

THAILAND NATIONAL PERIODIC REPORT

SECTION II

State of Conservation of Specific World Heritage Properties

Section II: State of Conservation of Specific World Heritage Properties

II.1. Introduction

- a. State Party
Thailand
- b. Name of World Heritage property
Thung Yai - Huai Kha Khaeng Wildlife Sanctuaries
- c. Geographical coordinates to the nearest second
See inserted Figure 1.
- d. Date of inscription on the World Heritage List
1991
- e. Organization or entity responsible for the preparation of the report
**Royal Forest Department
61 Phaholyothin Rd., Chatuchak,
Bangkok, 10900, Thailand
Tel : (66 2) 579-4835
Fax : (66 2) 579-7048
e-mail :**
- f. Date of the report
September 2002
- g. Signature on behalf of State Party

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(Plodpasob Suraswadi, Ph.D.)
Director General, Royal Forest Department

II.2. Statement of significance

Justification for inscription provided by the State Party and the criteria under the Committee inscribed the property on the World Heritage List.

The Committee inscribed the Thung Yai - Huai Kha Khaeng Wildlife Sanctuary as a natural property of outstanding universal value on the World Heritage List under criteria (ii), (iii), and (iv). The justification for inscription submitted by the Wildlife Conservation Division of the Royal Forest Department in 1990, indicated for the following reasons, it is unique in:

1. Size

- a.) Thung Yai - Huai Kha Khaeng is the largest area of legally protected forest in mainland South - East Asia today, and is the core of a conservation area covering over 12,000 km². It is thus the best area in the region for ensuring the long-term survival of habitats and species.
- b.) It is one of few protected area in the region large enough, and sufficiently undisturbed, to support truly natural communities containing populations of large herbivores and predator species within this dry tropical ecosystems.

2. Diversity and Integrity of habitats

- a.) Thung Yai - Huai Kha Khaeng incorporates near pristine examples of almost all the principal inland forest formations of continental South - East Asia, and one (the savanna forest of Thung Yai) which may be unique.
- b.) It includes significant variations in topography, altitude, rainfall, soil types and aquatic environments which have created a mosaic of many habitats and an ecosystem that is both intricate and fragile.
- c.) It constitutes the most complete and most secure example of South - East - Asia's dry tropical forest ecosystem - an ecosystem that is more critically endangered than the region's equatorial rain forest.
- d.) It incorporates two intact river systems whose watersheds are largely encompassed by its boundaries. It is rare in Asia today to find rivers with both banks well protected. It is especially rare to find accessible lowland rivers with their riparian forest still intact. Most have been logged and settled, or dammed.

(see Figure 1)

3. Diversity of Flora and Fauna

- a.) Species diversity in Thung Yai - Huai Kha Khaeng is exceptionally high because, in addition to its high habitat diversity, the sanctuary occupies a unique position at the junction of the four biogeographic zones of mainland South-East Asia. Many species reach the north, south, east or western limit of their range within its boundaries and do not occur together in any other area. It also includes many endemic species not known to occur outside west Thailand or the Dawna-Tenasserim highlands.
- b.) The sanctuary supports at least a third of all terrestrial vertebrates know for mainland South-East Asia, almost two thirds of the region's large mammals and many of its large birds, including rare riparian and wetland species. Altogether, 28

species are internationally threatened species; fifteen mammals, nine birds and four reptiles (see Figure 2).

- c) It supports the wide forms of many domestic plants and animals and may, in future, provide the genetic stock for hardier breeds. Wild species are usually better adapted to environmental stresses and extremes.



Figure 1 Diversity and Integrity of habitats of the Thung Yai - Huai Kha Khaeng World Heritage.

4. Scientific Value

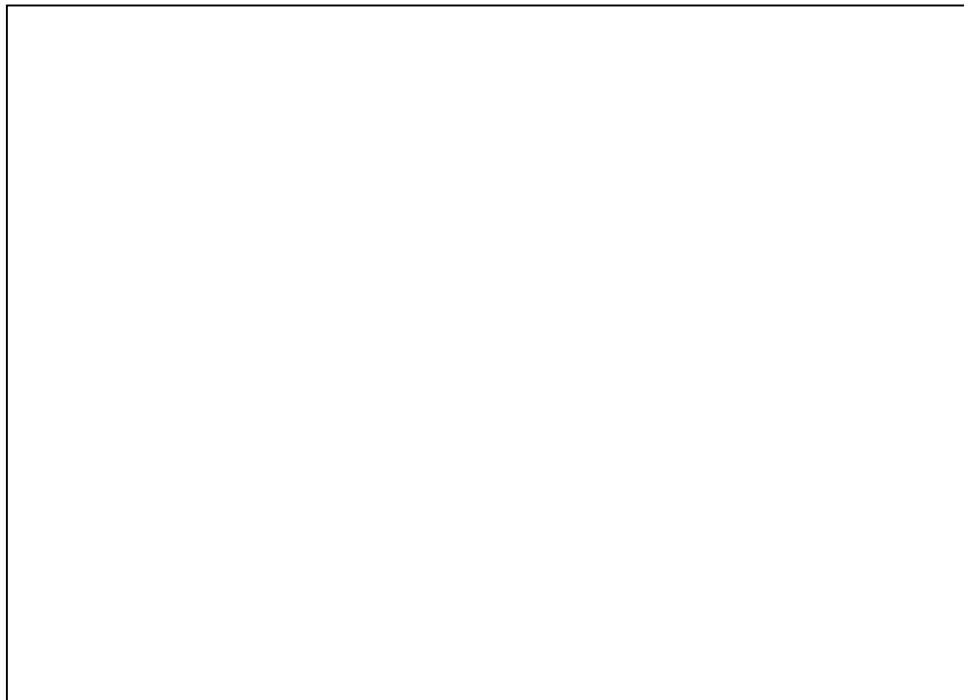
- a) Thung Yai - Huai Kha Khaeng is a key area for clarifying taxonomic relationships because the ranges of many parapatric species and sub-species overlap in the sanctuary. Cases to date include Rhesus and Crab-eating Macaques, Wreathed and Plain-pouched Hornbills. Future cases may well include murids, squirrels and bulbuls.
- b) The sanctuary incorporates the only two rivers in the Mae Klong basin which have not been modified in any way, so its aquatic and riparian communities are not only important for conservation and taxonomy, but also research into the ecological impact of large dams and commercial fishery projects.
- c) Because it survives in a primitive state and supports so many animal species, the sanctuary provides excellent, in some cases exclusive, opportunity to study ecological relationships within different communities and various aspects of forest dynamics, including the impact of fire.

For example;

- no other protected area in mainland South-East Asia supports all five of the region's macaques or the same three leaf-monkeys.
- no other protected area is known to support the Gaur, Banteng and Wild Water Buffalo.
- Few areas in the region support as many carnivores, particularly felids and viverrids;
- No where else in the world is known to support as many woodpeckers.

A sum, this sanctuary is unique in size, complexity and diversity. Its distinction derives from its location and the disturbed nature of its habitats.

Figure 2 Diversity of Fauna in the Thung Yai - Huai Kha Khaeng World Heritage.



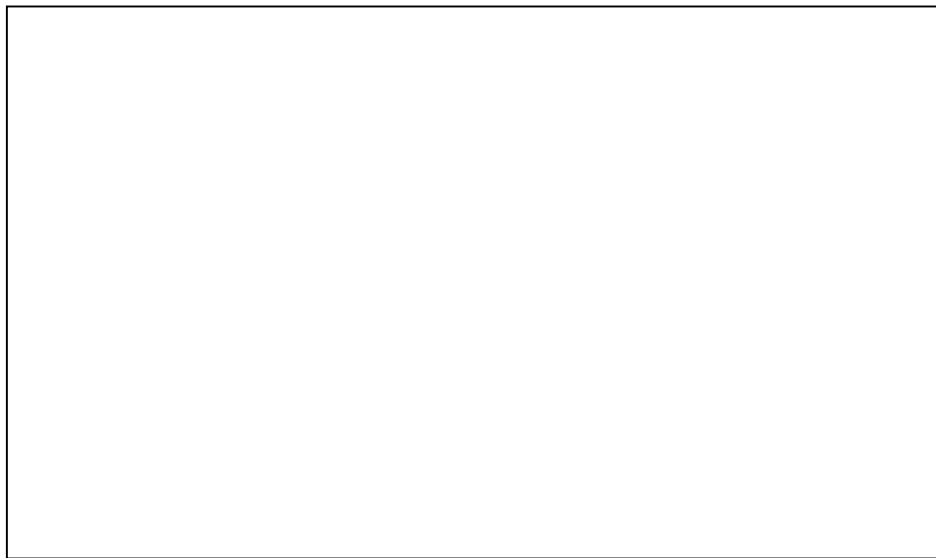
The World Heritage values of the property or is re-submission necessary

The statement of significance fully reflects the World Heritage values of Thung Yai – Huai Kha Khaeng wildlife sanctuary.

The boundary of the world heritage is a wildlife sanctuary type boundary under the wildlife law , which is the strongest protection type for protected areas in Thailand. Fortunately, the northern and southern borders of the Thung Yai – Huai Kha Khaeng World Heritage are contiguous to other protected areas (see Figure 3). Therefore, the condition of the buffer areas on both ends is quite intact and firm. The western part of Thung Yai – Huai Kha Khaeng World Heritage is next to border between Thailand and Myanmar and the forest on Myanmar side is still virtually intact. The only worrying border is in the Eastern side of the World Heritage. There is very narrow forest area (< 5 kilometers in width) buffering the Heritage from the urbanization and human developments. The side needs strong protection and awareness building programs to keep this strip of forest as a buffer zone for the Heritage.

At the moment there is no need to expand the boundaries of the Heritage. However, there are two points to be addressed for future consideration.

1. The protected areas over the northern and southern borders of the Heritage also contain biological and ecological values although currently disturbed by long history of human activities. If well managed, they would regain their past natural wonder quality and would be appropriate to include them under the World Heritage boundary.
2. The geo-morphological property of the World Heritage is actually extended beyond the Heritage. For example, the Limestone Karst Formation creating networks of magnificent caves and sinkholes is not limited inside the Heritage border. The formations can be found in many protected areas outside the Heritage. Future consideration to include such areas into the Heritage would be possible if well managed.



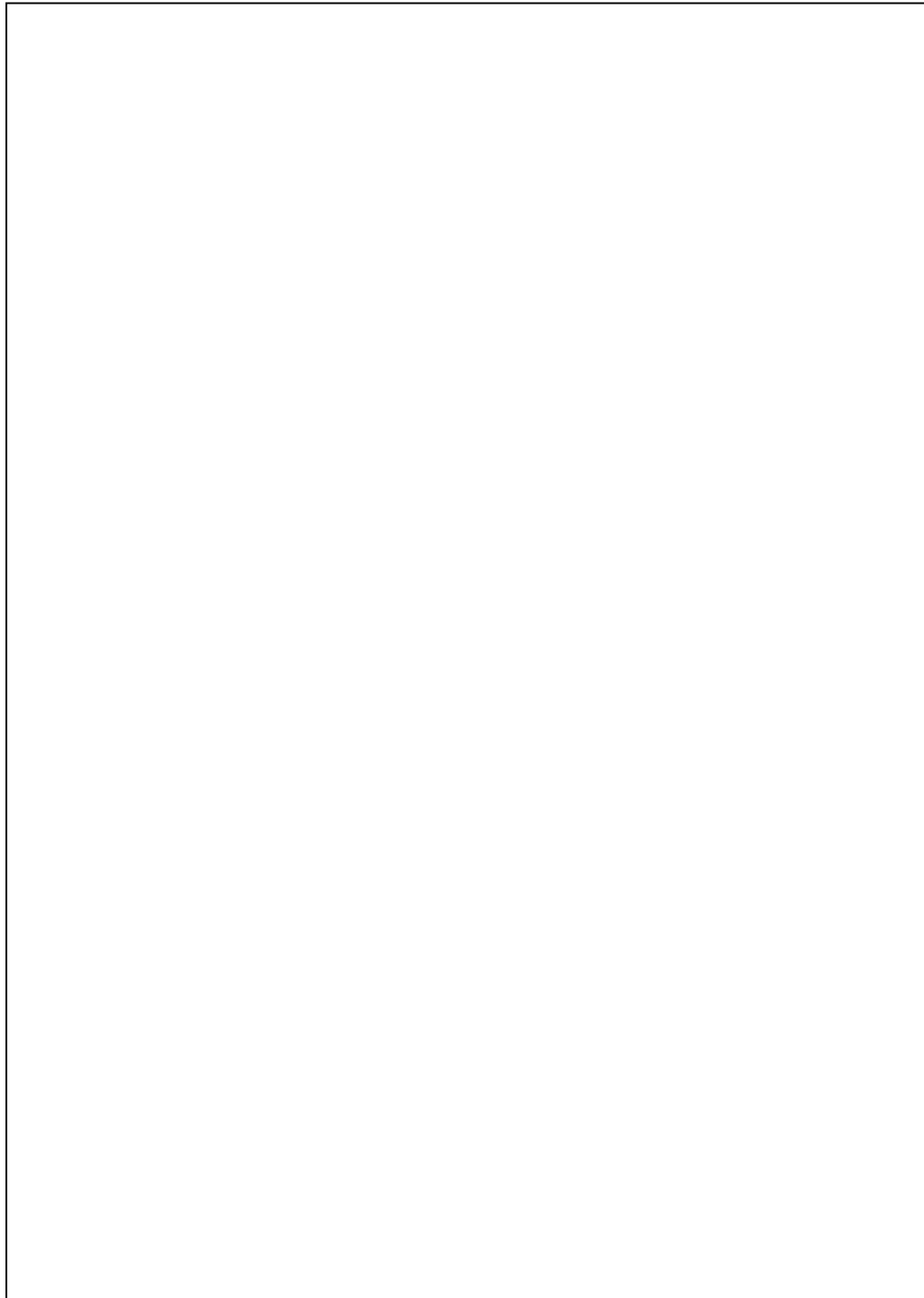


Figure 3 Map showing the Thung Yai – Huai Kha Khaeng World Heritage surrounding with other protected areas.

II.3. Statement of authenticity/Integrity

The values on the basis of the property was inscribed on the World Heritage List, and reflected in the statement of significance under item II.2 above, are being maintained.

The justification for inscription in the Report of the 15th session of the Committee in 1991 had stated as follows:

"The Committee encouraged the authorities of Thailand to accelerate the implementation of management plans for the two Sanctuaries. The Committee complimented Thailand for rejecting the proposal for the construction of the Nam Choan Dam. The Committee observed that it would be concerned over any proposal that might affect the integrity of adjacent forests in Myanmar. The Committee noted that the Government of Myanmar may nominate these adjacent forests for inscription on the World Heritage List when it becomes a State Party to the Convention."

It is not necessary to review the values of which the Heritage was inscribed on the World Heritage list because the authenticity/integrity of the area has been well maintained since. The area status as wildlife sanctuary allows a strong protection under the Wild Animals Reservation and Protection Act B.E. 2535 (A.D. 1992). Since the area has become a World Heritage, there are many new ranger stations built. There are now totally 44 ranger stations covering the Heritage (See Figure 4 and see also Table 1 section II.4). The establishment of ranger stations is accompanied with other actions including more fire protection units fully equipped with fire fighters. Moreover, there are suspensions of all major development projects particularly dam and road constructions inside the Heritage and the construction of the Thung Yai - Huai Kha Khaeng World Heritage center with annual budget for management.

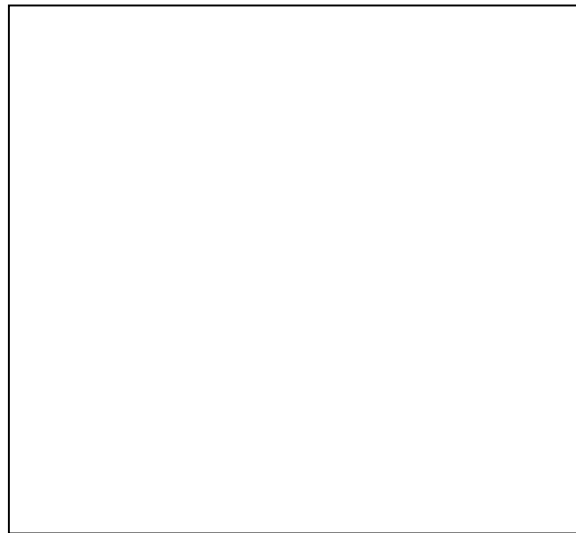


Figure 4 Showing the 44 ranger stations covering the Heritage.

II.4. Management

The World Heritage comprises two wildlife sanctuaries that are Thung Yai Naresuan Wildlife Sanctuary, and Huai Kha Khaeng Wildlife Sanctuary. The Wildlife Conservation Division of the Royal Forest Department is the agency taking full authority of looking after the area. The status of ownership is clear and firm.

The address of agency in charge of the World Heritage is as below.

Director General,
Royal Forest Department,
61 Paholyotin Road, Chatuchak
Bangkok 10900, Thailand.
Tel/Fax (66-2) 561-4835

Note that the Royal Forest Department of the Ministry of Agriculture and Cooperative is under the reform, the address and name of agency will be later notified.

Implementation and effectiveness of protective legislative and management

Implementation and effectiveness of protection, legislation, and management can be summarized into national and provincial levels as follows:-

National level

1. The Wild Animals Reservation and Protection Act A.D. 1960 (1992 Amendment) is the main legislative body used for protection of the Thun Yai - Huai Ka Khaeng World Heritage and all wildlife sanctuaries in Thailand. The law has given a high degree of protection to the Heritage and maintained the authenticity/integrity of the Heritage as we see today. There is no legislation specific for World Heritage sites in Thailand.
2. The Royal Forest Department has setup the World Heritage Center in Huai Kha Khaeng Wildlife Sanctuary and allocated an annual budget for the center.
3. The Royal Forest Department with collaboration of the Government of Denmark has launched a project called the Western Forest Complex Ecosystem Management (WEFCOM) to promote public participation and science-based ecosystem management. The project area encompasses the World Heritage and the surrounding protected areas being naturally connected as a whole ecosystem.
4. Adding up new ranger stations to give better protection to the World Heritage is a national concern. The updated number of ranger stations is shown in Table 1.

Table 1. The Number of ranger stations in the World Heritage from 1992 to 2002.

Year	Number of ranger stations on each side of the World Heritage		Total number
	Huai Kha Khaeng	Thung Yai	
1992	17	19	36
1997	20	21	41
1998	20	22	42
2002	21	23	44

5. Five forest fire protection units have been placed around the World Heritage in the last 3 years. One of these units is a center equipped with a helicopter and fire crew. The work of the fire protection units has proved quite successful in Huai Kha Khaeng side by which there have been no major forest fires occurring in the area for the last 3 years. This result is concurrent with the resolutions addressed in the 1998 conservation report after the meeting on the issue of forest fires in the World Heritage. The meeting was funded by the World Heritage committee.
6. This year (2002), the Royal Forest Department is building a nature education center in Huai Kha Khaeng Wildlife Sanctuary. This center will soon play a major role in promoting the values of the World Heritage.
7. In 1991, not too long after the area became the World Heritage, the resettlement program was conducted and resettled 3 villages inside Huai Kha Khaeng Wildlife Sanctuary to the locations on the edge of the World Heritage.

Provincial level

There is less activities in the provincial level due to the fact that the World Heritage is wildlife sanctuary status and they are under Wildlife Conservation Division of the Royal Forest Department. However, some activities originated at the provincial level is related to buffer zone management as below:-

1. Sometimes after the resettlement program there was a collaborative project between the Land Reform Department and local NGOs on buffer zone management.
2. A committee to manage Huai Kha Khaeng buffer zone was setup. This committee is composed of representatives from provincial and national agencies and related organizations and chaired by the Deputy Prime Minister and the Governor, respectively.

Future actions

Some significant future actions benefiting the preservation of natural values of the World Heritage that should be mentioned now are for examples;

1. The launch of Western Forest Complex Ecosystem Management Project (WEFCOM), a collaborative project between the Royal Forest Department and the government of Denmark, will significantly affect the management of the World Heritage in the future. The WEFCOM project considers the World Heritage and surrounding protected areas as a large ecosystem. The project focuses on 3 approaches as follows.
 - a. Adaptive management based on scientific information and ecological monitoring.
 - b. Management based on management zones of the forest complex that is now under the zoning process.
 - c. Establishment of the provincial conservation forum in each province to participate in management and conservation of the forest complex that comprises the World Heritage and the less of the protected areas.
2. Annex the mining site named Pu Jur to Thung Yai Wildlife Sanctuary. The mining site has not been functioning for some time and the National Wild Animals Reservation and Protection Committee has approved the proposed annex. This annex will surely reduce all the threats and disturbances from mining.

Budget

The total amount of budget for the World Heritage in the last 5 years (1997-2002) ranges from US\$ 0.8 – 1.53 million annually. The wide range of the budget is due to the budget for constructing ranger stations and the world heritage center. The annual budget is divided into budget lines including labor, per diem, supply and equipment, and construction. The details of the budget are shown in Table 2.

Table 2. The budget for World Heritage by budget lines from 1997 to 2002.

Year	Budget (US\$)				
	Labor (Wages)	Operating Cost	Utility cost	Construction and attachments	Total
1997	598,395	154,424	71	106,911	859,800
1998	642,056	162,706	198	721,252	1,526,212
1999	585,767	234,965	85	51,647	872,463
2000	619,633	131,534	141	-	751,308
2001	624,094	138,593	141	-	762,828
2002	625,033	125,492	141	138,475	889,142

Note: Exchange rate : 1 US\$ = 42.5 Baht

World Heritage Center was established in 1998

The World Heritage staffing

The staff looking after the World Heritage is shown in Table 3.

Table 3. The numbers of staff by position type from 1997 to 2002.

Year	The numbers of staff			Total
	Forest Officers	Permanent Employees	Temporary Employees	
1997	14	61	478	553
1998	12	54	511	577
1999	11	55	485	551
2000	8	47	438	493
2001	12	43	498	553
2002	16	40	495	551

Training need

Training courses needed for the World Heritage staff is shown in Table 4.

Table 4. Training courses needed for the staffs of World Heritage by level of responsibility.

Courses	Forest Officers	Ranger/Guard
1. Protection and patrolling		✓
2. Nature education	✓	✓
3. Research and monitoring	✓	
4. Use of GIS	✓	
5. Use of GPS, maps, etc.	✓	✓
6. Research and Technical assistance		✓

Regarding training the World Heritage staffs to gain experiences with various training courses arranged by the Western Forest Complex Ecosystem Management Project (WEFCOM) and the Wildlife Conservation Division. The Courses and numbers of staff working for the World Heritage and surround protected areas trained are shown in Table 5 and Figure 5a and 5b.

Table 5. The detailed courses and numbers of staff being trained from 2000 to 2002.

Courses	Days/ Course	Operating Year	Numbers of Participants (Course/pers on)
<i>Permanent employees and Temporary employees</i>			
1. Protection and patrolling: Basic course	13	2000	2/203
2. Protection and patrolling: Protection and prevention course	13	2000	1/69
3. Protection and patrolling: Natural Interpretation course	12	2000	1/48
4. Leadership for the Ranger Station	20 21	2000	1/23 1/20
5. Protection and patrolling: Basic course	13	2001	4/291
6. Leadership for the Ranger Station	20	2001	4/24
7. Protection and patrolling: Basic course	13	2002	2/181
<i>Forest Officers</i>			
1. Study tour for the Site Managers on Protected area Management, Australia	12	2000	1/14
2. Study tour for the Site Manager's Assistants in Protected area Management, Malaysia	7	2001	1/14
3. Study tour for the Site Manager's Assistants in Protected area Management, Nepal	7	2001	1/15
4. Ecosystem Management training course	5	2002	1/16

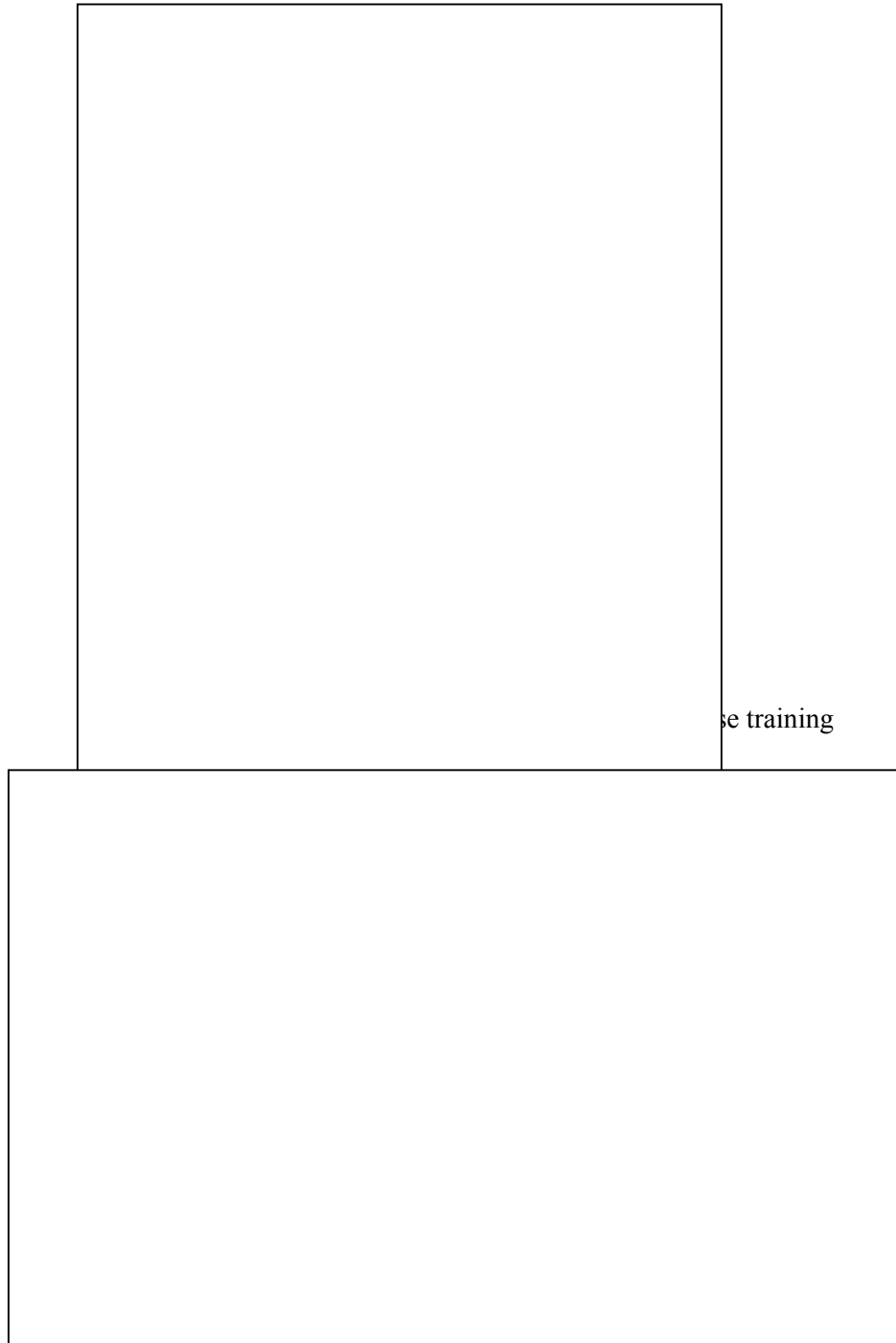


Figure 5b. Protection and patrolling: Basic course training

Scientific study

The World Heritage is the prime biological and ecological research site in Thailand. However, most of the research works, about 130 research topics, were conducted in Huai Kha Khaeng side (see Table 6). Only 15 topics were in Thung Yai side (see Table 7). List of research works is shown below.

Table 6. List of research works in the Huai Kha Khaeng Wildlife Sanctuary.

No.	Research works in the Huai Kha Khaeng Wildlife Sanctuary
1	Aphichonbutr, S. et.al.1986. The Status of Mammals in Huai Kha Khaeng Wildlife. Khao Nang Rum Annual Research Paper. Wildlife Conservation Division, RFD (in Thai) 14pp.
2	Apply Research on Economic Center.1998. Estimation of Natural resource Value of Protected Area : Case study in Huai Kha Khaeng Wildlife Sanctuary. Faculty of Economic. Kasetsart University. 132pp.
3	Arunbanjerdkun, N. 1990. The Distribution of Natural Salt-licks around the Khoa Nang Rum Research Station in the Huai Kha Khaeng Wildlife Sanctuary. B.S. Special Paper, Environmental Science Dept. ,Fac.of Science Technology, Thammasart University.
4	Arunmai, W.1995. The comparative studies of socio-economic of forest village project and without forest village project case study: in buffer Zone of Huai Kua Khaeng Wildlife Sanctuary Uthaithani province. M.S.Thesis. Mahidol University. Bangkok.
5	Bhumpakphan, N. 1988. Ecology of White-handed Gibbon (<i>Hylobates lar</i>) and Phayre's Langur (<i>Presbytis phayrei</i>) in Huai Kha Khaeng Wildlife Sanctuary. MSc thesis, Faculty of Forestry, Kasetsart University (Thai/English abstract).
6	_____ and N. Naksatit. 1991. Notes on the Footprints of some Even-toed Ungulates in the Huai Kha Khaeng Wildlife Sanctuary. J. of Wildlife in Thailand. Vol 1(1).
7	_____, U. Kutintara and N. Naksatit. 1986. Ecology of Barking Deer (<i>Muntiacus muntjak</i>) of Huai Kha Khaeng Wildlife Sanctuary. In Proceedings of the 8th Wildlife Thailand Annual Seminar p.12.1-42.44. Faculty of Forestry, Kasetsart University. (in Thai)
8	_____, _____ and _____. 1986. The Wild Fauna of Huai Kha Khaeng. Department of Forest Biology, Faculty of Forestry, Kasetsart University Bangkok. (in Thai)
9	Burns, D.M. .1969. A Survey of theValley Huai Kha Khaeng. Conservation News from Thailand Vol 9. Association for the Conservation of Wildlife, BKK.
10	Chanard T. and Nabhitabhata J. 1986. Reptiles of the Huai Kha khaeng Wildlife Sanctuary. In Khao Nang Rum Annual Research Paper, Vol.1. Wildlife Conservation Division, RFD (in Thai)
11	Chanard T.1986. The diversity of Herpetofauna in the Tree Buttress System of Evergreen Forest in the Huai Kha Khaeng Wildlife Sanctuary. Special Paper, Faculty of Forestry, Kasetsart University, Bangkok (in Thai).
12	_____.1986. The Status of Amphibian and Reptile in the Huai Kha Khaeng Wildlife Sanctuary. Uthai Thani - Tak Province. P13. In Khao Nang Rum Annual Research Paper Wildlife Conservation Division, RFD (in Thai)

Table 6. (cont.)

No.	Research works in the Huai Kha Khaeng Wildlife Sanctuary
13	_____.1987. A Survey of Amphibian fauna in the Huai Kha Khaeng Wildlife Sanctuary. Uthai Thani - Tak Province. P1-5 In Khao Nang Rum Annual Research Paper Vol.3. Wildlife Conservation division, RFD (in Thai)
14	Chavangnirun, S. and S. Apichonbut. 1983. The Status of Birds in Huai Kha Khaeng. Studies of the Status of Wildlife in Huai Kha Khaeng Wildlife Sanctuary. Wildlife Conservation Division, RFD (mimeograph in Thai).
15	Chimchome, V. 1995. Biology and Ecology of Two Endangered, Rufous-necked and Plain-pouched Hornbills, in Huai Kha Khaeng Wildlife Sanctuary. Submit to: Pro Natural Foundation-Japan. 41pp.
16	_____. 1996. The breeding biology of the Rufous-necked Hornbill (<i>Aceros nipalensis</i>) in Huai Kha Khaeng Wildlife Sanctuary, Thailand. M.S. Thesis, Dept. of Plant and Soil Science, Aberdeen Univ.
17	Conforti , K. 1996. The status and distribution of small carnivores in Huai Kha Khaeng / Thung Yai Naresuan Wildlife Sanctuaries, West-Central Thailand. M.S. Thesis,Univ.,of Minnesota.66p.
18	Drikhomthair, S. 1998. Breeding Biology of Great Slaty in Huai Kha Khaeng Forest, Uthai Thani Province. Research Abstract of Research Project and Thesis. BRT Annual Seminar (2) p.162.
19	Duengkae, P. 1996. Breeding biology of silver-breasted broadbill, <i>Serilophus Lunatus</i> (Gould) in Huai Kha Kaeng Wildlife Sandtuary, Changwat Uthai-Thani. M.S.Thesis , Kasetsart University. 76pp.
20	Ecology of Tapir (<i>Tapirus indicus</i>) in Huai Kha Khaeng Wildlife Sanctuary. Journal of Forestry 7,3 p.277-288.
21	Edwards, A. M. 1988. Preliminary Report to the Royal Forestry Department on the Feeding Ecology of <i>Hylobates</i> in Dry Evergreen Forest Type at Khao Nang Rum Wildlife Research Station p58-64. In Khao Nang Rum Annual Research Paper, Vol.3. Wildlife Conservation Division, RFD (in Thai)
22	_____. 1989. Interim Report to RFD on Dry Season Feeding Ecology of <i>Hylobates lar</i> in Dry Evergreen Forest at Khao Nang Rum Wildlife Research Station, Huai Kha Khaeng Wildlife Sanctuary, West Thailand. Cambridge University.
23	Eidthong, V. 1993 . The taxonomic study of the family Fagascae in Haui Kha Kheng Wildlife Sancturay. M.S. Kasetsart University. Bangkok
24	Eudey, A.A. 1989. 14 April 1986, Eviction Orders to the Hmong Huai Yew Yee Village , Huai Kha Khaeng Wildlife Sanctuary. In McKinnon and Viene (eds) Hill Tribes Today; Problems in Change. White Lotus-orstom.
25	Faculty of Forestry.1989. Draft Management Plan for the Huai Kha Khaeng Wildlife Sanctuary Uthai Thani -Tak province. Faculty of Forestry. Kasetsart University.342pp. (In Thai)
26	_____. 1989. Final Report of Master Plan of Huai Kha Khaeng Wildlife Sanctuary Uthai Thani -Tak Province. Faculty of Forestry. Kasetsart University.138pp. (In Thai)

Table 6. (cont.)

No.	Research works in the Huai Kha Khaeng Wildlife Sanctuary
27	Faculty of Forestry.1989. Final Report of Master Plan of Huai Kha Khaeng Wildlife Sanctuary Uthai Thani - Tak Province (1980-1994). Faculty of Forestry. Kasetsart University.239pp. (In Thai)
28	_____.1989. Final Report of Master Plan of Huai Kha Khaeng Wildlife Sanctuary Uthai Thani - Tak Province. Faculty of Forestry. Kasetsart University. (In Thai)
29	Forest Resource Assessment Division,1997. Progress Report of The project: Management plan of Huai Kha Khaeng Wildlife Sanctuary Phase II. Natural Resource Division RFD Jatujak, Bangkok.
30	Grogan, J. 1993. Forest Ecological Studies at the Huai Kha Khaeng Wildlife Sanctuary, Thailand: Methods and Project Description Centre for Tropical Forest Science. Harvard University. Miscellaneous Internal Report No.18.3.93.
31	_____. 1995. Fire in the Huai kha khaeng Wildlife Sanctuary, Page. 22-24 in Technical paper of Khoa Nang Rum. Vol.4 Wildlife Conservation Division. RFD. Bangkok. (in Thai)
32	Jamjumroon, V. 1995. Taxonomy and Analysis in plant seedlings of dry evergreen forest of Klong Plu, Huay Kha Kheng Wildlife Sanctuary, Changwat Uthai-Thani. In Forestry Journal, Forest Research Center, Kasetsart University. pp369-372.
33	_____. 1997. The morphological study and identification of some woody plant seedlings of dry evergreen forest of Klong Plu, Huay Kha Kheng Wildlife Sanctuary, Changwat Uthai-Thani . M.S. Thesis. Kasetsart University.
34	Kanchanasaka B. 1985. Aspect of the Feeding and Nesting behavior of black-necked Oriole (<i>Oriolus xanthornus</i>) in Huai Kha Khaeng. In Proceedings of the 7th Wildlife Thailand Annual Seminar p.259-262 Faculty of Forestry, Kasetsart University. (in Thai)
35	_____, M. Srikrajang and S. Thongaree. 1985.Natural Salt Lick in Huai Kha Khaeng Wildlife Sanctuary. P250-270 In Proceedings of the 1985 Royal Forest Department Annual Seminar Vol.1 Bangkok (in Thai).
36	Kanchanawanich, S. 1992. Fire Ecology in the Huai Kha Khaeng Wildlife Sanctuary. PhD thesis, Department of Geography, School of Oriental and African Studies, University of London.
37	Kawgrom P. 1996. Result of defoliation of
38	Khao Nang Rum Wildlife Research Station. 1987. Khao Nang Rum Annual Research Paper, Vol.2. Wildlife Conservation Division, RFD (in Thai) 143pp.
39	_____. 1988. Khao Nang Rum Annual Research Paper, Vol.1. Wildlife Conservation Division, RFD (in Thai) 183pp.
40	_____.1988. Khao Nang Rum Annual Research Paper, Vol.5. Wildlife Conservation Division, RFD (in Thai) 116pp.
41	_____. 1992. Khao Nang Rum Annual Research Paper, Vol.4. Wildlife Conservation Division, RFD (in Thai) 116pp.
42	_____. 1992. Temperature and Rainfall quality at Khao nang Rum Wildlife Research Station. Khao Nang Rum Annual Research Paper, Vol.4. P1-16. Wildlife Conservation Division, RFD (in Thai)

Table 6. (cont.)

No.	Research works in the Huai Kha Khaeng Wildlife Sanctuary
43	_____. 1993. Khao Nang Rum Annual Research Paper, Vol.5. Wildlife Conservation Division, RFD (in Thai) 52pp.
44	Komantein. 2539. Relative of soil quality and structure of ecosystem Mixed deciduous forest. Huai Kha Khaeng Wildlife Sanctuary. B.S. Thesis. Chulalongorn University
45	Kruuk, H., B. Kanchanasaka and S. O. Sullivan. 1993. Niche separation in three sympatric otters <i>Lutra perspicillata</i> , <i>L. lutra</i> and <i>Aonyx cinerea</i> in Huai Kha Khaeng, page.39 in Technical aggregation of research paper in Huai Kha Khaeng Wildlife Sanctuary.
46	Kumthorn, T., P. P. van Dijk. 1992. Interim Report on the Turtles of Huai Kha Keang and Thung Yai Narasuan, p. 40-48 in Technical paper of Khoa Nang Rum. Vol.4 Wildlife Conservation Division. RFD. Bangkok. (in Thai)
47	Kutintara, U. and N. Bhumpakphan. 1988. Management Plan for the Huai Kha Khaeng Wildlife Sanctuary. Forest Biology Group, Faculty of Forestry, Kasetsart University, Bangkok (in Thai).
48	Laoung S. S. Apichonbut. et.al.1986. The Status of birds in Huai Kha Khaeng. Studies of the Status of Wildlife in Huai Kha Khaeng Wildlife Sanctuary. Wildlife Conservation Division, RFD. P78-79.
49	Larphananont P. and S. Weeravong.1995. The Study on Social and Economic of Community in Buffer zone of Huai Kha Khaeng Wildlife Sanctuary. Social Research Institute, Chulalongkorn University .108pp.
50	Lertpanich, K. (n.d.) Optimal Sampling Plot of Deciduous Forest Ecosystem in Huai Kha Khaeng Wildlife Sanctuuary. Abstract of Research paper and Thesis Technical seminar of BRT project, 2th
51	_____. 1970. Suitable area size for study in Deciduous Forest ecology in Huai Kha Khaeng. M.S. Thesis. Chulalongkorn University. (in Thai)
52	Maksririsombart, C.1997. Characteristic of Dry Dipterocarp forest after forest fire: Case study in Huai Kha Khaeng Wildlife Sanctuary. B.S. Special paper Faculty of Environmental and Resource science, Mahidol.52pp.
53	Maneekorn, D. 1986. Huai Kha Khaeng Wildlife Sanctuary. M.S. special problem paper, Kasetsart University, Bangkok (in Thai).
54	_____. 1986. Some Nesting Birds at Huai Kha Khaeng Wildlife Sanctuary. M.S. special problem paper, Kasetsart University, Bangkok (in Thai).
55	_____. 1987. Biology and behaviour of Laughing Thrush species in the Huai Kha Khaeng Wildlife Sanctuary. M.S. thesis, Kasetsart University, Bangkok (Thai/English Abstract).
56	McNeely, J. A. and J. Seidensticker. 1974. Huai Kha Khaeng: A Preliminary Ecological Survey. Assoc. for Conservation of Wildlife, Bangkok (typescript).
57	MIDAS Agronomics company, Limited. 1993. Detailed Program for Protected Areas Management and Biodiversity Conservation for the Thung Yai Naresuan-Huai Kha Khaeng Complex (Final Report). Bangkok, Thailand.
58	Nakhasathien, S.1993. Forest Fire Suituation in Huai Kha Khaeng Wildlife Sanctuary. Forestry Journal. 51(2):108-109.

Table 6. (cont.)

No.	Research works in the Huai Kha Khaeng Wildlife Sanctuary
59	_____, N. Bhumpakphan and S. Simcharoen. 1987. Forest and Wildlife Ecology in Thung Yai Naresuan and Huai Kha Khaeng Wildlife Sanctuaries. Royal Forest Department and Wildlife Fund Thailand, Bangkok (Thai/English abstract).
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64	Nootong, T. 1992. Thung Yai - Huai Kha Khaeng Wildlife Sanctuary, Natural World Heritage, p.7-17 In Khao Nang Rum Annual Research Paper Vol.4. Wildlife Conservation Division, RFD (in Thai)
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76	_____. 1998. Mineral Licks in Huai Kha Khaeng Wildlife Sanctuary. Research paper, Development and Extension in Wildlife Conservation Subdivision, Wildlife Conservation Division RFD. 68pp.
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91	Robinson M.R. <i>et.al.</i> 1995. Small mammals of Thung Yai Narasuan and Huai Kha Khaeng Wildlife Sanctuaries in Western Thailand. Nat. His. Bull. Siam Soc 43:27-54
92	_____, A. L. Smith and S. Bumrungsri. 1994. Small Mammals of Thung Yai and Huai Kha Khaeng Wildlife Sanctuary in Western Thailand. The Seub Nakhasathien Foundation and the Royal Forest Department. 96 pp.
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98	Sangvichien, S. 1981. The Study of Artifacts and Skeletons contained in Two Earshern Jars from Huai Kha Khaeng Forest, Uthai Thani Province. Journal of the National Research Council of Thailand Vol 13(2).
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102	Siriprasert W. 1997. Utilization of Forest Resources in the Community Buffer Zone around Huai Kha Khaeng Wildlife Sanctuary in Uthai Thani Province. M.S. thesis, Faculty of Forestry, Kasetsart University . 94pp. (Thai/English abstract)
103	Smitinand, T. 1987. Flora of the Thung Yai and Huai Kha Khaeng Wildlife Sanctuaries. National Herbarium, Royal Forest Department (typescript in Thai).

Table 6. (cont.)

No.	Research works in the Huai Kha Khaeng Wildlife Sanctuary
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*109	Sririprasert, V. 1997. Utilization of forest resources in the community buffer zone around Huai Kha Khaeng Wildlife Sanctuary in Uthai Thani Province. M.S.Thesis. Kasetsart University.
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112	_____, J. Nabhitabhata, T. Chanard and T. Roberts. 1991. A Survey of Fish in the Huai Kha Khaeng Wildlife Sanctuary: Report and Results. Wildlife Conservation Division, Royal Forest Department.
113	Sukmasuang R.1993. Ecology of Asian Elephant (<i>Elephas maximus</i> Linnaeus,1758) in Huai Kha Khaeng Wildlife Sanctuary Uthai Thani-Tak province. M.S. Thesis. Faculty of Forestry. Kasetsart University. Bangkok. (in Thai)
114	_____. 1999. A study of Pellet Groups Decay Rate of Common Barking Deer and Sambar Deer in Huai Kha Khaeng Wildlife Sanctuary. Annual Research Paper of Wildlife Research Division. RFD. p.119 (in Thai)
115	_____. 1999. Population Density and Habitat Utilization of Some Ungulates in Huai Kha Khaeng Wildlife Sanctuary. Annual Research Paper of Wildlife Research Division. RFD. p.130 (in Thai)
116	Suphanitusanakorn, A.1990. Ecology Quantity Characteristic of Dry Evergreen forest around Khao Nang Rum Wildlife Research Center. Huai Kha Khaeng Wildlife Sanctuary. In Khao Nang Rum Annual Research Paper p32-33 . Wildlife Conservation Division, RFD (in Thai)
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No.	Research works in the Huai Kha Khaeng Wildlife Sanctuary
118	Tharaphome, K, 1997. Radio tracking technic for study home range size and activity of Yellow tortoise (<i>Indotestudo elongata</i> (Blyth,1853)) in Huai Kha Khaeng Wildlife Sanctuary. M.S. Thesis. Chulalongkhorn University. (in Thai)
119	Thitatummakul.1985. Vegetation Change along the Altitudinal Gradient in Huai Kha Khaeng Wildlife Sanctuary. M.S. Thesis. Faculty of Forestry. Kasetsart University. Bangkok. (in Thai)
120	Uicharoensak, V. 1993. Ecology and Distribution of Water Buffalo in Haui Kha Kheng Wildlife Sancturay. M.S. Special paper, Kasetsart University. Bangkok
121	Uimumphai, K. 1995. A survey on bird specie in Huai Kha Khaeng Wildlife p.297-299. Forest research center, Faculty of Forestry, Kasetsart University.(in Thai)
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123	Usawachaicharn S. (Editor). 1992. Huai Kha Khaeng : Fauna and Floral Wold Heritage. Feature magazine. Bangkok. 135pp.
124	Van Dijk, P. P. 1995. Interim Report on the Turtles of Thang Substation p32-35 , In Khao Nang Rum Annual Research Paper, Vol.4. Wildlife Conservation division, RFD (in Thai)
125	_____. 1995. Narrow Headed Soft shell Turtle (<i>Chitra indica</i>) ,p36-39 In Khao Nang Rum Annual Research Paper, Vol.4. Wildlife Conservation division, RFD (in Thai)
126	Varawan, P. 1997. Feature Magazine November Vol.169 (13). Sarakadee pointing and publish. Ammarin Printing and Publishing. Bangkok. P.76-86.
127	_____. 1999. Feature Magazine March Vol.169 (15). Sarakadee publish. Ammarin Printing and Publishing. Bangkok. 184pp. (in Thai)
128	Vincent, D.L. 1978. Elephant Movements in Reletion to Habitat in Huai Kha Khaeng Wildlife Sanctuary. Wildlife Conservation Division, Royal Forest Department (mimeograph in Thai).
129	Walker, S. and A. Rabinowitz. 1992. The small-mammal community of a dry-tropical forest in central Thailand. In Khao Nang Rum Annual Research Paper, Wildlife Conservation division, RFD (in Thai) 37pp.
130	Wanussakul, S.1989. Seasonal variation in biomass, nutrients content and dynamics of updergrowth in deciduous dipterocarp forest at Huay Kha Khaeng Wildlife Sanctuary, Uthai Thani M.S. Thesis. Kasetsart University. Bangkok.
131	Wanussakul, S.1989.Seasonal variation in biomass, nutrients content and dynamics of updergrowth in deciduous dipterocarp forest at Huay Kha Khaeng Wildlife Sanctuary, Uthai Thani Msc.Thesis. Kasetsart University. Bangkok.

Table 7. List of research works in the Thung Yai Wildlife Sanctuary.

No.	Research works in the Thung Yai Wildlife Sanctuary
1	Bhumpakphan, N. and N. Jirawatkawee. 1987. Some Bird Species of the Mae Chan Valley, Thung Yai, 21-25 May 1987. Forest Biology Group, Faculty of Forestry, Kasetsart University, Bangkok (manuscript in Thai).
2	Chantaraprasong, J. 1989. Report on a Survey of Flora around the Mae Kasa and Song Tai Streams, Thung Yai Wildlife Sanctuary 2-6 May 1988. Horticulture Unit, Department of Agriculture, Kasetsart University, Bangkok (in Thai).
3	Chukaew A. (manuscript) The study on Kraren' Botanical knowledge in Thung Yai Wildlife Sanctuary. Abstract of Research project and Thesis with supported by Knowledge Development and study in policy of Biographical in Thailand Project. Page. (in Thai)
4	Dobias, R.J., T. Tech, V. Wangwacharakul and N. Sansawang. 1988. Beneficial Use Quantifications of the Huai Kha Khaeng and Thung Yai Naresuan Wildlife Sanctuary Complex: Executive Summary and Main Report. WWF Project 3757.
5	Faculty of Forestry. 1989. Final Report of Master plan of Thung yai Wildlife Sanctuary Uthaitanee- Tak Province. Faculty of Forestry. Kasetsart University. 266p. (In Thai)
6	Faculty of Forestry. 1989. Master plan of Thung yai Wildlife Sanctuary Uthai Thani - Tak Province. Faculty of Forestry. Kasetsart University.
7	Faculty of Forestry. 1989. Progress Report of Master Management plan of Thung yai Wildlife Sanctuary Uthai Thani - Tak Province. Faculty of Forestry. Kasetsart University. 250p. (In Thai)
8	Kaewsuk S. 1993. Feature Magazine. September. Vol.103 Year IX. Sarakadee printing. J. film Propress.co.th. Bangkok. 220p. (in Thai)
9	Kunkormdee S. 1994. Nature travel magazine. Vol.6(1) September. Pakarang printing, Bpitt printing co.th., Bangkok. pp.84-92
10	Maneerat S. 1997. Land Utilization of Guar in Thung Yai Wildlife Sanctuary. Research paper of Thung Yai Wildlife Sanctuary (East) Tak province, Royal Forest Department. pp.1-3.
11	Nakhasathien, S. 1987. Assessment of the Impact of the Upper Khwae Yai Dam Project on Forest and Wildlife in the Thung Yai Wildlife Sanctuary. Royal Forest Department.
12	Nakhasathien, S. and B. Stewart-Cox. 1990. Nomination of the Thung Yai- Huai Kha Kheang Wildlife Sanctuary to be a U.N.E.C.O. World Heritage Site, submitted by the Wildlife Conservation Division, Royal Forest Department, Bangkok.
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15	Steinmetz R. and R. Mather. 1996. Impact of karen villages on the fauna of Thung Yai Naresuan Wildlife Sanctuary: A Participatory research project. Nat. Hist. Bull. Siam Soc. 44 : 23-40. (page 33 wwf.)

Awareness building

The values of World Heritage have long been appreciated among Thai people through various means such as nature and travel magazines, documentary films, etc. However, the value of World Heritage has been emphasized through following activities:-

1. The World Heritage Day: The government designated 9th of December each year to celebrate “the World Heritage Day” and promote the values of Thuang Yai – Huai Kha Khaeng World Heritage Site. The Uthai Thani provincial office in collaboration with the Royal Forest Department has arranged the celebration including exhibits, music, talks, art and photo contests.
2. Seub Nakhasathien Foundation donated the memorial after the late Seub Nakhasathien the former superintendent of Huai Kha Khaeng Wildlife Sanctuary, who first drafted the proposal to nominate the site as World Heritage. The memorial is multipurpose and used mainly to promote the natural values of the World Heritage.
3. Publications, for example newspaper, newsletter, and magazines (weekly or monthly), have given attention and have published several documents concerning the World Heritage value and matters for numbers. Besides, there are numbers of independent and dependent photographers who have publish numbers of books, films, postcards and so on.

WORLD HERITAGE Plaque

There are two main World Heritage plaques in the area, one posted next to the road entering Huai Kha Khaeng Wildlife Sanctuary and other at Thung Yai Naresuan headquater (Figure 6 and 7).

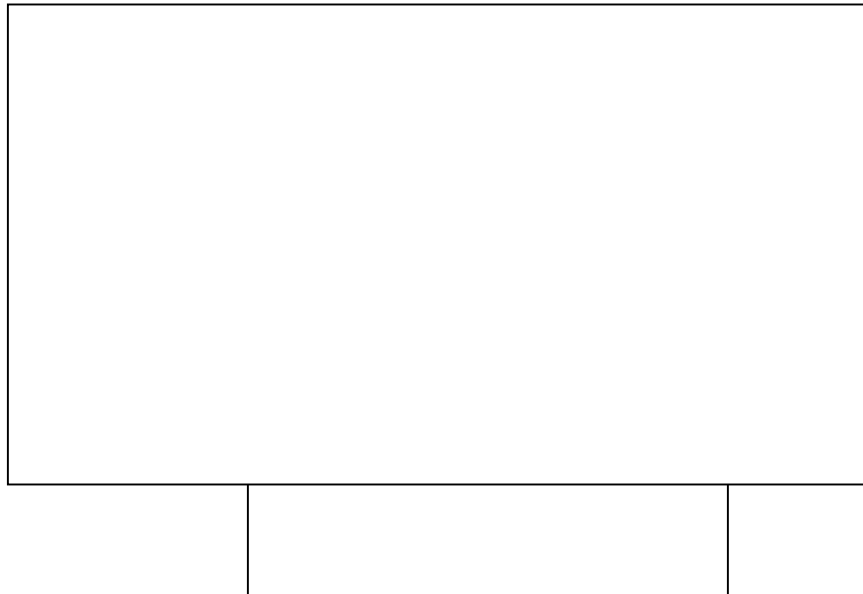


Figure 6 World Heritage plaques at the Huai Kha Khaeng Wildlife Sanctuary.



Figure 7 World Heritage plaques at Thung Yai Naresuan Headquarter.

Mainstream education system

Although the World Heritage values and significance have not been officially incorporated into the national education system, informal environmental studies in primary and secondary schools have often been mentioned concerning the values of the World Heritage.

Facilities for nature education

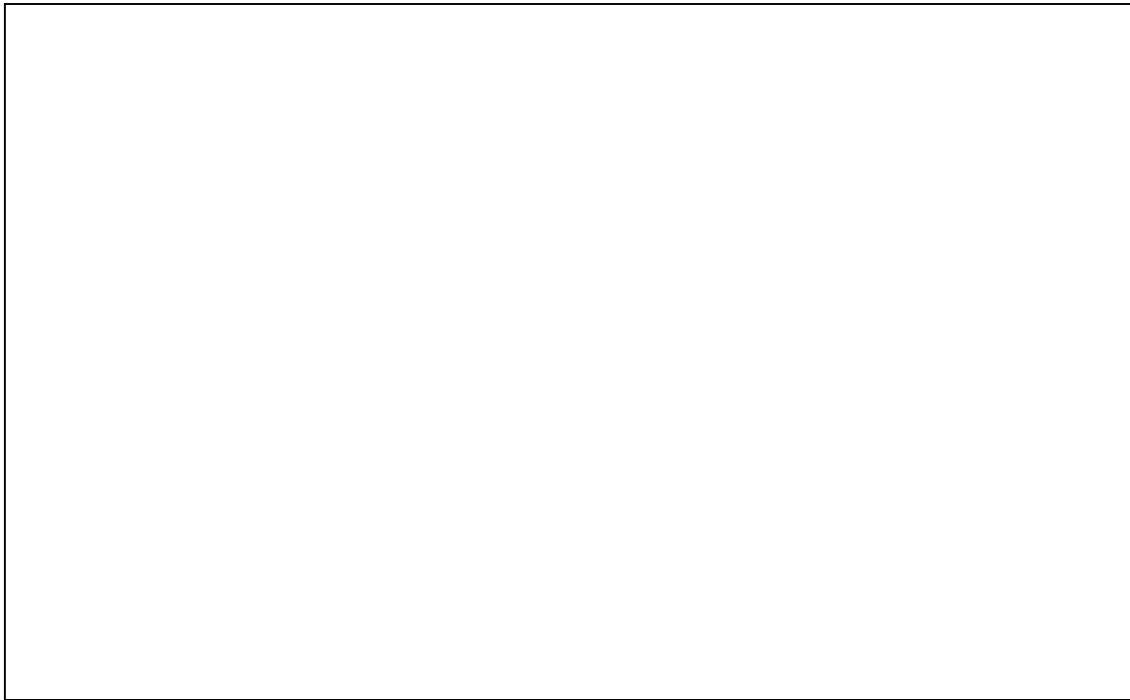
Although the world heritage center at Huai Kha Khaeng has been for official use, there are arrangement for exhibits at Seub Nakhasathien Memorial where people can get information on the values of the World Heritage. Moreover, there are four nature trails for visitors in the World Heritage, three trials in Huai Kha Khaeng and one in Thung Yai. Brochures to promote World Heritage values are also available at Seub Nakhasathien Foundation and have been distributed widely (see brochure sample). Due to the fact that the area is wildlife sanctuary by which the law is not allow for the tourism yet there have been limited numbers of visitors visiting the area. Most of the visitors are students who come for nature education purpose. No entrance fee for visitors.

The role of World Heritage

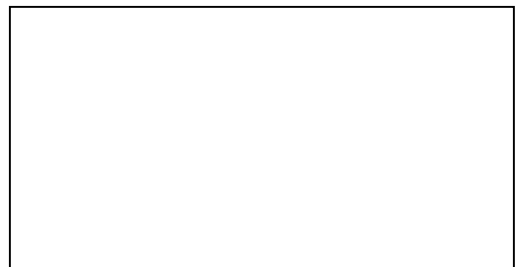
The World Heritage status of the area is very important for promoting nature conservation. The status has been mentioned for defending the areas from some development projects such as road construction proposals. With the effort to use “ecosystem management approach” onto the Western Forest Complex, the World Heritage site was valued as a core zone where the biological and ecological dynamics are interwoven with the contiguous forest ecosystems around the World Heritage. The World Heritage status is also essential in the long-term awareness building programs in the effort to conserve this precious natural ecosystem.

Legislative provision

About the legislative and administrative provisions for conservation of the property, the Wild Animals Reservation and Protection Act B.E. 2535 (A.D. 1992) and the Royal Forest Department as a key body to look after the area is strong and useful enough to protect the World Heritage. There is no need for a substantial revision.



*Scenery in the Thung Yai - Huai Kha
Khaeng World Heritage.*



II.5. Factors affecting the property

Threats to the World Heritage identified in the inscription includes poaching, fires, livestock raising, forest product collection, illegal logging, and mining. Although those activities are considered chronic, they do not pose a serious threat to the area. Success in protection can be supported by an increase in wildlife abundance and a recovery of plant and wildlife communities in the sites previously occupied by villages (see section II.6).

Due to the fact that threat from fires is one of the major threats addressed in the inscription, therefore, it is worth mentioning some statistics of fire and fire protection shown in Table 8.

Table 8. Fire statistics in the World Heritage and vicinity.

Year	Numbers of fire protection units	Area burned (ha)
1998	1	75,788
1999	2	19,292
2000	5 *	19,900
2001	5 *	6,639
2002	5 *	32,496

Note: * The statistic of the two fire protection units include area burned outside the property.

Long-term threats to the area that prompt the Royal Forest Department to be prepared are

1. *Increasing of the people who living inside the area, especially Karen villages in Thung Yai Naraesuan,*
2. More frequent poaching incidents,
3. Increasing pressure on forest product collection

To deal with such long-term threats, three measures have been taken with details as below.

1. Western Forest Complex Management Zoning: The Western Forest Complex Ecosystem Management Project (WEFCOM) has inflicted the Ecosystem Management concept for managing the World Heritage and surrounding protected area. The WEFCOM has just finished a management-zoning map, which is being reviewed by the stakeholders. Hopefully, zoning of this ecosystem will become a useful tool for the future protection of the area.
2. There are many activities that can guarantee the long-term protection of the area. Those include installing new facilities including ranger stations, nature education center, fire protection units; supporting more research; improving officials' and guards' capacity through various courses of training. The immediate goals are to reduce poaching, illegal logging, and forest fires.
3. There is a proposal to revoke mining concession at the site next to Thung Yai Wildlife Sanctuary. If the proposal pass, it will increase protection capacity to the World Heritage.

Areas where improvement would be desirable, and towards which the State Party is working

Concerning the threats to World Heritage improvement to the following areas would be desirable;

1. Management style must rely more on science (science-based management). Science will help protect, maintain, and restore wildlife populations and habitats. Recommendations and solutions for threats will be more precise and prediction can be more powerful with scientific data support.
2. More researchers are necessary especially to conduct research applicable to management. This can be immediate started by expanding collaboration between the Royal Forest Department and the universities which specialized in the field of ecology, biology, protected area management.
3. Building and strengthening local networks is the long-term way to protect the World Heritage amid the increasing demands of local natural resources utilization. This has been started under the Western Forest Complex Ecosystem Management Project by which local networks were formed. Such local networks are called “Provincial Conservation Fora (PCF)”. The members of the fora are from local conservation groups, educational institutes, representatives of villagers, and WEFCOM protected area superintendents.
4. Local participation in the protection conservation of World Heritage.

Information on all factors which are likely to affect or threaten the property (threats to measure)

Up-to-date information on factors, which are likely to affect or threaten the World Heritage and the measures to deal with them is shown in Table 9.

Table 9. Factors likely to affect or threaten the World Heritage in the future.

Threats	Measurement
1. Inhabitants to areas: There are villages inside Thung Yai Wildlife Sanctuary. Although their lifestyle is not really cause severe destruction to the area, the long-term health of the area could be doubtful with increasing of population and increasing demands of natural resources.	1. Improving collaborations with local people and NGOs, 2. Use management zoning as a tool to work with local people and limit the natural resources use. 3. Monitoring of ecosystem changes to keep track of human use. 4. Conducting relocation, if the damage to natural resources in World Heritage is becoming more serious.

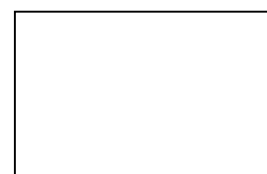


Table 9. (cont).

Threats	Measure
<p>2. There have been some suspended development proposals such as road and dam construction in the recent years. These large development projects could be raised up again and again in the future.</p>	<ol style="list-style-type: none"> 1. Conducting research to promote the ecological values of the World Heritage especially the ecosystems related to the proposed building sites. 2. Expanding networks of conservationists and local organizations to participate as the World Heritage stewardship.
<p>3. Pressures from poaching and over harvesting of the forest products from people living next to the eastern and southern side of Huai Kha Khaeng Wildlife Sanctuary is also worrisome.</p>	<ol style="list-style-type: none"> 1. Strengthening the buffer zone programs and findings out alternatives to natural resources inside World Heritage. 2. Strengthening the capacity of rangers and guards to deal with poaching. 3. Not weakening the law enforcement program to control the utilization.



Patrolling by air

II.6. Monitoring

The conditions of the property on the basis of key indicators for measuring its state of conservation.

Monitoring of the World Heritage health can be divided into 2 scales, one is coarse scale including satellite interpretation, and the other is fine scale including field survey. The Royal Forest Department in collaboration with Faculty of Forestry, Kasetsart University have conducted GIS Analysis on forest area changes in World Heritage and a wildlife research center inside Huai Kha Khaeng Wildlife Sanctuary has taken the monitoring role of wildlife resources in the area. In Thung Yai, the research team has kept monitoring the dynamics of ecosystem change after the relocation of Hmong villages out of the areas. The summary of the monitoring result is shown in Table 7.

Table 10. Indicators for the state of conservation of World Heritage.

Conservation value	Indicators
Flora	1. In Tung Yai, forest successions in the sites where villages were relocated out of the area are recovering.
Fauna	2. More large mammals such as gaurs, bantengs can be detected in Huai Kha Khaeng. 3. Numbers of tigers and preys estimated in the 100 km ² research site in Huai Kha Khaeng has revealed that at least 13 tigers are using the habitats and preys are still abundant. 4. In 2000, WEFKOM Project has conducted surveys on key fauna in this ecosystem by Rapid Ecological Assessment. The assessment has resulted in the fauna distribution maps over the area where the World Heritage is the core zone. These maps will be used as baseline data to plan long-term monitoring to the area.
Forest area	5. Forest area around Karen villages in Thung Yai west are reducing through time, although the reduction rate is not serious alarming.
Socio-economics	6. During 2000-2002, WEFKOM Project has conducted a survey of all villages inside the World Heritage. All baseline information such as numbers of households, numbers of inhabitants, resource uses has been accumulated and input into the WEFKOM database. This will be used for long-term monitoring of socio-economic change.

The key indicators

In fact, the monitoring of World Heritage is quite spotty. The most systematic one is in the central zone of Huai Kha Khaeng Wildlife Sanctuary, where as, for the rest of the World Heritage, the monitoring is ranged from sketchy to none. However, the establishment of ecosystem wise monitoring is being considered. The key indicators include;

- Habitat suitability mapping for key species,
- Abundance of key species,
- Land use change detection by satellite interpretation,
- Numbers of households of inhabitants

Describe what improvement the State Party foresees or would consider desirable in improving the monitoring system.

To improve monitoring system in this ecosystem, it is necessary to consider improvement in the following details:-

- *Building capacity of officers, rangers, at least to see an importance of monitoring system and can assist the monitoring in some degrees.*
- Budget to conduct monitoring should be clearly allocated and evaluation should be conducted with quality.
- Planning and management should be based on monitoring results.
- Collaboration and coordination with university and educational institutes should be strengthening.
- Volunteer system to assist monitoring should be established.



Fire tower

II.7. Summary of conclusions and recommended actions

State of World Heritage values

1. The world heritage site's integrity is being maintained and its values are still outstanding to the region.
2. Its significance and values are increasingly appreciated among Thai people and this can strengthen conservation of the World Heritage in the future.

Management and factors affecting the World Heritage

1. Long-term threats to the integrity of the areas including
 - *poaching,*
 - *increasing forest product collections,*
 - *human population growth in villages inside WEFCOM,*
 - *increasing livestock raising inside and around WEFCOM.*

Note: WEFCOM area includes the World Heritage property and surrounding protected areas of other three Wildlife Sanctuaries and twelve National Parks (see Figure 1).
2. Strengthening the protection system inside the World Heritage is still necessary to deal with such threats previously mentioned.
3. The adoption of the ecosystem management approach by taking the whole forest complex of western Thailand, in which the World Heritage is a core area, into consideration for conservation and management, is in the initial stage. The approach still needs both financial and administrative supports to efficiently implement.
4. Although a wildlife research station at Huai Kha Khaeng is in charge of the wildlife monitoring in Huai Kha Khaeng, the long-term monitoring programs has not happened for the most part of World Heritage. The Western Forest Complex Ecosystem Management Project has finished the ecological rapid assessment of the whole western forest ecosystem. It plans to develop the monitoring schemes for the complex, which will include the World Heritage. However, the program still needs strong financial and administrative supports.

Future actions

Future actions, responsible agencies, and timeframe for implementation is summarized in Table 11.

Table 11. Showing the Timeframe of future actions and its responsible agencies.

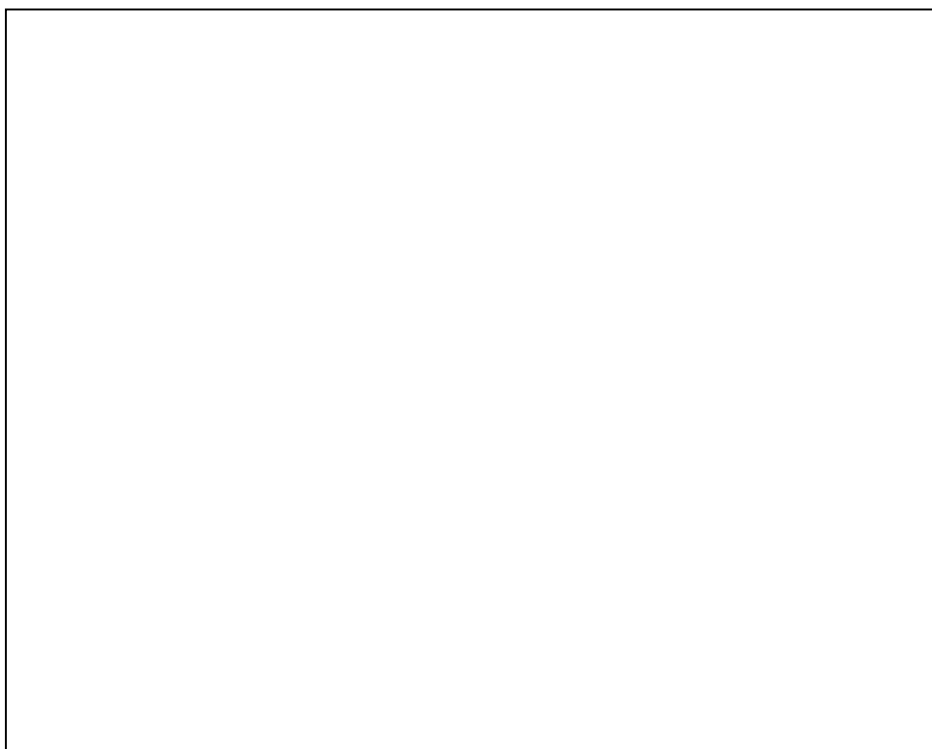
Future Actions	Responsible agencies	Timeframe	Funding
1. Wildlife population monitoring	Wildlife Research Division, Royal Forest Department (RFD)	Continuing	Thai Government
2. Ecosystem management project for the WH and surrounding forests	Ecosystem Management Project, RFD together with local conservation NGOs and education institutes.	<ul style="list-style-type: none"> ▪ First phase ends March 2003, ▪ Second phase from 2003 on is under consideration. 	Thai Government and Danish Government
3. Annexing the old mining site.	Wildlife Conservation Division, RFD	<ul style="list-style-type: none"> ▪ 2003 – 2004 	Thai Government
4. Establishing the forest ranger station in Thung Yai Naraesuan Wildlife Sanctuary	Wildlife Conservation Division, RFD	<ul style="list-style-type: none"> ▪ 2003 - 2004 	Thai Government
5. Nature Education Center at Huai Kha Khaeng Wildlife Sanctuary.	Wildlife Conservation Division, RFD	<ul style="list-style-type: none"> ▪ 2003 	OECF

Needs for international assistance

1. Long-term ecological monitoring is an important further step to ensure sustainable conservation of the World Heritage. However, the Royal Forest Department has not enough experience in setting up and conducting the long-term monitoring programs because the majority of the work has been involved with protection of the World Heritage. It will be very helpful to get recommendations for philosophical, technical, and implementing schemes from international experts who has strong experience in the field.
2. Nature education is gaining appreciation in the Thai society. It is quite important to gain more technical supports and ideas to work on this aspect from well-experienced nature education experts.
3. It would be quite useful for the managers and researchers in Thailand involving the World Heritage conservation to get some international supports to exchange their experiences with other country world heritages. UNESCO should have a program concerned to improve capacity of the area management and cooperation.

Experience learned and helpful for other World Heritages

1. The very positive results to the World Heritage ecosystem restoration after resettlement programs. Although resettlement of villages from protected areas are now considered by many as non-preferable schemes, the resilience of natural biological resources in Thailand World Heritage after relocations is well documented. Whatever perception people have on the resettlement programs the programs conducted in the World Heritage site here indicates quite a success story for long-term conservation of the natural resources.
2. Ecosystem approach to conserve the World Heritage site is logically sound for the World Heritage site in Thailand. The natural World Heritage in Thailand is not a stand-alone wild place. It is connected to other forestlands surrounding the area. The World Heritage values have been used to stimulate local conservation NGOs and educational institutes to see an importance to conserve the whole ecosystem. This strategy has been successful in building more networks of conservation groups to protect the forest. A further step is to use convince people, both managers and local groups, to think about how to rely on “**best science**” for long-term conservation of the World Heritage. The WEFKOM ecosystem management project is distributing ecological knowledge to local groups and institutes to learn about the status of the area. This is an important process for the future cooperation and coordination among stakeholders on area management.



Wild animals in the Thung Yai - Huai Kha Khaeng World Heritage

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