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CHAPTER 3

The state of raptors in Malaysia

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Abstract: In Malaysia, 69 raptor species have been recorded, comprising 47 diurnal and 22 nocturnal species, including two near-endemics and about 20 migratory species. Among these, one is Endangered, four are Vulnerable, and 11 are Near Threatened. Recent taxonomic revisions, such as those involving the Collared Scops-owl (*Otus lettia*), Sunda Owlet (*Taenioptynx sylvaticus*) and Eastern Barn-owl (*Tyto javanica*), have refined species classification and distribution. Over the past three decades, 79 journal articles on Malaysian raptors have focused on behaviour, species assemblages, and anthropogenic threats, with increasing emphasis in the past 15 years on nocturnal species. Citizen science initiatives have provided valuable insights into the natural history, behaviour, and ecological interactions of local residents, including the Peregrine Falcon (*Falco peregrinus ernesti*), Black-thighed Falconet (*Microhierax fringillarius*), Grey-headed Fish-Eagle (*Ichthyophaga ichthyaetus*), Crested Honey-buzzard (*Pernis ptilorhynchus torquatus*) and Rufous-bellied Eagle (*Lophotriorchis kienerii*). Most of these records are available in the Malaysian Bird Report, with earlier reports also appearing in Suara Enggang, now temporarily halted. A 2024 survey documented 39 confirmed and suspected breeding sites of the Peregrine Falcon on limestone hills in Peninsular Malaysia. Tanjung Tuan, Melaka, serves as the only long -term migration count site, and nearly full-season counts at Tanjung Tuan (northbound) and Taiping (southbound) in 2009 and 2010 revealed differing patterns among the Crested Honey-buzzard (*P. ptilorhynchus orientalis*), Black Baza (*Aviceda leuphotes*), and Chinese Sparrowhawk (*Tachyspiza soloensis*). Gaps remain in long-term monitoring and threat assessments, with most research concentrated in Peninsular Malaysia. Major threats include habitat loss, secondary poisoning from agricultural chemicals, poaching, and illegal pet trade facilitated by social media. Strengthening conservation through renewed local collaborations, such as the Raptor Study Group (halted in 2018), and regional initiatives under the Asian Raptor Research and Conservation Network (ARRCN) is crucial. Future research should prioritise integrated monitoring, migration flyway protection, habitat conservation, and citizen science to ensure the long-term survival of Malaysian raptors, particularly poorly studied species.

INTRODUCTION

Raptors are an integral component of both terrestrial and aquatic ecosystems, functioning as apex predators, mesopredators, and scavengers across different trophic levels. Through predation, raptors regulate populations of small mammals, birds, reptiles, amphibians, fish, and large invertebrates, thereby contributing to food-web stability and ecosystem regulation (Sergio *et al.* 2008). For these reasons, raptors are widely recognised as suitable indicators of ecosystem health (Sergio *et al*., 2008; McClure *et al.* 2018), in addition to serving as biological control agents in agricultural landscapes (Ravindran *et al.* 2022). Raptors also play important roles in human culture, including mythology, religion, and national identity. Updating their status and distribution is therefore essential for conservation planning and biodiversity assessment in Malaysia.

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The raptor assemblage in Malaysia is ecologically diverse, occupying various niches and comprising both habitat specialists and generalist species that vary in their tolerance to environmental disturbance. Generalist raptors are frequently associated with human-modified landscapes such as agricultural areas, plantations, rural and urban environments where they exploit predictable food resources and open foraging habitats (Ferguson-Lees and Christie 2001). These species often persist in fragmented landscapes and may increase in abundance with moderate levels of land-use change.

On the other hand, specialist raptors are closely associated with specific habitat features and ecological conditions. Forest-dependent species rely on structurally complex lowland and montane forests (Concepcion and Puan 2025), particularly pristine ones (Puan *et al.* 2015), while others are restricted to freshwater wetlands, peat swamps, mangroves, coastal ecosystems, or limestone karst formations (Kéry *et al.* 2025). Such specialisation increases vulnerability to habitat loss and degradation, which are widespread in Malaysia due to deforestation, agricultural expansion, and infrastructure development (Thiollay 1998; Wells 1999; Concepcion and Puan 2025).

Raptors of Malaysia

Located within the Sundaland biodiversity hotspot, Malaysia supports a rich assemblage of resident and migratory raptors across both Peninsular Malaysia and Malaysian Borneo (Wells 1999; Puan *et al.* 2020). This diversity reflects the country's wide range of habitats across altitudinal, landscape and local gradients as well as its position along major migratory flyways linking East Asia and Australasia, with Malaysia serving as wintering and staging sites.

To date, a total of 69 raptor species have been recorded in Malaysia, comprising 47 diurnal and 22 nocturnal species. Diurnal raptors are represented by one species in the family Pandionidae, 39 species in Accipitridae, and seven species in Falconidae, while nocturnal raptors include three species in Tytonidae and 19 species in Strigidae. This assemblage includes two near-endemic species and approximately 20 migratory species that occur seasonally during passage or wintering periods. In terms of conservation status, one species is classified as Endangered, four as Vulnerable, and 11 as Near Threatened according to the IUCN Red List of Threatened Species.

Recent taxonomic revisions have refined species limits and clarified distributional patterns of several raptor taxa in Malaysia, with important implications for conservation planning. These include the recognition of the Collared Scops-owl (*Otus lettia*) in Peninsular Malaysia, while the Sunda Scops-owl (*Otus lempiji*) is now considered its counterpart in eastern Malaysia (Borneo) (Wu and Rheindt 2023). Similarly, the Collared Owlet (*Taenioptynx brodiei*) occurring in Peninsular Malaysia has been taxonomically separated from the Sunda Owlet (*Taenioptynx sylvaticus*) in eastern Malaysia (Gwee *et al.* 2019). Revisions involving the Eastern Barn-owl (*Tyto javanica*) have also clarified its species status and regional distribution.

At higher taxonomic levels, revisions within the family Accipitridae have resulted in the reassignment of several species formerly placed in the genus *Accipiter* to the genera *Tachyspiza* and *Lophospiza* (Catanach *et al.* 2024). Likewise, eagle-owls in Malaysia previously classified under *Bubo* are now placed in the genus *Ketupa*. These taxonomic updates reflect advances in molecular, morphological, and vocalisation studies, and highlight the importance of accurate taxonomy for assessing species distributions and conservation status, as well as for guiding conservation planning in the country.

Raptor research in last 30 years

Over the past three decades, raptor research in Malaysia has grown steadily, with at least 79 peer-reviewed journal articles addressing various aspects of raptor ecology and conservation. Early studies were largely descriptive, focusing on species occurrence, behaviour, and assemblage composition, particularly in forested and coastal habitats. More recent research has increasingly examined anthropogenic threats, including habitat loss, land-use change, persecution and disturbance associated with development. Notably, there has been a marked increase in studies on nocturnal raptors over the past 15 years (Yahya *et al.* 2020), reflecting improved survey techniques and growing recognition of the conservation importance of owl species, many of which are forest-dependent and poorly understood (Puan *et al.* 2015; Atikah *et al.* 2019).

Citizen science initiatives have made substantial contributions to raptor research in Malaysia, particularly in documenting natural history, breeding behaviour, and ecological interactions of resident species. Observations submitted by birdwatchers and local raptor enthusiasts have generated valuable data on species such as the Peregrine Falcon (*Falco peregrinus ernesti*), Black-thighed Falconet (*Microhierax fringillarius*; Khoo *et al.* 2024), Grey-headed Fish-eagle (*Ichthyophaga ichthyaetus*; Lim 2015), Crested Honey-buzzard (*Pernis ptilorhynchus torquatus*; Chiu 2024), and Rufous-bellied Eagle (*Lophotriorchis kienerii*; McAfee 2025). Much of this information has been published in the Malaysian Bird Report (www.malaysianbird.report), with earlier records also published in *Suara Enggang*, which is currently inactive. These citizen-generated data have been particularly important for species that were difficult to monitor in the past.

Targeted research efforts have also yielded important conservation-relevant findings. A recent survey in 2024 documented 39 confirmed and suspected breeding sites of the Peregrine Falcon on limestone hills, which may not be occupied annually, in Peninsular Malaysia (Kéry *et al.* 2025), with the national estimate of 60 – 70 pairs and a potential decline in the West Malaysian population over the last five years. This highlights the significance of limestone karst landscapes as breeding habitats and the vulnerability of these sites to quarrying and other forms of anthropogenic development. Tanjung Tuan, Melaka, remains Malaysia's only long-term and systematic raptor migration count site. Nearly full-season counts conducted in 2009 and 2010 at both Tanjung Tuan (northbound migration; Puan *et al.* 2014) and Taiping, Perak (southbound migration; Lim *et al.* 2022) revealed distinct migration patterns among key species such as the Crested Honey-buzzard (*P. p. orientalis*), Black Baza (*Aviceda leuphotes*) and Chinese Sparrowhawk (*Tachyspiza soloensis*). Since 2016, shorter migration counts of approximately two weeks have continued annually at Tanjung Tuan. Taiping represents the second most extensively surveyed site, with sustained autumn migration counts from 2000 to 2014 and additional shorter monitoring periods in 2020 and 2021. The site supported records of 13 species during these counts, compared to 11 species recorded at Tanjung Tuan.

Other locations across Peninsular Malaysia, including Perlis State Park (Perlis), Bedong (Kedah), Lakum (Pahang), Pulau Tioman (Pahang), Bukit Kepong (Johor) and Pulau Babi Tengah (Johor), have been subject to only short-term or single-year surveys, often focusing on either spring or autumn migration seasons (Table 1). These migration counts have been exploratory in nature, aimed at identifying potential long-term survey sites. In Malaysian Borneo, short-duration surveys were conducted at selected locations, such as Kudat, Semporna and Tanjung Datu, as well as in broader areas of Sabah and western Sarawak. However, none of these efforts have been maintained over extended periods. Despite their limited duration, these surveys still provide valuable baseline data on migratory raptor movements in eastern Malaysia where long-term monitoring remains scarce.

Table 1. Raptor migration counts conducted in Malaysia (2000 – 2025).

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Perlis State Park, Perlis									↓																	
Bedong, Kedah													↓	↓												
Taiping, Perak	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						↓	↓				
Lakum, Pahang				↑																						
Pulau Tioman, Pahang													↓													
Tanjung Tuan, Melaka							↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑↓	↑	↑	↑	↑	↑	↑	↑	↑	↑
Bukit Kepong, Johor																	↓									
Pulau Babi Tengah, Johor												↓														
Semporna, Sabah														↓												
Kudat, Sabah			↓																							
Tanjung Datu, Sarawak			↓																							
Sabah & western Sarawak											↑	↓														

↑ northbound migration ↓ southbound migration

Raptor conservation

Raptors in Malaysia face a wide range of conservation challenges due to rapid environmental change and increasing human pressures. Major threats include habitat loss and degradation caused by deforestation, agricultural expansion, infrastructure development and quarrying, particularly in forested (Atikah *et al.* 2019) and limestone karst ecosystems (Kéry *et al.* 2025). Secondary poisoning from agricultural chemicals, including rodenticides and pesticides, poses additional risks to both diurnal and nocturnal raptors through bioaccumulation (Ravindran *et al.* 2022). Collisions with vehicles, feeding of unnatural food, and intentional or accidental trapping by farmers and fishermen further exacerbate these threats (Puan 2023). Poaching (Shepherd and Shepherd 2009) and the illegal pet trade, particularly for falconry or exotic pet markets, have become more prominent with the rise of online platforms and social media.

Between 2008 and 2009, Malaysian authorities uncovered the largest recorded illegal owl trade in the country, with a total of 1,519 owl carcasses seized alongside other protected wildlife during multiple raids in Johor and Pahang (Shepherd and Shepherd 2009). These seizures revealed a previously unknown trafficking network, as there had been no local signs of owl consumption or trade before. Most of the confiscated owls were Eastern Barn-owls, a species common in plantations, raising concerns that some birds may have been taken directly from nest boxes or captured using nets. The full extent of the trade remains unclear; it remains unknown whether illegal owl trade continues today or if these cases were isolated.

Effective raptor conservation in Malaysia requires a combination of species- and habitat-focused approaches. Habitat specialists, including forest-dependent and limestone -associated species (Kéry *et al.* 2025), are especially vulnerable to landscape alteration and require targeted protection of key breeding and foraging sites (McClure *et al.* 2018). At the same time, species such as the Brahminy Kite (*Haliastur indus*) demonstrate ecological flexibility, occurring in coastal habitats as well as inland along rivers and in human -dominated landscapes (Wells 1999). While such adaptability may confer resilience to moderate disturbance, these species are still susceptible to threats such as pollution, human-wildlife conflict and persecution (Shepherd and Shepherd 2009). The same applies to plantations adjacent to forests, where some owl species can adapt, but others, such as Brown Boobook (*Ninox scutulata*), Dusky Eagle-owl (*Ketupa coromanda*), and Barred Eagle-owl (*Ketupa sumatrana*), likely rely primarily on forests and use plantations only as suboptimal habitat (Atikah *et al.* 2019).

Collaborative networks play a vital role in advancing raptor conservation in Malaysia and throughout Asia. At the national level, revitalising local partnerships, such as the Raptor Study Group, which halted in 2018, could greatly enhance research coordination, long-term monitoring, and capacity building among conservation stakeholders. Regionally, the Asian Raptor Research and Conservation Network (ARRCN) serves as a crucial platform for data sharing, training, and transboundary conservation planning. Strengthening engagement at both local and regional scales is essential to address shared threats, close knowledge gaps, and ensure the long-term survival of raptors in Malaysia. Public education and outreach remain priorities, with ARRCN highlighting local conservation efforts, conducting workshops, and engaging communities to raise awareness and promote effective conservation actions.

Biennial ARRCN symposia provide an important forum for exchanging research findings and conservation strategies. Malaysian raptor research has been featured at many of these events. Notably, Malaysia hosted the 4th symposium in 2005 in Taiping, Perak, and the 12th symposium as a virtual meeting in 2022. Contributions from Malaysian researchers have enriched regional dialogues on raptor ecology and conservation challenges, fostering strong cross-border collaborations that are crucial for tackling threats that transcend national boundaries.

Conclusion and recommendations

Over 40% of Malaysian raptor species remain understudied, particularly forest-dependent and threatened species, highlighting the urgent need to fill critical knowledge gaps. Research over the past 30 years has expanded, with growing attention to nocturnal species, yet most studies remain concentrated in Peninsular Malaysia and in agricultural landscapes (Yahya *et al*. 2020), particularly the Eastern Barn-owl (Lim 2015). Major gaps persist in long-term monitoring and threat assessments, making Tanjung Tuan, Malaysia's only long-term migration count site, a key effort of the Malaysian Nature Society. Citizen science continues to provide essential complementary data on raptor ecology, behaviour and distribution.

Future priorities should focus on integrated monitoring, protection of migratory flyways, conservation of key habitats, and expansion of citizen-science initiatives. Effective conservation will also require stronger local and regional collaboration, sustained capacity building, and increased support from government agencies and research institutions (Puan 2023). By addressing these research and conservation priorities, Malaysia can promote more informed management and safeguard the long-term survival of its diverse raptor populations.

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