1200
1000
800
600
400
200
0
Axis Title
2014 2015 2016 2017 2018 2019 2020 2021
Non NP 188 352 193 250 211 199 252
NP 321 618 610 494 607 642 650
Kilometers
0 10 20 40
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors


Map of the presence sign
Sumatran Elephant
In the Kerinci Seblat Landscape
2014 - 2021
0 15 30 45 km
Capital city
Province boundary
Kerinci Seblat NP
Sign of Sumatran elephant presence
Low
Middle
High
Source: SMART Database BBTNKS-FFI
RIAU
WEST SUMATRA
JAMBI
BENGKULU
SOUTH SUMATRA
Painan
Padang Aro
Muara Bungo
Sungai Penuh
Bangko
Sarolangun
Mukomuko
Rupit
Muara Aman
Lubuk Linggau
Arga Makmur
Curup
100°36'0.00"
101°21'0.00"
102°6'0.00"
102°51'0.00"
-1°54'0.00"
-2°54'0.00"