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Displacement of the Malayan Tapir (*Tapirus indicus*) in Peninsular Malaysia from 2006 to 2010

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Introduction

Peninsular Malaysia is the centre of the Malayan Tapir's, *Tapirus indicus*, distribution range. Tapirs are found in every forest type, including peat swamps up to lower montane forest (Holden et al., 2003; Kawanishi et al., 2002; Novarino et al., 2004; Traeholt and Sanusi, 2009; Williams, 1979). The Department of Wildlife and National Parks' (DWNP) wildlife inventories have recorded signs of tapirs in lowland areas and up to 1430m near Gunung Tahan, 1,720m at Gunung Benom in Krau Wildlife Reserve and 1730m at Gunung Bintang Hijau. Tapirs were recorded in forest fringes as well as logged disturbed forest, and occasionally passing through rubber and oil palm plantations. William and Petrides (1980) reported that tapirs were found in all states of Peninsular Malaysia, and although its current distribution range, according to states, remains similar, its effective range has been reduced to primarily the main range, Belum forest complex (including Ulu Muda), greater Taman

Negara forest complex, Pahang peat swamp forest and Endau-Rompin forest complex (DWNP, 2009).

The first report on displaced Malayan tapir in Peninsular Malaysia was published in 1991 (Zainal Zahari et al., 2001) and to date, this remains the only study on large mammal displacement in Peninsular Malaysia. It reviews displacement of Asian elephant (*Elephas maximus*), Sumatran rhinoceros (*Dicerorhinus sumatrensis*) and Malayan tapir (*Tapirus indicus*) suggesting that the trend of displacement of large mammals in Peninsular Malaysia follows a standard pattern; an initial increase followed by a slight decrease that reflects the possible effect of management intervention (Zainal Zahari et al., 2001). The study also reiterated that the displacement is related to home range size, the largest being that of the Asian elephant (*E. maximus*), followed by the Sumatran rhinoceros (*D. sumatrensis*) and, subsequently, the Malayan tapir (*T. indicus*). The estimated home range of the Malayan tapir is 13 km² (Williams, 1979, 1978).

Loss of habitat through forest clearing for agricultural purposes and illegal hunting are considered the main reasons for declining populations of large

mammals (Bradshaw *et al.*, 2009; Dermawan, 2001; Fuller *et al.*, 2004; Kinnaird *et al.*, 2003; Khan, 1997; Koh *et al.*, 2009; Novarino *et al.*, 2004). In addition, agricultural and urban development often leads to habitat fragmentations, which also contributes to population decline of many large mammals, including tapirs (Dobson *et al.*, 2006; Kawanishi *et al.*, 2002). Habitat fragmentation could lead to isolation in forest areas with insufficient food resources forcing individuals of large mammals to alter home-ranges and risk crossing highways or venturing into urban areas. Malayan tapirs have been recorded in secondary forest, palm oil and rubber plantations as well as semi-urban areas (Holden *et al.*, 2003; Novarino *et al.*, 2004; Traeholt personal observation). Secondary forest, however, is not necessarily unattractive to Malayan tapirs. As Zainal Zahari *et al.* (2001) suggests, habitat alteration caused by selective logging activities may result in an increased abundance of saplings as compared to a primary forest. In such cases, it is the physical disturbance from heavy machinery and human presence that seems to drive away tapirs rather than the location's suitability.

This study quantifies the displacement of Malayan tapir in the period from 2006-2010 based on records from the Department of Wildlife and National Parks, Malaysia.

Methodology

DWNP's database was searched for "displacement of tapirs" and "tapirs", which includes monthly reports from State offices, information on wildlife disturbance cases, local zoos and reports from the general public (phone, email, e-service, presence). "Displaced" tapirs also include individuals that were rescued or captured and subsequently relocated to zoos, the conservation centre or, for the healthy individuals, released into forested areas or wildlife reserves.

Results

The total number of displaced Malayan tapirs for the 2006-2010 period was 142 individual with the number generally increasing gradually from 2006 to 2010 (Fig.1). The highest and lowest numbers of displaced Malayan tapir was recorded in 2008 and 2006, with 39 and 15 individuals, respectively. The five states with the highest number of displaced individuals were Pahang (46), followed by Johor (32), Negeri Sembilan (21), Selangor (17) and Terengganu (15) (Fig. 2). These states also enjoys the highest degree of urbanization and agricultural development, where the original extent of forest cover has declined the most (JPSM, 2008).

Zainal Zahari *et al.* (2001) reported that Pahang

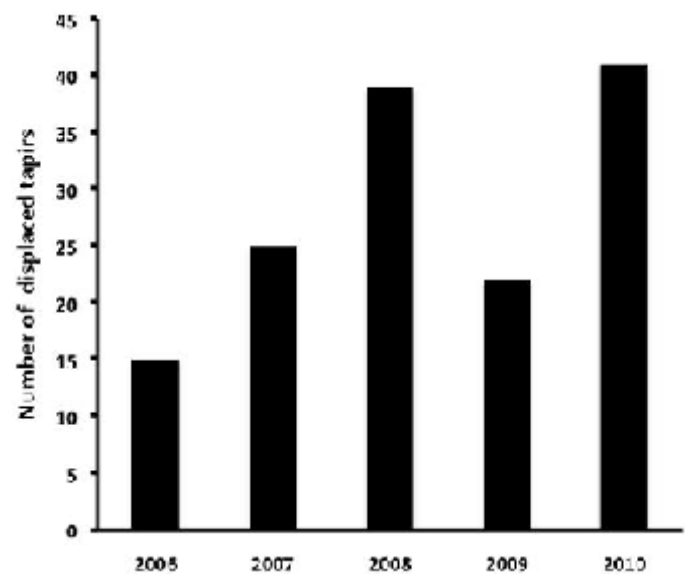


Figure 1: The number of displaced Malayan tapirs in Peninsular Malaysia from 2006 to 2010.

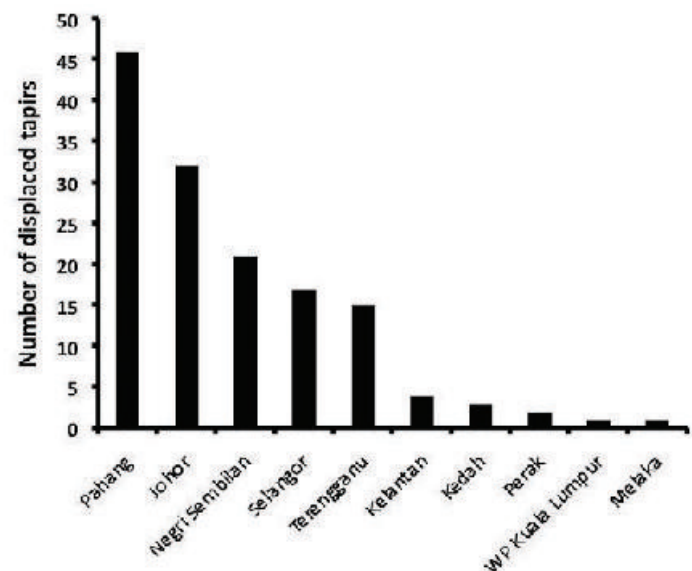


Figure 2: The number of displaced Malayan tapirs in different states of Peninsular Malaysia from 2006 to 2010.

had the highest number of displacement of large mammals over a 25 year period. The current study reveals that the highest reported number of Malayan tapir displacements still occurs in Pahang (Fig. 2). The highest displacement rate occurs in human settlement and agricultural areas with 48% and 31% of the total displacements, respectively (Fig. 3). "Human settlement" is defined as villages and traditional indigenous settlements of the *orang asli*.

Of the total of 142 recorded displacements, 95 individuals were returned to the wild, 12 were rescued but died due to injuries sustained prior to capture, 15 were already dead upon the arrival of DWNP's officers (primarily road accidents), and 20 individuals were

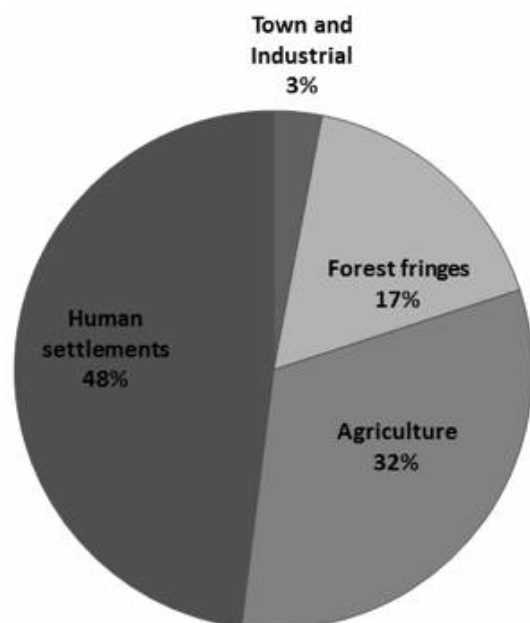


Figure 3: The percentage of displaced Malayan tapirs according to the site of occurrence.

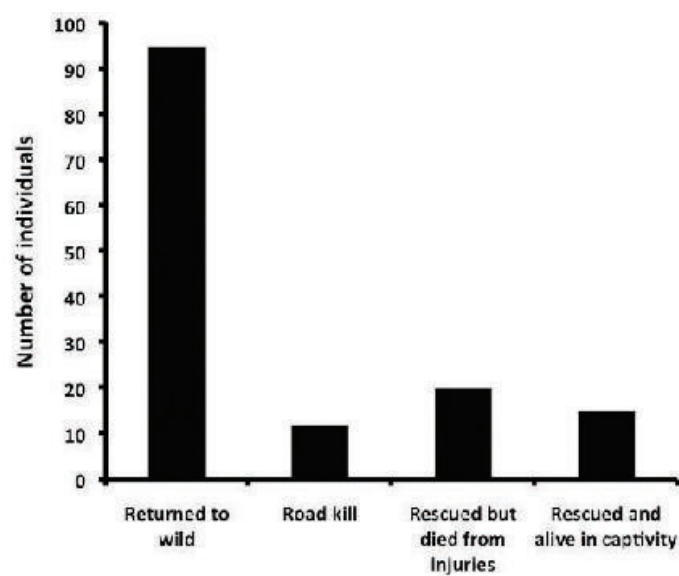


Figure 4: The actions taken and the fate of displaced Malayan tapirs in the period 2006-2010 in Peninsular Malaysia.

rescued and brought into captive facilities for treatment and rehabilitation (Fig. 4). All individuals that were rescued in healthy condition and close to natural forest habitats were released immediately again. Individuals in need of veterinarian treatment and care were brought into captivity with some undergoing a rehabilitation process and others retained as captive breeding stock. Of the 32 individuals brought into captive facilities, Sungai Dusun Wildlife Conservation Centre received 11 individuals, seven individuals were sent to Melaka Zoo, eight were released after rescue and six died a few days later as a result of injuries sustained prior to capture.

Discussion

The largest remaining natural habitat on Peninsular Malaysia is found in Pahang state. Yet, 46 (32.4%) Malayan tapir individuals were recorded as displaced in Pahang (Fig. 2), which is also the highest number in the country. Most of these records (63%) were from areas near to Pahang's state capital, Kuantan, that has experienced rapid development of new townships and industrial complexes in areas surrounding it. Similar displacement trends appear in other states with, originally, large natural habitats such as Johor, Negri Sembilan, Selangor and Terengganu that are also subject to rapid urban and industrial development (Fig. 2). At the same time, most of the displaced individuals occurred in semi-urban and agricultural areas (Fig. 3), which suggests that habitat loss and fragmentation are indeed key reasons for wildlife displacements in Peninsular Malaysia. The average annual forest loss in Malaysia during the 1990s was estimated to be modest at approximately 1.2% (FAO, 2009) and, while this loss is largely attributable to planned land-use changes in line with national development policies, the change in land-use has been dramatic enough to cause an increasing trend in large mammal displacements. There is a strong positive correlation between the percentage of agricultural land in a state and the number of displaced tapirs (Fig. 5; Pearson's $R =$

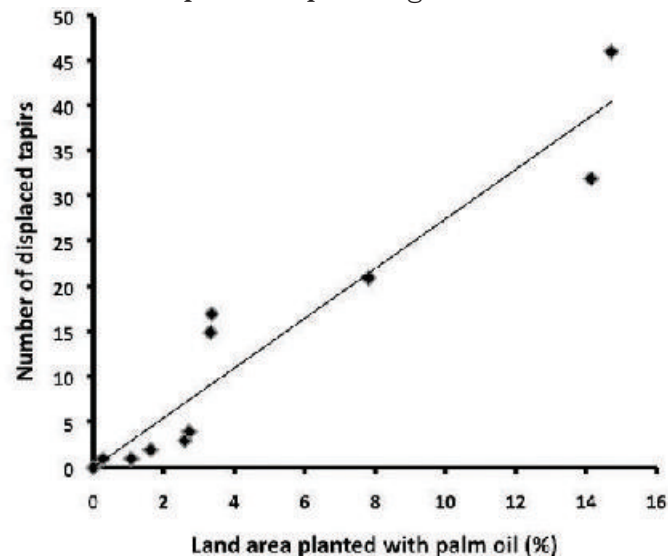


Figure 5. The correlation between agricultural development in % of land-area per state and the number of recorded tapir displacements (Pearson's $R = 0.96$). Palm oil is not necessarily the reason for tapir displacement, however, it is by far Malaysia's largest production crop in terms of hectares and competes with tapirs for the same type of habitat. The effect of habitat loss is similar irrespective of the type of agricultural or urban development that may take place in an area.



Figure 6. A wildlife viaduct constructed to mitigate the fragmentation effect of highway development in forested areas. The viaduct is designed to allow wildlife to disperse safely between forested areas on both sides of the highway and reduce the number of serious traffic accidents.

0.96). As expected, states without tapirs (Melaka, 3.2% forest; Pulau Pinang, 7.6% forest; Perlis, 13.7% forest; Federal Territory of Kuala Lumpur and Putrajaya, 9.6% forest) did not have displacement problems in the 2006-2010 period.

From 2006-2010 Perak recorded only two cases of displaced Malayan tapir, while Kedah and Kelantan recorded three and four cases respectively (Fig. 2). Whereas 18% of Perak state is considered agricultural land and only half of the state is covered by forest (JPSM, 2008), most of the forest is found in large continuous blocks of forests in the area known as the Banjaran Titiwangsa-Banjaran Bintang-Banjaran Nakawan range (Fig. 7). Albeit to a lesser extent, similar contiguous forests complexes are found in the states of Kelantan and Kedah, where displacement records are also very low (Fig. 2). In contrast to this, the forests in Pahang and Johor are becoming increasingly fragmented with most tapir habitats found as part of protected areas such as Taman Negara National Park, Krau Wildlife Reserve and Endau-Rompin state parks.

DWNP's "displacement records" do not capture all incidents of displaced animals. Naturally, some incidents are never reported whereas others may be false claims. To ensure records are reliable and usable, the details of "complainers" were recorded; including name, contact number, address and location, after which DWNP staff and the "complainers" make a site visit to verify the reported displacement. Signs of Malayan tapir (e.g. feeding signs, feces, footprints) are recorded along with location waypoint, nearest forest reserve and type of adjacent habitat. Therefore, we consider the data that forms the foundation of this study to be reliable.

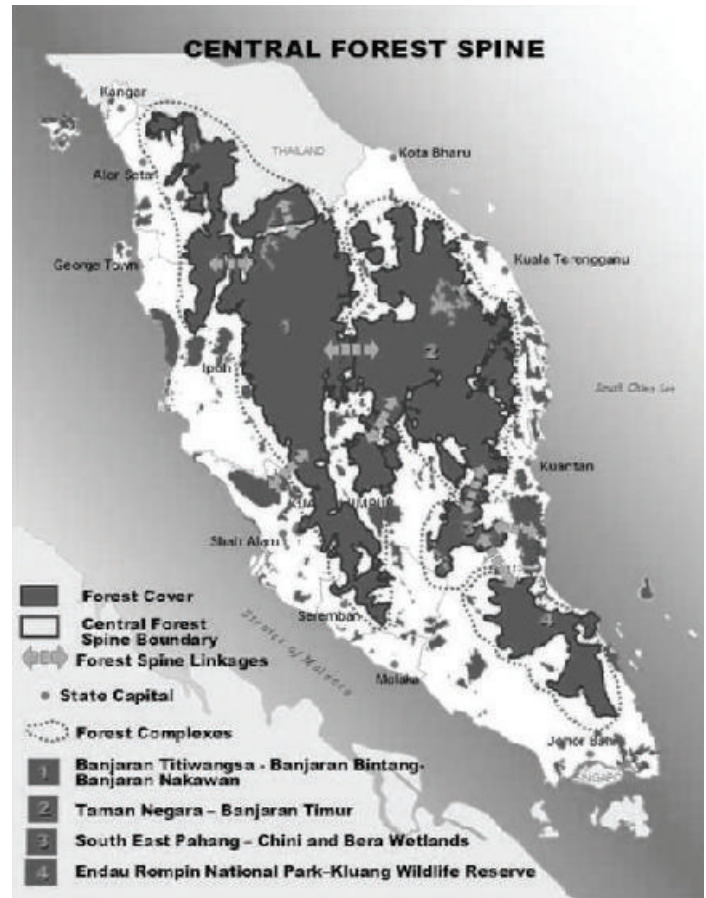


Figure 7. Peninsular Malaysia illustrated with the main forest complexes

Local communities frequently file reports to DWNP when they spot a Malayan tapir wandering through orchards or village areas. Since many villages and orchards are often found near the tapirs' natural habitats, such incidents are common. The question remains if these can be considered "displaced" individuals that warrants DWNP's intervention? With many villagers depending on home-grown crops, potential human-wildlife conflicts often necessitates DWNP's proactive interference, even if roaming tapirs are not essentially "displaced" in ecological terms.

As a response to the increasing number of displaced Malayan tapirs, DWNP has made several initiatives aimed at reducing wildlife related problems emerging from habitat loss and fragmentation. Since the displacement of tapirs and other large mammals species often leads to human-wildlife conflicts and serious road accidents, three wildlife viaducts were built in 2006 to act as safe highway crossing points for wildlife within northern forest complex (Fig. 6). Another three viaducts are being built along the Kuala Lipis - Gua Musang highway to the west of Taman Negara National Park. DWNP anticipates that these wildlife viaducts effectively reduces the negative effects of fragmentation resulting from infrastructure development, because they allow for animal dispersal that simulates natural

circumstances. Other mitigation actions consists of erecting “wildlife crossing” signboards at known wildlife crossing hotspots, setting up electric fences and conducting public awareness programmes, such as the Biodiversity Education Programme and the Local Community extension programme.

At policy level, Malaysia has formulated various plans with a potential to improve wildlife conservation and management tremendously. The National Tiger Action Plan 2008-2020 lays out specific actions for securing viable tiger populations, including its prey, in Malaysia for the next century and beyond (DWNP 2008). In 2005, the National Physical Plan (DTCP, 2005) identified the Central Forest Spine as the core forest area to conserve and to reconnect important fragmented forest complexes for better protection of the environment and biodiversity (Fig. 7). In the implementation of the Central Forest Spine plan, DWNP plays a key role.

In conclusion, the displacement of tapirs in Peninsular Malaysia increased in the 2006-2010 period, which is primarily due to habitat loss and fragmentation. However, if there is effective implementation of two key National Plans i.e. the “National Tiger Action Plan” and the “National Physical Plan” the future seems bright for Malayan tapirs. In the meantime, DWNP continues to mitigate the effect of habitat loss and fragmentation by promoting the construction of wildlife viaducts¹, carrying out translocation of displaced individuals, putting up road signs and electric fences and, finally, conducting awareness programs.

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¹ Currently, there are ongoing studies aiming to measure the effect of wildlife viaducts to evaluate if wildlife do indeed make use of this type of facility.