Thungyai - Huai Kha Khaeng Wildlife Sanctuaries

2020 Conservation Outlook Assessment

SITE INFORMATION

Country: Thailand  
Inscribed in: 1991  
Criteria: (vii) (ix) (x)

Stretching over more than 600,000 ha along the Myanmar border, the sanctuaries, which are relatively intact, contain examples of almost all the forest types of continental South-East Asia. They are home to a very diverse array of animals, including 77% of the large mammals (especially elephants and tigers), 50% of the large birds and 33% of the land vertebrates to be found in this region. © UNESCO

SUMMARY

2020 Conservation Outlook  
Finalised on 02 Dec 2020  
GOOD WITH SOME CONCERNS

The Thungyai-Huai Kha Khaeng World Heritage site is relatively well protected from threatening processes by its isolation and inaccessibility, making it some of the least disturbed forested areas in Southeast Asia. However, a number of current and potential threats persist, including illegal logging and wildlife poaching. Compounding this is a number of management deficiencies including inter-agency cooperation on issues around law enforcement and modest community engagement capacities. Despite that, overall the site has a relatively effective legal protection and management regime. The landscape setting of the site continues to be relatively protected from environmental degradation and the site has significant value as a sanctuary for global flagship species such as tigers, Asian elephants, banteng, wild Indian water buffalo, Sumatran serow and rufous-necked hornbill.
FULL ASSESSMENT

Description of values

Values

World Heritage values

▶ Biological features of outstanding natural beauty and of great scientific value

Thungyai – Huai Kha Khaeng Wildlife Sanctuaries' (TYHKK) remarkable rock formations distinguish the western edge of mainland southeast Asia and the impact of geological activity on an area of pristine dry tropical forest is exemplified here better than anywhere else. The striking karst topography combines with diverse forest types, small lakes, ponds and swampy areas to create a landscape of exceptional scenic quality. The natural beauty of TYHKK derives from mountains, with some eighteen peaks over 1,000m, and valleys interspersed with small lowland plains (IUCN, 1991; UNEP-WCMC, 2011; World Heritage Committee, 2013).

▶ Stunning landscapes encompassing superlative forest habitats

The two Wildlife Sanctuaries that comprise TYHKK lie alongside the border with Myanmar and encompass two important river systems. The mountains of the site, the tallest of which reaches 1,830masl, descend into numerous valley bottoms many of which slope up from 250 – 400masl, creating stunning landscapes that include relatively intact forest habitats. The site incorporates near pristine examples of most of the principal inland forest formations found in continental Southeast Asia. The combination of the spectacularly beautiful and dramatic mountain slopes, enhanced by a host of tributary streams and waterfalls alongside the unique mosaic forest types and the sweeping spectacles of variations in colour, form and foliage emphasise the stunning landscapes of TYHKK (IUCN, 1991; UNEP-WCMC, 2011).

▶ An outstanding and unique biome in mainland Southeast Asia, combining Sino-Himalayan, Sundac, Indo-Burmese, and Indo-Chinese biogeography elements

TYHKK represents an outstanding and unique biome in mainland Southeast Asia, combining Sino-Himalayan, Sundac, Indo-Burmese, and Indo-Chinese biogeography elements, with flora and fauna characteristics of all four zones. The site includes a dry tropical forest ecosystem, which is more critically endangered than the region’s equatorial rain forest. The highest slopes are covered with hill evergreen forest. Slopes above 600m generally support seasonal dry semi-evergreen forest. At lower altitudes mixed deciduous and bamboo forests predominate, with dry deciduous dipterocarp forest occurring in areas with poor or shallow soil. There is also savanna forest, which with grassland, occurs at every elevation and is the most complete and secure example of Southeast Asia’s dry tropical forest. In lowland areas, mainly near the larger rivers, there are some small patches of open grassland, especially in Thungyai (IUCN, 1991; UNEP-WCMC, 2011; World Heritage Committee, 2013).

▶ Exceptional species and habitat diversity.

The site supports at least a third of all terrestrial vertebrates known from mainland Southeast Asia, almost two-thirds of the region’s large mammals and many of its large birds, including rare riparian and wetland species. Species lists for the site include 120 mammals, 400 birds, 96 reptiles, 43 amphibians, and 113 freshwater fish. In addition to many regional endemic species and some 28 internationally threatened species, at least one-third of all mainland South-east Asia’s known mammals are represented within the boundaries of the site, providing a major stronghold for the long-term survival of
many species (IUCN, 1991; World Heritage Committee, 2013).

Assessment information

Threats

Current Threats

The site’s natural values are in good condition primarily due to its isolation and inaccessible nature. However, encroachment and the associated threats of illegal logging, poaching and agricultural development continue to pose a threat to the site. Current threats are considered manageable although increased implementation of enforcement measures to prevent poaching of wildlife and high valuable timbers is required. Potential of increased development, particularly for dams, poses additional threats to the integrity of the site.

▶ Housing/ Urban Areas

(Encroachment from local housing and developments in surrounding areas)

At the time of designation of the Thungyai Sanctuary, some 6,000 ethnic Karen (DNP, 2013) were resident within the reserve with relocation programmes moving all of them out of the site by 1991. Resettlement programmes appear to have been sensitively handled with adequate compensation to affected residents (UNEP-WCMC, 2011). Residential occupation of the site is a growing concern (DNP, 2013) and research has shown that recent population increases has resulted in increased threats to biodiversity, which is a relatively widespread phenomenon in the region (Paradis, 2018). However, under the new Wildlife Law effective since 2019, Karen settlements in Thungyai Sanctuary are allowed in clearly demarcated farmlands with very restricted and non-destructive use of natural resources under the approved conservation projects with the maximum duration of twenty years (DNP, 2019).

▶ Dams/ Water Management or Use

(Hydroelectric projects)

The construction of the Thap Salao Dam to the east deforested much of the buffer zone of the site. Encroachment increased with the construction of the Sri Nakarin and Khao Laem dams to the south and the Electricity Generating Authority’s (EGAT) illegal road to the proposed Nam Choan Dam site. The greatest threat was from this proposed dam, a project revived by the EGAT, which would have flooded 75km of the valleys of the upper Kwae Yai (UNEP-WCMC, 2011). During 2013-18, the proposed irrigation dam in Mae Wong National Park north of Huai Kha Khaeng has also raised concerns because its reservoir would flood habitat considered important for endangered species including tigers. Fortunately, the concerted efforts from various sectors in the society to protest against the dam project resulted in the government withdrawing the Mae Wong dam project (Pattanavibool and Phoonjampa, 2017).

▶ Livestock Farming / Grazing

(Agricultural encroachment)

With increasing human population pressures, agricultural encroachment is likely to become a more significant threat. Currently considered chronic but not seriously threatening are issues associated with livestock rearing, forest produce collecting and fire (IUCN, 1991; UNEP-WCMC, 2011). Duangchatrasiri et al. (2019) showed in a study on impact of prey occupancy and anthropogenic factors on tiger distribution in the Western Forest Complex that low tiger occurrence is primarily due to low abundance of large prey, which in turn is often a consequence of degradation of habitat by livestock grazing.

▶ Hunting and trapping

(Poaching of wildlife and high value timber)

Low-level subsistence hunting is occurring within the boundaries of the site as well as adjacent to the site with majority of target species including banteng, gaur, and sambar deer. In addition, poaching of
wildlife and high value timbers for commercial trade has been detected and identified as the highest current threat to the values of the site (UNEP-WCMC, 2011). Poaching has been the most significant threat to the values of the site (World Heritage Committee, 2013). During 2011-13, tiger poacher gangs poisoned and killed almost 10 tigers in TYHKK. Three of them were later arrested and sentenced to four-to-five year jail terms (DNP, 2020). In 2019, several newsagents reported on a high-profile court case where the president of one of Thailand's largest construction firms and three associates were convicted of wildlife poaching (black leopard, kalij pheasant and barking deer) in Thungyai Naesuan Wildlife Sanctuary (The Nation, 2019; Reuters, 2019). The case sparked a public outcry and local wildlife groups praised the authorities for the arrest (BBC News, 2019). A study by Duangchantrasiri et al. (2016) indicated that due to the recent past poaching pressure, overall tiger densities in Huai Kha Khaeng were 82–90% lower than in ecologically comparable sites in India and recovery of tiger populations was slower than anticipated. Due to intensive law enforcement based on the SMART (Spatial Monitoring And Reporting Tool) patrol system, in the last five years poaching pressure has been significantly reduced from almost ten poacher camps to less than two poacher camps encountered by the patrol teams for every 1,000 km of patrol distance (IUCN Consultation, 2020). However, due to its value as one of the best tiger sites in Asia and that poaching threats can return anytime if protection and law enforcements are weakened, the threat from poaching remain high.

**Potential Threats**

Potential threats to the site relate to the development pressure in important existing buffer zone areas, including potential hydro-engineering development in areas adjacent to the site. Careful management of the buffer zone is needed to maintain an appropriate setting for the core areas. Climate change impacts on the values of the site are not fully understood and need further monitoring and research.

**Habitat Shifting/ Alteration**

*(Climate change leading to long-term shift in vegetation communities to higher elevations)*

The site is potentially vulnerable in part due to the vertical zonation of plants and animals and the lack of connectivity of the area to other natural areas. In the longer term climate change is expected to cause a general shift of vegetation zones to higher elevations. However, details of impacts on the biodiversity are limited and unavailable at the current time.

**Dams/ Water Management or Use**

*(Plans for hydro-electric development including dam construction)*

There have been past concerns regarding proposed hydro-engineering development in areas adjacent to the site and a lack of transparency in the process associated with approvals. Recently concerns have been raised around the proposal for the construction of the Mae Wong irrigation dam, despite the fact that the project has never passed an Environmental Impact Assessment (EIA). Construction of this dam would inundate the core area of the Mae Wong National Park, which adjoins the northern boundary of Huai Kha Khaeng and is part of the well-protected and well-managed northern buffer zone of the site. In 2017, WWF-Thailand released a report examining how the proposed Mae Wong Dam project could degrade the ecosystem, open up the forest to poachers and illegal loggers, and destroy the water and forest resources of local communities. The report is showing evidence of four tigers that dispersed from the Huai Kha Khaeng Wildlife Sanctuary into Mae Wong National Park. A dam in the middle of this new tiger habitat would significantly affect their population and destroy important areas for much of the park’s wildlife along the banks of the Mae Wong river (Pattanavibool and Phoonjampa, 2017). Owning to large protests, this project was recently withdrawn by the government and the current threat from dam constructions are therefore perceived as relatively low.

**Overall assessment of threats**

In general, the site’s remoteness coupled with relatively effective management and limited tourism have combined to mitigate current and potential threats to the identified values.
Nevertheless, many complex and entrenched threats persist which will require vigilance and long-term commitment from the management authorities and international partners. Reports continue to emerge of poaching and threat from proposed hydro-engineering developments adjacent to the site, which would have a detrimental effect on the site’s integrity.

Protection and management

Assessing Protection and Management

▶ Management system

The current management plan and system does not address issues of management planning or development of long-term management policies (UNEP-WCMC, 2011). There is also poor inter-agency coordination to address issues of poaching and planned development. However, the Thailand Tiger Action Plan, which aims to increase tigers by 50% by 2022, is the most effective plan the managers and scientists have been working towards in the last decade. Under the new Wildlife Law of 2019, every protected area including TYHKK, is required to have a management plan and this requirement will become effective within the next two years (DNP, 2019).

▶ Effectiveness of management system

Management is constrained by budgetary and staffing levels. Staffing levels are below levels anticipated for a site of this size and complexity. The two Sanctuaries, which make up the World Heritage site, are relatively isolated and despite development of guard stations, this creates challenges for coordination. On the other hand, the management effectiveness at the site level has been under the international standard under the SMART (Spatial Monitoring And Reporting Tool) patrol system for almost a decade (IUCN Consultation, 2014).

▶ Boundaries

The boundaries of the site are appropriately drawn to protect the naturalness of the landscape and the areas required to maintain the scenic qualities of the site and its integrity. The inclusion of a buffer zone around the site assists in providing added protection to the core area (IUCN, 1991). Adjacent to a number of other protected areas, the site’s location provides additional protection (World Heritage Committee, 2013).

▶ Integration into regional and national planning systems

The site is subject to a broader Management Plan for the Western Forest Complex (WEFCOM). In the past, lack of coordination between provincial authorities and the Management agency for the site has led to clashes between the needs of the site against provincial and local needs and plans for development, which would have a detrimental effect on the site’s integrity (IUCN, 1991; UNESCO, 1998; UNEP-WCMC, 2011). In the last decade, the Thailand Tiger Action Plan has used the site as a key success indicator, where proofs provided by camera trapping have confirmed that TYHKK has become a source site for more than ten tigers to disperse and recover tiger populations in the rest of WEFCOM. Recently, provincial and central government agencies have appreciated the values of TYHKK as a World Heritage site and joined together to promote its value.

▶ Relationships with local people

In the past, the level of consultation on current management issues has been unclear. However, in the last decade, TYHKK has had an active protected area committee (PAC) that involved leaders from local communities, non-profit organizations, and government units to meet regularly. However, some conflicts between local people and management authorities still exist on land use, forest product collections, and human-elephant conflicts along the boundary of Huai Kha Khaeng and the areas near
Karen villages in Thung Yai.

Legal framework

Mostly Effective

The site is state owned land and is protected under a number of national laws. The Wild Animal Reservation and Protection Act B.E.2562 (2019), enforced by the Department of National Parks, Wildlife and Plant Conservation (DNP), provides the strongest legal framework for the protection of the site. The site combines two contiguous sanctuaries, Thung Yai Naresuan and Huai Kha Khaeng, separately established as Wildlife Sanctuaries in 1972 and 1974, respectively (World Heritage Committee, 2013).

Law enforcement

Mostly Effective

In the last 15 years, the ranger patrol system inside the World Heritage site has been continuously developed under the most sophisticated and intensive adaptive management regime of the highest international standard (WCS, 2019). In collaboration with the Wildlife Conservation Society (WCS), the Government of Thailand established systematic, intensified foot patrols in TYHKK to reduce hunting pressures on tigers and prey species, which initially appeared to reduce poaching; however, no clear increase in population density were evident in the following years and in the face of prevailing levels of poaching pressures, the recovery of tigers in TYHKK appears slow (Duangchantrasiri et al., 2016). Nonetheless, more than ten tigers have dispersed and recovered in protected areas surrounding TYHKK (DNP, 2020). Under the SMART patrol system, park rangers in TYHKK are performing under 50 patrol teams of 5-6 rangers per team, covering about 80% of TYHKK annually with higher than 20 patrol frequencies per year in high-risk areas. The TYHKK patrol system has become a model for protected areas in the whole country (WCS, 2019; DNP, 2020). The improved law enforcement has resulted in increased wildlife populations in TYHKK, especially tiger, banteng, gaur, and sambar (DNP 2020).

Implementation of Committee decisions and recommendations

Data Deficient

There has been one State of Conservation report for the site since its inscription and this was in 1998, and there have been no Committee decisions more recently.

Sustainable use

Some Concern

The new Wildlife Law of 2019 allows for restricted use of natural resources around the settlements of Karen villages inside Thung Yai Wildlife Sanctuaries. However, local communities will have to come up with conservation projects for approval (DNP, 2019). It is the initial process after the new law with some concerns over the types and volumes of activities to be allowed.

Sustainable finance

Some Concern

The budget for TYHKK from the government has been a solid source of funding for management. Since 2015, WCS and partners have been contributing with additional funds for enforcement and monitoring of tigers and prey. During 2015-2021, GEF-UNDP Tiger Project has contributed a major fund to improve enforcement, monitoring, and management of TYHKK (UNDP, 2016). However, concerns remain over how the government plan to maintain the management quality and quantities after the end of the GEF-UNDP Tiger Project. The COVID-19 pandemic has also caused some budget cuts by the government that requires adjustments of conservation activities on the ground (IUCN Consultation, 2020).

Staff capacity, training, and development

Some Concern

Significant funds have been spent to train rangers of the site, however, as current threats from poaching still exist, the numbers of patrol rangers and equipment are insufficient for the large-size Wildlife Sanctuaries that make up the World Heritage site. To strengthen the effectiveness of patrol teams regarding threat detection and prevention, modernization of equipment and patrol activities with information technology for better site protection and increased knowledge of natural resources in the area are needed (WCS, 2019). A Regional Tiger Conservation Training Centre (RTCT) was also established in Huai Kha Khaeng Wildlife Sanctuary in collaboration with the United Nations Development Program, the Wildlife Conservation Society, and Kasetsart University (DNP, 2010).
Education and interpretation programs

Mostly Effective

The government-run Huai Kha Khaeng Nature Education Center is equipped with programs and activities to work closely with local schools and communities to promote conservation of TYHKK. WCS has also a strong nature education team with high quality materials to promote values of TYHKK by working closely with local schools (WCS Thailand, 2017). WCS together with TYHKK authorities have built various batches of wildlife volunteers from various sectors of the society to promote awareness of TYHKK conservation values (IUCN Consultation, 2020).

Tourism and visitation management

Mostly Effective

Tourists are now allowed to visit designated areas in the World Heritage site, although the government does not promote the Sanctuaries for tourism as much as they do with National Parks.

Monitoring

Mostly Effective

The Government of Thailand in partner with WCS and the GEF-UNDP Tiger Project has maintained one of the longest and most intensive tiger population monitoring programs in Southeast Asia (DNP, 2020). It is the best monitoring system of tigers outside India. However, the most recent data from the monitoring programme of key tiger prey species populations (banteng, gaur, sambar, muntjac, and wild pig) are from 2007-2009 (WCS, 2007-2020). The prey population survey in Huai Kha Khaeng is planned to resume in 2020-21 under the partnership with GEF-UNDP and WCS (DNP, 2020).

Research

Mostly Effective

As the prime biological and ecological research sites in Thailand, a wildlife research station is maintained in Huai Kha Khaeng with more than 50 projects having been carried out in the Sanctuary. More research is needed to improve management practices and participation in them by local people (UNEP-WCMC, 2011). Research within the site remains limited, however, a number of articles have been published recently on tiger-leopard and other species temporal and spatial partitions (Simcharoen et al., 2018; Saisamorn, et al., 2019; Vinithporunsawan and Fuller, 2020), tiger distribution (Duangchatrasiri et al., 2019) and monitoring of some other species (see Thunhikorn et al., 2016; Jinamoy et al., 2014). In a recent study, Tantipisanuh and Gale (2018) noted that although Thungyai Naresuan and Huai Kha Khaeng Wildlife Sanctuaries were found to be biodiversity hotspots, there is a concern regarding available up-to-date published data on wildlife where, for example, published records of amphibian and reptile species from Huai Kha Khaeng WS were much outdated (pre 1993). The authors suggest that "responsible government agencies and grant supporters encourage researchers and amateur naturalists to explore relatively poorly surveyed areas to increase overall biodiversity coverage at national scales" (Tantipisanuh and Gale, 2018).

Overall assessment of protection and management

Mostly Effective

The World Heritage site has effective legal protection and a sound planning framework. Government support and funding along with investment and support from Non-Governmental Organisations and the isolation of the site ensure that the natural resources and values are currently maintained in relatively good condition and threats are considered manageable. The most significant threat relates to the future increase in development pressure and potential increase in poaching. Its rugged inaccessible typography affords some protection from outside human impact and limits any impact on the core zone of the site. However, efforts to ensure effective law enforcement need to be continued.

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

Some Concern

The management measures that have been applied to the site are largely effective at combatting external threats. However, it will be a challenge to maintain the existing quality and quantity when the GEF-UNDP Tiger Project finishes its support in 2021. Furthermore, impacts of COVID-19 on some budget cuts need performance and threat monitoring programs to keep track of changes. Some
concern also exists over the type and extent of resource use allowed around the settlements of Karen villages inside Thung Yai Wildlife Sanctuaries granted through the new Wildlife Law of 2019, especially considering previous conflicts between local people and management authorities in the area.

▶ Best practice examples

TYHKK contains one of the most intensive SMART patrol systems in Asia. It also has the most intensive and long-term tiger population monitoring systems in the world (DNP, 2020).

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ Biological features of outstanding natural beauty and of great scientific value

Up to date comprehensive data is limited; however, the site's natural resources are reported to be in good condition and threats are considered manageable. There is an effective management regime in place for the site, which will ensure that the site retains its aesthetic values, with a delicate balance being found between the provision of visitor access and the maintenance of the site's Outstanding Universal Value (UNEP-WCMC, 2011; World Heritage Committee, 2013).

▶ Stunning landscapes encompassing superlative forest habitats

There is no evidence to suggest that the landscape values of the World Heritage site have been diminished. There is also little evidence of deteriorating forest habitats within the core area of the site, although reports of poaching and potential removal of high value timbers may be impacting on individual forest species. In the past, there have been concerns relating to potential indirect threats from hydro-engineering development adjacent to the site.

▶ An outstanding and unique biome in mainland Southeast Asia, combining Sino-Himalayan, Sundaic, Indo-Burmese, and Indo-Chinese biogeography elements

The World Heritage site incorporates two intact river systems whose watersheds are largely encompassed by its boundaries. The site, together with other surrounding protected areas, is larger than any other legally protected, single forest conservation area in mainland Southeast Asia (World Heritage Committee, 2013), which should help preserve its ecological processes.

▶ Exceptional species and habitat diversity.

The Government of Thailand and WCS completed a WEFCOM-wide occupancy survey for all large mammals in 2010-2012. There is also annual monitoring of tiger populations in Huai Kha Khaeng, plus periodic monitoring of tiger numbers. In 2010, the tiger population was reported as being stable in Huai Kha Khaeng (WCS, 2010). A relatively recent study assessed tiger density and abundance in Huai Kha Khaeng from 2005 to 2012 and concluded that, while tiger densities were below their potential levels (estimated comparing with densities in wildlife reserves in India), with over 50 tigers, Huai Kha Khaeng still probably supported the largest source population of tigers outside the Indian sub-continent (Duangchantrasiri et al., 2016). However, for many key species recent data on their population trends remains very limited (Thunhikorn
Summary of the Values

Assessment of the current state and trend of World Heritage values

The World Heritage site, together with other surrounding protected areas, is larger than any other legally protected, single forest conservation area in mainland Southeast Asia and many of its values remain well preserved. While more recent data is limited, indications are that the condition of the site remains good due primarily to the area’s isolation and rugged topography, which limits access and human impact. Its quality as containing one of the largest tiger populations in Southeast Asia need active and vigilant enforcement and monitoring systems.

Additional information

Benefits

Understanding Benefits

Soil stabilisation, Flood prevention

The site’s retention of forest cover significantly helps prevent landslides while it is also likely to assist with flood prevention and on a broader scale contribute to climate change mitigation.

Factors negatively affecting provision of this benefit:

- Habitat change: Impact level - Low, Trend - Continuing

Traditional agriculture

Sustainable small scale agriculture should be compatible with buffer zones of the site and provide benefits to local communities.

Water provision (importance for water quantity and quality)

The watershed protection by the site’s forests was estimated to be annually worth some US$ 13.8 million.

Summary of benefits

The site provides significant ecosystem services, most notably the provision of valuable water supplies to the surrounding region and the prevention of landslides through retention of forest cover. The values of TYHKK for Thailand’s rich assemblages of wildlife and scenic amenity should provide tangible benefits for all stakeholders, particularly local communities wherever possible.

Projects

Compilation of active conservation projects

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<th>Organization</th>
<th>Brief description of Active Projects</th>
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<tr>
<th></th>
<th>Wildlife Conservation Society (WCS)</th>
<th>WCS have worked on several topics for many years, including ongoing monitoring of populations of key species with years of camera trapping monitoring and analysis, and SMART patrolling.</th>
<th><a href="http://www.wcsthailand.org">www.wcsthailand.org</a></th>
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<td>2</td>
<td>GEF-UNDP Tiger Project</td>
<td>This is a GEF-5 project focusing on improving management and monitoring for Thung Yai and Huai Kha Khaeng Wildlife Sanctuary in many aspects through tiger conservation. It is active from 2015-2021.</td>
<td><a href="http://www.undp.org/content/undp/en/home/librarypage/poverty-reduction/burning-bright--undp-and-gef-in-the-tiger-landscape.html">www.undp.org/content/undp/en/home/librarypage/poverty-reduction/burning-bright--undp-and-gef-in-the-tiger-landscape.html</a></td>
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