

Thailand

Species Conservation Priorities in Thailand

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Introduction

Thailand covers an area of about 541,000 km² extending between 6° and 20°N latitude in mainland Southeast Asia. The country encompasses diverse kinds of ecosystems and spans the Indo-Chinese, Indo-Malaysian, and Indo-Burmese subregions of the Oriental biogeographical region. The wildlife is diversified, but most species are not very abundant, which may be a consequence, in part, of their evolutionary history. The details of geographical distribution and habitat preference remain to be compiled for most vertebrates, including mammal and, to a lesser extent, bird species. Inventories of floristic communities are in progress, and efforts are being made to identify plants of potential use to the human population.

As is true of other developing countries in the tropics, Thailand is attempting to conserve its wildlife and forest habitats in the face of increasing exploitative pressures, both internal and external. According to government inventories, the forest cover of Thailand declined from more than 53% in 1961 to only 28% in 1981. The rate of forest destruction may have been nearly 10% a year during much of the last decade. Slash and burn agriculture and illegal logging, especially of teak and other tropical hardwoods, contributed significantly to this rate. In Thailand there are six major hilltribe populations, altogether consisting of more than 300,000 people, who practice shifting cultivation. Not only hilltribe peoples, but also ethnic Thais, have cleared large areas of forested land, which may be abandoned entirely after only a few years of use. A variety of timbering activities as well as irrigation and hydroelectric projects, highway construction, resettlement programs for hilltribe peoples and others, mineral exploration, and even recreation increase the pressure on forests and wildlife.

Illegal hunting or poaching of wildlife constitutes another serious problem. Traditional food hunting continues in areas near villages, but it is not nearly as detrimental to animal populations as the more modern type of hunting for sale. "Market hunting" is very difficult to control because of the sophistication of weapons available to hunters. The ready availability of modern forms of transportation and firearms results not only in wild animals being subjected to heavy slaughter, but also in forests being cleared and burned at an alarming rate to increase the area for cultivation as squatters do not hesitate to move in and settle down even in reserved forests.

Commercial exploitation for international trade also severely reduced certain populations of wild animals, for example, macaque monkeys, especially stump-tail macaques (*Macaca arctoides*). A ban on the commercial export of all macaque species went into effect in 1976.

Pesticides and insecticides are used freely in Thailand. In some places the widespread use of insecticides on crops has caused the

death of fish and other aquatic fauna, as well as birds. Such use also destroys predators and beneficial insects.

Species Conservation in Thailand

Early efforts in Thailand to protect wildlife were species-oriented. In 1921 a Wild Elephant Act was enacted, and in 1931 there were unsuccessful attempts to establish protection for the cows of wild water buffalo and some other large mammals. However, wild animals were reported to be still plentiful in every part of Thailand before World War II. Soon after the war, the impact of a rapidly expanding human population, declining economic wealth, and greater numbers of firearms and vehicles, as described above, resulted in both wildlife and their habitats being severely reduced. The Royal Forest Department and some societies, including the Siam Society, were responsible for the passage in 1960 of the Wild Animal Preservation and Protection Act B. E. 2503, which came into effect on January 1, 1961.

The Act established two major groups of wild animals: Reserved and Protected. These categories form the basis for the regulation of traffic in wildlife, to which a heavy commitment was made by private enterprise in Thailand, and are reflected in the schemes for captive breeding and restocking that are included within the Thai conservation strategy. These activities are under the jurisdiction of the Wildlife Conservation Division, Royal Forest Department.

Reserved wild animals are those considered to be rare or endangered, and are not permitted to be captured or hunted or even kept in possession except for educational or scientific purposes or for exhibition at zoological gardens. Nine species are included in this group: Javan rhinoceros (*Rhinoceros sondaicus*), Sumatran rhinoceros (*Dicerorhinus sumatrensis*), kouprey (*Bos sauveli*), wild water buffalo (*Bubalus bubalis*), Eld's deer (*Cervus eldi*), Schomburgk's deer (*Cervus schomburgki*), hog deer (*Axis porcinus*), goral (*Naemorhedus goral*) and serow (*Capricornis sumatraensis*; Table 1; Fig. 1).

Schomburgk's deer was endemic to Thailand and is now extinct; the last buck was shot in 1913. Of the rhinos, the Javan is believed to have been wiped out, while a few Sumatran are presently reported in some remote areas of the country. Villagers of Sisaket Province, in the northeast, reported having seen five kouprey near the Kampuchean border in August, 1982; it is believed that some animals moved to Thailand during the rainy season. Two subspecies of Eld's deer are found in Thailand, *Cervus eldi siamensis* and *Cervus eldi thamin*. The *siamensis* subspecies may have been extirpated in the wild, but small numbers of the *thamin* subspecies are reported to exist in areas near the Burmese border. The range of the goral is limited to remote parts of northern Thailand; a few goral were recently reported in Mae Tun Wildlife Sanctuary. It is doubtful if any hog deer still exist

Table 1. Reserved wild animals of Thailand

List of Reserved Wild Animals

1. Javan Rhinoceros (*Rhinoceros sondaicus*)
2. Sumatran Rhinoceros (*Dicerorhinus sumatrensis*)
3. Kouprey (*Bos sauveli*)
4. Wild Water Buffalo (*Bubalus bubalis*)
5. Eld's Deer (*Cervus eldi*)
6. Schomburgk's Deer (*Cervus schomburgki*)
7. Hog Deer (*Axis porcinus*)
8. Serow (*Capricornis sumatraensis*)
9. Goral (*Naemorhedus goral*)

*Schedule of Reserved Wild Animals, the Wild Animals Reservation and Protection Act B.E 2503

within the former range of the species. However, a number of hog deer are being kept in captivity. The only known wild water buffalo population occurs in Huai Kha Khaeng Wildlife Sanctuary, where approximately 50-80 animals survive. Poaching is presently the main problem threatening this relict group of wild cattle. The least threatened species in the reserved category seems to be the serow, which ranges throughout every region of the country, mainly in limestone mountains and can be found in every wildlife sanctuary.

The Protected group of wild animals is composed of two categories (Table 2). The first category legally includes wild animals whose flesh is not usually used as human food, or which are not usually hunted for sport, or which destroy plant pests, or which should be protected for their natural beauty or for increasing their population numbers. Capturing live animals of this first category is permissible, but killing of these animals is not allowed except by collecting permit issued only for educational or scientific purposes. There are presently 184 vertebrate taxa declared as Protected Wild Animals of the First Category: 35 mammal, 131 bird, and 14 reptile (Table 2). Since venomous snakes pose a threat to the human population in agricultural areas, protection for reptiles is difficult to obtain, and, as a consequence, large numbers of snakes continue to be exported annually.

Protected wild animals of the second category are considered to be those that are palatable for human consumption or that are traditionally hunted for sport. Hunting of these animals can be done by securing a license. There are presently 35 vertebrate taxa declared as Protected Wild Animals of the Second Category: 12 mammal, 22 bird, and one amphibian (Table 3). Gaur (*Bos gaurus*) and banteng (*Bos banteng*), sambar deer (*Cervus unicolor*) and barking deer (*Muntiacus muntjak*), tiger (*Panthera tigris*) and leopard (*Panthera pardus*) are among the mammals historically included in the second category.

In Thailand the breeding program for wild animals has two objectives. Some species of rare animals, for example, Eld's deer, banteng and fireback pheasant (*Lophura diardi*), are being bred in captivity for restocking in areas where they have been depleted; no release has yet been made. A number of hog deer are being kept in captivity for study and breeding purposes; some animals introduced onto an island in the southeast are breeding successfully. Likewise, reports of sightings of kouprey on the Thai-Kampuchean border have resulted in expeditions by the Wildlife Conservation Division to capture for propagation and study individuals of this wild cattle species which was believed to have been hunted to extinction in Thailand during this century. No capture has yet been made. In contrast, animals such as sambar deer and peafowl (*Pavo muticus*) are being maintained in captivity to increase their numbers and to study the requirements for commercially farming them.

Table 2. Protected wild animals of Thailand

Schedule 1. List of Protected Wild Animals of the first category

No.	<i>Protected Wild Animals of the first category</i>
MAMMALIA	
1	Flying Squirrels of genera <i>Hylopetes</i> and <i>Pteromyscus</i>
2	Giant Flying Squirrels of genus <i>Petaurista</i>
3	Prevost's Squirrel (<i>Callosciurus prevostii</i>)
4	Langurs of genus <i>Presbytis</i>
5	Kitti's Hog-nosed Bat (<i>Craseonycteris thonglongyai</i>)
6	Wrinkled-lipped Bat (<i>Tararida plicata</i>)
7	Large Indian Civet (<i>Viverra zibetha</i>)
8	Small Indian Civet (<i>Viverricula malaccensis</i>)
9	Large Spotted Civet (<i>Viverra megaspila</i>)
10	Otter Civet (<i>Cynogale bennetti</i>)
11	Gibbons of genus <i>Hylobates</i>
12	Asiatic Wild Elephant (<i>Elephas maximus</i>)
13	Otters of genera <i>Lutra</i> , <i>Lutrogale</i> and <i>Amblyonyx</i>
14	Flying Lemur (<i>Cynocephalus variegatus</i>)
15	Giant Squirrels of genus <i>Raufa</i>
16	Mongoose of genus <i>Herpestes</i>
17	Back-striped Weasel (<i>Mustela strigidorsa</i>)
18	Siberian Weasel (<i>Mustela sibirica</i>)
19	Malaysian Weasel (<i>Mustela nudipes</i>)
20	Asiatic Brush-tailed Porcupine (<i>Atherurus macrourus</i>)
21	Common Porcupine (<i>Hystrix brachyura</i>)
22	Brush-tailed Porcupine (<i>Atherurus angustiramus</i>)
23	Marbled Cat (<i>Felis marmorata</i>)
24	Leopard Cat (<i>Felis bengalensis</i>)
25	Flat-headed Cat (<i>Felis planiceps</i>)
26	Jungle Cat (<i>Felis chaus</i>)
27	Slow Loris (<i>Nycticebus coucang</i>)
28	Macaques of genus <i>Macaca</i>
29	Pangolins of genus <i>Manis</i>
30	Malayan Tapir (<i>Tapirus indicus</i>)
31	Clouded Leopard (<i>Neofelis nebulosa</i>)
32	Golden Cat (<i>Felis temminckii</i>)
33	Fishing Cat (<i>Felis viverrina</i>)
34	Binturong Bear Cat (<i>Arctictis binturong</i>)
35	Hog Badger (<i>Arctonyx collaris</i>)
36	Ferret Badger (<i>Melogale personata</i>)
37	Yellow-throated Marten (<i>Martes flavigula</i>)
38	Banded Linsang (<i>Prionodon linsang</i>)
39	Spotted Linsang (<i>Prionodon pardicotor</i>)
40	Banded Palm Civet (<i>Hemigalus derbyanus</i>)

AVES

1	Cormorants of family Phalacrocoracidae
2	Spot-billed Pelican (<i>Pelecanus philippensis</i>)
3	Painted Stork (<i>Ibis leucocephalus</i>)
4	Black Stork (<i>Ciconia nigra</i>)
5	White-necked Stork (<i>Ciconia episcopus</i>)
6	Black-necked Stork (<i>Xenorhynchus asiaticus</i>)
7	Ibises of family Threskiornithidae
8	Hill Partridges of genus <i>Arborophila</i>
9	Long-billed Partridge (<i>Rhizothera longirostris</i>)
10	Ferruginous Wood Partridge (<i>Caloperdix ocellata</i>)
11	Bamboo Partridge (<i>Bambusicola fytchii</i>)
12	Roulroul (<i>Rollulus roulroul</i>)
13	Pheasants of genus <i>Lophura</i>
14	Hume's Pheasant (<i>Syrmaticus humiae</i>)
15	White-breasted Waterhen (<i>Amauornis phoenicurus</i>)

No. Protected Wild Animals of the first category

AVES (Continued)

16	Sarus Crane (<i>Grus antigone</i>)	75	Broad-billed Sandpiper (<i>Limicola falcinellus</i>)
17	Lapwings of genus <i>Vanellus</i>	76	Curlew Sandpiper (<i>Calidris furruginea</i>)
18	Thick-knees of family Burhinidae	77	Asian Dowitcher (<i>Limnodromus semipalmatus</i>)
19	Munias and Weavers of family Ploceidae	78	Drongos of family Dicruridae
20	Red-billed Ground Cuckoo (<i>Carpococcyx renauldi</i>)	79	Koel (<i>Eudynamis scolopacea</i>)
21	Coucak or Crow Pheasant of genus <i>Centropus</i>	80	Thrushes of genera <i>Zoothera</i> and <i>Turdus</i>
22	Kingfishers of family Alcedinidae	81	Common Sandpiper (<i>Actitis hypoleucos</i>)
23	Laughing Thrushes of genus <i>Garrulax</i>	82	Wagtails and Pipits of family Motacillidae
24	Hoopoe (<i>Upupa epops</i>)	83	Greater Adjutant Stork (<i>Leptoptilos dubius</i>)
25	Silver-eared mesia (<i>Leiothrix argentauris</i>)	84	Lesser Adjutant Stork (<i>Leptoptilos javanicus</i>)
26	Grey-headed Parakeet (<i>Psittacula finschii</i>)	85	Great Barbet (<i>Megalaima virens</i>)
27	Treepies of genus <i>Dendrocitta</i>	86	Tits of family Paridae
28	Great Hornbill (<i>Buceros bicornis</i>)	87	Coppersmith Barbet (<i>Megalaima haemacephala</i>)
29	Indian Pied Hornbill (<i>Anthracoceros albirostris</i>)	88	Wandering Tattler (<i>Heteroscelus incanus</i>)
30	Black Hornbill (<i>Anthracoceros malayanus</i>)	89	Night Jars of family Caprimulgidae
31	Racket-tailed Treepies (<i>Crypsirina temia</i>)	90	Black-billed Roller (<i>Coracias benghalensis</i>)
32	Babblers, Thrushes, Mesia, Cutia, Barwing, Sivas, Yuhinas, and Sibilas of genera <i>Pellorneum</i> , <i>Trichastoma</i> , <i>Malacopteron</i> , <i>Stachyris</i> , <i>Macronous</i> , and <i>Chrysomma</i>	91	Dollar Bird (<i>Eurystomus orientalis</i>)
33	Parrots of genus <i>Psittacula</i>	92	Nuthatches of family Sittidae
34	Magpie Robin (<i>Copsychus saularis</i>)	93	Pittas of family Pittidae
35	White-rumped Shama (<i>Copsychus malabaricus</i>)	94	Knots and Stints of genus <i>Calidris</i>
36	Forktails of genus <i>Enicurus</i>	95	Swifts, Tree Swifts, Swallows, and Martins of family Apodidae, Hemiprocnidae, and Hirundinidae
37	Rock Thrush of genus <i>Monticola</i>	96	Gulls and Terns of family Laridae
38	Warblers of subfamily Sylviinae	97	Malkohas of genus <i>Phaenicopheus</i>
39	Black-collared Starling (<i>Sturnus nigricollis</i>)	98	Bulbuls of family Pycnonotidae
40	Sunbirds of family Nectariniidae	99	Little Grebe (<i>Podiceps ruficollis</i>)
41	Crested Jay (<i>Platylophus galericulatus</i>)	100	Open-billed Stork (<i>Anastomus oscitans</i>)
42	White-winged Black Jay (<i>Platysmurus leucopterus</i>)	101	Parrotbills of genus <i>Paradoxomis</i>
43	Flowerpeckers of family Dicaeidae	102	Black-tailed godwit (<i>Limosa limosa</i>)
44	Robins of genera <i>Phoenicurus</i> , <i>Rhyacornis</i> , <i>Thamnotaea</i> , <i>Hodgsonius</i> , and <i>Cinclidium</i>	103	Bar-tailed godwit (<i>Limosa lapponica</i>)
45	Red-breasted Parakeet (<i>Psittacula alexandri</i>)	104	Comb Duck (<i>Sarkidiornis melanotos</i>)
46	Cuckoo Dove of genus <i>Macropygia</i>	105	White-winged Wood Duck (<i>Cairina scutulata</i>)
47	Red Turtle Dove (<i>Streptopelia tranquebarica</i>)	106	Pigeons of genus <i>Treron</i>
48	Spotted-necked Dove (<i>Streptopelia chinensis</i>)	107	Jambu Fruit Pigeon (<i>Ptilinopus jambu</i>)
49	Zebra Dove (<i>Geopelia striata</i>)	108	Brown-throated Tree Creeper (<i>Certhia discolor</i>)
50	Emerald Dove (<i>Chalcophaps indica</i>)	109	Frogmouths of family Podargidae
51	Rufous Dove (<i>Streptopelia orientalis</i>)	110	Spectacled Barwing (<i>Actinodura ramsayi</i>)
52	Cutia (<i>Cutia nipalensis</i>)	111	Cochoas of genus <i>Cochoa</i>
53	Trogon of family Trogonidae	112	Pintail Parrot Finch (<i>Erythrura prasina</i>)
54	Ioras and Leafbirds of family Chloropscidae	113	Broadbills of family Eurylaimidae
55	Hill Myna (<i>Gracula religiosa</i>)	114	Minivets of family Campophagidae
56	White-eyes of family Zosteropidae	115	Turnstone (<i>Arenaria interpres</i>)
57	Orioles and Bluebirds of family Oriolidae	116	Barbets of genus <i>Megalaima</i>
58	Sanderling (<i>Crocethia alba</i>)	117	Brown Dipper (<i>Cinclus pallasi</i>)
59	Rail Babbler (<i>Eupetes macrocerus</i>)	118	Hérons, Bitterns, and Egrets of family Ardeidae
60	Red-winged Crested Cuckoo (<i>Clamator coromandus</i>)	119	Green Peafowl (<i>Pavo muticus</i>)
61	Cuckoos of genus <i>Cacomantis</i>	120	Scimitar of genus <i>Pomatorhinus</i>
62	Cuckoos of genus <i>Cuculus</i>	121	Ruff and Reeve (<i>Philomachus pugnax</i>)
63	Cuckoos of genus <i>Chrysococcyx</i>	122	Pied Imperial Pigeon (<i>Ducula bicolor</i>)
64	Drongo Cuckoo (<i>Surniculus lugubris</i>)	123	Peacock pheasants of genus <i>Polyplectron</i>
65	Owls of family Strigidae	124	Sivas of genus <i>Minla</i>
66	Anhinga (<i>Anhinga anhinga</i>)	125	Barn Owl (<i>Tyto alba</i>)
67	Hornbills of family Bucerotidae	126	Greenpies of genus <i>Cissa</i>
68	White-eyed River Martin (<i>Pseudocheilidon sirintarae</i>)	127	Golden-crested Myna (<i>Ampeliceps coronatus</i>)
69	Bee-eaters of family Meropidae	128	Shrike babblers of genera <i>Pteruthius</i> and <i>Gampsorhynchus</i>
70	Larks of family Alaudidae	129	Blue-rumped Parrot (<i>Psittinus cyanurus</i>)
71	Flycatchers and Niltavas of subfamily Muscicapinae	130	Hanging lorikeets of genera <i>Loriculus</i>
72	Brown Barbet (<i>Calorhamphus fuliginosus</i>)	131	Helmeted Hornbill (<i>Rhinoplax vigil</i>)
73	Nicobar Pigeon (<i>Caloenas nicobarica</i>)	132	Great Argus Pheasant (<i>Argusianus argus</i>)
74	Sandpipers and Shanks of genus <i>Tringa</i>	133	Hawks, Kites, Buzzards, Goshawk, Shikra, Eagles, Vultures, Harriers, Ospreys, Falconats, Falcons, Hobby and Kestrels of Order Falconiformes
		134	Woodpeckers of family Picidae
		135	Plovers in genera <i>Charadrius</i> and <i>Pluvialis</i>
		136	Blue Whistling Thrush (<i>Myophonus caeruleus</i>)

No. *Protected Wild Animals of the first category*

AVES (Continued)

- 137 Ashy Wood Swallow (*Artamus fuscus*)
- 138 House Crow (*Corvus splendens*)
- 139 Large-billed Crow (*Corvus macrorhynchus*)
- 140 Black-headed Shrike (*Lanius schach*)
- 141 Pied Starling (*Sturnus contra*)
- 142 Jerdon's Starling (*Sturnus burmannicus*)
- 143 Common Myna (*Acridotheres tristis*)
- 144 Crested Myna (*Sturnus javanicus*)
- 145 Owls of genera *Ketupa* and *Bubo*

- 16 Leathery Turtle (*Dermochelys coriacea*)
- 17 Giant Asiatic Tortoise (*Testudo emys*)
- 18 Pacific Ridley's Turtle (*Lepidochelys olivacea*)
- 19 Elongate Tortoise (*Testudo elongata*)
- 20 Roughneck Monitor (*Varanus rudicollis*)

AMPHIBIA

- 1 Crocodile Salamander (*Tylotriton versucosus*)

*Ministerial Regulation No. 14 (B.E. 2525) Issued according to the Wild Animals Reservation and Protection Act B.E. 2503

REPTILIA

- 1 Flying Lizard of genus *Draco*
- 2 Garden Lizard of genus *Calotes*
- 3 Spiny Lizard of genus *Acanthosaura*
- 4 Angle-headed Lizard of genus *Goniocephalus*
- 5 Oriental Water Lizard (*Physignathus cocincinus*)
- 6 False Gavial (*Tomistoma schlegelii*)
- 7 Gecko of genus *Cyrtodactylus*
- 8 Flying Gecko of genus *Ptychozoon*
- 9 Hawksbill Turtle (*Eretmochelys imbricata*)
- 10 River Turtle or Four-toed Turtle (*Batagur baska*)
- 11 Spiny Hill Turtle (*Geoemyda spinosa*)
- 12 Impressed Tortoise (*Testudo impressa*)
- 13 Green Turtle (*Chelonia mydas*)
- 14 Loggerhead Turtle (*Caretta caretta*)
- 15 Big-headed Turtle (*Platysternum megacephalum*)

Table 3. Protected Wild Animals of Thailand

Schedule 2. List of Protected Wild Animals of the second category

No. *Protected Wild Animals of the second category*


A. MAMMALIA

- 1 Gaur (*Bos gaurus*)
- 2 Mouse Deer of genus *Tragulus*
- 3 Siamese Hare (*Lepus siamensis*)
- 4 Sambar Deer (*Cervus unicolor*)
- 5 Dugong (*Dugong dugong*)
- 6 Banteng (*Bos banteng*)
- 7 Tiger (*Panthera tigris*)
- 8 Leopard or Panther (*Panthera pardus*)
- 9 Asiatic Black Bear (*Selenarctos thibetanus*)
- 10 Malayan Sun Bear (*Helarctos malayanus*)


สัตว์ป่าสงวน

สัตว์ป่าสงวน (Reserved Wild Animal) หมายถึงสัตว์ป่าที่หายาก มี ๑ ชนิดคือ เนื้อสมัน ละองหรือละมั่ง กวางผา เลียงผา เนื้อทราย กระซู่ แรด กูปรี และควายป่า


ตามพระราชบัญญัติสงวนและคุ้มครองสัตว์ป่า พ.ศ. ๒๕๐๓ ห้ามมิให้ผู้ใดล่าหรือมีไว้ในครอบครอง เว้นแต่จะเป็นการกระทำเพื่อการศึกษา หรือ วิจัยทางวิชาการ หรือเพื่อ กิจการสวนสัตว์สาธารณะ ซึ่งจะต้องได้รับหนังสืออนุญาตจากอธิบดีกรมป่าไม้



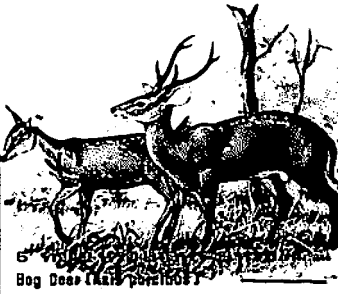
Schomburgk's Deer (*Cervus schomburgki*)




๓ กวางผา
Gaur (*Neomohedus gaur*)



๑ เลียงผา
Goral (*Neomohedus goral*)



๑ เนื้อทราย
Bog Deer (*Kaia porcinus*)



๑ เนื้อสมัน
Sumatran Rhinoceros (*Rhinoceros sumatranus*)



๑ เนื้อสมัน
Javan Rhinoceros (*Rhinoceros sondaicus*)



๑ กูปรี
Kouprey (*Bos sauveli*)



๑ ควายป่า
Wild Buffalo (*Bubalus bubalis*)

Fig. 1: Poster produced in Thailand depicting the country's nine Reserved Wild Animals. These include Schomburgk's deer, Eld's deer, goral, serow, hog deer, Sumatran rhinoceros, Javan rhinoceros, kouprey and wild buffalo.

MAMMALIA (Continued)

- 11 Barking Deer (*Muntiacus muntjak*)
 12 Fea's Barking Deer (*Muntiacus feae*)

B. AVES

- 1 Grey Heron (*Ardea cinerea*)
 2 Purple Heron (*Ardea pupurea*)
 3 Dusky Grey Heron (*Ardea sumatrana*)
 4 Francolin (*Francolinus pintadeanus*)
 5 Green-legged Tree Partridge (*Arborophila charltonii*)
 6 Finches and Buntings of family Fringillidae
 7 Red Jungle Fowl (*Gallus gallus*)
 8 Night Heron (*Nycticorax nycticorax*)
 9 Ducks, Garganeys, Pintails, Pochards, Shelducks, Shovellers, Teals, and Wigeon of family Anatidae
 10 Painted Snipe (*Rostratula benghalensis*)
 11 Snipes of genus *Capella*
 12 Thick-billed Green Pigeon (*Treron curvirostra*)
 13 Bronze-winged Jacana (*Metopidius indicus*)
 14 Mountain Imperial Pigeon (*Ducula badia*)
 15 Pale-capped Pigeon (*Columba punicea*)
 16 Green Imperial Pigeon (*Ducula aenea*)
 17 Rails and Crakes of family Rallidae
 18 Curlews and Whimbrel of genus *Numenius*
 19 Watercock (*Gallicrex cinerea*)
 20 Moorhen (*Gallinula chloropus*)
 21 Purple Gallinule (*Porphyrio poliocephalus*)
 22 Pheasant-tailed Jacana (*Hydrophasianus chirurgus*)

C. AMPHIBIA

- 1 Asiatic Giant Frog (*Rana blythii*)

Each year a quota is set for the numbers and species of Protected wild animals to be hunted and traded. In 1981, 12 bird taxa of the first category and six bird taxa of the second category were so listed, (Table 3), but no mammals or reptiles.

In January 1983, Thailand ratified CITES and became the 79th member country effective as of April 21, 1983. In order to guard against the smuggling of wildlife from Thailand to non-CITES countries, which continues to be a serious problem, the Wildlife Conservation Division maintains two checkpoints, at the airport and at the harbor in Bangkok. Three more checkpoints will be established, at the borders with Laos and with Malaysia, and at Chiangmai International Airport.

Habitat-Oriented Conservation Activities

The Wildlife Act of 1960, in recognition of the need to maintain critical habitat for species survival, also provided for the creation of protected areas for wild animals (wildlife sanctuaries). The Wildlife Conservation Division has jurisdiction over the sanctuaries. The first sanctuary, Salak Phra, in the province of Kanchanaburi in west-central Thailand, was established in 1965. Since then, 23 more sanctuaries have been set up. The total area included within the sanctuaries is somewhat less than 2 million hectares, or almost 4% of the country's area (Figure 1).

The first national park of Thailand, Khao Yai, spanning the provinces of Nakhon Rachasima, Saraburi, Nakhon Nayak and Prachinburi in central Thailand, was declared in 1963, following enactment of the National Parks Act of the previous year.

TABLE 3. HUNTING AND TRADING QUOTA OF PROTECTED WILD ANIMALS FOR 1982

The Wildlife Conservation Committee has determined the limit for numbers of protected wild animals to be hunted and traded per licensee for 1982. The export of these protected animals will, therefore, not exceed these limited numbers.

A. Hunting and Trading Quota of Protected Wild Animals of the First Category.

No.	Animal Taxon	Bag Limits	Trading Limits
1	White-breasted waterhen (<i>Amaurornis phoenicurus</i>)	5	30
2	Laughing thrushes of genus <i>Garrulax</i>	5	20
3	Parrots of genus <i>Psittacula</i> excluding Red-breasted parakeet (<i>Psittacula alexandri</i>) and Large parakeet (<i>Psittacula eupatria</i>)	15	60
4	White-rumped shama (<i>Copsychus malabaricus</i>)	5	10
5	Spotted-necked dove (<i>Streptopelia tranquebarica</i>)	10	20
6	Zebra dove (<i>Geopelia striata</i>)	10	50
7	Hill myna (<i>Gracula religiosa</i>)	5	30
8	Koel (<i>Eudynamis scolopacea</i>)	2	10
9	Great barbet (<i>Megalaima virens</i>)	2	10
10	Pintail parrot finch (<i>Erythrura prasina</i>)	10	50

B. Hunting and Trading Quota of Protected Wild Animals of the Second Category.

No.	Animal Taxon	Bag Limits	Trading Limits
1	Francolin (<i>Francolinus pintadeanus</i>)	5	10
2	Snipes of genus <i>Capella</i>	10	20
3	Thick-billed green pigeon (<i>Treron curvirostra</i>)	10	30
4	Watercock (<i>Gallicrex cinerea</i>)	20	50
5	Moorhen (<i>Gallinula chloropus</i>)	20	50
6	Purple gallinule (<i>Porphyrio poliocephalus</i>)	10	40

The national parks, which are under the jurisdiction of the National Parks Division, Royal Forest Department, are intended, in contrast to the wildlife sanctuaries, to provide a place for recreation in addition to protecting local flora and fauna. At present there are 42 national parks, including several marine parks, encompassing a total of more than 2.3 million hectares, or about 4.5% of Thailand's area (Figure 2).

Many of the protected areas contain excellent forest and other habitats for wild animals. The survival of relatively intact ecosystems frequently can be attributed to the location of these areas in regions peripheral to human development. All efforts are be-

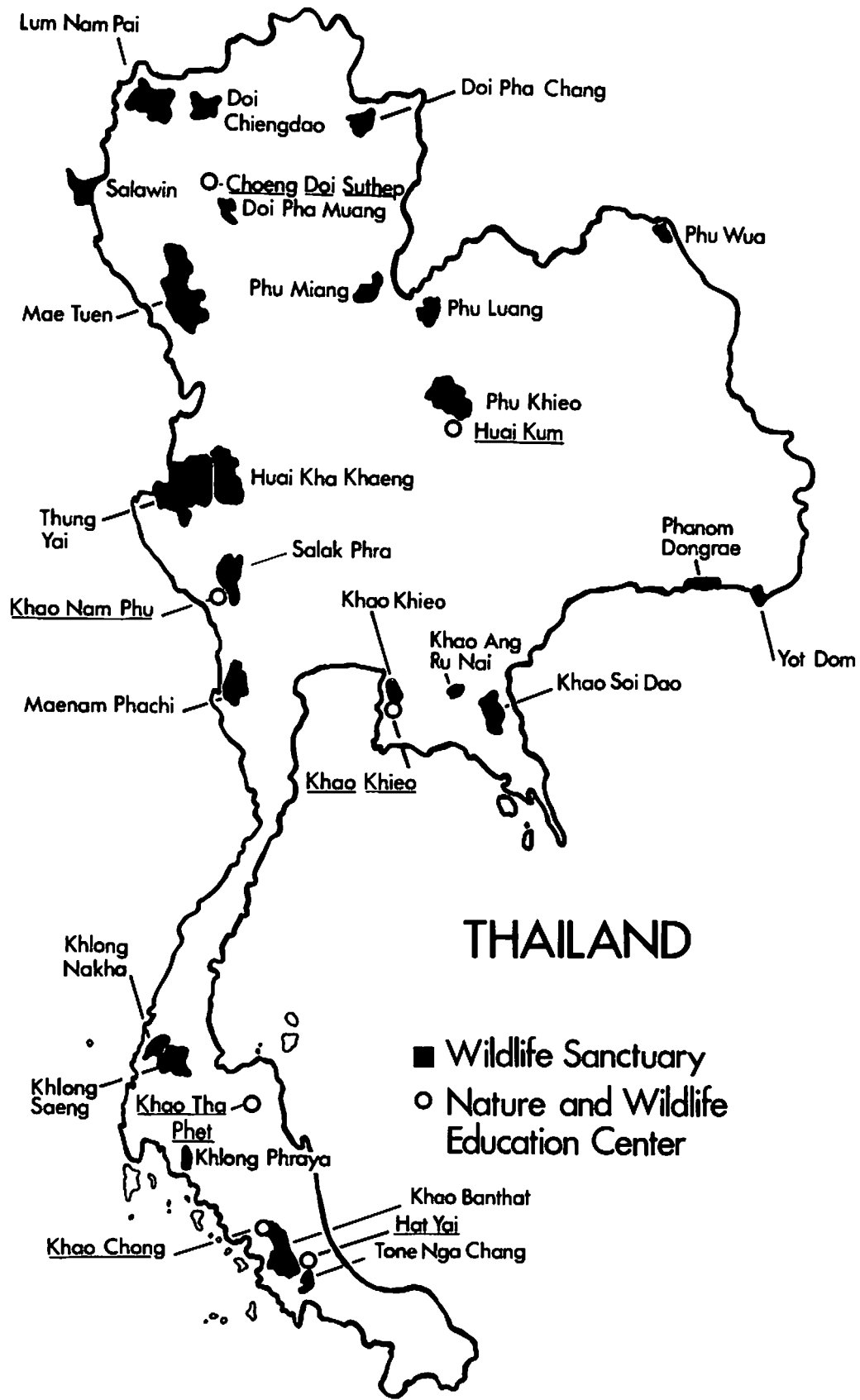


Fig. 2: Map of Thailand showing the location of existing Wildlife Sanctuaries and Nature and Wildlife Education Centers.

ing made by the Royal Forest Department to protect the sanctuaries and national parks, but each area appears to have its own set of conservation problems, as discussed below. Based on surveys conducted by the Royal Forest Department, there seem to be good forests and other habitats for wild animals remaining, that if brought under the jurisdiction of the sanctuaries or national parks would increase the reserved areas to about 10% of the total area of Thailand. Within the Royal Forest Department there is some debate over whether the more effective conservation strategy involves strengthening protection for already existing reserves or declaring as much remaining area as possible part of the reserve system before human encroachment occurs.

Within the wildlife sanctuaries and national parks, hunting, timbering and mining are prohibited. Other activities are strictly regulated. However, hydroelectric and irrigation projects increasingly are threatening protected areas. Salak Phra, the first sanctuary, lost much of its wildlife richness as a consequence of the construction of Srinakarin Dam. Elsewhere in western Thailand, the proposed Nam Choan Dam, to be financed with the assistance of the World Bank, threatens to disrupt the migrations of large mammals such as elephant between Huai Kha Khaeng and Thung Yai sanctuaries and open up the latter to human exploitation.

Research on wildlife in Thailand is aimed at producing management techniques or at adding to our general knowledge about species. Several projects to identify species and numbers of animals and habitat requirements have been initiated in protected areas. Both Thai scientists and foreign scientists are involved in these activities. Thai researchers have concentrated on the study of bird populations, including the shore birds found at Songkhla Lake in southern Thailand. Foreign researchers, in cooperation with Thai students or Thai counterparts in the Royal Forest Department, have concentrated on the study of primate populations (see below).

Many efforts are being made to make the Thai public aware of the value of their natural heritage and of how to enjoy nature. The Wildlife Conservation Division has set up Nature and Wildlife Education Centers in seven sanctuaries, representing every part of Thailand (Figure 1). The National Parks Division also is improving its visitor centers in the national parks.

Conservation Action Priorities

The comments which follow address the problem of developing effective local conservation strategies and were prepared by Brockelman and Eudey as a consequence of their field work on primates in Khao Soi Dao and Huai Kha Khaeng Wildlife Sanctuaries, respectively.

As in neighboring countries, there are a large number of endangered species in Thailand, some of which have been identified above. The Species Survival Commission (SSC) has the same ultimate goal as the other IUCN Commissions. Our particular responsibility is to help identify the species and habitats in need of urgent attention and establish some priorities for action. This should be followed up with project proposals. We are now rethinking how species and project priorities should be set to arrive at some useful recommendations for Thailand. What should be the criteria?

The first and most obvious criterion for the SSC is the *degree of endangerment of the species*. Critically endangered species should receive more attention than vulnerable species.

A second criterion is the *probable effect of the proposed action*. Is the anticipated effect small or large, localized or widespread, measurable or highly diffuse? Is the probable effect high per dollar spent? This is clearly important. For example, the Sumatran rhinoceros is highly endangered in Thailand; as such, it is classified as a Reserved Animal, and its survival is prob-

lematical. It is doubtful if \$50,000 spent on this species would have any effect; spending a comparable amount to conserve elephants, which are also endangered but more abundant, would seem to hold more promise.

A third criterion is the *feasibility of the project* — can it, in fact, be carried out? Feasibility depends on many factors, such as:

1. Available infrastructure, for administrative and managerial support.
2. Local enthusiasm and cooperation.
3. Availability of capable principal investigators.
4. Logistical and/or scientific feasibility.

The probable effect of the project and its feasibility, to a large degree, depend on another consideration, the *strategy of conservation*. By this, we refer to areas of action such as the following:

1. Protection: creation of guard stations or procurement of equipment.
2. Field information: population inventory and habitat survey.
3. Research: ecological study.
4. Management and technical training assistance.
5. Education: dissemination of information on population and habitat significance on appropriate levels.
6. Socioeconomic action involving local residents near reserved areas.

Each of these areas of action has probable effect on, and a feasibility for, a given population or ecosystem. The efficacy of each action depends heavily on local circumstances and may vary even from one protected area to another within the same region. We can make some generalizations for Thailand. Equipment for protection is budgeted by the Thai government and, at this point in time, is not lacking; we do not feel that WWF or other outside agencies normally need assume this responsibility as it is not really efficient use of limited funds. Population inventory and habitat survey are badly needed in the greatly expanding system of sanctuaries and parks in Thailand, and some assistance in planning and actual execution of such activities may be essential. Research assistance may be useful in breeding or managing a few species, such as deer for rural economic development, or sea turtles. Education of persons living near sanctuaries and parks, especially children, is a valuable long-term investment, but it is doubtful if it will modify the immediate poaching and problems attendant upon shifting cultivation, which have largely socioeconomic causes and solutions. Education of high government officials is not such a priority in Thailand because conservation and protection are well supported by the law and the bureaucracy, but education of politicians may be critical because of the potential destruction of species and habitat by rapid technological development.

Nearly 10% of the territory of Thailand, as indicated above, may soon be included in the expanding protected area system. The problem now is how to most effectively maintain and strengthen this area. Socioeconomic action to us seems to be a neglected concern. We will illustrate our concept of the need for action in this area with experiences in two major reserved areas, both of which contain a diversity of endangered species.

Khao Soi Dao Wildlife Sanctuary. This area, which includes over 1,000 km² in southeast Thailand not far from the Kampuchean border, contains elephant, gaur, tiger, wild dog, silvered leaf monkey (*Presbytis cristatus*) and many other species. The very lush rain forests covering its mountains, valleys, and hills contain probably the most dense and extensive population of the pileated gibbon (*Hylobates pileatus* Figs. 4 & 5), making it a top priority for action for this reason alone. Although deforestation has been largely halted, poaching by local farmers continues in



Fig. 3: Map of Thailand showing the location of existing National Parks.

nearly all parts of the sanctuary, and the guards are unable to stop it anywhere except near the three or four stations at the edge of the sanctuary (and usually away from the forest). The forest is not patrolled.

What actions could further conserve the species in this sanctuary since existing protection is insufficient to do the job? Management planners might say that the first priority is more protection, i.e., more jeeps, guns, guard stations, radios and motorcycles. But researchers with several years' experience in Khao Soi Dao have concluded that a project oriented toward more protection capability would probably have little positive effect and might actually have adverse effects. The approximately 30 men stationed there are reasonably well-equipped, but there are too few men to man the existing stations and patrol the forest. It is not likely that their numbers will be increased because the budget is limited for manpower, and an increase cannot be affected by outside financial help. The critical factor may be relations with the local residents, who harvest plant and animal products within the forest. Experience over the years has shown that if strict enforcement is attempted, the local residents resist with a variety of tactics: appeal to local politicians or police to pressure the sanctuary officials, threats on the sanctuary headquarters, and actual shooting at the guards. What is to be done? To advocate that the Royal Forest Department become an occupying army would only worsen an existing insurgency problem in the region. Khao Soi Dao is now nearly a forest island surrounded by several thousand relatively poor farm families (and some not-so-poor rambutan orchards) that cannot be managed or regulated by force. What may be needed is a change in the concept of wildlife sanctuary. Every effort must be made to realize the considerable value of the sanctuary to science, education, and the benefit of the local residents who must make economic sacrifices to preserve it. No such effort is being made now, and we see little hope that local poaching will stop. There is no ethical mandate to stop it.



Fig. 5: Adult male pileated gibbon (*Hylobates pileatus*) in Khao Soi Dao Wildlife Sanctuary (photo by W. Y. Brockelman).



Fig. 4: Juvenile pileated gibbon (*Hylobates pileatus*) in Khao Soi Dao Wildlife Sanctuary (photo by W. Y. Brockelman).



Fig. 6: The stump-tailed macaque (*Macaca arctoides*), probably the most endangered of Thailand's macaque species (photo by R. A. Mittermeier).



Fig. 7: Forest destruction caused by shifting cultivation to the east of Huai Kha Khaeng Wildlife Sanctuary, Uthaitani Province. The area was covered with dry evergreen forest until about 200 years ago (photo by A. A. Eudey).

Huai Kha Khaeng Wildlife Sanctuary. This area is more than twice as large as Khao Soi Dao and encompasses monsoon deciduous and evergreen forest in lowland and mountain regions in the Dvana Range in west-central Thailand near Burma. Huai Kha Khaeng and the contiguous sanctuary of Thung Yai to the west total about 4,830 km² and constitute one of the largest remaining forested areas in Thailand. In the former the mammal fauna includes elephant, wild water buffalo, tapir (*Tapirus indicus*), serow, and many congeneric species, for example, banteng and gaur, tiger and leopard, Phayre's leaf monkey (*Presbytis phayrei*) and silvered leaf monkey, and five species of macaques, including the stump-tail macaque (*Macaca arctoides*, Fig. 6), which appears to be endangered throughout its disjunct distribution in Asia. Only the lar or white-handed gibbon (*Hylobates lar*) is found in the region. Although research or conservation efforts may be based on a species approach (Eudey, for example, has been studying the ecology of sympatric macaques in Huai Kha Khaeng since 1973), the importance of this protected area, with an extremely patchy environment, lies in the complexity of its ecosystem. The area may have been a forest refuge or refugium in the Pleistocene during periods of decreasing temperature and precipitation induced by glacial advances at more northern latitudes.

The region is remote (few Thais in Bangkok have ever visited the province of Uthaitani in which most of the sanctuary is found), yet easily accessible for research (and for poaching). Although the presence of human occupation in the general area and hunting of wildlife can be documented in the archaeological record to about 14,000 years ago, contemporary encroachment by

the human population is recent.

Since its declaration in 1972, some effort has been made to employ local residents in the actual running of the sanctuary; a settlement of former hunters even has been incorporated into sanctuary headquarters. Initially Karen hilltribe men, the local people most knowledgeable of the forest and animals, were employed as guides and general assistants, but their numbers have dwindled and no effort is being made to recruit them now. A resettlement scheme for Karen south of the sanctuary may even increase the amount of poaching done by these people. Meo villages occur within the sanctuary. Some of the villages engage in insurgency and some in opium-growing. Throughout the Meo area shifting agriculture is destroying primary forest and wildlife is being threatened by subsistence hunting (Fig. 7 & 8). Increasing communication and cooperation with hilltribe peoples seem essential for strengthening of the sanctuary.

Patrol of the forest against hunting does occur, and this is one sanctuary where, because of its size, an increase in guard stations and acquisition of more sophisticated weapons is necessary. Hunting may be commercially motivated or for sport by people equipped with modern weapons.

Expansion of the boundaries of the sanctuary to the east and south is essential to include habitat critical for bovids. A plywood concession to the east makes the boundary artificial and excludes an area of important salt licks from legal protection. Habitat of wild water buffalo is outside the present boundary in the south. Minor and major irrigation and hydroelectric projects, if executed, will increase the accessibility of the sanctuary to the human population, necessitating more protection. In this context, educa-

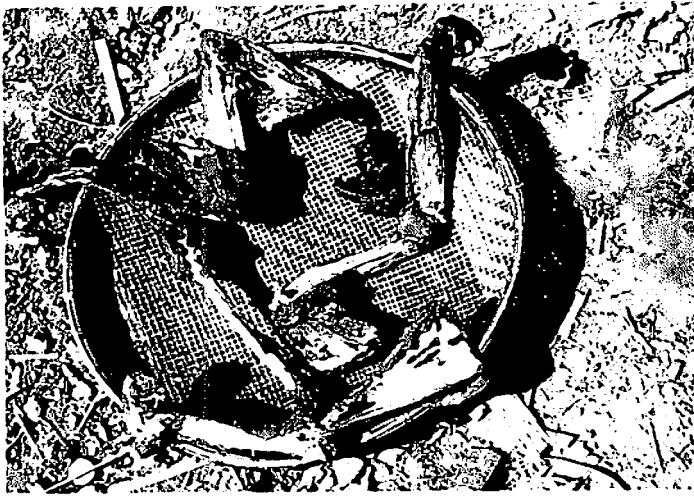


Fig. 8: Signs of subsistence hunting of protected wild animals by Meo hilltribe peoples. In the basket are limb bones of a colobine monkey, probably Phayre's leaf monkey (*Presbytis phayrei*), which has been smoked over a fire, and on the ground is the hair of a white-handed gibbon (*Hylobates lar*) (photo by A. A. Eudey).

tion of politicians as to the consequences for conservation of their decisions about technological development seems critical.

These two examples illustrate that the local conditions that determine an appropriate conservation strategy may vary greatly from place to place. Intimate knowledge of how each system works appears essential. Only persons with local field and cultural ex-

perience, including many on our commission, have the knowledge necessary to formulate effective proposals. Thus, we must concern ourselves not merely with deciding on species priorities, but also with helping to formulate and decide on new strategies. All too often strategies are formulated and evaluated on the basis of abstract philosophy or theories currently in vogue.

In Thailand, virtually every visiting consultant and expert in conservation has noted the difficulty of conserving protected areas and recommended, with the best of intentions, increased training, management planning, administration, and equipment for protection. These are, of course, all important. With the best possible management planning, the limiting factors early on should be identified and remedied in the plans, but in practice planners seem to advocate more of the same — guard stations, guns, and other equipment. The needed fundamental changes are seldom recommended except as a very low priority. The scope of conservation management planning, as it has grown largely out of Western experience, is not broad enough to include the needed solutions.

In Thailand, we advocate re-examining the objectives of wildlife conservation and the uses of reserved areas. We feel it is time to address the socioeconomic problems that appear to be worsening and that are limiting progress in conservation.

In conclusion, we advocate that the SSC, while using species and habitats as starting points, broaden the scope of concern to include the identification of locally limiting problems and the most promising and effective strategies to overcome them. In this, the collaboration of other commissions in designing proposals will be of critical importance.



Fig. 9: The slow loris (*Nycticebus coucang*), a nocturnal prosimian found in Thailand and a number of other Southeast Asian countries (photo by R. A. Mittermeier).