



ICAO

International Civil Aviation Organization

ICAO Asia/Pacific Wildlife Hazard Management Workshop  
and Seventh Meeting of the Asia/Pacific Wildlife Hazard  
Management Working Group (AP-WHM/WG/7)

Pokhara, Nepal, 5 to 9 May 2025

### Agenda Item 3: Global, Regional and National Guidance/Best Practices on Wildlife Hazard Management

#### WILDLIFE HAZARD MANAGEMENT PRACTICES FOLLOWED BY COCHIN INTERNATIONAL AIRPORT

(Presented by India)

##### SUMMARY

The paper highlights Wildlife Hazard Management strategies implemented at Cochin International Airport in Kochi, tailored to its tropical terrain. It explores active measures like wildlife deterrents and passive techniques including habitat management to ensure airport safety. These efforts showcase effective solutions addressing the unique challenges posed by the region's environmental characteristics.

## 1. INTRODUCTION:

1.1 Cochin International Airport is located around 28 kilometres northeast of Kochi city which serves as a critical gateway to the southern part of India. It holds the distinction of being the first airport in India developed under a Public-Private Partnership model. Renowned for its sustainability efforts, it became the world's first fully solar-powered airport in 2015. The airport is a major hub, handling significant passenger traffic and connecting Kerala to numerous domestic and international destinations.

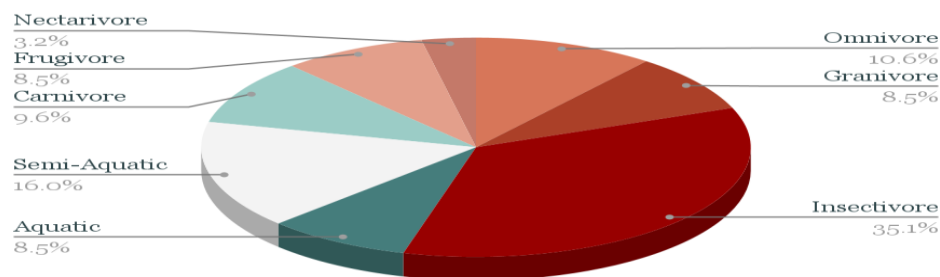


1.2 In accordance with guidelines outlined in ICAO Doc 9137 Part 3 and directives from the Directorate General of Civil Aviation, India (DGCA), Cochin International Airport bears the primary responsibility for maintaining aerodrome safety and mitigating wildlife strike risks. Periodic surveys conducted by experts throughout the year are indispensable for gathering comprehensive data on wildlife presence and behavior relative to the aerodrome. These surveys should account for diverse environmental variables, including aircraft movements, runway utilization, and wildlife behavior patterns, to inform targeted mitigation strategies.

1.3 In 2024, the management decided to invite Salim Ali Center for Ornithology and Natural History (SACON, Govt of India organization) to take up a comprehensive study to understand the bird community of the airport, identify the problematic birds and mitigation measures to reduce the bird and wildlife-related hazards to aircraft.

1.4 The study comprised of Field Survey, Point Count, Line transect count, Perimeter survey, Vegetation profile, Human made bird influencing activity, Social survey etc., to reach upon the results.

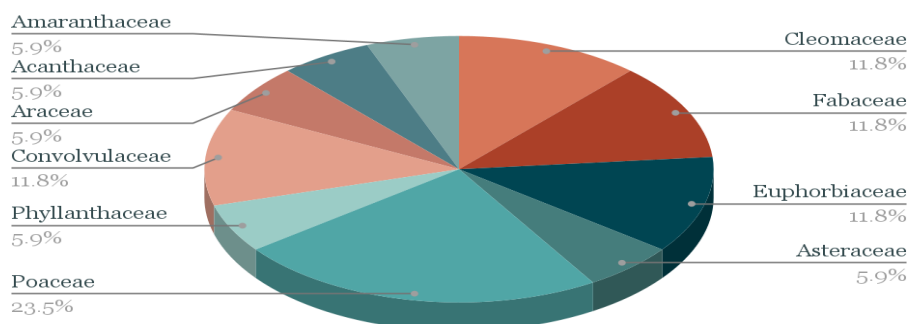
1.5 A total of 60 bird species were identified inside the aerodrome and 93 species were identified from the 13 km radius of the airfield. The figure below shows the composition of the birds inside the airfield.



1.6 Similarly, the species composition in 2km, 5km, 10km, and 13km radius were assessed as part of the study. Based on the initial report submitted in August 2024, identified problematic species are Black Drongo, Common Myna, Indian Pond Heron, Red-wattled Lapwing, White-throated Kingfisher, Indian Roller, Rock Pigeon, Cattle Egret and Yellow-wattled Lapwing.

1.7 Apart from the birds, other wildlife creatures like rats, mongoose, flying foxes, snakes were also seen during the survey. Other smaller fauna includes earthworms, dragon flies, frogs, crabs etc.

1.8 Floristic profile of the airfield was also taken into consideration and species belonging to 10 families were identified. The figure below shows the composition.



1.9 Based on the data collected within & outside the airfield and other observations made around 13km radius, an interim report was submitted by SACON. The fundamental principle of the recommendations made was to reduce the viable habitat through various interventions.

## 2. DISCUSSION:

### **Common practices by the Airport Operator (CIAL)**

2.1 Habitat management is the most important method of preventing or reducing wildlife strikes in and around an airport. The airfield habitat should be less attractive to the animals than the surrounding areas. If there are off-airport sites that attract birds these may need dealing with - also these can create flight-line of flight paths of birds moving from one area to another (e.g. from an overnight roost to a feeding location) then the airport should, in conjunction with local regulators, seek to reduce the attractiveness of these off-airport sites also. Typical examples include manipulating the species and/or height of vegetation cover on the airport, removal of trees and bushes fencing off the aerodrome, netting of water bodies, excluding birds from buildings by netting or other means, selection of non-attractive amenity planting around terminals.

2.2 In CIAL, the terminal buildings and structures are designed to prevent the wildlife/bird activity in and around the structures. Roofs are designed with adequate slope to exclude birds from nesting in the structures. Where birds have already nested in buildings, nest removals are done regularly including the Apron area in compliance with local and national environmental requirements. The trapping, removal or relocation of young birds are also adopted on case-to-case basis. Any Openings present in the roof/structures are positively sealed. Other types of deterrents are installation of spikes, netting, barriers etc.

2.3 A complete perimeter fence is the prime method of preventing hazardous wildlife, other than birds, from gaining access to the aerodrome. CIAL has secured its boundaries with a compound wall as per the specifications of DGCA to ensure Safety & Security.

2.4 Perimeter Intrusion Detection system will prevent intrusion activities via NLPF (Non-lethal power fence) system and vibration sensors. If any intrusion happens it will generate an alert at the command-and-control Centre and PTZ camera will be zoomed to the point of intrusion. The same methodology is adopted for securing the drainage outlets also which will give alert if the outlet mesh door is disturbed.



2.5 The vegetation cover in CIAL consists of 70% grass, 16% herbs followed by bush, creeper, sedges and woody. Grass heights are decided based on the target substantial risk species. There is no single recommended grass height that is effective at all aerodromes including Cochin International Airport. Site-specific study conducted by SACON suggested a grass height of 15-20 cms would be optimal. CIAL is striving to maintain this optimal grass height in the airfield.

2.6 Regular mowing and maintenance schedules are implemented to keep the grass at optimal heights and conditions as specified in the report. CIAL has deployed Grass Cut & Collect machines for removal of cut grass from operating area, since it will help reduce the extent of habitat available for termites and other insects for insectivores' birds. Open soil patches are completely avoided as that are most suitable for the breeding of ground nesting birds such as lapwings.



2.7 CIAL has implemented innovative spraying methods like Tractor mounted Boom Sprayer for spraying bird repellent to prevent /reduce wildlife activity, particularly focusing on bird deterrent measures. These bio-degradable products are safe for both humans and animals. By mixing them with water and spraying them over basic strip premises and areas with noted bird activities, we create an environment that discourages birds from gathering, thus reducing the risk of bird strikes and ensuring safer aircraft operations. Insecticides like Neem oil extracts are also being used in between to reduce insect activity levels in order to keep away insectivorous birds, as majority of our fauna are insectivores' birds.



2.8 Lime (powder form) is being spread across the entire Runway edge on both North & South side stretch during rainy season which acts as protective barrier and deters snails & earthworms from crossing the runway shoulders which will in turn attract Birds.

2.9 CIAL has developed a robust mechanism to avoid any kind of waste disposal in operational area. All along the perimeter boundary wall, CIAL has kept wildlife - proofing waste disposal containers at regular intervals including Watch tower huts. Regular waste collection schedules have been formulated in the operational area and strictly monitored by our team. All the wastes are collected at one point in cityside and are processed OFF aerodrome at an inhouse Waste Treatment plant, in compliance with the Regional & Central regulations.

2.10 The Wildlife Hazard Control and Management Team deployed by CIAL takes care of the entire scaring activity throughout day and night. The team uses a variety of equipment to ensure safety at the airside. These tools are used to scare birds and other wildlife away from the airfield, which reduces the probability of bird strikes. Before using any equipment, the team takes several precautions to ensure that it is safe and effective. Some of the commonly used equipment are Shell crackers, LPG operated Zone guns, Six-shot launchers, Laser torches, Bait traps etc.



### Mitigation Measures for the Problematic birds

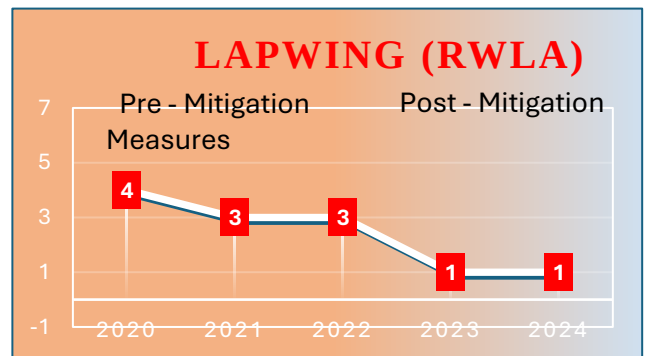
2.11 Identifying potential threat species is crucial for aerodrome safety and management. Some of the critical species at CIAL and methods adopted are as follows;

**Red-wattled Lapwing (RWLA):** Lapwings are known for their ground-nesting behavior, laying eggs in shallow scrapes among grasses or agricultural fields. Lapwings are adaptable and often found in various habitats including farmland, wetlands, and coastal areas, where they forage for insects, worms, and small invertebrates. The well-kept grassland inside the airfield is apt for the Red-wattled Lapwings for foraging and breeding. Lapwings were involved in most confirmed bird hit incidents inside the airfield.



#### **Measures in place:**

Maintenance of grass cover with an average height of less than 15cm in airfield. Prevention of breeding in airfield. Egg Collection drives. Periodical removal of visible eggs can disturb the breeding and they may search for alternative places. Avoid stony patches of land as they prevent ground nesting. Regular patrolling. Active scaring measures. Regular Bird deterrent application found to be effective against lapwing. Deploying Laser guns at night



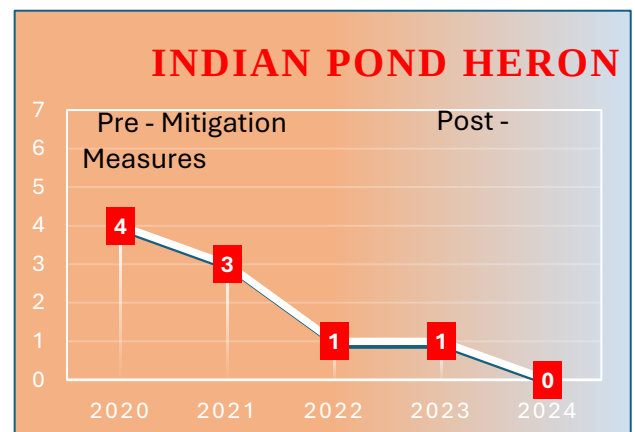
Year Wise Strike Data of RWLA (Pre & Post Mitigation Measures)

**Indian Pond Heron (IPHE):** Drainage canals and grass fields are the hotspots for Pond Herons. The presence of fish in the canals attracts them in large numbers into the airfield. They cross runways individually or in groups, making them a threat to aircraft operations. Monitoring the activity of these birds near grass fields and water drainage canals is very important for managing these birds. Zon guns, crackers, frequent disturbance by human movement in the grass field etc. are also employed to reduce their activity in the airfield.



#### **Measures in Place:**

Physical deterrence, Active Measures, Zone Gun Swapping, Storm Drain Covering, Active Measures, Avoiding Water Stagnation in airside etc.



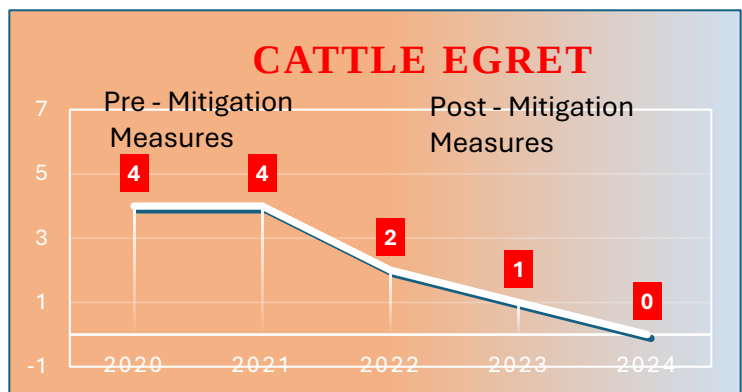
Year Wise Strike Data of IPHE (Pre & Post Mitigation Measures)

**Cattle Egret (CAEG):** Cattle Egrets were found inside the airfield in large numbers during the winter season. Since the beginning of migratory season, their presence has decreased substantially with one or two individuals spotted occasionally. Egrets are generally active throughout the daytime. They were seen crossing the runway in groups as they move from & to the roosting site.



**Measures in place:**

Grass Cover maintenance, Active measures, Physical deterrence, covering of drains, grass cut & collect machines to be deployed during peak hours, Deployment of chasers with grass cutting machines during peak time etc. Zon guns, crackers, frequent disturbance by human movement in the grass field etc. are also be employed to reduce their activity in the airfield.



**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

—END—