International Civil Aviation Organization

Sixth Meeting of the Asia/Pacific Wildlife Hazard Management Working Group (AP–WHM/WG/6)

Bangkok, Thailand, 14 to 17 May 2024

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

BEST PRACTICES ON WILDLIFE HAZARD MANAGEMENT

(Presented by India)

SUMMARY

Wildlife strikes have been a challenge since the dawn of aviation. Birds, mammals, reptiles, and aircraft may seem to share airport grounds in relative peace, but their co-existence can lead to extremely high-risk situations. A collision between an aircraft and an animal can cause severe damage that can bring about the loss of a plane, its passengers, and crew. To avoid this, an operator must have 'Wildlife Hazard Management Plan (WHMP)" in place. The plan must deliver strategies to mitigate wildlife hazard attractants and high-risk species. At DIAL, dedicated WHM team is proactively taking and implementing all the necessary mitigation measures to limit the bird strikes. This paper describes the mitigation measures and their effect on two critical bird species identified at Delhi Airport.

1. INTRODUCTION

1.1 Wildlife management at any airport is key activity to ensure safety of aircraft operations. All airports are required to invest heavily in terms of manpower, resources and procedures to reduce the chances of wildlife strikes.

1.2 Delhi International Airport Limited (DIAL) – GMR is one of the largest and most complex airports located at New Delhi, India. It has four active runways (two pairs of parallel dependent runways). This airport is spread over an area of 5500 acres of land and accounts for approx. 1400 ATMs per day. Despite being located in an urban and second most populated city in the world, the airport is also surrounded by many natural and restored green areas accounting for 22% green cover area. Further, the climate of Delhi is semi-arid, and there is a vast difference between summer and winter temperatures. The green areas and temperature variations ultimately lead to wildlife attractions which is a matter of concern to DIAL as wildlife may enter the airport especially the birds and probabilities are there the birds may get habitual to airport environment. Therefore, to keep bird strike probabilities down to minimum, proactive bird strike mitigation measures have been taken as mentioned in DIAL's WHMP and following those, the bird strike rate of two bird species namely, Red-wattled Lapwing and Indian Rock Pigeon has been reduced drastically.

2. DISCUSSION

2.1 To develop mitigation measures for bird species, assessment of behavioral pattern and food preference of the said species is one of the most important requirements. The details of the mitigation measures developed by DIAL for the two critical birds are mentioned below.

The Red-wattled Lapwing

2.1.1 The Red-wattled Lapwing is active during the day and nighttime. The characteristic features of red-wattled lapwing are as follows:

Identification - Red-wattled lapwings are large waders, about 35 cm (14 in) long. The wings and back are light brown with a purple to green sheen, but the head, a bib on the front and back of the neck are black. A prominent white patch runs between these two colours, from belly and tail, flanking the neck to the sides of crown. Short tail is tipped black. A red fleshy wattle in front of each eye, black-tipped red bill, and the long legs are yellow. In flight, prominent white wing bars formed by the white on the secondary coverts. Refer image below for pictorial presentation.

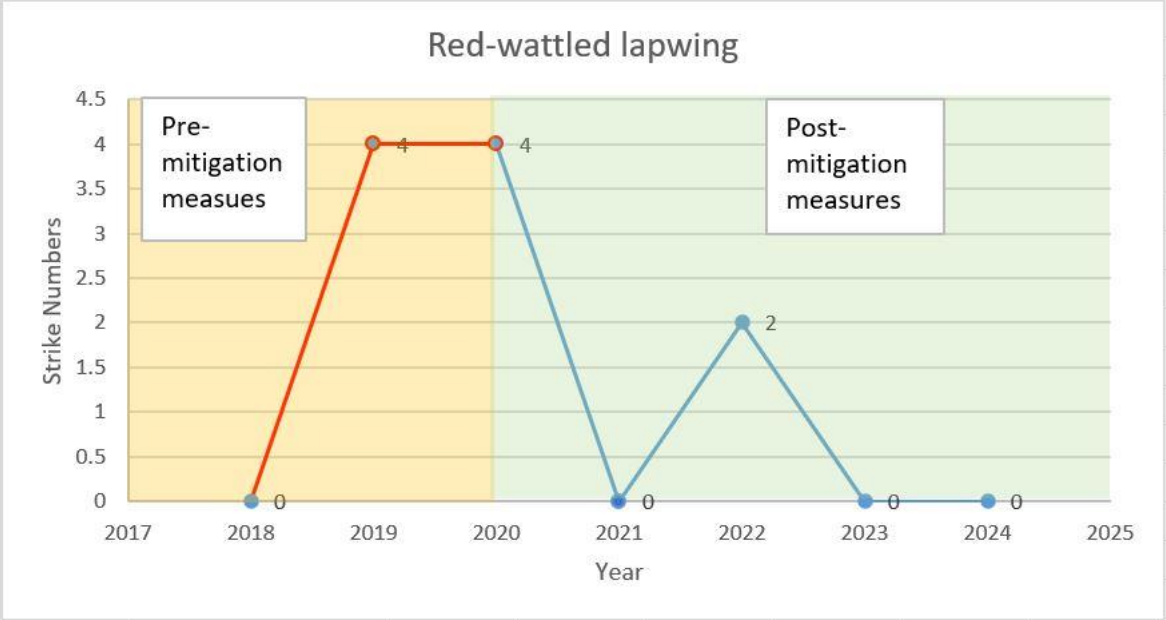
Behaviour – Red-wattled lapwings are ground birds that are incapable of perching and that is reason, they are always found on the ground and known as ground-dwellers birds. Usually seen in pairs or small groups not far from water, they sometimes form large aggregations in the non-breeding season (winter).

Breeding - The breeding season is mainly from March to August. The courtship involves the male puffing its feathers and pointing its beak upwards. The eggs are laid in a ground scrape or depression sometimes fringed with pebbles. Nests are difficult to find since the eggs are cryptically coloured and usually match the ground pattern.

Diet - The diet of the lapwing includes a range of insects, snails, and other invertebrates, mostly picked from the ground. They may also feed on some grains. They feed mainly during the day, but they may also feed at night. They may sometimes make use of their legs to disturb insect prey from soft soil.

Image 1: Pictorial presentation of Red-wattled Lapwing (Source: Wikipedia)

Strike Rate - Year-wise bird strike rate of red-wattled lapwing is mentioned in the graph below. Year-wise, a dipping rate has been observed with the implementation of the best mitigation measures at the airport. The mitigation measures for this species were implemented from the year 2020 and since then a dropping effort has been observed.



Graph 1: Year-wise strike rate of Red-wattled Lapwing with pre and post mitigation measures.

Mitigation measures – the best mitigation measures to reduce the bird-strike rate down for red-wattled lapwing is as follows:

- Since it is a ground dwelling bird and makes it nest on the grounds, bald patches have been covered with grass and small stones/ pebbles have been removed so that no nesting can take place.
- The airside grassland areas are being treated with insecticides to control the insect's population, which ultimately leads to no food source availability to these birds.
- Further, Eco-solar traps are placed at insect prone sites to control the insect's population, which in turn reduces the food availability.
- Regular surveys are being conducted during the pre-breeding phase that is, from February month onwards at the probable nesting sites, so that it stresses the species for de-nesting and abandoning the place.
- Removal of stagnant water has been from the airport so that there is no source of water and water bodies as this bird prefers to live nearby to water bodies.
- Covering of all perennial drains has been done so that there is no roosting site available for them.
- Bio-acoustic devices (scare-crow system, avian defender) are in place to scare away these birds whenever they are found in flocks.
- Pyrotechnics are in place, used in irregular patterns so that these birds do not habitual to mitigation measures.
- Awareness session is being regularly carried out at nearby areas of the airport where locals are being sensitized about the non-accumulation of open water body, waste accumulation and not to feed wild birds.

Indian Rock Pigeon

2.1.2 On the other hand, Indian Rock Pigeon, is a generalist feeder and feeds on anything. It mostly depends upon the offered food and is known to live close in human habitation. The characteristic features of Indian Rock Pigeon are as follows:

Identification - The adult pigeon is 29 to 37 cm (11 to 15 in) long with a 62 to 72 cm (24 to 28 in) wingspan. It has a dark bluish-grey head, neck, and chest with glossy yellowish, greenish, and reddish-purple iridescence along its neck and wing feathers. The iris is orange, red, or golden with a paler inner ring, and the bare skin round the eye is bluish grey. The bill is grey black with a conspicuous off-white cere, and the feet are purplish red. Refer image below for pictorial presentation.

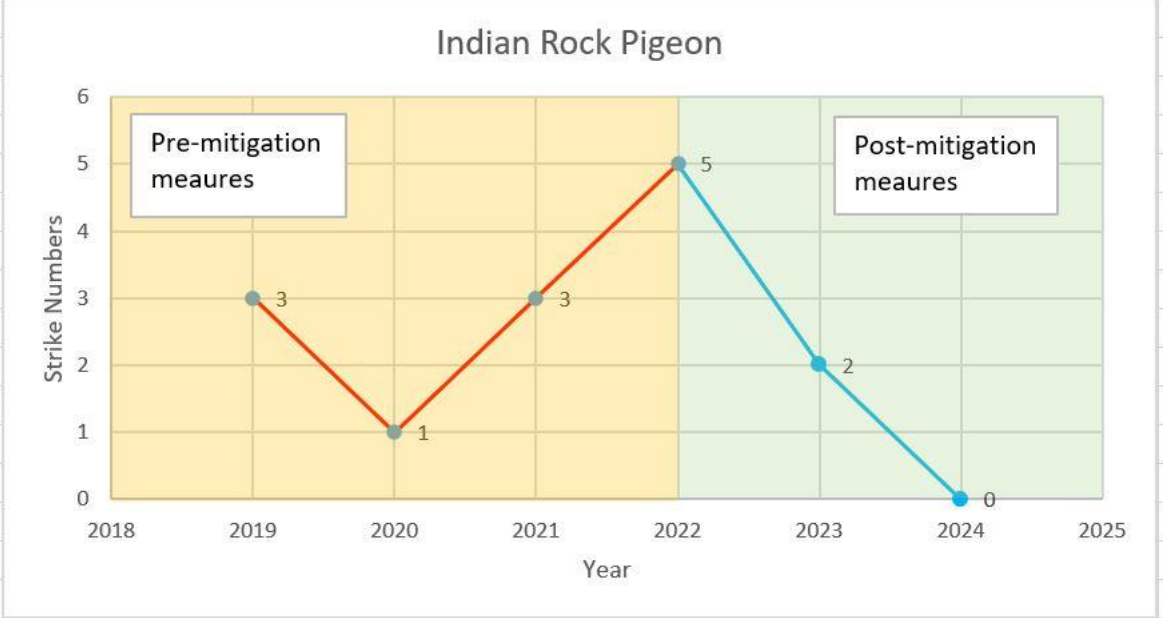
Behaviour – Pigeons are often found in pairs during the breeding season, but usually the **pigeons** are gregarious, living in flocks of 20 to 50 birds (dependent on the food supply). Habitats include various open and semi-open environments where they can forage on the ground. Cliffs and rock ledges are used for roosting and breeding in the wild.

Breeding – Pigeon breeds at any time of the year, but peak times are spring and summer. Nesting sites are along coastal cliff faces, as well as the artificial cliff faces created by apartment buildings with accessible ledges or roof spaces.

Diet - Pigeons can be seen eating grass seeds and berries in parks and gardens in the spring, but plentiful sources exist throughout the year from scavenging (e.g., food remnants left inside of dropped fast food cartons, in the form of popcorn, cake, peanuts, bread and currants) and they also eat insects and spiders. Additional food is also usually available from waste bins, tourists or residents who feed bird seed to pigeons for reasons such as empathy, fun, tradition and as a means for social interaction.

Image 2: Pictorial presentation of Red-wattled Lapwing (Source: Wikipedia)

Strike Rate - Year-wise bird strike rate of Indian Rock Pigeon is mentioned in the graph below. Year-wise, a dipping rate has been observed with the implementation of the best mitigation measures at the airport. The mitigation measures for this species were implemented from the year 2022 and since then a dropping effort has been observed.



Graph 2: Year-wise strike rate of Indian Rock Pigeon with pre and post mitigation measures

Mitigation measures – the best mitigation measures to reduce the bird-strike rate down for red-wattled lapwing is as follows:

- Specialized pigeon traps are being placed at multiple locations. These traps have food (mostly grains) and a water bowl placed inside it to lure the pigeons. Once the pigeons get entered the traps, the traps are automatically closed. These trapped pigeons are then later released into nearby protected areas. (Refer Image 3 for pigeon trap).
- Since these birds prefer to live near to human habitation, installation of anti-bird spikes have been done all around the airport buildings, sign boards, or on all the possible perching sites.
- Continuous de-flowering and insecticide sprays are being carried out to control grain formations and insect's control.
- Extensive awareness sessions are being regularly carried out at nearby traffic red light areas where locals generally found offering food to birds, especially to pigeons due to some myths. The locals are being sensitized and motivated not to offer food materials considering the probable impacts of bird aircraft strikes.
- Pigeon proof netting is being taken at the possible perching sites in building areas.
- Representative posters regarding not feeding/ offering food to birds especially or other wildlife species are being put at the all the frisking points to aware about each person entering inside the airside.
- Covering of drains has been done so that there is no roosting site available for them.
- Bio-acoustic devices (scare-crow system and avian defender) are in place to scare away these birds whenever they are found in flocks.
- Pyrotechnics are in place, used in irregular patterns so that these birds do not habitual to mitigation measures.
- Locals are sensitized for not conducting any pigeon rearing and to offer food to pigeons on their roofs.

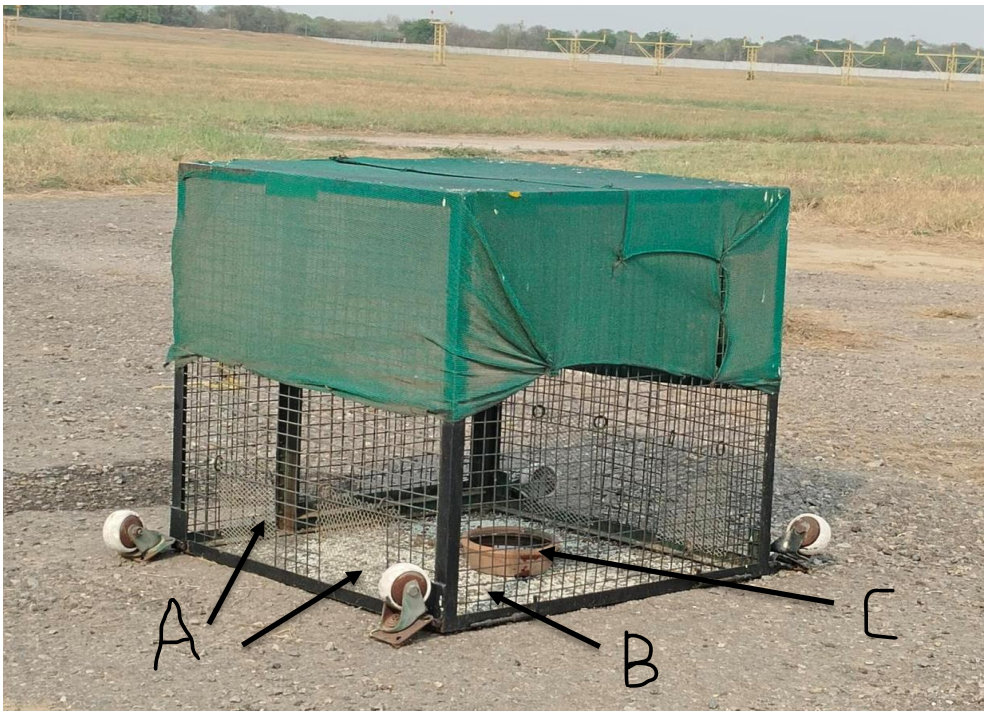


Image 3: Pigeon trap cage

A- Pigeon entry point which closes automatically once the bird gets into the cage
B- Feeding material offered inside the cage to lure the bird
C- Water pot is offered inside the cage to lure the bird

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—