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DIRECTORS GENERAL OF CIVIL AVIATION
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AGENDA ITEM 3: AVIATION SAFETY

**IMPLEMENTATION OF WILDLIFE HAZARD MANAGEMENT
AT KUALA LUMPUR INTERNATIONAL AIRPORT (KLIA)
THROUGH STRATEGIC PLANNING AND OPERATIONAL
EXCELLENCE**

(Presented by Malaysia)

INFORMATION PAPER

SUMMARY

This paper presents the strategic enhancements, resource allocations and operational frameworks implemented to strengthen the Aerodrome Wildlife Hazard Management Plan (AWHMP) at Kuala Lumpur International Airport (KLIA/KUL). Faced with an escalating risk profile correlating to increase post-pandemic flight movements, Malaysia Airports (Sepang) Sdn. Bhd. has shifted from conventional reactive mitigation methods toward an integrated data-driven framework. By focusing on data capture, specialised personnel allocation, renewed active tools and comprehensive habitat management, KLIA has effectively aligned its wildlife management systems with ICAO Standards and Recommended Practices (SARPs) and Civil Aviation Authority of Malaysia (CAAM) guidance materials.

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1. INTRODUCTION

1.1 Wildlife strikes remain a critical threat to global aviation safety, causing human fatalities and severe damage to airframes and engines—particularly from encounters with large or flocking species. Managing this risk is an operational priority at Kuala Lumpur International Airport (KLIA). Surrounded by tropical habitats, agricultural land, and industrial zones, the aerodrome intersects active seasonal migratory routes (northeast transit from September–November; southeast transit from February–April).

1.2 To mitigate collision risks, Malaysia Airports (Sepang) enhanced its Aerodrome Wildlife Hazard Management Plan (AWHMP), shifting toward data-driven risk mitigation and expert-backed strategies to safeguard aircraft operations.

1.3 This paper outlines the strategic and operational measures implemented at KLIA. Member States are encouraged to share data insights, address limitations in morphological reporting, and build multi-agency partnerships with academic and environmental bodies to enhance global aviation safety.

2. DISCUSSION

2.1 Enhancing Data Integrity and Analytics

2.1.1 Historical records at KLIA demonstrated a steady rise in documented bird strikes, expanding from 37 cases in 2021 to 158 cases in 2025 as aircraft movements recovered. Crucially, depending on standard morphological analysis resulted in a major operational blind spot, leaving approximately 82% of strike remains categorised as an "Unknown Species".

2.1.2 To eliminate this data deficit and meet the comprehensive monthly safety reporting mandates enacted by the Civil Aviation Authority of Malaysia (CAAM), KLIA created reliable digital and scientific ways of recording data:

- a) Collaborative Action with Operating Airlines: The deployment of shared tracking logs allows airline engineering units, pilots, and ground handlers to instantly coordinate verified or unconfirmed incidents, standardising reporting within a strict 48-hour timeline.
- b) DNA Sampling Protocols: Operational field personnel utilise formal DNA test kits on site. Carcass remnants and unidentifiable organic tissue are collected and preserved before being submitted to the Department of Wildlife and National Parks for accurate scientific identification.
- c) Digital Data Dashboard Platforms: Integration of standard logging tools into a centralised Wildlife Dashboard to track immediate data analysis including monthly strikes, phase of flight, hotspot area and bird species.

2.1.3 The output of these modern data streams directly informs an updated, independent Risk-Based Analysis (RBA) Matrix developed in partnership with independent third-party consultants. The matrix dynamically targets high-risk wildlife species groups such as the ‘concerning’ category species group "Mynas" (Javan and Common Mynas), which exhibit high strike frequencies despite low individual severity ratings, ensuring focused deployment of active control measures.

2.2 Resource and Personnel Restructuring

2.2.1 The implementation roadmap establishes a dedicated organisational hierarchy to isolate

wildlife planning from general airside maintenance, enhancing technical focus and operational efficiency. The framework operates via a seamless, three-tier coordination system:

- a) **Aerodrome Wildlife Management Committee:** This group provides oversight, feedback, and continues reporting of wildlife strikes as well sighted to the aerodrome operator as input in managing the hazards.
- b) **Aerodrome Specialist Wildlife Hazards Assessment Teams:** An on-ground, multi-background expertise group tasked with analysing the surrounding environment, seasonal movements, examining habitat attractants on and off airfield, and implementing mitigation actions.
- c) **Dedicated Site Operations Teams:** Shift personnel are explicitly assigned to runway inspections and active dispersal duties. Rather than executing generalised airside patrols, dedicated teams are deployed across each active runway to optimise response times and maximise patrol frequencies. Joint responsibilities with airport fire rescue ensure the runways are secured, especially during high concentrated of bird movement.

2.2.2 To maintain regulatory readiness, all airside and emergency personnel undergo a consolidated five-module training syllabus covering AWHMP fundamentals, hazard assessments, digital logging, field intervention and wildlife profiling.

2.3 **Renew Control Tools and Deterrent Devices**

2.3.1 KLIA has expanded its field equipment inventory, outfitting its specialised vehicle fleets with artificial annoyance sound tools. The standard operational toolsets now consist of:

- a) **Handheld Propane Deterrent Cannons (TB100):** Operating via MAPP gas to project loud explosive acoustic waves that prevent wildlife from settling near runway strips.
- b) **Class 3B Green Fat Beam Lasers:** Handheld optical systems optimised for low-divergence visibility up to 1,200 linear feet in providing high-efficiency dispersal during dawn, dusk, and night time shifts.
- c) **High-Power Sirens and Loud Hailers:** Standardised across all active safety vehicles to conduct a minimum of six mandatory daily dispersal patrols.
- d) **Specialised Non-Avian Traps and Cages:** Collapsible step-trigger live traps, handling gloves, and mobile transport systems used in immediate coordination with the Department of Wildlife and National Parks to manage stray domestic or wild terrestrial mammals safely.
- e) **Common Flag Waving:** Simple but effective, these tools provide extensions to the manual hand waving by highlighting visibility for a continuous disturbance to the wildlife concentration.

2.4 **Proactive Habitat Modification and Ecological Studies**

2.4.1 Recognising that source reduction is the most sustainable approach to wildlife management, KLIA deployed accredited third-party wildlife consultants to direct ecological transformations across both on-airport and off-airport zones:

- a) **Grass and Soil Engineering:** Initiating scientific plant-growth assessments with University Putra Malaysia (UPM) to manage grass heights adaptively (maintained between 50-100 mm inside the runway strip and 50-200 mm in peripheral fields) to depress insect and macro-invertebrate populations.

- b) Water Ecosystem Modifications: Mitigating surface water accumulation through continuous water suction tanker routines on active aprons, combined with rigorous desilting, mud removal and slope repairs at major off-site balancing ponds.
- c) Perimeter and Infrastructure Exclusion: Upgrading traditional curtain strip materials to heavy galvanised steel doors at Terminal 2 refuse chute points to exclude scavengers, alongside netting and sealing exposed structural ledges across airport facilities.
- d) Targeted Flora Removal: Conducting systematic eradication programs targeting specific vector vegetation such as *Acacia Mangium* trees, which serve as primary attractants for hazardous bee swarms near passenger boarding bridges.

3. ACTION BY THE CONFERENCE

- 3.1 The Conference is invited to note the information contained in this Paper:

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