

Necropsy protocol for tapir research on nutrition by Andy Beer

1. Please arrange for the necropsy to be carried out as soon as possible after death as decay sets in very quickly after body organs have ceased to function.
2. If possible please obtain photographs of the digestive tract *in situ* (with skin and ribs removed) and after removal from the abdominal cavity. Please ensure that the stomach and the hindgut are clearly visible in the latter case. Digital photographs for dispatch by e-mail would be particularly appreciated.
3. Please empty the contents of the stomach by pouring the contents into a volumetric vessel and recording the result. Please repeat for the caecum and the colon.
4. Please wash the tract free of superficial blood, and preserve it in an intact state in a 10% solution of

formalin (containers and preservative will be provided by the researcher on request).

5. If there is knowledge of impending death or euthanasia, please notify Andy Beer (contact details below) so that arrangements can be made to assist in the collection of digestive tract anatomy and histology at the time of death.

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Baird's Tapir Studbook

Change of Email Address for the Studbook Keeper – Joe Roman's email address has changed. It is now: jroman5@attglobal.net

Contributed Papers

Malayan Tapirs (*Tapirus indicus*): Far from Extinction in a Malaysian Rainforest

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Malaysia, Wildlife, and Protected Areas

Since independence in 1957, large areas of productive lowland forests in Malaysia have been converted into oil palm and rubber plantations through government agricultural development schemes. In addition to this habitat loss and fragmentation, increased demands for wild meat and high-priced body parts of some wild animals brought population declines of many large mammals, including elephant (*Elephas maximus*), sambar deer (*Cervus unicolor*), seladang or gaur (*Bos frontalis*), tapir (*Tapirus indicus*), Sumatran rhinoceros (*Dicerorhinus sumatrensis*), and tiger (*Panthera ti-*

gris). The Javan rhinoceros (*Rhinoceros sondaicus*) and banteng (*Bos javanicus*) are now believed to be extinct in Peninsular Malaysia. All of the above species are totally protected in Malaysia.

Peninsular Malaysia is still forested at 45%, and about 5.5% of the total land cover is strictly protected. The existing protected area system relies heavily on its only national park, Taman Negara. Established in 1938 and largely due to its inaccessibility, the park has remained intact and undisturbed for the most part. It encompasses 4,343 km², accounting for 59% of the total protected area in Peninsular Malaysia. It is not only the largest park among 13 national parks in the nation (12 other parks are in East Malaysia), but also one of the largest in Southeast Asia.

Taman Negara is part of a large contiguous tract of forest that stretches to southern Thailand. Encompassing a total of 27,469 km², this large forest tract includes 7,135 km² in five protected areas (Dinerstein *et al.*, 1997), offering the best chance for much of the endangered wildlife in Malaysia. Under the Constitution of Malaysia, land is a state matter and the State Executive Committee of each state, not the Federal Government, is the highest decision-making body concerning land-use policy. In addition to the geographical significance, Taman Negara thus represents the only

piece of land in Peninsular Malaysia that comes under direct jurisdiction of the Federal Government. Therefore, Taman Negara is a stronghold for many of the endangered species in Malaysia.



Malay tapirs (*Tapirus indicus*) captured on film by an infrared camera-trapping system in Taman Negara National Park, Malaysia.

Photo credit: University of Florida – Malaysia Tiger Project.

The UF-Malaysia Tiger Project and Tapirs

Yet, even in this most critical conservation area, ecological data on many endangered species are lacking. The UF-Malaysia Tiger Project, a joint project between University of Florida and Department of Wildlife and National Parks Peninsular Malaysia (DWNP), has been studying the ecology of tigers and their prey species in Taman Negara since 1998. Financial support for the project has been provided by the Save the Tiger Fund, a special project of the National Fish and Wildlife

Foundation created in partnership with the ExxonMobil Corporation, the World Wide Fund for Nature (WWF)-Japan, WWF-UK, the Disney Wildlife Conservation Fund, University of Florida, WWF-Netherlands, 21st Century Tiger, and Wildlife Conservation Society.

We collect all possible information (sightings, signs, photo-captures, and interviews) of all medium to large mammals, assuming that anything above 2 kg may be food for tigers. Preliminary results suggest that tapirs are among the most abundant and widespread large mammals in the sample areas (Kawanishi *et al.*, 1999). Of 3,900 wildlife photographs collected so far from three 200-km² sites, 12.7% are of tapirs, followed by 12.6% of barking deer (*Muntiacus muntjac*) and 10.2% of wild boar (*Sus scrofa*). These appear to be the three most common large mammals, next to humans (18.6%), in the area. The majority of the human photographs are of aborigines living in the park, the others are of tourists and villagers. Many photographs of tapirs were taken near or on trails leading to saltlicks, more so than barking deer or wild boar. Nevertheless, tapirs were photographed at 48% of all camera-trap locations ($n = 132$) spread out over the 600 km² sample area, whereas wild boar and barking deer were photographed at 68% and 85% (thus most widespread) of all trap locations, respectively.

Caution needs to be taken with interpretation of the number of photographs. The number reflects not only the abundance but also the activity level of animals. Furthermore, it does not consider their social system. For example, one individual tapir at a salt-lick site can expose an entire roll of film overnight, thus 36 photographs over 24 hours of trapping at that site (=1 trap night). On the other hand, one photograph of wild boar may contain 10 individual animals, whereas two individuals per photo have been the maximum group size photographed for tapirs. These factors, along with the heterogeneous capture probabilities, mean that the absolute abundance and number of photos does not have a correlation coefficient of 1.0. For tigers, which have unique stripe patterns, we use mark-recapture population models to estimate the population based on individually identified tigers on photographs (see Karanth and Nichols, 1998). A few tapirs have scars on the bodies that can be used for this purpose, but not all animals are marked. We will be looking at all images more closely when the field sampling ends in August 2001 to see if the technique suggested by Holden (1999) to identify tapirs by examining damage and injuries to the ears is applicable. Based on finding some individually identifiable animals, we can at least determine the minimum number known alive, minimum home-range size, and average daily distance tra-

velled for those animals. In addition, we should also obtain information on general activity patterns and gain some insights into the social system and reproductive patterns.

Camera-trapping and Track-counting as Monitoring Tools

Two of the objectives of this project are to establish a monitoring system and to gather baseline information for many of the endangered species, which includes tigers and tapirs, in Taman Negara for future monitoring purposes. A statistically defensible estimation of an absolute density of these large secretive mammals in rainforests is often difficult and expensive to obtain. Relative abundance indices (RAI) based on standardized data collected systematically will suffice for comparing the population trend among sites and/or over time. Although we have to assume equal capture probabilities among individual animals and species, this method is far better than counting the number of tracks or even photographs and calling it a 'population estimate'. To derive a RAI based on a number of photographs, we first define 'detection', a unit of observation, as more than one photograph of a species per trap night per camera-trap location. This does not eliminate, but minimizes the effect of the activity level in the number of photographs and standardizes the analytical procedure among studies. Basically an RAI based on camera-trapping data is a ratio of detection over total trapping efforts. Furthermore, we have devised a technique to incorporate results from track-count surveys into results from camera-trapping to derive a combined RAI as a more robust and easy-to-apply measure of abundance (see Kawanishi *et al.* 1999 for more details). Using this method, DWNP can monitor the trend of wildlife abundance throughout Malaysia.

The DWNP wildlife database, the clearing house for data from all inventories and wildlife studies carried out by DWNP staff, also suggest that tapirs are relatively abundant in many types of forest throughout Peninsular Malaysia, even in peat swamps.

Tapirs as Food for Humans

Why are tapirs so abundant? Cultural values of wildlife vary considerably in this multi-racial country, comprised of 50% Malays, 33% Chinese, 9% Indians, and 8% other minorities, including aborigines. Due to their religious beliefs, the Malays do not eat tapirs. Unlike the situation in Sumatra (Martyr and Holden, 2000), we are not aware of a regular market for tapir meat in the Chinese community in Malaysia especially when wild

boar meat is plentiful. Tapir are a totally protected species and fines of up to RM 5,000 (USD 1,300) and/or five years in jail may be levied against an offender while wild boar is a protected game animal, meaning that one can obtain a license to hunt boar throughout the year. So far, DWNP Law Enforcement Division has filed only one case of a tapir poacher who possessed a severed tapir head after the flesh was cooked and served in his restaurant in 1997. Intriguingly, many Chinese Malaysians are superstitious about this peculiar animal. In China's national language Mandarin, the tapir is written and pronounced as 'Mo'. The character is the same but is pronounced as 'Baku' among Japanese who think tapirs are comical cute animals that eat people's bad dreams while sleeping. It is a sort of imaginary character. The Chinese Malaysians, however, more commonly use another word, 'Si-bu-xiang' for tapirs. A direct translation of this word is 'Four-no-images/objects', meaning 'four images of no animal' or 'four images and nothing is like it'.

In mainland China, the Chinese use this word 'Si-bu-xiang' for the Père David's deer or Mi-lu (*Elaphurus davidianus*), a peculiar animal that became extinct in the wild 1800 years ago and has been reintroduced recently into its former range (Corbet and Hill, 1992). The Chinese superstitiously believe that Mi-lu is a mix of horse for its face, deer for its antlers, cow for its hooves, and donkey for its tail. Strange, yet clearly a deer, Mi-lu has been consumed as food and ingredients for traditional Chinese medicine. The Chinese migrated to Malay Peninsula in the early 15th century, saw the tapir, and called it a strange 'Si-bu-xiang' because it looked like a mix of a horse for its face, rhino for its hooves, elephant for its nose, and pig for its nostrils and general body shape. Yet it is nothing like deer, nothing like pig, no other animals resemble tapirs. Indeed, it is too strange to be consumed. No parts of tapirs are used in traditional Chinese medicine. Then why doesn't this superstition hold among Chinese in Sumatra? Unlike Chinese Malaysians, those who migrated to Thailand or Indonesia were not allowed to retain their culture until recently. Over time they lost their language and some cultural values. For example, Chinese Indonesians today have Indonesian names and speak Indonesian. Not quite Muslim they can eat pigs and not quite Chinese they eat tapirs.

We do not know if rural Indians in Malaysia hunt tapirs. We have never heard of tapir curry. Interviews with aborigines reveal that tapir meat is not palatable and that the meat or other body parts have little or no market value. Lastly, in Malaysia tapirs are not the major culprits for raiding cash crops, therefore they are not subject of retaliation by villagers.

Tapirs as Food for Tigers

The aspect of tapir ecology most interesting to us is their anti-predatory behaviour. We have no records of tapirs being killed by tigers. If jaguars (*Panthera onca*) prey on lowland tapirs (*T. terrestris*) (Taber *et al.*, 1997), then why not tigers on Malay tapirs? Experienced wildlife rangers in Malaysia say that tigers eat wild boar the most, then barking deer, supplemented by sambar deer and occasionally primates, mouse deer and porcupines. What about tapirs? The range countries where tiger and tapirs occur sympatrically are Malaysia, Sumatra, Thailand, and possibly southern Myanmar, Cambodia, and Vietnam. Information on either species from the latter three countries is scarce. The only tiger food habits data from this region are from Thailand (Rabinowitz 1989) and tapir was not documented as a prey for either tigers or leopards. More than half of the tiger diet in Thailand consisted of barking deer (42%) and wild boar (9%). Tigers were surviving on relatively smaller prey such as porcupines (12%) and hog badgers (9%), but did not feed on tapir, which would have been a more energetically efficient prey than any of the above. It is possible that tapir, having short hair, was not detected in the faeces. In the IUCN Status Survey and Action Plan for Tapirs, Mohd Khan (1997), the former Director General of DWNP, wrote, "Tigers (in Malaysia) have been known to kill tapirs but such cases are few in number." A researcher in Thailand observed that some tapir captured on film had deep scarring on the body and he speculated that it might be a result of escaping a predator (Lynam, 1999). According to our project veterinarian, Dr. Abraham Mathew from the National Zoo Malaysia, tapirs use their sharp incisors for intraspecific fights, especially among males, and they often leave nasty scars more frequently near the rump.

In a discussion of whether tigers can kill an adult tapir, a TSG member, Debbie Martyr, says, "...providing the alternative (deer, pig, monkeys) prey base is sufficient, I don't see why tiger should actively seek out a large adult tapir. ...like most cats, they prefer easy prey where possible" (Holden and Martyr, 1998). The largest terrestrial obligatory predator has evolved to take down the largest prey possible. In India where tigers have been studied for almost four decades, tigers are known to selectively kill larger prey: gaur, sambar and adult male chital. An average adult male gaur weighs 5 times as much as a male tiger (Karanth and Sunquist, 1995). In India and Nepal, when tigers have a choice, they go for larger prey. Coincidentally, large male tapir are about 5 times the weight of male

tigers in Malaysia. By default, tigers should select tapirs.

Furthermore, tigers are excellent swimmers. In India, a tiger will sometimes chase deer into water for an easy kill. The tapirs' ability to dive into water as defence behaviour against predation by large cats, postulated in *Tapir Conservation* (1997, vol. 7 p 2), is debatable. The Malay tapir's obscure coloration and extra thick skin around the neck and nape suggest that tapirs, too, might have evolved to fend off the predators by protecting its vital region. In our study sites, where gaur and sambar are rare, it is mysterious that tapir, the next largest possible prey for tigers, are as abundant as wild boar and barking deer in some places. Little is known about tiger predatory behaviour in tropical evergreen rainforests. The question of tapir as food for tigers remains an enigma at least until a dietary analysis of tiger faeces collected in this study is completed.

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Recent Observations of Melanistic Tapirs in Peninsular Malaysia

By Mr. Mohd. Azlan J.

Two melanistic or black tapirs (*Tapirus indicus spp brevetianus*) were recorded on two occasions in Jerangau Forest Reserve, Ulu Terengganu. Both of these records were made by infrared cameras set up to study tiger presence and movement. The first record was made on 9th July, 2000 at 19:44hrs at N 4^o 54.17; E 103^o 08.24. This lowland forest was logged over 30 years ago. Only the back half of the animal was recorded, but this was sufficient to show the all black colouring of the tapir (Fig. 1).

Fig. 1. All black Malay tapir recorded by an infrared camera in Jerangau Forest Reserve, Ulu Terengganu, Malaysia.

Photo by Mhd. Azlan J.



The second record was made on 20th July, 2001: 1:13hrs at N 4^o 59.80; E 103^o 06.36 (Fig.2). This was in hill forest which was also logged 30 years ago.



Fig. 2. Picture of another specimen without the typical white colour pattern (saddle).

Photo by Mhd. Azlan J.

The only published record on black tapir was by Kuiper (1926). He described a black tapir in 1924 found in Babat, a low-lying plain of Palembang, Sumatra, Indonesia. He noted that the adult male tapir was completely black. He proposed a separate subspecies for this animal based on a presumed genetic basis for this colouration.