

REVIEWS

Endangered Animals of Thailand by Stephen R. Humphrey and James R. Bain. Sandhill Crane Press, Inc., Gainesville, Florida. 1990. xi + 468 pp. Cloth: U.S.\$45.00. Fauna and Flora Handbook No. 6. ISBN 1-877743-05-4.

The opening paragraph of this volume reads:

“This work presents the state of knowledge on the endangered and threatened species of Thailand. Its pragmatic purpose is to improve Thailand's future by providing access to technical guidance for planning development projects or other land-use changes. This information also should stimulate naturalists, professional biologists, or anyone who wishes to learn about the status of animals in Thailand. Which species are now on the brink of extinction from Thailand, and why? How can the Thai people reorganize themselves to reverse the course of destruction? Can ways be found for both the people and the rest of the fauna to prosper?”

These are ambitious and laudable goals the achievement of which would fill a vacuum for both biologists and policy makers. The text was compiled in 1980-81, by an American mammalogist (Humphrey) and his undergraduate research assistant, for the U.S. Fish and Wildlife Service and was funded under the U. S. Agency for International Development/U.S. Man and the Biosphere Project. In its original 1982 incarnation (see below), it constituted the only national “red data book” and was a useful and timely survey. Unfortunately, in 1990, the volume is out-of-date and misleading.

The volume is organized around accounts of 249 endangered and threatened animal species selected from various national and international lists; detailed accounts are provided for 3 invertebrate and 165 vertebrate species. For each listed species the account includes notes on status, population size, distribution, habitat requirements, vulnerability and threats, key behaviors, conservation measures taken and proposed. Schematic maps are provided with each species account showing the probable original range based on knowledge of habitat requirements and the original distribution of the associated habitat. There is no doubt that current data on these topics would be invaluable as, for the majority of these species, the news is bad: habitat destruction, habitat fragmentation, overhunting and inadvertant poisoning. Rather little is known about many of the Thai species or populations considered and the authors have compiled a great deal of information and an extensive bibliography of 727 citations. Unfortunately, only 17% of these references are to the primary literature reporting observations made in Thailand (another 6% are to unpublished Thai reports). For example, there are 27 references associated with the four otter species accounts but only one of these concerns Thai observations. Not suprisingly, the authors' most commonly proposed conservation measure is for more local research.

Two factors render these species accounts generally misleading. First, the Thais destroyed their natural habitats at unprecedented rates during the 1980's. Lowland rain-

forest, freshwater swamp forest and mangrove forest have been almost completely destroyed. Overall, forest cover in Thailand has shrunk from 70% in 1940, to 53% in 1961, 39% in 1973, 29% in 1985 and less than 19% in 1988. In the period since this volume was compiled, Thailand lost about 2.5% of its wildlife habitat area annually. Accounts of endangered species distributions and habitat requirements prepared a decade ago are of limited utility to conservationists today. The second factor rendering the species accounts generally dated stems from the upsurge of scientific interest in the Thai biota during the 1980's. The impression, given by this volume, that very little research has been conducted in Thailand is no longer accurate. While we have a long way to go before we can conduct population viability analyses for most threatened species, the database is much richer than it was in 1980. The authors may have been unable to update their accounts, and publication may have been delayed by factors out of their control, but as it stands the book's opening sentence is incorrect and misleading.

To illustrate the significance of this problem I will compare the author's account with data known to me, a presumably equally naive foreigner. The species coverage is uneven and fails to adequately portray the real breadth of vertebrate species-level endangerment (Appendix). Fifteen fish are discussed out of a fauna of more than 600 freshwater and 850 marine species. Two species of amphibians are discussed out of a known fauna of 107 species, including 13 endemics. JARUJIN NABHITABHATA (1989) lists 8 species of amphibians as threatened and another frog species has Protected status. Five freshwater and 5 sea turtles are discussed out of a national fauna of 27 species. Three crocodile species are described; all very close to or recently extirpated. Three monitors are discussed from a fauna of 108 lizard species. The impact of the annual export of one million geckos, tens of thousands of monitor lizards, and over \$1 million worth of snakes is not discussed. Thailand has 160 species of snakes but only two pythons are described here. Humphrey and Bain thus list eighteen species of reptiles out of a fauna of 298 species including 39 endemics; NABHITABHATA (1989) lists 29 species as threatened (Appendix).

Of the 900 plus species of birds found in Thailand, 595 are resident forest species. 135 species are considered in this book, 59 individually. This list may be compared with the more authoritative assessment of ROUND (1988) who found that 113 species were endangered to some degree, 10 more have been extirpated or gone extinct recently and a further 17 were insufficiently known to classify (Appendix). Humphrey and Bain recognise only 44 of these 140 species as being threatened; the other 15 birds on their list include extirpated species, vagrants, occasional migrants, and birds that are satisfactorily protected by existing reserves. Humphrey and Bain failed to adequately portray the status of many partridges, pigeons, parrots, owls, trogons, woodpeckers, pittas, bulbuls, nuthatches, and babblers. 19 of the 26 birds found by ROUND (1984) to have disappeared from montane forests near Chiang Mai in the last 50 years were not initially identified by Bain and Humphrey as threatened. There are two endemic species in Thailand: the white-eyed river martin and the Deignan's babbler. The former, which has not been seen during the 1980's, is the only one discussed; the latter is known from three museum specimens, is probably difficult to recognise, and has

never been seen in the wild. Of the 63 subspecies of birds apparently endemic to Thailand only two are on Humphrey and Bains' list. There is no discussion of the impact of deforestation on Palearctic migrants.

There are about 282 species of mammals including 9 endemics in Thailand (LEKAGUL & MCNEELY, 1988; SONGSAKDI YENBUTRA, 1990) and Humphrey and Bain list 77 species as endangered. The most recent survey (YENBUTRA, 1989) lists 40 species as rare and endangered (Appendix) including the Javan and Sumatran rhinoceros, Schomburgk's deer, Eld's brow-antlered deer, and kouprey which are extinct or extirpated. Out of 110 species of bats only Kitti's hog-nosed bat is discussed: Humphrey and Bain report that the known population is approximately 160 animals. Here and elsewhere, no attempts are made to assess or up-date the population size estimates made in the 1970's for such species as pileated gibbon (13,600), tiger (500–600), leopard (400–500), elephant (1000) and tapir (1500). Although all of these populations have decreased in size we now know that there are more than 2000 Kitti's bats. In 1990, the dugong is close to extirpated and the wild water buffalo is down to one small herd.

Given the stature of this project's sponsors and the authors' good intentions it is a shame that this much-needed volume will not be more useful. Perhaps it was a mistake to contract this work out to someone who had such limited experience with the Thai fauna. The compilation began with World Conservation Union (IUCN) Red Data Books and involved correspondence with 31 Species Survival Commission Specialist Groups, computer-based and traditional literature searches, and a 6-week interview trip to Thailand. The initial 344 page report, authored by Bain and Humphrey, was entitled *A Profile of the Endangered Species of Thailand. Vol. 1* (University of Florida, Gainesville, 1982). This document provided a review of the rather patchy state of knowledge and proved useful to those few Thais who knew of its existence. It was reviewed by Thai-based scientists and many of their suggested technical corrections were incorporated in this book, for which Humphrey has assumed senior authorship. Unfortunately, no attempt has been made to keep the accounts current (only six citations to publications in 1983–1986, the year of the last citation, involve Thai research). On-going surveys and taxonomic revisions of the freshwater fishes by Thosaporn Wongratana, Chavalit Vidthayanon, Maurice Kottelat and Tyson Roberts suggest that as many as 250 species may need describing or revision. The 850 species of marine fish, studied by Sompote Ukkatawewat and others, are not considered although many are threatened by overfishing, coastal pollution and the destruction of coral reefs and mangroves. No mention is made of Uthai Treesucon's and Philip Round's discovery and subsequent work on Gurney's pitta, Belinda Stuart-Cox's studies of green peafowl, Pilai Poonswad's long-term observations of hornbills and Sompoad Srikosamatara's work on forest mammal density and biomass. Kasetsart University research projects and theses, including those by Utis Kutintara and Naris Bhumpakapun concerning the fauna and ecology of Huai Kha Khaeng Wildlife Sanctuary, merit citation. Surapon Duangkhae's study of Kitti's bat, the more recent results of Warren Brockelman's 15-year study of gibbons in Khao Yai National Park, Sawai Wanghongsa's ecological studies of dusky langur, Alan Rabinowitz's work on civets, small cats,

leopard and tiger, and the distributional surveys of stump-tailed macaque, elephant and other mammals by Uthai Treesucon, Ramesh Boonratana and Robert Dobias, should all have been reported as a basis for conservation planning.

In addition to being out-of-date this volume has two more serious flaws. One of these is a failure to assess the feasibility of maintaining viable populations of each threatened species in existing legally protected habitat reserves. As authority for enforcing the Wild Animal Reservation and Protection Act is the responsibility of the Royal Forest Department, wildlife is afforded very little protection outside national parks, wildlife sanctuaries, non-hunting reserves and some small religious sites. Distribution maps based on the former extent of habitat types are irrelevant to wildlife management today. The failure of the authors to recognise the highly fragmented patterns of the remaining potentially protected habitat patches render their maps grossly misleading and could lead to the development of inappropriate conservation proposals. At the very least the range maps should be redrawn to show existing and protected habitat patches. In cases where patch occupancy has been confirmed recently this should be indicated. The resulting maps would look quite different from many of those presented and give wildlife managers (and their foreign advisors) a much more realistic basis for planning species conservation efforts.

This volume's other basic flaw is its failure to discuss species-level conservation activities in the context of the considerable progress in biodiversity conservation (in addition to research activity noted above) made within Thailand during the last decade. This could have been done as an invited Foreword if the authors' themselves were unable to do the job. Between the time this study was commissioned and its publication the Thai system of national parks and wildlife sanctuaries grew from 1.4 to 2.2 million hectares. Comprising 120 land units and covering more than 10% of the country, these areas are of central importance for wildlife conservation. Their protection, although still inadequate, is improving and the staff of the Royal Forest Department is growing in both numbers and professionalism. Budgets for the National Parks Division and the Wildlife Conservation Division have doubled in real terms. For the first time management planning is being undertaken; a plan for Khao Yai National Park was released in 1986. An illustrated guide to the national parks has been published and in 1989 these areas received 4 million visitors. Nine wildlife propagation centers have been established and personnel are being trained in *ex situ* management techniques. Aquaculture and reintroduction projects for sea turtles (at the Phuket Marine Biological Research Center and under the auspices of the Queen at Man Nai Island) and the giant Mekong catfish have been initiated by the Department of Fisheries. The Wildlife Conservation Division now has captive propagation projects for endangered or extirpated species including white-winged wood duck, pheasants, saurus crane, and Eld's deer. The first animal rescue operation, directed by the late Seub Nakhasathien, was completed as rising waters of the Chiew Larn reservoir inundated a lowland rainforest. Thailand became a party to the Convention on International Trade in Endangered Species (CITES) and is now preparing legislation that will enable its national enforcement.

Official progress is matched by the private sector. Government proposals to flood another valley, that of the upper Quae Yai river, and trisect the largest remaining nature reserve met such opposition from local villagers and urban conservationists that the plans have twice been shelved. Illegal wildlife sales at the "Sunday" Chatuchak Market in Bangkok are monitored by a growing cadre of concerned citizens. The Bangkok Bird Club has grown to an active membership of 500. Wildlife Fund Thailand, a NGO founded in 1983, now has an annual budget of 14 million baht (U.S.\$560,000) and, under the leadership of Pisit na Patalung, has assumed a significant role in the areas of environmental lobbying, conservation education and species restoration. WFT funds an annual Outstanding Forestry Official award. In 1987, Mahidol University established a computerized national database on terrestrial vertebrate species, habitats and protected areas, and a Center for Conservation Biology under the direction of Warren Brockelman. In 1986 the Center organized one of the first workshops on conservation biology in Asia, attracting over 120 scientists and managers. Mahidol, Kasetsart, Chiang Mai and other universities are now offering training in conservation biology and wildlife management. The Siam Society and the Science Society of Thailand have organized major symposia on nature conservation and biodiversity, respectively. An authoritative profile of the Kingdom's natural resources has been published with U.S.A.I.D. support. The efforts of individual Thais are being recognised internationally: Dr. Boonsong Lekagul received the Golden Ark award of IUCN and the Conservation Medal of the Zoological Society of San Diego; Royal Forest Department Director-General Phairot Suvanakorn received the Outstanding Conservationist award of Wildlife Conservation International (New York Zoological Society); Mr. Seub Nakhasathien's tragic death while Head, Huai Kha Khaeng Wildlife Sanctuary, received international newspaper coverage.

Although the future of many of the threatened species of Thailand is not assured, the prospects for conservation of selected areas and species are improving. It is most unfortunate therefore that the money and labor expended on this long-delayed volume will not contribute significantly to this trend. More recent and more locally relevant information is available to Thais. Readers interested in the endangered vertebrate species of this country will need to supplement this book with the references listed below.

I acknowledge the assistance of Warren Brockelman, Ardith Eudey, Jarujin Nabhitabhata, and Phillip Round with the list of threatened species provided as an Appendix. Responsibility for the review is, however, mine alone.

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Appendix. List of the Threatened Vertebrate Animals of Thailand.

The Following list of threatened vertebrates was compiled in September 1990 from various sources. Under existing conditions and trends perhaps half of these species are expected to disappear from Thailand in the next century. Although conservation efforts in Thailand are largely irrelevant to the survival of some of the listed species (e.g. marine turtles, occasional avian visitors, whales), for many others local efforts are pivotal. The reader is referred to the primary sources for information with respect to the degree of threat (endangered, vulnerable, etc.) and reminded that these terms have multiple meanings. Simply rare species and those of indeterminate status were generally excluded unless they are also considered threatened by the authority cited. I have attempted to distinguish species that have gone extinct (**) from those that have either been extirpated or are still occasionally seen in Thailand but are very rare and/or no longer have viable populations there (*). The symbol **(R) indicates that a re-introduction program is underway. Thai laws (Wild Animals Reservation and Protection Act

(**WARPA**) of 1960 and the Thai Fisheries Act of 1947, as amended) afford some 950 species of vertebrates with varying degrees of legal protection. The international movement of some species is restricted by the Convention on International Trade in Endangered Species (**CITES**) and the U. S. Endangered Species Act (**ESA**). A few Thai species are included in the 1986 **IUCN** Red List of Threatened Animals.

Key to other abbreviations used:

WARPA — Reserved, **P1** Protected (first category), **P2** Protected (second category).

CITE — listed in Appendix **I**, **II**, or **III**.

IUCN — Endangered, Vulnerable, Rare, Indeterminate (probably **E**, **V**, or **R**), or insufficiently known.

ESA — Endangered or Threatened.

H&B — listed in Humphrey and Bain (1990) as probably eXtirpated or eXtinct, Endangered, Threatened or at indeterminate risk (+).

Thai — listed a threatened or endangered by Thai authorities (+): amphibians (**NABHITA-BHATA**, 1989), reptiles (**NABHITABHATA**, 1989), birds: **E, T, V, I**, or **R** (**ROUND**, 1988), mammals (**YENBUTRA**, 1989).

		WARPA	CITES	IUCN	ESA	H&B	THAI
FISHES (Humphrey and Baln, 1990)							
1	<i>*Scleropages formosus</i>	Asian bonytongue	I	K	E	X	
2	<i>Notopterus blanci</i>	featherback		R		T	
3	<i>N. borneensis</i>	featherback				E	
4	<i>Macrochirichthys macrochirus</i>	carp				T	
5	<i>Chela caeruleostigmata</i>	carp		R		T	
6	<i>Catlocarpio siamensis</i>	giant carp				E	
7	<i>Puntius sarana</i>	tapien or olive carp				T	
8	<i>*Balantiocheilos melanopterus</i>	burnt-tail carp				X	
9	<i>Labeo behri</i>	carp				E	
10	<i>Xenochellichthys gudgeri</i>	backwater fish				E	
11	<i>Hemisilurus heterorhynchus</i>	catfish				E	
12	<i>Prophagorus nieuhofi</i>	walking catfish				T	
13	<i>Pangasius sanitwongsei</i>	Sanitwongse's catfish		R	E	E	
14	<i>Pangasianodon gigas</i>	giant catfish	I	V	E	E	
15	<i>*Datnioides microlepis</i>	triple tails				E	
16	<i>Probarbus julleni</i>	minnow	I	I	E		
AMPHIBIANS (Nabhitabhata, 1989)							
1	<i>Tylototriton verrucosus</i>	crocodile salamander	P1			T	+
2	<i>Megophrys carinensis</i>	Burmese horned toad					+
3	<i>Ansonia siamensis</i>	Siamese slender toad					+
4	<i>Ingerana tasanæ</i>	Smith's wrinkled frog					+
5	<i>I. tenasserimensis</i>	Tenasserim wrinkled frog					+
6	<i>Rana aenea</i>	Doichang frog					+
7	<i>R. fasciculispina</i>	spiny-breasted giant frog				T	+
8	<i>R. kohchangæ</i>	Kohchang frog					+
REPTILES (Nabhitabhata, 1989)							
1	<i>Platysternon megacephalum</i>	big-headed turtle	P1			T	+
2	<i>Batagur baska</i>	river terrapin	P1	I	E	E	+
3	<i>Cyclemys mouhotii</i>	keeled box turtle					+
4	<i>Heosemys spinosa</i>	spiny turtle				E	+
5	<i>Manouria impressa</i>	impressed tortoise			K		+
6	<i>Geochelone emys</i>	giant brown tortoise	P1	II	K	T	
7	<i>*Caretta caretta</i>	loggerhead turtle	P1	I	V	T	E
8	<i>Chelonia mydas</i>	green turtle	P1	I	E	T	E
9	<i>Eretmochelys imbricata</i>	hawksbill turtle	P1	I	E	E	E
10	<i>*Lepidochelys olivacea</i>	Pacific Ridley turtle	P1	I	E	T	E
11	<i>Dermochelys coriacea</i>	leatherback turtle	P1	I	E	E	E
12	<i>Chitra indica</i>	narrow-headed softshell turtle					+
13	<i>Pelochelys bibroni</i>	giant softshell turtle				T	

			WARPA	CITES	IUCN	ESA	H&B	THAI
14	<i>*Crocodylus porosus</i>	saltwater crocodile		II	E	E	X	+
15	<i>C. siamensis</i>	Siamese freshwater crocodile		I	E	E	X	+
16	<i>*Tomistoma schlegelii</i>	false gavia	P1	I	E	E	X	+
17	<i>Gekko petricolus</i>	sandstone gecko						+
18	<i>Phyllodactylus melanostictus</i>	scarce ground gecko						+
19	<i>Calotes kakhlenensis</i>	garden or tree lizard	P1					+
20	<i>Draco quinquefasciatus</i>	five-striped flying lizard	P1					+
21	<i>Gonocephalus abbotti</i>	Abbott's crested lizard	P1					+
22	<i>Varanus bengalensis</i>	Bengal monitor		II		E	T	
23	<i>V. rudicollis</i>	red-headed monitor	P1	II			T	
24	<i>V. dumerilii</i>	black jungle monitor		II			T	
25	<i>Isopachys gyldenstolpei</i>	Gyldenstolpe's worm skink						+
26	<i>Lygosoma haroldyoungi</i>	banded supple skink						+
27	<i>L. koratense</i>	Korat supple skink						+
28	<i>Sphenomorphus stellatus</i>	Cambodian hill skink						+
29	<i>Python curtus</i>	blood or short python		II			T	+
30	<i>P. molurus</i>	Burmese or rock python		II	V		T	
31	<i>Bungarus flaviceps</i>	yellow-headed krait						+
32	<i>Opisthotropis spenceri</i>	Smith's mountain keelback						+
33	<i>Parahelicops boonsongi</i>	Boonsong's keelback						+
34	<i>Xenodermus javanicus</i>	xenodermine snake						+
35	<i>Trimeresurus puniceus</i>	ashy pit-viper						+
	BIRDS (Round, 1988)							
1	<i>*Pelecanus philippensis</i>	spot-billed pelican	P1				E	E
2	<i>*Sula leucogaster</i>	brown booby					T	X
3	<i>Anhinga melanogaster</i>	Oriental darter	P1				T	T
4	<i>Fregata andrewsi</i>	Christmas island frigatebird		I	V	E	E	
5	<i>Phalacrocorax carbo</i>	great cormorant	P1					X
6	<i>Ardea sumatrana</i>	great-billed heron	P2					T
7	<i>*A. cinerea</i>	grey heron	P2					X
8	<i>*Egretta eulophotes</i>	Chinese egret	P1		V	E	E	
9	<i>Mycteria leucocephala</i>	painted stork	P1				E	E
10	<i>Anastomus oscitans</i>	open-billed stork	P1				T	
11	<i>Ciconia episcopus</i>	wolly-necked stork	P1				E	E
12	<i>C. stormi</i>	Storm's stork	P1		I			E
13	<i>*C. nigra</i>	black stork	P1	II			T	
14	<i>*Ephippiorhynchus asiaticus</i>	black-necked stork	P1				E	E
15	<i>*Leptoptilos dubius</i>	greater adjutant	P1				E	E
16	<i>*L. javanicus</i>	lesser adjutant	P1				E	E
17	<i>*Threskiornis melanocephalus</i>	black-headed ibis	P1				T	E

			WARPA	CITES	IUCN	ESA	H&B	THAI
18	** <i>Pseudibis davisoni</i>	white-shouldered ibis	P1		I		X	X
19	** <i>P. gigantea</i>	giant ibis	P1		R		X	X
20	* <i>Sarkidiornis melanotus</i>	comb duck	P1	II			E	E
21	<i>Cairina scutulata</i>	white-winged wood duck	P1	I	V	E	E	E
22	<i>Macheirhamphus alcinus</i>	bat hawk	P1	II				T
23	<i>Milvus migrans</i>	black kite	P1	II				T
24	<i>Ichthyophaga humilis</i>	lesser fish-eagle	P1	II				T
25	* <i>I. ichthyaetus</i>	grey-headed fish-eagle	P1	II				E
26	* <i>Gyps bengalensis</i>	white-rumped vulture	P1	II			E	E
27	* <i>G. indicus</i>	long-billed vulture	P1	II			E	X
28	* <i>Aegypius calvus</i>	red-headed vulture	P1	II			E	E
29	<i>Spizaetus nanus</i>	Wallace's hawk-eagle	P1	II			E	T
30	<i>Ictinaetus malayensis</i>	black eagle	P1					T
31	<i>Falco peregrinus</i>	peregrine falcon	P1	I	V	E	E	
32	<i>Rhizothere longirostris</i>	long-billed partridge	P1	III				E
33	<i>Arborophila rufogularis</i>	rufous-throated partridge	P1					T
34	<i>A. brunneopectus</i>	bar-backed partridge	P1	III				V
35	<i>A. cambodiana</i>	chestnut-headed partridge	P1					T
36	<i>A. charltonii</i>	chestnut-necklaced partridge	P1					E
37	<i>Rollulus rouloul</i>	crested wood partridge	P1	III			T	E
38	<i>Lophura leucomelana</i>	Kalij pheasant	P1				T	V
39	<i>L. nychemera</i>	silver pheasant	P1				T	V
40	<i>L. ignita</i>	crested fireback	P1	III			T	E
41	<i>L. diard</i>	Siamese fireback	P1				T	T
42	<i>Syrmaticus humilae</i>	Hume's bar-tailed pheasant	P1	I	R	E	E	E
43	<i>Polyplectron bicalcaratum</i>	grey peacock-pheasant	P1	II			T	V
44	<i>P. malacense</i>	Malay peacock-pheasant	P1	II			E	E
45	<i>Argusianus argus</i>	great argus pheasant	P1	II			T	V
46	<i>Pavo muticus</i>	green peafowl	P1	II	V		T	T
47	** <i>(R)Grus antigone</i>	eastern saurus crane	P1	II			X	X
48	<i>Hellopals personata</i>	masked finfoot	P2				T	V
49	<i>Tringa guttifer</i>	spotted greenshank	P1	I	I	E	E	
50	<i>Limnodromus semipalmatus</i>	snipebilled godwit	P1		R		T	
51	<i>Burhinus oedicnemus</i>	stone curlew	P1					I
52	<i>Esacus recurvirostris</i>	great thick-knee	P1					I
53	<i>E. magnirostris</i>	beach thick-knee	P1					R
54	<i>Sterna aurantia</i>	river tern	P1					I
55	<i>S. acuticauda</i>	black-bellied tern	P1					I
56	<i>S. zimmermanni</i>	Chinese crested tern	P1		I		E	
57	<i>Anous stolidus</i>	brown noddy	P1					I
58	<i>Treron pompadora</i>	pompador pigeon	P1					V
59	<i>T. fluvicollis</i>	cinnamon-headed pigeon	P1					T

			WARPA	CITES	IUCN	ESA	H&B	THAI
60	<i>T. olax</i>	little green pigeon	P1				T	
61	<i>T. capellei</i>	large green pigeon	P1					T
62	<i>T. seimundi</i>	yellow-vented green pigeon	P1				T	
63	<i>T. phoenicoptera</i>	yellow-footed pigeon	P1					V
64	<i>Ducula aenea</i>	green imperial pigeon	P2					V
65	<i>D. bicolor</i>	pied imperial pigeon	P1				T	
66	<i>Columba pulchricollis</i>	ashy wood-pigeon					T	V
67	<i>C. punicea</i>	pale-capped pigeon	P2				T	
68	<i>Caloenas nicobarica</i>	Nicobar pigeon	P1	I			T	T
69	<i>Psittacula eupatria</i>	Alexandrine parakeet	P1	II				T
70	<i>Psittinus cyanurus</i>	blue-rumped parrot	P1	II				T
71	<i>Otus sagittus</i>	white-fronted scops-owl	P1	II				T
72	<i>O. rufescens</i>	reddish scops-owl	P1	II				T
73	<i>Bubo coromandus</i>	dusky eagle-owl	P1	II				I
74	<i>Batrachostomus auritus</i>	large frogmouth	P1	II				T
75	<i>B. stellatus</i>	Gould's frogmouth	P1	II				T
76	<i>Harpactes kasumba</i>	red-naped trogon	P1					T
77	<i>H. diardii</i>	Diard's trogon	P1					T
78	<i>H. orrhophæus</i>	cinnamon-rumped trogon	P1					T
79	<i>H. duvaucellii</i>	scarlet-rumped trogon	P1					V
80	<i>Megaceryle lugubris</i>	crested kingfisher	P1					T
81	<i>Pellargopsis amauroptera</i>	brown-winged kingfisher	P1					I
82	<i>Halcyon coromanda</i>	ruddy kingfisher	P1					I
83	<i>Berenicornis comatus</i>	white-crowned hornbill	P1				T	V
84	<i>Ptilolaemus tickelli</i>	brown hornbill	P1				T	V
85	<i>Anorrhinus galeritus</i>	bushy-crested hornbill	P1				T	V
86	<i>Aceros nipalensis</i>	rufous-necked hornbill	P1				T	T
87	<i>Rhyticeros corrugatus</i>	wrinkled hornbill	P1				E	E
88	<i>R. undulatus</i>	wreathed hornbill	P1					V
89	<i>R. subruficollis</i>	plain-pouched hornbill	P1					T
90	<i>Anthracoceros malayanus</i>	black hornbill	P1					T
91	<i>Buceros rhinoceros</i>	rhinoceros hornbill	P1	II			T	T
92	<i>B. bicornis</i>	great hornbill	P1	II			T	V
93	<i>Rhinoplax vigil</i>	helmeted hornbill	P1	I	I	E	E	V
94	<i>Megalaima rafflesii</i>	red-crowned barbet	P1				E	T
95	<i>Picus xanthopygmaeus</i>	streak-throated woodpecker	P1					I
96	<i>Gecinulus grantia</i>	pale-headed woodpecker	P1					T
97	<i>Mulleripicus pulverulentus</i>	great slaty woodpecker	P1				T	
98	<i>Dryocopus javensis</i>	white-bellied woodpecker	P1				T	V
99	<i>Picoides cathpharius</i>	crimson-breasted woodpecker	P1					V
100	<i>P. mahrattensis</i>	yellow-crowned woodpecker	P1					I
101	<i>Cymbirhynchus macrorhynchus</i>	black-and-red broadbill	P1					V

			WARPA	CITES	IUCN	ESA	H&B	THAI
103	<i>Pitta soror</i>	blue-rumped pitta	P1					R
104	<i>P. caerulea</i>	giant pitta	P1					T
105	<i>P. megarhyncha</i>	mangrove pitta	P1					I
106	<i>P. granatina</i>	garnet pitta	P1					T
107	<i>P. ellioti</i>	bar-bellied pitta	P1					T
108	<i>P. guajana</i>	banded pitta	P1	III				
109	<i>P. gurneyi</i>	Gurney's pitta	P1	III	I		T	E
110	** <i>Pseudocheilidon sirintarae</i>	white-eyed river martin	P1	I	I		E	X
111	<i>Hemipus hirundinaceus</i>	black-winged flycatcher-shrike						I
112	<i>Coracina striata</i>	bar-bellied cuckoo-shrike						T
113	<i>Pycnonotus zeylanicus</i>	straw-headed bulbul	P1					T
114	<i>P. outlotus</i>	puff-backed bulbul	P1					V
115	<i>Oriolus xanthanotus</i>	dark-throated oriole	P1					V
116	<i>Cissa thalassina</i>	short-tailed magpie						R
117	<i>Platysmus leucopterus</i>	black magpie						V
118	** <i>Corvus splendens</i>	house crow	P1					X
119	<i>Aegithalos conchinnus</i>	black-throated tit	P1					R
120	<i>Sylviparus modestus</i>	yellow-browed tit	P1					R
121	<i>Sitta magna</i>	giant nuthatch	P1					V
122	<i>S. formosa</i>	beautiful nuthatch	P1					V
123	<i>Certhia discolor</i>	brown-throated treecreeper	P1					V
124	<i>Cinclus pallasii</i>	brown dipper	P1					V
125	<i>Eupetes macrocerus</i>	rail-babbler	P1				T	
126	<i>Trichastoma rostratum</i>	white-chested babbler	P1					V
127	<i>T. bicolor</i>	ferruginous babbler	P1					V
128	<i>Malacopteron affine</i>	sotly-capped babbler	P1					T
129	<i>M. magnum</i>	rufous-crowned babbler	P1					T
130	<i>Kenopia striata</i>	striped wren-babbler	?P1					T
131	<i>Napothera macrodactyla</i>	large wren-babbler	?P1					T
132	<i>Stachyris maculata</i>	chestnut-rumped babbler	P1					T
133	<i>S. rodolphi</i>	Deignan's babbler	P1					R
134	<i>S. leucotis</i>	white-necked babbler	P1					I
135	<i>S. nigricollis</i>	black-throated babbler	P1					T
136	<i>Macronous ptilosus</i>	fluffy-backed tit-babbler	P1					V
137	<i>Garrulax merulinus</i>	spot-breasted laughingthrush	P1					R
138	<i>G. milnei</i>	red-tailed laughingthrush	P1					R
139	<i>Mniotilta strigula</i>	chestnut-tailed minla	P1					R
140	<i>Alcippe rufogularis</i>	rufous-throated fulvetta	?P1					I
141	<i>A. peracensis</i>	mountain fulvetta	?P1					R
142	<i>Yuhina flavicollis</i>	whiskered yuhina	P1					R
143	<i>Y. humilis</i>	Burmese yuhina	P1					R
144	<i>Paradoxornis atrosuperciliaris</i>	lesser rufous-headed parrotbill	P1					R

			WARPA	CITES	IUCN	ESA	H&B	THAI
145	<i>Brachypteryx montana</i>	white-browed shortwing	?P1					R
146	<i>Cinclidium frontale</i>	blue-fronted robin	P1					R
147	<i>Cochoa purpurea</i>	purple cochoa	P1					V
148	<i>Saxicola jerdoni</i>	Jerdon's bush-chat	P1					T
149	<i>Zoothera interpres</i>	chestnut-capped thrush	P1					I
150	<i>Abroscopus albogularis</i>	rufous-faced warbler	P1					I
151	<i>Phylloscopus maculipennis</i>	ashy-throated warbler	P1					R
152	* <i>Graminicola bengalensis</i>	large grass warbler	P1				X	X
153	<i>Tesia cyaniventer</i>	grey-bellied tesia	?P1					I
154	<i>Rhipidura hypoxantha</i>	yellow-bellied fantail	P1					R
155	<i>Aethopyga nipalensis</i>	green-tailed sunbird	P1					R
156	<i>Dicaeum melanoxanthum</i>	yellow-bellied flowerpecker	P1					R
157	<i>Pachycephala cinerea</i>	mangrove whistler	P1				T	
	MAMMALS (Yenbutra, 1989)							
1	<i>Craseonycteris thonglongyai</i>	Kitti's hog-nosed bat	P1		K	E	T	+
2	<i>Rhinolophus marshalli</i>	Marshall's horseshoe bat						+
3	<i>Hipposideros halophyllus</i>	disc-nosed roundleaf bat						+
4	<i>Eptesicus demissus</i>	Surat serotine bat						+
5	<i>Macaca nemestrina</i>	pig-tailed macaque	P1	II			T	
6	<i>M. assamensis</i>	Assamese macaque	P1	II			T	
7	<i>M. arctoides</i>	stump-tailed macaque	P1	II		T	T	
8	<i>M. mulatta</i>	rhesus macaque	P1	II			T	
9	<i>M. fascicularis</i>	crab-eating macaque	P1	II			T	
10	<i>Presbytis femoralis</i>	banded langur	P1	II			T	
11	<i>Trachypithecus obscurus</i>	dusky langur	P1	II			T	
12	<i>T. cristatus</i>	silvered langur	P1	II			T	
13	<i>T. phayrei</i>	Phayre's langur	P1	II			T	
14	<i>Hylobates lar</i>	white-handed gibbon	P1	I		E	E	+
15	<i>H. pileatus</i>	pileated gibbon	P1	I	E	E	E	+
16	<i>H. agilis</i>	agile gibbon	P1	I		E	E	+
17	<i>Manis javanica</i>	Malayan pangolin	P1	II			T	
18	<i>M. pentadactyla</i>	Chinese pangolin	P1	II			T	
19	<i>Ratufa bicolor</i>	black giant squirrel	P1	II			T	
20	<i>R. affinis</i>	cream-colored giant squirrel	P1	II			T	
21	<i>Sundasciurus hippurus</i>	horse-tailed squirrel						+
22	<i>Rhinosciurus laticaudatus</i>	shrew-faced ground squirrel						+
23	<i>Petaurista elegans</i>	lesser giant flying squirrel	P1				T	
24	<i>Aeromys tephromelas</i>	large black flying squirrel					T	
25	<i>Petinomys setosus</i>	white-bellied flying squirrel					T	
26	<i>Belamys pearsoni</i>	hairy-footed flying squirrel					T	

			WARPA	CITES	IUCN	ESA	H&B	THAI
27	<i>Pteromyscus pulverulentus</i>	smoky-footed flying squirrel	P1				T	
28	* <i>Eothenomys melanogaster</i>	Pere David's vole					T	
29	<i>Hapalomys longicaudatus</i>	marmoset rat					T	
30	<i>Niviventer hinpoon</i>	limestone rat					T	+
31	<i>Rattus sikkimensis remotus</i>	island rat					T	
32	<i>Leopoldamys neilli</i>	Neill's rat					T	
33	<i>Sousa chinensis</i>	Indo-Pacific humpbacked dolphin		I			+	
34	<i>Steno bradanensis</i>	rough-toothed dolphin		II			+	
35	<i>Stenella attenuata</i>	Malayan dolphin		II			+	
36	<i>S. longirostris</i>	spinner dolphin		II				
37	<i>Delphinus delphis</i>	common dolphin		II			+	
38	<i>Tursiops truncatus</i>	bottle-nosed dolphin		II			+	
39	<i>Orcella brevirostris</i>	Irrawaddy dolphin		II			+	
40	<i>Neophocaena phocaenoides</i>	black finless porpoise		I			+	
41	<i>Physeter macrocephalus</i>	sperm whale		I		E	+	
42	<i>Balaenoptera borealis</i>	sei whale		I		E	+	
43	<i>B. acutirostrata</i>	minke whale		I			+	
44	<i>Canis aureus</i>	golden jackel					T	
45	<i>Cuon alpinus</i>	dhole or wild dog		II	V	E	E	+
46	<i>Selanarctos thibetanus</i>	black bear	P2	I			T	
47	<i>Helarctos malayanus</i>	sun bear	P2	I			T	
48	<i>Mustela sibirica</i>	Siberian weasel	P1	III				
49	<i>M. strigidorsa</i>	black-striped weasel	P1				T	+
50	<i>Martes flavigula</i>	yellow-throated marten	P1	III				
51	<i>Lutra lutra</i>	common otter	P1	I	V		T	+
52	<i>L. perspicillata</i>	smooth-coated otter	P1	II			T	
53	<i>L. sumatrana</i>	hairy-nosed otter	P1	II			T	+
54	<i>Amblonyx cinerea</i>	small-clawed otter	P1	II			T	
55	<i>Prionodon linsang</i>	banded linsang	P1	II			E	+
56	<i>P. pardicolor</i>	spotted linsang	P1	I		E	E	+
57	<i>Arctictis binturong</i>	binturong	P1	III			T	
58	<i>Hemigalus derbyanus</i>	banded palm civet	P1	II			T	+
59	<i>Cynogale bennetti</i>	otter civet	P1	II			T	+
60	<i>Felis marmorata</i>	marbled cat	P1	I	I	E	E	+
61	<i>F. viverrina</i>	fishing cat	P1	II			T	
62	<i>F. bengalensis</i>	leopard cat	P1	II		E	T	
63	<i>F. planiceps</i>	flat-headed cat	P1	I	I	E	E	+
64	<i>F. chaus</i>	jungle cat	P1	II			T	+
65	<i>F. temminckii</i>	Asian golden cat	P1	I	I	E	T	+
66	<i>Neofelis nebulosa</i>	clouded leopard	P1	I	V	E	E	+
67	<i>Panthera pardus</i>	leopard	P2	I	V	E	E	+
68	<i>P. tigris</i>	tiger	P2	I	E	E	E	+

			WARPA	CITES	IUCN	ESA	H&B	THAI
69	<i>Elephas maximus</i>	Asian elephant	P1	I	E	E	E	
70	<i>Dugong dugon</i>	dugong	P2	I	V	E	E	+
71	<i>Tapirus indicus</i>	Malayan tapir	P1	I	E	E	E	+
72	* <i>Rhinoceros sondaicus</i>	Javan rhinoceros	R	I	E	E	X	+
73	* <i>Dicerorhinus sumatrensis</i>	Sumatran rhinoceros	R	I	E	E	E	+
74	<i>Tragulus napu</i>	greater mouse deer	P2					+
75	<i>Muntiacus feae</i>	Fea's barking deer	P2		E	E	E	+
76	* <i>Cervus eldi siamensis</i>	Eld's brow-antlered deer	R	I	E	E	X	+
77	* <i>C. porcinus</i>	Indochina hog deer	R	I		E	X	+
78	** <i>C. schomburgki</i>	Schomburgk's deer	R				X	+
79	<i>Bubalus bubalis</i>	water buffalo	R	III	E		E	+
80	<i>B. javanicus</i>	banteng	P2		V	E	E	+
81	<i>B. gaurus</i>	gaur	P2	I	V		E	+
82	* <i>Bos sauveli</i>	kouprey	R	I	E	E	X	+
83	<i>Capricornis sumatraensis</i>	serow	R	I		E	E	+
84	<i>Naemorhedus goral</i>	goral	R	I		E	E	+

