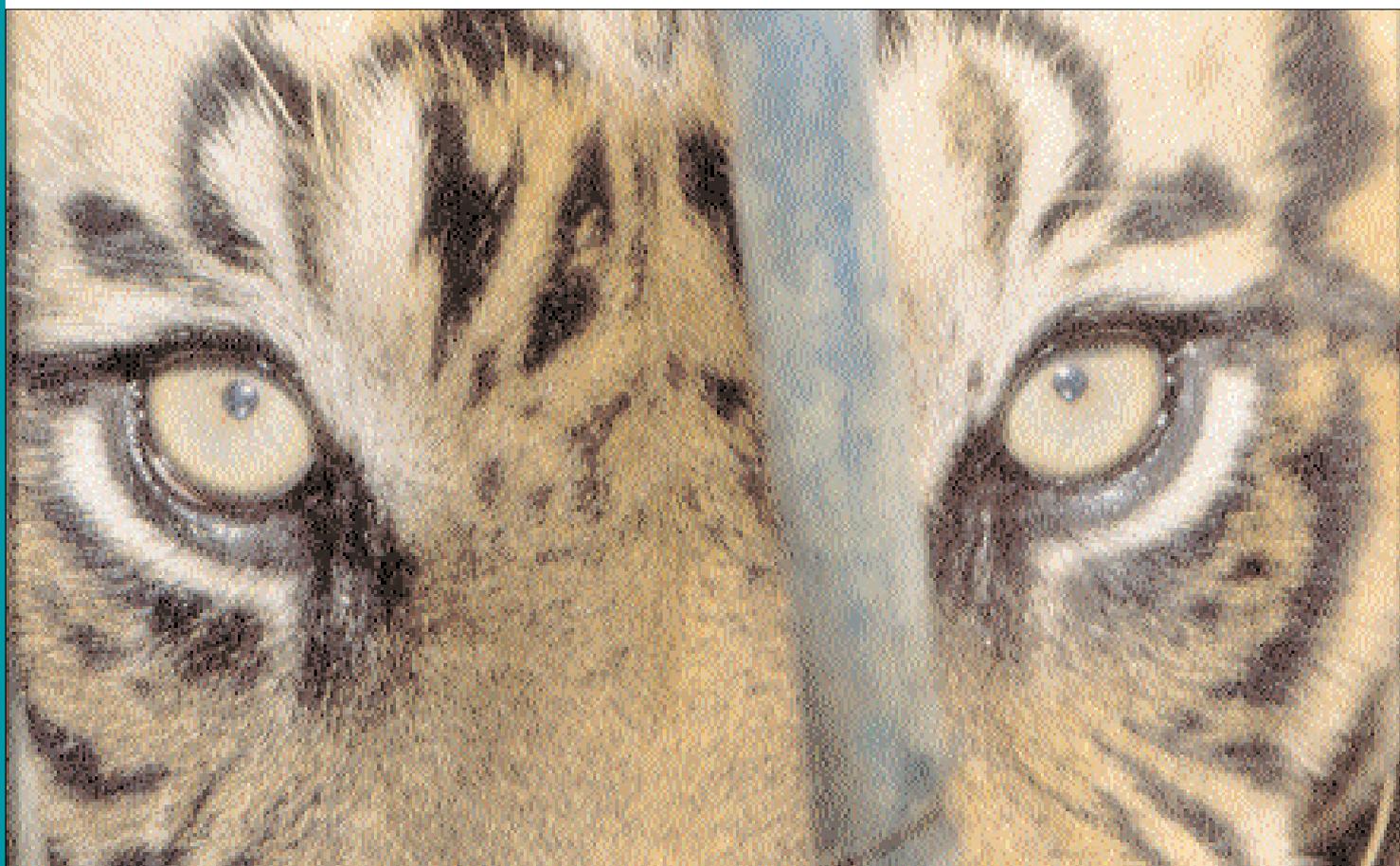


NOWHERE TO HIDE:
THE TRADE IN SUMATRAN TIGER

CHRIS R. SHEPHERD

NOLAN MAGNUS

A TRAFFIC SOUTHEAST ASIA
REPORT



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**NOWHERE TO HIDE:
THE TRADE IN SUMATRAN TIGER**

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Key to Abbreviations used in this report

CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora: treaty regulating international trade in endangered species
cm	centimetre
DFNC	Department of Forestry and Nature Conservation (Department of PHKA)
FFI-ID	Fauna and Flora International Indonesia Programme, British-based international conservation NGO
GIS	Geographic Information System: mapping software for combining different types of data
ID	Indonesia
IP	Indonesia Programme
IRF	International Rhino Foundation
kg	kilogramme
km	kilometre
KSDA	Natural Resources Conservation Agency (Under PHKA)
m	metre
NGO	Non-Governmental Organisation
PHKA	Perlindungan Hutan dan Konservasi Alam: Ministry of Forestry, Indonesia
PHVA	Population and Habitat Viability Assessment (program of the IUCN/SSC Conservation Breeding Specialist Group)
RPU	Rhino Protection Unit: anti-poaching teams managed by PHKA and the International Rhino Foundation
SECP	Sumatran Elephant Conservation Programme (FFI)
STCP	Sumatran Tiger Conservation Program: a partnership between the Tiger Foundation, Sumatran Tiger Trust and PHKA
TCU	Tiger Conservation Unit: large blocks of habitat for Tigers identified by GIS analysis (Wikramanayake et al 1998)
TPU	Tiger Protection Unit: anti-poaching teams for Tigers managed by PHKA and NGO partners including FFI, STCP and WCS
TRAFFIC	The wildlife trade monitoring network
WCS	Wildlife Conservation Society: US-based international conservation NGO
WWF-ID	Conservation organization

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Executive Summary

The Sumatran Tiger is listed as Critically Endangered, (the highest category of threat), on the IUCN 2003 Red List of Threatened Animals (Anon., 2003a). Since the early 1990s, a continued and leading threat faced by the Sumatran Tiger is poaching for their bones, which are used in a variety of traditional Asian medicines. Indonesia was singled out in South Korean Customs import records as being a major supplier of tiger bone (1975-1992). During the 1990s, the international conservation community and the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) greatly increased efforts to conserve wild tiger populations and eliminate domestic markets for tiger bone throughout the world, especially in Asian countries. A review of progress by TRAFFIC (Nowell, 2000) found that significant progress had been made. However, Sumatra was singled out as a tiger range area where trade in tiger bone and other tiger products continued in a fairly open manner. TRAFFIC thus organized a comprehensive survey of tiger poaching and trade in Sumatra to document the current extent of the problem and provide the necessary information to management and enforcement authorities to act upon.

Despite Sumatran Tigers being fully protected by law, with tough provisions for jail time and steep fines, as well as increased effort in tiger conservation and building law enforcement and anti-poaching capacity, this survey demonstrates the existence of a substantial market for tiger parts and products in Sumatra. Surveys were carried out in all eight provinces of Sumatra in 2002, with a total of 24 towns and cities being surveyed, recording 484 observations from shops and dealer sources in 2002. Only seven towns in this survey did not have tiger parts for sale (29% of towns). In the other 17 towns a total of 117 shops and dealers (25% of those surveyed) were found to have tiger parts for sale. A total of 453 retail shops were surveyed and 86 (19%) were observed to have tiger parts for sale, primarily canines and claws. Most trade in skins and bones was carried on in a covert manner by a variety of dealers. Thirty-one dealer contacts were made with information on the sale of tiger parts.

Most Sumatran tigers were found to be killed by professional or semi-professional hunters operating individually or in small groups. They were also found to be killed primarily with inexpensive and simple-to-make wire cable leg-hold snares. Sometimes the traps which catch and kill Sumatran Tigers were sometimes intended to catch other species, and the tiger was killed by accident. Information on this type of tiger killing from investigators suggests that at least four tigers per year are killed as “incidental killings”. Although not the target species, the tiger’s parts frequently entered the trade.

Human-tiger conflict has long been a serious problem in Sumatra, compared to other parts of the tiger’s global range. Many people have been killed or wounded by tigers; tigers frequently prey on livestock. As a result, villagers often seek to have problem tigers killed, although they are encouraged to contact the Forestry department to try to have the problem animal live-trapped and removed from the area.

Although the numbers of tigers lost through incidental killings or as a result of human-tiger conflict are significant, most tigers in Sumatra are apparently killed deliberately for commercial gain. Our

findings show that tiger poaching has not declined significantly over the past decade, despite greatly increased conservation efforts and global measures to curtail tiger bone trade. Previously it was thought that tigers were being poached primarily on the edges of forests in regions near villages where they come into conflict with people. However, in TRAFFIC's investigation, poachers and undercover investigators stated that tigers are hunted deep within national parks.

The survey also suggested the possibility that tiger bone trade in Sumatra has declined. TRAFFIC's surveys found less tiger bone available than in previous surveys from 1995 (Plowden and Bowles, 1997), and also lower prices for Sumatran Tiger bone than have been reported in the past (Tilson and Traylor-Holzer, 1994, Nowell, 2000). This report echoes the conclusion of TRAFFIC's global review of tiger bone trade in the late 1990s (Nowell, 2000): that despite apparent progress in curtailing markets for tiger bone used in traditional Asian medicines, there is little evidence to indicate a major decline in tiger poaching.

Information from traders in Sumatra also indicates that tiger bone and other tiger parts are reportedly still smuggled out of Sumatra. Traders report that tiger parts are sold to Korea, Taiwan, Singapore, Japan, Malaysia and China. Singapore and Malaysia may act as transit countries as well as consumers for tiger parts.

The findings of this report show the structure and extent of the trade, which is essential in guiding future work, and in highlighting the importance of increased enforcement. Numerous sources indicate that a lack of political will at best, and widespread corruption at worst, hinders enforcement of trade and hunting bans. In the last few years, there have been intensified efforts to improve law enforcement and anti-poaching capacity in Sumatra. This report should sound the alarm regarding the crisis Sumatra's Tigers currently face, and provide vital information for government and conservation organizations to work from.

Loss of habitat through illegal logging, and high levels of human-tiger conflict will continue to threaten the Sumatran Tiger unless greater effort is made to control timber harvest and land conversion, and develop effective policies to manage problem tigers and buffer zones around reserves.

However, since it appears that the majority of Sumatran Tigers are killed because of the value of their parts, eliminating the market for tiger parts in Sumatra and other consumer countries should lead to a reduction in tiger poaching. The primary recommendation of this report is that Indonesian authorities must urgently increase enforcement efforts and implementation of laws banning trade in tiger parts and products or extinction is near for the last of Indonesia's tigers.

1. INTRODUCTION

The Tiger *Panthera tigris* is today an Endangered species (Anon., 2003a), and over the past decade conservationists have considered illegal international trade in Tiger bone for traditional Asian medicines as the primary force driving Tigers toward extinction. TRAFFIC has led the way in helping the conservation community understand the scope, volume and workings of illegal Tiger trade. *Killed for a Cure: A Review of the Worldwide Trade in Tiger Bone* (Mills and Jackson, 1994) was the first comprehensive documentation of the extent of the trade. This report helped motivate countries, organizations and individuals around the world to focus on Tiger conservation and shutting down medicinal trade in Tiger bone. Progress toward implementation of new trade controls was reviewed in a second TRAFFIC report (Mainka 1997). In the late 1990s, TRAFFIC commissioned surveys around the world to evaluate markets for Tiger bone and other Tiger parts and products, and this was published as *Far from a Cure: The Tiger Trade Revisited* (Nowell, 2000). *Killed for a Cure* indicated Indonesia as a leading global source of Tiger bone from the mid 1970s to the early 1990s, despite this trade being illegal and there being no official Indonesian records for it, based on import statistics from South Korea (Mills and Jackson, 1994). *Far from a Cure* found evidence of substantial progress toward eliminating markets for Tiger bone in many countries, but Indonesia was highlighted as a supplying market for Tiger parts and products where illegal trade was still carried out relatively openly (Nowell, 2000).



Credit: TRAFFIC Southeast Asia

A Sumatran Tiger in captivity. Sumatran Tigers are rapidly disappearing from the wild.

As a next step, TRAFFIC undertook extensive market surveys in Sumatra to describe and document current illegal Tiger trade. This report summarizes Sumatran Tiger conservation efforts, provides background on Sumatran Tiger trade, and then draws together data from TRAFFIC surveys and a number of other sources to analyze poaching, the role of Tiger conflict with humans, and current illegal markets for Tiger parts and products in Sumatra. The state of Tigers in Sumatran zoos is also examined. The population of Sumatran Tigers *Panthera tigris sumatrae* is

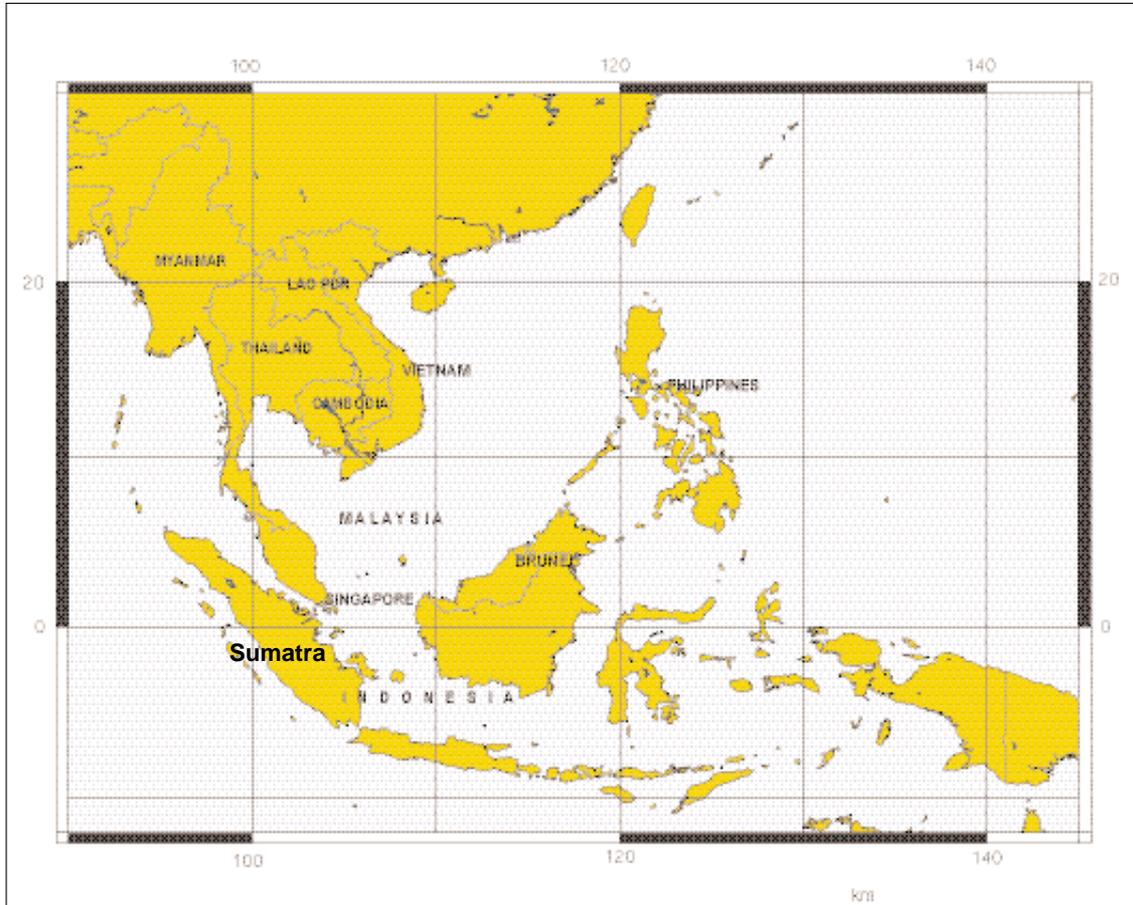
Critically Endangered (Anon, 2003a). In the late 1990s it was estimated that there were as few as 400-500 left in the wild (Seidensticker *et al.*, 1999). By providing the first in-depth examination of illegal Tiger trade in Sumatra, this report aims to help the Indonesian government and conservation community to better enforce hunting and trade bans, and ensure that Sumatran Tigers do not follow in the tracks of the now-extinct Tigers of Bali and Java.

1.1 Status and Conservation of the Sumatran Tiger

Indonesia is the world's largest archipelago, being made up of more than 17,000 islands extending for 4,500 km west from Sumatra to Papua (formerly Irian Jaya). With an area of approximately 476 000 km², Sumatra is the second largest Indonesian island as well as the sixth largest island in the world. Politically, the island is divided up into eight provinces, including Aceh, North Sumatra (Sumatra Utara), West

Sumatra (Sumatra Barat), Riau, Jambi, Bengkulu, South Sumatra (Sumatra Selatan), and Lampung (Map 1). Sumatra boasts some of the highest levels of biodiversity in the world and, with 201 species, has more mammals than any other island in Indonesia (Anon., 1994, Whitten *et al.*, 1997).

Map 1. Location of Sumatra in Southeast Asia region



Sumatra is the only Indonesian island to still retain a wild tiger population. Tigers became extinct on Bali and Java in the 20th century. Tigers were last positively recorded from the island of Bali in the late 1930s. The Bali Barat National Park was established in 1941 in tiger habitat in western Bali, but it is likely that tigers in Bali became extinct by the end of World War II or possibly as late as the early 1950s. The causes of extinction include hunting and loss of forest habitat and prey base (Nowell, 2003a). Tigers were formerly widespread on the Indonesia island of Java, but by 1970 had become restricted to the Meru Betiri Reserve on the eastern south coast. Javan Tigers were last positively recorded during a survey there in 1976. There have been no confirmed records since then (although Leopards *Panthera pardus* persist there, and their tracks are sometimes mistaken for tiger). The primary causes of the Javan Tiger's decline are hunting and loss of forest habitat, and its final disappearance from Meru Betiri Reserve is linked to the absence of suitable large wild cervid prey (Nowell, 2003b). There are no Javan Tiger or Bali Tiger subspecies in captivity; these races of tiger have been lost forever.

The population of Tigers on Sumatra is thus the last remaining Tiger population in Indonesia. Sumatra became isolated from mainland Asia as an island 6000-12 000 years ago when sea levels rose, but the island shares much of its fauna with Peninsular Malaysia, including Tigers (but not Leopards). There have been thousands of years of separation between Sumatran and mainland Asian Tigers (Seidensticker, 1986). The uniqueness and taxonomic classification of the Sumatran Tiger is a matter of debate among cat specialists. Sumatran Tigers are often described as smaller than mainland Asian Tigers, with darker coloration and thicker stripes. However, some researchers have found little difference between Sumatran Tigers and those found on the Asian continent on the basis of morphology (Kitchener, 1999) as well as genetics (Wentzel *et al.*, 1999). On the other hand, one group of researchers has argued that the Sumatran Tiger genome is consistently distinctive and warrants classification as a full species of Tiger, *Panthera sumatrae*, separate from the Tiger *Panthera tigris* of continental Asia (Cracraft *et al.*, 1998). The consensus and operating view in the cat conservation community is to classify the Sumatran Tiger as one of five existing Tiger subspecies, *Panthera tigris sumatrae*, as first described by the great early 20th century felid taxonomist, Reginald Pocock (Pocock, 1929).

There are far fewer Sumatran Tigers (*Harimau Sumatera* in Bahasa Indonesia) alive in the wild today compared to historical times. In the early 20th century, Dutch colonists often reported Tigers as a “plague,” so numerous and bold that they would enter the planters’ estate house compounds (Treep, 1973). Borner (1978) estimated that there were 1000 Sumatran Tigers; ten years later, Santiapillai and Ramono (1985) felt the population should be “numbered in hundreds rather than thousands.” But today the Sumatran Tiger is listed as Critically Endangered by the World Conservation Union, which means that the species is facing an extremely high risk of extinction in the wild (Nowell *et al.*, 2003c). The most recent attempt to estimate the total number of wild Tigers on Sumatra was at a 1992 international conference (Sumatran Tiger Population and Habitat Viability Analysis). The general consensus of the workshop was that “there are probably fewer than 400 Tigers living in six major protected areas of Sumatra. Another 100 or fewer Tigers outside of the protected areas are probably not going to survive for long” (Tilson *et al.*, 1994: 2).



A Sumatran Tiger in the Medan Zoo in North Sumatra.

Following the workshop, the Indonesian government developed a Sumatran Tiger Conservation Strategy (Ministry of Forestry, 1994). In the late 1990s, the Exxon oil company (now Exxon/Mobil corporation), which has the Tiger as its logo, established the Save the Tiger Fund, and in recent years it and other international donors have supported Indonesian efforts to conserve the Sumatran Tiger with significant investments. New research has updated estimates for some individual populations (see below and Table 2), but 400-500 is still the estimate of the total number of wild Sumatran Tigers in general use by the

IUCN/SSC Cat Specialist Group (Seidensticker *et al.*, 1999). For the purposes of a population estimate for the IUCN Red List, which includes only mature breeding individuals, the Cat Specialist Group estimates the number at approximately fewer than 250, with no single population much larger than 50 mature breeding individuals (Nowell *et al.*, 2003c).

The Sumatran Tiger occurs from sea level to at least 2,000 m, in both primary and secondary forests (Treep, 1973, 1978; Griffiths, 1993). The Sumatran Tiger lives in both lowland and montane rainforest and in freshwater swamp forests throughout Sumatra (Wikramanayake *et al.*, 2002). Unfortunately the habitat critical to both Tigers and their prey in Sumatra is rapidly vanishing. The approximate forest loss in Sumatra from 1985 to 1997 was 67 000km², most of this being lowland rainforest. However, the annual rate of forest loss has been increasing across Indonesia. Country-wide, the deforestation rate in the 1980s was 8000km²/year. In the early 1990s this rate had increased to around 12 000km²/year. From about 1996 to the present the rate has almost doubled to more than 20 000km²/year. In Sumatra's lowland forests from 1985 to 1997 the average annual forest loss was about 2800km²/year (Wikramanayake *et al.*, 2002). Indonesian forestry officials themselves say that illegal logging is widespread and out of control (Paddock, 2004). There are few areas with large enough tracts of lowland forest to support Tiger populations.

Wikramanayake *et al.* (1998) carried out a comprehensive range-wide analysis of Tiger habitat to identify priority areas for conservation. Their system of Tiger Conservation Units (TCUs) has been widely adopted by the conservation community. TCUs in Sumatra are shown in Table 1. Three large habitat blocks in Sumatra are Level I TCUs, of global Tiger conservation significance and having the best probability of long-term persistence of Tiger populations: the areas surrounding Kerinci Seblat, Gunung Leuser, and Bukit Barisan Selatan National Parks. Altogether, Wikramanayake *et al.* (1998) estimate that Sumatra currently contains approximately 130 000 km² of habitat for Tigers, of which just 42 000 km², or one-third, has some form of protection from development and logging.

Table 1. Priority conservation areas and estimated habitat for the Sumatran Tiger (Wikramanayake *et al.*, 1998)

Tiger Conservation Unit	Total area of unit (km ²)	Total protected area of unit (km ²)
Level I: Highest probability of persistence of Tiger populations over the long term		
Kerinci Seblat-Seberida	50,884	16,605
Gunung Leuser-Lingga Isaq	36,530	11,423
Bukit Barisan Selatan-Bukit Hitam	6,594	4,784
Level II: Medium probability of persistence of Tiger populations over the long term		
Kerumutan-Istana Sultan Siak	11,816	1,742
Berbak-Sembilang	6,670	2,196
Siak Kecil-Padang Lawas	2,235	1,995
Way Kambas	1,300	1,300
Level III: Low probability of persistence of Tiger populations over the long term		
Four small areas were identified	1,309	0
Areas recommended for immediate survey as potential significant Tiger habitat		
Sibolga-Dolok Surungan	4,685	594
Dangku	3,431	106
Padang Sugihan	2,505	652
Air Sawan	2,444	605
Total	130,403	42,002

Six national parks in Sumatra offer the highest level of protection for Tigers (Map 2). Unfortunately, these areas have largely been isolated from one another through logging and conversion of forest to plantations and agriculture, leaving little or no Tiger interchange and gene flow between these separate populations (Tilson *et al.*, 1994). The status of these parks and their Tiger populations is reviewed in detail below, and summarized in Table 2.

Map 2: a map of the TCUs, with 6 national parks overlaid.



Courtesy of WWF US

A recent development in efforts to protect Tigers and stop poaching in Sumatra's national parks has been the establishment of anti-poaching teams called Tiger Protection Units (TPUs), based on the Rhino Protection Unit (RPU) model championed by the International Rhino Foundation (Anon., 2004). The teams carry out patrols to deter and detect poaching, follow up with investigations, arrests and prosecution, and also conduct community education and outreach. The teams are typically made up of PHKA Forest officials, park staff, park police, members of communities bordering the park and conservationists, and all receive special and intensive training programs. In addition to the newly established TPUs, there are currently 10 RPUs in Gunung Leuser National Park, six in Bukit Barisan Selatan National Park, five in Way Kambas National Park, and three in Kerinci Seblat National Park (Anon., 2004).

A. Kerinci Seblat

Kerinci Seblat National Park was established in 1981 and extends into four provinces: Jambi, West Sumatra, South Sumatra and Bengkulu. Kerinci Seblat is the largest single protected area in the world where Tigers occur (Jackson and Kemf, 1999), covering 14,846 sq km and is the second largest park in Southeast Asia. Wikramanayake *et al.* (1998) assigned it the top score out of all the Tiger Conservation Units within the Tiger's range, making it of leading global significance for Tiger conservation. However, much of the buffer-zone around the park has been heavily affected by human activities, including illegal logging and conversion to agriculture (Hartana and Martyr, 2001). There are some 450 villages along the borders of this national park with 1.4 million people. Certain areas of the park and its buffer-zone have also been designated as 'Traditional' or 'Special Use' zones. The former are areas of forest traditionally utilized by local people for the collection of non-timber forest products and village timber requirements but which must remain under forest cover to maintain watershed protection. Special Use zones are areas converted to agriculture within the national park borders, usually in areas of long-standing enclaves (Hartana and Martyr, 2001). The habitat within Kerinci Seblat has been split into two main blocks which are becoming increasingly fragmented, mainly due to road building (the park has a 1500 km road network), logging and human encroachment. About 15 000 households illegally farm approximately 50 000 ha within the park. Illegal logging and mining, as well as conversion of park land to oil palm and rubber plantations continue to eat away at the remaining forest (Pratje, 1998).

Tiger population: In 1992, participants at the Sumatran Tiger PHVA workshop estimated the population of Tigers in Kerinci Seblat and surrounding forest areas to be approximately 76 animals (Faust and Tilson, 1994). However, Hartana and Martyr (2001) consider this an underestimate, based on camera trapping, field surveys and patrols led by Fauna and Flora International Indonesia Programme (FFI-ID) since 1995. They suggest the park has a carrying capacity, or potential, of 170 Tigers, based on GIS analysis of satellite imagery of the area. However, poaching is a serious threat, and they do not estimate the actual number of Tigers currently in the park.

Tiger conservation: With reports of a serious rise in Tiger poaching in Kerinci Seblat in the late 1990s, the Kerinci Seblat Tiger Protection Project was initiated in 2000, a partnership between the park administration and the FFI-ID. Two TPUs were established in 2002, with a third planned. The TPUs are led by KSNP rangers and staffed by members of local forest-edge communities. The units patrol an average of 12 days per month, and made 69 arrests in their first years work (Hartana and Martyr, 2001). In 2002 they broke up a major Tiger poaching syndicate (FFI-ID pers. comm. to TRAFFIC, 2002).

B. The Leuser Ecosystem and the Gunung Leuser National Park

The Leuser Ecosystem, first established in 1995 and expanded in 1998, is a legal entity based on Presidential Decree No. 33/1998, to be managed for conservation. It was designed to contain viable populations of all major wildlife species. It covers 25 000 km² and includes a number of protection forests and the Gunung Leuser National Park, established in 1980 and approximately 9000 km² in size. Much of this land is montane tropical forest, with mountains extending over 3000 meters. Although Tigers and their prey are less abundant at higher elevations (Griffiths, 1993), the large area of the Leuser Ecosystem is a significant and high priority area for Tiger conservation (Level I TCU: Wikramanayake *et al.*, 1998). Some logging concessions and transmigration areas are found in the Leuser Ecosystem, as these had already been granted before the Ecosystem was established (van Schaik *et al.*, 2001). Unfortunately, this important area is under threat by current rates of illegal logging and conversion of forest to plantations and agriculture. An official with the Leuser Management Unit (LMU) told the Indonesian press in 2003 that some 34 000 ha (340 km²) was being deforested every year (LMU pers. comm. to TRAFFIC, 2003). In 2003 the military undertook high-profile enforcement actions in the Gunung Leuser National Park to crack down on illegal logging. Major road construction is planned in the Gunung Leuser National Park, known as the Ladia Galaska highway project, which would further fragment Tiger habitat.

Tiger population: On the basis of camera trapping and extrapolation of densities, Mike Griffiths (1992, 1993) estimated the population of Tigers in Gunung Leuser National Park to be between 110-180 adult individuals. He felt that this number was “probably less than half of what it was six years previously” (Griffiths, 1993). The 1992 Sumatran Tiger PHVA workshop used a working estimate of 110 Tigers based on Griffith’s work (Faust and Tilson, 1994; Griffiths, 1992), and underscored the importance of GLNP as probably the most secure large area remaining for Tigers in Sumatra (Tilson *et al.*, 1994). However, habitat continues to be lost as legal and illegal logging, conversion to plantations and clearance for agriculture eats away at the remaining forest. No recent surveys have been undertaken to determine the present number of Tigers in the Leuser area, but Tigers are likely to be declining due to uncontrolled poaching, killing of ‘problem’ Tigers and massive habitat loss.

Tiger conservation: Much effort by numerous organisations has gone into protecting the Ecosystem, led by the Leuser Development Programme. The Leuser Management Unit was formed to implement the first seven years of the Programme backed by a partnership between the Government of Indonesia and the European Union. Later management authority will transfer to the Leuser International Foundation, an Indonesian non-profit NGO established by presidential decree. The Leuser Development Programme lists a number of Tiger research and conservation priorities on its website (<http://www.eu-ldp.co.id/>), but no specifically Tiger-related work is currently being undertaken. There are 10 Rhino Protection Units carrying out poaching patrols which do provide a measure of protection for Tigers and their prey (IRF, 2004).

C. Bukit Barisan Selatan National Park

The Bukit Barisan Selatan National Park was established in 1982 and is the third largest national park in Sumatra at approximately 3560 km² (Pratje, 1998). It is shared by both Lampung and Bengkulu provinces. Lampung, Sumatra’s most populated province, holds 82% of the park (Pratje, 1998). BBSNP has been identified as one of the three high priority Level I Tiger Conservation Units in Sumatra by

Wikramanayake *et al.*, (1998: Table 1). But villages, cultivated areas and plantations surround the park and encroachment and illegal settlements threaten the forests within this park. The park's thin shape results in approximately 700km of borders where encroachment for logging, agriculture and illegal hunting are major problems (O'Brien *et al.*, 2003). From analysis of satellite images, it appears that the park has lost 662 km² of forest since 1985, and all forest within 10 km of the park boundaries has disappeared. Projecting current deforestation rates into the future, all lowland forest within the park will be gone by 2036 (Anon., 2002c). Poaching is also a serious problem, and Pratje (1998) singled out the villages of Bintuan and Krui for illegal animal trade.

Tiger population: Based on extensive camera trapping and extrapolation of density, it is currently estimated that the park population totals 40-43 adult Tigers (O'Brien *et al.*, 2003). Tiger abundance declined dramatically in the southern portions of the park due to heavy poaching, dropping from an estimated 13 animals in 1999 to 4-5 in 2000/2001 (Anon., 2002c). Based on current rates of forest loss, (Kinnaird *et al.*, 2003) predict that by 2010 there will not be sufficient habitat remaining to conserve Tigers.

Tiger conservation: From 1999-2002 the Wildlife Conservation Society (WCS) Indonesia Program carried out intensive research into the status of the BBSNP Tiger population using camera traps. They found that Tigers and their prey are more abundant in the core interior parts of the park, and less abundant on the edges where they come into contact with people (Anon., 2002c, Anon., 2003b; O'Brien *et al.*, 2003). Evidence of Tiger poaching collected during this period led to the formation of two Tiger Protection Units in 2001. The four person teams have members from the Indonesian Department of Forestry (PHKA) as well as staff from local NGOs and are overseen by WCS. One of the TPUs carries out regular anti-poaching patrols in the park; the other works inside and outside the park on intelligence and investigation. During 2002, the patrolling team spent 169 days in the field and covered approximately 690 km, removing a number of Tiger snares. The intelligence team focused on the southern part of the park and carried out 11 operations in 279 days (Anon., 2003b). In January 2003, WCS helped set up a Wildlife Crime Unit for Lampung province to identify arrest and prosecute illegal wildlife traders (Anon., 2003c).

D. Berbak National Park

Berbak's protection status was changed from Game Reserve to National Park in 1992. Although it gained more protection, its area shrank from 2447 to 1716 km². Located on the east coast of Sumatra, the landscape in Berbak is generally flat and sloping with altitudes ranging from sea level to 12.5 m. Berbak is an internationally significant RAMSAR wetland. It contains the largest peat swamp conservation forest in Asia, and much of the forest is flooded for up to nine months of the year. Tilson *et al.* (1994) considered Berbak to have the best habitat for Tigers in Sumatra; but others consider peat swamp to be poor habitat for the large mammals which are the Tiger's primary prey species (Seidensticker, 1986; Santiapillai and Ramono, 1985). Illegal logging and cultivation on the borders of the park have led to large-scale fires within its boundaries, especially in 1997, when four people were killed by Tigers leaving the park (Anon., 1997). In a 2002 news report, the Head of the local branch of the Natural Resources Conservation Agency (BKSDA) Agus Priambudi said that illegal logging was gradually destroying the park. The interview took place after a Tiger killed two men in a logging concession adjacent to Berbak (Anon., 2002d).

Tiger population: The Sumatran Tiger PHVA workshop estimated the Berbak Tiger population at approximately 50 (Faust and Tilson, 1994). Santiapillai and Ramono (1985) considered Berbak to be an important reserve with a significant Tiger population. To date there has been little Tiger research effort in Berbak.

Tiger conservation: The Sumatran Tiger Conservation Program (STCP), which works in Way Kambas and Bukit Tigapuluh National Parks, plans to help develop future Tiger conservation project activities in Berbak. GIS analysis of satellite imagery has identified a possible habitat corridor which would link Berbak and Bukit Tigapuluh National Parks and provide connectivity for the two Tiger populations (Nyhus *et al.*, 2000).

E. Way Kambas National Park

Way Kambas National Park (1300 km²) is located in Lampung province on the southeast coast of Sumatra. As a result of the Indonesian government's transmigration program, which moved tens of thousands of villagers from other islands to Sumatra, Lampung province is now one of Sumatra's most densely populated regions. More than half a million people live near the park's borders (Nyhus *et al.*, 1999). Way Kambas was first declared a nature reserve in 1937 and its protection status was upgraded to national park status in 1989. However, the area has been extensively logged during the last 30 years, and is now comprised primarily of lowland secondary forest and grassland. Because of its history of disturbance, Tiger researchers consider it a representative model for much of the potential Tiger habitat remaining in Sumatra (Franklin *et al.*, 1999).

Tiger population: Based on extensive camera trapping and extrapolation of densities in 1995-1997, Franklin *et al.* (1999) estimated the Way Kambas population at 36 resident adult Tigers. They identified 21 individual Tigers in their study site in the centre of the park, comprising just 12% of the park's total area.

Tiger conservation: The STCP is a collaborative conservation effort between the Directorate General of Forest Protection and Nature Conservation (PHKA), The Tiger Foundation (Canada) and the Sumatran Tiger Trust (UK). The STCP has been working in Way Kambas since 1985. A detailed study of Tiger status and ecology has been carried out using camera traps (Franklin *et al.*, 1999). These camera traps turned up surprising evidence of a Sumatran Rhino population in the park, and Rhino Protection Unit anti-poaching teams were established in 1996, with a current total of seven RPUs. However, Tigers and rhinos favour different habitats within the park, so two four-member Tiger Protection Units were formed in 2003. Team members are from local communities, the PHKA and the STCP (Franklin *et al.*, 2003).

F. Bukit Tigapuluh National Park

Bukit Tigapuluh National Park is located near to Kerinci Seblat National Park and is included in the Kerinci Seblat Tiger Conservation Unit (Table 1). It was officially declared a national park in 1995. This park covers approximately 1290 km² and contains montane forest as well as a large and significant area of lowland rainforest. Parts of the park were formerly logged over and are now being regenerated and a remnant 300 km² of primary forest remains (Pratje, 1998). Illegal logging and loss of habitat is a severe threat in Bukit Tigapuluh National Park. Weak enforcement and poor boundary demarcation have resulted in significant timber losses within the park (Anon., 2003d). There is also pressure to convert

more land to agriculture, and there are several settlements located inside the park boundaries (Pratje, 1998). Logging roads leading into the park have fragmented much of the forest and make the park vulnerable to further encroachment and destruction. However, there is a strong advocacy movement to establish a buffer zone around the park, and the Indonesian government is considering implementation of increased protection for remaining forestland surrounding the park (Anon., 2003d).

Tiger population: The STCP has begun carrying out camera trap surveys in Bukit Tigapuluh National Park. Preliminary analysis has produced photographic capture rates for Tigers similar to those in Way Kambas National Park, which is approximately the same size, suggesting that the Tiger populations may be equivalent (Anon., 2003d).

Tiger conservation: As in Kerinci Seblat, the main threat to Tigers in Bukit Tigapuluh is poaching. As discussed later in this report, levels of Tiger hunting have been high in this area for decades. In 2003, the STCP began establishing Tiger Protection Units, with a total of 6-8 planned. Members of the team are recruited from PHKA and local communities bordering the park and given intensive training. In 2003, the TPUs patrolled for 104 days, covering 700 km by motorcycle and foot (Anon., 2003d).

Table 2 summarizes Tiger status and conservation in the six major national parks of Sumatra.

Table 2 Tiger status and conservation in the six major national parks of Sumatra.

National Park	Year Establ.	Area (km ²)	Tiger population*	Density tiger/100 km ²)	TCU level ⁹	Tiger Anti-poaching
Kerinci Seblat	1981	14,846	76-170? ¹		I	2 ¹⁰
Gunung RPU ¹¹	1980	9,000	110-180 ²		I	10
Leuser Bukit Barisan Selatan	1982	3,560	40-43 ³	1.6 ⁷	I	2 ¹²
Berbak	1992	1,716	50? ⁴		II	
Way Kambas	1989	1,300	36 ⁵	4.3 ⁸	II	3 ¹³
Bukit Tigapuluh	1995	1,290	1,290	36? ⁶	I	2 ¹⁴

References: *? = population is an estimate not based on Tiger data specific to the area. 1. Faust and Tilson, 1994, Hartana and Martyr, 2001. 2. Griffiths, 1992, 1993; Faust and Tilson, 1994. 3. O'Brien et al., 2003. 4. Faust and Tilson, 1994. 5. Franklin et al., 1999. 6. Anon., 2003d – based on camera trap encounter rates being similar to Way Kambas, which is of equivalent area. 7. O'Brien et al., 2003. 8. Franklin et al., 1999. 9. Wikramanayake et al., 1998 (see Table 1 for Tiger Conservation Unit level description. 10. Hartana and Martyr, 2001. 11. Rhino Protection Unit: Anon., 2004. 12. Anon., 2003b. 13. Franklin et al., 2003. 14. Anon, 2003d

1.2. Background on trade in Sumatran Tiger parts and products

As throughout much of Tiger range, historical records from the previous two centuries point to the skin as the most valued part of a Tiger from Sumatra. The value of a skin from Sumatra in the early 1930s was reported as 150-350 Dutch florins (Treep, 1973). By the 1970s, the price of a Sumatran Tiger skin was quoted as USD\$1,000, and by the mid 1980s Santiapillai and Ramono (1985) found the retail value of a Sumatran Tiger skin had risen to US\$3,000. None of these sources mention Tiger bone as a valuable commodity, although Treep (1973) noted that “the Chinese especially” valued some parts of the Tiger as “magic medicines”.

But in 1990 the IUCN/SSC Cat Specialist Group issued an alarm call, linking reports of intensive poaching in India and Nepal, the Tiger’s South Asian stronghold, with market demand for Tiger bone in traditional Asian medicine (Jackson, 1990). Shortly thereafter, Mills (1993) pointed to Sumatra as among the world’s largest sources of Tiger bone in international trade, after she found Customs records in South Korea showing extensive imports of Tiger bone from Indonesia dating back to the mid-1970s. Indonesia, however, has not recorded any official exports of Tiger bone since it joined CITES in 1979.

This section analyzes the historical international trade in Tiger bone from Indonesia, and provides detailed background on domestic trade in Sumatra. The discussion is divided into two main categories and six sub-categories:

A) International trade

- I. Export of Tiger skins and bones for international markets.
- II .Importation of manufactured or processed medicines that contain Tiger bone.
- III. Markets predominately catering to international workers and tourists for custom designed gold pendants using Tiger teeth and claws.

B) Domestic trade

IV. Traditional Asian Medicine/magic practiced throughout Sumatra and other parts of Indonesia uses Tiger derivatives as ingredients for prescriptions or as amulets to ward off evil spirits



Sumatran Tiger skin from a dealer in Kerinci.

- V. Domestic trade in Tiger skins and stuffed Tigers appears to be a highly specialized market with police, army and business men as the primary consumers.
- VI. Finally there appears to be a minority of individuals selling live Tigers to zoos and private collections locally and possibly internationally

1.2.1. International trade

Beginning in 1975 all Tiger sub-species were listed on CITES Appendix I with the exception of the Amur Tiger *Panthera tigris altaica*, of the Russian Far East and adjoining areas of China and North Korea. In 1987, this sub-species was also listed on Appendix I, creating a total ban on commercial Tiger trade and thus closed an important loophole that had allowed international trade of Tigers to continue. Indonesia acceded to CITES in 1979, and since then official Indonesian records show no exports of Tiger bone. In July of 1993, South Korea acceded to CITES. Prior to this South Korean customs kept records of Tiger bone imports, nearly all of which were in violation of CITES, because the source of many of these imports were countries that had already joined CITES, including Indonesia (Mills, 1993: Table 3). These detailed records reveal Indonesia as South Korea's main supplier of Tiger bone, and they provide some of the best and only insights into international Tiger exports from Indonesia. Post 1992 there is no further information regarding international trade from Indonesia. This should not imply that international trade no longer exists: illegal international trade carried out by smuggling will of course not be reported in official exports or imports.

Export

Indonesia's past exports of Tiger bone to South Korea

Prior to becoming a signatory to CITES in 1993 the Department of Customs Administration of South Korea kept records of Tiger bone imported since 1975. The Department's statistics show that, between 1975 and 1992, South Korea imported 6128 kg of Tiger bone, an average of 340 kg per year (Mills, 1993). The majority of this import was from Indonesia, a total of 3720 kg (61%) over 18 years (Table 3). While imports from other countries were sporadic, Indonesian imports occurred regularly, nearly every year for which records were kept. If the average dried weight of a Tiger skeleton is approximately 12 kg (Nowell, 2000), these shipments may represent 333 dead Tigers. Unfortunately, there is no way to know how many Tiger skeletons went into these shipments, or indeed be certain that the bones declared as Tiger did not include other species, as fakes or substitutes, mixed in.

South Korean importers declared a value of their Tiger bone imports to the Department of Customs Administration. Table 3 shows the total and average per kg declared values for Indonesian Tiger bone imports (Table 3). The largest volume years for Indonesian imports were 1981 (1060 kg), 1975 (620 kg), and 1988 (560 kg). It is interesting that the lowest per kg declared values were associated with these large-volume imports. The highest per kg value (USD 238/kg) was reported in 1992 for a relatively small shipment of 55 kg in 1992, the year before South Korea joined CITES and Tiger imports became illegal. However, when adjusted for inflation, using the midpoint year of 1985 as the basis, this figure of USD 238 declines to USD 151, not significantly different from the overall inflation-adjusted average declared value of Indonesian Tiger bone of USD 158/kg (Table 4). The overall average inflation-adjusted declared value of Indonesian Tiger bone is not significantly different from that of USD 175/kg from other countries, including range states such as India and consumer states such as Japan. However, while the value of Indonesian Tiger bone did not decline much over time when adjusted for inflation, the value of Tiger bone from other exporters fell by 40%. These types of changes in price are somewhat surprising, given declining Tiger populations and thus a decline in the supply of Tiger bone, which would be expected to result in a price increase, even when adjusted for inflation.

Other countries that South Korea recorded import of Tiger bone from during this period include China, Japan, Thailand, Malaysia, India, Singapore, Taiwan, oddly Madagascar, and others (“others” making up for less than 10% of the total imports) (Mills, 1993). Of the nine countries recorded as being sources of South Korea’s Tiger bone imports, only five are range states for Tigers. It is possible, even likely that some of the Tigers exported from non-range states could also have originated from Indonesia.

Singapore and Malaysia’s role in the trade of Indonesia Tiger products

Singapore and Malaysia are close neighbours to Sumatra, and there is some evidence that Singapore is a re-exporter of illegal Tiger products from Sumatra. In 1987 Singapore joined CITES and since that time it has shown no records of international Tiger trade. Between 1991 and 1992 China reported exporting more than 26 000 containers of traditional Asian medicine and tonics containing Tiger derivatives to Singapore. However, what is more interesting is the number of exports. Between 1970 and 1985 South Korea recorded importing 195 kg of Tiger bone from Singapore. The obvious question is where did these bones originate? From Singapore it is suspected that Tiger parts are then shipped to Korea, China, Taiwan, Malaysia and possibly Japan (WWF-ID, pers. comm. to TRAFFIC, 2002). In an expose on Sumatran Tiger poachers (WWF-ID *in litt.* to TRAFFIC, 2000) interviewees indicated that Singapore was an important market for Tiger bones, which was confirmed in the findings of this report. According to one poacher’s account, the Tiger bones were delivered to Riau Province and then shipped to Singapore by speedboat. Upon arrival Singapore investors met the delivery but what happened to the bones from there is unknown, (WWF-ID *in litt.* to TRAFFIC, 2000). According to dealers interviewed in this survey, Tiger parts continue to be sold not only to Singapore but also to Malaysia.

Indonesian exports of Tiger bone to Taiwan

From 1980 and 1987, when Tiger and bear imports were banned by their Wildlife Conservation Law, Taiwan reported importing 3949 kg of Tiger and bear bones from Singapore. Tiger bone from Singapore may have originated in Indonesia, as Singapore has no Tigers of its own. Taiwan had no separate category for listing Tiger bones, so it is impossible to determine what proportion of these shipments were Tiger (Mills and Jackson, 1994). Taiwan’s Customs data also document that Indonesia directly exported 100 kg of Tiger and /or bear bone to Taiwan in 1984, though again how much of the shipment was Tiger bone is unknown (Mills and Jackson, 1994). There is no recent evidence pointing to Taiwan as an importer of Tiger parts from Indonesia, and Taiwan has made great strides toward eliminating illegal trade in Tiger bone medicines (Nowell, 2000), but some illegal trade may continue.

International import of Tiger products to Sumatra

In 1991 and 1992, China’s annual CITES reports indicated that Indonesia imported 225 containers of Tiger medicines (Mills and Jackson, 1994). However, there have been no further reports or anecdotal evidence of imports into Indonesia and no imported Tiger products were observed during this survey. The ready availability of locally sourced Tiger parts, including bones, in Sumatra would suggest that importing of further Tiger products to Sumatra from other countries unlikely because of the associated expense and unnecessary risk.

Table 3. Tiger bones imported into South Korea from Indonesia

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Bones imported from Indonesia																		
Kg	620	131	110	96	144	70	1,060	-	18	-	41	23	182	560	190	170	250	55
USD	6,188	7,707	11,283	12,458	17,731	10,536	12,513	-	3,019	-	7,875	3,852	44,026	31,584	32,165	21,932	44,349	13,114
USD/kg	10	59	103	130	123	151	12		168		192	167	242	56	169	129	177	238
Estimated number of tigers*	51	10	9	8	12	5	83	-	1	-	3	1	15	46	15	14	20	4

Adapted from the Statistical Yearbook of Foreign Trade, Department of Customs Administration, South Korea, Volume 12 (mills, 1993).

**Assuming that a dried tiger skeleton weighs 12 kg (Nowell, 2000)*

Table 4. Average inflation-adjusted *USD price per kg of South Korean tiger bone imports from Indonesia

Time period	Indonesia	Others
1975-1983	172	216
1984-1992	143	128
1975-1992	158	175

**Source: Mills (1993) (includes annual IMF inflation adjustment factors)*

1.2.2. Domestic trade

Indonesia has a substantial and well-developed domestic market for Tiger products (Nowell, 2000). Previous reports from investigations of the trade suggested that much of the Tiger products available are utilized within Indonesia (Plowden and Bowles, 1997; Indrawan *et al.*, 1999). Tigers are traded within Indonesia for a number of reasons, including use in traditional Asian medicines and magic, trophies and curios, and to be kept live as pets and status symbols.

Traditional medicinal and magic uses of Tiger parts in Sumatra

Tiger parts have long been used in Asian systems of traditional medicine, especially that of the Chinese. Although many parts of the Tiger may be used in traditional Asian medicines, traditionally the bones are most widely used to treat rheumatism. The Tiger's penis is also considered an aphrodisiac when soaked in wine (Chan, 1995). Tiger parts are also used for magic purposes as well, which often has an overlap with medicinal uses and is therefore included in the same category. Skins, claws and canines are also valued as novelties and souvenirs. The following is a list of Tiger parts and their uses in traditional Asian medicinal and magical practices in Sumatra:

Canines – *Magic, curios* – Canine teeth used to make ornamental jewellery, primarily pendants on necklaces. Some local people believe Tiger canines provide good luck and protective powers to those who wear them (Anon. vendor Bukittinggi, West Sumatra, pers. comm. to TRAFFIC, 2002). The sale of canines is predominantly carried out through shops selling gold, but shops selling precious stones, antiques and souvenirs also sell Tiger canines.

Claws – *Magic, curios* – Claws are most often inlaid in gold to make pendants for necklaces. Local people believe Tiger claws provide good luck and protective powers to those who wear them (Anon. vendor Jambi, pers. comm. to TRAFFIC, 2002). The selling of claws appears to be almost exclusively carried out through gold shops, although antique shops and souvenir shops also sold Tiger claws.

Whiskers – *Magic* – Whiskers are believed to have magical powers to protect those who possess it from malicious curses. Magic from whiskers is believed to be most powerful when removed from a live Tiger (WWF-ID, pers. comm. to TRAFFIC, 2002).

Tail – *Magic* – The tail is usually sold still intact with the skin. However, if the skin is badly damaged the skin may be divided into small pieces for individual sale. In such cases the tail is sometimes sold separately as a trophy or talisman that is said to protect one from curses if kept in the home.

Skin – *Magic* – Some people in Indonesia also believe that Tiger skin contains magical powers. Most typically small pieces of Tiger skin are used to protect the owner from black magic. These pieces are also used by Shaman to cast black magic spells on others (WWF-ID, pers. comm. to TRAFFIC, 2002). Additionally they maybe shaped into a belt with a magical code used to protect the one who wears it from all dangers posed by wild animals or bad spirits (FFI-ID *in litt.* to TRAFFIC, 2003). Intact skins in good condition are far more valuable than the total of small pieces that can be derived from a skin. Therefore only those skins, which are badly

damaged, are cut into pieces for sale (FFI-ID, pers. comm. to TRAFFIC, 2002). Some local people believe that the skin will have no powers if it is covered by a human shadow before the trapped Tiger is killed (C. Saleh, pers. comm. to TRAFFIC, 2002).

Skin from sole of paw – *Magic* – Used by some local people for ritual purposes.

Skin from the forehead – *Magic* – This is said to be the most expensive part of the skin, as the stripes between the ears are thought to look like the Chinese character for royalty (Shepherd, pers. obs., 2002). This piece of skin is believed to bring the owner prosperity and good luck.

Eyebrows – *Magic* – The eyebrows are said to be very powerful and have the ability to protect the owner from evil and give them strength.

Penis – *Traditional “tonic”* – The penis is said to have aphrodisiac powers.

Gall – *Traditional medicine* – Tiger gall is dried and put into tablets used to cure bone diseases.

Flesh - *Traditional medicine, crop protection* – Flesh is cooked and eaten to treat skin diseases. Farmers burn small strips of flesh around the edge of a field to keep wild pigs away. The market for Tiger flesh remains generally local and is not apparently commercially significant. However, it is known that there is a market for dried Tiger flesh for about IDR 71 200-89 000/kg (USD 8-10/kg) in remote rural areas (FFI-ID *in litt.* to TRAFFIC, 2001). Further it is known there is a dealer in Riau who exports Tiger meat to Malaysia (Shepherd, pers. obs., 2000).

Fat – *Magic* – Farmers believe keeping a bottle of Tiger fat will protect their farms from depredation by Wild Pigs (WWF-ID *in litt.* to TRAFFIC, 2000).

Milk – *Traditional medicine* – Used in medicinal remedies (FFI-ID *in litt.* to TRAFFIC, 2001).

Tiger dung – *Magic, crop protection* – Some Indonesian ‘Dukuns’ (Shaman or Witch Doctor) use the manure to treat people who are suffering from black magic spells that has been cast upon them. In one instance, a Dukun brought a man to the Medan Zoo, who was suffering terribly from a spell that had been cast on him. The Dukun requested Tiger manure from the keeper at the zoo and fed it to the suffering man on the spot. Occasionally farmers and plantation workers request Tiger manure from keepers at the Medan Zoo. The manure is spread around the edges of the crops or plantations and the scent apparently keep Wild Pigs *Sus scrofa* away. While Tigers are not likely killed for this purpose, it is interesting to note its use (Shepherd, pers. obs., 2000).

Bone – *Traditional medicine* – Ground into powder to be taken with a glass of warm water. It is used to treat rheumatism and head aches. The front humerus bone is said to be most highly valued for its strength in traditional medicine (Chan, 1995).

Right front paw bone - *Traditional medicine, magic* – According to dealers, the bone found in the right front paw is regarded as being the strongest one, which enables a Tiger to pull a prey bigger than itself. The bone is put into a glass of warm water and let for a short period of time, then drunk to treat headaches. Some users believe it to have a power to drive away bad spirits. Fake Tiger paws are commonly observed in Chinese markets (Nowell, 2000).

Domestic trade in Tiger skins and stuffed Tigers

Indonesia enacted major conservation legislation in 1990 (see Section 3), and shortly thereafter the Indonesian Ministry of Forestry required all persons in prior possession of protected species and their parts and products to register and obtain a permit. The initial registration period was to extend from February through May of 1992 (Decree No. 301/Kpts-II/1992) but was extended to October 1992 (Decree No. 479/Kpts-VI/1992). A total of 1081 stuffed and mounted Tiger skins were reported to have been registered. Registered Tiger specimens included 100 stuffed Sumatran Tigers kept in houses of government officials and businessmen in South Sumatra. Another 200 stuffed Tigers were held by private individuals in Lampung and about 300 in Palembang. The origin of these Tigers was undetermined, but presumably they were from Sumatra originally, or were captive-born offspring from either wild-caught or privately-held Tigers (Tilson and Traylor-Holzer, 1994).

Interest in possessing a Tiger skin continues in Sumatra. The skin maybe stretched or stuffed. Intact skins in good condition are far more valuable than the total of small pieces that can be derived from a skin (FFI-ID, pers. comm. to TRAFFIC, 2002). Tiger skins are reportedly given to a senior officer by police or military personnel to help them attain a more senior position or are given as gifts by businessmen to help close a business deal. It is still seen as a sign of great prestige to have skins or live animals that are rare or highly endangered (FFI-ID, pers. comm. to TRAFFIC, 2002). High-ranking officers may receive stuffed Tigers from their colleagues as a gift upon retirement (C. Saleh, pers. comm. to TRAFFIC, 2002).

The domestic trade of live Tigers for zoos and private collections

While much of the trade in Tigers revolves around the demand for traditional Asian medicines, there is also a trade in live Tigers as pets or status symbols. In Sumatra, as is the case throughout much of Indonesia, the owning of a rare species, especially those protected by law, is viewed by many to indicate status. It shows that an individual is important and powerful as to be immune from prosecution over wildlife infractions (Nash, 1993). Tigers are no exception. Wealthy individuals or people of senior positions, such as military, police, or government officials, often have their own private collections of animals; some may reach the size of small zoos (Shepherd, pers. obs, 2002.).

Wild Tigers are also offered for sale to zoos. According to the Director of the Medan Zoo, Tigers have been offered to the zoo on numerous occasions, but the identity of the dealers remains unknown. Offers usually come in the form of an anonymous phone call to the Director, asking if he is interested in purchasing a Tiger. As dealers do not reveal their identity, it is unknown if the same individual repeatedly offers Tigers for sale or if there is a number of different individuals selling live Tigers. Equally it is unknown if the individuals offering Tigers are hunters, dealers or villagers trying to rid themselves of a conflict Tiger. The Director of the Medan Zoo says that he has never accepted any Tigers that have been offered in such a manner and does not know the fate of such animals. In one case, however, the Medan Zoo turned down the opportunity to purchase two Tiger cubs in August 2002, and the cubs are

known to have gone to a zoo in Riau two weeks later (Anon, 2002). The Director of the Medan Zoo reports receiving three to four calls of such a nature each year over the past five years. It is believed that Tigers offered to the Medan Zoo originate from North Sumatra.

1.2.3. The role of fakes

Around the world, many Tiger parts and products seen in trade are fake – that is, they are neither actual Tiger parts nor are they derived from Tigers. For example, it is possible, even probable, that much of the “Tiger bone” content of manufactured pills, plasters, gels and wine does not actually contain any (Nowell, 2000). Whole bones from other animals are frequently passed off as Tiger bones. Fake Tiger parts are not limited to those used in medicine, but also include fake penises (typically water buffalo with carved, exaggerated barbs), skins (painted dog, cattle or goat skins), and claws and teeth (from other animals, or made out of plastic or resin). Yates (2000) provides a photo and text guide for investigators to help them distinguish genuine and fake Tiger products. In many retail markets, fakes are common. For example, biologists from the Institute of Ecological and Biological Resources in Hanoi, Vietnam carried out a Tiger trade survey for TRAFFIC in 1999, and estimated that 50-70% of the teeth and claws they found in souvenir markets labelled as Tiger were fake (Nowell, 2000). However, with the exception of some plastic Tiger canines and one small fake piece of Tiger skin seen in markets of southern Sumatra (Hartana and Martyr, 2001), there have been very few reports of fake Tiger parts and products in Sumatra. The majority of items documented in this TRAFFIC survey were genuine Tiger. Sumatra stands out internationally as an area where most trade is in verifiable genuine Tiger parts, and as such its markets represent a significant threat to the Sumatran Tiger’s continued survival.

1.3. Legal protection framework for Sumatran Tigers

The first national legislation to protect Tigers in Indonesia was passed in 1972. In 1990, Indonesia passed the Act of the Republic of Indonesia on Conservation of Living Resources and Ecosystems (1990), which is also known as the Conservation Act (No. 5) of 1990. This Act is used as the legal basis for the conservation of wild species, including fully protected species, such as the Tiger (Mills, 1994). The act is also known as Conservation Act No. 5. Intentional violations of this Act are punishable by imprisonment of up to five years and/or fines up to IDR 100 000 000 (USD 11 235). Violations through negligence are punishable by imprisonment of up to one year and/or fines up to IDR 50 000 000 (USD 5600). These penalties are very high, compared to the average annual gross national income for Indonesia, which in 2001 was IDR 6 052 000 (USD 680) and IDR 3 827 000 (USD 430) for low income families. This law should pose a strong deterrent to illegal hunting and trade in Sumatran Tigers, if properly enforced. The Indonesian government further strengthened existing domestic laws by requiring all individuals holding Tigers or Tiger parts to register these possessions by acquiring a one-time permit (Tilson and Traylor-Holzer, 1994; Plowden and Bowles, 1997). The agency responsible for implementing the Conservation Act is the Department of Forest Protection and Nature Conservation, Indonesian Ministry of Forestry (Perindungan Hutan dan Konservasi Alam: PHKA).

Indonesian legislation allows the government to seize and confiscate specimens of protected animals involved in violations. All seized items are held in stocks or used in research and education activities or

destroyed. All stock, both government and privately owned, are marked and registered. At the end of 1992, 1081 Tiger skin mounts were registered in private hands in Indonesia (Tilson and Traylor-Holzer, 1994). Government held stocks are consolidated (Mainka, 1997). However, in late 2003, a new Decree (Number: 447/Kpts-II/2003) was enacted under the Ministry of Forestry. In Chapter VII: Disposal of Confiscated (Seized) Specimens of that Decree, Part One, Article 113 states that all confiscated specimens of protected species listed in CITES Appendix I will be used for scientific or educational purpose. If these are valueless for scientific and educational purposes, they are to be destroyed. There is no mention of keeping these specimens in stock.

Four confiscated mounted Tiger specimens were burned in a public ceremony at an August 2002 government-NGO workshop on Anti-Poaching and Illegal Trade in Sumatran Tigers and their Products (Anon., 2002b).

Indonesia has a substantial number of Forest ranger personnel spread throughout its provinces, who are under the control of PHKA's Department of Forestry and Nature Conservation (DFNC). These include specialist '*Jagawana*' who, together with Forest Police and Investigators, tackle poaching and other forms of wildlife crime. Field units have access to speedboats, pick-up trucks, motorbikes, rifles and revolvers. The total strength of personnel who could potentially be involved in enforcement is intended to be raised to some 15 000 in the near future. Undercover operations are permitted. DFNC staff appears to enjoy a relatively good working relationship with the police, Customs and army. DFNC staff who detain offenders are obliged to pass them over to the police. The police thereafter initiate prosecution procedures (Sellar *et al.*, 1999).

In addition to having national legislation to protect the Tigers, Indonesia is also a member state to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Indonesia became a Signatory to CITES on 28 December 1978, which came into effect on 28 March, 1979. The Tiger is listed in Appendix I by CITES which prohibits any commercial trade of live Tigers or their parts and derivatives. PHKA-DFNC is the agency in Indonesia responsible for the implementation of CITES with regards to Tigers. All CITES shipments have to be inspected in cooperation with Indonesian Customs prior to export (Sellar *et al.*, 1999).

While all commercial Tiger trade was made illegal under CITES in 1987, following the alarming reports of poaching for Tiger bone in the early 1990s the Parties to CITES enacted a number of resolutions to strengthen efforts to stop the trade. In 1994, a Resolution (Res. Conf. 9.13) was passed exhorting the Parties to prohibit domestic trade in Tiger bone (an area technically beyond the remit of the Convention, which focuses on trade between nations). The Resolution also called for a number of additional measures aimed at stopping the use of Tiger parts for traditional medicine (Mainka, 1997; Nowell, 2000). CITES also commissioned CITES Technical and Political Tiger Missions to visit key supplying and consuming Parties, including Indonesia (Sellar *et al.*, 1999). While the CITES Tiger Missions Technical Team was impressed with some aspects of Indonesia's implementation of CITES for Tigers, particularly the Tiger Protection Units carrying out anti-poaching measures in several national parks in Sumatra, they also found "sufficient grounds to suspect that significant illicit trade of Indonesia's fauna and flora, to domestic and international markets, is taking place...The open nature of the trade noted by the technical team suggests that few deterrent factors are operating at present" (Sellar *et al.*, 1999). The CITES Tiger

Resolution was modified and strengthened in 2000 partly on the basis of the report of the CITES Tiger Missions Technical Team, and in 2002, the Parties extended its provisions to cover all Asian Appendix I big cat species, whose bones could potentially be used as a substitute for Tiger bone (Res. Conf. 12.5).

Adequate legislation is in place to protect the Sumatran Tiger, making illegal hunting and both domestic and international trade (Mainka, 1997; Sellar *et al.*, 1999). However, enforcement and prosecution are sorely lacking or, in many areas, non-existent. In Sumatra there have been only four known convictions for Tiger poaching and trade since 1997 (D. Martyr, pers comm., to TRAFFIC, 2003). There are a number of factors blocking progress. Resources are limited, especially for prosecution of wildlife cases. Lack of capacity of trained and capable enforcement personnel is a problem which is steadily being addressed by the government and conservation groups, as will be discussed later in this report there have been major investments in training and support for forestry staff and police. Still, corruption at worst and lack of political will and commitment at best severely hinder the control of the illegal hunting and trade (FFI-ID, WWF-ID *in litt.* 2000, 2003). The next section of this report presents extensive data documenting illegal hunting and trade in the Sumatran Tiger, showing that much more law enforcement effort is required to save this endangered animal.

2. METHODS

TRAFFIC's first comprehensive review of the Tiger trade *Killed for a Cure* (Mills and Jackson, 1994) was able to draw on official trade statistics for analysis, and with this information showed the severity of the global Tiger situation. By the early 1990s international and domestic Tiger trade was illegal in most consumer and range states, including Indonesia. The awareness and pressure brought to bear on elements of the Tiger trade meant that much of the information compiled for a follow-up report, *Far from a Cure: the Tiger Trade Revisited* (Nowell, 2000), had to be gathered through market surveys and investigations. Similar methods were relied upon for this survey, for there is no longer any legal documentation of domestic or international trade in Tiger parts and products from Indonesia. From April to November 2002, surveys were conducted by TRAFFIC Southeast Asia throughout Sumatra to assess the level of domestic and international trade in Tigers and their parts. To achieve the most comprehensive and accurate account of the Sumatran Tiger trade possible, data were gathered from a variety of sources including literature reviews, market surveys, surveys by protected area staff, and interviews with hunters, retailers, dealers, zoo staff, undercover investigators working for NGO-government Tiger conservation programs, and local non-governmental organizations.

Monetary figures collected in Indonesian Rupiah were converted to US Dollars using the web-based currency converter provided by OANDA (<http://www.oanda.com>). At the time (late 2003) of writing this report the conversion rate was 1 US Dollar (USD) = 8900 Indonesian Rupiah (IDR).

2.1 Literature review

A comprehensive review of relevant literature was conducted. Sources included:

- Information provided by the Government of Indonesia to TRAFFIC.
- Published and unpublished information including; interviews, surveys and progress reports.

This was provided by Tiger and Tiger trade experts from, FFI-ID, WWF-ID, WCS, the STCP and numerous individuals working in the region.

- Relevant data collected by TRAFFIC during other wildlife trade surveys.
- Articles and reports on Tiger trade and conservation sourced from media reports and the Internet.
- Sumatran Tiger captive breeding and zoo records from Indonesian zoos and members of the international zoo community.

2.2 Market surveys

Market surveys were carried out by TRAFFIC Southeast Asia in major cities and suspected Tiger trade hubs in Aceh, North Sumatra, Riau, West Sumatra, Jambi, South Sumatra and Lampung. Surveys were not carried out in Bengkulu by TRAFFIC, but by other organisations who contributed their findings to this report.

In each province, cities, towns and villages identified by previous studies by TRAFFIC, other NGOs and informants as trade centres for Tigers and Tiger parts were investigated. Surveys were conducted in gold, precious stone, souvenir, western pharmaceutical, and traditional Asian medicine shops in these towns, as these are the outlets known to sell Tiger and other wildlife parts. Occasionally, based on information gathered during the course of these surveys, other markets or shops selling Tiger parts or products were identified by interviewees and investigated. For the purposes of conducting research in the markets, investigators posed as buyers to gather data on highly sensitive subjects such as customers, suppliers, origins, trade routes, and availability of Tigers and Tiger parts. Although the primary purpose of this research was to investigate the Tiger trade, all species of wildlife observed were identified and counted. No wildlife products were actually purchased. Tiger parts were counted, identified as genuine or fake (see Yates, 2000) and in most instances, prices were recorded. In addition to those specimens openly available for sale, investigators made requests of salespersons to search for items concealed in boxes, under the counter or that were kept at other locations.

Due to the illegal nature of the trade and the variety of sources and localities examined by the authors, it was not possible to use a standardised questionnaire. When interviewing dealers selling Tiger parts, researchers attempted to collect information on volumes of trade, uses of Tiger parts, sources and origin of Tiger parts, prices at different market levels, methods of hunting, trade routes and end markets.

2.3 Non-governmental and governmental authorities

To gain a deeper insight into Tiger trade activities, especially covert activities and changes in trends, TRAFFIC Southeast Asia worked in collaboration with the Sumatran offices of international non-governmental organizations, including FFI-ID, WWF-ID, the WCS, and the STCP. All of these organizations been very active in Tiger protection in Sumatra and have been collecting intelligence on the identity of Tiger hunters and buyers of Tiger products. Moreover, in collaboration with local authorities, they have been actively working towards prosecuting illegal trade in Tiger parts and products. Information on Tiger status and poaching was specifically sought from these sources. This information also helped to verify and validate information collected from shopkeepers, wildlife dealers, zoos, and forestry officials.

3. The supply: Tiger hunting in Sumatra

Habitat loss, fragmentation and reduction of prey base are important threats to Tigers. Moreover, they serve to increase the Tiger's vulnerability to poaching, which has been considered the most urgent threat to the survival of the species since the early 1990s. Genuine Tiger products seen in markets come from two potential sources of supply: wild Tigers, or Tigers in captivity. Tigers in captivity are discussed later in this report. Conservation concern focuses on preventing poaching of wild Tigers.

Sumatra stands out for having a graphic documentation of the threat posed by Tiger poaching for trade captured on film. In 1988, Cinecontact Productions produced a video program for Survival Anglia called "Animal Traffic: 31 Tigers". The filmmakers accompanied a team of Tiger hunters somewhere in Sumatra as they set wire snares and eventually caught, then shot, a female Sumatran Tiger. The Tiger was skinned and its parts were hidden and taken into an urban market for sale. The lead hunter claimed to have already caught 30 Tigers in the past year; this program documented his 31st. An Indonesian taxidermist in the video claimed to have sold 10 Tiger skins within the last year (Tilson and Traylor-Holzer, 1994).

Since then, much effort has been invested throughout Tiger range in improving anti-poaching measures, and in collecting data on Tiger poaching in order to monitor the effectiveness of conservation measures. This is especially true in Sumatra. This report presents the first comprehensive data on Tiger poaching in Sumatra, gathered from a number of different sources, including TRAFFIC's own interviews with Tiger hunters (Box 1). This information can be very difficult to collect: since Tiger hunting is illegal, it is covert and difficult to detect. Sumatra stands out among Tiger range states for having made good progress in collecting this type of data, which provide a basis for evaluating the severity of the poaching threat for the Sumatran Tiger.



Wire snare confiscated in the Bukit Barisan Selatan National Park. Simple snares like these are used to catch tigers.

Box 1. Interview with a hunter.

This interview was conducted by TRAFFIC with a second-generation tiger hunter who was taught the trade by his father and began hunting in 1954. He has lived in the same rural village in Lampung Province nearly all his life. He comes from a village that is relatively poor where the primary source of income is derived from farming. Now 81 years old, he continues to hunt with his sons and teach others the trade of tiger hunting.

He said that his hunting methods and traditions have not changed in the 48 years he had been hunting tigers. Hunting takes place deep within Bukit Barisan Selatan National Park. Although he claimed that hunting tigers was his primary means of livelihood, he also said he only made two hunting trips each year.

During these trips, a trap line is laid consisting of approximately 60 snares, set along paths frequently used by tigers. Over his lifetime he claimed to have caught more than 115 Sumatran Tigers. The interviewee could not give an annual average for the number of tigers he had illegally killed over the 48 years he had been actively hunting. However, he was able to provide some interesting insight into rate of illegal killing and how this has changed. In 1989, he had a record take of 14 tigers in one year. However, the last five years he and his sons had killed an average of two tigers per year. "Now," he says, "it is much tougher to catch tigers because there are so many more men hunting tigers than ever before." In fact the intensity of competition to catch tigers has led to hunters robbing each other's traps when they happen upon a snared animal.

Almost all the tigers caught in this village are sent to East Java or Jakarta where they are sold locally (not exported out of the country). The few that are not sent to Java are sold in Palembang or to local buyers. Prior to our arrival this interviewee said he had sold a stuffed Sun Bear for IDR 12 004 320 (USD 1348.80) and one tiger skin for a price of IDR 20 007 200 (USD 2248). In 1989, when he caught 14 tigers, he sold all specimens to East Java, where they were sold for local use including taxidermy, skins, ornamentation, and magic purposes. His sale of all tiger parts to Java appears to contradict reports from investigators that most tiger parts from this area are transported from Bandar Lampung to Palembang before being exported to Singapore. The explanation for this anomaly is that this community originated in Java and still maintains strong ties to this region through family or business connections. Another interesting phenomenon of this region in southern Sumatra is that many local hunters here do not sell the bones for traditional Asian medicine as is the common practice elsewhere. Apparently this is because the hunters here perceive the skins, teeth and claws as the only valuable parts on a tiger. When a tiger is killed, the current practice is to immediately skin the animal either where it is caught or in a safe location. Only the skin, teeth, and claws are removed while the meat and bones are left to rot.

In addition to tigers this interviewee also hunted other animals. It was indicated that although other species were caught they were usually not the primary targets. Many animals use the same paths in the forest and are caught accidentally in tiger snares. Although these leg hold snares are intended to be species-specific they are often not. The intention of using species-specific snares for tigers stems not from conservation minded concerns but rather from an effort to maximize the dollar earned per unit of effort spent hunting. Sambar Deer *Cervus unicolor*, Sun Bear and Binturong *Arctictis binturong* were the species he said he most frequently snared as incidental killings. However, he also said on occasions when orders are placed for specific species or when there is a known demand for an item, these animals are actively pursued.

Hunting methods

1. Snares

Just as depicted in the 1988 film “31 Tigers”, Sumatran Tigers are today still predominately hunted using wire snares (Anon, 2002; FFI-ID, pers. comm. to TRAFFIC, 2002; WWF-ID, pers. comm. to TRAFFIC, 2002). There are two types of snares used; spring loaded leg-hold snares and also neck snares.

A. Leg Hold Snares

Tigers are primarily hunted using a traditional wire cable leg hold snare. Although there can be some minor regional variations in the methods or materials used for snaring, by and large the descriptions that follow will hold true throughout all regions of Sumatra (FFI-ID, pers. comm. to TRAFFIC, 2002; WWF-ID, pers. comm. to TRAFFIC, 2002). These snares are simple, cheap and yet highly effective. This method of hunting allows teams of hunters to set 60 or more snares per day providing maximum coverage of an area in an effort to catch Tigers with very little financial cost, physical exertion or risk of being caught (Anon., pers comm. to TRAFFIC, 2002).

Professional poachers prefer heavy-duty cable since this minimizes lacerations that would reduce the value of the Tiger pelt. However, this type of cable requires a substantial investment by poachers and financial constraints thus limit the number of snares that can be set (FFI-ID, pers. comm. to TRAFFIC, 2002). Brake cable or heavy-duty nylon rope may also be used; the advantage being that cheap materials allow for a large number of snares to be set, as reported from Lampung province (Anon., pers comm. to TRAFFIC, 2002).

Men usually go out in teams of two to four individuals to set snares in the forest, including within national parks, two or more times a year, with each team setting between five and 60 snares per trip. Prior to setting the snares a scouting trip is often conducted to select sites. Hunters look for Tiger sign (tracks or faeces), but also choose areas that are relatively rich in ungulate sign, including hilltop ridge trails and salt licks. These scouting trips usually take at least one or two days. The setting of the snares usually takes about one day to complete. A small pit is then dug and the snare is set and covered with leaves and debris to conceal it. A young flexible but solid tree or tree branch near the snare acts as the spring. Finally a small log or branch is placed across the path in front of the snare. This requires that the Tiger step across the log into the loop of wire snare, triggering the tree spring and tightening the noose around its foot. The use of a log obstacle is reported to cause the Tiger to place its full weight on the readied trap and prevents it from quickly pulling back when the trap is sprung. Some hunters claim they know the length of a Tiger’s stride and this allows them to place the log in order to specifically catch Tigers. This same trap is also used for Sambar Deer, mouse deer *Tragulus* spp., Malayan Tapirs *Tapirus indicus*, Sun Bears *Helarctos malayanus*, Binturong, and other species of wild cats. Tigers can be caught in any cable snare with a large enough loop setting for its foot, no matter what the target species a hunter may have been aiming for.



Credit: Nolan Magnus, TRAFFIC Southeast Asia

Demonstrating how snares are set. Snares are simple and inexpensive.

B. Body and Neck Snares

Two sticks about 130 cm long are erected approximately 60 cm apart (or as large as is deemed necessary from a consideration of paw prints) on either side of a path. A snare approximately two feet in diameter is made using steel wire. The snare is placed between the two sticks and the end is connected to a solid flexible young tree trunk, which serves as a spring (WWF-ID, pers. comm. to TRAFFIC, 2002).

The tree is selected based on strength and flexibility. It must be small enough and flexible enough that it can be bent over to act as a spring for the snare, yet big enough that it can hold the partial weight of the Tiger suspended in the air once the snare is sprung. Setting the spring usually requires the help of at least two other people to bend the tree over and set the trigger mechanism. A Tiger walking along this trail would push the wire releasing the trigger. This allows the tree to snap back to its upright position and draws the snare tight around the neck or body of the Tiger. The tree in its upright position keeps tension on the wire so that the snare does not loosen allowing the Tiger to escape (WWF-ID, pers. comm. to TRAFFIC, 2002).

2. Poison

Poison was used by the Dutch colonial government to kill Tigers in the early 1900s, by spraying animal carcass bait with pesticide (Treep, 1973). Treep (1973) also relates an incident in 1937 where a dog carcass poisoned with strychnine was used to kill a Tiger previously wounded by gunshot. The poison most often used now appears to be a commercially available organophosphate-based poison for Wild Pigs, known as the TheMix 500 mg (FFI-ID, pers. comm. to TRAFFIC, 2002). There are two primary methods for poisoning Tigers. The first involves killing a chicken and then filling the stomach with poison. The carcass is then taken to an area frequented by the Tiger and left for the Tiger to find. The other means by which Tigers are poisoned involves locating a Tiger kill. Tigers usually eat some of their kill and cache the rest for later. This cache is then covered with poison by the hunters, who come back in several days to collect the poisoned Tiger that has returned to feed again on the poisoned carcass. This method is frequently used when Tigers prey on livestock close to a village (FFI-ID, pers. comm. to TRAFFIC, 2002; WWF-ID, pers. comm. to TRAFFIC, 2002), but it is also used by poachers (WWF-ID, pers. comm. to TRAFFIC, 2002).

3. Rifles or homemade guns

Hunting Tigers using guns alone is very rare (FFI-ID, pers. comm. to TRAFFIC, 2002). Hunting clubs, army and police are the individuals most often responsible for this type of Tiger poaching. Often police and army personnel are used as guards for timber or other types of industrial companies in or around the protected areas where Tigers might be found. Although it is believed they do not go out purposefully looking for Tigers to poach, they often shoot whatever they see as a recreational past time. However, once an animal has been shot (Tiger, wild pig or deer) the carcass is often sold (WWF-ID, pers. comm. to TRAFFIC, 2002). It is important to note that it is thought that these men are not going to the forest to work for Tiger traders or gangs selling Tigers. In the Province of Riau in the last two years four Tigers are known to have died by these means (WWF-ID, pers. comm. to TRAFFIC, 2002).

4. Pit traps

Pit traps are rarely used to hunt Tigers. There are several reasons for this. The first reason is that although making a pit trap is cheap it is very labour intensive. Digging pits that are large and deep requires time. The more time an individual must spend in the protected area, the greater the likelihood they may be caught. At the same time the hunter cannot set as many traps which reduces the probability of catching a Tiger (60 snares can be set in one day where as a single pit trap may take several days to dig). Pit traps may be used for elephants and rhino as well as Tigers (WWF-ID, pers. comm. to TRAFFIC, 2002).

5. Box traps

Treep (1973) wrote, “In Sumatra the local population captures Tigers, at least when they become a nuisance for the people, by means of cage-traps. The trap is a “room” made of poles (approximately 3.25 m long, 0.60 m wide, and approximately 1.30 m high); within it, a living bait (e.g., a goat), tied up at the back. When the Tiger enters the trap, it sets in action a mechanism which shuts the door. Before use the traps are inaugurated by a Dukun. Klees (1920) mentions nine Tigers captured that way in Padang, West Sumatra.” Treep (1973) also notes a 1914 Dutch colonial report of 100 Tigers captured over a 6 year period in 60 box traps. Santiapillai and Ramono (1985) relate news reports of “Tiger charmers” in Aceh province live-trapping over 64 Tigers over the space of a few months. While no further information regarding this method of trapping was found during this survey, it should be noted that one injured Tiger was captured in this way by villagers in 1997 (See ‘A Tiger Called Tele’, Box 3 Chapter 5) in North Sumatra.

3.2. Incidental killing of Tigers

Many Sumatran hunters set snares to catch other species, including bears, which are also valued in traditional Asian medicine, but also ungulates, prey species of Tigers, which humans also like to eat. And since where there are Tiger prey species there are likely to be Tigers, these snares can also kill Tigers, unintended by the hunter. Snares placed near agricultural areas to catch crop-raiding animals like deer and Wild Pigs, can also catch their predator, the Tiger. Ironically, the Tigers could provide a natural means to control Wild Pig and deer populations (FFI-ID *in litt.* to TRAFFIC, 2001; FFI-ID, pers. comm. to TRAFFIC, 2002; WWF-ID, pers. comm. to TRAFFIC, 2002). This can be considered accidental or incidental killing of Tigers.

Snares set for the smaller animals with light cable or strong nylon cord are often not strong enough to hold a Tiger (FFI-ID *in litt.* to TRAFFIC, 2001). On occasion the Tiger may escape a snare, often suffering debilitating wounds (See ‘A Tiger Called Tele’, Box 3 chapter 5). These wounded animals are likely to become the area’s next ‘problem Tigers’ as wounded animals often can no longer catch their regular prey and therefore turn to simpler prey such as domestic animals including cattle, goats and dogs. However, the ones that do not escape are either taken to zoos, or more likely killed and sold.

According to information provided primarily by FFI-ID, a total of 12 Tigers were reportedly accidentally captured in snares set for other species, especially wild pigs, between late 1999 and mid 2002 (Table 5). Ten of the 12 Tigers listed in Table 5 were killed or died, and the remaining two possibly escaped. The

FFI-ID reports indicate at least four Tigers per year are incidentally killed, rather than on purpose. However, this figure is likely to be an underestimate of the total number of Tigers killed in this manner, as such kills are seldom reported and are instead discovered through investigation and intelligence reports. This indicates that as long as snare-hunting for other species continues, Tigers will continue to be caught incidentally, and potentially enter into trade.

Table 5. Tigers as incidental killings

Case	Received	Area	Source	Brief details and results
Tiger killed accidentally in pig snare	Late 1999	Sungai Pelakar, Sarolanggun, Jambi	<i>FFI-ID, 2003</i>	Tiger killed in snare set for Wild Pig by oil palm company. Manager sold. Witnesses confirm the manager was sacked for killing the tiger.
Tiger dies in deer snare	2000	Tabir Hulu, Merangin Merangin district	<i>FFI-ID, 2003</i>	Tiger caught in Sambar Deer snare set by hunter seeking meat for the Eid-ul-Fitri celebrations at end of fasting month of Ramadan.
Tiger caught in pig snare	September 2000	Desa Kuta Balang, Tapanuli Tengah, North Sumatera	<i>FFI-ID-SECP and KSDA I, 2002</i>	Report of villagers obtaining a tiger caught and killed in a wild pig trap
Tiger caught in pig trap	November 2000	Desa Mambang Baru Kec. Batang Toru Kab. Tapanuli Selatan, North Sumatera	<i>FFI-ID-SECP and KSDA I, 2002</i>	A tiger responsible for a non-fatal attack on a local man was snared by a pig trap.
Tiger killed in snare	September 2000	Desa Kuta Balang, Tapanuli Tengah, North Sumatera	<i>FFI-ID-SECP Survey Team, Sept 2002</i>	Villager reported that a tiger had been trapped in a Wild Pig trap.
Man attacked when tiger caught in snare	November 2000	Desa Mambang Baru Kec. Batang Toru Kab. Tapanuli Selatan, North Sumatera	<i>FFI-ID-SECP Survey Team, Sept. 2002</i>	Tiger caught in a Wild Pig snare but it escaped causing some bite and scratch would to one individual
Tiger killed accidentally in snare	April 2000	Lubuk Linggau, South Sumatera	<i>FFI-ID, 2003</i>	Farmer reported incident to TNKS but when rangers went to site, carcass had gone
Three tigers killed (snares)	July-Aug 2001	North Bengkulu district, Bengkulu	<i>FFI-ID, 2003</i>	Rotting pelts found (no bone) of three tigers (plus 4 tapirs) in one snare line poachers had not checked their snares till

3.3. Human-Tiger conflict

Tigers pose a threat to humans as well as their livestock. Many parts of Sumatra have high levels of Tiger-human conflict, situations in which large numbers of people as well as Tigers have been killed (Nowell, 2000). This has a long history: Treep (1973) includes a number of early 20th century descriptions of incidents where Tigers killed people, or their livestock, and were subsequently hunted and killed. At the 1992 Sumatran Tiger PHVA Workshop, Indonesian Forestry officials estimated that, on average, about 17 incidents involving problems with Tigers are reported every year from the five national parks of Sumatra. Of these 17 instances, about 12 resulted in Tiger losses: about six through poaching or poisoning and another six through official removal with government involvement (Tilson and Traylor-Holzer, 1994). Nowadays, human-wildlife conflict “has reached a critical level”, posing a serious threat to animal conservation (Nazir Foad of WWF-ID, quoted in the Jakarta Post, Sept. 28, 2002). For example, Tigers killed at least six and possibly as many as 30 people in one area of Riau province from 2000-2003; seven Tigers were killed, six captured and taken to a zoo, and two captured and released into a newly established forest reserve (Anon. 2003e, Paddock, 2004).

Adi Susmianto, director of Indonesia’s National Biodiversity Reference Unit was quoted as stating “The conflict is mostly driven by people’s activities in forests” (Jakarta Post, Sept. 28, 2002). Indeed, the most recent Tiger attack in Riau province took the life of an illegal logger (Paddock, 2004). As plantations and logging remove forest and villagers push their cultivated areas further and further into the Tigers’ habitat, the number of conflicts increases. Furthermore, the areas near newly settled villages are quickly emptied of the Tiger’s main prey species, especially deer. It appears that many of the Tigers in trade were killed or captured as a result of their conflict with man (Jakarta Post, Sept. 28, 2002).

Table 6 suggests that at least 17 Tigers have been reported as killed in Sumatra from 1997-2002, with two additional Tiger being trapped and possibly killed and another two being captured live and given to zoos. Many of these Tigers were caught in snares, while others were shot. Ten humans were killed and a further eight wounded by Tigers during this same period. Furthermore, there were 23 incidents of Tigers preying on domesticated animals, the majority of these being dogs, with one Tiger taking over 40 dogs over a period of time.

Unfortunately these numbers likely reflect only a portion of the true total annual number of Tigers killed or captured each year as a result of conflict with humans. This report has collected additional reports of Tiger-human conflict which indicate that government statistics (included in Appendix 1) are incomplete (Appendix 1 and Anon., 2003e). Moreover, through anecdotal evidence it has been suggested that park authorities often turn a blind eye to reports of Tiger killings to protect human lives or to protect livestock (WWF-ID, pers. comm. to TRAFFIC, 2002). However, as hunting Tigers is illegal, Tiger killings often go unreported even if the initial attack on humans or livestock was reported. This is further complicated by the fact that there is currently no scheme in place to compensate villagers for loss of property or life in the event of a Tiger attack. This means that the illegal sale of a Tiger killed after it comes into conflict with humans is the only way locals might recuperate losses.

It would appear from the data that human Tiger conflict is greatest in the province of West Sumatra as over 80 percent of Tiger attacks occurred there within the last three years. West Sumatra has one of the

most active Tiger conservation and Protection Unit programs and several NGOs, but especially FFI-ID, collect detailed information whenever possible, which is lacking for other regions in Sumatra (Appendix 1). The lack of comprehensive data for the other provinces does not necessarily indicate that human-Tiger conflict is less than in West Sumatra, or that fewer Tigers are killed or captured for this reason. Many people interviewed by TRAFFIC in Aceh province indicated high levels of human-Tiger conflict; however, civil unrest in the region makes it difficult for conservationists to work effectively there. On the other hand, Nyhus *et al.* (1999) carried out an intensive monitoring program around Way Kambas National Park and found a surprisingly low level of conflict, “in stark contrast to the rest of Sumatra.”

Mitigation and management of human-Tiger conflict is essential to the well-being of the communities living around Tiger populations and for the conservation of Sumatran Tiger. Villagers, commercial agro forestry workers and forest product collectors, who most often come into conflict with Tigers, often feel the only resolution is to remove the threat by either killing or trans-locating the problem animal. Removing the problem Tigers does not seem to be a viable long-term solution, and real steps towards reducing this conflict will require better education for the people living in rural areas regarding livestock management, and better planning of land use and other practices.

Tigers that attack humans, prey on livestock, take up residence in farmland or move into a village are likely to be killed by villagers trying to protect themselves and their livelihoods. In attempting to deal with these problems on their own, poisoned bait is often used by villagers to eliminate problem Tigers (WWF-ID, pers. comm. to TRAFFIC, 2002). In situations where villagers are content to wait for problem Tigers to move away poachers are often quick to offer their services resulting in the deaths of Tigers that could otherwise have been avoided (FFI-ID *in litt.* to TRAFFIC, 2003). Poachers who come to a village offering to kill problem Tigers usually only want the Tiger and do not request additional payment. Alternatively, a community may hire a professional hunter to destroy problem animals. In such cases the hunter may be paid a fee ranging from IDR 500 000 – 2 000 000 (USD 56-225) or he may take the skin depending on the wishes of the community (WWF-ID *in litt.* to TRAFFIC, 2000). In February 2002, local television aired a news clip regarding a Tiger that had killed more than forty dogs in the province of West Sumatra. Less than a day and a half later three groups of hunters approached the village offering to ‘resolve’ the problem posed by the Tiger (WWF-ID, pers. comm. to TRAFFIC, 2002).

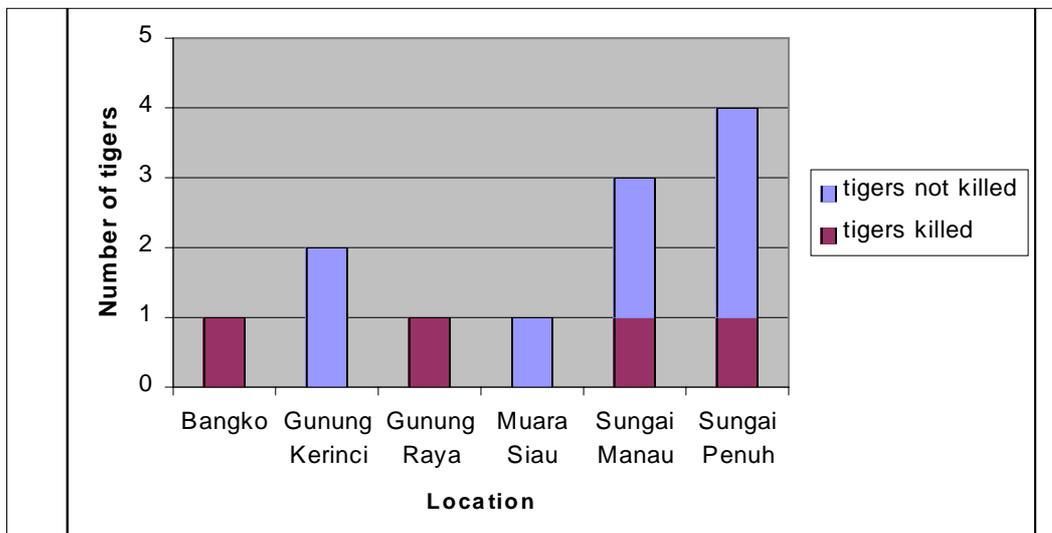
Table 6. Records of human-Tiger conflicts by Province, 1997-2002

Province	Number of tigers killed (captured)	Human fatalities	Humans wounded	Number of attacks against livestock	Source
North Sumatra					
1997-98	1				FFI-SECP survey team. Sept. 2002
1999	1				FFI-SECP survey team. Sept. 2002
2000	1, (1)		3		FFI-SECP survey team. Sept. 2002; KSDA Unit I, Pak Ambar
2001			1		KSDA Unit I, Pak Ambar
2002		3		1	FFI-SECP survey team. Sept. 2002; KSDA Unit I, Pak Ambar
Aceh					
1997	1*			1	FFI-SECP survey team. Sept. 2002
1999	2		1	2	FFI-SECP survey team. Sept. 2002
2000	1				FFI-SECP survey team. Sept. 2002
2001	1			1	FFI-SECP survey team. Sept. 2002
West Sumatra					
2000	2		2	6	FFI-ID tiger progress report, 2001
2001	4, 1*			7	FFI-ID tiger progress report, 2001; FFI-ID, 2003
2002	3		1	5	FFI-ID, 2003
Jambi					
2002		2			Jakarta Post, June 18, 2002
Riau					
2002	1, (1)	5			Reuters, Nov. 07, 2002
TOTALS	17, 2*, (2)	10	8	23	

*Trapped but not confirmed to be killed

() Trapped live and placed in zoos

Figure 3. Outcome of human-Tiger conflict incidents known in six sub-districts in Jambi between 2001 and 2002.



Source: FFI-ID in litt to TRAFFIC, 2002

In Jambi four Sumatran Tigers are known to have been killed out of a total of 12 cases of human-Tiger conflicts in 2000-2001 (Figure 3). The remaining eight animals may have been killed, but if so, this went unreported, or escaped persecution. However, recently villagers who encounter conflict with a Tiger have begun to call local Tiger conservation and protection units for aid instead of attempting to take matters into their own hands (FFI-ID, pers. comm. to TRAFFIC, 2002). The major problem with Tiger-human conflicts is the Indonesia urban perception of the Tiger is that it is a “savage animal”. These perceptions are increasingly eroding traditional beliefs about Tigers and its beneficial relationship with communities (FFI-ID, pers. comm. to TRAFFIC, 2002). Currently it is felt that an immediate proactive response by Tiger protection and conservation units can be extremely useful in mitigating conflict (FFI-ID, pers. comm. to TRAFFIC, 2002).

The Indonesian government has had a long-standing policy that when conflict arises, they will provide assistance to live-trap the problem Tiger and remove it from the area (Tilson and Traylor-Holzer, 1994). If they are successful, the question then remains what are they to do with the animal? In the past, the problem Tigers were put into zoos, particularly the large Taman Safari Zoo on Java, which has over 30 Sumatran Tigers, many of which are problem Tigers live trapped by a team of hunters specially organized by the zoo (Box 2). However, this only provides a temporary solution to the problem.

Throughout Sumatra, zoos are sorely overcrowded and many cages for housing wildlife are in a terrible state of disrepair (TRAFFIC, pers. obs. 2002). Zoos cannot continue to take in a multitude of problem animals when they barely have resources to take care of the animals they already have (Drh. Anhar Lubis, Medan Zoo, pers comm. to TRAFFIC, 2002). As one of the main attractions, Tigers in these zoos are exposed to hundreds of thousands of human visitors each year. Human acclimatization is inevitable making it highly unlikely that Tigers can be safely reintroduced from facilities such as these to the wild where they are expected to live in harmony with their human neighbours.

Box 2 Tiger claims the life of five people in Riau province

In August, Riau residents angry over the deaths of four locals launched a search for a man-eating tiger. They caught and killed a very young tiger and killed they thought was responsible. Unfortunately they were wrong, as two weeks later another man was found dead.

Seeking the assistance of professional tiger hunters a team from Safari Park Zoo in Cisarua was sent to help. A 243-pound, 7-year-old tiger was captured in September. After long negotiations with locals who wanted to exact revenge by killing the tiger team members were allowed to take the tiger back to the Zoo where it is hoped in the future he can become a stud for their breeding centre.

Source: (Reuters, November 07, 2002)

The Ministry of Forestry and the STCP are evaluating the establishment of a Tiger Rescue Centre. This is envisioned as a holding facility for problem Tigers, a place which will always be open for problem Tigers so that accommodation arrangements do not continually need to be made on a case-by-case basis (Anon., 2002b). It is hoped to translocate problem Tigers to other blocks of habitat far from people, although such areas are becoming increasingly few in Sumatra. In 2003, this strategy was tried for the first time. For the previous two years, the area around the town of Dumai, Riau province had been suffering serious levels of human-Tiger conflict, as noted in Box 2. Altogether, perhaps as many as 30 people, and numerous livestock, were killed by Tigers, and seven Tigers killed by people, with another six captured and removed to zoos. In an unprecedented initiative by the mayor of Dumai, logging concessions were suspended in a 600 km² region of Sungai Sembilan district, near Dumai, and this area was formally declared as the Senepis Tiger Conservation Area in August 2003. Further Tiger attacks in September to October 2003 resulted in the loss of nine goats and two cows, and the local people demanded that the problem Tiger be removed. Working together, the local conservation authorities and the STCP live-trapped two adult male Tigers and translocated them to the new Tiger Conservation Area. The Tigers are monitored by camera traps set up in the area, and a management plan is being developed for the area, with plans to incorporate radio-collaring to better monitor the movements and fate of translocated problem Tigers (Anon., 2003e).

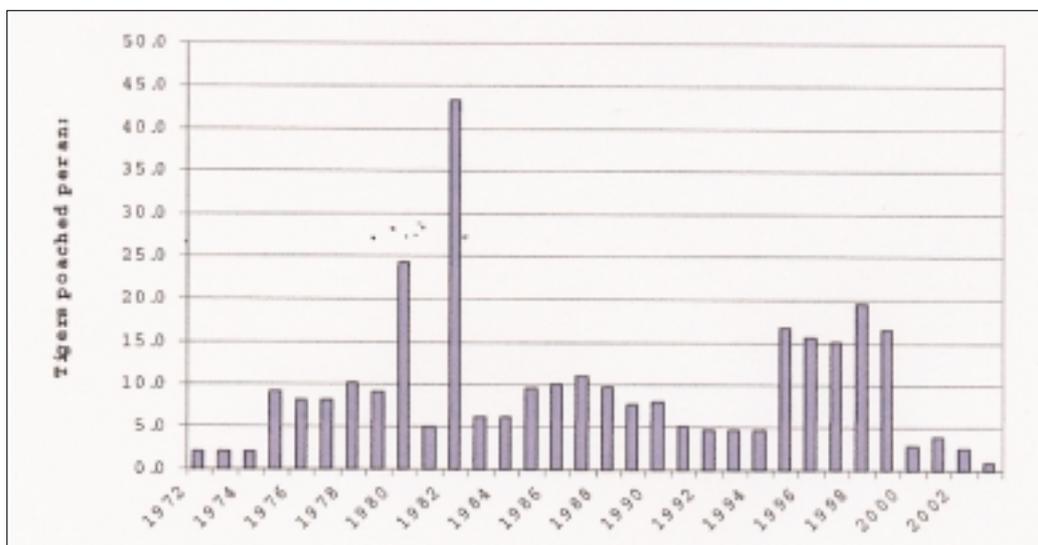
A solution more likely to succeed in reducing human-Tiger conflict in the long term would focus on changing attitudes and taking preventative measures. Public education is important for this. For example plantation workers should not go to the plantation and cattle should be kept in paddocks between 7am and 9am and at night, as it is found that Tigers come out to hunt during these times and people should travel in groups in areas where there might be Tigers.

3.4. Estimating the total number of Sumatran Tigers killed and removed

Knowledge of the levels of Tiger poaching throughout Sumatra (number of Tigers killed each year) is critical information for Tiger conservation. Tilson and Traylor-Holzer (1994) estimated that 42 Tigers per year were removed from the population in the early 1990s: six being problem Tigers live-trapped and removed from the wild by PHKA, and an estimated 36 being illegally killed, primarily for trade. Since then no comprehensive estimates have been attempted for the total annual number of Sumatran Tigers killed throughout the island.

One of the most detailed databases of current and historic Tiger poaching cases has been published recently by the STCP (2003), working in Bukit Tigapuluh National Park. Intensive effort in 2003 was put into developing an informant network, and through many interviews with local people detailed estimates were put together for the number of Tigers poached in BTNP for a 30 year period, from 1972-2003 (Figure 3). Their information indicates that approximately 305 Tigers were poached from BTNP during that period, at an average rate of 10 per year. They estimate that 32 different poaching gangs were active in the area during this period. A peak in poaching activity (number of poachers or poaching groups active) was noted during the 1980s, a decade characterized by unprecedented rates of land conversion and logging in Riau province.

Figure 4. Estimated number of Tigers poached in the Bukit Tigapuluh National Park and surrounding areas, 1972-2003 (Anon., 2003d)



Source: STCP

In order to provide a working estimate for the total number of Sumatran Tigers killed or captured in recent years, we have pulled together data collected from a number of different sources, including data collected by NGO's (FFI-ID, WWF-ID, WCS and STCP), government agencies and newspapers. In a few cases NGOs have published detailed data in their reports, but generally this information is kept in unpublished databases and was personally communicated to TRAFFIC. Ideally, reports of Tigers killed can be verified by the presence of an actual Tiger carcass, but in many cases reports of Tiger deaths are second-hand. Due to the many sources of data, we carefully inspected detailed accounts of each Tiger killed to try to eliminate duplicate data. In the event of uncertainty, we have attempted to err on the side of caution.

As shown in Table 7, an estimated 253 Sumatran Tigers were killed or live-trapped from 1998-2002, at an average of 51 Tigers per year. On the face of it, this suggests that removal rates for Tigers have not changed much over the past decade, despite major increases in Tiger protection efforts in the late 1990s. However, it is difficult to be certain about this conclusion. First, Tilson and Traylor-Holzer's (1994)

estimate of 42 Tigers per year was an estimate, and is likely to be off by some unknown factor. Secondly, the numbers may to some degree reflect the intensity of conservation effort – numbers in Riau, West Sumatra, Jambi and Lampung are highest, but these are also areas with major Tiger conservation programs (See Section 1.1.). Other districts where there is less active Tiger conservation effort may have higher numbers of Tigers killed which go undetected. In particular, civil unrest in Aceh deters monitoring and Tiger protection in this province, which was formerly recognized as a stronghold for Tigers (Treep, 1973). The city of Medan in North Sumatra was found by this survey to be one of Sumatra’s main markets for Tiger parts and products (see Section 4.1.1.), which suggests that Tiger poaching may be higher in North Sumatra and Aceh than indicated by the data.

Table 7. Estimated number of Sumatran Tigers removed from eight provinces, 1998-2002

**Eighteen Tigers, or 8% of the total, were not killed but were problem animals trapped alive and removed*

Province	1998	1999	2000	2001	2002	Total	Average	Source
North Sumatra	1	1	4	n/a	n/a	6	2.4	FFI-SECP, 2002; TRAFFIC, 2002
Aceh	n/a	2	2	1	n/a	5	1	FFI-SECP, 2002; TRAFFIC, 2002
Riau	19	17	9	12	10	67	13.4	WWF-ID, 2002; STCP, 2003
West Sumatra	2	14	35	12	3	65	13	FFI-tiger progress report, 2001; FFI-ID, 2003
Jambi	2	9	1	5	22	39	7.8	FFI-ID, 2002; WWF-ID, 2002
South Sumatra	2	4	1	2	n/a	9	1.8	WWF-ID, 2002
Lampung	19	8	12	6	12	57	11.4	WWF-ID, 2002; WCS ID, 2003
Bengkulu	n/a	2	1	n/a	1	4	0.8	FFI-ID, 2002
Total	45	57	65	38	48	253*	Approx. 51	

from the wild.

Totals for the province of Riau were sourced from records from both STCP and WWF-ID, with the higher counts from either organization being used in the totals given in Table 7. The records of Tigers removed from the wild, as recorded in Table 7, were taken from a number of unpublished sources and carefully examined to avoid duplication.

An example of the effect of intensified Tiger conservation efforts can be seen in West Sumatra. In 1998 only two Tigers were known to have been killed in this province. During this time members of the FFI-ID Kerinci team conducting surveys and camera trapping began to record a rise in numbers of Tigers poached (FFI-ID, pers. comm. to TRAFFIC, 2002). In 1999, the number rose to 14 animals. Then in the year 2000, when FFI-ID began patrolling and enforcement activities in Kerinci Seblat National Park, the

number of Tigers confirmed killed rose dramatically to 35. This increase is not necessarily a result of increased poaching activity, but in large due to the tremendous effort FFI-ID made to uncover poaching and the illegal Tiger trade. However, in 2001 and subsequently in 2002, the number of Tigers killed in West Sumatra decreased to less than half the number of Tigers killed in 2000. As FFI-ID has made a consistent effort during this time to uncover poaching and illegal trade, it is likely that this provincial decrease in the total number of Tigers killed is a result of their anti-poaching and Tiger protection efforts in the area.

Thirdly, despite the proven track record of Indonesian authorities of tolerance and lenience towards individuals who kill Tigers because of human-Tiger conflict (FFI-ID *in litt.* to TRAFFIC, 2001; FFI-ID *in litt.* to TRAFFIC, 2003), killing a Tiger is illegal, and many deaths go unreported to the authorities because of fear of reprisal (WWF-ID, pers. comm. to TRAFFIC, 2002). Further, because of the secretive nature of poaching Tigers it is unlikely that investigators would discover all Tigers killed in any given year (WWF-ID, pers. comm. to TRAFFIC, 2002). The secretive nature of the Tiger trade in combination with fear and suspicion, and inconsistent and incomplete reporting, makes gathering and compiling accurate detailed information on Tiger poaching an extremely difficult task (FFI-ID *in litt.* to TRAFFIC, 2003). Professional and semi-professional poachers have pre-existing networks of buyers established through which Tiger products are easily and quietly moved (WWF-ID, pers. comm. to TRAFFIC, 2002). Although the use of undercover investigators in recent years to gather data on poaching of Tigers has provided researchers with a wealth of information not previously available, it is impossible for occasional surveys by undercover agents to detect all of the Tigers killed annually. The relatively large scale which Tigers are traded on and the apparent lack of regularity with which investigators gather information further complicate this. Therefore, it is likely that the data in Table 7 underestimate the total number of Tigers poached.

Finally, there were numerous discrepancies in the 1998-2002 data, which makes it difficult to ascertain how accurate the count of Tiger removals is. These discrepancies highlight the importance of having a centrally and carefully managed Tiger database (see Recommendations). During data collection for this project, researchers posing as buyers and accompanying undercover investigators from other NGOs and discovered a lack of consistency in their reporting. During the process of writing investigators found a number of inconsistencies in data for the total number of Tigers killed annually. The data used in this report was therefore analysed thoroughly and cautiously to avoid duplication. It is likely that the number of Tigers killed annually is higher than estimated in this report.

It has previously been suggested that Tigers killed as a result of conflict with humans are the primary source for Tiger parts and products seen in trade from North Sumatra (Plowden and Bowles, 1997). Anecdotal information given to TRAFFIC by interviewees in Aceh province also corroborates the importance of Tigers killed as a result of conflict as a source for Tiger parts in trade. However, on an island-wide basis it appears that the number of Tigers killed for commercial gain far outweighs the numbers of Tigers killed as a result of conflict. From Table 6, at least 17 Tigers are known to have been killed from 1998-2002 as a result of human-Tiger conflict. Another 18 Tigers were live-trapped during this period, probably as a result of human-Tiger conflict as well. This is a total of 35 Tiger removals likely to be a direct result of human-Tiger conflict, but it is just 14% of the total number of Tigers killed during this period. As discussed previously, an average of at least four Tigers per year are thought to be killed

accidentally, as incidental killings, in traps set for other species. Subtracting the incidental killings, estimates still leaves the apparent motive for the remaining 78% of dead Tigers, at least 198 Tigers over a five year period, as poaching for trade.

Tigers in conflict with people constitute a local problem likely to be a feature of conservation management for as long as Tigers and people continue to compete for space and sustenance. Parts of Sumatra do suffer high levels of human-Tiger conflict, and it is important that the conservation community continue to work toward developing successful solutions to this problem. Population dynamics models suggest that Tiger populations may be resilient to steady low off-takes (Karanth and Stith, 1999), such as would be expected to arise from human-Tiger conflicts. Commercial poaching, on the other hand, is likely to result in higher off-takes, increasing the chances of sharp population declines or extinction of vulnerable Tiger populations (Kenney *et al.*, 1994). Kenney *et al.* (1994) emphasize, moreover, that “it is unwise to be complacent even if anti-poaching efforts are successful,” since the demographic consequences of poaching might not be immediately obvious and extinction may occur many years after poaching is reduced or eliminated.



Credit: Chris Shepherd / TRAFFIC Southeast Asia

A Sumatran Tiger taken from the wild after having been crippled by snares. The tiger was placed in the Medan Zoo in North Sumatra.

Data collected by this survey indicates that Sumatran Tigers are being killed and removed at an average rate of at least 51 Tigers per year over the past five years. With a total population estimated at 400-500 Tigers (Seidensticker *et al.*, 1999), this implies that at least 10% are being lost every year. As discussed above, although this estimate of current Tiger losses is the most comprehensive to date, for many reasons it is likely to be an undercount, and annual losses are likely to be greater. In order to be most useful, it is important to link Tiger deaths to Tiger populations in order to evaluate their impact, since most Sumatran Tiger populations are isolated from each other, and the population dynamics of each will differ.

At the 1992 Sumatran Tiger PHVA Workshop, it was estimated that approximately 42 Tigers were killed or removed each year on an annual basis, with 12, or 29%, the result of human-Tiger conflict (Tilson and Traylor-Holzer, 1994). This survey estimates that approximately 51 Tigers per year have been killed or removed from 1998-2002, with 14% the result of human-Tiger conflict. Given the speculative nature of the earlier estimate, and the likely under-reporting of the current estimate, it is not possible to conclude that human-Tiger conflicts have decreased. The only certain conclusion is that there is no evidence that Tiger poaching for trade has declined significantly since the early 1990s, despite intensified conservation and protection measures in Sumatra over the past decade, and apparent success globally in curtailing markets for Tiger bone. This survey of Tigers killed in Sumatra indicates that poaching for trade is responsible for the vast majority (over 78%) of estimated Tiger deaths, at least 40 per year and possibly higher.

4. The market: Illegal trade in Sumatran Tiger parts and products

Historically, the Tiger's skin is described of being the product of primary commercial value in Sumatra (Treep, 1973), with prices ranging from USD 1000 in the 1970s (Borner, 1978) to USD 3000 in the 1980s (Santiapillai and Ramono, 1985). When new conservation legislation was enacted, the government required people already in possession of endangered species products to register these with the authorities. Some 1081 stuffed Tiger mounts were registered in Indonesia (Tilson and Traylor-Holzer, 1994), demonstrating the existence of a sizeable domestic market for Tiger skins.

At the 1992 Sumatran Tiger PHVA workshop, a number of anecdotal reports were compiled concerning trade in Tiger parts in Sumatra (Tilson and Traylor-Holzer, 1994). A former poacher interviewed in Padang, West Sumatra, in 1992 said that Tiger products were smuggled to Singapore with relative ease. An earlier report of Sumatran Tiger skins for sale in Singapore surfaced in 1988, when a British journalist was offered Tiger skins and told he could be supplied with 10 pelts per month, mostly from Sumatran Tigers. In 1993 a restaurant in the city of Pekanbaru, the capital of South Sumatra province, which has a large ethnic Chinese population, offered Tiger meat to a group of Chinese tourists as one of its courses. A Jakarta taxidermist offered a complete Sumatran Tiger skin (reputedly wild-caught from Jambi, South Sumatra) for IDR 5 million (USD 2500) in 1994, which included an official permit from PHKA legally registering this specimen in Indonesia. The Tiger skin without the permit would have only cost IDR 1 million (USD 500). He also offered a sack of Tiger leg bones for IDR 300 000/kg (USD 250/kg) as well as claws and canine teeth from Tigers for IDR 40 000 (USD 20) each. This individual stated that most of his customers were from Thailand or South Korea.

Until this report, there has only been one systematic survey of Sumatran markets for Tiger products, carried out in North Sumatra in 1995 (Plowden and Bowles, 1997). They concluded, "No evidence was found that there is organized poaching for Tigers or for the international trade in bones used in oriental medicine. However, it is apparent that many Tigers killed opportunistically or deliberately by farmers are being fed into a commercial domestic market for Tiger bones, teeth, claws and skins. This is centred on the gold shops in the main communities in Sumatra." This was a somewhat surprising result given the history of large exports of Tiger bone from Indonesia to South Korea from the mid-1970s to the early 1990s (Mills 1993: see Section 1.2.). It is also surprising given the wholesale nature of the Tiger bone trade that they documented in 1995: Tiger bone was being sold by the kg in seven out of the sixty-three gold shops surveyed, or 11% of the gold shops in North Sumatra. Several of these had complete Tiger skeletons, which they allowed the investigators to examine and weigh. On the other hand, only one of the nine traditional Asian medicine shops they surveyed offered small quantities of Tiger bone preparations for retail customers (7% of shops surveyed). Although staff at the other shops had denied it, the shop owner carrying Tiger bone claimed that other traditional medicine shops in Medan also stocked Tiger bone. Plowden and Bowles (1997) also found gold (eight out of 63: 13%) and souvenir shops (one out of seven: 14%) selling canine teeth and claws.

For this project, TRAFFIC carried out extensive island-wide surveys of a variety of retail outlets, including souvenir shops, gold shops and traditional Asian medicine shops. We also conducted interviews with individual traders, middlemen and Tiger poachers. In this section, we describe the market structure for Tiger parts in Sumatra and analyze the results of our market surveys in detail.

4.1. Market structure

In Sumatra the Tiger hunters sometimes live very close to the protected areas they poach from (i.e. they are primarily local villagers). However, Tiger hunters also include police, military, and the local shooting/hunting associations. Hunters sometimes work in teams and typically, after a Tiger is killed, the body is divided between members of the hunting team. Depending on whether the hunter is opportunistic or is a professional he may have a buyer already lined up or he may have to wait to find a buyer.

While waiting for potential buyers, it is reported that bones are often buried and skins are left in a secure location. Results of interviews indicated hunters might not always keep skins at their home. On several occasions during this survey, when talking to hunters near protected areas where Tiger(s) had been poached, individuals were sent to fetch skins from secure locations. If skins are kept at the hunter's home they are often stored in sealed pails of preservative (D. Martyr, pers. comm. to TRAFFIC, 2002). Due to increased enforcement efforts by the local authorities, some dealers take extra caution when selling Tiger parts. Currently hunters in West Sumatra will not deliver Tiger parts until all the goods have been fully paid for. Poachers are safe in their village and cannot be arrested there because of the lawlessness that has become commonplace in some places within Indonesia (FFI-ID, pers. comm. to TRAFFIC, 2002), making enforcement efforts difficult. In the current political and social climate, to make an arrest, authorities must convince a hunter or dealer to leave his village and come to a designated place where it is safe for the police to arrest him. Villagers will defend each other to the point of killing anyone who enters the village to arrest a member of the village or cause problems (FFI-ID, pers. comm. to TRAFFIC, 2002). In other areas where enforcement is lacking, parts are openly displayed for sale in shops.

Figure 5 shows the structure of the trade of Tiger parts in Sumatra. Middlemen or brokers either help the hunters to find a buyer or buy directly for resale. In the latter case the middleman usually has potential buyer organized, perhaps a long time client. Middlemen may also sell to a district buyer (FFI-ID, pers. comm. to TRAFFIC, 2002). For example, in Banko, West Sumatra, district buyers purchase Tiger parts from middlemen who buy directly from villagers near Kerinci-Seblat National Park. In Bukittinggi district buyers may sell teeth, claws or off cuts of pelts or entire skins (often lesser quality merchandise) to retailers for sale to tourists (FFI-ID, pers. comm. to TRAFFIC, 2002).

Almost all district level dealers in Tiger products are dealers in other wildlife products, in particular Agarwood *Aquilaria* spp. (also known as *gaharu*), freshwater turtles and tortoises, snake skins and edible swiftlet nests. In Bandar Lampung reptile dealers are the main dealers of Tiger skins (WWF-ID, pers. comm. to TRAFFIC, 2002). In addition to collecting turtles, snakes and monitor lizards these men also opportunistically hunt Tigers. Along with local village hunters, they are the primary dealers of Tiger part and skins, as they have the trade routes for illicit wildlife and contacts already established. The majority sell directly to provincial level dealers but in West Sumatra at least two are known to have sold directly to Jakarta and other parts of Java (FFI-ID, pers. comm. to TRAFFIC, 2002). FFI-ID has received narrative reports of a market in Surabaya and Bandung, Java, (the latter is said to be a traditional Asian medicine production centre), as well as, a number of reports of Tiger skins and bone being sold to a major dealer in Bali who subsequently exports pelts and bone (FFI-ID, pers. comm. to TRAFFIC, 2002). The final destination of these exports is not known.

From the district dealers the Tiger parts are moved relatively quickly to provincial dealers in Jambi, Palembang, Bandar Lampung, Padang, and Pekanbaru. Provincial dealers have holding facilities where Tiger parts are accumulated, usually in a “safe house” or warehouse, until buyers come along or until a shipment is ready to go overseas (FFI-ID, pers. comm. to TRAFFIC, 2002).

In Indonesia, the end users of Tiger skins are very often police or military. They give Tiger skins as gifts to their superior officers in hopes of climbing the ranks more quickly. This is apparently a very long-standing tradition that goes back to the monarchy of Indonesia. Although there is no monarchy it is practiced amongst the military and to a much lesser extent the police, as noted in Figure 5. Tiger parts also leave Indonesia for international markets.

Although it is suspected that most of the Tiger products exported from Indonesia go through Singapore it is still not clear how much remains in Singapore and how much continues on to other international markets.

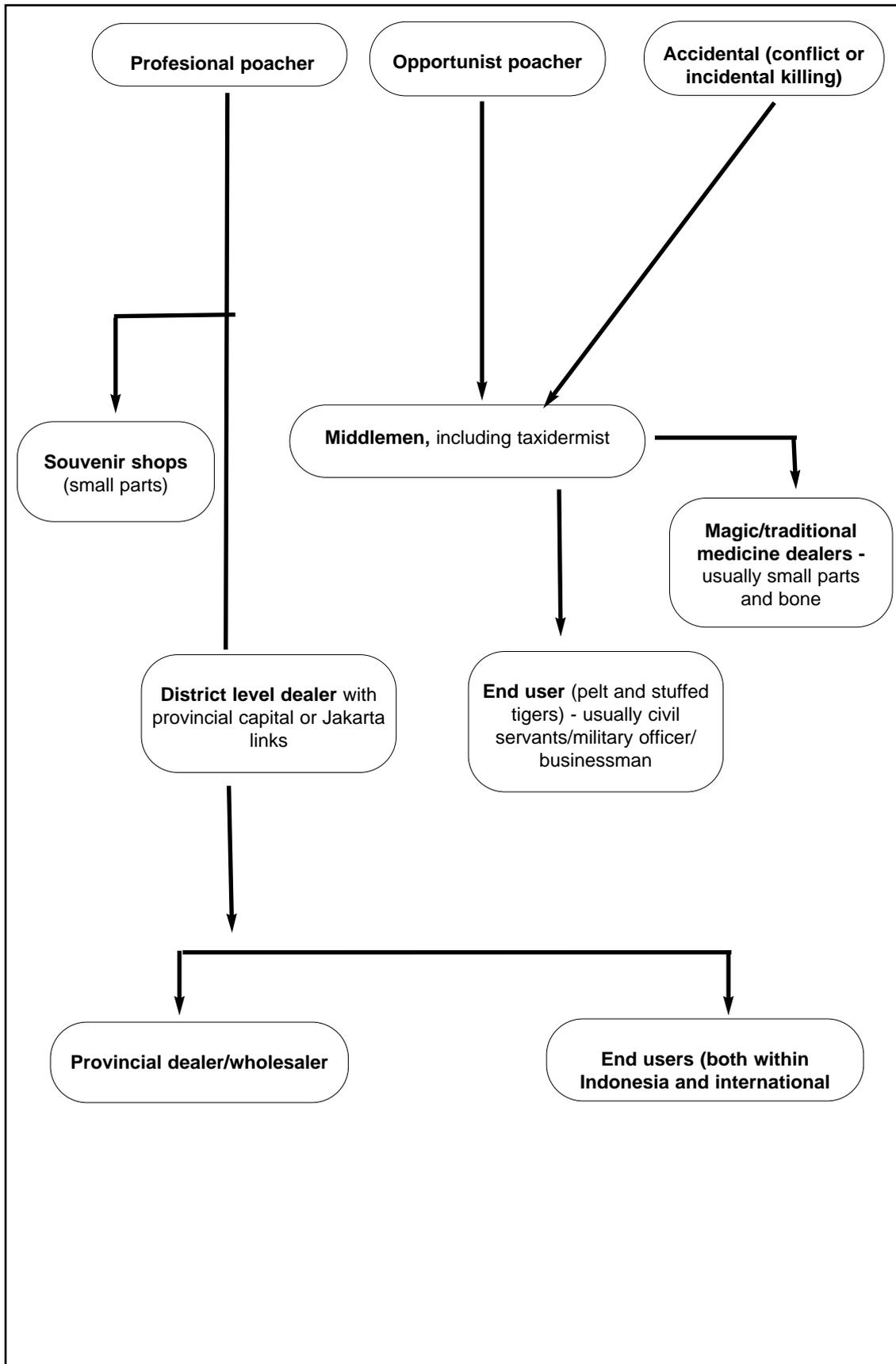
4.2. Market surveys

Throughout the eight provinces of Sumatra, a total of 24 towns and cities were surveyed in 2002, recording 484 observations from shops and dealer sources in 2002. Only seven towns in this survey did not have Tiger parts for sale (29% of towns), but in the other 17 towns a total of 117 shops and dealers, or 25% of those surveyed overall, were found to have Tiger parts for sale, as recorded in Appendix 2. A total of 453 retail shops were surveyed, and of these 19% (86) were observed to have Tiger parts for sale. Table 8 shows the main types of retail outlet surveyed, with the percentage having Tiger products for sale.

Map 3.
Sumatra: 8 provinces and towns surveyed.



Figure 5. Market structure for the sale of tiger parts in Sumatra



Similar to the previous 1995 survey (Plowden and Bowles, 1997) in North Sumatra, TRAFFIC found one traditional Asian medicine shop in Medan city stocking Tiger bone (the owner claimed to stock a small quantity, but was uncomfortable discussing the subject and would not show it to the TRAFFIC investigator). TRAFFIC also found several gold shops in North Sumatra – and only in North Sumatra – selling wholesale quantities of Tiger bone by the kg. One shop had a complete skeleton. Around Sumatra, TRAFFIC found gold and souvenir shops selling Tiger claws, canine teeth, and skin pieces. Of all retail outlets, antique shops had the highest availability of Tiger parts, mainly canines and claws, and it is possible that their offerings are antique rather than of recent origin.

In addition to the retail outlets surveyed, thirty-one dealer contacts were made, and all had either Tiger parts for sale, information on Tiger parts, or claimed to be able to obtain Tiger parts. Most of the Tiger bone and whole Tiger skins observed or reported during this survey were offered in a clandestine fashion through various types of dealers, ranging from poachers to middlemen to taxidermists. This strongly suggests that there is a substantial underground trade in Tiger parts in Sumatra, which does not depend upon retail outlets to openly display these items.

Table 8. Availability of Tiger products in retail outlets in Sumatra

Type of retail outlet	Total number surveyed	Percent having tiger parts or products for sale
Souvenir shop	109	7%
Gold and gems shop	331	13%
Antique shop	16	50%
Traditional Asian medicine shop	12	8%
Wildlife market	2	0
Restaurant	1	100%
<i>Jamu</i> medicine and magic shop	1	100%

Table 9. Main types of Tiger parts observed during 2002 market surveys

Tiger part or product	Total number observed	Percent of total observed
Claw	175+	42%
Canine	102+	24%
Whisker	80+	19%
Whole skin	24+	6%
Piece of skin	20	5%
Bone	8 (= 8 cases)	2%
Whole stuffed tiger	5	1%

Table 10. Summary of Tigers and Tiger parts observed in trade in Sumatra in 2002

Location / Canine Part	Molar	Claw	Whisker	Tail	Pieces of skin	Whole skin	Skull	Bone (kg)	Stuffed tiger	Live	
North Sumatra											
Medan	19	54			7+	1	2	1 +		4	
Pancur Batu	7		28		75+	1	15	1	1	30 +**	
Belawan	3	2									
Binjai	15		17								
Siantar			1								
Tebing Tinggi	1	4	1								
Padang											
Sidempuan	5+										
Sibolga	6+	7+	3+			3+	1				
Mandailing											
Natal	1+	1+									
Brastagi*											
Stabat*											
Sembahe*											
Sei Rampah District*											
Tangung Morawa*											
Aceh											
Aceh											
Tamiang	6										
Aceh Timor	8										
Riau											
Riau								present		1	
Pekanbaru	2										
Batam	1	2				1					
West Sumatra											
Padang	2										
Bukittinggi	26	9			1						
Jambi											
Jambi	4	49			1	10		present	5		
Bengkulu											
Bengkulu						3		5			
South Sumatra											
Palembang		18									
Lampung											
Bandar Lampung*											
Villages bordering Bukit Barisan National Park							5				
TOTAL	106+	2	189+	80+	1	24+	24	4	36 +	5	5

*locations surveyed with no Tiger parts observed

** 20 kg of bone was reportedly available but not seen by investigators

Note: Information regarding skin and bones in West Sumatra from FFI-ID,

Table 9 (on previous page) shows a breakdown of the types of Tiger parts and products observed during our surveys. Tiger claws were the item most frequently seen, with canine teeth second. A surprisingly large number of whole Tiger skins (24+) have been observed or offered to investigators (FFI-ID, pers. comm. to TRAFFIC, 2002; TRAFFIC, 2002): there are few other markets in Asia where such a volume of skins could be readily observed (Nowell, 2000). None of the Tiger bone observed was on open display, and in only four cases did dealers allow investigators to see the bones. One complete skeleton (minus the skull) was seen at a gold shop in Pancur Batu, North Sumatra. Staff at the traditional Asian medicine shops knew Tiger bone was illegal and said that was why they did not carry it.

Table 10 (on previous page) shows a breakdown of the types of Tiger parts seen in different locations around Sumatra.

Table 11. Prices for Tiger parts and products collected during this survey

Item	Quantity	Average price (IDR) (n prices)	Average price (USD) (n prices)	Price range (IDR)	Price range (USD)
Stuffed tiger mount	5	25 009 000	2810 (2)	20 007 200-30 010 800	2248-3372
Whole skin: retail 4+		18 342 900	2061 (3)	10 003 600-35 012 600	1124-3934
Whole skin: wholesale	20+	4 610 200	518 (11)	2 002 500-8 499 500	225-955
Skin piece	24+	1 361 700	153 (10)	53 400-7 502 700	6-843
Bones	36 kg+	240 300	27 (7)	106 800-605 200	12-68
Skull	4	1 174 800	132 (2)	854 400-1 504 100	96-169
Canine	106+	676 400	76 (24)	44 500-2 002 500	5-225
Claw	149+	249 200	28 (25)	35 600-1 005 700	4-113
Claw inlayed gold	40+	827 700	93 (18)	391 600-1 602 000	44-180
Whisker	80+	115 700	13 (3)	17 800-249 200	2-28
Bottle of tiger fat	6	427 200	48 (2)	258 100-605 200	29-68
Dried tiger flesh	per kg	80 100	9 (n/a)	71 200-89 000	8-10
Tiger penis	1	258 100	29 (1)		
Live tiger cub	5	1 005 700	113 (1)		

Sources: Appendix 2, Table 17, and text.

Table 11 shows the average and range of prices observed for Tiger parts during this survey. Skins and skin mounts obtained the highest prices IDR 30 010 800-30 206 600 (USD 3372-3394). The average wholesale price (from dealers) for a Tiger skin IDR 4 610 200 (USD 518) was substantially lower than the price asked by retail outlets IDR 18 342 900 (USD 2061). Skin pieces, canines, and claws were the next most valuable Tiger parts. Surprisingly low prices were asked per kg of Tiger bone, lower than the average retail price of a claw or canine tooth. The skull was the most valuable Tiger bone, not for traditional Asian medicine, but for display.

Table 12. Comparison of prices collected by the TRAFFIC 2002 survey and prices reported by Hartana and Martyr (2001)

Item	Price this survey (Sumatra-wide average) (IDR)	Price this survey (Sumatra-wide average) (USD)	Price for Kerinci Seblat area (Hartana and Martyr, 2001) (IDR)	Price for Kerinci Seblat area (Hartana and Martyr, 2001) (USD)
Whole tiger skin (wholesale)	4 610 200	518	4 734 800-5 259 900	532-591
Tiger bone (kg) (wholesale)	240 300	27	213 600-267 000	24-30
Canine (retail)	676 400	76	89 000	10

Table 12 compares the prices for Tiger parts observed during this survey to prices reported by Hartana and Martyr (2001) for the Kerinci Seblat National Park area, in West Sumatra. Similar prices are reported for skins (wholesale) and bones, but Tiger canines are quite inexpensive in the Kerinci Seblat area when compared to the remainder of Sumatra.

Table 13. Prices for Sumatran Tiger products, early 1990s to 2000

Item	Early 90s price(USD)	Late 90s price (USD)	2002 price (USD)
Whole skin	500-2500	n/a	2061
Bones/kg	250	20-200	41
Canine	20	34-68	76
Claw	20	2-16	28
Penis		3(fake) 100-150 (real)	29 (real?)

Sources: *Tilson and Traylor-Holzer, 1994 (early 1990s skin price); Nowell, 2000 (other 1990s prices); this survey (2002 price).*

Table 13 compares the prices for Tiger parts observed during this survey to prices previously reported for the same items in the early and late 1990s (not adjusted for inflation). Prices for Sumatran Tiger products have remained relatively steady over time, and have not risen, as might be expected, as a result of inflation or of a declining supply of Tigers. The only product to show a decline in price is Tiger bone.

Table 14. Hunter and trader price comparison for Tiger bone (per kg), late 1990s to 2002

Market segment	Late 1990s (IDR)	Late 1990s (USD)	2002 (IDR)	2002 (USD)
Hunter	124 600	14	106 800-151 300	12-17
Trader	178 000-1 780 000	20-200	204 700-605 200	23-68

Source late 90s: Nowell (2000) and Beebach, WCS-Indonesia Program in litt. to TRAFFIC, 2003 Source early 2000: Appendix 2

Table 14 breaks down Tiger bone prices into prices sought by hunters, and prices asked by dealer/traders. The price asked for a kg of Tiger bone by hunters has remained remarkably steady, and low, over time. The price asked by dealers and traders, however, appears to have fallen. This suggests the hopeful possibility that demand for Tiger bone medicines, both inside Sumatra and internationally, is falling. Hartana and Martyr (2001) write of the Kerinci Seblat area: “There does not appear to be a large, organized market for Tiger bone in this area of Sumatra although the bones of a Tiger marketed in Muara Bungo in March were sold before the pelt... Hunters here perceive the skins, teeth and claws as the only valuable parts on a Tiger.” However, it would be premature for conservationists to claim a victory in reducing demand for Tiger bone medicines and illegal trade in Tiger bone, as several cases were documented during this survey, and there are still numerous reports of Tiger bone trading in Sumatra that could not be verified. Section 3 showed that the majority of Sumatran Tigers are still being poached for trade, and even if Tiger bone is no longer the product most in demand, markets for other Tiger parts are apparently sufficient to provide a strong motive for Tiger poaching.

4.2.1. Market surveys: North Sumatra

Fourteen towns and cities were surveyed in North Sumatra. Three of these locations, Padang Sidempuan, Sibolga and Mandailing Natal, were surveyed in less detail than the other 11 locations.

1. Medan

Medan is the capital of North Sumatra. It is the third largest city in Indonesia and has a large ethnic Chinese community. It has an international airport and seaport, and is a major hub for wildlife trade, including the export of freshwater turtles and tortoises, python skins, the international and domestic trade in birds, Asian Arowana Fish *Scleropages formosus* and wildlife-based traditional Asian medicines. Medan is also situated relatively close to the Gunung Leuser Ecosystem, one of the largest wildlife areas in Sumatra, and home to one of Sumatra’s largest Tiger populations. Past observations of Tiger parts in trade in Medan led TRAFFIC to target this city as a priority site:

In 1996, a traditional Asian medicine dealer selling various wildlife parts in front of the Medan Central Post Office was asked about high-profile species such as Tiger. The dealer invited the researcher to his home, where numerous items were stored. Among these were a complete Tiger skeleton and two near complete rhino skeletons, all of which he claimed were from Kerinci Seblat National Park (Shepherd, 1996).

In February 1999, three Tiger claws, one canine and some small pieces of skin were observed by the same researcher in a precious stone shop behind Medan Mall in Medan. These items were extremely fresh, as there was still dried blood and bits of flesh on them, and according to the dealer, had come from a Tiger killed in the Kotacane (Aceh) area two weeks earlier.

Observations of Tiger parts for sale in Medan in 2002

Twelve souvenir shops, 33 gold shops and two shops selling precious stones were surveyed. Four traditional Asian medicine dealers, four 'western' pharmacies and one roadside traditional Asian medicine dealer were also surveyed. Furthermore, one wildlife market was surveyed, where informal interviews were held with dealers there. Five of the 53 dealers surveyed stated that the Tiger parts came from animals killed in Aceh, while the others did not know, as they were purchased from middlemen.

A. Souvenir and antique shops in Medan

Twelve souvenir shops in Medan were surveyed, including six shops inside the departure lounge of the Polonia Airport. Although a number of wildlife parts were observed for sale in the airport shops, no parts of Tigers were available. Four of the remaining six shops in the city (67%) had Tiger parts openly for sale, as well as a number of other wildlife parts (including those from Sun Bear, Sambar Deer and Asian Elephant *Elephas maximus* ivory and bones). It is likely that at least a portion of these souvenir shops were the same shops surveyed by Plowden and Bowles (1997), as these are all of the souvenir shops in Medan. In conversations with the dealers at the four shops with Tiger parts for sale, it was stated by one dealer that the Tiger parts had originated from animals killed in Aceh, while the other three said they did not know where they came from as they purchased their Tiger parts from other middlemen who randomly brought wildlife products to the shops for sale.

One of these shops was also surveyed by TRAFFIC in November 2000, when one head and one skull and two canines were observed. It was surveyed again in 2001, and one head, with the teeth all removed, and four paws were observed. This same shop had a complete stuffed Tiger about five years ago (Shepherd pers. obs., 1997) but no longer does. When asked about this, the dealer stated that it had been chopped up and pieces of the skin sold separately. The head on display was all that remained. The other pieces of skin were sold much cheaper than what was being asked for the pieces off of the head.

Another dealer said that approximately 10 years ago he commonly received Tiger bone, skin and other parts for resale but rarely does now. He stated that at that time, when bones were purchased, buyers from Singapore would always come to buy them. He claimed to have sold the bones to them for as much as IDR 1 780 000/kg (USD 200/kg). This shop, during this survey, had only three Tiger claws for sale.

The information regarding the Tiger parts for sale in the souvenir shops in Medan was given to the KSDA Unit in Medan (the enforcement arm of the PHKA) approximately two days after these observations were made by TRAFFIC. The KSDA claims to have sent a team into to investigate, but stated that no Tiger or other protected wildlife parts were observed in any of the shops. TRAFFIC again went to the shops in the following days and again observed all the same Tiger parts in open display.

B. Gold and precious stone shops in Medan

Thirty-three gold shops and two precious stone shops were surveyed in Medan in 2002, of which eight (23%) had Tiger parts for sale. Dealers in two of these shops stated that the Tiger parts they sold were from Aceh, while the rest said that hunters or middlemen brought parts to them and were not sure of the origins. Three of these dealers stated that it was becoming increasingly difficult to acquire Tiger parts to sell, possibly due to Tigers becoming scarce, and that middlemen coming around selling parts of Tigers and bears do so less often than before. One of the dealers had four canine teeth and a complete skin (skin not observed by TRAFFIC) for sale that appeared to be relatively fresh and according to the dealer, were from a Tiger killed near Kotacane, Aceh, approximately eight months earlier.

The majority of the products were canine teeth and claws, some of which were inlaid in gold. The gold obviously made the price of this item much more expensive. One dealer said these products are now too expensive for people to buy, and therefore fewer of these products are sold. When asked if he had any Tiger skin for sale, he said no as it was illegal. However, he said that one would not get arrested for having claws and teeth of Tigers, as this was not illegal.

Another shop had for sale three Tiger canines and 1kg of Tiger bones. According to this dealer, he used to sell a lot of Tiger bone from this location, as well as bear parts (bear claws were also available). The Tiger bones in stock observed by TRAFFIC were apparently a few years old. The bones were kept in the shop itself, under the counter. According to this dealer, it is becoming harder to acquire Tiger parts for resale than it was in the past. This dealer claimed to have one regular buyer of Tiger parts from the Netherlands. It is not known what this individual does with the parts.

C. Traditional Asian medicine shops in Medan

Four traditional Asian medicine shops were visited in Medan, and none of these had any Tiger products on display, although some parts of other species were. Only one admitted to having any Tiger bones in stock, while the others refused to discuss the issue, saying it was illegal and that they therefore did not carry any. It was obvious that these well-educated people knew of the legislation protecting Tigers, and were wary (being ethnic Chinese they may have felt under more pressure by local authorities). It is very possible that these dealers do have Tiger products, but do not trade with strangers. The owner of this one traditional Asian medicine shop stated that he did have a small unspecified amount of Tiger bone in stock, to be used in medicines. The bone is not sold on its own, but mixed in with other ingredients, depending on the illness. The dealer stated he had no other Tiger parts, but was clearly uncomfortable discussing this topic.

D. Western pharmacies

Four large western pharmacies were surveyed, and although a few types of patent medicine, manufactured in China, claiming to contain tortoise and pangolin *Manis* sp. were available, there were no medicines claiming to contain Tiger parts.

E. Street sellers of traditional Asian medicines

A dealer selling a whole variety of different animal parts was often set up on the walkway in front of Medan's central post office. Among all the animal parts was on Tiger claw for IDR 35 000 (USD 4) which the dealer claimed to have been from Padang, West Sumatra. The dealer also claimed to have one

incomplete Tiger skeleton and was asking IDR 500 000 (USD 56) for it. The skeleton was apparently missing the front legs, head and the paws. The TRAFFIC investigator did not see this skeleton, as it was kept at the dealer's home and a small down payment was requested before he would show it to interested buyers. The other parts of the animal had already been sold off.

2. Pancur Batu

Seven gold shops were surveyed (which also dealt in precious stones and decorative items) in the small town of Pancur Batu, situated along the road between Medan and Brastagi. Wildlife products, including those from Sun Bears, Sambar Deer, Muntjac *Muntiacus muntjak* and Serow *Naemorhedus sumatraensis* and small wild cat species, were openly for sale in six of these shops, with five of them (71%) having Tiger parts.

One shop had a number of Tiger parts, as well as bear parts for sale. The Tiger parts included five canines, 12 claws, one complete skeleton minus the skull and one near complete skin (minus the forehead) which according to the owner, was purchased five years ago from a dealer or hunter in the town of Kotacane, Aceh. No price was given as the dealer asked for offers and did not really know current prices, but was very anxious to sell it. The skin was kept in a bag at his home but he promptly retrieved it by motorbike for the TRAFFIC investigator to see. A second piece of Tiger skin, approximately 30x60 cm in size was also kept hidden under the counter and was brought out for display by the dealer. This piece was very old and in poor condition, and according to the owner, originated in Aceh.

The dealer in another shop stated that a well known senior mafia figure from Medan often comes to their shop to purchase Tiger whiskers, as do senior members of the military, as it is believed these offer the owner protection against harm. Approximately 20 kg of Tiger bones were also for sale, but as the boss was not present, a price was not given for these. The skull from this Tiger had already been sold and was not observed. The owner of this shop is a hunter and claimed to have killed all the animals observed in the shop himself. He hunts with a small team, usually in Aceh, which was apparently where the Tigers were killed.

Another shop seemed to specialize in selling Tiger parts and apart from 19 Sun Bear claws for sale, the only wildlife products this shop sold were those from Tigers. All parts were displayed openly and included one piece of skin from a Tiger's forehead for, 10 small pieces of skin, measuring approximately 6x 4 cm, a larger piece of skin, measuring approximately 90x60 cm, three leg-bone portions cut into lengths of approximately 10 cm in length, four bottles of Tiger fat, a number of Tiger whiskers and one Tiger skull (with no teeth, as these were already sold). According to this dealer, these Tiger parts came from animals killed in and near Aceh. She said that a couple of years ago she had four complete Tigers, all of which were sold to buyers from Singapore. She also said that a buyer from Java used to occasionally buy Tiger parts from him, but no longer after being caught by police *en route* back to Java (no records of this arrest were found by TRAFFIC). The dealer stated to the investigator that if he assisted in selling all of the Tiger parts, he would get an IDR 2 000,000 (USD 225) commission. She also stated that she would likely not get anymore Tiger parts in as they are now very rare and hard to get.

Market surveys were previously carried out in Medan and Pancur Batu in 1995 by Plowden and Bowles (1997). Table 15 compares their survey results with the TRAFFIC survey. TRAFFIC's 2002 survey

found more gold and souvenir shops engaged in selling Tiger products than in the mid-1990s. However, whereas Plowden and Bowles (1997) found that gold shops were important sellers of Tiger bone, with five whole skeletons seen that were verifiably Tiger, TRAFFIC surveys found the shops selling mainly Tiger canines and claws. Plowden and Bowles (1997) found seven gold shops selling a total of 36 kg of bone, which they were allowed to inspect and weigh. Four gold shops surveyed by TRAFFIC in North Sumatra were found to have Tiger bone: one with a small lot (1 kg), one reportedly with rather more (20 kg, not seen and verified), one with portions of leg bones, and one with a complete skeleton, minus the skull. It is notable that only in North Sumatra did TRAFFIC find gold shops selling Tiger bone; elsewhere, Tiger bone was mainly sold by various types of dealers. TRAFFIC also found more trade in whole skins and skin pieces than was previously observed by Plowden and Bowles (1997) in North Sumatra.

Table 15. Retail outlets in Medan and Pancur Batu selling Tiger products: comparison of 1995 and 2002 surveys

Type of shop	Location	Percent having tiger products for sale in 1995	Percent having tiger products for sale in 2002
Traditional Asian medicine shop	Medan	11% (1/9)	25% (1/4*)
Western pharmacy	Medan	0 (0/4)	0 (0/4)
Gold shop	Medan	10% (1/10)	23% (8/35)
Souvenir shop	Medan	14% (1/7)	67% (4/6)
Gold shop	Pancur Batu	100% (1/1)	71% (5/7)

Sources: 1995: Plowden and Bowles (1995); 2002: this TRAFFIC survey.

*One traditional Asian medicine shop owner claimed to have a small amount of Tiger bone in stock, but he would not show it and was uncomfortable discussing the subject

3. Brastagi

Nine souvenir shops in the central market in Brastagi, which caters mostly to local and foreign tourists, were surveyed. Of the nine shops, only one had any wildlife parts available; one very old muntjac antler set for sale. The owner of this shop said he sometimes sells other wildlife products, such as bear claws, Malayan Pangolin *Manis javanica* skins and tongues and, in the past, had sold Tiger canines. This dealer also stated that usually Malaysian tourists buy the wildlife products, such as the teeth and claws, and in the past had purchased Tiger and bear claws from him.

4. Belawan

Nine gold shops, two traditional Asian medicine shops and two souvenir shops were surveyed in the port town of Belawan. None of the gold shops in Belawan had Tiger parts or any other wildlife parts for sale. All dealers were asked if they knew where such products could be purchased. Most did not know, although two suggested the souvenir shops in Belawan or Medan.

A. Souvenir shops in Belawan

Two souvenir shops were surveyed, one in the town centre, the other at the port itself. Wildlife parts were observed only in the former of these two locations. Some Hawksbill Turtle *Eretmochelys imbricata* shell

items were available, as well as parts of two Tiger canines and two Tiger molars. The origin of these items was not known, as they were purchased from a dealer.

B. Traditional Asian medicine shops in Belawan

Two traditional Asian medicine shops in Belawan were surveyed, and according to the dealers, the only products from animals these two shops had were seahorses. One of the dealers suggested looking in Toko Bintang, on Jalan Sumatra, Belawan.

5. Binjai

Twenty-nine gold shops and one traditional Asian medicine shop were surveyed in the town of Binjai. Additionally, the home of one dealer was visited and information was gathered from him. Another dealer, a middleman for suppliers in Aceh, was met with and much information was recorded. Of the 29 gold shops surveyed in Binjai, only four (14%) had Tiger parts for sale, although a number of others had wildlife parts on sale. It is interesting to note that none of these dealers in Binjai openly displayed the Tiger parts, or any other wildlife parts, but all instead had these parts kept in safes in the shops. However, none seemed reluctant to show TRAFFIC staff, posing as a potential buyer, the parts. One dealer that did not have any Tiger parts for sale suggested going to Medan, again highlighting the fact that Medan is a known trade hub for these products. No Tiger parts were available in the medicinal shop.

The owner at a glass-cutting and cabinet making shop had Tiger parts for sale and invited TRAFFIC to observe these. Upstairs, in the dealer's home, above the main business, twelve Tiger canines, apparently from three animals were produced from a box in a closet. The dealers said that two sets were from Tigers killed approximately 15-20 years ago, while the third set was from a Tiger that was apparently killed approximately two years ago. According to him, all of the Tigers were killed in Aceh. This dealer said that he only deals in Tiger canines, more for hobby reasons than anything. He stated that a Malaysian man comes around semi-regularly, looking for Tiger parts to buy. This particular dealer has sold three sets of four Tiger canines (12 teeth in total) to the Malaysian buyer. He did not know (or would not say) the name of the Malaysian dealer, only that he thought he was from Kuala Lumpur. The dealer said he did not deal in skins, as they are too hard to conceal in his home. He also cautioned the investigator that if one was going to buy any of the teeth, not to buy the fresh ones, as they were illegal, however the old ones were not. He stated that taking them out of the country would be dangerous as it is against the law because Tigers are protected. He also stated that he used to receive Tiger canines from hunters more frequently, but that Tigers were now very hard to find.

Middleman in Binjai

TRAFFIC met with a dealer who acts as a middleman for hunters and other dealers in the area in Binjai. This middleman stated that he only had two Tiger canines in his possession at the time, but claimed he had contacts with many more. He also stated that one of his contacts currently had a rhino horn, and that some ivory was also available, but he would rather not deal in ivory as it was very risky. He stated that it could be acquired but it was easier to move chopped up pieces rather than whole tusks. He also said that his family was in the live reef fish business. He claimed that all the wildlife parts, such as the Tiger and rhino, he deals in are from Aceh, but he kept the parts at a location known as Tanjung Pura.

6. Stabat

Five gold shops were surveyed in the small town of Stabat, but none of these had any wildlife parts for sale.

7. Sembahe

A wildlife market, set up on the side of the road in the small village of Sembahe, between Medan and Brastagi, sells a number of animals. However, the dealers here stated that they did not sell Tigers, or Tiger parts, and recommended that the TRAFFIC investigator go to Pancur Batu or Medan.

8. Siantar

Fifteen gold shops and one antique shop were surveyed in the city of Siantar. Of these, only the antique shop had any Tiger parts for sale. Two of the gold shop dealers stated that if one wanted to buy Tiger parts, it would be better to go to Medan. In the antique shop the dealer stated that he used to deal in Tiger parts on a regular basis. However, although he said that he no longer did, one Tiger whisker was available from him. According to him, it was not illegal to sell Tiger whiskers as these are found in the forest, not taken from killed animals.

9. Tanjung Morawa

Three gold shops were surveyed in the central market area of this town, and no Tiger parts were available.

10. Sei Rampah District

Two gold shops were surveyed in this small town and no Tiger parts were available.

11. Tebing Tinggi

Seven gold shops and one restaurant that also sold precious stones were surveyed. Of these, two of the gold shops and the restaurant had Tiger products openly available for sale. One of these shops had claws for sale that were obviously from a freshly killed animal as there was still fur, skin and dried meat attached to the base. The dealer said he did not know where these originated, as they were brought to the shop by another dealer. This shop also had one Tiger canine for sale, but the price was not given for it, and again, the owner said he did not know the age or origin, as it had been brought to the shop by another dealer, different from the one that sold the fresh claws.

4.2.2. Aceh

Many dealers in Tiger parts interviewed in the cities and towns of North Sumatra province identified Aceh province as where the Tigers were killed. According to people interviewed in Aceh, the primary reason Tigers are killed is due to conflict with humans and livestock. The locals take it upon themselves to kill the Tigers, as they are dissatisfied with the efforts by the government to take care of these problem animals. These problem Tigers, once killed, inevitably end up being sold, and the killing of such problem Tigers is seldom reported or detected (Section 3.3). Hunting Tigers purely for profit is also a serious problem in this province. Locals that were interviewed generally supported the killing of Tigers, as they felt they were a threat to themselves and their livestock. According to one hunter, in the 1970s Tigers were often captured for sale live, to circuses and perhaps zoos. This practice carried on into the 1990s, although the motive had changed and the majority of the captured Tigers were presented as gifts to local

authorities or to employers. Stuffed Tigers are also commonly given to these sorts of people as gifts from Aceh. Some Tigers and Tiger parts are reportedly also smuggled out of the country from Aceh. In 2001, one live Tiger, along with three Sumatran Orangutans *Pongo abelii*, were reportedly smuggled from Aceh to Peninsular Malaysia, on a speedboat (C. Saleh, pers. comm. to TRAFFIC, 2002).

Souvenir shops in Aceh often carry parts and products derived from wildlife, often species protected by law. Lack of strict enforcement of these laws allows for the dealers in these shops to openly display the wildlife products and to speak freely about them. Although much of the province of Aceh was unable to be surveyed due to political unrest, a total of 17 shops were surveyed of which eight (47%) had Tiger canines openly displayed for sale. On average, more souvenir shops in Aceh openly sold Tiger canines than anywhere else in Sumatra (the Sumatra-wide average being 7% of souvenir shops having Tiger parts: see Table 9). A total of fourteen canine teeth were observed in these shops and, according to the dealers, more were available, but were not on display.

4.2.3. West Sumatra

A Tiger dealing syndicate based in Siulak, North Kerinci, West Sumatra, was broken up in September 2002 through the investigative efforts of FFI-ID and the local enforcement agencies. The syndicate was buying Tigers from Kerinci itself and the districts of Pesisir Selatan and Solok in West Sumatra. The most active poaching centre in West Sumatra appeared to be villages near the town of Tapan in the South Pasisir District, where former rhino poachers have turned their focus to Tigers and travel widely, covering West Sumatra as well as Bengkulu and Jambi (D. Martyr *in litt.* to TRAFFIC, 2003). They appear to have been sending Tiger pelts to Padang but were holding on to the Tiger bone, for reasons which have not been ascertained. The son of one of the two main players in this syndicate works at Padang airport in a senior capacity. It is suspected that this man was subsequently exporting Tiger bone and pelts (FFI-ID *in litt.* to TRAFFIC, 2003). There is also circumstantial evidence of strong demand for Tiger bone from a Chinese dealer in Padang. This individual has reportedly also bought Clouded Leopard *Neofelis nebulosa* bone for traditional Asian medicine (FFI-ID *in litt.* to TRAFFIC, 2003).

Bukittinggi shop owners interviewed by TRAFFIC during market surveys indicated that Tigers killed locally were the source of at least some of their Tiger products. These findings are corroborated by local NGO's, who report that Tiger parts including claws, canine teeth, whiskers and poor quality skins go to Bukittinggi for sale to foreign and local tourists (FFI-ID *in litt.* to TRAFFIC, 2003). High quality Tiger skins and parts from West Sumatra go to Padang, where there are believed to be one or maybe two main dealers (not found by TRAFFIC during the 2002 surveys). It is uncertain if Tiger products from Padang then go to Jakarta or Singapore, possibly via Batam (FFI-ID, pers. comm. to TRAFFIC, 2003). However, a WWF-ID investigator from Palembang believes that from Padang Tiger parts are not sent to Batam and then on to Singapore, but rather are sent directly to Singapore (WWF-ID, pers. comm. to TRAFFIC, 2002). (TRAFFIC surveys in Batam found no direct evidence of Tiger parts for sale: Section 4.2.8)

Surveys in West Sumatra were conducted in the cities of Padang and Bukittinggi by TRAFFIC in 2002 and observations were as follows:

Padang

A total of 41 gold shops, 38 souvenir shops and one antique shop were surveyed in Padang. No authentic Tiger parts were available in any of the gold or souvenir shops were observed and dealers, when asked by TRAFFIC surveyors, stated that none were available. Four souvenir shops had fake Tiger canines for sale, which they insisted were genuine. A survey of the antique shop revealed two genuine Tiger canine teeth displayed in a glass case. No information was provided as to the origin of these.

Bukittinggi

A comprehensive survey of all gold shops, souvenir shops and antique shops in Bukittinggi was carried out, with surveys being conducted in eight precious stone shops, 11 gold shops, 23 souvenir shops, and 14 antique shops. No Tiger parts were observed in any of the precious stone, gold or souvenir shops. Of the 14 antique and art shops, six had genuine Tiger parts. The Tiger parts were openly displayed in all of these shops, and included canine teeth, claws and pieces of skin. The dealers in these shops stated that they did not know where the parts came from as they were brought to them for sale by a middleman. One shop owner stated that each month a supplier from a local village brings him more Tiger parts. He did, however, indicate that it was getting more difficult to obtain Tiger parts. He also stated that he had two complete Tiger skins for sale as well but that they were kept at his house, and not on display. The owner of the shop stated that he sells Tiger parts mostly to customers from Singapore and claimed he had sold one large canine tooth the previous day to a man from Singapore for IDR 2 002 500 (USD 225). This may have been the same Bukittinggi shop owner interviewed a year earlier by Hartana and Martyr (2001), who offered a tooth for IDR 400 000 (USD 47) that he said would fetch IDR 800 000 (USD 95) in Bali. He urged investigators to buy the canine on the spot, because he planned to send it to Singapore.

4.2.4. Jambi

The Tiger is the official mascot of the province of Jambi. This province plays an important role in the illegal trade of Tiger parts in Sumatra. The supply of Tigers and Tiger parts for this market comes mostly from Bangko, Muara Bungo and Sarolangun. Kerinci Seblat National Park is an important source of Tiger parts in Jambi and all Tigers poached from Kerinci Seblat National Park apparently go to Jambi, which is the centre for provincial dealers (FFI-ID *in litt.* to TRAFFIC, 2003). From Jambi most of the Tiger skins and bones are reportedly moved through the ports of Tembilahan (Riau), Pekanbaru (Riau), Palembang and possibly to a lesser extent directly to Jakarta. There are collectors at provincial level that sell directly to traders in Tembilahan, Palembang, Jakarta, and Singapore (WWF-ID, pers. comm. to TRAFFIC, 2002), as well as traders that sell direct to the end user. Ten skins were observed for sale in the province of Jambi in 2002 (FFI-ID, 2002 *in litt.* to TRAFFIC, 2002; WWF-ID, pers. comm. to TRAFFIC, 2002).

Although it is known that many civil servants and police and army officers in Jambi own stuffed Tigers (and other protected animals), it is believed that Jambi is mainly a clearing house for Tiger products (FFI-ID *in litt.* to TRAFFIC, 2003). It is suspected that the small ferry port of Kuala Tungkal, approximately two hours by road north of Jambi, may be a main exit point for Tiger products from this area, with products being exported to Malaysia or Singapore (FFI-ID *in litt.* to TRAFFIC, 2003; WWF-ID, pers. comm. to TRAFFIC, 2002).

In 2002 TRAFFIC surveyed a total of 36 gold shops and three antique shops in the city of Jambi. Thirteen of these shops had Tiger parts for sale (33%), though none were openly displayed. When a request was made to purchase such items, the owners of all shops that did not have Tiger parts on display indicated they did not have any Tiger parts available. One gold shop indicated that he had no Tiger parts for sale right now as he had sold the last of his stock (two Tiger claws) the previous day. Several of the shops that had Tiger parts for sale had unusually large numbers of Tiger claws available for sale. One shop had 12 claws and one canine; another had 16 claws, and the last shop had six Tiger claws. In every case the owners kept all the Tiger merchandise at home with the possible exception of a sample, which they had hidden away at the shop. For each of these three shops investigators waited while the merchandise was retrieved so that parts and quantities could be verified.

Fifty-two Tiger claws and two Tiger canines were found for sale during market surveys in Jambi. Because of the quantity of Tiger claws available claws were divided according to size into the categories small, medium and large. The 11 large claws observed during surveys ranged in price from IDR 102 350-302 600 (USD 11.50-34) and sold for average price of IDR 222 500 (USD 25). There were also 11 medium sized claws for sale ranging in price from IDR 53 400-200 250 (USD 6-22.50) with an average price of IDR 133 500 (USD 15). There were 29 small claws ranging in price from IDR 35 600-151 300 (USD 4-17). The average price for a small claw was IDR 57 850 (USD 6.50). Although gold shop owners indicated it had become more difficult to obtain large and medium Tiger claws two shop owners stated that it was still relatively easy to obtain small claws. The two gold shop owners had 28 claws and a canine tooth between them. Only two Tiger canines were found for sale. One owner asked IDR 849 950 (USD 95.50) and the other owner wanted IDR 1 797 800 (USD 202).

Trade of canine teeth and claws in Jambi's gold shops fluctuates (FFI-ID *in litt.* to TRAFFIC, 2003). However, it would appear from anecdotal evidence and interviews conducted with shop owners that Tiger claws and teeth are becoming more difficult to obtain. There are two possible reasons for this. If Tiger populations are declining, then so is the supply of parts. But also the conservation and protection measures undertaken in the area may be paying off. Local hunters, traders, middlemen, as well as retail outlet shops appear to have become much more secretive in their transactions for fear of legal reprisals. Gold shops surveyed in Jambi, that did have Tiger parts already set in gold had them openly displayed but raw Tiger parts were kept hidden either in safes in a back room, in drawers below the display counters, or at the individual's home. One shop that had bear and Tiger claws for sale had the bear claws openly displayed while Tiger claws were hidden. The shop owner indicated that this was because he was scared of being arrested for selling Tiger claws

From information collected in Jambi province during this survey, it is estimated that the average income for a hunter from the sale of primary Tiger parts would be over IDR 8 366 000 (USD 940) (Table 16). The average gross national income (GNI) for Indonesia for 2001 was IDR 6 052 000 (USD 680) and IDR 3 827 000 (USD 430) annually for low income families. Thus a hunter can make as much as twice the GNI of a low income earner from a single Tiger. However, hunters still make substantially less money from Tiger trade in comparison to middlemen and retailers (Table 17).

Table 16. Price of Tiger parts in Jambi

Parts of body	Hunter price (IDR)	Hunter price (USD)	Amount from one tiger one tiger	Value of parts from one tiger (IDR)	Value of parts from one tiger (USD)
Bone	102 350	11.50 /kg	12 kg	1 201 500	135
Penis	253 650	28.50 /piece	1	253 650	28.50
Claw	53 400	6 /piece	18	907 800	102
Skin	5 001 800	562	1	5 001 800	562
Canine	253 650	28.50 /piece	4	1 001 250	112.50
Total				8 366 000	940

Table 17. Price comparison of Tiger parts in each market level in Jambi

Parts of body	Prices at market level					
	Hunter (IDR)	Hunter (USD)	Middlemen (IDR)	Middlemen (USD)	Collectors/ Investors (IDR)	Collectors/ Investors (USD)
Bone	102350/kg (b)	11.50/kg (b)	-	-	-253650/kg (a)	28.50/kg (a)
Penis	253650/piece(a)	28.50/piece (a)	253650/piece (a)	28.50/kg(a)	-	-
Claw	53400/piece (a)	6/piece (a)	151300/piece (a)	17/piece (a)	218050/piece (c)	24.50/piece (c)
Skin	5001800/tiger (b)	562/tiger(b)	10003 600/tiger (b)	1124/tiger(b)	20007200/tiger (c)	2248/tiger (c)
Stuffed tiger	-	-	-	-	30010/tiger (c)	3372/tiger (c)
Canine	253650/piece (b)	28.50/piece (b)	302600 (b)	34/piece (b)	1201	135/piece (c)

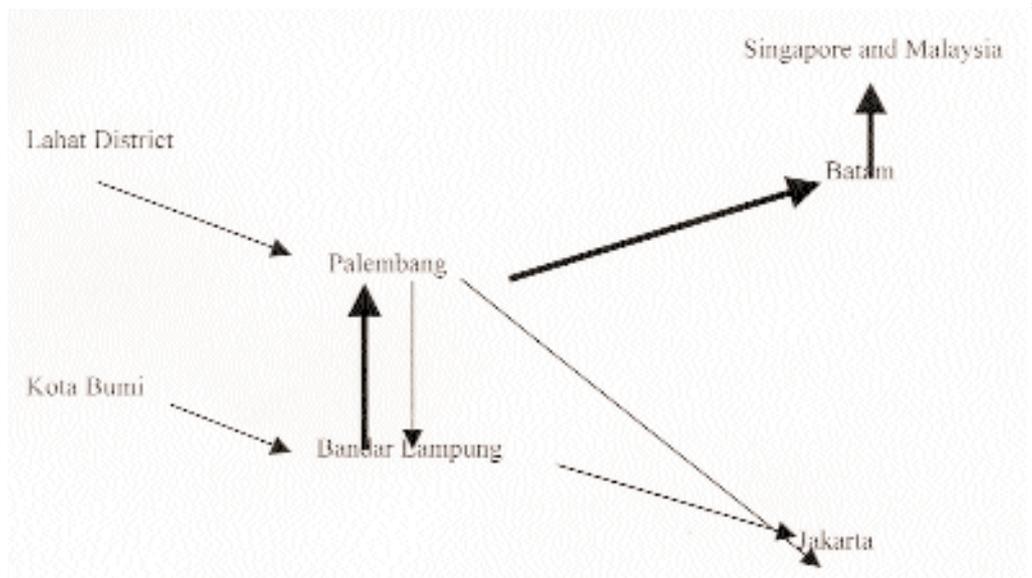
Sources: (a = WWF-ID *in litt.* to TRAFFIC, 2000; b = FFI-ID, pers. comm. to TRAFFIC, 2002; c = TRAFFIC Market Survey)

4.2.5. South Sumatra

WWF-ID (pers. comm. to TRAFFIC, 2002) considers that gold shops selling Tiger claws constitute the primary form of Tiger trade in Palembang, the capital city of South Sumatra. Evidence from TRAFFIC market surveys (see Table 10) support these claims. However, other investigators also suggest that Palembang is a central hub in the illegal Tiger trade network in South Sumatra (C. Saleh, pers. comm. to TRAFFIC, 2002). The WWF-ID investigator responsible for Lampung Province said his intelligence indicated that approximately 60% of the Tigers and Tiger parts poached in Lampung were sent to Palembang (WWF-ID, pers. comm. to TRAFFIC, 2002). There are also many hunters in Lahat and Lubuk Linggua that sell to Palembang. Large quantities of Tiger bones are reportedly sent to Palembang (WWF-ID, pers. comm. to TRAFFIC, 2002), but it is not known what happens to those bones after arrival in Palembang. The Tiger trade in Palembang, South Sumatra, is apparently controlled by reptile dealers

and organised criminals (WWF-ID, pers. comm. to TRAFFIC, 2002). According to WWF-ID investigators, there is one main shop selling Tiger in Palembang. From Palembang only a very small proportion of Tiger parts reportedly go to Jakarta. Most are sent to Batam and then onto Singapore (Figure 6).

Figure 6. Dynamics and routes of Tiger trade in South Sumatra



Larger arrows indicate greater volume and frequency of trade

TRAFFIC conducted market surveys in a total of 32 gold shops and of these nine (28%) were found to have Tiger claws for sale. Eighteen Tiger claws, many of which were inlaid in gold, were available for sale.

Investigations in Palembang revealed the presence of an active taxidermist, locally known as the best taxidermist in this region of Sumatra. This taxidermist often receives skins from other provinces to have mounted, reportedly often brought to him by senior military and police officials (C. Saleh, pers. comm. to TRAFFIC, 2003). Investigators had little trouble locating his house, as he was well known to locals. Although investigators were able to locate this individual, attempts to establish further contact for the purposes of data collection were unsuccessful, as he appeared to be highly suspicious of strangers.

4.2.6. Lampung

Bandar Lampung is the capital of Lampung Province. It is only a short boat trip to Java, making trade with Jakarta possibly more feasible than with the next major urban centre Palembang which requires travelling inland over rough roads. Bandar Lampung is also the gateway to two large national parks – Way Kambas and Bukit Barisan Selatan National Park, both of which have Tigers and active conservation projects by WCS, WWF-ID and the STCP, WWF-ID and WCS are also actively investigating Tiger poaching and trade in Lampung (Anon., 2003b; WWF-ID pers. comm.).

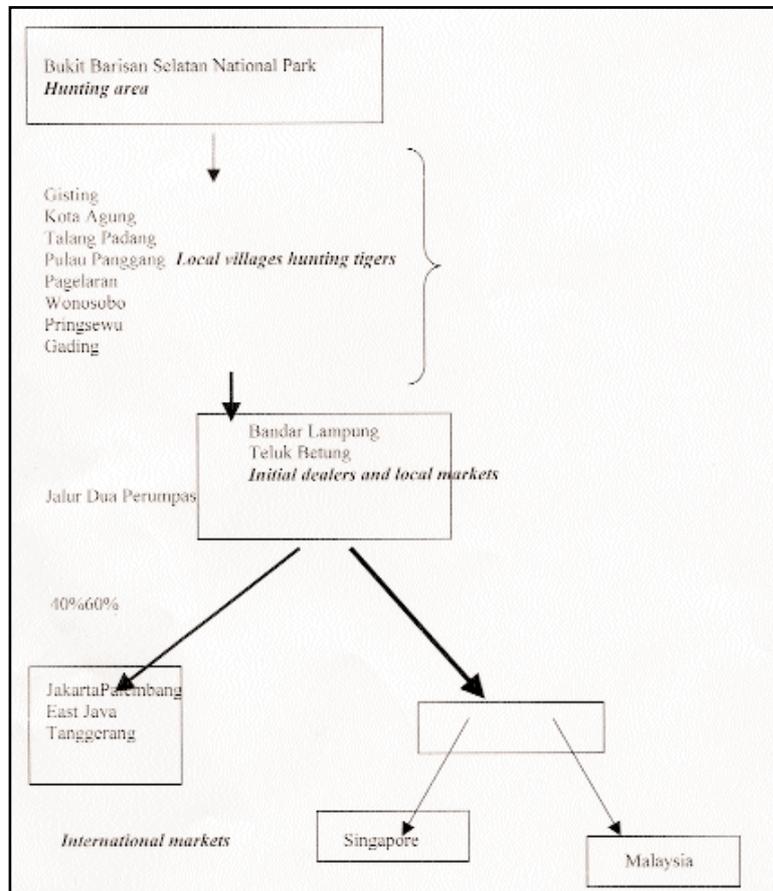
In Lampung Province, the Tiger trade is reportedly controlled by organized crime groups that specialize in the sale of Tiger parts, rhino horn and elephant tusks. A network extends through Padang, Jambi, Palembang, Lampung Jakarta, and Bengkulu connecting these gangs, though it is not known who is coordinating them. Freshwater turtle and tortoise traders play a role in the trade through the sale and 'laundering' of Tigers and Tiger parts (FFI-ID, pers comm. to TRAFFIC, 2002).

Most of the Tigers in trade throughout Lampung Province originate from Bukit Barisan Selatan National Park (see Figure 7, on the next page). Locals from several villages nearby the national park including Gisting, Kota Agung, Talang Padang, Pulau Panggung, Pagelaran, Wonosobo, Pringsewu, and Gading are known to actively hunt Tigers within the park boundaries (WWF-ID, pers. comm. to TRAFFIC, 2002). Upon killing a Tiger, it is reported that most hunters send skins and other valued parts to initial dealers and local markets in Bandar Lampung, Teluk Betung and Jalur Dua Perumpas. From the results of the market survey in Bandar Lampung it is evident that there is only a small market for Tiger parts. It is suspected that the towns of Teluk Betung and Jalur Dua Perumpas have similarly small Tiger markets. Investigators believe that these initial dealers send at least 60% of the Tiger parts to Palembang most of which is apparently exported to Malaysia and Singapore. The remaining 40% of the Tiger parts from Tigers killed in Lampung are apparently sent to Jakarta, East Java and Tangerang where they are sold by dealers and retail outlets such as gold shops, traditional Asian medicine shops and antique shops to consumers (WWF-ID, pers. comm. to TRAFFIC, 2002).

Bandar Lampung is not known as a tourist town and subsequently there are only a few souvenir shops. Market surveys conducted by TRAFFIC focused on gold shops and traditional Asian medicine shops. No Tiger parts were observed in Lampung during this survey. However, during early 2002, WWF-ID personnel carried out surveys in the city's gold shops and an unspecified number of Tiger claws were observed for sale. One shop owner told TRAFFIC that a week earlier a man had come here to his shop trying to sell one Tiger claw, asking IDR 752 050 (USD 84.50). The owner offered IDR 502 850 (USD 56.50), more than three times the average price of claws in Jambi, but the man left saying it wasn't enough. The apparent lack of any open commercial market in Lampung is noteworthy, as Lampung province had the second highest level of Tigers killed or removed in 2002 (Table 7), and quotes of relatively high prices for Tiger parts.

Although no Tiger parts were found for sale in the city of Lampung itself, five Tiger skins were found for sale in villages bordering Bukit Barisan Selatan National Park. At the home of one poacher three skins were discovered. Two were sold to Jakarta at a price of IDR 15 005 400-20 007 200 (USD 1686-2248) each and a third sold to Palembang (price unknown). Two other Tiger skins stored at the home of another poacher in a nearby village were also discovered during a visit by TRAFFIC. These results suggest that most Tiger trade in this region has likely moved underground as vendors sell only to individuals they know and poachers have resorted to selling directly from their homes.

Figure 7. The flow of tiger trade originating from Bukit Barisan Selatan National



4.2.7. Bengkulu

Tiger skins from Bengkulu Province are primarily sold to Lubuk Linggau, where allegedly the best taxidermist in Sumatra is located. Lesser quality skins and other Tiger parts then go to either Jambi or Palembang. Tiger and rhino hunted in this area may also be sent to Lampung and from Lampung onto Jakarta (WWF-ID, pers. comm. to TRAFFIC, 2002). There are many hunters in Lahat and Lubuk Linggau, Bengkulu, who sell to Palembang. Hunters from Lubuk Linggau are also known to sell to Jambi.

This province was not surveyed by TRAFFIC, however intelligence was provided to TRAFFIC from FFI-ID carrying out investigations there, for use in this report. Investigations were carried out on three individuals or businesses that had been identified as major Tiger dealers in the city of Bengkulu, in Bengkulu Province.

Location 1

The home-based business of one taxidermist was visited by investigators posing as interested buyers in early 2003. The business was run by an elderly man and his son, the former being well known for his work, and has done work for a number of individuals and institutions, including the Natural History Museum in Bogor, Java. The investigators were shown a photograph of a Sumatran Tiger, stuffed and photographed in the taxidermist's home.

According to this individual, he had previously sold a stuffed Sumatran Tiger for IDR 15 000 000 (USD 1685), and currently had the skin of another large adult Sumatran Tiger, measuring 2 m in length, which he was willing to sell for IDR 13 000 000 (USD 1460). The taxidermist did not allow the investigators to see the stuffed Sumatran Tiger, unless a sale was agreed upon, but he did display some Sumatran Tiger claws.

The son of the taxidermist also offered to sell Tiger bones, of which he claimed to have 6 kg and was asking IDR 200 000/kg (USD 22.50/kg). He also offered bear bones and deer antlers, as well as marine turtle meat. He also stated that they had Tiger meat sometimes, but were out of stock at the time.

He went on to say that he once had in his possession two live Tiger cubs, but these were given to the Chief Minister of that district. No further information was obtained regarding these cubs. It was claimed by locals nearby that this taxidermist currently had a live Tiger in his possession but investigators found no further evidence of this during their visit.

Location 2

Investigators visited the premises of a freshwater turtle and tortoise and snake dealer in the city of Bengkulu in early 2003. This dealer stated that in the past he had bought and sold Tiger bones quite frequently but now found obtaining them difficult. He currently had in his possession 3 kg of bones for sale at IDR 400 000 (USD 34) which he said came from a young male Sumatran Tiger. He showed a few of the bones to the investigators for proof. According to the dealer, he had not yet been able to sell the skull and skin of the Tiger because they were damaged (the head had been crushed by a spear), and the Tiger was quite small, making the skin of less value as a trophy.

Location 3

In early 2003, investigators in Bengkulu received information from an informant that an individual in a town on the borders of Bengkulu and South Sumatra, had purchased a stuffed Sumatran Tiger from a taxidermist there, and then wanted to sell it for IDR 14 000 000 (USD 1573). The investigators visited the premises of the taxidermist, who claimed to be a retired military officer, who now did taxidermy from his home, catering largely to police and military officials. In his home a number of stuffed animals were observed including Asiatic Golden Cat *Catopuma temminckii*, Leopard Cat *Felis bengalensis*, and one Clouded Leopard still in the process of being stuffed, and was immersed in preservatives. He claimed he had a second Clouded Leopard skin also being prepared. A number of other species were also observed. The dealer showed the investigators one Tiger tooth that had been fashioned into a pendant. Photographs of this individual preparing Tiger parts for use in a traditional dance were also observed by investigators.

According to him, he was often asked by military and police to stuff Tigers, for which he charged approximately IDR 1 000 000 (USD 112) and which took about 20 days to complete. He claimed to be able to acquire permits to own and transport Tigers for the clients, and showed a recently signed permit to the investigators, giving permission for a client to transport two dead male Tigers from Palembang. The permits were signed and stamped by a KSDA Unit in South Sumatra, indicating the level of corrupt connections this taxidermist had. According to the taxidermist, it takes two to three days to arrange a possession or transport permit for a Tiger. Permits provided by this dealer apparently all bear the same permit number and date, with a forged government stamp (FFI-ID *in litt.* to TRAFFIC, 2003).

This individual is reported to have sold two stuffed Tigers to the local head of district Parliament, indicating his connections with powerful backers.

This individual also said that he has bought Clouded Leopard skins which, according to this dealer, were purchased in the Lubuk Linggau area for approximately IDR 3 000 000 (USD 337) and selling for IDR 4 000 000 (USD 450)

4.2.8. Riau

Pekanbaru is the capital of the province of Riau. It has a large Chinese population and is near one of Sumatra's largest ports, the closest major port to Singapore, making it another suspected hub for Tiger trade (The island of Batam, which is part of the Riau province, is considered an important transit point for Tiger parts leaving Sumatra to Singapore, and is dealt with in a separate section of this report). While it is known that wildlife is illegally traded in Riau, no prior studies focusing specifically on Tiger have been carried out.

Tigers and Tiger products are collected primarily from the three districts in Riau: Kuantan Sengingi, Indragiri Hulu and Indragiri Hilir. From these districts Tiger and Tiger parts are transported to the cities of Dumai, Pekanbaru and Batam. From inland regions of Riau Tiger products go mostly to Pekanbaru. In the south and central coast regions Tiger products go directly from hunters to dealers in Batam. In the northern regions of Riau Tiger products go to Dumai first, then on to Batam by boat (FFI-ID *in litt.* to TRAFFIC, 2003; WWF-ID, pers. comm. to TRAFFIC, 2002) and then apparently on to Singapore or Malaysia. Because of its close proximity to Singapore and Malaysia, Riau is a prime location for the trade of Tigers and it is one of the main gateways for international Tiger trade from Sumatra. The reason for this is because of the ease with which Tiger parts can be moved to Batam and then shipped to Singapore with little or no law enforcement to stop trade (C. Saleh, pers. comm. to TRAFFIC, 2002).

Three markets were surveyed by TRAFFIC in 2002 in Pekanbaru: Pasar Nangka, Pasar Pusat and Pasar Kodim. In each market, investigators attempted comprehensive surveys of all gold shops and traditional Asian medicine shops.

In Nangka Market (Pasar Nangka) there are no traditional Asian medicine shops and a total of 20 gold shops, none of which had Tiger parts and when the owners were questioned they stated that none were available. However, one shop did have three bear claws for sale, suggesting that there is a market for this type of merchandise.

In the Central Market (Pasar Pusat) there were two gold shops and two traditional Asian medicine shops. One gold shop had a Tiger canine for sale (price not available). The canine was not yet set in gold but the owners would only to sell it to a customer who was interested in purchasing a Tiger pendent necklace. The shop would then do the gold work as part of the deal. Results from surveys from traditional Asian medicine shops indicated no Tiger bone or other parts were currently available for sale. However, one shop had a variety of other wildlife products for sale including bear gall bladder as a medicine to treat heart ailments.

A total of 11 gold shops and three traditional Asian medicine shops were surveyed in Kodim Market (Pasar Kodim) and no Tiger parts were found.

Results from surveys of Pekanbaru indicate that Tiger parts are not openly available as in other cities, including Jambi and Palembang. Wildlife parts that were available in the traditional Asian medicine shops had, according to WWF-ID, often been there for long periods of time which may suggest demand is not high.

However, there still may be substantial underground wildlife trade in Pekanbaru. One major wildlife dealer was interviewed in Pekanbaru who claimed to deal in a variety of endangered species products including ivory, Tiger parts, live Sumatran Tigers, live Siamang *Hylobates syndactylus*, Sun Bear parts etc. He claimed to have encountered live Tiger cubs in trade in 1997-1998. This information was corroborated by a second source, a staff member at the Pekanbaru Zoo (Section 5).

Batam Island, Riau

Batam is a popular holiday destination, especially for tourists from nearby Singapore, which is approximately an hour away by ferry. Most of the tourists that come to visit from Singapore are apparently businessmen. Consistent narrative evidence collected by individuals monitoring trade over the long term indicates that the island of Batam is a major transit point for Sumatran Tiger skins and bones (FFI-ID *in litt.* to TRAFFIC, 2003; WWF-ID, pers. comm. to TRAFFIC, 2002). Information from traders in Batam indicates that most goes to Korea, Taiwan, and Singapore but that Tiger parts are also sold to Japan, Malaysia, and China (WWF-ID, pers. comm. to TRAFFIC, 2002). From Batam parts are reportedly shipped to Singapore by boat and plane. Skins are put in bags and carried over to Singapore by individuals. Traders are aware that to an x-ray machine, a Tiger skin appears to be just like folded clothes, so it is very difficult for officials to detect. Other small parts such as teeth and claws are put in luggage or are carried over by individuals (WWF-ID, pers. comm. to TRAFFIC, 2002). The volume of such illicit trade is impossible to estimate as such trade is rarely detected, but it may account for a large proportion of the Tigers killed each year.

This city has very few souvenir shops and the supply of Tiger parts openly available was found to be limited. Market surveys were conducted in all the gold shops, souvenir shops and curious shops found in Batam Centre, Nagoya and Jodoh districts. In Batam Centre District a total of five souvenir shops were surveyed in the Batam Centre and Carnival Plaza Malls. There was no evidence of any Tiger or wildlife products for sale in any shops. In Nagoya surveys of 10 gold shops and three souvenir shops were conducted. The six gold shops located in Lucky Plaza had no Tiger parts openly displayed or offered for sale when investigators made requests to purchase such items. Four gold shops in Centre Point Mall were

also surveyed but no Tiger parts were found for sale. Souvenir shops randomly located throughout the Nagoya district did not reveal any Tiger parts for sale upon investigation. Surveys were administered to a total 35 gold shops and one magic shop in Jodoh district. Thirty-three shops did not have Tiger parts displayed openly or available for sale when investigators made requests. One gold shop indicated they did not have any Tiger parts for sale but an attendant indicated that he had a friend with Tiger claws for sale. Arrangements were made to view the Tiger claws, which were kept at the man's home. Investigators verified that three genuine Tiger claws were for sale. According to this individual, the claws had come from Palembang. One gold shop had a fake Tiger canine made from quartz inlaid in a gold pendant setting. Surveys of a magic shop located in this district revealed a variety of wildlife parts for sale including one small piece of Tiger skin.

To determine if Tiger parts were in fact available in Batam TRAFFIC investigators used the assistance of locals to determine the availability of Tiger products. Word passed to local dealers who believed the TRAFFIC investigator to be a tourist looking for souvenirs. Within two hours of beginning research in Batam, a local man turned up in the lobby of the investigator's hotel with two Tiger claws for sale.

The results of the market survey in Batam appear to indicate that Tiger products are not openly available for sale. If Singapore were the main destination for Tiger products being exported out of Sumatra then why would Tiger parts not be more readily available to the masses of Singaporean tourists in Batam? Enforcement does not appear to be any more stringent in Batam than elsewhere, so it is unlikely that the trade is controlled there. The most likely reason few Tiger parts were found is because Tiger products only go through Batam, as a transit point.

Conclusion

This survey found 25% of shops and dealers surveyed in Sumatra in 2002 selling Tiger parts and products. Table 19 indicates the main trouble spots for Tiger trade in Sumatra. While there is some cause for optimism – fewer gold shops were seen selling Tiger bone compared to a previous survey (Plowden and Bowles, 1997), and prices for Tiger bone appear to be quite low and possibly declining (Tables 14 and 15) – there is still plenty of cause for concern. Tiger bones were still seen for sale, as well as an increased number of Tiger skins, skin pieces, claws, canines and other parts, in comparison to Plowden and Bowles (1997) survey. All of this trade is illegal, and must be made an enforcement priority in order to eliminate the poaching threat to the Sumatran Tiger.

Table 18. Locations identified by this survey as being hotspots for illegal Tiger trade

Location	Type of establishment	Type of tiger product
Medan	Gold and souvenir shops	Skins, bones, canines, claws,
Pancur Batu	Gold shops	Skins, bones, canines, claws, whiskers
Bukittinggi	Antique shops	Claws and canines
Jambi	Gold shops	Claws and canines
Bengkulu	Taxidermists and wildlife dealers	Skins and bones
Villages bordering	Poachers' homes	Skins
Bukit Barisan		
Selatan National Park		

Table 19. Availability of tiger parts and products in 2002 surveys in retail shops in the eight provinces of Sumatra

Province	Percent of retail shops selling tiger parts
North Sumatra	16%
North Sumatra: Medan and Pancur Batu	35%
Aceh	47%
West Sumatra	5%
Jambi	33%
South Sumatra	28%
Lampung	no data
Bengkulu	no data
Riau	3%

Table 19 shows that enforcement can have a strong deterrent effect, at least upon open retail trade in Tiger parts and products. Availability of Tiger parts and products in retail shops (including gold, souvenir and antique shops) is lowest in the parts of Sumatra where law enforcement effort has been highest, with active government-NGO partnerships such as the Lampung Wildlife Crime Unit (Anon., 2003b) and the Tiger Protection Unit anti-poaching teams operating in parts of West Sumatra and Riau provinces. The TRAFFIC surveys show the need for these efforts to be increased, and expanded to the remainder of Sumatra.

5. The role of Sumatran zoos in Tiger conservation and trade

International captive breeding

Globally, there are five regional captive populations of Sumatran Tigers, which include the European programme, the Australasian programme, the SSP in North America, the JAZGA in Japan and the PKBSI programme in Indonesia. Combined, the total number of Sumatran Tigers in the world's zoos is about 250 (Christie, 2002). Of these, approximately 80 are in Indonesian zoos.

Sumatran zoos

There are seven main public zoos in Sumatra, including ones in Medan and Siantar in North Sumatra, Pekanbaru in Riau, Bukittinggi in West Sumatra, a mini zoo in Lahat, a zoo in Palembang and one in Bengkulu. While these zoos are improving slowly, they remain in a state of extremely poor condition.

Captive breeding in Sumatran zoos

Captive breeding of Sumatran Tigers and other endangered species appears to be high on the agenda of the zoos in Sumatra. However, it appears that only a few of these zoos are actually equipped with proper facilities and trained staff. Many of these zoos seem to be under the illusion that their mission should be to breed endangered species, regardless of the fact that they are not equipped to efficiently and practically do so. The Medan Zoo provides a perfect example of why captive breeding of Sumatran

Tigers should be discouraged in at least some of the Sumatran zoos at this time. Cubs were born at the zoo before any enclosures were built to house them and before any plans as to where they would end up were arranged. Funding to house, feed and care for these extra Tigers was, and remains, insufficient. Through no fault of their own, staff lack sufficient skills and training needed to properly care for these animals. Furthermore, veterinary supplies are severely lacking. While it is recognised that these Tigers hold genes vital to the long-term health of the world's captive population of Sumatran Tigers, proper preparations should first be made.

Zoos as rescue centres

Zoos also find themselves acting as depositories for injured or confiscated Tigers (see Box 3). These Tigers are an important source of new genetic material to contribute to the captive breeding program. However, many of the zoos in Sumatra are not set up to handle the Tigers that they already keep, let alone sudden additions. For these zoos to be able to function as rescue centres, and ultimately benefit the international community involved in the Captive Breeding Programme for Sumatran Tigers, international aid, both technical and financial, is needed.

Aside from zoos, there are currently no rescue centres set up in Sumatra to keep confiscated Tigers, although PHKA and the STCP are evaluating the establishment of a Tiger Rescue Centre. This is envisioned as a holding facility for problem Tigers, a place which will always be open for problem Tigers so that accommodation arrangements do not need to be made on a case-by-case basis when problems arise (Anon., 2002a). Currently, there are several rescue centres in Indonesia, but very few of these are able to handle animals such as Tigers, and all face financial and technical obstacles, as the zoos do. As a result, officials are sometimes reluctant to confiscate animals, as there is no place to put them. One example of such a case took place in Bali, where a sausage factory in Denpasar was found to be keeping a number of protected animals in a private collection, including three young orangutans, one Sun Bear, two Estuarine Crocodiles *Crocodylus porosus*, ten Bali Starlings *Leucopsar rothschildi* and a number of other bird species and one Sumatran Tiger. When officials were alerted to this collection by members of local NGOs, they raided the premises and confiscated only the orangutans, as this was the only species that could be sent to a well established rescue centre (although the Bali Starlings could have been sent to the Bali Starling Breeding Centre in West Bali) (WWF-ID, pers. comm. to TRAFFIC, 2002).

Zoos involved in the trade

While zoos have a significant role to play in the conservation of the Sumatran Tiger, some zoos appear to have a very negative role in Tiger conservation, as some zoos actively partake in the illegal trade of Tigers, and other endangered wildlife. In conversations with staff in a number of Sumatran zoos, it was reported that many of the species that are protected by law in Indonesia kept in these zoos were acquired illegally, from hunters or wildlife markets. Zoos are often approached by poachers and dealers who have animals to sell. According to one senior staff in a Sumatran zoo, this is the easiest way to acquire animals, as there is no paperwork involved.

The staff at a zoo in Riau stated that senior management staff from a large zoo on Java often contacted them, looking for species for their own zoo, which included Sumatran Tigers as well as Malayan Tapirs and Golden Cats. The staff at this zoo also stated that this particular Javan zoo has offered rewards for these species to local hunters in Riau and possibly elsewhere.

One dealer, based in Pekanbaru, Riau, carries out wildlife trade in both Pekanbaru and Medan (North Sumatra). Not only does he deal in many types of wildlife himself, but he is also very well connected with many of the major dealers in Indonesia and abroad. He deals in all sorts of wildlife including ivory, Tiger parts, live Tigers, live Siamang, Sun Bear parts etc. Regarding the Tiger trade in Indonesia, this individual gave the following information: Live Tiger cubs are often encountered by this individual. In 1997 and the first half of 1998, three sets of cubs, totalling six cubs were sold. According to this dealer, all the live cubs captured in Sumatra are sold to a zoo on Java. He went on to say that this zoo pays a higher price than any other zoos or private collectors for Tigers and other species.

Another source, working in the zoo in Riau, stated to TRAFFIC in October 1997, that a dealer approached the zoo and had four Tiger cubs for sale, and was asking IDR 1 000 000 each (USD 112). Around this same time the zoo in Medan was offered four cubs as well, presumably the same ones. However, neither of these two zoos purchased them. The staff at the zoo in Pekanbaru claimed that the cubs were sold for the asking price to a zoo on Java. The staff at the zoo in Pekanbaru claimed that the zoo on Java was given preference over them due to close relations with the Forestry Department.

Another zoo in North Sumatra is also alleged to purchase a number of species for their collection from dealers and wildlife markets. Staff at the zoo stated to TRAFFIC in October 1999 that a number of animals are purchased from the large bird markets in Jakarta as well as the wildlife market in Medan. This zoo makes no secret of its actions, as a "Wanted" advertisement appeared in the Analisa Newspaper (Medan) (Figure 8), stating that the zoo wanted to buy rare animals, including mouse deer, Serow, Malayan Tapir, Binturong, Clouded Leopard, Sumatran Tiger and others – dead or alive. Presumably the dead animals were wanted for the Wildlife Museum in Medan, which is under the same ownership as the Siantar Zoo. The PHKA in North Sumatra often dispose of confiscated wildlife by donating them to this zoo as well.

Education and awareness

Despite the poor conditions of the zoos in Sumatra, having many broken down facilities, inadequate housing for the animals and often having unhealthy animals on display, the number of visitors remains high. To visitors, the Sumatran Tigers are always one of the main attractions. However, very little is available in these zoos regarding education for the visitors on the subject of Tiger conservation. This is truly a wasted opportunity, as having educational material available in these locations would provide information and raise awareness of Tiger conservation to a large number of people at a low cost. Currently, many of these zoos treat the Tigers as circus-like attractions with members of staff observed harassing the Tigers for the entertainment of the crowds at various zoos during this survey.

Box 3. A Tiger called Tele

In February 1997, a team of three people, including the first author of this report, left from Medan with a vehicle offered by the Leuser Development Programme. Information regarding the trapped tiger was far from detailed and the condition of the animal was not known. The basic plan was to get the tiger and move it, after the veterinarians had examined it, to the Gunung Leuser National Park. However, upon arrival, it was found that this animal would not be able to be released due to multiple wounds. The tiger's tail was pinched in the door of the trap and had already become infected. Furthermore, after tranquilising it and examining it closely, it was found to be missing all but two digits on one forepaw and all of the digits on the other, as a result of snaring. Further examination revealed a snare on the foreleg that the animal's skin had grown over completely except for a piece of wire protruding from one spot. The snare was made of the brake cable from a bicycle.

Interestingly, the village people that had captured the tiger did not want to see it destroyed, as the local police intended on doing. A few local entrepreneurs had set up a small tent and were selling soup and rice, as well as charging admission to the bus loads of villagers coming to see the trapped tiger. The Forestry Department was involved as well, but was quite undecided as to what should be done. It was finally agreed that the animal should be taken back to the Medan Zoo, for treatment. While loading the tranquilized animal into the truck, the crowd swarmed around it, pulling out its whiskers, hair and trying to pull out claws.

Finally, at the Medan Zoo, a thorough examination was made and the wire snare on its foreleg was removed. The tail, all but a short stub, was amputated as it had begun to rot. It was observed that the animal, a female, was in the later stages of its life, as the canine teeth were old and worn and two were broken off.

As the zoo did not have enough cages, the resident male was placed in a temporary cage and the female in his cage. However, due to the lack of cages, this was only until the female recovered and began to adapt to the new surroundings. Later the male was introduced into the same enclosure by the staff of the zoo. According to the zoo staff, pleas were made to international zoos as well as to the Sumatran Tiger Breeding Programme for funds to build a new enclosure, but none came. As a result, the female became pregnant and gave birth to three cubs – a male and two females in December 1997. The male was again moved to a small temporary holding cage. Due to poor conditions in the cages, the male cub died. The two surviving female cubs were registered with the Sumatran Tiger Captive Breeding Programme.

When the cubs reached sub-adult age, they were separated from the female. Now the cage situation was such that the male was in the temporary holding cage, the female in one half and the cubs in the other of the cage (the cage was initially split into two to facilitate cleaning). As this arrangement did not allow for the cages to be cleaned, the female was again put in the same cage as the male. She soon gave birth, this time to a lone male. At the time of writing, this male has not yet been registered with the programme.



Credit: Nolan Magnus/TRAFFIC Southeast Asia

A Sumatran Tiger Tele, showing badly wounded front paws. The paws were wounded when the animal was caught in snares. As a result, this tiger turned to small domestic livestock. It was caught and placed in the Medan Zoo in North Sumatra.

6. Conclusions

The Sumatran Tiger is listed as Critically Endangered, the highest category of threat, on the IUCN 2003 Red List of Threatened Animals (Anon., 2003a). The total population was most recently estimated at just 400-500 Sumatran Tigers (Seidensticker *et al.*, 1999). Habitat for Tigers has been reduced by logging and settlement to approximately 130 000 km², with only about 42 000 km² protected as some form of conservation area (Wikramanayake *et al.*, 1998). Loss of habitat remains a significant threat to Tigers. Indonesian Forestry officials acknowledge that in many parts of Sumatra, illegal timber harvesting and conversion of land for agriculture and plantations are out of control (Paddock, 2004). In one critically important Tiger conservation area, Bukit Barisan Selatan National Park, which has an estimated 40-43 Tigers (O'Brien *et al.*, 2003), researchers estimate that if current rates of loss continue by 2010 illegal logging will have nearly eliminated all the habitat for Tigers (Kinnaird *et al.*, 2003).

Since the early 1990s, poaching of Tigers for their bones, used in a variety of traditional Asian medicine systems, has been considered the leading threat to Tigers (Mills and Jackson, 1994). Indonesia was singled out by South Korean Customs import records as being a major supplier of Tiger bone, exporting an astonishing 3720 kg from 1975-1992. This trade was in violation of the CITES, which Indonesia became Party to in 1979, and indeed the Indonesian government has no official record of these exports. During the 1990s, the international conservation community and the Parties to CITES greatly increased efforts to conserve wild Tiger populations and eliminate domestic markets for Tiger bone in Asian countries and elsewhere in the world. A review of the situation by TRAFFIC (Nowell, 2000) found that a good deal of progress had been made. However, Indonesia was singled out as a Tiger range state where trade in Tiger bone and other Tiger products continued in a fairly open manner. TRAFFIC thus organized this comprehensive survey of Tiger poaching and trade in Sumatra to document the current extent of the problem and provide the necessary information for law enforcement authorities to act upon.

Despite Sumatran Tigers being fully protected by law, with tough provisions for imprisonment and steep fines, as well as increased effort in Tiger conservation and building law enforcement and anti-poaching capacity, this survey demonstrates the existence of a substantial market for Tiger parts and products in Sumatra. Surveys were carried out in all eight provinces of Sumatra in 2002, with a total of 24 towns and cities being surveyed, recording 484 observations from shops and dealer sources in 2002. Only seven towns in this survey did not have Tiger parts for sale (29% of towns). In the other 17 towns, a total of 117 shops and dealers (25% of those surveyed) were found to have Tiger parts for sale. A total of 453 retail shops were surveyed and 86 (19%) were observed to have Tiger parts for sale, primarily canines and claws. Most trade in skins and bones was carried in a covert manner by a variety of dealers. Thirty-one dealer contacts were made with information on the sale of Tiger parts.

Most Tigers are killed by professional or semi-professional hunters operating individually or in small groups. In the provinces of Lampung and Riau it is estimated that each team kills an average of two Tigers annually (WWF-ID, pers. comm. to TRAFFIC, 2002). Some hunters may catch many more (TRAFFIC interview with a hunter, Box 1, and Anon., 2003d).

Sumatran Tigers are killed primarily with inexpensive and simple-to-make wire cable leg-hold snares. Some are also poisoned, particularly those killed as a result of human-Tiger conflict. Previously, it was

thought that Tigers were being poached primarily on the edges of forests in regions near villages where they come into conflict with people. However, in this survey, poachers and undercover investigators state that Tigers are hunted deep within national parks.

The wire snares which catch and kill Sumatran Tigers are sometimes intended to catch other species, and the Tiger dies by accident. Tiger prey species are also favoured as human food, and other rare species in Sumatra with commercial value are also targeted by hunters, including the Sun Bear. Information on this type of Tiger killing from investigators suggests that at least four Tigers die as “incidental killings” each year. Although not the target species, the Tiger parts frequently enter the trade.

Human-Tiger conflict has long been a serious problem in Sumatra, compared to other parts of the Tiger’s global range. Many people have been killed or wounded by Tigers. Tigers frequently prey on livestock and, as a result, villagers often seek to have problem Tigers killed, although they are encouraged to contact the Forestry department to try to have the problem animal trapped alive and removed from the area. This survey found that at least 35 Tigers were killed or removed as a result of human-Tiger conflict from 1998-2002. Based on investigators’ reports, many of these Tigers, although killed for a different reason, subsequently enter into the trade.

Although the numbers of Tigers incidentally killed or as a result of human-Tiger conflict are significant, most Tigers in Sumatra are apparently killed deliberately for commercial gain. Information collected during this survey indicates that an average of at least 51 Sumatran Tigers per year were killed or removed from 1998-2002. For at least 78% of these, the primary motive appears to be poaching for trade. These high numbers of Tigers being removed over this five year period, from an increasingly fragmented population suggest that the estimated population of 400-450 remaining Sumatran Tigers in the wild (Seidensticker, 1999) may have been low.

The annual number of Sumatran Tigers killed or removed in the early 1990s was estimated at 42 (Tilson and Traylor-Holzer, 1994). For many reasons, both this estimate and this survey’s estimate are rough and incomplete. While it is unclear whether the level of Tiger removals has increased or remained relatively steady, it is clear what the findings do not show is that Tiger poaching has declined significantly over the past decade – despite greatly increased conservation efforts and global measures to curtail trade in Tiger bone.

TRAFFIC market surveys did suggest the possibility that trade in Tiger bone has declined in Sumatra. This investigation found less Tiger bone available than a previous survey from 1995, and also lower prices for Sumatran Tiger bone than have been reported in the past (Tilson and Traylor-Holzer, 1994; Nowell, 2000). This investigation echoes the conclusion of TRAFFIC’s global review of Tiger bone trade in the late 1990s (Nowell, 2000): that despite apparent progress in curtailing markets for Tiger bone for traditional Asian medicines, there is little evidence to indicate a major decline in Tiger poaching.

In Sumatra, the existence of a substantial domestic market for Tiger skins and other parts, especially claws and canines, as trophies, charms and souvenirs, is a major factor in the continuing incidence of poaching. Retail prices for quoted for Tiger skins have remained high, at USD 1000-3000, since the 1970s.

Information from traders in Sumatra also indicates continued illegal international trade in Tiger parts out of Sumatra. Traders reported that Tiger parts are sold to Korea, Taiwan, Singapore, Japan, Malaysia, and China. Singapore and Malaysia may act as transit countries as well as consumers for Tiger parts. Tiger bone is reportedly still smuggled out of Sumatra, along with other Tiger parts.

Qualified zoos in Sumatra should support Sumatran Tiger conservation through education, outreach, captive breeding, and as holding facilities for problem animals. However, a number of zoos are reportedly involved in the illegal trade, purchasing illegally captured Tigers. One zoo in North Sumatra placed an advertisement in a local newspaper in June 2000 looking for Sumatran Tigers, and other animals, “dead or alive.”

The findings of this report show the structure and extent of the trade, which is essential in guiding future work, and in highlighting the importance of increased enforcement. Numerous sources indicate that, at best, a lack of political will and in the worst-case scenario, widespread corruption, hinders enforcement of hunting and trade bans. In the last few years there have been intensified efforts to improve law enforcement and anti-poaching capacity in Sumatra, and it is hoped that soon these efforts will begin to pay off. This report will hopefully sound the alarm regarding the crisis Sumatra’s Tigers currently face and provide vital information for government and conservation organisations to work from.

The numbers of Tigers killed and quantity of Tiger parts and products presented in this report should be treated as an under-representation, as it was not possible to survey all locations where poaching and trade may occur. Some locations, such as the majority of the province of Aceh, were not surveyed due to political unrest, and therefore information for this province should be treated as incomplete. Provinces where Tiger conservation and anti-poaching programs are active have more information about Tiger trade, but levels of poaching and trade are not necessarily higher than in places where conservation and enforcement are weaker. Information given in this report should be treated as an indicator of the severity of the trade in Tigers and Tiger parts in Sumatra, and not as a definitive summary. Recommendations are made in the next section to improve Tiger trade monitoring and enforcement.

7. Recommendations

This report suggests that 78% of the approximately 51 Sumatran Tigers killed every year are being poached for the value of their parts in Sumatran markets. The primary recommendation of this report is that Indonesian authorities must improve enforcement of their laws banning trade in Tiger parts and products. Eliminating the market for Tiger parts in Sumatra should lead to a reduction in Tiger poaching. However, this will not necessarily save the Critically Endangered Sumatran Tiger. Loss of habitat through illegal logging, and high levels of human-Tiger conflict will continue to threaten the Sumatran Tiger unless greater effort is made to control timber harvest (including illegal logging) and land conversion, and develop an effective policy to manage problem Tigers.

Recent years have seen substantial investment in building the capacity of Indonesian authorities to enforce trade bans for Tigers in Sumatra. In August 2002, a workshop on Anti-Poaching and Illegal Trade of Sumatran Tigers and their Products was held in Bogor (Anon., 2002b). More than 240 participants attended the workshop, representing a number of government agencies with law enforcement roles, as well as the NGO conservation community. A public burning of confiscated wildlife specimens was held, including several whole stuffed Tigers. The mainly Indonesian participants, representing a broad spectrum of government and NGO stakeholders, issued a number of detailed recommendations related to law enforcement, which TRAFFIC endorses and urges the international community to support implementation of. These recommendations are:

- Develop a system of information management relating to the Sumatran Tiger with a focus on aspects relating to status, conflict, poaching and trade;
- Increase capacity and focus of law enforcement bodies, in particular PPNS and Forest Police, with the goal of raising awareness and the application of conservation law;
- Develop a process of integrated law enforcement that involves all stakeholders, including local people, Forest Police/PPNS, Police, Armed Forces, Justice Department, Criminal Courts, the media and NGOs, all with the common goal of fighting against poaching and trading in Sumatran Tigers and other endangered species (rhino and elephant);
- Provide legal assistance to prosecuting teams on important cases, with the goal of setting legal precedents through proper and heavy sentencing;
- Increase the capacity and active role of NGOs and civil society in Tiger conservation, through a process of developing institutional capacity, including the working programme and capacity of the Tigers, Rhinos and Elephants Advocacy Network (see below);
- Develop an effective protocol for the monitoring of private possession and commercial possession of wildlife and their products, both living and dead, with emphasis on Tiger, rhino and elephant;
- Develop a protocol for the handling of conflict between humans and wildlife, in order to assure security of both wildlife and the existence of human communities;
- Promote and develop the welfare of local traditional people as a component of an integrated strategy of Tiger conservation;
- Develop a strategic campaign of outreach for the general public in accordance with conservation needs and identified target groups;
- Extend and expand the conservation areas available for Tigers, which can also serve to protect other wildlife species, as an effective means of conserving endangered species in isolated habitats;

- Develop mechanisms of reward and punishment for those personnel and institutions involved in conservation law enforcement.

TRAFFIC also makes the following recommendations on the basis of the findings of this report.

The Indonesian authorities should be encouraged and supported to follow through on the data presented on Tiger markets in this report and prioritize enforcement actions against retail outlets and urban dealers in Tiger products. North Sumatra is particularly highlighted as an area where trade in Tiger bone and skins is still carried out in a relatively open manner, and would provide a good starting point. In other cities and towns, trade is carried out covertly, and undercover tactics must be employed. Indonesian-NGO partnerships have proven effective in identifying traders in Tiger bone; these efforts must be backed up with more effective prosecution. The penalties for illegal Tiger trade are severe enough to serve as a strong deterrent if properly enforced.

In order to evaluate the effectiveness of increased law enforcement efforts, there must be more effective monitoring of Tiger trade and poaching. Monitoring networks in both Tiger range areas as well as in trade centres should be established. Networks already established should continue to be expanded upon. NGO-Indonesian partnerships have greatly increased their ability to monitor and collect data, but data sharing and communication between groups and different areas is poor. As recommended by the workshop on Anti-Poaching and Illegal Trade of Sumatran Tigers and their Products (August 2002), there should be a centralized database to track incidents and reports of Tiger poaching and trade. The recently created NGO consortium, the Tigers, Rhinos and Elephants Advocacy Network, should be supported in its efforts to create and manage a centralized database. TRAFFIC's expertise on such databases and experience in other Tiger range states should be contributed to the effort.

Other Asian Tiger range states, including Thailand and Cambodia, have successfully converted Tiger poachers into wildlife rangers. The Sumatran conservation community should consider adopting this model, particularly in North Sumatra and Aceh. Since Tiger poachers are motivated primarily by commercial gain, providing them with a decent living wage should remove their incentive to poach. Not only does this directly reduce the poaching threat to Tigers, but it also allows conservationists to make use of these men's knowledge of local Tiger populations.

Funding should be found, possibly from the international zoological body, to establish and implement education and awareness programmes within each Sumatran zoo. Local staff should be fully trained and initially funded to carry out this work. Given the conditions at these zoos and the excellent opportunity to reach vast numbers of people, this should be looked at as the highest priority for the zoos' role in Tiger conservation. Funding for such programmes should also provide for the design and creation of education and awareness materials, such as children's books, booklets, posters etc. The Tiger, one of the most popular animals in the zoos amongst the public, should be used as a 'flagship' in these programmes.

Zoos should become more transparent in their acquiring of, breeding and exchanges of Tigers. Precautionary measures, such as strict guidelines and monitoring should be put into place by the authorities to ensure that zoos are not involved in the illegal trade of Tigers.

The role of Sumatran zoos in any breeding programmes should be clarified and carried out in a responsible manner, so as to ensure the animals are well cared for and are a benefit to the global Sumatran Tiger captive breeding project. If the zoos are unable to provide quality care for the Tigers, or are not contributing to the conservation of the Tigers, then breeding of the species should be discouraged. Funding should be provided to assist these zoos in improving the conditions of the enclosures of the Tigers and all the species kept.

References

- Anon., 1994. Indonesian Sumatran Tiger Conservation Strategy. Directorate General of Forest Protection and Nature Conservation, Republic of Indonesia.
<<http://www.5tigers.org/Research/Conferences/indonesia/ConsStrat/sumcon.htm>>, downloaded 8 January 2004.
- Anon., 1997. Songbirds choked by smog. The Sun newspaper, October 6.
- Anon., 2002a. Progress report, July-December 2002. Sumatran Tiger Conservation Program (STCP). Downloaded 8 January 2004 from <http://www.5tigers.org/Research/sumatran/indonesia/SCTP2002July-Dec.pdf>
- Anon., 2002b. Report on tiger, elephant and rhino law enforcement workshop. Cipayung, Bogor, Indonesia, August 2002. Sumatran Tiger Conservation Program (STCP). Downloaded 1 January 2004 from <http://www.5tigers.org/Research/sumatran/indonesia/LawEnforcementWorkshop2002.pdf>
- Anon., 2002c. *Survey, Assessment and Conservation of the Sumatran Tiger (Panthera tigris sumatrae) in Bukit Barisan Selatan National Park – III*. Final report to the Exxon/Mobil Save the Tiger Fund. Wildlife Conservation Society (WCS). Downloaded 1 January 2004 from http://www.5tigers.org/STF/Reports/WCS/Indonesia/WCS_BBSNP_2000.pdf
- Anon., 2002d. Tiger kills two loggers. Antara news agency, downloaded from <www.laksamana.net> 20 January 2004.
- Anon., 2003a. *2003 IUCN Red List of Threatened Species*. IUCN Red List. < <http://www.redlist.org>>.
- Anon., 2003b. *Survey, Assessment and Conservation of the Sumatran Tiger (Panthera tigris sumatrae) in Bukit Barisan Selatan National Park – IV*. Final report to the Exxon/Mobil Save the Tiger Fund. Wildlife Conservation Society (WCS). Downloaded 1 January 2004 from http://www.5tigers.org/STF/Reports/WCS/Indonesia/WCS_BBS_IV.pdf
- Anon., 2003c. From Data to Action: Curbing Wildlife Crimes in Sumatra, Indonesia. Unpublished interim report to 21st Century Tiger, October 2003. Wildlife Conservation Society (WCS).
- Anon., 2003d. Integrated tiger protection and monitoring in Bukit Tigapuluh National Park of Sumatra, Indonesia. Report to the Save the Tiger Fund for the period April to September 2003. Sumatran Tiger Conservation Program (STCP). Downloaded 1 January 2004 from http://www.5tigers.org/STF/Reports/STCP/BTNP_8_03.htm
- Anon., 2003e. Wild Tigers released into new reserve in Riau. Press release, The Tiger Foundation and Sumatran Tiger Trust Indonesia Program. Downloaded 8 January 2004 from < <http://www.tigertrust.info/latest/newreservepressrelease.htm>>

- Anon., 2004. Rhino Protection Units (RPU). International Rhino Foundation. Downloaded 28 January from http://www.rhinos-irf.org/irfprograms/asiaprograms/rpu_all/
- van Beek, C.G.G., 1996. Geology, Geomorphology and Climate of Gunung Leuser National Park. In: van Schaik, C. P. and Supriatna, J., (eds) 1996. *Leuser: A Sumatran Sanctuary*. Yayasan Bina Sains Hayati Indonesia, Indonesia.
- Borner, M., 1978. Status and conservation of the Sumatran tiger. *Carnivore*, 1: 97-102.
- Chan, S., 1995. Study of Tiger Bone used in Chinese Medicine in Malaysia and Singapore. TRAFFIC Southeast Asia, Selangor, Malaysia. Unpublished report.
- Christie, S., 2002. Status in Zoos: The Sumatran Tiger. Unpublished report. The Zoological Society of London.
- Cracraft, J., Feinstein, J., Vaughan, J. and K. Helm-Bychowski. 1998. Sorting out Tigers (*Panthera tigris*): mitochondrial sequences, nuclear inserts, systematics and conservation genetics. *Animal Conservation* 1: 139-150.
- Faust, T. and Tilson, R., 1994. Estimating how many Tigers are in Sumatra. In Tilson, R.L., Komar Soemarna, Widodo Ramono, Sukianto Lusli, Traylor-Holzer, K., and Seal, U.S., editors. 1994. Sumatran Tiger Report: Population and Habitat Viability Analysis. A joint endeavour of the Indonesian Forest Protection and Nature Conservation (PHPA) and the IUCN/SSC Captive Breeding Specialist Group. Downloaded 1 January 2004 from <http://www.5tigers.org/Research/Conferences/indonesia/PHVA/faust.htm>
- Franklin, N., Bastoni, Sriyanto, Dwiatmo Siswomartono, Manansang, J. and Tilson R., 1999. Last of the Indonesian Tigers: A Cause for Optimism. Pp 131-147 in Seidensticker, J., Christie, S. and Jackson, P., eds. *Riding the Tiger: Tiger Conservation in Human-Dominated Landscapes*. Cambridge University Press, Cambridge, UK.
- Franklin, N., Hasiholan, Waldemar and Gill, D.S., 2003. Tiger Protection Units in Way Kambas National Park. 5 Sept 2003 Sumatran Tiger Trust report downloaded 8 January 2004 from <http://www.tigertrust.info/latest/protectionunits.htm>
- Griffiths, M., 1992. Population Densities of Sumatran Tigers in Gunung Leuser National Park. WWF-Indonesia. In R.L. Tilson, Komar Soemarna, Widodo Ramono, Sukianto Lusli, K. Traylor-Holzer, and U.S. Seal, editors. 1994. Sumatran Tiger Report: Population and Habitat Viability Analysis. A joint endeavour of the Indonesian Forest Protection and Nature Conservation (PHPA) and the IUCN/SSC Captive Breeding Specialist Group. Downloaded 1 January 2004 from <http://www.5tigers.org/Research/Conferences/indonesia/PHVA/griffiths>.
- Griffiths, M., 1993. Management of Large Mammals (June 1991-April 1993). Final report, project ID 0084, World Wildlife Fund, Gland, Switzerland.

Hartana Alip Tantun and Martyr, D.J. 2001. Kerinci Seblat Tiger Protection Project. Report to Save the Tiger Fund on activities and progress 200-2001. Downloaded 1 January 2004 from <http://www.5tigers.org/STF/Reports/KerinciSeblat/TigerReport.pdf>

Indrawan, M., Saleh, C., Wibisono, H.T., Shepherd, C.R., Foad, N. and H.K. Chen. 1999. Trade and poaching of tiger and rhino in Indonesia: from Sumatra to Java and Bali. Unpublished report, WWF Indonesia, Jakarta.

Jackson, P. 1990. Chinese medicine threatens Asia's last tigers. *Cat News* 13: 7.

Jackson, P. and Kemf, E., 1999. *Wanted Alive! Tigers in the Wild*. WWF International, Gland, Switzerland.

Karanth, K.U. and Stith, B.M., 1999. Prey depletion as a critical determinant of tiger population viability. Pp 104-113 in Seidensticker, J., Christie, S., and Jackson, P., eds. *Riding the Tiger: Tiger Conservation in Human-Dominated Landscapes*. Cambridge University Press, Cambridge, UK.

Kenney, J.S., Smith, J.L.D., Starfield, A.M. and McDougal, C.W. 1994. The long-term effects of tiger poaching on population viability. *Conservation Biology* 9(5): 1127-1133.

Kinnaird, M.F., Sanderson, E.W., O'Brien, T.G., Wibisono, H.T. and Woolmer, G., 2003. Deforestation trends in a tropical landscape and implications for endangered large mammals. *Conserv. Biol.* 17(1): 245-257.

Kitchener, A.C. 1999. Tiger distribution, phenotypic variation and conservation issues. Pp 19-39 in Seidensticker, J., Christie, S. and Jackson, P., eds. *Riding the Tiger: Tiger Conservation in Human-Dominated Landscapes*. Cambridge University Press, Cambridge, UK.

Mainka, S. A., 1997. *Tiger Progress? The response to CITES Resolution Conf. 9.13*. TRAFFIC International, Cambridge, UK.

Mills, J. A., 1993. Tiger bone trade in South Korea. *Cat News* 19:13-16.

Mills, J. A. and Jackson, P., 1994. *Killed for a Cure: A Review of the Worldwide Trade in Tiger Bone*. TRAFFIC International, Cambridge, UK.

Nash, S. V., 1993. Sold for a song: The trade in Southeast Asian non-CITES birds. TRAFFIC International, Cambridge, UK.

Nowell, K. and Jackson, P., 1996. *Wild Cats: Status Survey and Conservation Action Plan*. IUCN, Gland, Switzerland and Cambridge, UK.

Nowell, K., 2000. *Far from a Cure: the Tiger Trade Revisited*. TRAFFIC International, Cambridge, UK.

Nowell, K., Breitenmoser, U., Breitenmoser, C. and Jackson, P., 2003a. *Panthera tigris ssp balica* . In: IUCN 2003. *2003 IUCN Red List of Threatened Species*. < <http://www.redlist.org>>. Downloaded on 8 January 2004.

Nowell, K., Breitenmoser, U., Breitenmoser, C. and Jackson, P., 2003b. *Panthera tigris ssp sondaica* . In: IUCN 2003. *2003 IUCN Red List of Threatened Species*. < <http://www.redlist.org>>. Downloaded on 8 January 2004.

Nowell, K., Breitenmoser, U., Breitenmoser, C. and P. Jackson. 2003c. *Panthera tigris ssp sumatrae* . In: IUCN 2003. *2003 IUCN Red List of Threatened Species*. < <http://www.redlist.org>>. Downloaded on 8 January 2004.

Philip J. Nyhus, Ronald Tilson, Neil Franklin, Bastoni, Sriyanto, M. Yunus, and Sumianto. 2000. Tigers, Cameras, and Satellites: Interdisciplinary efforts to map the habitat and threats to the last Sumatran tigers. Downloaded 1 January 2004 from <http://www.5tigers.org/Research/sumatran/indonesia/NyhusESRI/NyhusESRI.htm>

Nyhus, P., Sumianto and R. Tilson. 1999. The tiger-human dimension in southeast Sumatra. Pp 144-145 in J. Seidensticker, S. Christie and P. Jackson, eds. *Riding the Tiger: Tiger Conservation in Human-Dominated Landscapes*. Cambridge University Press, Cambridge, UK.

O'Brien, T. G., Kinnaird, M. F. and Wibisono, H. T. 2003. Crouching Tiger, Hidden Prey: Sumatran tiger and prey populations in a tropical forest landscape. *Animal Conservation* 6: 131-139.

Paddock, R.C. 2004. Unkindest Cuts Scar Indonesia: As illegal logging eats away at the archipelago's land, the animals whose habitat is sacrificed bite back at the hand that wields the chainsaw. *Los Angeles Times*, January 2, 2004.

Plowden, C. and Bowles, D. 1997. The illegal market in tiger parts in northern Sumatra, Indonesia. *Oryx* 31(1): 59-66.

Pocock, R.I. 1929. Tigers. *Journ. Bombay Nat. Hist. Soc.* 33: 505-541.

Pratje, P., 1998. Reintroduction of the Sumatran Orangutan. FZS-Project –NO. 1253 /98. Frankfurt Zoological Society. Germany.

Santiapillai, C. and Ramono, W., 1985. On the status of the tiger (*Panthera tigris sumatrae* Pocock 1829) in Sumatra. Unpublished report to IUCN-The World Conservation Union and the World Wildlife Fund, Gland, Switzerland

van Schaik, C. P., Monk, K. A. and Robertson, J. M. Y., 2001. Dramatic decline in orang-utan numbers in the Leuser Ecosystem, Northern Sumatra. *Oryx*, 35(1) 14-25.

Seidensticker, J., Christie, S. and P. Jackson. 1999. Preface. Pp 1-4 in J. Seidensticker, S. Christie and P. Jackson, eds. *Riding the Tiger: Tiger Conservation in Human-Dominated Landscapes*. Cambridge University Press, Cambridge, UK.

Seidensticker, J. 1986. Large carnivores and the consequences of habitat insularization: Ecology and conservation of Tigers in Indonesia and Bangladesh. In *Cats of the World: biology, Conservation and Management*, ed. S.D. Miller and D.D. Everett, Pp 1-41. Washington DC, National Wildlife Federation.

Sellar, J. *et al.* 1999. Report of the CITES Tiger Mission Technical Team. to the 42d meeting of the CITES Standing Committee, Lisbon, Portugal, 28 Sept to 1 Oct 1999, Doc. SC.42.10.4. Downloaded January 25 2004 from <http://www.cites.org/eng/cttee/standing/42/42-10-4.pdf>

Shepherd, C. R., 1996. Some notes on Wildlife Trade in the City Of Medan, North Sumatra (Unpublished notes). TRAFFIC Southeast Asia, Selangor, Malaysia. Unpublished notes.

Shepherd, C. R., 2001. Observations of Wildlife Parts for sale in Souvenir Shops in Medan, North Sumatra, Indonesia (Unpublished notes). TRAFFIC Southeast Asia, Selangor, Malaysia. Unpublished notes.

Theile, S., Laux, T., Horstmann, B. and R. Nursaid, 1997. Domestic wildlife trade in Java and Bali, Indonesia. Final Project Report. Berlin, Germany and Malang, Indonesia. (Unpublished report)

Tilson R. L., Komar Soemarna, Widodo Ramono, Sukianto Lusli, Traylor-Holzer, K., and Seal, U.S., editors. 1994. *Sumatran Tiger Report: Population and Habitat Viability Analysis*. A joint endeavour of the Indonesian Forest Protection and Nature Conservation (PHPA) and the IUCN/SSC Captive Breeding Specialist Group. Downloaded 1 January 2004 from <http://www.5tigers.org/Research/Conferences/indonesia/PHVA/intrphva.htm>

Tilson, R. and Traylor-Holzer, K. 1994. [Estimating Poaching and Removal Rates of Tigers in Sumatra](#). In R.L. Tilson, Komar Soemarna, Widodo Ramono, Sukianto Lusli, K. Traylor-Holzer, and U.S. Seal, editors. 1994. *Sumatran Tiger Report: Population and Habitat Viability Analysis*. A joint endeavour of the Indonesian Forest Protection and Nature Conservation (PHPA) and the IUCN/SSC Captive Breeding Specialist Group. Downloaded 1 January 2004 from <http://www.5tigers.org/Research/Conferences/indonesia/PHVA/tilson.htm>

Treep, L. 1973. *On the Tiger in Indonesia (with special reference to its status and conservation)*. Report no. 164, Department of Nature Conservation and Nature Management, Wageningen, The Netherlands.

Wentzel, J. *et al.*, 1999. Subspecies of tigers: molecular assessment using 'voucher specimens' of geographically traceable individuals. Pp 40-49 in J. Seidensticker, S. Christie and P. Jackson, eds. *Riding the Tiger: Tiger Conservation in Human-Dominated Landscapes*. Cambridge University Press, Cambridge, UK.

Wikramanayake, E., Dinerstein, E., Loucks, C., Loucks, C. J., (editors), 2002. *Terrestrial ecoregions of the Indo-Pacific: a conservation assessment*. Island Press. Washington DC, USA.

Wikramanayake, E.D., Dinerstein, E., Robinson, J.G., Karanth, U., Rabinowitz, A., Olson, D., Mathew, T., Prashant Hedao, Conner, M., Hemley, G. and D. Bolze. 1998. An ecology-based method for defining priorities for large mammal conservation: The Tiger as case study. *Conserv. Biol.* 12(4): 865-878.

Whitten, A. J., Damanik, S. J., Anwar, J. and Hisyam, N., 1997. *The Ecology of Sumatra*. Periplus Editions (HK) Ltd.

Yates, B.C. 2000. Recognition of tiger parts in trade. Pp 90-96 in Nowell, K., 2000. *Far from a Cure: the Tiger Trade Revisited*. TRAFFIC International, Cambridge, UK.

APPENDIX 2. Market survey results by province

Market surveys for North Sumatra

Town	Store or dealer	Product	Quantity	Price (IDR)	Price (USD)	Origin	Age	Date of observation	Source of information
Medan	precious stone shop	claw	3	-	-	Aceh, near Kotacane	2 weeks prior to observation	Feb. 1999	TRAFFIC
		canine	1	-	-	Aceh, near Kotacane	2 weeks prior to observation	Feb. 1999	TRAFFIC
		piece of skin (small)	4	-	-	Aceh, near Kotacane	2 weeks prior to observation	Feb. 1999	TRAFFIC
Medan	precious stone shop	claw	3	-	-	Kotacane, Aceh	2 weeks prior to observation	Sept. 1999	TRAFFIC
		canine	1	-	-	Kotacane, Aceh	2 weeks prior to observation	Sept. 1999	TRAFFIC
		piece of skin	-	-	-	Kotacane, Aceh	2 weeks prior to observation	Sept. 1999	TRAFFIC
Medan	wildlife dealer	live cub	3	-	-	Aceh		May-00	Medan Zoo
Medan	souvenir shop	head	1	-	-			Nov. 2000	TRAFFIC
		skull	1	-	-			Nov. 2000	TRAFFIC
		canine	2	-	-			Nov. 2000	TRAFFIC
Medan	-	live adult	1	-	-	Tapanuli Selatan, North Sumatra		Jul-01	Medan Zoo
Medan	souvenir shop	claw	1	-	-			Aug. 2001	TRAFFIC
Medan	souvenir shop	head (teeth removed)	1	-	-	Aceh		Nov. 2001	TRAFFIC
		paw (no claws)	4	-	-	Aceh	-	Nov. 2001	TRAFFIC
Medan	souvenir shop	claw	3	200 250	22.5	Aceh	2 years	Nov. 2001	TRAFFIC
Medan	souvenir shop	claw	5	-	-	-	-	Nov. 2001	TRAFFIC
Medan	souvenir and antique shop	canine	1	600 750	67.5	Aceh	old	Mar-02	TRAFFIC

Town	Store or dealer	Product	Quantity	Price (IDR)	Price (USD)	Origin	Age	Date of observation	Source of information
Medan	gold shop	canine	3	351 550	39.5	-	-	Mar-02	TRAFFIC
		bone	1 kg	600 750	67.5	-	a few years old		
Medan	gold shop	canine	2	1 802 250/pair	202.50/pair	Kotacane, Aceh	8 months	Mar-02	TRAFFIC
		skin	1	-	-	Kotacane, Aceh	4 years		
		canines	4	876 650	98.5	-	-		
Medan	precious stone shop	canine inlayed gold	1	453 900	51	-	-	Mar-02	TRAFFIC
		skin piece 12x12 cm	1	75 650	8.5	-	-		
		claw	2	1 802 250/pair	202.50/pair	-	-		
Medan	traditional Asian medicine shop	bone	small amount	-	-	-	-	Mar-02	TRAFFIC
Medan	souvenir shop	skull	1	849 950	95.5	-	-	Mar-02	TRAFFIC
		skin from forehead (10x10 cm)	1	200 250	22.5	-	-		
		skin from forehead (10x10 cm)	1	400 500	45	-	-		
		canine	2	654 150	73.5	-	-		
		claw	12	6 483 650	28.5	-	-		
Medan	Antique shop	canine	1	654 150	73.5	-	-	Mar-02	TRAFFIC
		canine	1	151 300	17	-	-		
		claw	4	66 750	7.5	-	-		
Medan	gold shop	claw	5	151 300	17	Aceh	a few years old	Apr-02	TRAFFIC
Medan	gold shop	claw (inlayed in thick piece of gold)	1	1 001 250	112.5	-	-	Apr-02	

Town	Store or dealer	Product	Quantity	Price (IDR)	Price (USD)	Origin	Age	Date of observation	Source of information
Medan	gold shop	claw	1	-	-	-	-	Apr-02	TRAFFIC
Medan	gold shop	claw (inlayed In 16.75 grams of gold)	1	1 602 000	180	-	-	Apr-02	TRAFFIC
Medan	gold shop	claw (inlayed In 16.75 grams of gold)	1	1 602 000	180	-	-	Apr-02	TRAFFIC
Medan	gold shop	claw	14	102 350	11.5	-	-	Apr-02	TRAFFIC
Medan	-	live cub	2	-	-	-	2 months	Oct. 2002	Medan Zoo
Pancur Batu	gold shop	canine	5	-	-	-	-	Mar-02	TRAFFIC
		claw	12	-	-	-	-		
		bones	1 skeleton minus head	302 600	34/kg	-	-		
		skin	1	-	-	-	-		
		skin (30x60 cm piece - poor condition)	1	-	-	-	-		
Pancur Batu	gold shop	canine	1	-	-	-	-	Mar-02	TRAFFIC
		claw	16	-	-	-	-		
Pancur Batu	gold shop	skin from forehead (12x5 cm)	1	2 002 500	225	Aceh	recent	Mar-02	TRAFFIC
		canine	1	502 850	56.5	Aceh	recent		
		bones	20 kg	-	-	Aceh	recent		
		whiskers	75	62 300	7	Aceh	recent		
Pancur Batu	gold shop	skin piece 18x18 cm	1	151 300	17	-	-	Mar-02	TRAFFIC

Town	Store or dealer	Product	Quantity	Price (IDR)	Price (USD)	Origin	Age	Date of observation	Source of information
Pancur Batu	gold shop	skin from forehead	1	2 002 500	225	Aceh	recent	Mar-02	TRAFFIC
		skin (6x4 cm)	10	200 250	22.5	Aceh	recent		
		skin (60x90 cm)	1	7 502 700	843	Aceh	recent		
		bone (legs cut in 10 cm lengths)	-	752 050	84.5	Aceh	recent		
		fat	4 bottles	600 750	67.5	Aceh	recent		
		whisker	-	253 650	28.5	Aceh	recent		
		skull (no teeth)	1	1 504 100	169	Aceh	recent		
		skull (no teeth)	1	1 504 100	169	Aceh	recent		
Belawan	gold shop	canine	3	40 050	4.5	-	-	Apr-02	TRAFFIC
		molar	2	40 050	4.5	-	-		
Binjai	gold shop	claw	10	129 050	14.5	-	-	Jun-02	TRAFFIC
Binjai	gold shop	claw	7	200 250	22.5	-	-	Jun-02	TRAFFIC
Binjai	Toko Mas Sinar	canine	1	502 850	56.5	-	15 years	Jun-02	TRAFFIC
Binjai	Dealer	canine	12	-	-	Aceh	1x 2-3 years 2x 15-20 years	Jun-02	TRAFFIC
Binjai	Dealer	canine	2	-	-	-	-	Jun-02	TRAFFIC
Tebing Tinggi	gold shop	claw	1	356 000	40			Oct-02	TRAFFIC
Tebing Tinggi	gold shop	claw	3	302 600	34	-	recent	Oct. 2002	TRAFFIC
		canine	1	-	-	-			
Tebing Tinggi	Antique shop	whisker	1	17 800	2	-		Oct. 2002	TRAFFIC

Town	Store or dealer	Product	Quantity	Price (IDR)	Price (USD)	Origin	Age	Date of observation	Source of information
Kab. Tapanuli Selatan/ Padang Sidempuan	gold shop	canine	1	-	-	-	3 years	Jul-02	TRAFFIC
Kab. Tapanuli Selatan/ Padang Sidempuan	gold shop	canine	2	-	-	-	3 years	Jul-02	TRAFFIC
Kab. Tapanuli Selatan/ Padang Sidempuan	gold shop	canine	1	-	-	-	5 years	Jul-02	TRAFFIC
Kab. Tapanuli Selatan/ Padang	gold shop	canine	-	-	-	-	recent	Jul-02	TRAFFIC
		skin	-	-	-	-	recent		
		whisker	-	-	-	-	recent		
Kab. Tapanuli Tengah Sibolga	gold shop	canine	-	-	-	-	4 years	Jul-02	TRAFFIC
		claw	-	-	-	-	4 years		
Kab. Tapanuli Tengah Sibolga	gold shop	canine	-	-	-	-	-	Jul-02	TRAFFIC

Town	Store or dealer	Product	Quantity	Price (IDR)	Price (USD)	Origin	Age	Date of observation	Source of information
		claw	-	-	-	-	-		
Kab. Tapanuli Tegah Sibolga	gold shop	canine	-	-	-	-	-	Jul-02	TRAFFIC
		claw	-	-	-	-	-		
Kab. Tapanuli Tegah Sibolga	gold shop	canine	-		-	-	-		
		claw	-	-	-	-	-		
Kab. Tapanuli Tegah Sibolga	traditional Asian medicine shop	canine	-	-	-	-	recent	Jul-02	TRAFFIC
		skin	-	-	-	-	recent		
		claw	-	-	-	-	recent		
		whisker	-	-	-	-	recent		
		skull	1	-	-	-	recent		
Kab. Tapanuli Tegah Sibolga	traditional Asian medicine shop	canine	4	-	-	-	recent	Jul-02	TRAFFIC

Town	Store or dealer	Product	Quantity	Price (IDR)	Price (USD)	Origin	Age	Date of observation	Source of information
Kab. Tapanuli Tengah Sibolga	traditional Asian medicine	canine	4	-	-	-	recent	Jul-02	TRAFFIC
		skin	-	-	-	-	recent		
		claw	-	-	-	-	recent		
		whisker	-	-	-	-	recent		
Kab. Tapanuli Tengah Sibolga	traditional Asian medicine	canine	2	-	-	-	recent	Jul-02	TRAFFIC
		skin	-	-	-	-	recent		
		claw	-	-	-	-	recent		
		whisker	-	-	-	-	recent		
Kab. Mandailing Natal	gold shop	canine	-	-	-	-	-	Jul-02	TRAFFIC
		claw	-	-	-	-	-		

Market surveys for Aceh

Town	Store or dealer	Product	Quantity	Price	Price	Origin	Age	Date of observation	Source of information
				(IDR)	(USD)				
Kabupaten Aceh Tamiang	gold shop	canine	3	-	-	-	5 years	Jul-02	TRAFFIC
Kabupaten Aceh Tamiang	gold shop	canine	1	-	-	-	recent	Jul-02	TRAFFIC
Kabupaten Aceh Tamiang	gold shop	canine	1	-	-	-	7 years	Jul-02	TRAFFIC
Kabupaten Aceh Tamiang	gold shop	canine	1	-	-	-	4 years	Jul-02	TRAFFIC
Kabupaten Aceh Timur	gold shop	canine	3	-	-	-	6 years	Jul-02	TRAFFIC

Market surveys for Riau

Town	Store or dealer	Product	Quantity	Price	Price	Origin	Age	Date of observation	Source of information
				(IDR)	(USD)				
Riau	Dealer	bones	-	200 250/kg	22.50/kg	-	-	Sept. 1998	TRAFFIC
Riau	Dealer	live cub	1	1 001 250	112.5	Lipat Kain, Riau	recent	Sept. 1998	TRAFFIC
		skin	1	200 250	22.5	Lipat Kain, Riau	-		
Pekanbaru	gold shop	canine	1	-	-	-	recent	Nov. 2002	TRAFFIC
Pekanbaru	gold shop	canine	1	-	-	-	recent	Nov. 2002	TRAFFIC
Batam	gold shop	canine	1	502 850	56.5	-	recent	Nov. 2002	TRAFFIC
Batam	gold shop	skin	1	302 600	34	-	recent	Nov. 2002	TRAFFIC
Batam	Dealer	claw	2	302 600	34	-	-	Nov. 2002	TRAFFIC

Market surveys for Riau

Town	Store or dealer	Product	Quantity	Price (IDR)	Price (USD)	Origin	Age	Date of observation	Source of information
Riau	Dealer	bones	-	200 250/kg	22.50/kg	-	-	Sept. 1998	TRAFFIC
Riau	Dealer	live cub	1	1 001 250	112.5	Lipat Kain, Riau	recent	Sept. 1998	TRAFFIC
		skin	1	200 250	22.5	Lipat Kain, Riau	-		
Pekanbaru	gold shop	canine	1	-	-	-	recent	Nov. 2002	TRAFFIC
Pekanbaru	gold shop	canine	1	-	-	-	recent	Nov. 2002	TRAFFIC
Batam	gold shop	canine	1	502 850	56.5	-	recent	Nov. 2002	TRAFFIC
Batam	gold shop	skin	1	302 600	34	-	recent	Nov. 2002	TRAFFIC
Batam	Dealer	claw	2	302 600	34	-	-	Nov. 2002	TRAFFIC

Market surveys for Sumatra

Town	Store or Dealer	Product	Quantity	Price	Price	Origin	Age	Date of observation	Source
				(IDR)	(USD)				of information
West Sumatra	hunter and dealer	skin	1	2 901 400	326	-	recent	Sept. 2001	FFI-ID, 2003
West Sumatra	Hunter	skin	1	8 503 950	955.5	-	recent	Oct. 2001	FFI-ID, 2003
West Sumatra	Hunter	skin	1	2 251 700	253	-	recent	37316	FFI-ID, 2003
West Sumatra	Hunter	bone	4.5kg	151 300	17	-	recent	37316	FFI-ID, 2003
West Sumatra	Dealer	skin	-	2 002 500	225	-	recent	37438	FFI-ID, 2003
		bone	-	-	-	-	-		
Padang	antiques Shop	canine	2	351 550	39.5	-	5 years	Oct. 2002	TRAFFIC
Bukittinggi	souvenir shop	claw	4	80 100	9	-	recent	Oct. 2002	TRAFFIC
Bukittinggi	souvenir shop	canine	6	253 650	28.5	-	recent and old	Oct. 2002	TRAFFIC
Bukittinggi	souvenir shop	canine	9	351 550-2 002 500	39.50-225	West Sumatra	-	Oct. 2002	TRAFFIC
		claw	2	-	-	West Sumatra	-		
Bukittinggi	souvenir shop	canine	6	253 650-502 850	28.50- 56.50	-	-	Oct. 2002	TRAFFIC
		piece of skin	1	-	-	-	-		
		claw	3	-	-	-	-		
Bukittinggi	souvenir sop	canine (carved)	4	400 500	45	-	old	Oct. 2002	TRAFFIC
		canine	1	502 850	56.5	-	-		

Market surveys for Jambi

Town	Store or Dealer	Product	Quantity	Price	Price	Origin	Age	Date of observation	Source
				(IDR)	(USD)				of information
Jambi	dealer	skin	1	3 502 150	393.5	-	recent	Jun-00	FFI-ID, 2003
Jambi	hunter	skin	1	6 804 050	764.5	-	recent	Jul-00	FFI-ID, 2003
Jambi	hunter	skin	1	7 204 550	809.5	-	recent	Jul-00	FFI-ID, 2003
Jambi	dealer	skin	1	3 804 750	427.5	-	recent	Sept. 2000	FFI-ID, 2003
Jambi	dealer	skin	1	4 703 650	528.5	-	recent	Sept. 2000	FFI-ID, 2003
Jambi	dealer	skin	1	4 703 650	528.5	-	recent	Sept. 2000	FFI-ID, 2003
Jambi	Hunter and dealer	bone	4	102 350	11.5	-	recent	Feb. 2002	FFI-ID, 2003
Jambi	dealer	bone	8.5	102 350	11.50/kg	-	recent	Feb. 2002	FFI-ID, 2003
Jambi	dealer	piece of skin	1	1 001 250	112.5	-	recent	Feb. 2002	FFI-ID, 2003
Jambi	hunter and poacher	skin	1	4 503 400	506	-	recent	Mar-02	FFI-ID, 2003
Jambi	dealer	skin and bone	1	3 804 750	427.5	-	recent	Jul-02	FFI-ID, 2003
Jambi	dealer	skin and bone	1	4 503 400	506	-	recent	Jul-02	FFI-ID, 2003
Jambi	dealer	full tiger skin	1	35 012 600	3934	-	recent	Nov. 2002	FFI-ID, 2003
Jambi	dealer	stuffed tiger	2	30 010 800	3372	-	two years	Nov. 2002	FFI-ID, 2003
Jambi	dealer	stuffed tiger	3	20 007 200	2248	-	recent	Nov. 2002	FFI-ID, 2003
Jambi	gold store	claw inlayed gold	1	542 900	61	-	-	Nov. 2002	FFI-ID, 2003
Jambi	gold store	claw	13	35 600	4	-	recent	Nov. 2002	FFI-ID, 2003
		claw	3	102 350	11.5	-	recent		
Jambi	gold store	claw inlayed gold	1	796 550	89.5	-	-	Nov. 2002	FFI-ID, 2003
		claw inlayed gold	1	596 300	67	-	-		
		claw inlayed gold	1	467 250	52.5	-	-		

Market surveys for Jambi

Town	Store or Dealer	Product	Quantity	Price (IDR)	Price (USD)	Origin	Age	Date of observation	Source of information
Jambi	gold store	claws inlayed gold	2	872 200	98	-	-	Nov. 2002	FFI-ID, 2003
		claw inlayed gold	1	698 650	78.5	-	-		
Jambi	gold store	claw inlayed gold	2	391 600	44	-	recent	Nov. 2002	FFI-ID, 2003
Jambi	gold store	claw	3	226 950	25.5	-	recent		
		claw	3	151 300	17	-	recent		
Jambi	gold store	claw	2	129 050	14.5	-	recent	Nov. 2002	FFI-ID, 2003
		canine	1	854 400	96	-	-		
Jambi	gold store	claw	1	302 600	34	-	recent	Nov. 2002	FFI-ID, 2003
Jambi	gold store	claw inlayed	1	200 250	22.5	-	recent	Nov. 2002	FFI-ID, 2003
		claw	12	253 650	28.5	-	recent		
		canine	1	1 802 250	202.5	-	recent		
Jambi	gold store	claw inlayed gold	1	1 250 450	140.5	-	recent	Nov. 2002	FFI-ID, 2003
		claw inlayed gold	1	453 900	51	-	recent		
Jambi	gold store	claw	1	302 600	34	-	recent	Nov. 2002	FFI-ID, 2003
Jambi	gold store	claw	2	302 600	34	-	recent	Nov. 2002	FFI-ID, 2003
Jambi	dealer	canine	1	801 000	90	-	recent	Dec. 2002	FFI-ID, 2003
Jambi	dealer	canine	1	1 504 100	169	-	recent	Dec. 2002	FFI-ID, 2003

Market surveys for Bengkulu

Town	Store or Dealer	Product	Quantity	Price	Price	Origin	Age	Date of observation	Source of information
				(IDR)	(USD)				
Bengkulu	restaurant	skin	1	10 003 600	1124	-	recent	Aug. 2001	FFI-ID, 2003
Bengkulu	restaurant	skin	2	10 003 600	1124	-	-	Aug. 2001	FFI-ID, 2003
Bengkulu	dealer	bone	2.5 kg	151 300	17/kg	-	recent	Jan. 2002	FFI-ID, 2003
Bengkulu	hunter	bone	2.5 kg	151 300	17/kg	-	recent	Feb. 2002	FFI-ID, 2003

Market surveys for South Sumatra

Town	Store or Dealer	Product	Quantity	Price	Price	Origin	Age	Date of observation	Source of information
				(IDR)	(USD)				
Bengkulu	restaurant	skin	1	10 003 600	1124	-	recent	Aug. 2001	FFI-ID, 2003
Bengkulu	restaurant	skin	2	10 003 600	1124	-	-	Aug. 2001	FFI-ID, 2003
Bengkulu	dealer	bone	2.5 kg	151 300	17/kg	-	recent	Jan. 2002	FFI-ID, 2003
Bengkulu	hunter	bone	2.5 kg	151 300	17/kg	-	recent	Feb. 2002	FFI-ID, 2003
South Sumatra	hunter	skin	1	4 501 620	505.8	-	-	2002	FFI-ID, 2003
South Sumatra	hunter	skin	1	4 501 620	505.8	-	-	2002	FFI-ID, 2003

APPENDIX. 1. Provincial records of known incidents of human-tiger conflicts in Sumatra from 1997 to 2002

Table 1. List of known human-tiger conflict incidents in North Sumatra

Date	Location	Conflict	Result	Source
1997-1998	Desa Rantau Panjang Kec. Muara Batang Gadis Kecamatan Mandailing Natal	An old tiger was seen regularly in and around the village's agricultural land at the edge of the forest.	Because of the fear and anxiety caused by the close proximity of the tiger, the villagers captured & killed it although it had not harmed them or their livestock yet.	FFI-ID-SECP Survey Team, Sept 2002
20-Nov-99	Gunung Tua Tapanuli Selatan	Further information not available	Villagers trapped a tiger because it they thought it posed a danger to them. The remains were sold to a foreigner road construction worker.	FFI-ID-SECP Survey Team, Sept 2002
21-Jan-00	Desa Napompa, Kec. Nasambilan Kab. Labuhan Batu	Sarina Harahap (9 yr) was attacked and seriously wounded by a tiger.	Then the tiger (sized: length: 190 cm, weight 250 kg) was later killed using rat poison.	FFI-ID-SECP Survey Team, Sept 2002
Nov-00	Desa Mambang, Tapanuli Selatan	A tiger was frequenting a small town in Tapanuli Selatan when it apparently attacked and injured somebody.	A team was organized by the Leuser Management Unit to capture the animal when it was decided by the Forestry Department that the animal should be moved to the Siantar Zoo or killed. It is not known what happened to this animal as the LMU team did not cat	FFI-ID-SECP Survey Team, Sept 2002
2000	Desa Sempurna, Tapanuli Selatan,	Man attacked by tiger but survived.	Tiger has not been captured	KSDA Unit I (Pak Ambar)
2000	Labuhan Batu	Disturbing villagers	Tiger was captured but no information as to what happened to it	KSDA Unit I (Pak Ambar)
2001	Labuhan Batu	Small girl was attacked but survived	Further information not available	KSDA Unit I (Pak Ambar)
23 Feb. 2002	Desa Siunggas, Tapanuli Utara	Man killed and partially eaten in plantation	Not yet captured despite continuing efforts	KSDA Unit I (Pak Ambar)
28 Feb. 2002	Desa Bulupayung, Tapanuli Selatan	Man killed and partially eaten in plantation (most likely by the same tiger as above)	Not yet captured despite continuing efforts	KSDA Unit I (Pak Ambar)

APPENDIX. 1. Provincial records of known incidents of human-tiger conflicts in Sumatra from 1997 to 2002

Table 1. List of known human-tiger conflict incidents in North Sumatra

2-Mar-02	Desa Buluh Payuh, Sipirok Tapanuli Selatan	Siregar (25 yr) was killed and partially eaten by a tiger. The village was only 5 km from Desa Sunggas (above).	Further information not available	<i>FFI-ID-SECP Survey Team, Sept 2002</i>
Oct-02	Desa Kendit Kec bahorok Langkat	Tiger preyed on four people's livestock.	The incidents were reported to TNGL.	<i>FFI-ID-SECP Survey Team, Sept 2002</i>

Table 2. List of known human-tiger conflict incidents in Aceh

Date	Location	Victim	Result	Source
1997	Manggeng – Aceh Selatan	Tiger reported to be preying on livestock.	It was subsequently trapped. Further information is/ is not available	<i>FFI-ID-SECP Survey Team, Sept 2002</i>
1999	Desa Jeuring – Lokop Aceh Timur	A tiger was reportedly attacking humans and livestock.	It was eventually poisoned.	<i>FFI-ID-SECP Survey Team, Sept 2002</i>
1999	Singkil – Aceh Singkil	A tiger was reportedly attacking livestock in the area.	The tiger was later caught and killed.	<i>FFI-ID-SECP Survey Team, Sept 2002</i>
2000	Tanah Merah, Aceh Utara	A lactating female tigers was trapped	The tiger was killed and milk was taken for	<i>FFI-ID-SECP Survey</i>

Table 3. List of known human-tiger conflict incidents in West Sumatra

Date	Location	Victim	Result	Source
Feb. 2000	Pungut Mudik area; Pungut/Rena Pematik Enclave	Reportedly killed one goat and subsequently a dog close to the Pungut Mudik village	Tiger poisoned on instructions of senior member of administration of this ICDP village.	<i>FFI-ID Tiger Progress Report 2001</i>
Jun-00	Air Dikit River TNKS	Man dragged out of his forest resting hut by legs and badly bitten before logging friends could drive animal off.	Further information not available.	<i>FFI-ID Tiger Progress Report 2001</i>
Aug. 2000	Lubuk Pinang/ Pesisir Selatan	Illegal loggers complained about the presence of a tiger and the perceived threat it posed.	Tiger shot.	<i>FFI-ID, Tiger Progress Report 2001</i>
Aug. 2000	Sungai Penuh Kerinci	Tigress with two cubs killed dog guarding farmland at forest edge. Attack took place during daylight hours.	Unknown	<i>FFI-ID, Tiger Progress Report 2001</i>
Sept. 2000	Kec Gunung Kerinci	Dog killed by tiger when tied up and left unattended over night.	Further information not available.	<i>FFI-ID, Tiger Progress Report 2001</i>
9-16 Nov. 2000	Dusun Masjid and dusun Batu Kijang; Sungai Manau Kab Merangin	3 goats, 5 chickens and one duck eaten by tiger. All incidents took place at night and not during daylight hours with animals taken from enclosures or underneath occupied houses	Following November 16 th this tiger was not seen again until it was shot January approximately 6km from this site.	<i>FFI-ID, Tiger Progress Report 2001</i>
Nov. 2000	Sarolanggun	Man bitten in the leg by a tiger while farming his land.	Tiger was hunted by the community but it escaped.	<i>FFI-ID, Tiger Progress Report 2001</i>
15 Dec. 2000	Gunung Kerinci	One dog killed	Neighbors tried to shoot tiger but failed. Dog carcass subsequently baited with but did not return to kill. Local informants advise that this tiger had previously escaped from a trap and had a rope around its forequarters and belly.	<i>FFI-ID, Tiger Progress Report 2001</i>

Table 3. List of known human-tiger conflict incidents in West Sumatra

Date	Location	Victim	Result	Source
19 Dec. 2000	Danau Kerinci	While out hunting one dog killed and eaten by tiger.	Further information not available.	<i>FFI-ID, Tiger Progress Report 2001</i>
18 March 2001	Jangkat, Merangin	One water buffalo calf killed.	Tiger likely killed, but not confirmed.	<i>FFI-ID, Tiger Progress Report 2001</i>
25 March 2001	Jangkat, Merangin	One water buffalo killed.	There was strong pressure from the community to kill this animal and despite the PHS team's work in this area it was subsequently trapped and shot. The tiger was divided up amongst certain villagers and the skin was sold.	<i>FFI-ID, Tiger Progress Report 2001</i>
Dec. 2001	Gunung Kerinci	Dog killed at the edge of farmland	Subsequently a Palembang man came to the village offering to kill this tiger although the offer was not taken up. Given the poaching activities of certain individuals in this area, the fact that this tiger is not reported to have taken other livestock may	<i>FFI-ID, Tiger Progress Report 2001</i>
July 2001-Feb. 2002	Central Kerinci area: Animal depredating dogs along a 25km (n-s) strip of farmland in central Kerinci valley area	Not fewer than 40 dogs.	Adult or young adult tiger (Batak Tiger) taking dogs in farm land up to 2.5km from forest edge. Possibly two animals (July-October) with a tiger reported shot (poacher named) in early November. Permission was requested in late February for this animal to be caught with aid of Taman Safari vet team and moved to a safe area. The tiger was shot dead, second week of March while the team was awaiting a decision from PHKA on intervention	<i>FFI-ID, 2003</i>

Table 3. List of known human-tiger conflict incidents in West Sumatra

Date	Location	Victim	Result	Source
Nov. 2001	Jembatan Dua, Sungai Penuh, Kerinci	1 goat killed	Tiger not killed.	<i>FFI-ID, 2003</i>
Feb. 2002	Sungai Asam, North Kerinci	Farmer seriously injured by tiger (believed sub adult male)	Tiger not killed.	<i>FFI-ID, 2003</i>
Feb. 2002	Talang Lindung, Sungai Penuh, Kerinci	Water buffalo attacked by female with cub. Not seriously injured	Tigers not killed.	<i>FFI-ID, 2003</i>
Mar-02	Renah Kayu Embun, Kerinci	Two dogs, one chicken	Tiger not killed.	<i>FFI-ID, 2003</i>
May-02	Nilo Dingin village, Merangin	Chickens	Patrols taken up and the tiger was chased away.	<i>FFI-ID, 2003</i>
Aug. 2002	Birun village, Sungai Manau, Merangin	Adult female with two cubs ear village	Adult female killed	<i>FFI-ID, 2003</i>
Aug. 2002	Birun village, Sungai Manau, Merangin	One goat	Two cubs: - one (female, aged six months) shot dead	<i>FFI-ID, 2003</i>
Sept. 2002	Perentak village, Sungai Manau, Merangin	One chicken	One cub: aged six months, shot dead	<i>FFI-ID, 2003</i>

Table 4. List of known human-tiger conflict incidents in Jambi

Date	Location	Victim	Result	Source
May 19 2002	Kumpeh Hulu	Two farmers killed by tiger attack	No further information available	<i>Jakarta Post June 18 2002</i>

Table 5. List of known human-tiger conflict incidents in Riau

Date	Location	Victim	Result	Source
Mid 2002	Riau Province	Five people killed by tiger attacks	In August residents launched a search for the animal. They found a young male and killed it in an act of revenge. However they did not get the right animal as another man was found dead two weeks later. Seeking help from a zoo on Java the animal was 1	<i>Reuters Nov 07 2002</i>

TRAFFIC, the wildlife trade monitoring network, works to ensure that trade in wild plants and animals is not a threat to the conservation of nature. It has offices covering most parts of the world and works in close co-operation with the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

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