THE HARVEST AND TRADE OF REPTILES AT U MINH THUONG NATIONAL PARK, SOUTHERN VIET NAM

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BURMESE PYTHON *PYTHON MOLURUS BIVITTATUS* WWF-CANON / URS WOY

Reptiles are heavily harvested and traded in Viet Nam for food and traditional medicine. This study, carried out in October and November 2000, examines the harvest and trade of reptiles by residents living inside or near the U Minh Thuong National Park in southern Viet Nam. A total of 21 reptile species, amounting to approximately 1900 individual reptiles, were found in reptile trade shops, of which 16 species were seen harvested by local people living in the park. The three most abundant species observed in trade were, in descending order, Sunbeam Snake Xenopeltis unicolor, *Bocourt's Watersnake* Enhydris bocourti, *and Puff-faced Watersnake* Homalopsis buccata. *Of the 21 species found in trade, one species (Yellow-headed Temple Turtle* Hieremys annandalii*) is globally listed in the 2003 IUCN Red List as Endangered, two species (Malaysian Box Turtle* Cuora amboinensis *and Malayan Snail-eating Turtle* Malayemys subtrijuga*) are listed as Vulnerable, and the status of the Mekong Delta Watersnake* Enhydris innominata, *endemic to southern Viet Nam, is poorly known. The current harvesting practices in and around U Minh Thuong National Park are probably not sustainable for some of these 21 reptile species.*

INTRODUCTION

Turtles, snakes, and lizards (especially monitors *Varanus* and geckos *Gekko*) are widely hunted and traded in Viet Nam for food and traditional medicine (Compton and Le Hai Quang, 1998; Hendrie, 2000; Jenkins, 1995; Le and Broad, 1995; Lehr, 1997; Li and Wang, 1999; Martin, 1992; Nash, 1997; Ziegler, 2002). These are consumed in Viet Nam or exported to markets in China (Compton and Le Hai Quang, 1998; Cuc Phuong Conservation Project and TRAFFIC Southeast Asia, 2000; Jenkins, 1995; Le and Broad, 1995; Li and Wang, 1999; Martin, 1992; Nash, 1997; Yiming and Dianmo, 1998). A recent review concluded that all species of freshwater turtles and tortoises in Viet Nam are seriously threatened in the wild by trade demands (Hendrie, 2000).

The demand for reptiles by Vietnamese wildlife traders extends not only throughout Viet Nam, but also into the neighbouring countries of Lao PDR (Laos) and Cambodia. Reptiles from Laos and Cambodia are exported to Viet Nam, often via a series of traders, where they join Vietnamese reptiles along northward trade routes to China (Compton and Le Hai Quang, 1998; Nash, 1997; Stuart *et al.*, 2000b). Thus, reptiles observed in transport or in urban markets in Viet Nam may have originated from Viet Nam, Laos, or Cambodia. Consequently, observations on the reptile trade in Viet Nam are often confounded by the uncertain provenance of the animals. In one of the first studies on the exploitation of reptiles at a specific site in Viet Nam, Ziegler (2002) reported a large diversity of turtles, lizards and snakes in trade around protected areas in Ha Tinh Province.

During the course of an amphibian and reptile biodiversity survey at U Minh Thuong National Park in the Mekong Delta of southern Viet Nam in November 2000, data were obtained on the harvest and trade of reptiles by residents living inside or near the park boundary. These data consist of observations of people in the park in possession of harvested reptiles, and of surveys of the reptile trade shops near the park that purchased these reptiles prior to shipping them elsewhere.

BACKGROUND

U Minh Thuong National Park (UMTNP), classified as U Minh Thuong Nature Reserve during the study period, encompasses 22 918 ha in An Minh and Vinh Thuan Districts, Kien Giang Province, Viet Nam (Buckton *et al.*, 1999). UMTNP lies in the U Minh Thuong peatland (Safford *et al.*, 1998), and is the largest protected area in the Mekong Delta (Buckton *et al.*, 1999; Figures 1 and 2). The park consists of a core area (8468 ha) surrounded by a buffer zone (+13 000 ha) (Buckton *et al.*, 1999). The core area contains mature *Melaleuca* forest, seasonally flooded grassland and sedge communities, and open swamp. Artificial canals throughout UMTNP support a diverse community of aquatic plants. The buffer zone is largely unprotected and consists principally of cultivated paddy fields with small patches of *Melaleuca* forest (Buckton *et al.*, 1999) and many human residents. Buckton *et al.* (1999) and Safford *et al.* (1998) concluded that UMTNP is one of the most important sites for biodiversity conservation in the Mekong Delta.

Figure 1. Map of Indochina showing the Mekong Delta and approximate location of U Minh Thuong National Park in southern Viet Nam.

METHODS

Harvest Records

Between 20 October and 20 November 2000, harvested reptiles were observed in the buffer zone of UMTNP in the boats of hunters and fishermen or in containers at their homes. Fishing in the extensive artificial canal network in the park is a major livelihood for residents, and it appeared that many reptiles were caught incidentally in gillnets and lift-nets by people while fishing. Live and dead watersnakes were frequently observed entangled in lift-nets that had been temporarily raised out of the water. The method used for hunting and trapping reptile species that are not associated with water was not observed.

U MINH THUONG NATIONAL PARK HAS BEEN DESCRIBED AS ONE OF THE MOST IMPORTANT SITES FOR BIODIVERSITY CONSERVATION IN THE MEKONG DELTA

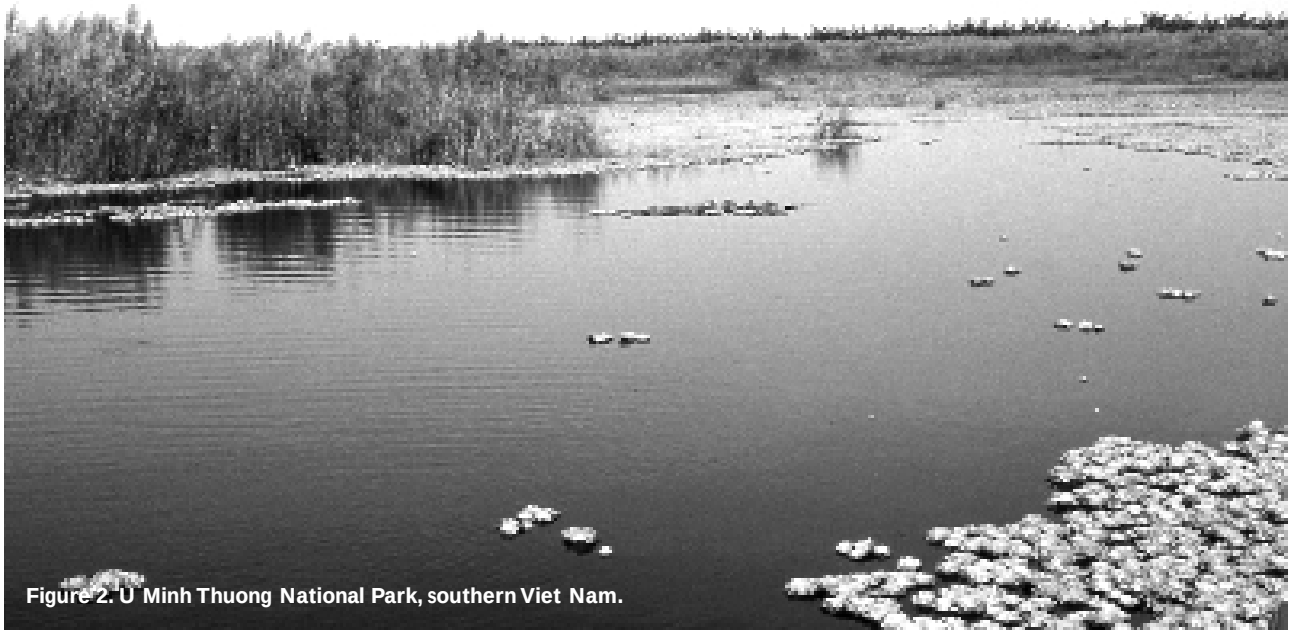

Figure 2. U Minh Thuong National Park, southern Viet Nam.

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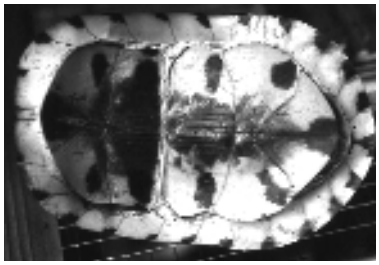
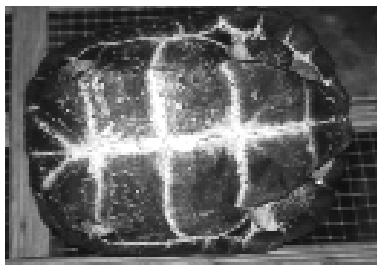
Cuora amboinensis > is seriously threatened in Viet Nam.



Hieremys annandalii > is considered to be one of the most immediately threatened species of turtle in Viet Nam.



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Reptile Trade Shops

Five reptile trade shops at or near the boundary of UMTNP were visited on nine occasions between 29 October and 19 November 2000 (Tables 1 and 2). Shops were located by signs on the premises that offered to buy reptiles (Figure 3), or by asking local residents of their whereabouts. These shops were owned by "middlemen traders" that accumulated reptiles purchased from local hunters and fishermen prior to selling them in bulk to other traders for transporting elsewhere. Although the exact provenance of the reptiles in these shops cannot be ascertained, local fishermen and hunters were observed selling their catches in these outlets, suggesting that reptiles were accumulated locally. In the shops, reptiles were generally kept in crowded conditions in containers, often with individuals lying several layers deep. Thus it was often not possible to count accurately the number of individuals of each species, and numbers presented here are sometimes based on estimates.

Conventions

The global conservation status of species was taken from the *2003 IUCN Red List of Threatened Species* (IUCN, 2003) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix listings (CITES, 2003); the English common and scientific names follow one or both of these publications. When available, trade values of species are presented in Vietnamese dong (VND) and are converted to the US dollar (USD) equivalent at the time of the study.

Results

Twenty-one species of seven families of reptiles, consisting of approximately 1900 individuals, were observed in the reptile trade shops near UMTNP (Table 2). Of these 21 species, individuals of 16 species (76%) were also seen in the possession of local people in the park.

Species Accounts

GEOEMYDIDAE (Asian Freshwater Turtles)

Malaysian Box Turtle *Cuora amboinensis*
[2003 IUCN Red List: Vulnerable; CITES Appendix II]
Local people in the buffer zone were seen in possession of two individuals of *Cuora amboinensis*. Ten were seen for sale at local reptile trade shops (Table 2). Hunters at a house in the buffer zone of UMTNP reported that *C. amboinensis* was sold to traders for VND20 000-40 000/kg (USD1.42-2.84/kg), depending on season and market demands. *Cuora amboinensis* is restricted to lowlands in the centre and south of the country. The species is seriously threatened in Viet Nam from heavy hunting pressure for trade and from habitat alteration, and "few if any viable populations of *C. amboinensis* are likely to exist in Viet Nam" (Hendrie, 2000). This species was reported in trade just south of UMTNP in Ca Mau (Le and Broad, 1995), to be commonly seen for sale in markets in Ho Chi Minh City (Jenkins, 1995), and in trade en route from southern Viet Nam to the Chinese border (Cuc Phuong Conservation Project and TRAFFIC Southeast Asia, 2000).

Yellow-headed Temple Turtle *Hieremys annandalii*
[2003 IUCN Red List: Endangered; CITES Appendix II]
Three juvenile *Hieremys annandalii* were seen being kept alive in outdoor water vessels at two houses in the buffer zone while awaiting sale to traders. Four individuals were seen for sale at local reptile trade shops (Table 2). Hunters at a house in the buffer zone of UMTNP reported that *H. annandalii* was sold to traders for VND20 000-40 000/kg (USD1.42-2.84/kg), depending on the season and market demands. Safford *et al.* (1998) photographed *H. annandalii* alive in captivity at a UMTNP office. Owing to its large size, which makes it easier to catch, and its association with low-lying wetlands in the south of the country, which also tend to harbour high densities of people, *H. annandalii* can be considered to be one of the most immediately threatened species of turtle in Viet Nam. The species is susceptible to heavy hunting pressure and habitat alteration, and "natural populations are unlikely to sustain present levels of collection" (Hendrie, 2000). This species has been reported in trade en route from southern Viet Nam to the border with China (Cuc Phuong Conservation Project and TRAFFIC Southeast Asia, 2000).

Shop	District	Location	Dates Visited
1	Vinh Thuan	09º30'48"N 105º15'32"E	29 Oct, 11 Nov
2	Vinh Thuan	09º36'10"N 105º11'08"E	11 Nov
3	An Minh	09º38'52"N 105º08'35"E	29/31 Oct, 10/19 Nov
4	An Minh	09º45'04"N 104º59'35"E	31 Oct
5	An Minh	09º45'25"N 105º00'03"E	10 Nov

Table 1. Reptile trade shops visited near U Minh Thuong National Park in Kien Giang Province, southern Viet Nam, in October to November 2000.

TRADE SHOP	**#1**		**#2**		**#3**			**#4**	**#5**	
TAXON	**29 Oct**	**11 Nov**	**11 Nov**	**29 Oct**	**31Oct**	**10 Nov**	**19 Nov**	**31 Oct**	**10 Nov**	**TOTAL**
GEOEMYDIDAE										
Malaysian Box Turtle *Cuora amboinensis*	9	-	-	-	-	-	-	1	-	10
Yellow-headed Temple Turtle *Hieremys annandalii*	1	-	-	-	-	-	-	2	1	4
Malayan Snail-eating Turtle *Malayemys subtrijuga*	6	-	-	-	-	-	-	30	8	44
GEKKONIDAE										
Tokay *Gekko gecko*	-	-	-	-	1	-	-	-	-	1
PYTHONIDAE										
Burmese Python *Python molurus*	1	-	-	-	-	1	-	2	-	4
XENOPELTIDAE										
Sunbeam Snake *Xenopeltis unicolor*	250	-	-	-	200	200	75	100	50	875
ANILIIDAE										
Red-tailed Pipe Snake *Cylindrophis ruffus*	5	1	-	3	1	2	-	-	-	12
COLUBRIDAE										
Oriental Whip Snake *Ahaetulla prasina*	-	-	-	-	1	-	-	-	-	1
Radiated Rat Snake *Elaphe radiata*	5	-	1	6	1	3	-	10	-	26
Bocourt's Watersnake *Enhydris bocourti*	250	7	-	20	-	20	40	2	2	341
Rainbow Watersnake *Enhydris enhydris*	30	10	-	-	20	30	50	10	-	150
Mekong Delta Watersnake *Enhydris innominata*	2	4	-	1	5	3	3	2	-	20
Striped Watersnake *Enhydris jagorii*	-	1	-	2	1	1	50	20	-	75
Tentacled Snake *Erpeton tentaculatum*	-	-	-	-	-	-	1	-	-	1
Puff-faced Watersnake *Homalopsis buccata*	20	3	-	10	40	40	30	30	-	173
Indochinese Rat Snake *Ptyas korros*	-	-	-	-	-	1	-	1	-	2
Common Rat Snake *Ptyas mucosus*	5	-	-	6	-	-	1	10	-	22
Chequered Keelback *Xenochrophis piscator*	6	3	-	10	20	25	20	10	-	94
ELAPIDAE										
Banded Krait *Bungarus fasciatus*	-	-	-	-	1	-	-	-	-	1
Monocellate Cobra *Naja kaouthia*	1	-	-	-	-	-	-	1	-	2
Indochinese Spitting Cobra *Naja siamensis*	30	-	-	-	-	-	-	10	-	40
TOTAL	**621**	**29**	**1**	**58**	**291**	**326**	**270**	**241**	**61**	**1898**

Table 2. Reptiles observed in trade shops near U Minh Thuong National Park in Vinh Thuan, An Minh Districts, Kien Giang Province, southern Viet Nam, in October to November 2000.

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Malayan Snail-eating Turtle *Malayemys subtrijuga* is the most frequently seen species of turtle in trade in Viet Nam and natural populations are unlikely to sustain present levels of collection.

Malayan Snail-eating Turtle *Malayemys subtrijuga*
[2003 IUCN Red List: Vulnerable]
Twenty-three *Malayemys subtrijuga* juveniles and adults were seen being kept alive in an outdoor water vessel at a house in the buffer zone, awaiting sale to traders, and two more juveniles were being kept in similar conditions at another house. One juvenile was seen in a lift-net after being fished from a canal in the buffer zone. Approximately 44 individuals were seen for sale at local reptile trade shops (Table 2). Hunters at a house in the buffer zone reported that *M. subtrijuga* was sold to traders for VND20 000-40 000/kg (USD1.42-2.84/kg), depending on season and market demands. Safford *et al.* (1998) photographed *M. subtrijuga* alive in captivity at a UMTNP office. *Malayemys subtrijuga* is one of the most frequently seen species of turtle in trade in Viet Nam, and Hendrie (2000) considered that "natural populations are unlikely to sustain present levels of collection." This species was reported to be the most frequently traded turtle in Ca Mau, a town south of UMTNP (Le and Broad, 1995), to be commonly seen for sale in markets in Ho Chi Minh City (Jenkins, 1995), and in trade en route from southern Viet Nam to the Chinese border (Cuc Phuong Conservation Project and TRAFFIC Southeast Asia, 2000).

GEKKONIDAE (Geckos)

Tokay *Gekko gecko*
Gekko gecko is frequently traded for medicinal purposes in Viet Nam and China (Cuc Phuong Conservation Project and TRAFFIC Southeast Asia, 2000; Li and Wang, 1999; Martin, 1992; Nash, 1997; Yiming and Dianmo, 1998; Ziegler, 2002). One individual was seen for sale in a jar of rice wine mixed with assorted snakes at a local reptile trade shop (Table 2).

PYTHONIDAE (Pythons)

Burmese Python *Python molurus*
[2003 IUCN Red List: Lower Risk, near threatened; CITES Appendix II].
A live adult pair of *Python molurus* was seen in captivity at a house in the buffer zone of UMTNP. The house owner reported that the 2.5 m female had been caught as a juvenile in the park three years earlier. The male had been borrowed from a nearby household for breeding. The female had already produced two clutches of about 20 eggs each, and the babies were sold to reptile traders for VND150 000 (USD10.64) each. The owner of the male received two free baby pythons as a fee. Four sub-adults and adults were seen at local reptile trade shops (Table 2), and these appeared to be wild-caught. The species has been observed for sale for meat and medicine in a Ho Chi Minh City market (Martin, 1992), in trade en route from southern Viet Nam to the Chinese border (Cuc Phuong Conservation Project and TRAFFIC Southeast Asia, 2000), and crossing the border from Viet Nam to China (Li and Wang, 1999; Yiming and Dianmo, 1998).

XENOPELTIDAE (Sunbeam Snakes)

Sunbeam Snake *Xenopeltis unicolor*
Approximately 875 *Xenopeltis unicolor* individuals were seen for sale at local reptile trade shops, making this the most abundant reptile species in trade around UMTNP (Table 2). Traders at trade shop #3 sold *X. unicolor* for VND45 000/kg (USD3.19/kg). Fishermen in the buffer zone of UMTNP were seen in possession of one specimen.

ANILIIDAE (Pipe Snakes)

Red-tailed Pipe Snake *Cylindrophis ruffus*
Fishermen in the buffer zone of UMTNP were seen with two adult *Cylindrophis ruffus*. Approximately 12 individuals were seen for sale at local reptile trade shops (Table 2).

COLUBRIDAE (Typical Snakes)

Oriental Whip Snake *Ahaetulla prasina*
One *Ahaetulla prasina* was seen for sale in a jar of rice wine containing various snakes and one *Gekko gecko* at a reptile trade shop (Table 2).

Radiated Rat Snake *Elaphe radiata*
Approximately 26 *Elaphe radiata* were seen for sale at local reptile trade shops (Table 2). This species has been reported in trade in Ha Tinh Province (Ziegler, 2002), en route from southern Viet Nam to the Chinese border (Cuc Phuong Conservation Project and TRAFFIC Southeast Asia, 2000), and crossing the border from Viet Nam to China (Li and Wang, 1999; Yiming and Dianmo, 1998).


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Red-tailed Pipe Snake *Cylindrophis ruffus*


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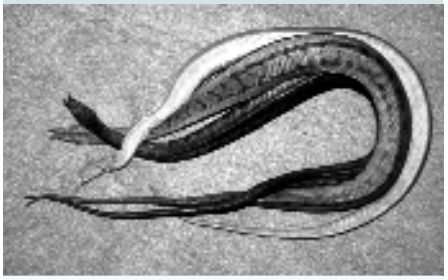
Monocellate Cobra *Naja kaouthia*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Tentacled Snake *Erpeton tentaculatum* (three colour phases)


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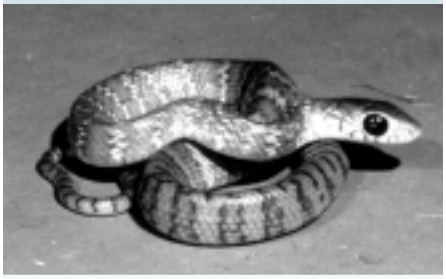
Mekong Delta Watersnake *Enhydris innominata*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Common Rat Snake *Ptyas mucosus* hatchling

Bocourt's Watersnake *Enhydris bocourti*

Enhydris bocourti was the second-most abundant reptile species in trade around UMTNP, with a total of approximately 341 individuals seen at local reptile trade shops (Table 2). Hunters at a house in the buffer zone of UMTNP reported that *E. bocourti* was sold for at least VND150 000/kg (USD10.64/kg), and traders at trade shop #3 confirmed this by selling *E. bocourti* at their shop for VND155 000/kg (USD10.99/kg). A wildlife restaurant owner near trade shop #1 reported that many people catch or buy small individuals of *E. bocourti*, raise them in cages until they weigh about two kilogrammes, and then sell them into the trade. Fishermen at a house in the buffer zone of UMTNP claimed that in recent years *E. bocourti* is harder to find than in the past. This large species of watersnake has been reported in trade en route from southern Viet Nam to the Chinese border (Cuc Phuong Conservation Project and TRAFFIC Southeast Asia, 2000), and is heavily exploited in Cambodia for export to Thailand, Viet Nam and China (Stuart *et al.*, 2000a).

Rainbow Watersnake *Enhydris enhydris*

Live and dead individuals of *Enhydris enhydris* were frequently seen entangled in lift-nets over canals throughout the buffer zone of UMTNP. Approximately 150 individuals in total were seen for sale at local reptile trade shops (Table 2). *Enhydris enhydris* is harvested in Cambodia for domestic trade (Stuart *et al.*, 2000a).

Mekong Delta Watersnake *Enhydris innominata*

Two *Enhydris innominata* were seen captured in gill nets by fishermen in the buffer zone of UMTNP. A total of approximately 20 individuals were seen for sale at local reptile trade shops (Table 2). *Enhydris innominata* is a very poorly known species that is endemic to southern Viet Nam (Saint Girons, 1972). Consequently, it may be exploited throughout most of its range. *Enhydris longicauda*, which is endemic to Tonle Sap, Cambodia, and considered part of the same species complex as *E. innominata* (Saint Girons, 1972), is harvested in Cambodia for domestic trade (Stuart *et al.*, 2000a).

Striped Watersnake *Enhydris jagorii*

Like *Enhydris enhydris*, live and dead individuals of *E. jagorii* were frequently seen caught up in lift-nets over canals throughout the park. Approximately 75 individuals in total were seen for sale at local reptile trade shops (Table 2). *Enhydris jagorii* is harvested in Cambodia for domestic trade (Stuart *et al.*, 2000a).

Tentacled Snake *Erpeton tentaculatum*

Three live *Erpeton tentaculatum* were seen in the possession of a fisherman who caught them from a canal in the buffer zone of UMTNP. Another was seen for sale at a local reptile trade shop (Table 2).

Puff-faced Watersnake *Homalopsis buccata*

Approximately 173 *Homalopsis buccata* individuals in total were seen for sale at local reptile trade shops, making *H. buccata* the third-most abundant reptile species in trade around UMTNP (Table 2). Traders at trade shop #3 sold *H. buccata* for VND31 000/kg (USD2.20/kg). Four dead and one live *H. buccata* were found entangled in a large net blocking a canal. This large species of watersnake is heavily exploited in Cambodia for international export to Thailand, Viet Nam and China (Stuart *et al.*, 2000a).

With the exception of the Ptyas mucosus *hatchling, all snakes illustrated here were photographed during the course of the survey in U Minh Thuong National Park.*

Indochinese Rat Snake *Ptyas korros*
Two individuals of *Ptyas korros* were seen for sale at local reptile trade shops (Table 2). This species has been reported in trade in Ha Tinh Province (Ziegler, 2002), en route from southern Viet Nam to the Chinese border (Cuc Phuong Conservation Project and TRAFFIC Southeast Asia, 2000), and crossing the border from Viet Nam to China (Li and Wang, 1999; Yiming and Dianmo, 1998).

Common Rat Snake *Ptyas mucosus* *[CITES Appendix II]*
Approximately 22 *Ptyas mucosus* were seen for sale at local reptile trade shops (Table 2). This species has been reported in trade in Ha Tinh Province (Ziegler, 2002), en route from southern Viet Nam to the Chinese border (Cuc Phuong Conservation Project and TRAFFIC Southeast Asia, 2000), and crossing the border from Viet Nam to China (Li and Wang, 1999; Yiming and Dianmo, 1998).

Chequered Keelback *Xenochrophis piscator*
Approximately 94 *Xenochrophis piscator* were seen for sale at local reptile trade shops (Table 2). In the buffer zone, fishermen were seen with one captured live individual, and two others were found alive in a large net across a canal.

ELAPIDAE (Cobras and Kraits)

Banded Krait *Bungarus fasciatus*
One *Bungarus fasciatus* was seen in the possession of fishermen in the buffer zone and sold for VND50 000 (USD3.55) each. A second was seen for sale in a jar of rice wine mixed with assorted snakes and one *Gekko gecko* at a local reptile trade shop (Table 2). This species has been reported in trade in Ha Tinh Province (Ziegler, 2002) and crossing the border from Viet Nam to China (Li and Wang, 1999; Yiming and Dianmo, 1998).

Monocellate Cobra *Naja kaouthia* *[CITES Appendix II]*
Fishermen in the buffer zone were seen in possession of one *Naja kaouthia*. Two individuals were seen for sale at local reptile trade shops (Table 2). Hunters at a house in the buffer zone of UMTNP reported that cobras were sold for up to VND100 000/kg (USD7.09/kg) and were much rarer than they used to be. Other members of the *Naja naja* species group have been reported in trade in Ha Tinh Province (Ziegler, 2002) and crossing the border from Viet Nam to China (Li and Wang, 1999; Yiming and Dianmo, 1998).

Indochinese Spitting Cobra *Naja siamensis*
[CITES Appendix II]
All records of *Naja siamensis* came from local reptile trade shops, where approximately 40 individuals were seen (Table 2). None could be closely examined in the bags and cages, but were identified as *N. siamensis* from their pale coloration and indistinct hood markings (Wüster *et al.*, 1997). Hunters at a house in the buffer zone of UMTNP reported that cobras were sold for up to VND100 000/kg (USD7.09/kg) and were much rarer than they used to be. Other members of the *Naja naja* species group have been reported in trade in Ha Tinh Province (Ziegler, 2002) and crossing the border from Viet Nam to China (Li and Wang, 1999; Yiming and Dianmo, 1998).

Figure 3. A sign outside reptile trade shop #1, near U Minh Thuong National Park.

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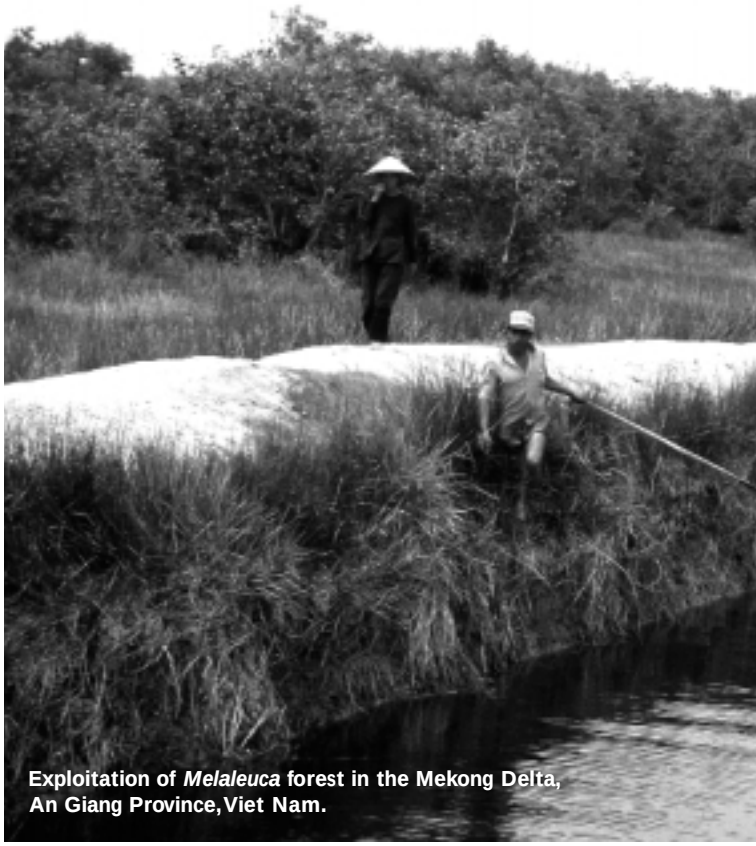
DISCUSSION

The most significant finding of this study was the high taxonomic diversity of reptiles in trade. The hunting of turtles and snakes by local people was widespread at UMTNP and the surrounding area and did not appear to be species-specific. Rather, it appeared that all snakes and turtles had trade value, and even small snakes, such as newly born watersnakes, were seen in reptile trade shops. Hendrie (2000) reported that all species of turtles in Viet Nam were traded, and Ziegler (2002) reported a large diversity of turtles, lizards and snakes in trade around protected areas in Ha Tinh Province. Hunting for trade purposes appears to be the major conservation threat to reptiles in UMTNP. Safford *et al.* (1998) identified hunting, fire, drainage, clear-cutting, and conversion to agriculture as threats to biodiversity at UMTNP.

Stuart *et al.* (2000a) observed a large harvest and trade of homalopsine watersnakes at Tonle Sap Great Lake, Cambodia. Two species of watersnakes - *Enhydris bocourti* and *Homalopsis buccata* - were exported from Cambodia to Thailand, Viet Nam, and China (Stuart *et al.*, 2000a). These two species were the second- and third-most frequently traded species of reptiles at UMTNP, respectively. Like Tonle Sap, UMTNP is a source of snakes for the same trade to Viet Nam and China. The most frequently traded species at UMTNP - *Xenopeltis unicolor* - has not been previously reported to be traded in large numbers in Indochina.

Le and Broad (1995) reported a very active trade in turtles in Ca Mau, a town just south of UMTNP, where farmers searched for turtles in canals, swamps, mangrove forests, and *Melaleuca* forests using small boats. The farmers sold the turtles to traders in Ca Mau, who in turn sold them to traders in Ho Chi Minh City; these were then shipped to the north of Viet Nam for eventual export to China. Le and Broad (1995) estimated a weekly turnover by traders in Ca Mau of almost eight tonnes of turtles. At least one species of turtle, *Cuora amboinensis*, was specifically obtained by dealers in Ca Mau from sources near U Minh (the region surrounding UMTNP) (Le and Broad, 1995). It is likely that most of the reptiles observed in trade in the present study also travel to Ho Chi Minh City after leaving the vicinity of UMTNP, and are then moved north towards the Chinese border. Indeed, Cuc Phuong Conservation Project and TRAFFIC Southeast Asia (2000) reported on three illegal shipments of reptiles originating from southern Viet Nam that were intercepted by Forest Protection Department rangers in Ninh Binh Province, northern Viet Nam, en route to the Chinese border. One of these shipments originated from Kien Giang Province (the province where UMTNP is located), and the other two from nearby Ca Mau Province (the province where Ca Mau town is located) and Soc Trang Province. The three shipments largely comprised the same species reported in trade around UMTNP, some in considerable numbers (e.g. more than 1900 *Malayemys subtrijuga* and 560 kg of *Enhydris bocourti*).

Annam Leaf Turtles *Mauremys annamensis* were reported by Le and Broad (1995) to be abundant in trade in Ca Mau. However, this species, listed in IUCN (2003) as Critically Endangered, is endemic to central Viet Nam (Iverson, 1992). Jenkins (1995) found Le and Broad's report of *M. annamensis* in trade in Ca Mau to be surprising given that turtles in trade in Ca Mau are generally obtained locally, and trade routes in Viet Nam move northward, rather than southward, for ultimate export to China. Jenkins (1995) noted that records of *M. annamensis* in trade in Ca Mau would represent a significant southward extension of the species' range, and proposed the possibility that these turtles were misidentified by Le and Broad (1995). No evidence of *M. annamensis* was found during the present study. Based on the known distribution of this species and the direction of wildlife trade routes in Viet Nam, it is suggested here that the *M. annamensis* reported in Le and Broad (1995) were actually juvenile *Hieremys annandalii*, a species that was recorded in trade in UMTNP. Juvenile *H. annandalii* are distinct in shape and colour pattern from adults (Cox *et al.*, 1998), and could be confused as a separate species. Black Marsh Turtles *Siebenrockiella crassicollis* were photographed in captivity at an office at Vo Doi Nature Reserve, in the U Minh Ha peatland very near to UMTNP (Safford *et al.*, 1998), but the species was not recorded in this study.



Exploitation of *Melaleuca* forest in the Mekong Delta, An Giang Province, Viet Nam.

It was learned that *Enhydris bocourti* was sometimes locally reared in captivity from wild-caught juveniles and sold into the trade as adults, and that *Python molurus* was sometimes locally bred in captivity. Because captive stock of *Enhydris bocourti* consisted of wild-caught animals, all of which were sold, and *Python molurus* continued to be hunted in the wild, neither practice is presently seen as contributing positively to the conservation of either species.

Population data are not available to allow conclusive statements to be made on the sustainability of current harvesting practices of reptiles in and around UMTNP. However, based on reports by local people that at least three species of snake are rarer now than in the recent past, and judging by the high levels of trade observed during this brief study, it is strongly suspected that viable populations of many of the species of reptiles reported here cannot be maintained in UMTNP under current harvesting levels. Turtles in particular are known to be very susceptible to even low levels of adult mortality (Congdon *et al.*, 1993; Doroff and Keith, 1990). Crocodiles have already been extirpated from the wild in and around UMTNP, largely because of overexploitation by local people (Stuart *et al.*, 2002). It is strongly recommended that managers of UMTNP curb the harvest and trade of reptiles within the park.

WWF / HERVÉ LETHIER

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A proposal has been submitted by Indonesia to the 13th meeting of the Conference of the Parties to CITES to include the Malayan Snail-eating Turtle Malayemys subtrijuga *in Appendix II. This is the only species currently described in the genus* Malayemys, *which, as a whole is proposed to be included in Appendix II through a separate proposal, submitted by the USA.*