Malaysian Peregrine Falcon Survey Report 2024: A Summary of Findings and Conservation Concerns Marc Kéry, Zaharil Dzulkafly, Robert Percival, Zan-Hui Lee & Sein-Chiong Chiu

The **Malaysian Peregrine Falcon Survey Report 2024** details the fourth survey of West Malaysia undertaken by the MNS Perak Branch Peregrine Survey Team in West Malaysia. The team comprised Marc Kéry, Zaharil Dzulkafly, Robert Percival, Zan-Hui Lee and Sein-Chiong Chiu. Conducted over 12 days from January 15-26, 2024, the survey focused on the local nesting subspecies, *Falco peregrinus ernesti* (Plate 1). This extensive effort, following previous surveys in 2017, 2018, and 2019, aimed to revisit known nesting territories and discover new ones, providing crucial insights into the population status of this rare raptor in one of Malaysia's most unique, and endangered, habitats: karst hills.

Plate 1: The tiercel, or male, of the pair at Bukit Keplu, Kedah, Malaysia. The Malaysian subspecies of the Peregrine Falcon *ernesti* is probably the darkest of all the peregrines in the world.

Introduction: The Rare Peregrine in a Rare Habitat

The peregrine falcon, despite its global distribution, is inherently rare, particularly in tropical regions like Southeast Asia. While many European populations boast high densities (e.g., 2 pairs per 100 km²), West Malaysia's estimated breeding population, initially thought to be around 70-80 pairs, translates to a far lower density of approximately 0.06 breeding pairs per 100 km². This makes the peregrine falcon potentially one of Malaysia's rarest breeding bird species, with recent surveys suggesting even this estimate might be optimistic.

A major threat to these falcons is the widespread destruction of their primary nesting habitat: **limestone (karst) hills** (Plate 2 & 3). These unique geological formations, which offer the

open, vertical cliff faces peregrines prefer, constitute only a minute percentage of West Malaysia's land surface.

Plate 2: The nesting cliff on the karst of Jebak Puyuh, Pahang. This is a major karst hill of more than 1 km across, standing in a vast plain with the biggest cliff facing north, but with many other cliffs all around.

Plate 3: The nesting cliff on the karst of Gua Bama, Pahang. This is a moderate karst hill that stands totally isolated in another vast plain.

They are home to a large number of specialist plants and animals that occur only on karst hills (Plate 4). Quarrying, driven by the demand for construction materials, poses a significant and

immediate danger, capable of eradicating entire karst hills within years. Consequently, the peregrine falcon is considered an **umbrella species**, its conservation intrinsically linked to the preservation of the entire karst ecosystem in Malaysia.

Plate 4: Wonderful hanging gardens with herbaceous members of the plant family of the Gesneriaceae on the karst of Gua Bama, Pahang, as seen through the telescope. Karst hills are home to certain unique communities of plants and animals that occur nowhere else in the country.

Despite the species' wide distribution, there's a significant knowledge gap regarding its biology and ecology in tropical latitudes. Most studies originate from temperate and colder regions, highlighting the urgent need for more research on tropical peregrine populations, both breeding and wintering. The MNS Perak Branch Peregrine Survey Team initiated these surveys in 2017 to address this gap, with the 2024 survey marking the continuation of this vital long-term population study after a hiatus due to the COVID-19 pandemic and other commitments. All surveys have been strategically timed for January, coinciding with the peak of courtship and egg-laying, when breeding pairs are most detectable. While peregrines are known to occasionally nest on tall buildings elsewhere, the surveys exclusively focused on natural cliff habitats, as building-nesting is currently considered rare in West Malaysia.

The 2024 survey introduced two key innovations: the integration of the comprehensive inventory of Malaysian karst hills by Liew et al. (2021) for standardized site naming and geographical referencing, and the use of drones for photographic documentation of surveyed karst hills, providing unprecedented aerial perspectives. The continued support from the Tan Kean Cheong Bird Conservation Memorial Fund (TKCBCMF) of the Perak Branch of the

Malaysian Nature Society (MNS) has been instrumental in funding these important ornithological explorations.

Methods: A Comprehensive and Innovative Approach
The 2024 survey spanned 12 days (January 15-26) and covered approximately **3,000 km by road**, forming a broad triangle between Kuala Lumpur/Temerloh in the south and east and Perlis (at the Thai border) in the north, encompassing states like Selangor, Pahang, Kelantan, Perak, Kedah, and Perlis. The team undertook three separate trips (north, south-southeast, and east), with additional surveys around their Ipoh "HQ."

Prior to fieldwork, known peregrine sites were identified using Google Earth and Google Maps. During the survey, GPS and aerial photographs (Plate 2) aided navigation to cliff vicinities. The 2024 survey marked the first time the inventory by Liew et al. (2021) was used, with karst polygons incorporated into Google Earth for enhanced mapping.

Field methods remained consistent with previous surveys. Visits occurred between 8:00 AM and 7:30 PM, lasting from 15 minutes to over 2 hours, with an average of 45-60 minutes per site. The team searched for perched or flying peregrines from distances ranging from 100m to 1000m, and also looked for **whitewash** (fecal droppings) indicating roosting or nesting sites.

A crucial and highly successful method employed was the **playback of the 'eee-chup' call** of peregrines using a portable FoxPro game call amplifier. This technique, mimicking an intruding pair, typically provoked a reaction from resident peregrines (becoming airborne and/or calling), significantly increasing detection rates. To minimize disturbance, playback sessions were brief (1-6 repetitions of a 26-second recording, max 3 minutes total) and ceased as soon as birds were detected. The report emphasizes that such brief, single-time playback for scientific and conservation purposes is justifiable, but strongly discourages its recreational use, e.g., for photography.

The report provides detailed records for all 65 surveyed sites, presented in a south-to-north order (Plate 5). For historical context and comparison, it maintains a database of over 100 cliff objects in West Malaysia, drawing on information from Molard (2005), Molard et al. (2007), and all four surveys. This 2024 report notably incorporates the standardized naming and numbering system from Liew et al. (2021) for site identification, a significant improvement over previous subjective naming conventions. Additionally, **coordinates read from Google Earth** were used for precise site localization, typically marking the observation point of peregrines or the tallest part of the cliff. The report includes numerous aerial photographs taken by drones, offering unique new perspectives on many sites in their fascinating karst environment.

Results: A Snapshot of the 2024 Survey
The 2024 survey encompassed **65 cliffs** (one in Thailand), with 28 (43%) previously identified as peregrine territories. Of these 28 known peregrine sites, **19 (72%) were confirmed to be occupied** (15 by pairs, 4 by single birds). The survey also yielded two new discoveries: a single bird at a previously unsurveyed cliff near Kuala Betis, Kelantan, and the rediscovery of an adult pair at a site in Perlis State Park first noted in 2002 but unvisited since. Furthermore, one pair

was rediscovered at a new cliff within an existing territory. In total, the 2024 survey found **21 occupied sites**: 16 with adult pairs and 5 with single birds.

A breakdown of occupied cliffs by state (excluding the Thai site) reveals varying occupancy percentages (Plate 5):

- Selangor: 2 (100%)
- Pahang: 11 (36%)
- Perak: 26 (19%)
- Kelantan: 10 (30%)
- Kedah: 6 (33%)
- Perlis: 9 (55%)

Overall, only 34% of the 64 checked cliffs in West Malaysia were occupied.

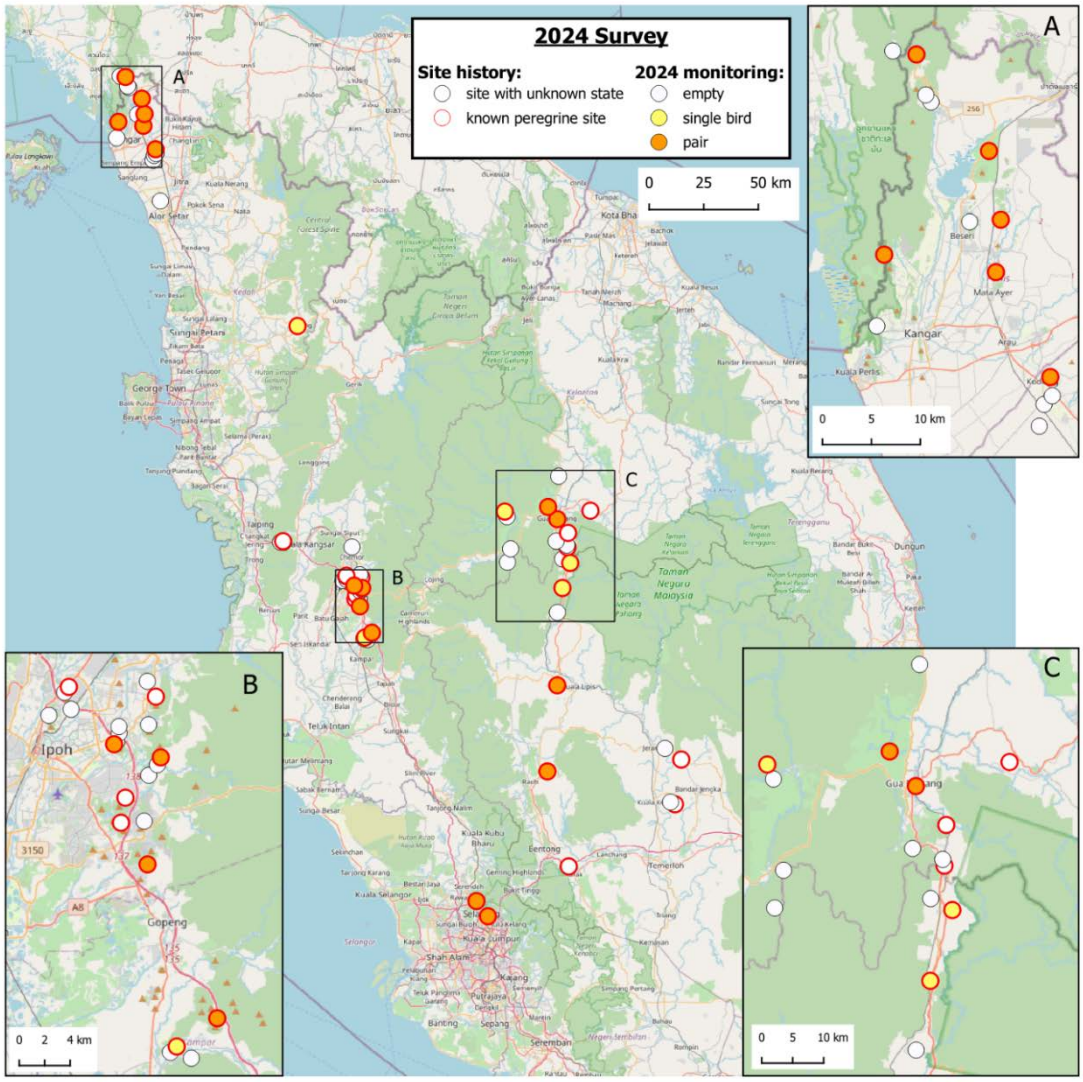

Plate 5: Map showing the surveyed sites with their previous history, i.e., whether they are known peregrine sites or not, along with the results during the 2024 survey, i.e., whether no peregrine, a single bird, or a pair was detected. Map created by David Pinaud from CEBC, Chizé, France.

The playback method proved highly effective, often prompting peregrines to become airborne and vocalize within 36-52 seconds of playback, even at distances up to 1000 meters. This greatly enhanced survey efficiency and confirmation of occupied sites.

The results section provides detailed, site-specific observations, complete with Google Earth maps showing observation posts and marked cliff locations, and incorporates the new site naming conventions from Liew et al. (2021) and drone-captured aerial photographs.

Summary and Conclusions: Key Findings and Conservation Implications

What Was Achieved

The 2024 survey, the fourth of its kind, involved 12 days of fieldwork, covering approximately 3,000 km, and inspecting 65 potential cliff sites. The report documents these sites and the peregrine observations made during their visits, contributing significantly to one of the very few population studies of peregrines in any tropical country. This effort provides crucial baseline information on nesting density and population size in West Malaysia, filling a notable knowledge gap of this species with a worldwide distribution.

What Was Found

Out of 64 surveyed cliffs in Malaysia, 28 were known peregrine territories (Plate 6). Of these, **19 were confirmed occupied**, while 9 showed no peregrine activity. One new site was discovered, and one previously recorded but unvisited site from 2002 was rediscovered. Additionally, a pair was found to have moved to an alternative cliff within their territory. In total, **21 occupied sites were found in 2024**, with 16 hosting adult pairs & 5 with single birds.

Plate 6: The mighty cliffs on the karst of Gunung Biol, near Kuala Betis, Kelantan. Along with the Ipoh region and the state of Perlis, the Kelantan/Pahang border in the wider Gua Musang region is one of the strongholds of the peregrine falcon in West Malaysia.

Regarding the national **population size and density**, the total number of **confirmed or suspected breeding sites in West Malaysia** currently stands at **39**. Only two new sites have been added since the 2019 survey: one found during the 2024 survey and another, a new pair on a building in Subang, discovered outside the survey. This total is still significantly lower than the 70-80 pairs estimated by Molard et al. (2007) for Peninsular Malaysia, suggesting that the earlier estimate might have been overly optimistic, with the true population size likely closer to the lower bound.

A key uncertainty is the population nesting on buildings. While two pairs have been confirmed on buildings in the Kuala Lumpur area during the last 20 years, and some sightings in Penang and Genting Highlands exist, the overall impression is that **building-nesting peregrines are currently very rare in Malaysia and constitute a negligible proportion of the national total**. However, this could change in the future, as observed in other parts of the world where peregrines have colonized man-made structures in areas lacking natural nesting sites. If this trend were to emerge in Malaysia, it would likely occur in major cities, distinct from the current strongholds in Perak, Kelantan, and Perlis.

Compared to high-density European populations, the peregrine in Malaysia appears to be very rare and widely dispersed. Nearest-neighbour distances are typically many kilometres, in stark contrast to the 1-2 km common in areas like the Jura Mountains in France. Furthermore, during four extensive surveys, only one or two instances of intruding peregrines were observed, and no immature birds were ever seen—a significant difference from high-density populations where such observations are frequent, especially during peak courtship. This suggests that the **peregrine is a widely distributed, yet very rare breeding bird in West Malaysia, and almost entirely confined to tall limestone cliffs. Conservation of this unique and very rare habitat type is therefore a key to conservation of the peregrine (see end of report)**.

When Do Peregrines in Malaysia Lay Eggs?

Previous knowledge suggested egg-laying from late January to early February. However, a crucial observation in March 2024 (outside the survey period) of 30-35 day old nestlings at the Gunung Panjang karst site in Ipoh, Perak, indicated an egg-laying date **as early as January 2**. This significantly earlier date has implications for future survey planning and interpretation of results, as incubating birds are far less visible and responsive to playback.

Has the Peregrine Population Declined Since 2019?

The 2024 survey detected fewer occupied sites and pairs compared to the 2019 survey. In 2019 (10 days, 68 sites checked), 28 occupied sites were found (25 pairs, 3 single birds), including 9 new discoveries. In 2024 (12 days, 65 sites checked), **only 21 occupied sites were found** (16 pairs, 5 single birds), with only one truly new discovery. Additionally, peregrines were not confirmed at 9 previously known sites. This suggests a potential decline in the West Malaysian peregrine population over the last five years.

Several factors could explain this reduction in the observed numbers:

- **Methodological Challenges/Bad Weather**: Heavy rain and fog during monsoon season, particularly in Kelantan (a peregrine stronghold), significantly hindered survey efficiency. This led to missed survey opportunities at remote cliffs, inability to see cliffs, or forced early

departures, potentially preventing the confirmation of known pairs or discovery of new ones.

- **Natural Variability and Site Shifts**: Populations exhibit natural fluctuations in site occupancy, with pairs sometimes moving to alternative, unvisited cliffs within the same territory. This might have occurred at several sites, making them appear abandoned. Additionally, 2024 might have been an "early year" for breeding, with more pairs already on eggs during the survey period, leading to fewer visible or responsive birds.
- **Genuine Population Decline**: However, a true population decline remains a plausible explanation. One potential cause might be **Highly Pathogenic Avian Influenza** (HPAI), which has affected peregrine populations in Europe and, originating in Asia, could be impacting Malaysian populations.

Conserving a Rare Bird in a Rare Habitat

Since the first confirmed breeding in West Malaysia at the turn of the century, fewer than 40 distinct nesting territories have been identified, and not all are occupied annually. While some undiscovered territories likely exist, their number is probably less than the currently known sites. Based on these findings, the report tentatively revises the national **population size estimate of *Falco peregrinus ernesti* in West Malaysia down to 60-70 pairs** (from the previous 70-80).

With such a small breeding population, the peregrine falcon stands as one of Malaysia's rarest breeding bird species, warranting **strong conservation measures**. The extreme rarity of this species in its equally rare and unique karst hill habitat (Plate 7) underscores the urgent need for dedicated conservation efforts.

Plate 7: The vast karst of Gua Belong, Kelantan, stands as an isolated refuge for the remnant natural vegetation and is home to another pair of peregrines.

Full report of the survey and citation

A full report on the survey is available for download. The recommended citation for the report is this: Kéry, M., Dzulkafly, Z., R. Percival, Zan Hui, L. & Sein Chiong, Ch. 2024. *Malaysian Peregrine Falcon Survey Report 2024*. Technical Report. Sempach/Switzerland and Ipoh/Malaysia. 177 pages. Download link: https://malaysianbird.report/wp-content/uploads/Malaysian-Peregrine-Falcon-Survey-Report-2024_SemiPublic.pdf

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