

## ARTICLE

### A WORKING REVIEW OF THE HAIRY-NOSED OTTER (*Lutra sumatrana*)

Lesley WRIGHT<sup>1</sup>  
Annette OLSSON<sup>2</sup>  
Budsabong KANCHANASAKA<sup>3</sup>

<sup>1</sup>International Otter Survival Fund (IOSF), Broadford, Isle of Skye, SCOTLAND.  
e-mail: l.c.wright@rl.ac.uk

<sup>2</sup>Conservation International, P.O.Box 1356, Phnom Penh, CAMBODIA.  
e-mail: a.olsson@conservation.org

<sup>3</sup>Wildlife Research Division, Forest Technical Bureau, Royal Forest Department, Paholoyothin rd.,  
Chatujak, Chatujak, 10900 Bangkok, THAILAND. e-mail: kbudsabong@yahoo.com



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**Abstract:** The hairy-nosed otter (*Lutra sumatrana*) is one of the rarest and least-known of the 13 otter species. A review of current knowledge about this species, its historical and current known range and the threats facing it, derived from both the published literature and current ongoing investigations is presented. The future for this species is poor, with large-scale habitat degradation and hunting for the illegal skin trade assaulting the tiny and fragmented populations at utterly unsustainable levels. Immediate and urgent actions to save this species from extinction in the very near future are recommended.

**Keywords:** Hairy-nosed otter; *Lutra sumatrana*, skin trade, poaching, threats

## INTRODUCTION

This paper is an attempt to synthesise field work and literature reviews to give some idea of the current situation of the Hairy-Nosed Otter (*Lutra sumatrana*), in order to give a basis for future conservation decisions. It covers the physical appearance of this animal, what we know about behaviour and diet, an indication of its former range and habitat use, and what we currently know of its range and use of

habitat today. Threats facing this species and its current conservation situation are covered, and recommendations for urgent further work are given.

The hairy-nosed otter is a medium-sized otter, around 1.3m in length and weighing around 7-8kg. The paws are fully webbed with well-developed claws. The fur is dark brown above, slightly paler underneath with a contrasting pale chin and upper lip. The whole nasal area (rhinarium) is covered in short, dark fur. It was formerly found across much of Southeast Asia but is now known only as tiny populations in a handful of locations.

## APPEARANCE AND ANATOMY

This otter is very long and snaky in shape, which is more obvious in life than in mounted specimens. The tail is long and slender, and more rounded in cross section than in the smooth coated otter (*Lutrogale perspicillata*). The paws are fully webbed with well-developed claws, with fine fur on the upper surfaces and naked beneath fore and hind. Kanchanasaka (2001) gives casts of footprints of this animal. Whole body measurements are given in Table 1; skull measurements in Table 2.

**Table 1:** Body measurements of *Lutra sumatrana*

Source	Length			Weight (kg)
	Head + Body (cm)	Tail (cm)	Total (cm)	
Harris (1968)	70 – 82.6	35 – 50.9	105 – 133.5	
Kanchanasaka (unpublished data)	63 – 67.7	41 – 46.6	104 – 114.3	5 - 8 kg
Payne et al (2005)	57.5	37.5	95	7 kg
	61.5	38.5	100	

**Table 2:** Skull Measurements of *Lutra sumatrana*

Source	Total Length (cm)	Condylobasal Length (cm)	Interorbital (cm)	Maxillary Tooththrow
Harris (1968)	10 – 10.1 (Quoting Lyon, 1908)	5.5 – 7.3 (Quoting Pocock, 1941)	1.5 – 1.8 (Quoting Pocock, 1941)	
Payne et al. (2005)		9.1-10.1 (3 specimens)	14.4-14.8 (3 specimens)	31.5-31.6 (3 specimens)

There is little information available about sexual dimorphism – although the skull measurements given in Harris (1968) show the two adult males measured as larger than the single adult female, the animals were from different populations, and it does seem that Malaysian otters were historically considered larger than Sumatran ones. However, Kanchanasaka found that in two captured otters, the female weighed 7kg and the male 8kg, and considers that in the Thai population, the male is the larger. Of 15 skins recorded from Cambodia from 2006-2008 the head-body length ranged from 62-93 cm, and the width of the skins ranged from 40-56 cm. One of the largest skins recorded was from an adult (pregnant) female. Tails could not be measured as they in most cases were cut off. Other *Lutra* species do show sexual dimorphism, with males being somewhat larger and heavier than females (Lynch et al., 1996 for *Lutra lutra*, Harris, 1968 for *L. maculicollis*), so it would not be surprising if the same were true for *L. sumatrana*.

Sasaki (per comm.) compared the skulls of the four species of otters found in Asia, finding that *L. sumatrana* and *L. lutra* are very similar, both being distinct from *Lutrogale perspicillata* and *Aonyx cinereus*. Detailed statistical treatment of measurements indicated that *L. sumatrana* has a more elongated skull, with a shorter distance from eye to nose, but a more rounded braincase than *L. lutra*. Nguyen Xuan Dang (2005), the Sarawak Forestry Department (2007), and Payne et al. (2005) agree that the skull is flattened compared to *Lutrogale perspicillata*; Sivasothi and Nor (1994) provide a set of skull drawings comparing the four species in Asia, and Sasaki has photographs of skulls and mandibles of the four species, which he has allowed us to use (Figure 1). These features are of limited use in field identification to differentiate between *L. lutra* and *L. sumatrana*, but if a body of measurements can be built up from dead animals such as from road kills, it may eventually be possible to use this in identification of, for example, badly decomposed cadavers where external features cannot be used. The dental formula is I 3/3 C 1/1 P 4/3 M ½



**Figure 1:** Skulls and lower mandibles of the four Asian otter species (by permission of Hiroshi Sasaki). From left to right: *Aonyx cinereus*, *Lutra lutra*, *Lutra sumatrana*, *Lutrogale perspicillata*

The diagnostic feature of this species, the rhinarium, is entirely covered in short, dark fur, apart from the upper edge of the nostrils, which is naked (see Figure 2). In old animals, skins and museum specimens, this hair may be abraded, but the skin texture left is finely pitted (visible under a hand lens), different from that of the other otter species, which have naked, leathery rhinaria (Pocock, 1941).

The main coat colour is dark brown, sometimes a reddish chestnut but usually dark chocolate brown, with the ventral and dorsal surfaces almost the same (Harris, 1968). The male is slightly darker than female in both adults and juveniles (Kanchanasaka et al., 2003). Both sexes have a sharply contrasting white or yellowish upper lip, chin and the front part of the throat, which does not extend down the breast as in the other otter species in the area (see Figure 2); this feature is of great use in field identification if the head is clearly visible. The underfur is very pale. In Cambodia the hairy-nosed otter is referred to as the 'black otter' by local people, whereas the smooth-coated otter is called the 'grey otter' (see Figure 3) as in general they consider that *L. sumatrana* has a darker coat than *Lutrogale*.

Little is known about internal anatomy. Cantor (1846) describing the post-mortem dissection of a male hairy-nosed otter, says the intestinal canal measured 2.7m, with a circumference of 57 mm, with no caecum. He also states that the kidney consists of “ten loosely connected glands”.

Nothing has been published about the physiology of this species.



**Fig 2:** Left: The white throat patch is in sharp contrast with the rest of the body, and is smaller than in other otter species in the region. Right: Fine hairs cover the rhinarium apart for the very edge of the nostrils.



**Fig 3:** Skin of hairy-nosed otter (left) and smooth-coated otter (right). The colour of the hairy-nosed otter is generally much darker than that of the other otters in the region. The throat patch is small and in high contrast to the rest of the body.

## BEHAVIOUR

Kanchanasaka (2007) in a film excerpt showed that this animal is a very sinuous and snaky animal, much more so than *Lutra lutra*. They also stand up on their hind legs as many other otter species do (Sivasothi and Nor, 1994). They are considered by local people to be fast swimmers.

Nothing is known about the territoriality of this species. Kanchanasaka (2007) considers from observation that it is probably solitary like its sister species, *L. lutra*. Nor (1999) describes two otters in traps and a third trying to rescue them. Nguyen Xuan Dang (2005) reports that hairy-nosed otters often forage in small groups of two to five individuals, which stay together as they move from one area to another. Nguyen Van Nhuan et al. (2008) had a direct sighting of two *Lutra sumatrana* together on land along a canal bank in U Minh Ha National Park, about 30 km U Minh Thuong National Park. The Sarawak Forestry Department website (in reference list) says “May be seen solitary or in groups of up to at least six. Pairing of male and female may be limited to the breeding period” (*sic*), but gives no original source. The nature of these groups – mothers with cubs, or parents with cubs, or bachelor groups or some other combination – is unknown.

Cantor (1846) indicates that juveniles are easily tamed, and that the species is used by people in Malaya for river fishing. The single captive representative is also very tame, and appears to wish for social interaction (Olssen, pers. obs.), which may indicate a higher degree of sociality than in, for example, *L. Lutra*, where tamed animals usually become less tame and more solitary upon maturity.

Cantor (1846) says that 'Its voice is a short shrill whistling, not unlike the sound of the cricket, but stronger'. The Sarawak Forestry Department describe the typical otter contact call of a single syllabic chirp, and says that mothers use a staccato chatter with their offspring. Nicole Duplaix recorded vocalisations in captive animals and considers them to be similar to *Lutra lutra* (N. Duplaix, pers. comm.)

Little is known about holts and resting behaviour, but Kanchanasaka *et al* (2003) found an old resting place described as "like a bird's nest" in the melaleuca forest in tall grass i.e. a mound of grass with a central depression. Nguyen Van Nhuan *et al.* (2008) found that from interviews with local hunters and people living and working around their study area in U Minh Ha National Park, Mekong Delta, Vietnam, that their opinion was that both of these species like to rest and sleep on high ground with thick reed areas. The same authors say that these animals prefer to use natural canal banks with thick reeds rather than banana plantations. They also prefer to live in traditionally planted forest areas more than intensively planted forest, partly because the water in such plantations has lately become brackish, and most of the native fish and other aquatic prey animals that the otters eat cannot survive in it. In addition, in the dry season, this habitat dries out completely.

Nguyen Vu Khoi *et al* (2007) found that in Viet Nam, in the Mekong Delta, this species is active in the morning between 06:00 and 07:30, and again in the late afternoon, from 16:30 to 17:30, even when people were present. The most common time to see the otters is between four and five in the afternoon. In Nguyen Van Nhuan *et al.* (2008), however, the researchers directly observed two *L. sumatrana* at 20:30 pm in the evening on 28th March 2008 for around 20-30 seconds. The animals did not appear to be disturbed by their presence, and one was apparently curious about the LED torch, approaching within 2 m. The area in which they were encountered has a significant level of human disturbance during the dry season.

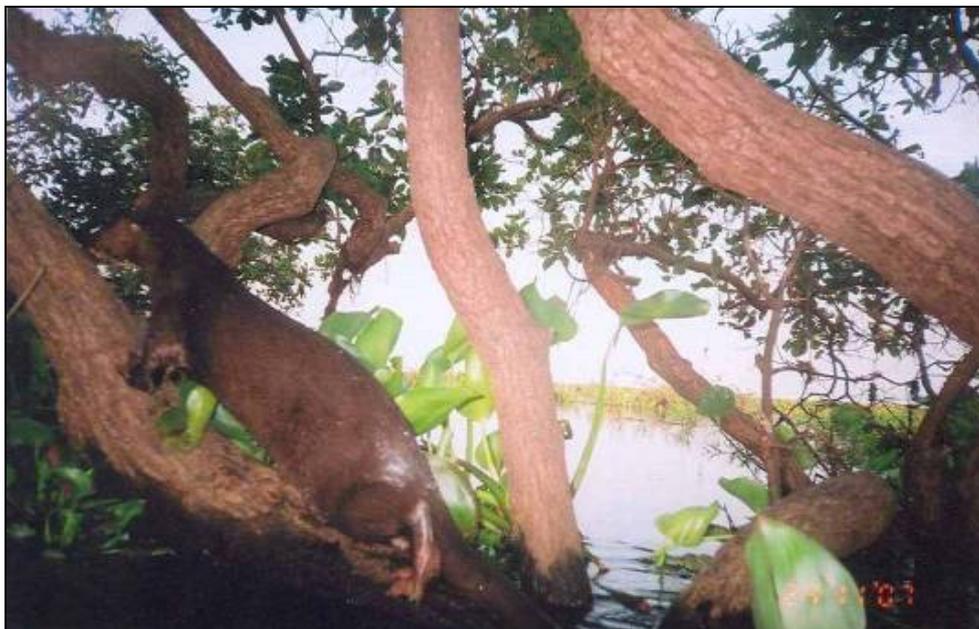
Data from camera trapping in Thailand showed that the hairy-nosed otters are active all day with high frequency in the morning (6.00-10.00) and at night (24.00-3.00) (Kanchanasaka *et al.*, 2003).

In Cambodia, camera trap photos are from early morning or late afternoon.

Kanchanasaka (2001, 2007) indicated that in Thai flooded forest, this species prefers to defaecate on sloping or horizontal tree trunks, branches and aerial roots. Rather than producing a scat heap, the deposit is long and thin, and laid along the route. In a piece of film footage of this species (Kanchanasaka, 2007), the animal walked up a sloping branch, then turned and smeared scat down the branch. Nguyen Xuan Dang (2005) in Viet Nam also found that they do not have regular latrines. This is possibly because they mainly live in seasonally flooded forest with differing water levels – scat not placed on tree limbs will not persist. In Cambodia, hairy-nosed otters have also been found to defaecate on logs or branches reaching out of the water (Figure 4). Only a few scats are found at each site. In Cambodia, local people report that this species always defaecates on branched or stumps, never on the ground in the dry season when the ground is dry.

According to Nguyen Vu Khoi and Hoang Xuan Thuy (2007), interviews with fishermen indicated that this species mainly breeds in November-December in the Mekong delta.

Kanchanasaka et al. (2003) found that gestation was around 2 months as with other otters, and cubs were seen in December to February, and one family observed consisted of both parents and a cub.



**Figure 4:** Hairy-nosed otter defaecating on branch just above the water level at Tonle Sap Lake, Cambodia.

In Cambodia, the skin of a recently caught pregnant female (foetus 8-9 cm long) was recorded at Tonle Sap Lake in December 2006 (Olsson, pers. obs.).

As far as we can generalise from these accounts, the otters are active in the morning, and again later in the day, evening or night (it may depend on the patterns of human disturbance, or prey activity patterns in the different environments). The gestation appears to be the otter norm of about 2 months, with birth between November and February, and it is possible that the male remains with the female and young, but more work is needed to clarify this.

## HABITAT

### Current Habitat Use

In Thailand, the otters were first rediscovered in 1998 in the Toa Daeng peat swamp forests of Narathiwat province (Figure 5), scattered in the evergreen inundated primary forest, and also near the mouth of the Bang Nara River. The main habitat is two types of swamp forest - a central flooded primary forest zone consisting of a three-storey formation of climax vegetation, which is very hard for humans to penetrate, and surrounding by secondary forest of stands of almost pure *Melaleuca cajuputi*, with adjacent grassland. The Bang Nara River is tidal.

There are a few records from Klong Saeng Wildlife Sanctuary and Khao Sok National park in 1984 before the construction of the dam in that area – these are from streams in evergreen forest at least 100m above sea level (Kanchanasaka et al., 2003), but

surveys after the reservoir filled found no further sign. The area still contains Smooth-Coated Otters and Small-Clawed Otters (Passanan, 2008, pers. comm.).

In Viet Nam, the otters are found in U Minh Thuong National Park and the nearby Vo Doi Nature Reserve (30km away), both in the Mekong Delta, near the Cambodian border and lying at about 2.5m above sea level. Both of these are peat swamp forests, with core areas mostly of *Meleleuca cajuputi* 15m high, covered in dense lianas (such as *Stenochlaena palustris*), surrounded by secondary, replanted melaleuca forest, which usually have a well-developed grass ground layer, and outside this are seasonally inundated meadows dominated by *Eleocharis dulcis*. The area has many canals and these and the swamps are covered by dense floating aquatic plants such as *Eichhornia crassipes*, *Pistia stratiotes* (both invasive aliens), *Salvinia cucullata* and *Ipomoea aquatica*. Surrounding all of this are buffer zones containing paddy fields and isolated stands of melaleuca. In addition, two hairy-nosed otters were observed directly on a canal bank in U Minh Ha National Park, in an area of young melaleuca plantation which was replanted 5 to 6 years ago following a forest fire. The canals contain many species of fish, and the area is densely reeded (Nguyen Van Nhuan *et al*, 2008).



Figure 5: Toa Daeng peat swamp forest

In Cambodia, this species has been recorded from the flooded forest surrounding the the large Tonle Sap Lake (see Figure 6.) The largest permanent freshwater lake in SE Asia, it is a natural reservoir in a depression in the Cambodian plain (10-30 m asl), and is really a widening of the Tonle Sap River which flows into the Mekong River near Phnom Penh. During the dry season (Dec to June), the lake is much reduced in size and in some places is only about a metre deep. In the Monsoon, the Mekong pushes water up the Tonle Sap River, reversing its flow and flooding the lake into nearby fields and forests and increasing to up to ten metres in depth. The area of the lake is about 2,500 km<sup>2</sup> during the dry season, expanding to about 15,000 during the wet season. The otters live mainly in the flooded forest and scrub surrounding the lake, using the drainage canals and ponds in the dry season, but foraging into the flooded forests of *Barringtonia acutangula*, *Hydrocarpus anthelminthica*, *Terminalia chabula*, *Homalium brevidans* and *Amelia asiatica* when available.

A recent camera trap sighting of *L. sumatrana* has been made in highland marsh at 560m in the Central Cardamom Protected Forest in the Cardamom Mountains of southwest Cambodia. These marshes comprise reeds, sedges and melaleuca, and vary in size from 1000 to 50 ha depending on the season; the area is used locally as lowland rice paddy, and is surrounded by evergreen hill forest

(Simpson, 2007). In addition, Olssen has recorded a camera trap photograph and a skin from a tributary of the Tonle Sap River at about 300m; the hunter reported that the otter came from the stream near the village, which is in mixed forest (Olssen et al., in prep).

In Sumatra, the animal was found in an area of oil palm and rubber plantations, with rivers and other small watercourses and areas of flooded open swamp (Lubis, 2005).



Figure 6. Flooded forest habitat of hairy-nosed otter at Tonle Sap Lake, Cambodia

### Earlier Records of Habitat Use

All the modern records describe the habitat of this species to be lowland flooded forests with watercourses and adjacent grassland, and this seems to have always been its main habitat. The current distribution of these habitats is very limited in these countries today, but in times past extended much further.

Historically however, the animals seem to have also made use of higher altitude rocky streams in jungle areas. Sivasothi and Nor (1994) quote other researchers finding this otter at 3900' (1800m) in the Kelabit Highlands of Sarawak (Davis commenting on Harrison's collection, 1956), and at 800m in inland forest in Malaya (Wayre, 1974 reporting Medway pers. comm.). The Sarawak Forestry Department (2007) consider the animal to be found from coast up to far (mountainous) interior. Hussain (2004) also gives shallow, swampy coastal environments as a possibility for this animal, based on the sources in Sivasothi and Nor (1994).

### DISCUSSION

When dealing with older historical sources, we have to consider whether the species identification was accurate, and whether the animal was personally collected/sighted by the person reporting, or whether they relied on what local people reported. In the case of at least one species, Gurney's Pitta, it transpired that the reported collecting locations were inaccurate, leading to a false representation of the species' range (Deignan, 1955). We present the data in the previous paragraph, but can make no assessment of accuracy given the passage of time.

In general, the habitat in which extant populations are found is flooded swamp forest. However, the existence of two recent camera trap photographs and a skin from higher altitude marshes and streams in evergreen forest indicates that future surveys should consider this as another potential habitat to cover.

## DIET

In Thailand, otter hunting behaviour was reported in the melaleuca forest. The otters swim fast, frightening fish into the roots of plants, where they easily can be caught. They have been caught on camera traps raiding fish traps so skilfully that the fishermen never know they have been there (Kanchanasaka, 2007). In the dry season, they forage mainly in canals and remaining pools.

In Viet Nam, Nguyen Xuan Dang (2005) found that the otters forage in all the habitat types, but are more often observed foraging in the secondary melaleuca forest, especially in the canals and swamps

In Thailand, the main prey selected were three-spot gourami (*Trichogaster trichopterus*), common climbing perch (*Anabas testudineus*), and snakeheads (*Channa* sp) with some water snakes: fish were in >80% of scats and snakes in >10% (Kanchanasaka, 2001, 2007). This remained constant all year.

In Viet Nam, in U Minh Thuong, they mainly took walking catfish (*Clarius macrocephalus*), which are farmed, and snakeheads (*Channa* sp.) in the dry season. If no other fish are available, they will also take climbing perch and snakeskin gourami (*Trichogaster pectoralis*), which are scaly and less liked (Nguyen Vu Khoi et al., 2007, 2008). According to interviews with local people, this area used to have abundant fresh-water crabs, but now due to salt water incursions, the crabs are no longer present; during surveys in U Minh Ha National Park, the same author's team did not observe any freshwater crabs in canals or forest. The local people commented that both Short-Clawed and Hairy-Nosed Otters ate fish and snakes, which they considered to be a change in diet resulting from the loss of the crab population.

In both locations, they will also take small numbers of frogs, lizards, crabs, insects, birds and small mammals, as was found historically (see references in Sivasothi and Nor, 1994).

In Cambodia studies of prey species have not yet been carried out. However, given the proportion of water snakes in the diet of *L. Sumatrana* in Thailand it could be speculated that the large off-take of water snakes from Tonle Sap Lake (Stuart et al. 2000) could impact on the otters there.

## PREDATORS AND COMPETITORS

Most of the animals that could prey on this species, e.g. leopards and tigers, have been reduced to extinction in its range by illegal hunting and habitat degradation. The hairy-nosed otter is probably the only large predator left in the areas where it is found.

In Thailand's Tao Daeng peat forest, it is possible that cubs particularly may fall prey to birds of prey such as the Grey-headed Fish-eagle (*Ichthyopaga ichthyaetus*), which is known to take other water-dwelling animals such as turtles (Maheshwaran, 1994). Stray dogs may also be a problem as they penetrate the forest regularly. There may still be Reticulated Pythons in the area which may take cubs.

In Viet Nam, eagles and Burmese Pythons (*Python molurus*) might prey on otters, but again all the major predators are gone.

In the Tonle Sap Lake, Cambodia, the highly endangered Siamese Crocodile (*Crocodylus siamensis*), and hybrids between it and *C. porosus* or *C. rhombifer* (frequently deliberately encouraged in crocodile farms with the inevitable escapes into the wild according to Jelden et al, 2005), which pose, which pose a potential risk to

the otters. Large birds of prey (*I. ichthyaetus* is particularly common, with one of its most important surviving world populations centred on the lake; Davidson, 2006) and pythons are also found here, and could potentially prey on otters.

In the area of Sumatra where the single road kill animal was found (Lubis, 2005), the only likely animal predator are feral dogs.

In Thailand, in Tao Daeng, it may be in competition with the Flat-Headed Cat (*Prionailurus planiceps*), the Fishing Cat (*Prionailurus viverrinus*) and the Grey-headed Fish-eagle (*Ichthyopaga ichthyaetus*), as these animals also prey on the same fish as the hairy-nosed otter.

In Viet Nam and Cambodia, Fishing Cats (*Prionailurus viverrinus*) might compete with otters for food. Again, all the big predators that could exploit the same food source are gone.

At Tonle Sap Lake, Cambodia, the many water snakes and fish-eating water birds will compete with the otters for fish.

This species is sympatric throughout its range with Asian Small-Clawed otter, *Aonyx cinerea*, but the two species live entirely different lives and so do not compete. *A. cinereus* is a small otter, living in large family groups around an alpha breeding pair, evolved as crustacean predators, and making use of shallow water, marshes, areas of mud, ditches and swamps, contrasting with what we know of *L. sumatrana*. Kruuk et al., (1993) describes the separation and overlaps in resource use between *L. lutra*, *Lutrogale perspicillata* and *Aonyx cinereus* in Thailand; it would be very interesting to extend this to include *L. sumatrana*. The hairy-nosed otter is also sympatric with the Smooth-Coated Otter, *Lutrogale perspicillata*, but there is no information on how these interact. Since the smooth-coated otter is a larger animal, it may well be that it targets larger size prey than the hairy-nosed otter.

There is evidence that in the past, *L. sumatrana* inhabited areas where it would have shared its range with *Lutra lutra* in northern Myanmar (Duckworth, 2008) – we have no information about how they interacted or partitioned resources. Than Zaw et al. (2008) indicate that there are still otters in Myanmar - if the two species are still extant in the same area, the relationship between these apparently similar animals could be investigated.

## GEOGRAPHIC DISTRIBUTION

The authors experience many difficulties in compiling this section. We are pretty sure of the accuracy of the “today’s known population” information.

We suspect there are more undiscovered populations out there but

- a) We need to know where to look, so that when we can get people interested, we can
- b) Indicate the most important areas to survey.

The historical range is incredibly hard to establish. We can either trust the peer review process and the literature it generates, or assume we can know nothing from the past except that some skins were found from some locations (and even then the collectors might have been inaccurate about exactly where they were found).

We believe that:

- a) The six known populations did not evolve in isolation *in situ* parallel to each other.
- b) It therefore follows that there must have been some population contiguity in the past.
- c) Before the relatively recent human population growth and habitat development/degradation, there was a great deal more habitat available for the species.
- d) From the literature accounts, we also suspect it can use more kinds of habitat than the flooded lowland peat swamp where it is found today.
- e) Again from the literature, we also feel that there were likely to have been a lot more of these animals around when there was more suitable habitat and less population fragmentation

On our map (Fig. 7) we have indicated where we know the species exists today, and the area that the literature states was former range. This may well be inaccurate, but the historical range is offered mainly for interest.

The important point is that there are some areas that the literature implies is part of the historical range that still contains potential habitat and where nobody has recently (or ever) surveyed for the species. Absence of evidence of hairy-nosed otters is not evidence of absence of the animal if nobody has actually been to look for it.

We have therefore also marked on the map the areas where we feel that surveys should be done as a matter of priority.

### **What the Literature Says about Historical Range**

Some of these accounts could be pure speculation, but the readers are free to decide for themselves whether they are reliable.

Historically, this species was considered fairly common in the first part of the twentieth century. Harrison, 1966, quoted in Nguyen Xuan Dang, 2005, says that in Malaya, 'It is abundant in the sea off Penang Island. It is also recorded from Singapore, but not from the sea there.' (p. 223); '... have been recorded from time to time, and one suspect that they visit here from the mainland.' Medway, (1977), quoted in Nguyen *opus cit*: observes that '... specimens indicate that this otter occurs throughout mainland Borneo, from the coast to small streams of the far interior' (p. 133), and Davies and Payne (1982) say: 'most information come from chance sightings and published works; large otters (*L. sumatrana* and *L. perspicillata*) are seen along the Kinabatangan river. The otters are not regarded as sufficiently rare or threatened by development to warrant special conservation methods now' (p. 141-146). Sivasothi and Nor (1994) say that the species was relatively common in Malaysia and Singapore, in Borneo (it is recorded from scattered localities in the N and W of Borneo in Payne et al. (2005), although the quality of the identification illustrations of all species shown is very poor, but the text is accurate) and particularly in Sarawak in the early part of the twentieth century, and that it is also recorded from most of Indochina south of the 16<sup>th</sup> parallel, Sumatra and Java. The British museum of Natural History holds a skin (specimen # 50.587) from far northern Myanmar (Gam Majaw N26.43 E97.58), which is far outside the known ecological and geographic range. This skin collected in 1939 seems to have never been referred to in print, but the skin has been checked and the identification confirmed as correct (Duckworth and Hills, 2008). This species is believed to be extremely rare in peninsular Malaysia. Since the 1960s there are only two records (from early 1990s) from Peninsular Malaysia, and further surveys are needed to confirm the continued presence here

(Sebastian, 1995). It is possible that there are populations in Lao People's Democratic Republic (which has given it legal protection despite having no records of its occurrence), and elsewhere in Indonesia.

### Current Geographical Range

At present, the Hairy-Nosed Otter is definitely known to exist in seven locations:

Country	Location	Evidence	References
Thailand	Toa Daeng peat swamp, Narathiwat province	Live capture, camera trapping, observation	Kanchanasaka (2001)
Thailand	Khao Banthad wildlife Reserve, Trang Province	Observation, camera trapping	Kanchanasaka et al. (2003)
Vietnam	U Minh Thuong National Park	Observation, camera trapping	Nguyen Xuan Dang et al (2001)
Vietnam	Vo Doi Nature Reserve	Observation, camera trapping	Nguyen Van Nhuan et al. (2008)
Cambodia	Tonle Sap lake	Skins, observation, camera trapping	Olsson et al. (2007)
Cambodia	Cardamon Mountains	Skins, observations, camera trapping	Simpson (2007); Olssen et al. (in prep)
Sumatra	Sekayu District, Southern Sumatra	Road kill	Lubis (2005)

### Recommended High Priority Areas of Research

- Northern Myanmar: this area should be surveyed even though it is so far out of the known historic range because of the existence of the skin described by Duckworth (2008).
- A corridor along the Tonle Sap river between the known ranges in Cambodia (Tonle Sap) and Vietnam (Mekong Delta)
- The former range in Malaysia, because there are no recent records as nobody has been surveying for this species.
- A second area in Sumatra that was formerly part of the historic range, but which has not been recently surveyed for these animals, plus any suitable habitat linking it to the known location.
- The island of Borneo should be surveyed wherever this is possible as suitable habitat still exists, it was part of the historic range, and there are some (not very reliable) recent anecdotal reports. On Borneo particularly, there is much misidentification of otters as the standard reference used (Payne and Frances, 2005) is very poor in distinguishing the species – the illustrations for *Aonyx*, *Lutra lutra* and *Lutrogale* appear identical except in scale, and there is no illustration

given of *L. sumatrana* at all, but museum specimen collection locations indicate that the latter species was historically present.

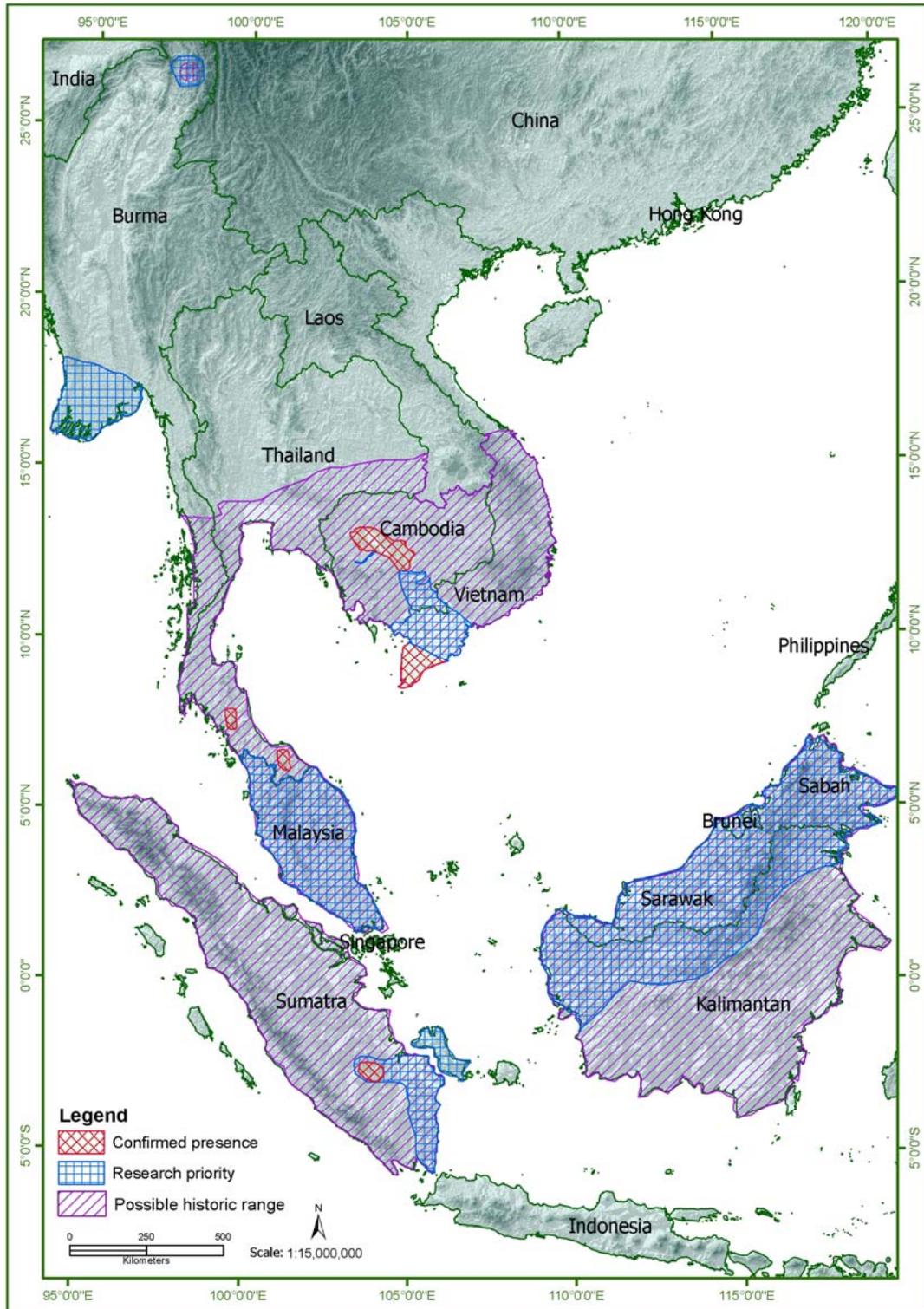


Figure 7: Historic and current distribution of *Lutra sumatrana* with suggested future survey sites

## TAXONOMIC POSITION

The taxonomic position of this species has gone through a great deal of confusion. It was probably first referred to (but not formally describe) by Raffles in 1822, who called it Barang. The IUCN-accepted formal description was made by Gray, in 1865, who called it *Barangia sumatrana* (Harris, 1968).

For a while, there was debate based on physical measurements as to whether *L. sumatrana* was not actually a species, but a subspecies of the Eurasian Otter (Koepfli et al., 2008), although this was further complicated by the suspicion that the subspecies of *Lutra lutra* inhabiting the same range was itself a new species, *Lutra barang* (van Bree, 1998). As a subspecies, the hairy-nosed otter would have a lower conservation priority than a species.

Fortunately, DNA work has untangled this web, and established that *Lutra sumatrana* is a true species (Koepfli et al., 2008). Bininda-Emonds et al. (1999) give it as a recent divergence from *Lutra lutra* and their results have since been reinforced by workers using different markers (Koepfli, pers. comm.).

## CONSERVATION STATUS

Up until the middle of the Twentieth Century, this species seems to have been generally considered common, and Cantor (1846) reports that it was one of the species tamed and used in fishing by people.

By the time of this species' CITES listing in 1977, this species was considered to be reducing in number and placed on Appendix II; the IUCN/SSC Red List Authority have mainly listed it as Data Deficient, which is not a helpful rating in terms of assessing conservation need, but reflects the lack of knowledge about the status of this animal.

The literature widely reports that it was believed to be extinct in 1998 as there had been no sightings at all for more than ten years (we have not been able to track down the source of this statement but it is referred to in the CITES entry at <http://www.cites.org/eng/resources/species.html>), but in 1999, the first sighting of the hairy nosed otter for many years was made in the peat swamp forest in Narathiwat province, southern Thailand (Kanchanasaka et al., 2003), and a handful of tiny populations in Vietnam, Cambodia and Sumatra have been found since then.

There is currently only one hairy-nosed otter in captivity in a zoo. Phnom Tamau Wildlife Rescue Center (PTWRC), Cambodia, received a young male in late 2007, from an illegal zoo that was being closed down; it previously held another animal in 2005, but this did not survive. PTWRC successfully keep and breed Smooth-Coated Otters, so hopes are high that they will succeed in obtaining a mate for this animal and establishing a breeding colony. Fishermen around Tonle Sap often keep otter cubs as pets (Poole, 2003). However, according to interviewees, they often die after short time in captivity (probably due to inappropriate care), or they are eventually killed and skinned. The local authorities are now passing such animals when discovered on to PTWRC.

The IUCN Otter Specialist Group currently considers *Lutra sumatrana* and *Lontra provocax* to be the species in most need of urgent *in situ* and *ex situ* conservation (J.W.H. Conroy, Chairman OSG, 2008, pers. comm.)

## Legal Protection

*Lutra sumatrana* is formally legally protected in all the countries where it is known to still survive – however, the passing of law and the upholding of that protection are two different things.

All otters in Thailand have been protected since 1961, being listed under Protected Wild Animals in the Wild Animals Preservation and Protection Act and were listed as endangered species in Thailand Red Data: Mammals, Reptiles and Amphibian (Nabhitabhata and Chan-ard, 2005). The Tao Daeng peat forest in Thailand is RAMSAR site no. 1102. It was given Wildlife Sanctuary status in 1991 after two-thirds of the forest was lost to rice cultivation (which only lasted for two years due to soil acidification, leading to more areas being cleared). It is now managed by the Department of National Park, Wildlife and Plant Conservation.

In Viet Nam, otters are listed by Government Decree No. 32/2006/ND-CP, dated 30 March 2006 as Group IB – hunting and use is strictly banned. In 2003, Nguyen (2005) conducted a census of hairy-nosed otter in U Minh Thuong National Park based on direct observation, which indicated a population of around 50– 230 animals, which may be the largest population in the country.

In Cambodia, Ministry of Agriculture Forestry and Fisheries (MAFF) is responsible for the implementation of the Law on Forest Management, which was revised and passed in August 2002. It includes a chapter on wildlife conservation, which, for the first time, provides a legal framework for national wildlife conservation. In early 2007, the national species list was finally passed, listing the Hairy-nosed otter as ‘Rare’, giving it full protection. However, although Cambodia’s laws are strict, limited capacity often leads to insufficient enforcement of them. The largest population of Hairy-nosed otters in Cambodia is at the Tonle Sap Lake. This is a UNESCO Biosphere Reserve. One of the core zones of the Biosphere Reserve is furthermore a RAMSAR site. The lake contains many fishing lots, sold to private individuals to harvest fish. Conservation practices are being introduced step by step as public acceptance is gained which is necessary in this very poor area still recovering from the past troubles. Surrounding the open water part of the lake is large area of flooded forest, scrub, grasslands, and agricultural land. Rice, lotus and mung beans are among the crops being farmed there. Traditional fishing communities living on and around the lake are very poor and fully dependent on fish and other natural resources from the lake area for their livelihoods. Conservation initiatives are in their early stages here.

In Sarawak, they are totally protected by the First Schedule [Section 2(1)] PART II on Protected Animals from the Wild Life Protection Ordinance, 1998 (Chapter 26). We could not trace any peer-reviewed records of them having been seen there for at least ten years, but the Sarawak Forestry Commission makes the claim on its website that “Hairy-nosed otter are sometimes seen early in the morning around the mangroves at Telok Assam” in Bako National Park (<http://www.forestry.sarawak.gov.my/forweb/np/np/bako.htm> )

## **THREATS FACING THE HAIRY-NOSED OTTER**

The Hairy-nosed otter faces many threats to its survival. Chief amongst these is the illegal fur trade, fuelled by high demand and prices in China (including Tibet, where otter skins form part of the traditional chupa costume (Yoxon and Yoxon, 2007 and Figure 8).



**Figure 8:** Otter skin forming part of traditional Chupa costume in Tibet. Photo courtesy of Paul Yoxon, Furget-Me-Not campaign (<http://www.furgetmenot.org.uk>) and Environmental Investigation Agency (EIA)

In Viet Nam, otter populations have crashed: “Otters are hunted mostly for illegal national and trans-border wildlife trade, and to a lesser extent for meat and medical use. During the 1990s there was an illegal nationwide campaign to catch otters for the illegal export of their skins to China. The hunters used large numbers of strong metal leg-hold traps and snares to catch the animals. This campaign greatly reduced the otter numbers in the country. Otter hunting is much reduced now due to the low number of animals in the wild and better enforcement of wildlife management laws and regulations. However, hunting still remains a significant threat to otters, especially in Viet Nam’s Mekong Delta where the wildlife trade is still out of control” (Nguyen Xuan Dang, 2005).



**Figure 9:** Hairy-nosed otter skin plus six typical traps, Tonle Sap lake, Cambodia.

In Cambodia, especially at the Tonle Sap Lake, massive hunting is taking place as commercial traders provide fishermen with traps and a guaranteed market for the furs, which are then exported to China (see Fig. 9). The entire trade is illegal, but the instigators, i.e. the middle men, are very hard to catch, and police often end up only being able to arrest desperately poor fishermen who have taken part in the trade to augment their pitifully low incomes. Large areas at the lake are divided into fishing lots. The owners of these sites, protect the sites astonishingly well from intruders. However, otter hunters are often welcome in the lots, as otters oppose threat to the fish stocks and are seen as a pest species.

The second major threat throughout Southeast Asia is habitat destruction. In Thailand, the main threat to this otter is further destruction of its peat forest habitats. Although Tao Daeng is now heavily legally protected, it is also in an area where there is a great deal of insurgency, making law enforcement and monitoring work very difficult and dangerous (Kanchanasaka, pers. comm.).

According to Nguyen Xuan Dang (2005), in Viet Nam, the otter habitat is still recovering from the bombing and defoliation of the Vietnam War. Subsequent development is draining and polluting wetlands, and logging for commerce and to clear land for more agriculture is putting intense pressure on the swamps, and only the two reserves in which the hairy-nosed otter are found represent significant swamp forest left in the country. However, even these areas are under threat, and burning has recently destroyed a large proportion.

In Cambodia, villagers living in and around the Tonle Sap Lake, cut and collect firewood from the flooded forest there. Some areas are also illegally being cleared for agricultural (paddy field) purposes.

In Sumatra, the sole animal recently found was a road traffic casualty, so it could be expected that as their habitat is developed for human use, this could be an increasing danger.

In Sarawak, 500,000 ha of peat swamp forest have been earmarked for oil palm plantations (Sebastian, pers. comm.).

In Viet Nam, water pollution due to runoff from agriculture is starting to have an effect (Nguyen Xuan Dang, 2005). No thorough studies on water pollution and its effect on wildlife have been carried out in Cambodia.

In Viet Nam, fishermen are over-exploiting fish, reducing the otters' prey base (Nguyen Xuan Dang 2005). In Cambodia and Thailand, they are directly persecuted as raiders of fish traps, and for damaging the nets that confine fish in aquaculture (Hotta and Yahaya, 1985, Kanchanasaka, 2007, A. Olsson pers. Comm.).

In Cambodia, parts of the otters are sometimes used in traditional medicine. Skin, gall-bladders and foetuses have been recorded for use in medicine, curing symptoms like fever and making you stronger. Normally the meat will be eaten, but bones are useless and will be thrown away.

In Sumatra, and in Java too, there is a belief that otters possess stones embedded under their skins that let them swim very fast and hold their breath underwater, and people try to acquire these stones (Lubis, 2005).

In Viet Nam, there is no tradition of using otter skins or meat – they do not have any special status.

In addition to these the closer encroachment of human populations and their attendant companion animals means there is a growing risk of exposure of otters to rabies and distemper transmitted by feral dogs.

In Thailand, Cambodia and Vietnam, invasive foreign waterplants *Eichhornia crassipes* (Global Invasive Species Database) and *Pistia stratiotes* (Waterhouse,

1993) are spreading and altering the ecology of waterways and lakes for over twenty years; however, Nguyen Vu Khoi (2007) records *L. sumatrana* making use of habitat colonised by the latter, so it may not have a significant effect on these otters.

In Cambodia, the invasive snail *Pomacea canaliculata* is present in the otters' habitat (Olsson, Pers. Obs.). This was deliberately introduced into south-east Asia from its original South American range as a potential gourmet food item, but no market developed, and the snails have since spread to become a major crop pest on rice; they have a voracious appetite for many water plants and can transform wetland ecologies. As it is also a potential food source for otters, it is as yet unclear whether it will be a net threat or benefit for the Hairy-Nosed Otter.

## CONCLUSION

The hairy-nosed otter is under great pressure and may soon be extinct for good unless concerted and effective conservation measures take place. It is the opinion of the authors that suppression of the illegal fur trade, protection of habitat and establishment of a healthy, genetically viable captive population are the three biggest steps that can be taken toward this species' survival. Further research is very important, but practical and immediate protective actions are vital if we are not to simply chart the disappearance forever of another species of otter.

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## EXIRPTS

The following excerpts are those given in Sivasothi and Nor (1994); they are quoted here by permission of the authors as they are valuable historical reference material which are hard to obtain. They are given in date order.

- Cantor, 1846: [as *L. barang* Raffles] "Mumrang' or 'Amrang' of the Malays of the Peninsula.' 'The Malayan individuals appear to attain to a greater size than the Sumatran, described by Raffles'; Distr. - Malayan Peninsula, Borneo (p. 195).  
 'This [*Aonyx leptonyx*], as well as the two preceding species (*L. perspicillata* & *L. sumatrana*), inhabits numerously the banks of the Malayan rivers, and all are at times used by the Malays in river fishing.'; Distr. – Malayan Peninsula, Singapore” (p. 196).
- Lydekker, 1894: 'The hairy-nosed otter (*L. sumatrana*) is a very well-marked species from the Malayan region (p. 96).
- Ridley, 1895: Two species of otter have been met with in Singapore, viz., *Lutra sumatrana* and *L. leptonyx*; but they seem to be rare, and little is known about them. The Malays often call them 'Anjing Ayer' (water dogs) (p. 94).
- Flower, 1900: 'Recorded from the Malay Peninsula by Cantor, and from Singapore by Ridley. A specimen caught in Selangor is in the Museum at Kuala Lumpur.'; Distr. - Malay Peninsula and Islands (p. 334).
- Kloss, 1908: included in the provisional list of mammals of the peninsular region.
- Kloss, 1909: Distr. - The Peninsula, Singapore and Langkawi Island. (p. 33).
- Chasen, 1924: listed in checklist of mammals of Singapore; 'Otters of any species are either not common in Singapore or adepts at concealment, possibly the latter.' (p. 84).
- Chasen, 1925a: included in the true Singapore land fauna (p. 88).
- Banks, 1931: occurs in Sarawak (p. 60).
- Chasen, 1940: Distr. - Malay States, Sumatra, Banka, Borneo (p. 93).

- Davis, 1958. Reporting on Harrison's collection between Sept. 1945 and Dec. 1949: One male, Pa Umur, 3900 feet. Collector's note. - 'In small rocky brook. The animal also goes into jungle. Food: crabs and small fish.' (p. 133).
- Tate, 1947: 'The range includes the whole of the Malay Peninsula ... It also occurs on Sumatra ... and on Borneo' (p. 157).
- Banks, 1949: listed as a mammal of Borneo (p. 40).
- Harrison, 1969: 5 animals collected by IMR between 1947- 1957 (p. 175); family in river seen in an area of disturbed rainforest at Sg. Buloh, Selangor (p. 176).
- Harrison, 1964: recorded from North Borneo (Sabah) (p. 22).
- Wayre, 1974: 'Medway told us that in 1964 a Hairy-nosed Otter had been caught by Aborigines near Janda Baik in the Bentong division of Pahang at approximately 550 metres in a torrent stream' (p. 37).
- Harrison, 1966: 'It is abundant in the sea off Penang Island. It is also recorded from Singapore, but not from the sea there.' (p. 223); '... have been recorded from time to time, and one suspect that they visit here from the mainland.' (p. 6); present in Penang (p. 7); known from Malaya (p. 332).
- Medway, 1977: '... specimens indicate that this otter occurs throughout mainland Borneo, from the coast to small streams of the far interior' (p. 133).
- Davies & Payne, 1982: most information come from chance sightings and published works; large otters (*L. sumatrana* & *L. perspicillata*) are seen along the Kinabatangan river. The otters are not regarded as sufficiently rare or threatened by development to warrant special conservation methods now (p. 141-146).
- Foster-Turley & Santiapillai, 1990: '... the current existence of ... the Hairy-nosed otter ... is unconfirmed', in Peninsular Malaysia. 'In Sabah and Sarawak, ... at least three species of otter occur', including the Hairy-nosed otter (p. 58-9).
- Foster-Turley & Santiapillai, 1990: Not reported in Peninsular recently, possibly still present in remote areas, in scattered localities in East Malaysia; believed extirpated in Singapore.
- Yang et al., 1990: In Singapore, current status unknown.
- Nor, 1990a: Only the Smooth Otter and the Small-clawed Otter found during survey of northern Malaysian states. No other species observed.

## **RESUME**

### **UN EXAMEN DE LA LOUTRE DE SUMATRA**

La loutre de Sumatra (*Lutra sumatrana*) est l'une des treize espèces les plus rares et les moins connues de la sous-famille des Lutrinés. L'état de nos connaissances sur sa biologie, sa distribution historique et actuelle et les menaces pour sa survie sont présentées ici, basées sur la littérature et sur de nouvelles recherches sur le terrain. L'avenir de cette espèce est problématique, en effet la dégradation très étendue de son habitat et la chasse pour le commerce illégal de ses peaux, ont tout deux un effet catastrophique sur la distribution très fragmentée des petits effectifs de sa population. Des actions urgentes et immédiates seront nécessaires pour sauvegarder cette espèce d'une extinction imminente.

## **RESUMEN**

### **UNA REVISION DE LA NUTRIA DE SUMATRA**

La nutria de Sumatra o de nariz peluda (*Lutra sumatrana*) es una de las más raras y menos conocidas de las 13 especies de nutrias. Presentamos una revisión del estado actual de conocimiento sobre esta especie, su área de distribución histórica y actual, y las amenazas a las que se enfrenta según la bibliografía publicada y las investigaciones en curso. Consideramos que el futuro de esta especie es preocupante, con una degradación de su hábitat a gran escala y una caza ilegal para el comercio de su piel, llevando a las escasas y fragmentadas poblaciones hasta niveles insostenibles. Recomendamos una acción una inmediata y urgente para salvar a esa especie de su extinción en un futuro muy cercano.

**Khmer:**

រោមមុខដីជាប្រភេទមួយដែលកំរកហើយមានពិសេសតិចតួចបំផុតក្នុងចំណោមប្រភេទរោមទាំង១៣ នៅលើពិភពលោក។ យើងសូមបង្ហាញថាយោងទៅតាមការសិក្សា និងពិនិត្យឡើងវិញលើពិសេសបច្ចុប្បន្នអំពី ប្រភេទសត្វនេះ ជីវប្រវត្តិ រចនាសាស្ត្របច្ចុប្បន្ន និងកត្តាគំរាមកំហែងចំពោះមុខ ដោយបានដកស្រង់ចេញពី ឯកសារដែលបានបោះផ្សាយរួច និងការបន្តសកម្មភាពតាមដានស្រាវជ្រាវនាពេលបច្ចុប្បន្ន។ ដូច្នោះយើងជឿជាក់ ថានៅពេលអនាគតរោមប្រភេទនេះនឹងកាន់តែខ្វះខាតទៅៗ ប្រសិនបើវាជួបប្រទះនឹងការបាត់ទីជីវកដែលមានទ្រង់ ទ្រាយធំ និងការប្រមាញ់សំលាប់ដើម្បីធ្វើអាជីវកម្មស្បែកដោយខុសច្បាប់ ព្រមទាំងចំនួនដែលមានតិចតួចស្រាប់ ផង វាអាចនឹងកើតនៃការបាត់បង់មានកិរិតកាន់តែខ្ពស់ឡើង។ យើងសូមផ្តល់អនុសាសន៍ថា ត្រូវចាត់វិធាន ការណ៍ជាបន្ទាន់ក្នុងការការពារ និងសង្គ្រោះរោមប្រភេទនេះអោយជៀសផុតពីការបាត់បង់ផុតពីជនាពេលអនាគតដ៏ខ្លី។

**Vietnamese:**

Rái cá lông mũi (*Lutra sumatrana*) là một trong 13 loài rái cá hiếm và rất ít thông tin về chúng. Trong cuốn sách này, chúng tôi giới thiệu những thông tin được tổng hợp gần đây về loài rái cá này, về phân bố hiện nay và trước đây của loài và những đe dọa đến sự tồn tại của loài, các thông tin này trích dẫn từ các tài liệu đã xuất bản cũng như các điều tra hiện đang tiến hành. Chúng tôi cho rằng loài rái cá này đang gặp nhiều nguy hiểm do môi trường sống bị hủy hoại nghiêm trọng trên diện rộng và do việc săn bắt bất hợp pháp để lấy da đã gây áp lực liên tục lên những quần thể nhỏ, rải rác còn sót lại. Chúng tôi đề xuất những hành động trực tiếp và ngay lập tức để cứu lấy loài rái cá này trước hiểm họa tuyệt chủng của loài trong tương lai gần.

**Thai:**

นากใหญ่จมูกขนเป็นนากชนิดที่หายากที่สุด และมีข้อมูลอยู่น้อยที่สุดในจำนวนนากทั้ง 13 ชนิด บทความนี้ได้นำเสนอข้อมูลที่มีอยู่ในปัจจุบันและในอดีต รวมทั้งข้อมูลการแพร่กระจายและปัจจัยคุกคามต่อนาก ข้อมูลเหล่านี้ได้มาจากการรวบรวมเอกสารอ้างอิงและการสำรวจที่ยังดำเนินอยู่นัก เราเชื่อว่าสถานภาพของนากใหญ่จมูกขนในอนาคตกำลังถูกคุกคามเนื่อง จากถิ่นอาศัยในภาพรวมทั้งหมดกำลังเสื่อมโทรม และผลจากการล่าเพื่อการค้าหนัง เป็นเหตุให้เกิดเป็นประชากรขนาดเล็กในพื้นที่อาศัยที่เสมือนเป็นเกาะที่ จึงไม่มีมียังยั้ง เราจึงสนับสนุนให้มีมาตรการเร่งด่วนในการอนุรักษ์นากใหญ่จมูกขน ก่อนที่มันจะสูญพันธุ์ไปในอนาคต