MALAYAN TAPIR CONSERVATION INITIATIVES AND ITS CHALLENGES IN PENINSULAR MALAYSIA

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ABSTRACT

The Malayan tapir, one of the big five mammals found in Peninsular Malaysia faces significant conservation challenges in its last remaining stronghold in Peninsular Malaysia. This paper examined the ongoing efforts to protect this unique and endangered species. It explored the key conservation initiatives undertaken by the government at multiple levels including habitat preservation, anti-poaching patrols, and public awareness campaigns. The paper also delves into the challenging obstacles these initiatives face, such as deforestation, fragmentation of tapir habitats, human-tapir conflict, and roadkills. The National Policy on Biological Diversity 2016-2025 has been developed and approved by the government to ensure the conservation of biodiversity in Malaysia is strengthened and the plan has been to align with the newly adopted Kunming-Montreal Global Biodiversity Framework 2030. The establishment of the Malayan Tapir Conservation Action Plan (MATCAP) 2021-2030 has provided direction and guidance toward the conservation of the Malayan tapir in Malaysia. Drawing on scientific research and stakeholder perspectives, the paper provides a thorough current state of Malayan tapir conservation in Peninsular Malaysia and identified critical areas that require immediate attention and action. The findings aim to inform policymakers, conservationists, and the public about the need to strengthen and expand conservation efforts to ensure the long-term survival of the iconic Malayan tapir.

Keywords: Malayan Tapir, conservation, Peninsular Malaysia, habitat fragmentation, endangered species

Received (08-November-2023); Accepted (02-July-2024); Available online (02-September-2024)

Citation: Magintan, D., Mohd Taufik, A.R., & Abdul Kadir, A.H., (2024). Malayan Tapir conservation and its challenges in Peninsular Malaysia. *Journal of Wildlife and Parks,* **39:** 1-17.

INTRODUCTION

Malaysia is fortunate to be home to the big five mammals in Peninsular Malaysia (Khan, 2014), including the Malayan tapir (*Tapirus indicus*). The Malayan tapir is easily recognizable by its white patch around the middle part of the body, black on the head and hind quarters; such unique coloration blends well with its environment. Malayan tapirs are primarily solitary except during breeding season. and are mostly active at night (Magintan *et al*., 2010) but are also often seen during the day, presumably at the time of feeding. The Malayan tapir belongs to the family of Tapiridae under the order of Perissodactyla with only one species found in Southeast Asia. Other species of tapirs are found in South America.

The Malayan tapir population found in Peninsular Malaysia and southern Thailand is considered the largest and the best studied (Traeholt *et al*., 2016). In previous studies, it was estimated that the population in Peninsular Malaysia ranges from 1300 – 1700 (Traeholt *et al*., 2016), 3500 individuals by Khan (1997) and Zainal *et al*. (2001). However, the numbers were overestimated. Based on records from camera traps, roadkill reports, public complaints, and the 1st National Tiger Survey (NTS) (2016 - 2020) in Peninsular Malaysia, the current population estimation by Department of Wildlife and National Park of Peninsular Malaysia (DWNP) was estimated at 700 – 800 individuals (Lim *et al*., 2022; DWNP, 2020).

The Malayan tapir are known as a selective browser (Khan, 1997), eating only the young leaves and growing twigs (Williams and Petrides, 1980). Khan (1997) revealed that Malayan tapirs eat more than 115 identified species of plants in Peninsular Malaysia. A study on the selection of food plants by captive Malayan tapir in a semi-wild, 30 ha-enclosure, identified 217 species of plants eaten by Malayan tapir (Simpson *et al*., 2013) which were mostly from the family of Phyllanthaceae, Myristicaceae and Sapindaceae. Based on the study by Simpson *et al*. (2013), Malayan tapir is known to feed on at least 380 species of plants.

The Malayan tapir is a globally threatened species especially in the past 36 years due to its decline in population (DWNP, 2021). In Peninsular Malaysia the distribution of the Malayan tapir has been decreasing due to habitat conversion for development and agricultural activities. Human-tapir

conflicts, roadkill, and victims of illegal poachers are among the issues faced by DWNP currently. Thus, this article is intended to review in details the previous and current challenges in the Malayan tapir conservation in Peninsular Malaysia.

THE CHALLENGES

Habitat fragmentations

With the vision of becoming a high-income and developed nation, Malaysia has undergone economic transition from focusing on the agriculture and mining sectors to manufacturing and service sector. In achieving the vision, rapid development has resulted in pressures on natural resources mainly on the biodiversity loss, degradation and fragmentation of natural habitats (KATS, 2019). The Malayan tapir has been threatened by habitat loss and forest fragmentation as stated in Kinnaird *et al*. (2003), Rayan *et al*. (2012), Clements *et al*. (2012), Magintan *et al*. (2012), Lim *et al*. (2022) and DWNP (2021).

According to the National Policy on Biological Diversity (NPBD) (2023), Malaysia's population growth is the main driver of biodiversity loss particularly for habitat and species loss due to land-use change pressures. The expansion of human population requires substantial development in residential infrastructures, new town or cities, and linear infrastructure (NRECC, 2023). The main activities leading to deforestation are agriculture, industrial activities, mining, road networks, dams, new townships, and human settlement (FDPM, 2021). All those mentioned activities have led to habitat fragmentation which is a common problem in other countries (Lim *et al*. 2022). Magintan *et al*. (2021) discussed that opening of more forest areas and construction of more road networks would increase roadkill occurrence. Likewise, Tipkantha *et al*. (2022) in their country report of the Malayan tapir conservation in Thailand mentioned that the Malayan tapir in Thailand is also threatened by habitat loss and fragmentation. Assessing habitat connectivity of Malayan tapir was one of their projects to achieve. As of 2021, the size of forested area in Peninsular Malaysia is 5,734,083 ha, which is 43.4% of the entire size of Peninsular Malaysia (FDPM, 2021). This forested area has been designated as permanent forest reserve, government land, wildlife reserves, etc. An estimated of 778,433.42 ha is under the jurisdiction of DWNP and it is bound by the implementation of the law under the department (DWNP, 2020). The existing and viable habitats for the Malayan tapir in Peninsular Malaysia have become the focus to be studied in the Malayan tapir Conservation Action Plan 2021-2030 (DWNP, 2021). According to the study by Magintan *et al*. (2021) to examine the

relationship between the cumulative decreased size of forested area in Peninsular Malaysia from 2006 to 2019 and a yearly number of roadkill occurrences involving the Malayan tapir in Peninsular Malaysia, there was a trend with a weak relationship between the two variables (Figure 1).

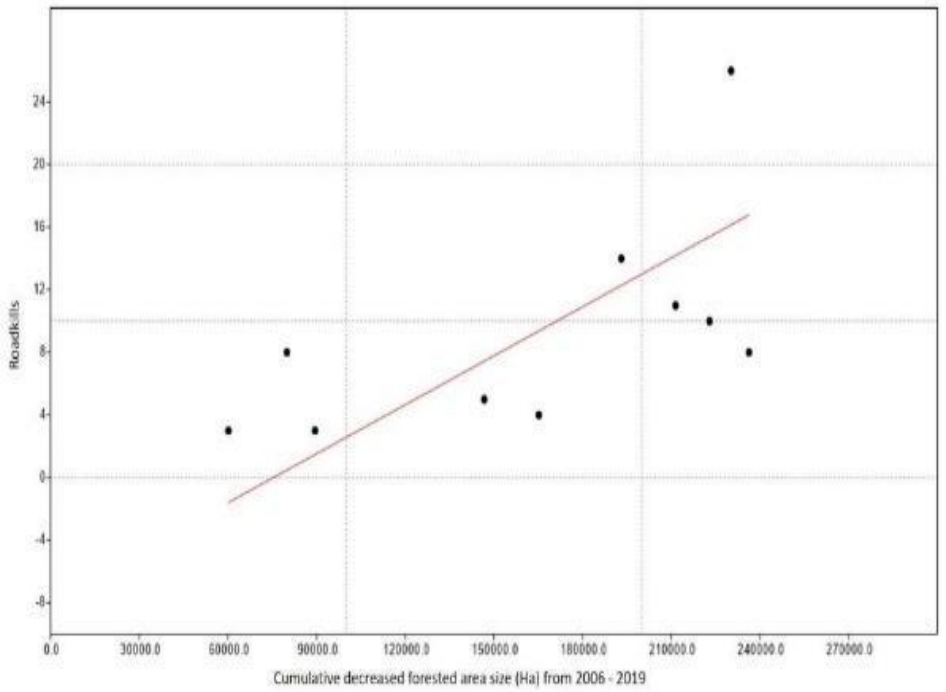

Figure 1: The number of roadkills of Malayan Tapir in Peninsular Malaysia according to the size of decreased forested area for 14 years (Magintan *et al*., 2021)

Illegal hunting

In the compendium report by DWNP (2020), a total of 61 cases of illegal hunting were reported between 2013 to 2019 (Figure 2). Snares are one of the tools usedcand is considered an illegal hunting method punishable by Malaysian law (Nur-Hazwani & Salman, 2018). In addition, since 2013 the total of encountered snares were from 44 snares in that year to 2,890 snares in May 2018 from hotspot areas (Nur-Hazwani & Salman, 2018) with at least 52 animals caught dead or alive in active snares. This number included eight Malayan tapirs. Though snares are not a primary cause of Malayan tapir population decline, Malayan tapir is one of the non-targeted victims that is often caught (DWNP, 2021). They can occasionally be rescued and found alive, although most of the time they have undergonme severe injury that

eventually leads to the death of the individual. To curb the snare associated threat to wildlife, DWNP has started to conduct yearlong anti-snare routine patrolling programs (KATS, 2019).

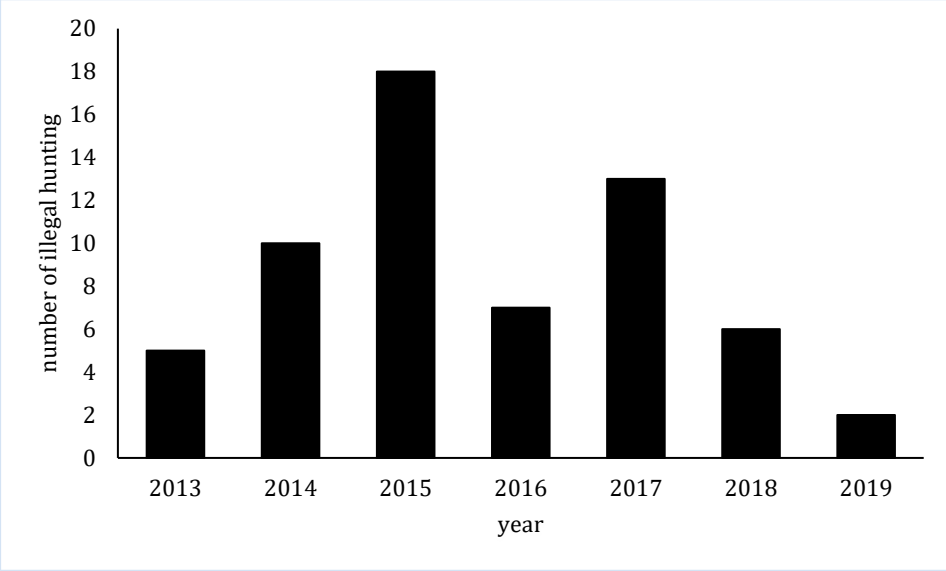

Figure 2 : The number of illegal hunting of wildlife in Peninsular Malaysia from 2013 to 2019 (DWNP, 2020)

Kawanishi (2002) mentioned that Malayan tapirs are excluded from the wild animals that are consumed by the locals due to religious belief and superstitions. Localized hunting occurs in Sumatera as well as elsewhere in its distribution range, but it was not a targeted species with no evidence of targeted hunting species particularly in Malaysia and Thailand (Traeholt *et al*. 2016). There were activities of hunting by the indigenous people adjacent to the Royal Belum State Park, in northern Perak, Peninsular Malaysia. A study by Loke *et al*. (2020) revealed that indigenous people hunt nine species of wildlife including the Malayan tapir using blowpipes and spears. Even though Malayan tapir was the fourth most preferred species by the indigenous people in the study, it was reported to be less hunted (Loke *et al*., 2020)

Roadkill

The trend of Malayan tapir roadkill incidence showed an increasing trend in past years and the yearly number of victims has doubled to tripled since 2014 (Magintan *et al*., 2021). According to KATS (2019), rapid urbanization and the accompanying increase in road networks have also placed pressure

on Malaysia's biodiversity; the proportion of the urban population has increased to 75% in 2017 from 62% in 2000 following the increase in the connectivity between urban and rural areas as reflected in the 178,140 km of roads by 2016. Construction of roads and highways on a large scale has encroached into Malayan tapir habitat (DWNP, 2021) and the cumulative decrease in forested area size was shown to be associated with roadkill of Malayan tapir in Peninsular Malaysia (Magintan *et al*., 2021).

It was reported that within six months, a total of 67 roadkill cases occurred in Peninsular Malaysia for mammals on roads spanning only eight kilometres on two highways (Hui *et al*., 2021). In an article by Magintan *et al*. (2021), construction of more highways has increased roadkill occurrences. In the same article, a total of 115 Malayan tapirs (Figure 3) were recorded as roadkill in Peninsular Malaysia from 2006 to 2019, with the highest number of roadkill occuring in 2017 (Magintan *et al*., 2021). This is due to the construction of roads and highways that have encroached into the Malayan tapir's natural habitat (DWNP, 2021).

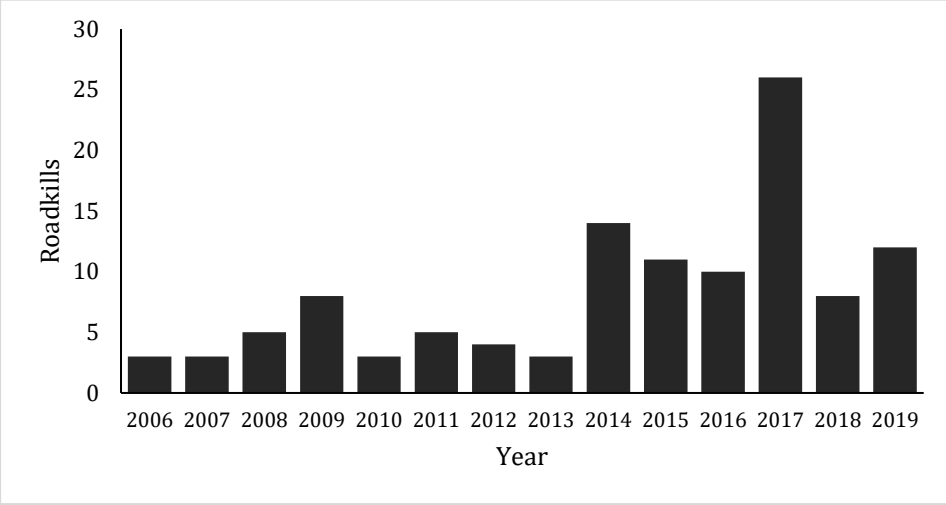

Figure 3: The number of roadkills of Malayan Tapir in Peninsular Malaysia according to year for 14 years (Magintan *et al*., 2021)

There have been efforts from the Malaysian government to reduce the roadkill by providing connection of isolated forests through the Central Forest Spine (CFS) Master Plan that introduces 37 ecological corridors within the northern and southern of Peninsular Malaysia that are known as vital linkages for the main forest complexes in CFS. In a review of this plan, the roadkill involving the Malayan Tapir was one of the criteria that had been

given attention in determining the CFS boundary (Plan Malaysia, 2022). Despite many initiatives being implemented by the government to reduce the roadkill of Malayan tapir, including the construction of viaducts in dissected forest areas, incidents of roadkills are still occurring every year. In Magintan *et al*. (2021), an increase in the number of roadkill to more than ten individuals yearly since 2014 was reported.

Human-Malayan tapir conflict

Human-Malayan tapir conflict is not new, and it occurs when wildlife, like the Malayan tapir, use the same space as humans. The first reported case of displaced Malayan tapir in Peninsular Malaysia was in the year 1991 (Zainal-Zahari *et al*., 2001). Human-Malayan tapir conflict is creating a threat to both the animal and the people. According to DWNP, Malayan tapirs are listed as one of 16 wildlife species that contribute to human-wildlife conflicts in Peninsular Malaysia (DWNP, 2020). Human population growth is one of the main factors in biodiversity loss (NRECC, 2023) that eventually leads to human-wildlife conflict. According to the Malaysian Ministry of Natural Resources, Environment and Climate Change, such growth is expected to bring more pressures on biodiversity especially on habitat and species loss due to land-use change pressures. There will be more roads and highways required by the growing human population for economic development in the rural areas and to connect with the urban areas for economic activities. Certainly, with the rapid development of roads and highways for economic activity purposes, human-wildlife conflict is expected to increase. In addition, the increase in land use to meet the demands for urbanization, food, water and energy of the growing human population will escalate human-wildlife conflicts (NRECC, 2023).

Forest degradation due to deforestation, agriculture expansion and infrastructure development are the main drivers of human-wildlife conflict and it often starts with human intolerance for crop and livestock losses (Asimopoulos, 2016). According to DWNP, referring to the records made between 2011 and September 2021, a total of 410 complaints on Malayan tapir disturbances were received by the department (DWNP, 2021) and it is a growing trend. The complaints obtained were normally due to incidences of Malayan tapirs roaming into human settlements and plantations, damaging properties and crops, and causing fear to public. The occurrence of Malayan tapirs wandering into human settlement and plantations contributed most to such conflicts (DWNP, 2021). The local communities living near or around Malayan tapir natural habitats frequently file reports to

DWNP when they spot a Malayan tapir wandering through orchards or village areas (Magintan *et al*., 2012).

THE CONSERVATION INITIATIVES

Enforcement

Protection and conservation of large mammals have been enforced by the department for many years under Protection of Wildlife Act 1972 (Act 76). In 2010, a new act was passed to replace the old Act (Act 76), namely, the Wildlife Conservation Act 2010 (Act 716) and Wildlife Conservation (Amendment) Act 2022 [Act A1646]. Under this, the Malayan tapir is listed as a "Totally Protected" species and any person who commits an offense involving hunting or keeping of any part or derivative of this animal without a special permit will be penalised. In addition, under the International Union for Conservation of Nature (IUCN) Red List, the Malayan tapir is listed as an Endangered (E) species (Traeholt *et al.*, 2016). DWNP has also established a Red List for mammals of Peninsular Malaysia which has classified Malayan tapir as an endangered species (DWNP, 2017a) based on the extent of its occurrence, area of occurrence and population size. The data, especially the extent of occurrence, was obtained as early as 1980 for comparison.

There are several initiatives by the Malaysian government to curb illegal activities in wildlife including Malayan tapir in their natural habitat. DWNP has been carrying out integrated operations (Operasi Bersepadu Khazanah) to combat issues such as encroachment, illegal logging and illegal harvesting of forest product in the forest reserves as well as wildlife hunting. As of now, the implementation of these initiatives has already entered its sixth year. To date, the result showed a positive achievement in terms of the number of cases, confiscation value, and number of offenders arrested. As an example, from 2019 to 2022, there were 291 cases with the confiscation value of RM224.08 million over four years of operation (DWNP, 2022). The department also has started a programme involving local communities called the Community Rangers. The rangers are consisting of the Malaysian Armed Forces Veterans (VAT), The Royal Malaysia Police Veteran (PDRM), communities of indigenous people (OA), local communities and civilian retirees to deal with the issues of encroachment and illegal hunting in national parks, wildlife reserves, state parks, permanent forest reserves and Ramsar sites. All these areas are the natural habitats of Malayan tapir. In 2022, a total of 901 individuals have been appointed under this programme (DWNP, 2022).

Conflict mitigation

The government of Malaysia has formulated plans to improve wildlife conservation and management, as well as to reconnect important fragmented forest complexes for better protection of the environment and biodiversity. One of the programmes is the implementation of Central Forest Spine (CFS) Masterplan. The project was to build viaducts to reduce vehicle collisions with wildlife in Peninsular Malaysia. Through the CFS Masterplan, the government has allocated money to build wildlife crossings (DTCP, 2005). The first viaduct project was at the highway connecting Kuala Berang in Terengganu and Chiku in Kelantan (Magintan *et al*., 2012). Records of animals using CFS corridors in Pahang showed that the Malayan tapir was observed to have utilised two out of three corridors that were assessed (Magintan *et al*., 2022). Clements *et al*. (2012) revealed in the preliminary assessment of the effectiveness of viaducts built along the Kuala Berang highway that nine species of mammals have used viaducts including the Malayan tapir. The construction of the viaduct is an important achievement to the department; however, further management interventions are needed (Tan *et al*., 2015) to ensure the effectiveness of the viaducts. This includes habitat restoration especially around the viaducts, establishment of artificial salt licks, and continuous wildlife monitoring of the project. Magintan *et al*. (2021) suggested that a study of the effectiveness of all viaducts should be carried out thoroughly.

The Public Works Department has constructed a total of 10 viaducts along highways to facilitate wildlife crossings (KATS, 2019). DWNP, in the year 2020, has produced a guideline for smart green linear infrastructure for safe movement of the large wild mammals in Peninsular Malaysia (Wan-Nordin *et al*., 2020). This guideline was drafted to standardize the construction of crossings using Smart, Green Infrastructure (SGI) based on species for policymakers and practitioners dealing with the development of the crossing. This approach was also upheld in the Forestry Department of Peninsular Malaysia reinforcing the importance of reconnecting fragmented forest by establishing wildlife ecological corridors (FDPM, 2021). The Forestry Policy of Peninsular Malaysia (FDPM, 2021) also has considered the issue of human-wildlife conflict, where, in its Strategy 3 of the policy, human-wildlife conflict will be mitigated by identifying and maintaining suitable forest areas for wildlife protection and intensifying the establishment of wildlife ecological corridors network. The Forestry Department of Peninsular Malaysia has included Wildlife Protection Forest as one of the forest classes specifically to preserve and protect the diversity of wildlife species via retaining and managing its habitat (FDPM, 2021).

DWNP is in the process of finalising the draft of a new plan for Malayan tiger conservation in Malaysia to replace the National Tiger Conservation Action Plan (NTCAP), 2008 – 2020. With the new conservation plan, not only will the Malayan tiger habitat be protected but also other wildlife such as the Malayan tapir. Likewise, the National Elephant Conservation Action Plan (2023 – 2030), or NECAP 2.0, aiming to sustainably conserve a healthy elephant population by framing 11 strategies, is to be achieved. One objective is to preserve and conserve elephant corridors and habitats. This objective promotes conservation not only for elephants but also other wildlife species such as the Malayan tapir (DWNP, 2023b). In addition, DWNP has placed wildlife crossing signboards at wildlife crossing hotspots to alert drivers to slow down their vehicles when passing through Malayan tapir habitat (Magintan *et al*., 2012).

STRENGTHENING EX-SITU CONSERVATION

Breeding programmes

The Malayan tapir breeding programme has been one of the vital projects to increase Malayan tapir population in this region. In support of that, the department encourages zoos with Malayan tapirs to run breeding programmes along with the Malayan tapir centre managed by DWNP. Breeding of Malayan tapirs in captivity in Malaysia started in 2004 at the Sungai Dusun Wildlife Conservation Centre (SDWCC) (Donny *et al*., 2022). Until now, this centre has served as the only operating wildlife conservation centre for the Malayan tapir in Peninsular Malaysia (DWNP, 2023a). Nevertheless, a new Malayan tapir centre is being established in Kenaboi, Negeri Sembilan to expand the breeding capacity for Malayan tapir in Peninsular Malaysia in the future (DWNP, 2023a).

It was reported that within 16 years of the breeding programme at the SDWCC, a total of 16 calves including a pair of twins (in the year 2007) were born and it was the first reported twin birth in the world for this species. This centre has successfully bred Malayan tapirs in captivity and an ongoing investigation is being conducted to understand the estrous cycle of the species in captivity for better breeding management in the future. Breeding at the SDWCC happens through natural mating inside a 10-acre semi-wild enclosure and in a night-stall or paddock (Donny *et al*., 2022). Based on the data of the SDWCC from 2004 to 2020, a total of 16 calves were produced at the centre. In 2017, a Malayan tapir release programme had been conducted to increase tapir populations in its natural habitat and to monitor the movement of the released tapirs (DWNP, 2017b). Based on DWNP's

(2023a) report, a total of three individual Malayan tapirs have been soft released to its natural habitat from 2017 to 2021.

Rehabilitation and Rescue

The department is responsible for a rescue action if an incident involving a Malayan tapir occurs. Incidents such a Malayan tapir being hit by a vehicle, or a Malayan tapir falling into a hole, requires a rescue team to be deployed to facilitate and give assistance. A veterinarian will then check the severity of the injury to determine if further treatment is needed. In the case of a Malayan tapir not requiring further treatment, the individual can be released immediately at a suitable site (Mohd-Samsudin *et al*., 2022). The function and role of a rescue centre is undertaken by the National Wildlife Rescue Centre, in Sungkai, Perak (DWNP, 2023a). The rescue centre covers wildlife rescue operations on the ground including Malayan tapir rescue. Its main function is to carry out major wildlife rescue operations such as snare-injured wildlife, wildlife trapped in holes, wildlife hit by vehicles, or wildlife kept by the public without a permit (DWNP, 2023a).

Animals with severe injuries will be treated and undergo a rehabilitation process conducted by DWNP's experienced staff which involves intensive care, rehabilitation, and training of the injured, sick, orphaned before releasing them back to their natural habitat. A release programme will be conducted when a Malayan tapir has successfully undergone the rehabilitation process. Normally, the rehabilitated Malayan tapir is released into their natural habitat followed by monitoring of the released individual for a certain number of days.

Awareness

One of the functions of DWNP is to conduct public awareness programmes for various target groups to share knowledge and understanding of biological diversity conservation in Peninsular Malaysia. Up till now, DWNP consistently organises awareness programmes at various levels, including school, universities, indigenous and local communities, organizations, and NGOs. The department has conducted courses and seminars at various locations throughout Peninsular Malaysia, sharing related information such as wildlife management, legislation and enforcement, protected areas management, and human-wildlife conflicts. As an example, in human-Malayan tapir conflicts, participants will be guided on actions that should be taken by the public whenever a Malayan tapir is encountered near their settlement or while they are on a vehicle on the road. The participants were also taught methods to improve their communication skills and deal with

wildlife disturbance complains and to professionally follow a procedure when dealing with wildlife disturbances.

The local community and indigenous people have been participating in courses conducted by DWNP related to initiatives to mitigate human-wildlife conflict. One of the most successful strategies was the electric fence system (SPEG), to deter encroachment of elephants as well as other large mammals such as the Malayan tapir. The participants were given detailed information on the installation, operation, and maintenance instructions of the electric fences. On the other hand, the department also organised programmes with school students to expose them to the functions of DWNP and the importance of wildlife biodiversity conservation. All programmes are not specifically focused on Malayan tapir but aim to create awareness and provide knowledge on the importance of protecting the environment and its biodiversity, indirectly increase awareness of the conservation of Malayan tapir (DWNP, 2021).

In the implementation of MATCAP, the department's partner, Universiti Putra Malaysia (UPM) and Malaysian Nature Society are also conducting awareness programmes for Malayan tapir conservation. Malaysian Nature Society, a non-profit organization has been consistently promoting awareness of the Malayan tapir. The organization, in collaboration with the Ministry of Education started a School Nature Club programme organising various nature-based activities to promote environmental conservation (DWNP, 2021). UPM has been supportive to increase awareness amongst students on the importance of conservation of Malayan tapir. In addition, students from the said university were strongly encouraged to conduct research on Malayan tapirs in many aspects. With their involvement, we hope that efforts to conserve Malayan tapir can be enhanced and improved.

Research

Even though Malayan tapirs have been documented since more than 200 years ago, as of now (2023) only 57 scientific articles have been published in journals and books or theses, technical reports and proceedings (DWNP, 2021) focusing on their behavioural and ecological aspects. Even though in the past five years research has been extended, it was small-scaled and isolated. There is a lot more to explore on the various aspects of the animal and to obtain more reliable data for the benefit of conservation of this species in the future. According to the Malayan tapir plan, there is a gap in research specifically on human dimensions. The specific research gap is crucial to ensure a more holistic understanding and approach towards

conservation and management of the Malayan tapir. Research on the Malayan tapir roadkill is actively being undertaken by researchers to identify the causes and the best mitigation to reduce the incidence involving the Malayan tapir (Lim *et al*., 2022).

During the Malayan tapir conservation workshop in August 2003, research (Medici *et al.*, 2003) was prioritised in many aspects including population, ecology, distribution, and habitat. Copenhagen Zoo, Denmark has been involved in Peninsular Malaysia Malayan tapir research since 2001 particularly on the ecological aspects. In the new conservation action plan, four outcomes need to be fulfilled. Firstly, the biology of the Malayan tapir needs to be well-studied. Secondly, the ecology of the Malayan tapir in the wild needs to be well documented. Thirdly, threats to the welfare and population of Malayan tapir reduced and lastly, effective awareness programme needs to be designed, implemented, and monitored (DWNP, 2021).

THE WAY FORWARD

In 2016, the National Policy on Biological Diversity 2016-2025 (NPBD) was developed and approved by the government to ensure conservation of biodiversity in Malaysia is strengthened (KATS, 2019). The plan has been updated to align with the newly adopted Kunming-Montreal Global Biodiversity Framework 2030, replacing the Aichi Biodiversity Targets 2010 – 2020. In the NPBD 2022 – 2030 plan, Malaysia is committed to conserve its biodiversity achieving the set targets by 2030. Establishment of the Malayan Tapir Conservation Action Plan (MATCAP) from 2021 – 2030 and to implement the plan. The MATCAP provides a direction and guidance towards the conservation of the Malayan tapir in Malaysia to create ecological and social conditions that allow the Malayan tapir to thrive in its natural habitat in Peninsular Malaysia. MATCAP was developed in alignment with the international and national policies, laws, and regulations in support of the Malayan tapir conservation initiative at the regional and global level. MATCAP enhances conservation efforts specifically in the field of habitat management, ex-situ management, communication, education and public awareness and research on the Malayan tapir through 16 outcomes and 49 activities for up to 2030. The outcomes of the policy will be evaluated and adapted throughout the implementation period.

ACKNOWLEDGEMENT

We, the authors, would like to thank the division at the headquarter and DWNP at the state and district levels for giving information and data regarding Malayan tapir. With the help from them, analysis and writing of this article made possible.

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