IUCN Conservation Outlook Assessment 2017 **(archived)**
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Please note: this is an archived Conservation Outlook Assessment for Dong Phayayen-Khao Yai Forest Complex. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

# Dong Phayayen-Khao Yai Forest Complex

## SITE INFORMATION

Country:
Thailand
Inscribed in: 2005
Criteria:
(x)

Site description:
The Dong Phayayen-Khao Yai Forest Complex spans 230 km between Ta Phraya National Park on the Cambodian border in the east, and Khao Yai National Park in the west. The site is home to more than 800 species of fauna, including 112 mammal species (among them two species of gibbon), 392 bird species and 200 reptile and amphibian species. It is internationally important for the conservation of globally threatened and endangered mammal, bird and reptile species, among them 19 that are vulnerable, four that are endangered, and one that is critically endangered. The area contains substantial and important tropical forest ecosystems, which can provide a viable habitat for the long-term survival of these species. © UNESCO

## SUMMARY

# 2017 Conservation Outlook

**Significant concern**

Sufficient threats remain to indicate that a greater level of protection and management control is urgently required in important areas of the property, particularly in response to the ongoing threat from removal of Siamese Rosewood. While a number of recent threats have resulted in immediate and decisive management action and intervention, other long present threats remain unaddressed and without action the property will continue to be threatened. These threats include the issues of illegal logging, land use and encroachment, ineffective management and ongoing potential threats from further infrastructure developments. Enforcement of speed limits on the sections of Highway 304 and other roads that run within the boundaries of the property appear to be ineffective. Similar concerns remain if there is expansion or re-opening of other roads throughout the property. Construction of the Huay Samong Dam nears completion and whilst mitigation activities have been implemented by DNP in collaboration with the RID, concerns remain in regards to the management of the area post construction, plans for the introduction of fish species, the impact of flooding on areas of the property and discussions around further dam developments. Large areas found within the current boundaries of the property have suffered heavily from encroachment into forested areas and subsequent land use change. The impact of resort developments within the boundaries and the encroachment into forest areas has not improved and continues to impact the integrity of the property and the values for which it was inscribed. Threats to the integrity of the property remain considerable and the conservation outlook for this property remains of significant concern.

## Current state and trend of VALUES

**High Concern**
**Trend: Stable**

The 2014 and 2017 IUCN missions affirmed that a number of issues highlighted

as threats to the OUV of the property in previous SOC reports, monitoring mission reports and decisions made by the World Heritage Committee, remain as threats to the property. While progress has been made on a number of the threats, a lack of updated monitoring results makes it difficult to measure the impacts of measures taken on the biodiversity values for which the property was inscribed. There have been some indications that the number of tigers present in the property is increasing, based on camera trap images of breeding, however, as there is limited data available on the current population and level of poaching for this species, and others, it remains difficult to determine the overall trends in the biodiversity values. In addition, illegal logging of Siamese Rosewood remains a key threat, and there is concern that other high value species, like tigers or pangolins, may be targeted in future. Encroachment of forest areas at the edge of the property also remains of concern.

## Overall THREATS

**High Threat**

There are a number of major threats to the integrity of the property and the Outstanding Universal Value for which it was inscribed: impacts from infrastructure developments (e.g. upgrade of Highway 304, construction and impacts of the Huay Samong Dam) both outside and within the site; continued encroachment around the edges and within the property; growing tourism use; illegal removal of high value timbers such as Siamese rosewood and inadequate management. The State Party has recently made significant efforts in addressing a number of these threats, however it will take some time for these efforts to demonstrate tangible results, in particular as regards the expansion of Highway 304 and the clarification of land use rights within the property. Sufficient threats remain to indicate that a greater level of protection and management control is required in major parts of the property. Unless there is continued and decisive management action and intervention, the property will continue to be threatened at a significant level.

## Overall PROTECTION and MANAGEMENT

**Some Concern**

As with the management of external threats to the property, concerns exist with the capacity to deal with internal issues, despite an adequate legal framework. These include impacts from upgrading works on Highway 304, traffic volumes,

enforcement of speed limits and provision for wildlife movement; encroachment and illegal logging. Levels of encroachment appear to be increasing since the inscription of the property and illegal logging has also increased dramatically over recent years. A number of threats have been addressed by concrete action; namely the extent of cattle grazing, implementation of activities to mitigate impacts during construction of the Huay Samong Dam, and the ongoing construction of wildlife corridors to mitigate the impacts from the expansion of Highway 304. Notable progress has been made in addressing the threat from illegal logging, but concerns remain around encroachment and a continued lack of clarity of land use rights in some parts of the property.

# FULL ASSESSMENT

## Description of values

### Values

### World Heritage values

► **Significant natural habitats for a diversity of species, including threatened and endangered species.**
**Criterion:(x)**

The Dong Phayayen-Khao Yai Forest Complex (DP-KYFC) is comprised of five protected areas covering 615,500 ha. The property is internationally important for the conservation of globally threatened and endangered mammal, bird and reptile species, including 1 critically endangered, 4 endangered and 19 vulnerable species. The property contains more than 800 fauna species, including 112 species of mammals, 392 species of birds and 200 species of reptiles and amphibians. The complex protects the last substantial area of globally important tropical forest ecosystem from the Central Indochina biogeographic province in northeast Thailand, and thus provides a viable area for the long-term survival of endangered, globally important species, including tiger, elephant, and banteng. The unique range overlap of two species of gibbon, including the vulnerable Pileated Gibbon, adds to the global value of the complex (IUCN, 2005; SoOUV, 2013; IUCN, 2014a).

► **Conservation of migratory bird species.**
**Criterion:(x)**

The complex plays an important role for the conservation of migratory species including the Near-Threatened Spot-billed Pelican (Pelecanus philippensis) and Endangered Greater Adjutant (Leptoptilos dubius) (IUCN,

2005; SoOUV, 2013).

### Other important biodiversity values

► **Important watershed area.**

As a result of its high annual rainfall, large forest area and mountainous catchments, the Dong Phayayen-Khao Yai Forest Complex (DP-KYFC) acts as a critically important watershed for Thailand. The rainfall drains into and feeds five of the country's major rivers: Nakhon Nayok River, Prachin Buri River, Lamta Khong river, Muak Lek River, and Mun River (SoOUV, 2013).

## Assessment information

### Threats

#### Current Threats

**High Threat**

A number of the identified threats have been addressed by concrete action, which is resulting in mitigation; namely the extent of cattle grazing and implementation of activities to mitigate impacts during construction of the Huay Samong Dam and the expansion of Highway 304. Progress on these issues has been slow initially but is now speeding up. There are concerns that the State Party has made insufficient progress in terms of enforcement of regulations in regards to land use change, encroachment and boundary issues. These require increased efforts from the management agencies and other government departments. The dramatic escalation of illegal logging has received the full attention of the State Party and significant efforts are being made to address this threat. Nevertheless, further efforts are needed, in particular to increase international cooperation on law enforcement and prosecution of transgressors.

### ► Dams/ Water Management or Use

**Low Threat**
**Inside site, localised(<5%)**
**Outside site**

The Thai Cabinet approved the EIA for the construction of the Huay Samong Dam in October 2009 (IUCN, 2011; IUCN, 2012; IUCN, 2014a). The State Party has made efforts to mitigate the impact on the property from the construction of the Dam and it is essential that there is continuation of these efforts during and post construction. The 2017 mission noted the dam was already filled to 60% of its maximum capacity with inundation of agricultural land and parts of the property along the boundaries of Thap Lan and Pang Sida National Parks. Concerns pertaining to the impacts from increased access following inundation, introduction of non-native fish species, increased human occupation associated with construction and potential impacts on remaining populations of Siamese Crocodile remain despite the efforts of the State Party to negate these impacts. Cooperation between relevant authorities specifically the Royal Irrigation Department (RID) and Department of National Parks (DNP) needs to continue with a view to improving enforcement of mitigation actions after construction (IUCN, 2012; IUCN, 2014a; IUCN, 2017). The progress achieved so far, including financial support provided until 2025 by RID to support DNP patrolling of the reservoir by boat, is encouraging.

### ► Tourism/ visitors/ recreation

**High Threat**
**Inside site, widespread(15-50%)**
**Outside site**

At the time of inscription it was noted that the impact from tourism pressure on the property and in particular Khao Yai National Park, was great and needed to be addressed by developing and implementing a ‘whole of complex’ tourism strategy (IUCN, 2005; IUCN, 2012; IUCN, 2014a). The number of tourist visits to the site doubled from 700,000 in 2001 to 1.4 million in 2006 with continued growth in visitor numbers since then. These high visitor levels should be managed through appropriate visitor use planning, based on a careful assessment of the site’s capacity. The State Party has previously reported that a Tourism Management Plan was in place,

however this plan was considered inadequate in identifying, avoiding and mitigating the potential negative impacts of tourism on the site's OUV (IUCN, 2011). A new draft Sustainable Tourism Management Strategy for the whole property was adopted in 2017, covering the period 2017-2027. Development of new resorts, especially around Khao Yai National Park, continues at a high pace, and requires strict regulation to avoid impacts on the OUV of the property. Illegal resort development inside the property, particularly in the area between Khao Yai and Thap Lan National Parks, has been a long-standing significant concern.

### ► Housing/ Urban Areas, Commercial/ Industrial Areas, Tourism/ Recreation Areas

**Very High Threat**
**Inside site, scattered(5-15%)**
**Outside site**

Large-scale encroachment has significantly increased since inscription of the property, particularly along the northern boundary of Thap Lan National Park. The local community has previously made efforts to prevent this area from being designated as part of the National Park as they claim ownership of the land (SOC, 2011). These issues have only increased since inscription on the World Heritage List and confusion as to the boundaries of the property, which were recognised as inappropriate and requiring confirmation at the time of inscription (IUCN, 2005). Encroachment remains a major threat to the integrity of the property and it is important that the State Party build a long-term plan that adequately and urgently addresses the situation. An assessment of land use changes and encroachment into the property since inscription is urgently needed. This should include location, magnitude, previous land use and their evolution since the inscription of the property, using satellite imagery analysis. This mapping should also differentiate between land use in regards to agriculture, settlements and resort development (IUCN, 2012; IUCN, 2014a).

### ► Roads/ Railroads

**High Threat**
**Inside site, localised(<5%)**
**Outside site**

Highway 304 is a busy national highway that runs along the boundary

between Khao Yai and Thap Lan National Parks, bisecting the World Heritage Property. The IUCN monitoring mission in 2017 noted that expansion works have begun to upgrade the road from two to four lanes, following approval of the EIA and plans for construction of wildlife corridors. The mission also noted considerable progress in regards to the construction of the elevated highway sections, one of the wildlife corridor methods being implemented to ensure connectivity between the two National Parks (IUCN, 2017). While the existing road represents a significant obstacle to wildlife movement, it is hoped that the construction of effective wildlife corridors will have a net positive benefit on movement of wildlife such as tigers and elephants, between Khao Yai and Thap Lan National Parks (IUCN, 2014a). Until the wildlife corridors have been completed and are proven effective, the current situation and ongoing construction works are considered to continue to represent a high threat.

### ► Livestock Farming / Grazing

**Very Low Threat**
**Inside site, scattered(5-15%)**

Grazing of domestic cattle in the Khonburi, Soeng Sang and the area around the Lam Plai Mart Dam has decreased markedly in recent years in response to decisions from the committee (IUCN, 2012; SOC, 2012; IUCN 2014a) and actions by the State Party. The State Party report numbers have fallen to 253 head of cattle (SP Report, 2014). Significant steps have been made to reduce the number of illegal settlements and cattle numbers, however, efforts need to continue to reduce illegal grazing and ensure removal of the remaining cattle. The State Party has made efforts to engage with illegal settlements that are grazing herds within the property. Ongoing efforts are needed to manage this threat through increased communication and dialogue with the district agriculture department and through supporting small family groups to secure land outside the property (IUCN, 2012; IUCN, 2014a).

### ► Hunting (commercial/subsistence)

**Low Threat**
**Inside site, widespread(15-50%)**

Poaching of wildlife has been an issue in some areas of the property where it was reported to be widespread and frequent (IUCN, 2014a). Previous reports indicate that commercial poaching of high-value species and subsistence level poaching is affecting some large mammals and bird species,

particularly from the areas east of Khao Yai and Thap Lan National Parks (IUCN, 2012; SOC, 2012; IUCN, 2014a). The current focus of enforcement efforts is to combat illegal logging of high value timber species and this is having some impact on other poaching but addressing subsistence hunting requires a wider, property wide approach and effort. The State Party has stated that no incidents of poaching of other wildlife has been reported (although other sources continue to regularly report such cases (IUCN Consultation, 2017)), and notes that illegal loggers of Siamese rosewood bring their own provisions into the forest, indicating that they do not rely on subsistence hunting during their time in the forest (State Party report, 2017). The 2017 mission noted that innovative approaches to combat poaching are being applied throughout the property, and are showing positive preliminary results. Therefore, poaching of species other than Siamese rosewood is currently considered a low threat, which should nevertheless receive the full attention of park authorities in order to prevent it from increasing in the future.

### ► Logging/ Wood Harvesting

**Very High Threat**
**Inside site, widespread(15-50%)**
**Outside site**

The property is home to significant populations of Siamese Rosewood (Dalbergia cochinchinensis), a high value hardwood timber species, increasingly sought after for furniture (IUCN, 2014a). Illegal logging of rosewood occurs in all components of the property. The domestic laws and penalties relating to its collection are inadequate (IUCN, 2014a), especially in terms of the international nature of the demand. Although the State Party has significantly increased efforts to address this threat both at a local and international level, further efforts are needed. Rosewood is classified as Vulnerable by IUCN and was recently listed under the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES). Rosewood poaching has occurred previously in the property at fairly low levels but has increased markedly in recent years, peaking in 2014. Illegal logging of Agarwood (Aquilaria spp) is also occurring inside the national parks in the Forest Complex. The majority of Agarwood in the parks, especially Khao Yai National Park, has been depleted (SOC, 2012). Illegal logging operations for the high value timbers have become

increasingly sophisticated and violent confrontations between loggers and park rangers often occur. The rate at which illegal logging has increased in recent years had outpaced the ability of park officials to respond and address this issue (IUCN, 2014a) but the IUCN mission in 2017 noted the ongoing efforts being made to address this threat, including at the national and international levels. These efforts will need to be further strengthened by international cooperation on law enforcement and prosecution, to ensure a strict control of the supply chain and prosecution of foreign loggers arrested in Thailand and who were deported largely without prosecution or penalties even though forestry law, immigration laws and others have been broken. Although the State Party has reported that cases of illegal logging of Siamese rosewood have been decreasing since 2014 (State Party report, 2017), new cases continue to be reported in local media, and the threat clearly remains very high.

### ► Other

**Low Threat**
**Outside site**

There is an increase in Human-elephant conflict (HEC), especially in Northeastern Thap Lan at Soeng Sang, Dong Yai and Wang Mee at Khao Yai. Over the last few years 7 people have been killed at Dong Yai and in 2017 two people were killed at Khao Yai. Expanded HEC mitigation measures are required, as this is an increasing problem as the elephant population increases. There are many reasons why elephants leave the park, but water availability is a main driver. Considering the climatic changes expected over the coming years, there is a need for more water pools deep in the property, to draw wildlife inwards rather than out of the parks (IUCN Consultation, 2017).

## Potential Threats

**High Threat**

Despite commendable efforts to address large-scale encroachment in areas around the property the potential remains for this threat to grow, particularly as the boundaries of the property require clarification. The protracted process to resolve land tenure and rights issues, hampered by poor information and lack of clarity on boundaries stemming from the time of the inscription of the

property, is compounding the potential for the property's values to be seriously eroded. Aside from the threats posed by existing developments there are reports of potential additional threats linked to proposed work on additional roads and development of dams within the boundaries of the property. Any additional road reopening or upgrading works would likely have serious adverse impacts on the property's integrity. Reports of new dam development proposals such those within the Klang Dong area of Ta Phraya National Park would similarly have negative impact on the property's intactness and ecological function and pose a significant threat to the OUV of the property.

### ► Dams/ Water Management or Use

**High Threat**
**Inside site, scattered(5-15%)**

IUCN has previously received information that a dam in the Klang Dong area of Ta Phraya National Park is under consideration, which, if approved, would inundate important wildlife habitats within the boundaries of the property (IUCN, 2014a; SOC, 2014). Plans for dam construction in addition to the Huay Samong Dam remain of concern given the potential impact to important areas of biodiversity, particularly noting a number of proposals for dam construction within the boundaries of the property. While DNP has not provided permission for the necessary EIA for the proposed Huay Saton Dam, inside the property, this dam and two others (Sai-noi Sai-Yai and Lam Prayathan) that could potentially impact on the property continue to feature in the Royal Immigration Departments (RID) development plans for eastern Thailand (IUCN, 2014a; IUCN, 2017), and therefore remain a high potential threat to the property.

In addition to these larger scale dams, small scale check dams have been built in many streams in all parks over the last 5 years, in an effort to help raise water tables and to provide drinking sources for wildlife. However, no ecological studies appear to have been conducted prior to building these dams, and their ecological impact, particularly on migratory species of small fish, is unknown (IUCN Consultation, 2017).

### ► Roads/ Railroads

**Low Threat**

**Inside site, localised(<5%)**
**Outside site**

Concerns exist over suggestions of the reopening of roads currently closed and the upgrading of other roads (e.g. Highway 348 and Route 3462) that bisect the property. Such potential activities would open up access and impact on an area of high biodiversity and have significant impacts on the property and its OUV. DNP has indicated that approval for re-opening and/or expansion of existing roads would not be granted. However, it remains an issue of concern as it remains clear that the Department of Highways (DoH) is still keen on further development of existing roads (IUCN, 2014a; IUCN, 2017), particularly Highway 348, which forms part of a larger economic corridor linking the Eastern Seaboard Economic Zone in Thailand to Da Nang port in Viet Nam (IUCN, 2017).

### ► Poaching

**High Threat**
**Inside site, widespread(15-50%)**

While currently the threat of poaching of species other than Siamese rosewood is not considered to be significant, there is a concern that illegal loggers may in future target other high value species such as tiger, elephant or pangolin. It is crucial that the current efforts undertaken by the Thai authorities to address the threat of illegal logging and trade of Siamese rosewood are extended to also ensure the protection of other wildlife species, and to be prepared to react swiftly if there is any evidence of other species being targeted.

## Protection and management

## Assessing Protection and Management

### ► Relationships with local people

**Some Concern**

The relationships with the local people and communities around and within the current defined boundaries of the property vary greatly from poor to good. There are significant issues with land tenure and land use change,

stemming from the initial gazetting of the National Parks and subsequent inscription on the World Heritage List, which often results in tensions between the Management Authority and the local communities (UNESCO Periodic Report, 2011). There is some involvement of local people in site management through the Protected Area Committees (PAC) that exist for all the protected areas making up the property. Community leaders participate and have a voice in PAC meetings (IUCN Consultation, 2017).

### ► Legal framework

**Mostly Effective**

The Dong Phayayen-Khao Yai Forest Complex is the property of the Government of Thailand, with the four national parks declared under the National Parks Act B.E 2504 (1961) and the Dong Yai Wildlife Sanctuary declared under the Wild Animal Reservation and Protection Act B.E. 2535 (1992). A lack of coordination between the national parks on the one hand and the wildlife sanctuary on the other leads to some frustration, as the wildlife sanctuary may unilaterally implement plans without consulting the National Parks Division (IUCN Consultation, 2017). Thailand has relatively strong protected area legislation and a number of other relevant laws and regulations in regards to National Parks and Reserved Area Management in Thailand, are in place (IUCN, 2011). A lack of clarity exists around land rights in some parts of the property, particularly in the north of Thap Lan National Park. A legal process is ongoing to clarify these issues, but this will take much time (IUCN, 2017).

### ► Enforcement

**Serious Concern**

The Department of National Parks holds primary responsibility for implementation of the Management Plan for the property, along with other key responsibilities including enforcement of the management and legal framework. The core components of the property are not permanently inhabited, although confusion over the designation of the boundaries means there are some communities within the World Heritage boundaries. Extraction of resources is prohibited within the boundaries. However, given the issues with the boundaries, land use changes and other jurisdictional issues this regulation is frequently broken. Poaching of high values species,

in particular Siamese Rosewood, has been repeatedly flagged as a concern by the Government, NGOs and local authorities. The resources and capacity to effectively address this threat and provide the necessary enforcement actions are mostly lacking with the management agency reliant on project specific funding for training and support. Strengthened collaboration with other enforcement agencies, such as the police, army, and customs, is being established, and will need to continue in order to address the threat from illegal logging and trade of Siamese Rosewood (IUCN, 2017). Enforcement of regulations to control encroachment and land use changes remains comparatively weak, and for this reason, overall enforcement is assessed as being of serious concern.

### ► Integration into regional and national planning systems

**Mostly Effective**

Responsibility for the management of all national parks and wildlife sanctuaries in Thailand currently sits with the Department of National Parks, Wildlife and Plant Conservation (DNP), under the Ministry of Natural Resources and Environment (MoNRE). This department was established in 2002 and as such the overall institutional framework for management of the property has not significantly changed since inscription of the property in 2005. A Superintendent manages each of the five protected areas comprising the property. These Superintendents report to the Head of the Dong Phayayen-Khao Yai Coordination Centre, who reports directly to the Director of the Natural World Heritage Office in Bangkok, which is part of DNP (IUCN, 2017), and which was formed following recent approval of changes to the administrative structure within DNP. The Natural World Heritage Office now holds primary responsibility for coordinating responses and for implementation of the Management Plan for the property (IUCN, 2014a). A wide range of other government agencies are involved in development activities such as transport infrastructure, irrigation, dams and rural development. Furthermore poaching and illegal logging operations, which are impacting the property, have wider national and regional implications and also involve multiple agencies. All of this highlights the importance of collaborative management approaches and harmonized objectives (IUCN, 2005; IUCN, 2011; IUCN, 2014a). Efforts to establish such inter-institutional collaboration have resulted in some progress being made on this front, in particular where it concerns the control and interception of illegally logged

Siamese Rosewood being transported out of the property. Coordination is also evident between DNP and the Royal Irrigation Department as far as mitigation of impacts of the Huay Samong Dam is concerned, and with the Department of Highways in the ongoing expansion of Highway 304 (IUCN, 2017).

### ► Management system

**Some Concern**

A revised management plan for the property has been prepared to update the site's original 2006 plan. Despite the updated plan, details regarding the resources available to ensure long-term management effectiveness remain unclear. It is also unclear how new management structures will be established and relate to the property as a whole. The State Party published a Tourism Management Plan in 2011 as an annex to its report (SP Report, 2011). However, the updated management plan lacks any mention of the negative impacts of increased tourism and the subsequent potential threats to the site's OUV (SOC, 2012). The new draft Sustainable Tourism Management Strategy 2017-2027 has not yet been approved.

### ► Management effectiveness

**Some Concern**

At the time of the 2014 IUCN monitoring mission the need for an updated and revised management plan for the complex was noted. This plan requires the involvement of all relevant ministries and agencies (e.g. forestry, highways, agriculture, irrigation, tourism) and stakeholders at both national and local levels (province and district authorities, NGOs, local communities, private sector). With the increasing threats from poaching of Siamese Rosewood this process also increasingly requires input from international agencies. It should also include development of long term management policies (SOC, 2012; IUCN, 2011). An overarching management plan for the property has since been developed: the Dong Phayayen-Khao Yai Forest Complex Management Plan 2016-2020. Together with the appointment of the Head of the Dong Phayayen-Khao Yai Coordination Centre, this is considered to be an improvement of the previous situation, facilitating better coordination of management across the whole property. Involvement of different stakeholders occurs through the Protected Area Advisory

Committees, but there remains an urgent need to improve the involvement of local communities in the management of the property.

### ► Implementation of Committee decisions and recommendations

**Mostly Effective**

The State Party has made progress in terms of addressing a number of the issues raised by the Committee, including the extent of cattle grazing; efforts to combat encroachment; measures to mitigate the impacts of the Huay Samong Dam and efforts to halt the illegal logging of Siamese Rosewood. Progress is also now being made on the construction of wildlife corridors as part of the expansion of Highway 304. In recent years the escalation of threats (particularly illegal logging of Siamese Rosewood) has outpaced the capacity of management to address them. Current efforts to halt illegal logging are starting to show some encouraging results. It will be important to build further on these efforts to continue to reduce illegal logging, which remains an active and omnipresent threat (IUCN, 2017). In addition there are concerns about remaining plans for further road upgrades and dam developments, which continue to feature in the development plans of the Department of Highways and the Royal Irrigation Department, respectively (IUCN, 2017). Illegal logging and the continued pressure from encroachment, including resort developments, have both previously been considered by the Committee to represent a clear ascertained danger to the OUV of the property. Therefore, efforts to address these issues should remain the highest priority. Although time is required to demonstrate the effectiveness of actions being taken by the State Party, it is making serious efforts to respond to the Committee's concerns. The implementation of Committee decisions and recommendations is therefore assessed as being effective.

### ► Boundaries

**Serious Concern**

From the time of the site’s inscription in 2005 there have been concerns around the boundaries of the site noting a need for the boundaries to be refined due to issues of encroachment and inappropriate areas being included within the property. The State Party has made commitments to a boundary adjustment on numerous occasions, including in 2007, however this issue has still not been addressed (IUCN/UNESCO, 2011; IUCN 2012;

IUCN 2014a). A need remains for the State Party to consider a detailed zoning plan for the property to ensure core areas of habitat are identified and provided with increased levels of protection. Additionally there is a need to legally designate an appropriate buffer zone around the property to provide an added layer of protection against inappropriate developments. A clear demarcation of the boundaries is also recommended (IUCN, 2014a).

### ► Sustainable finance

**Some Concern**

Approximately 50% of funding is obtained from the government at a National level with the remaining 50% coming equally from tourists and commercial operators within the site (UNESCO Periodic Report, 2011). Levels of funding, staff and capacity are considered to be inadequate to keep pace with mounting threats to the property (IUCN, 2014a; IUCN, 2014b).

### ► Staff training and development

**Mostly Effective**

Whilst all staff are full-time, only a small percentage of the total staff are permanent with the majority being seasonally employed or on short term contracts. While this is standard for Government agencies in Thailand it creates challenges in regards to continuity and capacity and often results in capacity moving from the property to other sites across the country. According to the State Party the staffing resources are inadequate (UNESCO Periodic Report, 2011). This view was supported by the 2014 IUCN monitoring mission and various stakeholder reports (IUCN, 2014a; IUCN, 2014b). Both the monitoring missions and stakeholder reports also note concerns over the small number of permanent staff and the need for improved capacity, training and staff development. However, there is a strong training programme for rangers, supported by the NGO Freeland Foundation, which has in recent years considerably improved their capacity to respond to the threat posed by heavily armed illegal loggers. The special response unit "Hasadin" consists of the most promising rangers, who have received specific training, and who can be deployed anywhere in the property on short notice (IUCN, 2017).

### ► Sustainable use

**Some Concern**

There is no evidence of sustainable use of the resources within the boundaries of the property with the legal framework prohibiting collection of materials from the National Parks. The site does remain under heavy pressure from encroachment and neighbouring land use practices in particular from tourism in Khao Yai and along the margins of a number of the roads that cross the property. Grazing of cattle within the property has been significantly reduced. Park staff working in conjunction with local communities and settlements, have made positive steps towards removal of all domestic cattle (IUCN, 2011; SP Report, 2014; IUCN, 2014a).

### ► Education and interpretation programs

**Mostly Effective**

Whist there are some education and interpretative programs these are largely of an ad hoc nature and there is a need for more programs to be developed and implemented, particularly within local communities (UNESCO Periodic Report, 2011). The visitor centre and facility has been recently redesigned for Khao Yai National Park as the centre of visitation and park management but there is a need to ensure similar education and awareness efforts in the other component parks. Some conservation awareness and educational outreach is conducted in conjunction with Freeland Foundation. This is mostly focussed on the 304 corridor area between Khao Yai and Thap Lan and in areas affected by Human-elephant conflict (HEC) such as Wang Mee at Khao Yai and Soeng Sang at Thap Lan. To expand this a teachers group has been established and they are replicating activities independently. This however is still small scale and should be expanded (IUCN Consultation, 2017).

### ► Tourism and visitation management

**Mostly Effective**

The visitor centre and provision of interpretative programs are adequate fir Khao Yai but with the high number of visitors and often strained relationships with local communities there is a need for further programs, guides, and information booths within the site as well as through outreach activities with

local communities surrounding and within the current boundaries of the property (UNESCO Periodic Report, 2011).

### ► Monitoring

**Some Concern**

Monitoring programmes are hampered by a lack of resources. Several NGOs work in close partnership with DNP to undertake training and improve capacity (IUCN, 2014a; IUCN, 2014b) and also assist with monitoring of populations of a number of species. However, overall monitoring of forest and population trends is largely lacking and there is limited baseline data available to properly assess trends. No official detailed mapping of land use, including forest cover, has been undertaken (IUCN, 2014a). Nevertheless, although the 2017 IUCN monitoring mission to the property did not have access to detailed wildlife monitoring data and population trends, many wildlife populations, including elephant and gaur, are now considered to be very healthy and increasing. Positive results have also been obtained for some other species, indicating that they are faring better than was previously thought (IUCN, 2017).

### ► Research

**Serious Concern**

There appears to be little or no planned program of research at the site apart from work conducted in cooperation with a number of NGOs. There is also no clear plan to look at management effectiveness, needs and/or improving understanding of the OUV of the property (UNESCO Periodic Report, 2011).

## Overall assessment of protection and management

**Some Concern**

As with the management of external threats to the property, concerns exist with the capacity to deal with internal issues, despite an adequate legal framework. These include impacts from upgrading works on Highway 304, traffic volumes, enforcement of speed limits and provision for wildlife movement; encroachment and illegal logging. Levels of encroachment appear to be increasing since the inscription of the property and illegal logging has also increased dramatically over recent years. A number of threats have been

addressed by concrete action; namely the extent of cattle grazing, implementation of activities to mitigate impacts during construction of the Huay Samong Dam, and the ongoing construction of wildlife corridors to mitigate the impacts from the expansion of Highway 304. Notable progress has been made in addressing the threat from illegal logging, but concerns remain around encroachment and a continued lack of clarity of land use rights in some parts of the property.

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

**Some Concern**

Previous State Party Reports, monitoring missions and various stakeholder consultations reinforce concerns regarding the effectiveness of management in addressing threats, which emanate from both outside and inside the property. These include development infrastructure such as dams and road transport upgrades; poaching and illegal logging pressure, which emanates from external drivers of demand; and the aspirations of tourism operators to capitalize on the World Heritage site as a valuable tourism asset. Of particular concern is encroachment pressure, including resort development, which continues to increase and, whilst management responses have been unprecedented, efforts are failing to address the issue and stem the external forces, which drive this (IUCN, 2012; SOC Report, 2014; IUCN, 2014a; IUCN, 2014b; IUCN, 2017). Current impacts could be potentially compounded by reports of possible new dam developments and road reopenings/upgradings. Of note are the efforts undertaken to address the illegal trade in Siamese Rosewood at a national and regional level, in cooperation with different government institutions in Thailand, and with neighbouring countries and international organizations.

### ► Best practice examples

The efforts undertaken by Thailand to improve regional collaboration on halting the illegal trade in Siamese Rosewood are an example of Best Practice. This includes the successful inclusion of all rosewood species in CITES Appendix II, and the establishment of a regional dialogue with transit and destination countries. There is an opportunity to expand this regional collaboration to include other countries, as well as to broaden its focus to

include other priority species that are subject to illegal or unsustainable legal trade.

## State and trend of values

### Assessing the current state and trend of values

#### World Heritage values

► **Significant natural habitats for a diversity of species, including threatened and endangered species.**

**High Concern**
**Trend:Stable**

Data on the current status of key species found within the property such as Asian Elephant and Gaur is improving and indicating healthy and growing populations. Monitoring of some other species is also indicating positive results. However, data on Siamese Crocodile and Banteng continues to be largely unavailable (IUCN, 2017). In the wider context of declining habitats within SE Asia it is clear that the importance of the forest complex is greater than ever for a wide range of rare and endangered species. Issues of encroachment, road construction, illegal logging and poaching impact on the site's value as significant habitat for the more than 800 faunal species present, particularly for the high value species such as tiger and elephant, as well as for a number of the plant species such as Siamese rosewood. Ultimately this is also impacting on the wider globally important forest ecosystem. Despite commendable efforts by the State Party it is evident that the conditions of integrity and current status of management remain of concern. Efforts directed at reducing illegal grazing and mitigating the impacts from the Huay Samong Dam have been effective (IUCN, 2014a), and progress is being made on mitigating the impacts of the expansion of Highway 304 (IUCN, 2017), although measures to enhance wildlife connectivity are yet to be fully implemented. Serious impacts arising from the continued threat of illegal logging and continued pressure from large scale encroachment pose the greatest threat to the site's values (SOC, 2014; IUCN, 2014a; IUCN, 2017).

### ► Conservation of migratory bird species.

**Low Concern**
**Trend:Data Deficient**

The justification noted above for the overall biodiversity values of the property more than likely applies also to the values of the property for migratory species as much as resident populations. That said, there is scant data available on the specific conservation status of key migratory bird species.

## Summary of the Values

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

**High Concern**

**Trend: Stable**

The 2014 and 2017 IUCN missions affirmed that a number of issues highlighted as threats to the OUV of the property in previous SOC reports, monitoring mission reports and decisions made by the World Heritage Committee, remain as threats to the property. While progress has been made on a number of the threats, a lack of updated monitoring results makes it difficult to measure the impacts of measures taken on the biodiversity values for which the property was inscribed. There have been some indications that the number of tigers present in the property is increasing, based on camera trap images of breeding, however, as there is limited data available on the current population and level of poaching for this species, and others, it remains difficult to determine the overall trends in the biodiversity values. In addition, illegal logging of Siamese Rosewood remains a key threat, and there is concern that other high value species, like tigers or pangolins, may be targeted in future. Encroachment of forest areas at the edge of the property also remains of concern.

### ► Assessment of the current state and trend of other important biodiversity values

**Data Deficient**

**Trend: Data Deficient**

The site remains an important watershed area for Thailand. It includes the catchment for five of Thailand’s major rivers. Specific data has not been sourced to assess the baselines and trends in water quantity and quality emanating from the site. However, it is likely that threats such as large-scale encroachment, road construction, tourist resort development, dam construction and human occupation will impact upon hydrological patterns and processes.

## Additional information

### Benefits

### Understanding Benefits

**► Outdoor recreation and tourism, Natural beauty and scenery**

The waterfalls and creeks within the property, together with the variety of flora and fauna and forested landscapes, attract millions of visitors every year for recreation and education purposes (SoOUV, 2013).

**► Water provision (importance for water quantity and quality)**

The Dong Phayayen-Khao Yai Forest Complex, with its high annual rainfall, acts as a critically important watershed for Thailand, draining into and feeding five of the country’s major rivers: Nakhon Nayok river, Prachin Buri river, Lamta Khong river, Muak Lek river, and Mun river (SoOUV, 2013), the last of which flows into the Mekong. However, this important environmental service is also why the property is threatened from dam developments.

**► Importance for research, Contribution to education**

The site provides an outstanding opportunity for education and awareness for the local, national and international community about regional biodiversity. It also provides an important site for research as it represents

and includes valuable habitat for over 800 species of flora and fauna including some of the worlds endangered species. The property protects some of the largest remaining populations in the region of many important wildlife species and is the only known location where White-headed and Pileated Gibbon species have overlapping ranges and interbreed.

► **Wilderness and iconic features, Cultural identity and sense of belonging**

The property is home to a number of local communities, many of which have inhabited the area for many generations. These communities were present prior to the designation of the National Park and World Heritage Property.

► **Direct employment, Tourism-related income, Provision of jobs**

Tourism continues to increase for the property and with high numbers of visitors many of the services to support them are provided by local communities both within the property and through tourism related activities adjacent to the site.

## Summary of benefits

The property occurs in an area of heavy rainfall and acts as a critically important watershed for the entire country. Significant opportunities exist to quantify this ecosystem service value and argue for the protection of the site's OUV as a contribution to watershed quality. The value of a healthy functioning natural system of this extent is critical to supporting human activities and should be factored into national decision-making regarding conservation and development.
The importance of this site for Thailand's substantial tourism industry should also be further quantified to ensure that this is well managed and sustainable and that benefits flow back to local people and communities.

## Projects

## Compilation of active conservation projects

| № | Organization/ individuals | Project duration | Brief description of Active Projects |
|---|---|---|---|
| 1 | DNP, GIZ, UFZ | | “Enhancing the economics of Biodiversity and Ecosystem Service in Thailand / South-East Asia (ECO-BEST)”. Project supporting updating of the site management plan. |
| 2 | Freeland Foundation | | Various cooperative projects with DNP and others including: • Enforcement Capacity Building (in partnership with DNP) • Park-based Monitoring Capacity Building (in partnership with DNP) • Wildlife Monitoring (in partnership with DNP) • Conservation-based Community Development |

# REFERENCES


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