AVISURE

MITIGATING BIRD STRIKE RISK

MackayAirport

# Wildlife Hazard Management Plan

## Supplement: 1.5

August 2017

# Summary

Wildlife, especially birds, are a threat to air safety, particularly when present on the airport and on or in the vicinity of runways. The aim of this Supplement for the Mackay Airport Wildlife Management Plan is to provide an update to the risk assessment and a general program review. This document should be read in reference to the Mackay Airport Wildlife Hazard Management Plan (2012).

Avisure has helped guide Mackay Airport's wildlife management program since 2005. During this time, the strike risk has declined in response to the successful implementation of wildlife management strategies by airport staff, and the maturity of the wildlife management program.

The previous three years of the program has seen Avisure and Mackay Airport work together to progress the airport's autonomy and independence regarding the implementation of the wildlife management program, including program evaluations and assessments. So far, noticeable improvements have been made in:

- bird identification
- strike handling and carcass identification
- monitoring and wildlife survey methods
- standard operating procedures
- data capture, handling, and analysis
- liaison with the Department of Environment and Heritage Protection regarding flying-foxes.

# Record of Review

Details of all Wildlife Hazard Management Plan annual reviews are maintained as separate documents (e.g. this Supplement), and are referred to as part of any major review.

This review will be attached to the current Wildlife Hazard Management Plan until the next major review.

| Rev | Review Date | Review Type | Authorised | Signature |
|---|---|---|---|---|
| 1.0 | Feb. 2012 | Wildlife Hazard Management Plan | Philip Clark<br>Manager Aviation Operations | |
| 1.0 | Sep. 2012 | Updates to:<br>• Risk assessment<br>• Species action plans | Philip Clark<br>Manager Aviation Operations | |
| 1.1 | Sep. 2013 | Updates to:<br>• Culling and egg/nest removal<br>• Risk assessments<br>• Species actions plans | Philip Clark<br>Manager Aviation Operations | |
| 1.2 | Jul. 2014 | Updates to:<br>• Risk assessment<br>• Species management table<br>• Species action plans | Philip Clark<br>Manager Aviation Operations | |
| 1.3 | Jul. 2015 | Updates to:<br>• Risk assessment<br>• Risk Characterisation<br>• Landscaping Policy<br>• Species action plans | Philip Clark<br>Manager Aviation Operations | |
| 1.4 | Jul. 2016 | Updates to:<br>• Risk assessment<br>• Risk Characterisation<br>• Species Action Plans<br>• Wildlife Count Procedure | Philip Clark<br>Manager Aviation Operations | |
| 1.5 | Jul. 2017 | Updates to:<br>• Risk assessment<br>• Risk Characterisation<br>• Species Action Plans | Philip Clark<br>Manager Aviation Operations | |

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# 1. Introduction

## 1.1 Background

In July 2012, Mackay Airport Pty Ltd (MAPL) developed and implemented a Wildlife Hazard Management Plan (WHMP) that aimed to define the wildlife strike risk at Mackay Airport (YBMK) and to set objectives, performance indicators and procedures for the systematic management of that risk. YBMK contracted Avisure to complete an annual review of the WHMP in accordance with the review schedule.

## 1.2 Annual Review

The annual review involved:

- On- and off-airport wildlife surveys to collect data for risk assessments and to evaluate wildlife trends.
- Assessing the risk via industry-endorsed methodologies to identify current hazardous species.
- Assessing the currency and efficacy of Wildlife Hazard Management Procedures and Policies.
- Cross-checking program performance against Key Performance Indicators (Appendix B).

The WHMP Supplement Report 1.5 (this document) presents a summary of the findings along with recommendations for appropriate progression of the wildlife management program, and should be read in conjunction with the WHMP which remains the guiding document for the management of wildlife hazards at YBMK.

The annual review was limited by:

- a single round (morning, midday, afternoon and nocturnal) surveys conducted quarterly
- local climatic conditions on the day of surveys.

Despite these limitations, the annual review:

- updated the risk assessment to determine current hazards
- reviewed and updated the scorecard to highlight program trends
- provided recommendations for further progression of the wildlife management program.

### 1.2.1 Review Summary

The current YBMK total strike rate is 6.55 strikes per 10,000 RPT aircraft movements[1]. YBMK did not report any damaging strikes between July 2016 and June 2017, and the strike trend overall since July 2012 is stable. YBMK achieved 100% compliance to of the WHMP Review Checklist (Appendix A), and the species risk assessment identified 6 high and 16 moderate risk species.

**Key program initiatives:**

Table 1 details the initiatives achieved to date after completing the final year of a three-year program. The goal of the program is to advance Mackay Airport to have one of the most internally capable programs within Australia.

**Table 1.** Program initiatives up to and including 2016/17, MAPL

| Year | Initiative | Outcome |
|---|---|---|
| 2014/15 | Advanced wildlife survey procedure training. | Ability to conduct professional on- and off-airport surveys independent of Avisure. |
| | Advanced bird identification training. | Ability to identify species using a dichotomous key. |
| 2015/16 | Advanced ecological event training. | Ability to identify the changes in season, weather, flora, etc., and have the ability to think critically on how it might impact the strike risk. |
| | Data entry handling. | Ability to enter data correctly into a database and make correct assumptions from the data. |
| 2016/17 | Two-day Wildlife Hazard Management Course. | Training program designed to equip anyone involved in the management of wildlife strikes with the appropriate skills and knowledge. |
| | Improved data analysis. | Improved database set up and increased data sharing with Avisure. |
| | Implementation of monthly wildlife surveys (morning, midday, afternoon and nocturnal). | Practice runs completed and approved to be operational into the 2017/18 financial year. |
| | Update WHMP to include MAPL program initiatives and risk assessment. | This Supplement (1.5) will satisfy this initiative. |

[1] At the time of analysing data for this Supplement, movement data from Airservices Australian was only available up to May 2017; therefore, June 2017 was based on the average monthly movements between July 2016 and May 2017.

**Initiatives for 2017/18:**

Table 2 details the 2017/18 key program initiatives.

**Table 2.** Program targets for 2017/18, MAPL

| Target | Detail |
|---|---|
| Audit MAPL's Wildlife management program. | Avisure will Audit YBMK against the targets and actions detailed in the WHMP, including Civil Aviation Safety Authority (CASA) regulatory compliance. |
| Analyse Aerodrome Reporting Officer (ARO) survey data monthly. | Avisure will review YBMK ARO survey data to produce monthly risk review. This will provide a more frequent and up-to-date understanding of wildlife issues. |

# 2. Risk Assessment

Avisure conducted a combined risk assessment using strike data from YBMK and Australian Transport Safety Bureau (ATSB), and on-airport survey data collected during quarterly site visits (Table 3).

Figures 1 and 2 provides the results of the survey risk assessment and Table 4 the strike risk assessment results. Refer to Appendix C for risk assessment methods.

**Table 3.** Overall species risk rankings, July 2017, YBMK.

| Rank | Overall Risk | Species | Survey Risk | | Strike Risk |
|---|---|---|---|---|---|
| | | | Diurnal | Nocturnal | |
| 1 | High | Plumed Whistling-Duck | High | High | High |
| 2 | High | Bush Stone-curlew | - | Low | High |
| 3 | High | Magpie Goose | High | - | - |
| 4 | High | Straw-necked Ibis | High | - | - |
| 5 | High | Australian White Ibis | High | - | - |
| 6 | High | Unidentified Bird | - | - | High |
| 7 | Moderate | Masked Lapwing | Moderate | Moderate | Moderate |
| 8 | Moderate | Wandering Whistling-Duck | Moderate | - | Moderate |
| 9 | Moderate | Cattle Egret | Moderate | - | Moderate |
| 10 | Moderate | Rainbow Lorikeet | Moderate | - | Low |
| 11 | Moderate | Magpie Lark | Moderate | Low | - |
| 12 | Moderate | Feral Pigeon | Low | - | Moderate |
| 13 | Moderate | Unidentified Flying-fox | - | Low | Moderate |
| 14 | Moderate | Torresian Crow | Moderate | - | - |
| 15 | Moderate | Pacific Black Duck | Moderate | - | - |
| 16 | Moderate | Australasian Figbird | Moderate | - | - |
| 17 | Moderate | Galah | Moderate | - | - |
| 18 | Moderate | Radjah Shelduck | Moderate | - | - |
| 19 | Moderate | Little Black Cormorant | Moderate | - | - |
| 20 | Moderate | Silver Gull | Moderate | - | - |
| 21 | Moderate | Greater Sand Plover | - | Moderate | - |
| 22 | Moderate | Black Kite | - | - | Moderate |

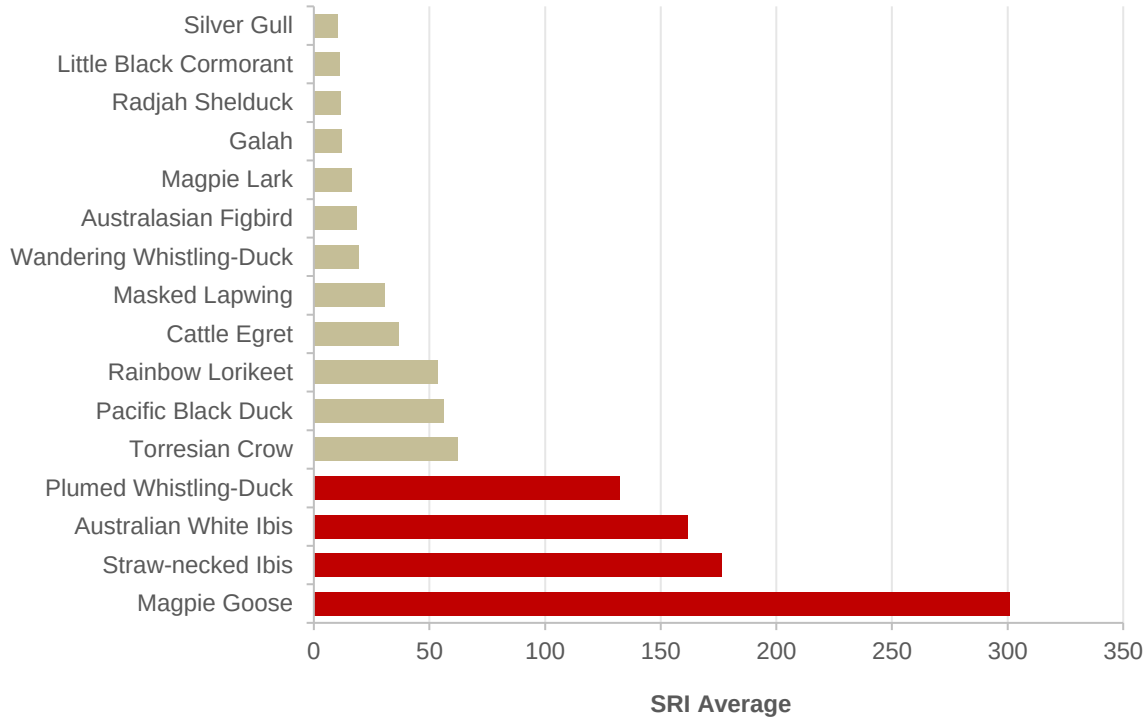


**Figure 1.** Species Risk Index (SRI) for species observed during diurnal surveys (moderate to high), July 2016 – June 2017, YBMK.

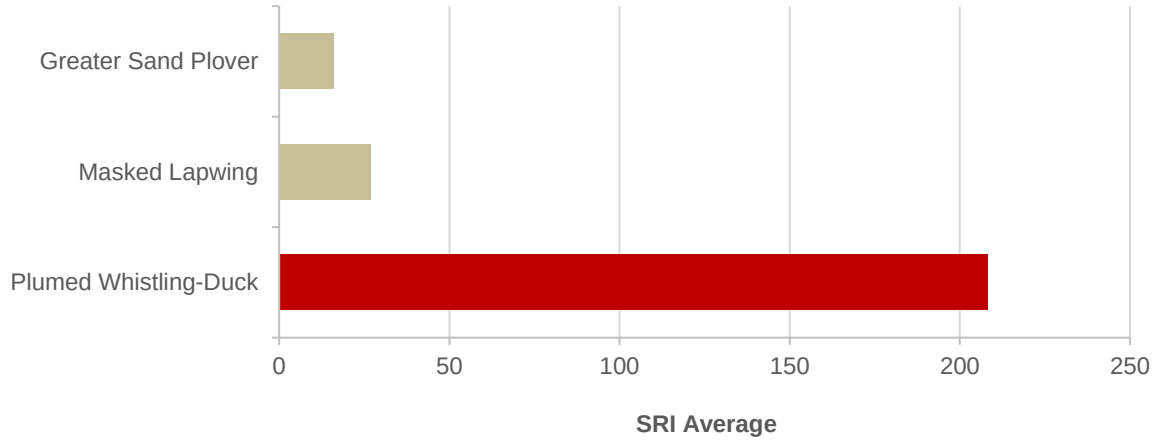


**Figure 2.** Species Risk Index (SRI) for species observed during the nocturnal survey (moderate to high), July 2016 – June 2017, YBMK.

**Table 4.** Species strike risk matrix, July 2012 to June 2017, YBMK.

| | | Probability of strikes (5 year strike average for each species) | | | | |
|---|---|---|---|---|---|---|
| | | Very Low | Low | Moderate | High | Very High |
| Probability of damage | Very Low | Unidentified Fairy-wren<br>Fairy Martin<br>Unidentified Tern<br>Rainbow Lorikeet<br>Red-capped Plover<br>Horsfield's Bushlark | Magpie Lark<br>Unidentified Microbat | Australasian Pipit | | |
| | Low | Eastern Grass Owl | Pacific Golden Plover | Nankeen Kestrel | | |
| | Moderate | | | Masked Lapwing*<br>Cattle Egret*<br>Black Kite<br>Unidentified Flying-fox | Unidentified Bird* | |
| | High | Feral Pigeon*<br>Wandering Whistling-duck | | Bush Stone-curlew* | | |
| | Very High | | Plumed Whistling Duck* | | | |

**Low Risk:** no further action beyond current management is required

**Medium Risk:** review current management practices and options for additional action required

**High Risk:** immediate action required to reduce the current risk

*** indicates elevation of strike risk rank due to multiple strike**

Comments:

- Three Plumed Whistling-ducks were involved in a single strike event in October 2013, this, along with significant numbers observed during airside surveys, contributed to their high-risk rank.
- The Bush Stone-curlew's high-risk rank is primarily due to four confirmed strikes in 2015/16.
- Frequent transits over the airfield by Australian White and Straw-necked Ibis often infringe critical airspace, which has resulted in their high-risk rank.
- The large body mass and flocking tendency of Magpie Geese contributes to their high risk. They are most frequently observed infringing critical airspace in the early morning and late evening as they leave and return to foraging and roosting habitats.

# 3. Strike and Survey Trends

## 3.1 On-airport Hazards

This section presents an analysis of strike data and professional survey data. YBMK and ATSB provided strike data, and Airservices Australia provided aircraft movement data.

### 3.1.1 Strike Data

**Table 5.** YBMK aircraft movement information

| Aircraft Classification | | Strike Susceptibility Level | Annual Movements 2016/17[1] |
|---|---|---|---|
| 1 | 136,000kg | High | 0 |
| 2 | 7,000kg – 136,000kg | Moderate | 10,886 |
| 3 | Military | Moderate | 146 |
| 4 | Under 7,000kg | Low | 6,744 |
| 5 | Helicopter | Low | 8,764 |

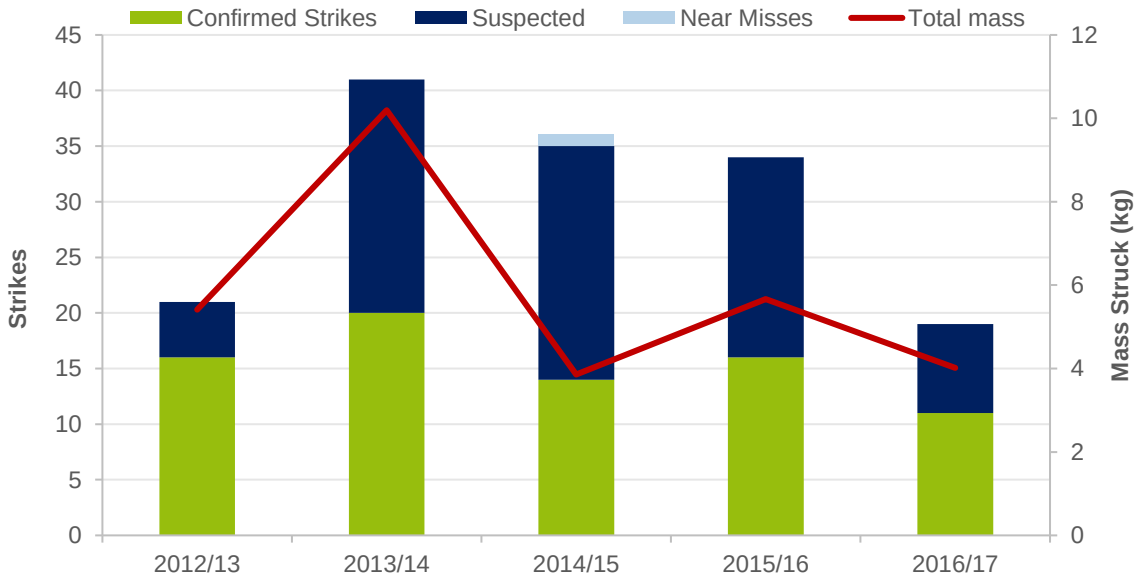


**Figure 3.** Total reported wildlife strikes and mass struck, July 2012 – June 2017, YBMK.

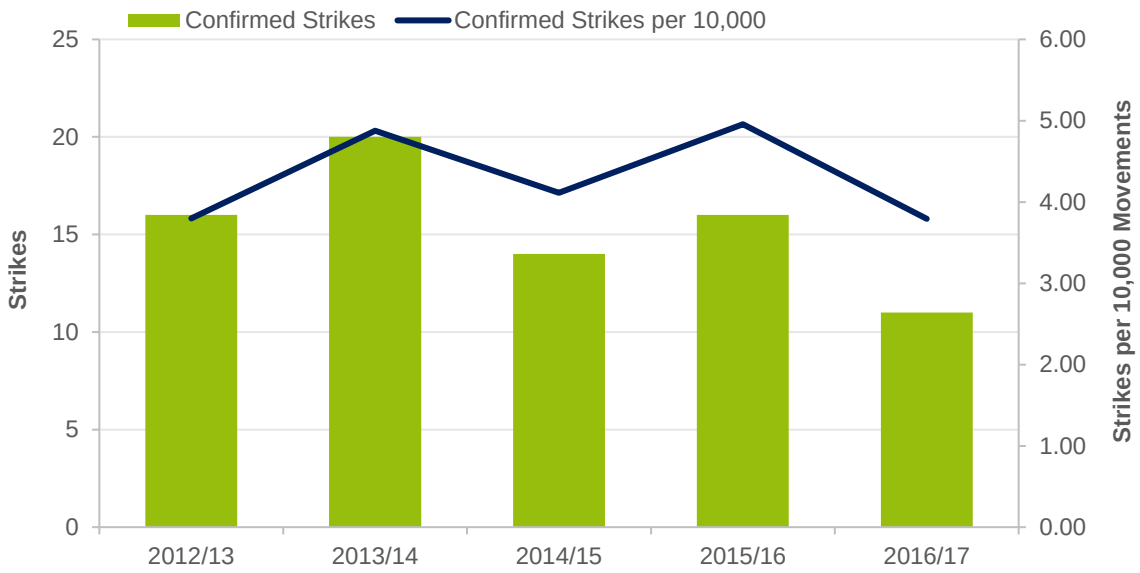


**Figure 4.** Total strikes, and total strikes per 10,000 aircraft movements for confirmed, on-airport and airport vicinity strikes, July 2012 – June 2017, YBMK.

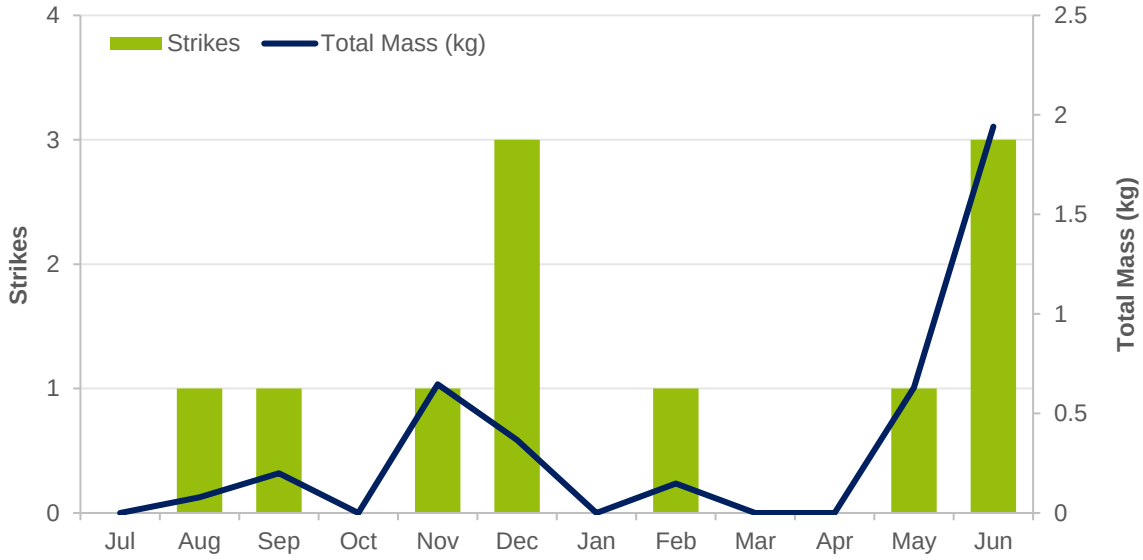


**Figure 5.** Total monthly strikes and mass struck (kg) for confirmed, on-airport and airport vicinity strikes, July 2016 – June 2017 YBMK.

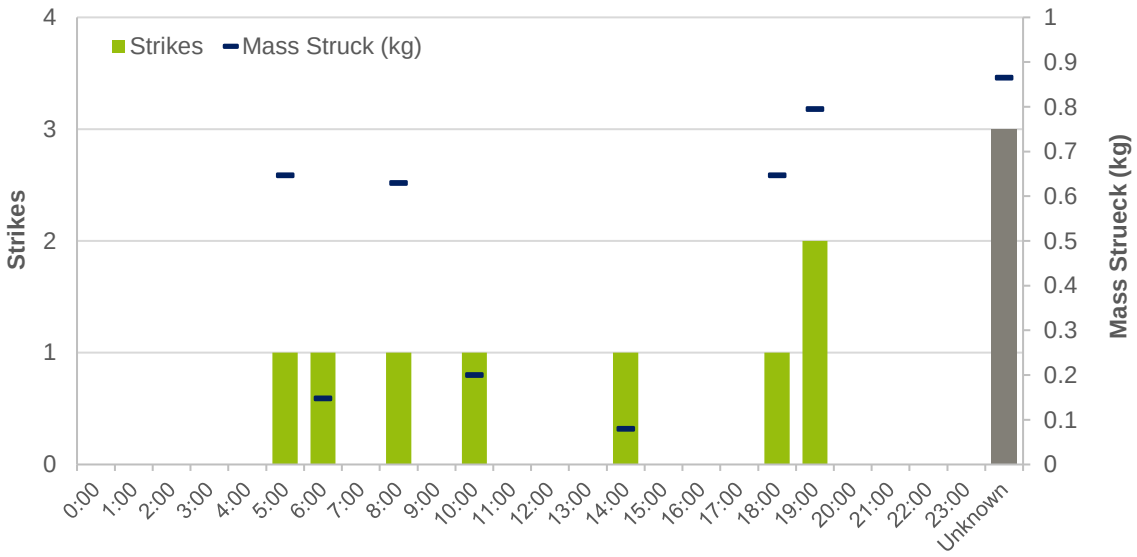


**Figure 6.** Total strikes and mass (kg) by time of day, July 2016 – June 2017, YBMK.

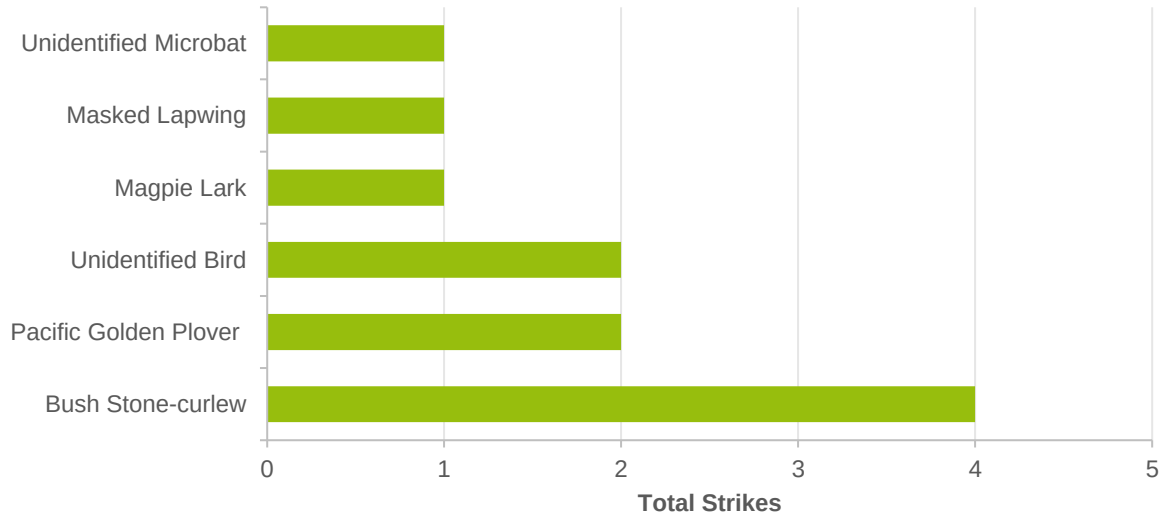


**Figure 7.** Species struck, July 2016 – June 2017, YBMK.

Comments:

- The high mass struck in June 2017 was due to three confirmed strike events with Bush Stone-curlews (647g each).
- December 2016 strikes involved an unidentified micro-bat, an unidentified bird and a Pacific Golden Plover.
- The morning strike risk is high due to more aircraft movement at that time, which also coincides with high bird activity.
- Species struck between 18:00 and 19:00 included Bush Stone-Curlew and Pacific Golden Plover.

### 3.1.2 Survey Data

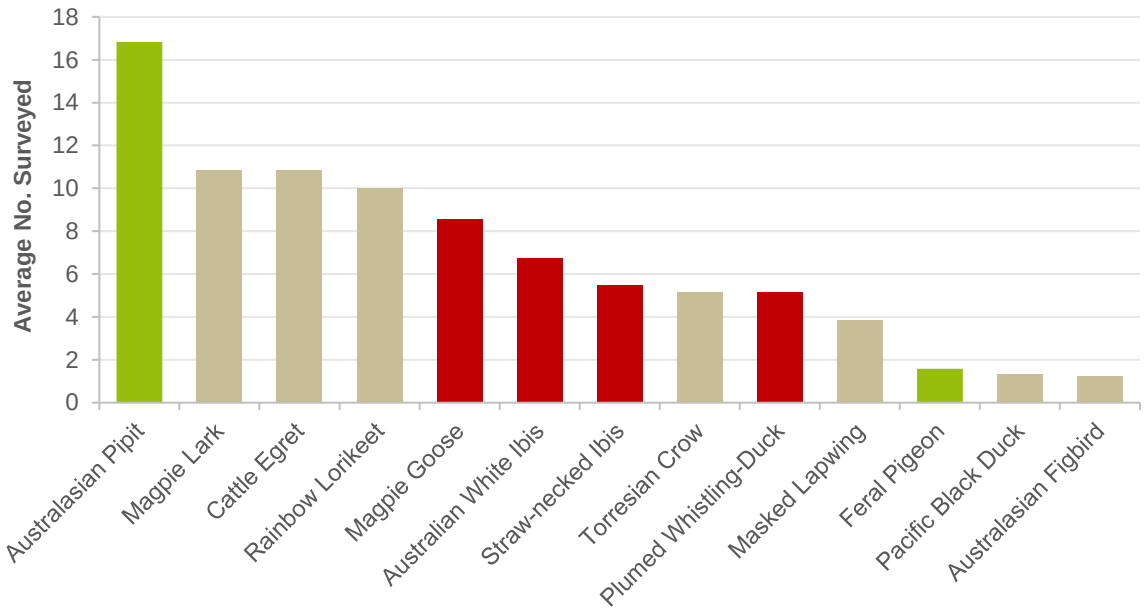


**Figure 8.** Average number of birds (>1) observed per survey, red = high risk, brown = moderate risk and green = low risk, June 2016 – July 2017, YBMK.

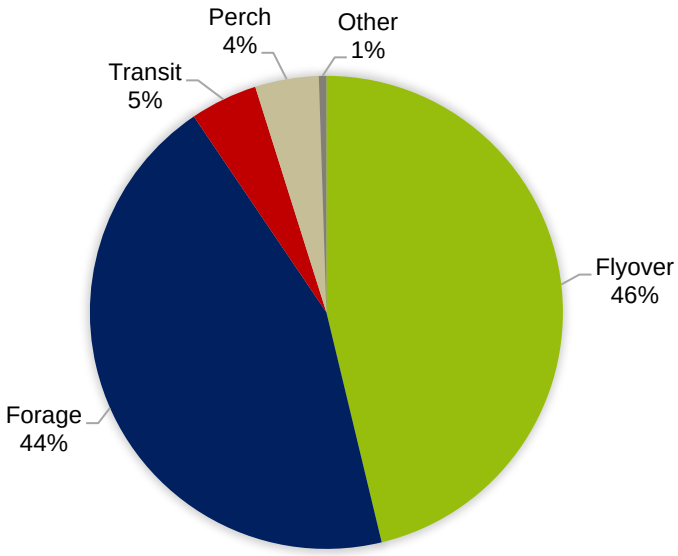


**Figure 9.** Proportion of bird behaviours observed (Other = loafing, nesting and chasing), June 2016 – July 2017, YBMK.

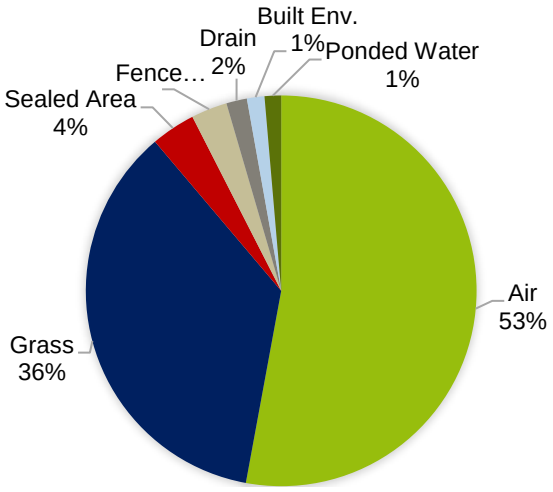


**Figure 10.** Proportion of habitat use by birds observed, July 2016 – June 2017, YBMK.

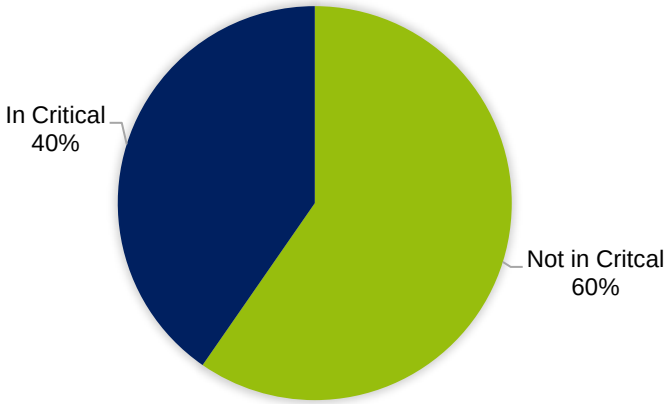


**Figure 11.** Proportion of birds observed in critical areas, July 2016 – June 2017, YBMK.

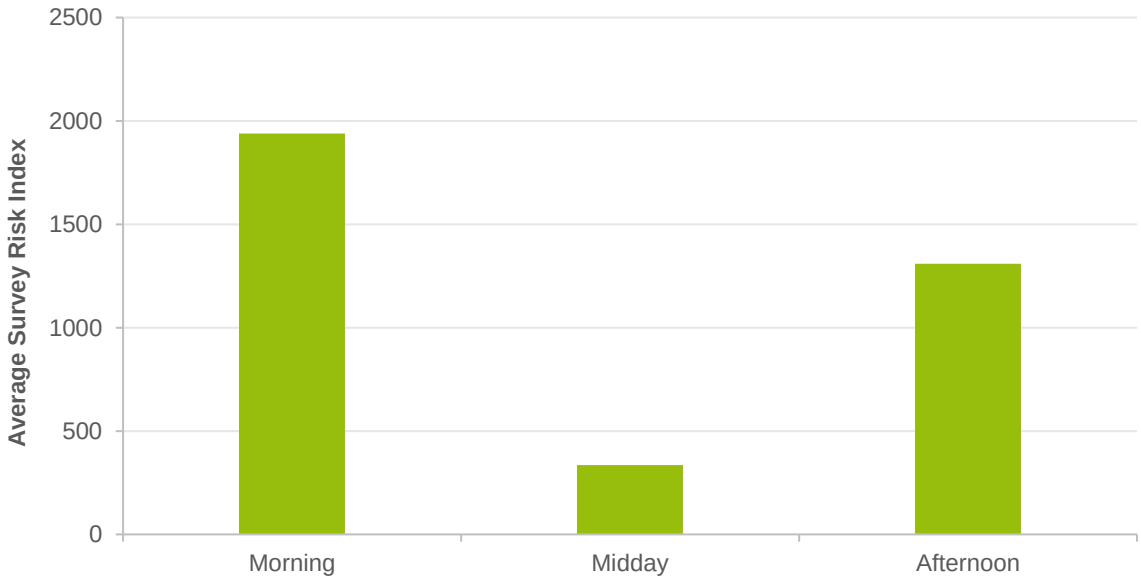


**Figure 12.** Airport Survey Risk Index by time of day, July 2016 – June 2017, YBMK.

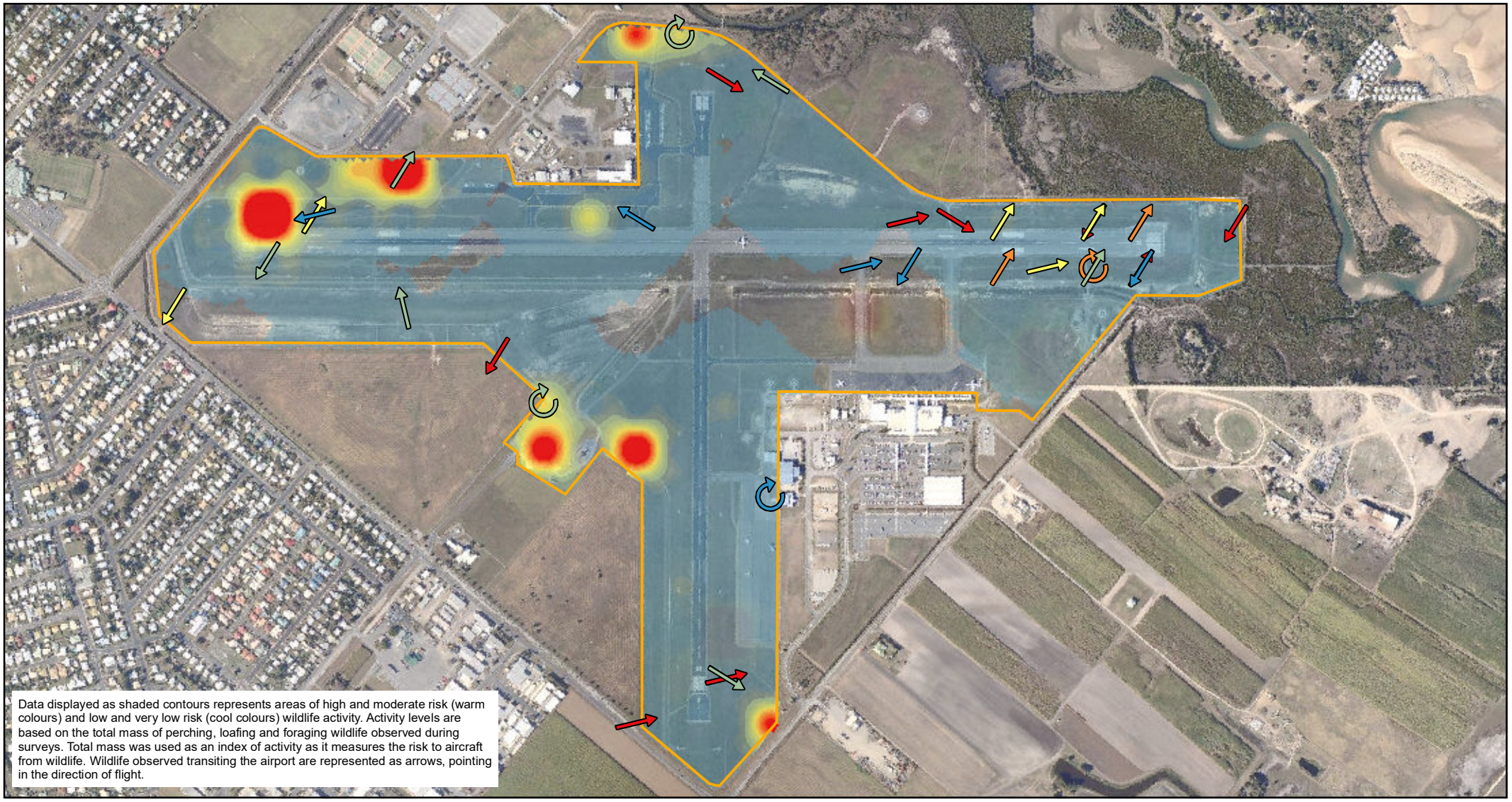


**Figure 13: Airside survey density using mass (kg) July 2016**

Mackay Airport Pty Ltd

Wildlife Management Program

Airport perimeter

**Mass recorded in air (kg)**

- Very low (< 0.140)
- Low (0.140 to 0.414)
- Moderate (0.415 to 0.696)
- High (0.697 to 1.407)
- Very high (>1.407)

**Mass recorded onground (kg)**

Very high: >1.407

Very low: <0.140

AVISURE
MITIGATING BIRD STRIKE RISK

Job number: PR1531
Revision: 0
Author: ALM
Date: 18/07/2017

0 100 200 400
Metres

GDA 1994 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA 1994
Units: Meter

**Data Sources:** © Avisure Pty Ltd, 2017; Aerial image : Nearmap, 2013
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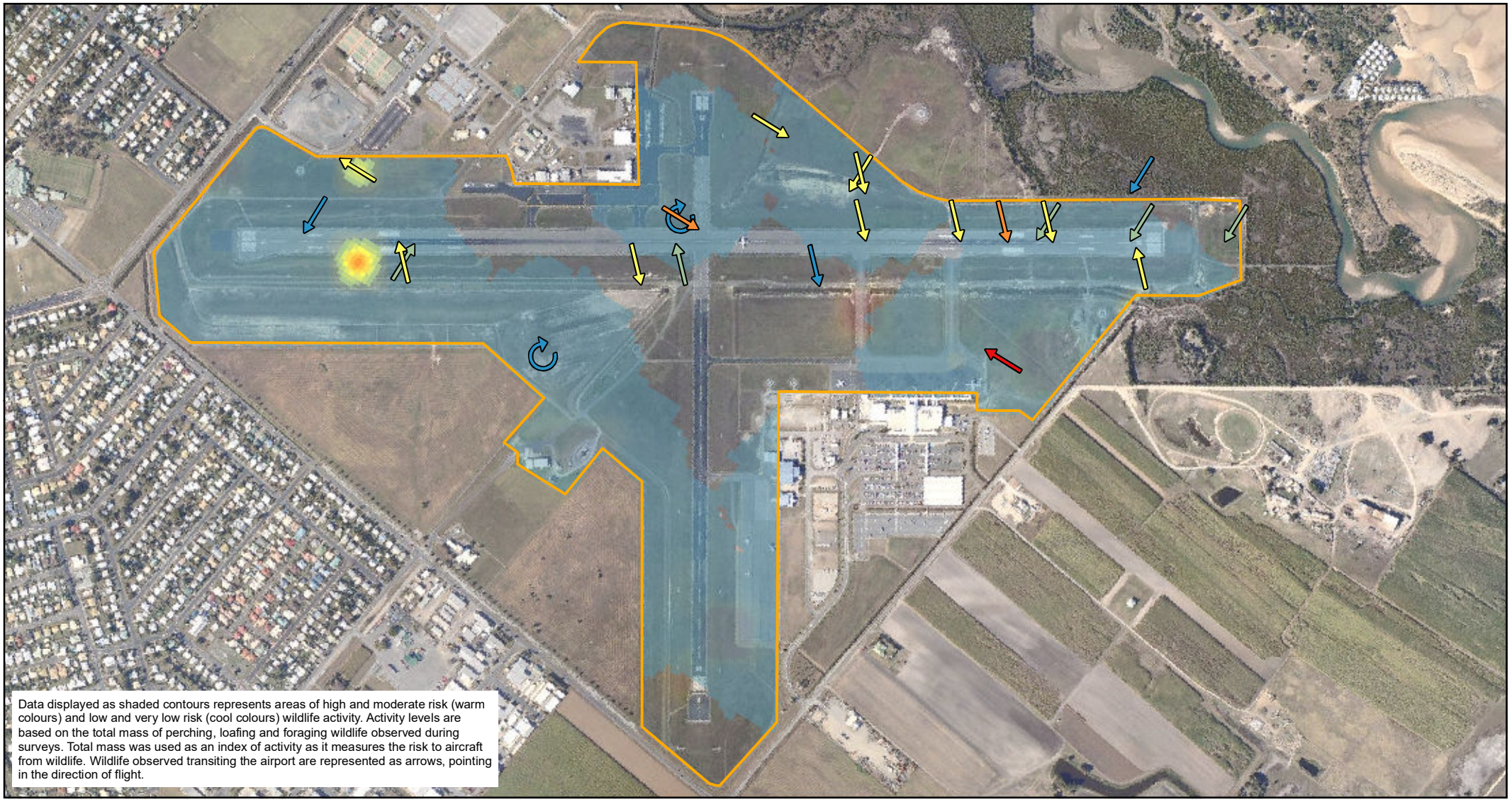


**Figure 14: Airside survey density using mass (kg) October 2016**

Mackay Airport Pty Ltd

Wildlife Management Program

**Mass recorded in air (kg)**

- Very low (< 0.140)
- Low (0.140 to 0.414)
- Moderate (0.415 to 0.696)
- High (0.697 to 1.407)
- Very high (>1.407)
- Airport perimeter

**Mass recorded onground (kg)**

Very high: >1.407

Very low: <0.140

AVISURE
MITIGATING BIRD STRIKE RISK

Job number: PR1531
Revision: 0
Author: ALM
Date: 18/07/2017

0 100 200 400
Metres

GDA 1994 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA 1994
Units: Meter

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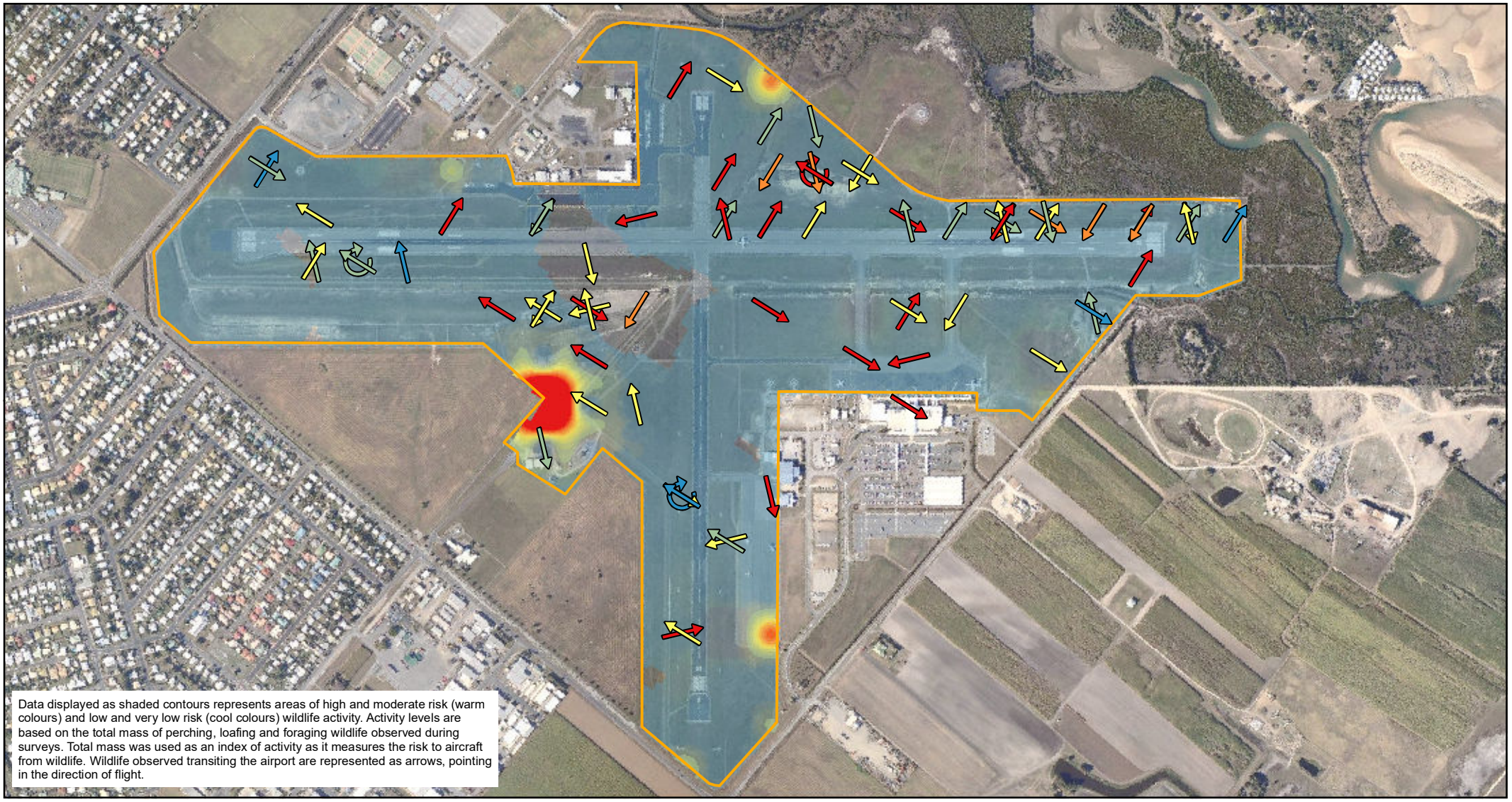


**Figure 15: Airside survey density using mass (kg) February 2017**

Mackay Airport Pty Ltd

Wildlife Management Program

Airport perimeter

**Mass recorded in air (kg)**

- Very low (< 0.140)
- Low (0.140 to 0.414)
- Moderate (0.415 to 0.696)
- High (0.697 to 1.407)
- Very high (>1.407)

**Mass recorded onground (kg)**

Very high: >1.407

Very low: <0.140

AVISURE
MITIGATING BIRD STRIKE RISK

Job number: PR1531
Revision: 0
Author: ALM
Date: 18/07/2017

0 100 200 400
Metres

GDA 1994 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA 1994
Units: Meter

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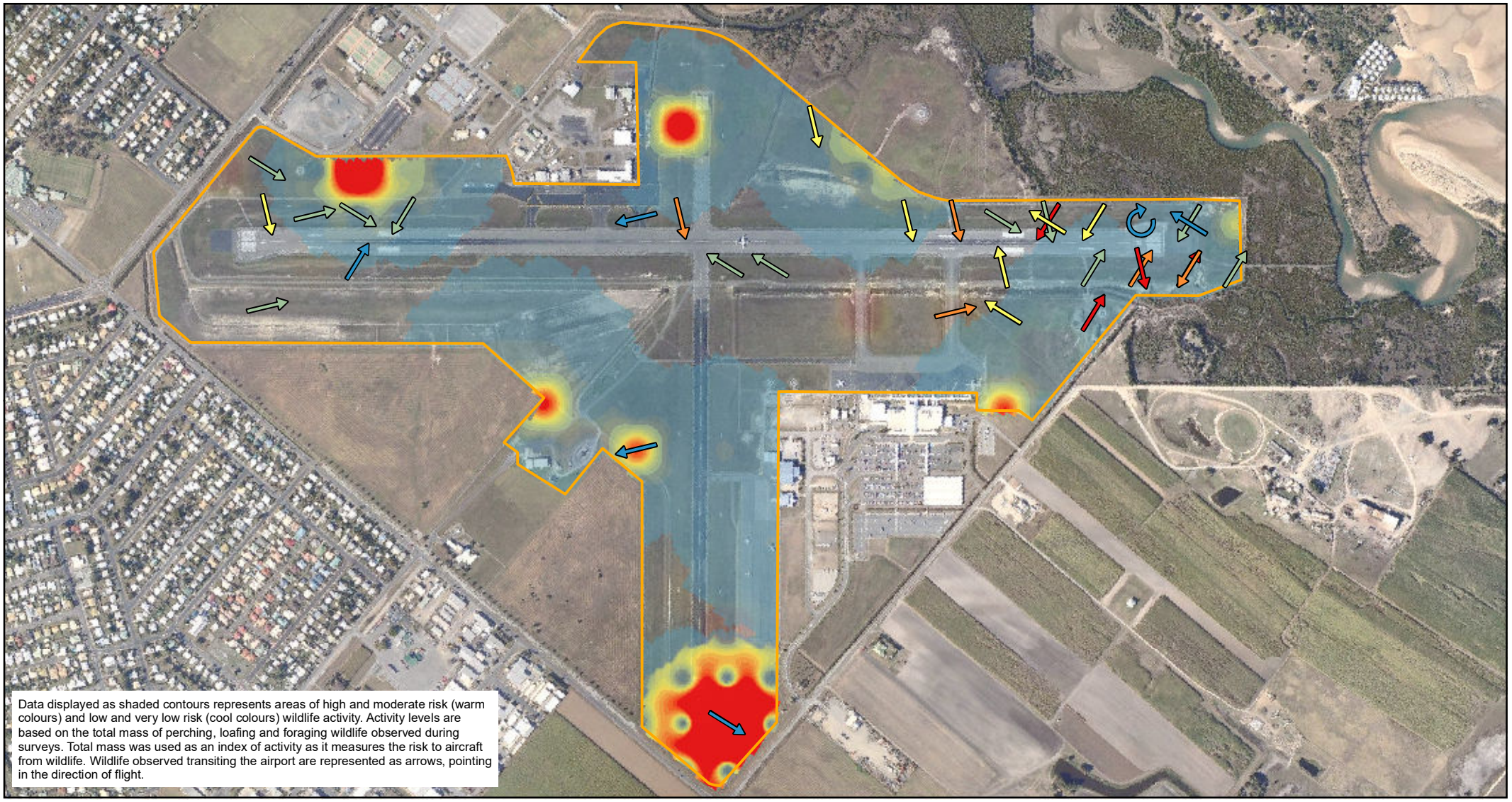


**Figure 16: Airside survey density using mass (kg) April 2017**

Mackay Airport Pty Ltd

Wildlife Management Program

Airport perimeter

**Mass recorded in air (kg)**

- Very low (< 0.140)
- Low (0.140 to 0.414)
- Moderate (0.415 to 0.696)
- High (0.697 to 1.407)
- Very high (>1.407)

**Mass recorded onground (kg)**

Very high: >1.407

Very low: <0.140

AVISURE
MITIGATING BIRD STRIKE RISK

Job number: PR1531
Revision: 0
Author: ALM
Date: 18/07/2017

0 100 200 400
Metres

GDA 1994 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA 1994
Units: Meter

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Comments:

- The highest proportion of birds observed in the air infringing critical airspace occurred over RWY32 (Figures 13-16).
- High risk species, including Plumed Whistling-duck, Magpie Goose, Australian White Ibis and Straw-necked Ibis, accounted for 47% of all critical airspace infringements.

## 3.2 Off-airport Hazards

Off-airport wildlife populations can contribute significantly to the strike risk at an airfield. Their movements may intersect aircraft flight paths either over the airfield, in the approaches or in areas used for low-level circuit operations. In addition, regional and local wildlife populations may fluctuate in response to seasonal, climatic or other environmental variables, increasing the strike hazard.

Avisure identified nine hazardous off-airport sites within 3 km of YBMK, fourteen within 8 km and one 13 km that attract wildlife (Table 6 and Figure 17).

**Table 6.** Summary of high and moderate risk species observed at off-airport hazardous sites, July 2016 – June 2017, YBMK.

| Location | Distance from YBMK (km) | Survey Frequency | Average birds per survey | |
|---|---|---|---|---|
| | | | High Risk | Moderate Risk |
| Off-airport Drains | 0.7 | Quarterly | 0 | 0 |
| Adjacent Cane Paddocks | 1.0 | Quarterly | 10 | 0 |
| Shellgrit Creek | 1.1 | Quarterly | 0 | 0 |
| Manzelmanns | 1.2 | Quarterly | 195 | 20 |
| Sportsfields | 1.3 | Quarterly | 0 | 23 |
| Illawong Beach | 1.7 | Quarterly | 0 | 0 |
| Farrelly's Road Farm | 2.1 | Annually | 55 | 12 |
| Botanical Gardens | 2.7 | Quarterly | 13 | 3 |
| Milton Street Oval Showgrounds | 2.9 | Annually | 67 | N/A |
| Paget Waste Management Centre | 3.1 | Annually | 11 | 6 |
| Racecourse | 3.2 | Annually | N/A | 12 |
| Gordan Street East Wetland | 3.3 | Annually | 1 | 4 |
| Sandfly Creek Estuary | 3.7 | Annually | N/A | 25 |
| Blue Water Lagoon | 3.9 | Annually | N/A | N/A |
| Bruce Highway Bridge | 4.4 | Annually | N/A | 50 |
| Thomas Borthwick and Sons Meatworks | 4.9 | Annually | 256 | 6 |
| North Mackay Dog Park | 5.2 | Annually | 127 | 14 |
| Walz Road Pond 2 | 5.4 | Annually | N/A | 2 |
| Gooseponds Park | 5.4 | Annually | 184 | 80 |
| Walz Road Pond 1 | 5.6 | Annually | N/A | 2 |
| Mackay South Water Recycle | 5.7 | Annually | N/A | N/A |
| Walz Road Pond 3 | 5.9 | Annually | N/A | N/A |
| Black Springs Golf Course | 6.0 | Annually | 17 | 3 |
| Mackay Marine Tourist Park | 6.7 | Annually | 2 | 3 |
| Mackay Harbour | 8.0 | Annually | N/A | N/A |
| Mackay Golf Couse | 9.4 | Annually | 144 | 25 |
| Bacasia Wetland | 14 | Annually | 7 | 40 |
| Mackay North Water Recycle | 16.0 | Annually | N/A | N/A |

Comments:

- Manzelmanns continues to contribute to the strike risk due to:
    - The provision of loafing and foraging habitat for high risk species (Australian White Ibis, Magpie Goose, and Plumed Whistling-duck).
    - Its close proximity to the airfield whereby flocks of birds travelling north along the coastline or to Pioneer River must cross YBMK airspace en-route.
- Since the previous annual review, additional locations have been included because they support large numbers of high risk species. New sites include: the Meatworks, Farrelly's Road Farm, Gooseponds Park, Mackay Golf Couse, Milton Street Oval Showgrounds, and North Mackay Dog Park.

**Figure 17: Off airport survey points - Mackay**

Mackay Regional Council

Shellgrit Creek Off-Airport Assessment

- Off airport survey site
- Airport perimeter
- Distance from runway (3, 8 and 13 km)

AVISURE
MITIGATING BIRD STRIKE RISK

Job number: PR2483
Revision: 0
Author: ALM
Date: 28/08/2017

0 1,000 2,000 4,000
Metres

GCS WGS 1984
Datum: WGS 1984
Units: Degree

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# 4. Recommendations

This section provides recommendations to improve management of wildlife hazards at YBMK and reduce the strike risk. (see Appendix D for quarterly program recommendations).

**Table 7.** YBMK wildlife hazard management recommendations, July 2017.

| Component | Recommendation | Responsibility | Timeframe |
|---|---|---|---|
| Hazard Monitoring | Increase nocturnal patrols to targeting Bush Stone-curlews and Plumed Whistling-ducks. | ARO | ASAP |
| Hazard Management | Manage Bush Stone-curlews in accordance with the Species Action Plan (Section 5). | ARO | As required |
| Off-airport Hazard Monitoring | Increase monitoring of the following off-airport sites:<br>• Meatworks<br>• Gooseponds Park<br>• Mackay Golf Course<br>• North Mackay Dog Park<br>• Milton Street Oval Showgrounds | Avisure and MAPL | July 2017 onwards |
| Communication | Provide MAPL with wording for any required updates of the YBMK ERSA entry, detailing seasonal wildlife hazards. | Avisure | Quarterly |
| | Invite landowners/operators from the newly identified off-airport sites to attend the YBMK Wildlife Hazard Committee meetings:<br>• Meatworks<br>• Gooseponds Park<br>• Mackay Golf Course<br>• North Mackay Dog Park<br>• Milton Street Oval Showgrounds | MAPL | Annually |

| | | | |
|---|---|---|---|
| | Re-invite the following landowners/operators to attend the YBMK Wildlife Hazard Committee meetings:<br>• Adjacent cane formers<br>• Manzelmans | MAPL | Annually |

# 5. Species Action Plans

This section details the actions required to manage moderate to very-high risk species.

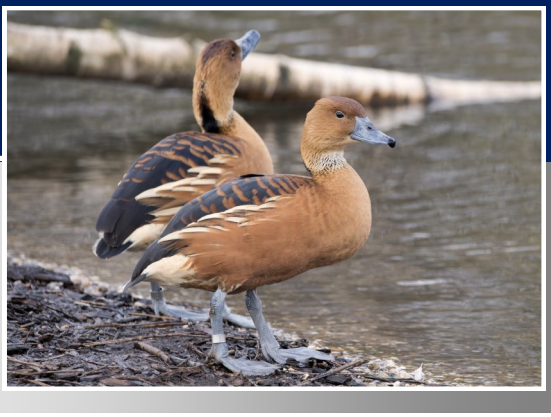
Species Action Plans (High Risk):

- Plumed Whistling-Duck
- Bush Stone-curlew
- Magpie Goose
- Straw-necked Ibis
- Australian White Ibis
- Unidentified Bird

Species Action Plans (Moderate Risk):

- Masked Lapwing
- Wandering Whistling Duck
- Cattle Egret
- Rainbow Lorikeet
- Magpie Lark
- Feral Pigeon
- Unidentified Flying-fox
- Torresian Crow
- Pacific Black Duck
- Australasian Figbird
- Galah
- Rajah Shelduck
- Little Black Cormorant
- Sliver Gull
- Greater Sand Plover
- Black Kite

AVISURE
MITIGATING BIRD STRIKE RISK



# Plumed Whistling Duck

*Dendrocygna eytoni*

**HIGH RISK**

## KEY IDENTIFICATION FEATURES

Elongated flank-plumes that project above the body line

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 1000 |
| Length (cm): | 40-60 |
| Wingspan (cm): | 75-90 |

## STRIKE HISTORY (2012/13 - 2016/17)

| | |
|---|---|
| Total Strikes: | 3 |
| Multiple Strikes: | 3 |
| Strikes/10000 RPT Mvts: | 1.03 |
| Damaging Strike Rate: | 0% |

## AIRSIDE ATTRACTANTS

**Food:**
Grasses and seeds.

**Habitat:**
Prefers grasslands in vicinity of water bodies.

**Activity Hotspots:**
Transits over YBMK between adjacent foraging and roosting habitats. They often use the airfield at night.

## HAZARD DESCRIPTION

Short grass, access to food and water, and lack of predators, make airports particularly attractive to Plumed Whistling Ducks. Their relatively large body size, coupled with their tendency to form small groups, create a serious strike risk when left unmanaged. They will often use airports at night to forage, venturing into open grassed areas adjacent aircraft movement areas to forage on grasses and seeds.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips, particularly at night, for individuals and groups, report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal and disperse during early evening periods to prevent them settling for the night.
- Consider employing the use of a dog trained to disperse ducks if conventional dispersal methods are ineffective
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.

### Passive Management:

- Remove, or restrict access to, permanent or semi-permanent water sources on-airport (e.g. retention ponds, drains etc.).
- Maintain airside grass height at 200-300mm, including the regular removal of seed heads.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

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# Bush Stone-curlew

*Burhinus grallarius*

**HIGH RISK**

## KEY IDENTIFICATION FEATURES

White lines over the top of the eye. Will often remain motionless when disturbed.

## CONSERVATION STATUS

NSW / VIC: Endangered
SA: Rare

## SIZE

| | |
|---|---|
| Weight (g): | 647 |
| Length (cm): | 55-59 |
| Wingspan (cm): | 80-105 |

## STRIKE HISTORY (2012/13 - 2016/17)

| | |
|---|---|
| Total Strikes: | 11 |
| Multiple Strikes: | 0 |
| Strikes/10000 RPT Mvts: | 3.79 |
| Damaging Strike Rate: | 0% |

## AIRSIDE ATTRACTANTS

**Food:**
Insects, molluscs, small lizards, seeds and occasionally small mammals.

**Habitat:**
Short grass to forage and loaf. Sealed areas, particularly at night, to forage on insects that are attracted by apron and runway lights.

**Activity Hotspots:**
Forages on the grass in runway undershoots. Often observed at night in grass and on sealed areas.

## HAZARD DESCRIPTION

Airside lighting attract insects which in turn attract Bush Stone-curlews into aircraft movement areas such as aprons, taxiways and runways. It is their presence in these critical areas that contribute to the strike risk. Because they are active at night, they are often difficult to detect by aircrews and wildlife control personnel. When disturbed they will often lay down flat, legs tucked in with their head and neck laying flat in front of their body. They will remain in this position motionless even when approached at close range before quickly fleeing.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips, particularly at night, for individuals and report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.
- Locate and destroy ground nests.
- Consider employing the use of a dog trained to disperse curlew if conventional dispersal methods are ineffective.

### Passive Management:

- Maintain airside grass height at 200-300mm.
- Turn off-runway lights when not in use to reduce insect activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

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# Magpie Goose

*Anseranas semipalmata*

**HIGH RISK**

## KEY IDENTIFICATION FEATURES

Orange-yellow legs. Black and white plumage. Distinctive cranial knob.

## CONSERVATION STATUS

NSW: Vulnerable
SA: Endangered
VIC: Threatened

## SIZE

| | |
|---|---|
| Weight (g): | 2400 |
| Length (cm): | 70-79 |
| Wingspan (cm): | 165 |

## STRIKE HISTORY (2012/13 - 2016/17)

Total Strikes: 0

## AIRSIDE ATTRACTANTS

**Food:**
Grass seeds in wet season, sedge rhizomes in dry season with grass when swamps dry out.

**Habitat:**
Habitat and distribution is largely determined by the presence of surface water. Open grassed areas (e.g. airports, ovals etc.) provide ideal habitat due to the presence of surface water and grass.

**Activity Hotspots:**
Transits through critical areas between adjacent off-airport habitats.

## HAZARD DESCRIPTION

Magpie Geese present a serious strike risk because of their large body mass and tendency to form large flocks. Outside of the breeding season, they are gregarious and can form colonies of up to 50,000 individuals. Although generally crepuscular, they may also feed throughout the day.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for individuals, report hazard to aircraft operators.
- Remove the immediate hazards using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal and disperse during early morning periods to prevent them settling for the day.
- Consider employing the use of a dog trained to disperse geese if conventional dispersal methods are ineffective.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.

### Passive Management:

- Remove, or restrict access to, permanent or semi-permanent water sources on-airport (e.g. retention ponds, drains etc.).
- Maintain airside grass height at 200-300mm, including the regular removal of seed heads. Do not exceed heights of 300mm.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

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PRESENT ON AIRPORT

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AVISURE
MITIGATING BIRD STRIKE RISK

# Straw-necked Ibis

*Threskiornis spinicollis*

**HIGH RISK**

## KEY IDENTIFICATION FEATURES

Black bald head. Downward curved black bill. Yellow throat plumes. Glossy black back.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 1100-1500 |
| Length (cm): | 60-70 |
| Wingspan (cm): | 100-120 |

## STRIKE HISTORY (2012/13 - 2016/17)

Total Strikes: 0

## AIRSIDE ATTRACTANTS

**Food:**
Insects such as grasshoppers, beetles, caterpillars and spiders.

**Habitat:**
Grasslands, terrestrial wetlands, farmland.

**Activity Hotspots:**
Often transits over YBMK through critical areas, occasionally forages on short grass throughout the airfield.

## HAZARD DESCRIPTION

Because of their preference for short-grass for foraging, airports are very attractive to ibis. Airports not only offer large areas of short-grass where they can safely forage whilst being vigilant to predators, they also offer a relatively predator-free environment thanks to the tall perimeter fence and general activity of aircraft and vehicles. Ibis transiting through airport airspace to access adjacent habitats, such as wetlands and agricultural fields, present a serious strike risk because of their large body mass.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for flocks and report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.
- Consider employing the use of a dog trained to disperse ibis if conventional dispersal methods are ineffective.

### Passive Management:

- Maintain airside grass height at 200-300mm.
- Limit the availability of irrigated and manicured grassland.
- Where possible, schedule flight operations to avoid peak activity.
- Mow at night, at least in the flight strip, to reduce the insect attraction.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.
- If local breeding colonies are identified, liaise with local government and land users to develop a regional ibis management program that may include options such as: roost management and breeding restriction programs (i.e. egg and nest removal).

BREEDING SEASON

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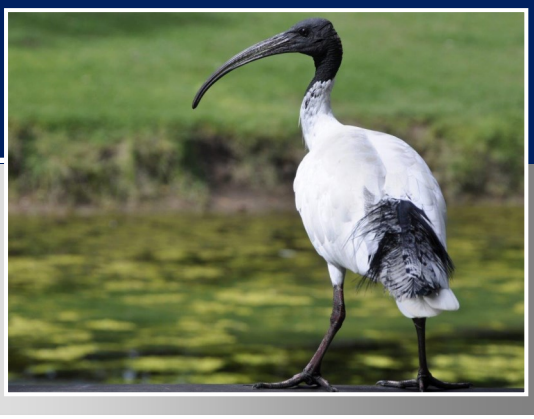
AVISURE
MITIGATING BIRD STRIKE RISK



# Australian White Ibis

*Threskiornis mollucca*

**HIGH RISK**

## KEY IDENTIFICATION FEATURES

Black bald head. Downward curved black bill. Exposed scarlet skin under the wing.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 1400-2500 |
| Length (cm): | 65-75 |
| Wingspan (cm): | 110-125 |

## STRIKE HISTORY (2012/13 - 2016/17)

Total Strikes: 0

## AIRSIDE ATTRACTANTS

**Food:**
Primarily small aquatic prey; fish, frogs, crustaceans. Also crickets, earthworms, beetles and sometimes snakes.

**Habitat:**
Terrestrial wetlands, sheltered marine and estuarine habitat. Also landfills and urban parks and gardens.

**Activity Hotspots:**
Generally flies over YBMK between adjacent habitats. Occasionally observed foraging in airside grass.

## HAZARD DESCRIPTION

Because of their preference for short-grass for foraging, airports are very attractive to ibis. Airports not only offer large areas of short-grass where they can safely forage whilst being vigilant to predators, they also offer a relatively predator-free environment thanks to the tall perimeter fence and general activity of aircraft and vehicles. Ibis transiting through airport airspace to access adjacent habitats, such as wetlands and landfills, present a serious strike risk because of their large body mass.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for flocks and report hazards to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.
- Consider employing the use of a dog trained to disperse ibis if conventional dispersal methods are ineffective.

### Passive Management:

- Maintain airside grass height at 200-300mm.
- Limit the availability of irrigated and manicured grassland.
- Restrict access to airside and landside waste bins and skips.
- Where possible, schedule flight operations to avoid peak activity.
- Mow at night, at least in the flight strip, to reduce the insect attraction.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.
- If local breeding colonies are identified, liaise with local government and land users to develop a regional ibis management program that may include options such as: landfill management, roost management and breeding restriction programs (i.e. egg and nest removal).

BREEDING SEASON

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AVISURE
MITIGATING BIRD STRIKE RISK

# Masked Lapwing

*Vanellus miles*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Yellow wattle in front of the eyes. Thorny spur on the wings.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 315 |
| Length (cm): | 30-37 |
| Wingspan (cm): | 78-85 |

## STRIKE HISTORY (2012/13 - 2016/17)

| | |
|---|---|
| Total Strikes: | 8 |
| Multiple Strikes: | 6 |
| Strikes/10000 RPT Mvts: | 2.76 |
| Damaging Strike Rate: | 25% |

## AIRSIDE ATTRACTANTS

**Food:**

Molluscs, crustaceans, worms, centipedes, millipedes, insects; occasional seeds, frogs, leaves.

**Habitat:**

Short grass to nest, forage and loaf. Sealed areas, particularly at night, to forage on insects that are attracted by apron and runway lights.

**Activity Hotspots:**

Forages throughout the airport, predominantly in areas of short grass.

## HAZARD DESCRIPTION

Because of their preference for short-grass to establish their breeding and foraging territories, airports are very attractive to lapwings. Airports not only offer large areas of short-grass where they can safety forage whilst keeping an eye out for predators, they also offer a relatively predator-free environment thanks to the tall perimeter fence and general activity of aircraft and vehicles. Lapwings are highly territorial during the breeding season, and will aggressively defend their nests and young against all potential predators, including aircraft. It is this behaviour that makes them a particularly hazardous strike

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for individuals and report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.
- Locate and destroy ground nests.
- Consider employing the use of a dog trained to disperse lapwings if conventional dispersal methods are ineffective.

### Passive Management:

- Maintain airside grass height at 200-300mm.
- Mow at night, at least in the flight strip, to reduce the insect attraction.
- Turn off-runway lights when not in use to reduce insect activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

J F M A M J J A S O N D

PRESENT ON AIRPORT

J F M A M J J A S O N D

# Wandering Whistling Duck

*Dendrocygna arcuata*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Loud whistle call, long legs, darkish crown.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 750 |
| Length (cm): | 54-60 |
| Wingspan (cm): | 80-95 |

## STRIKE HISTORY (2012/13 - 2016/17)

| | |
|---|---|
| Total Strikes: | 1 |
| Multiple Strikes: | 0 |
| Strikes/10000 RPT Mvts: | 0.34 |
| Damaging Strike Rate: | 0% |

## AIRSIDE ATTRACTANTS

**Food:**

Grasses, waterlilies, water plants, occasionally insects and aquatic vertebrae.

**Habitat:**

Lagoons, flooded grasslands, dams.

**Activity Hotspots:**

Primarily a nocturnal hazard. Commonly loafs in grass, drains and ponded water around YBMK.

## HAZARD DESCRIPTION

Short grass, access to food and water, and lack of predators, make airports particularly attractive to Wandering Whistling Ducks. Their relatively large body size, coupled with their tendency to form small groups, create a serious strike risk when left unmanaged. They will often use airports at night to forage, venturing into open grassed areas adjacent aircraft movement areas to forage on grasses and seeds.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips, particularly at night, for individuals and groups, report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal and disperse during early evening periods to prevent them settling for the night.
- Consider employing the use of a dog trained to disperse ducks if conventional dispersal methods are ineffective.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.

### Passive Management:

- Remove, or restrict access to, permanent or semi-permanent water sources on-airport (e.g. retention ponds, drains etc.).
- Maintain airside grass height at 200-300mm, including the regular removal of seed heads.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

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# Cattle Egret

*Ardea ibis*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Small all white egret. When breeding they develop orange on the crown, neck and chest.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 365 |
| Length (cm): | 48-53 |
| Wingspan (cm): | 90 |

## STRIKE HISTORY (2012/13 - 2016/17)

| | |
|---|---|
| Total Strikes: | 3 |
| Multiple Strikes: | 2 |
| Strikes/10000 RPT Mvts: | 1.03 |
| Damaging Strike Rate: | 33% |

## AIRSIDE ATTRACTANTS

**Food:**
Prefers grasshoppers, but will eat a range of invertebrates, frogs, lizards, and small mammals.

**Habitat:**
Cattle paddocks, pastures, croplands, landfill, wetlands, tidal mudflats.

**Activity Hotspots:**
Small flocks (<11) forage in airside grass, primarily during the morning.

## HAZARD DESCRIPTION

Short grass, access to food and water, and lack of predators, make airports particularly attractive to egrets. Their relatively large body size, coupled with their tendency to form small groups, create a serious strike risk when left unmanaged. They can be difficult to disperse, often relocating only short distances on the airfield when harassed, making persistence a key attribute of successful active management. Airports with cattle grazing activity in close proximity to airfield can elevate the strike risk.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for individuals, report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal and disperse during early morning periods to prevent them settling for the day.
- Consider employing the use of a dog trained to disperse egrets if conventional dispersal methods are ineffective.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.

### Passive Management:

- Remove, or restrict access to, permanent or semi-permanent water sources on-airport (e.g. retention ponds, drains etc.).
- Locate and fill low-lying areas on the airfield that temporarily accumulate water after rainfall.
- Maintain airside grass height at 200-300mm.
- Mow at night to reduce the insect attraction.
- Remove any refuges, such as small islands in the middle of water bodies, dense reeds and aquatic vegetation.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

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PRESENT ON AIRPORT

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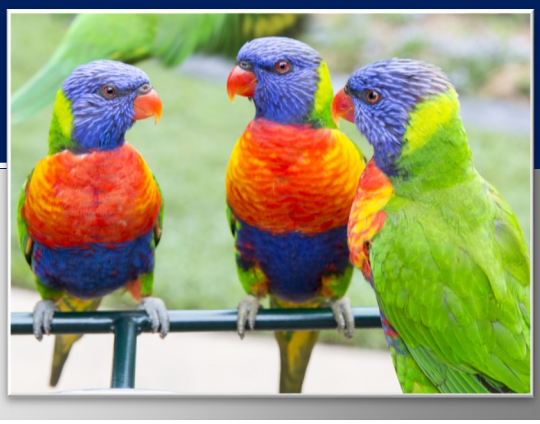

# Rainbow Lorikeet

*Trichoglossus haematodus*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Bright coloration. Loud call. Gregarious behaviour.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 120-130 |
| Length (cm): | 30 |
| Wingspan (cm): | 46 |

## STRIKE HISTORY (2012/13 - 2016/17)

| | |
|---|---|
| Total Strikes: | 2 |
| Multiple Strikes: | 2 |
| Strikes/10000 RPT Mvts: | 0.69 |
| Damaging Strike Rate: | 0% |

## AIRSIDE ATTRACTANTS

**Food:**
Primarily nectar and pollen of native trees and shrubs, but also fruits, seeds and insects.

**Habitat:**
Native woodlands, urban parks and gardens.

**Activity Hotspots:**
Transits over YBMK, at various heights and bearings, primarily during early morning and late afternoon.

## HAZARD DESCRIPTION

Although relatively small in size, lorikeets are particularly hazardous to aircraft because they can form large flocks. Native trees, such as eucalypts and melaleucas, can attract very high numbers of lorikeets during flowering seasons, presenting a significant strike risk when located in close proximity to airports and aircraft flight paths.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for individuals or flocks and report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal.

### Passive Management:

- Remove trees and shrubs from airside and landside areas whose fruits and flowers attract lorikeets.
- Develop a landscaping policy that provides guidance on appropriate plant species use.
- Install anti-perching devices on airport infrastructure such as signs, light poles and buildings.
- Remove non-essential infrastructure (e.g. posts and poles) to limit perching opportunities.
- Implement a roost management program for any identified roosts. Program may consist of dispersal and habitat modification.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

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PRESENT ON AIRPORT

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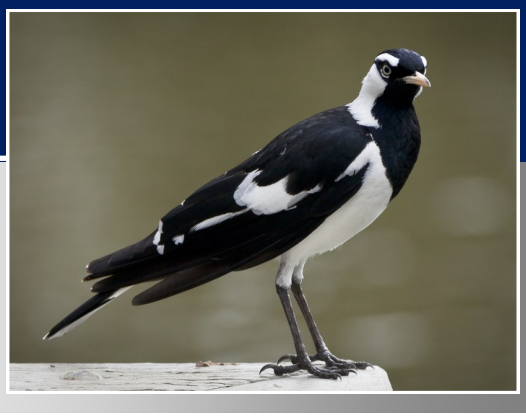
AVISURE
MITIGATING BIRD STRIKE RISK



# Magpie Lark

*Haliastur sphenurus*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Black and white plumage. Noticeably smaller than Australian Magpies.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 85 |
| Length (cm): | 27 |
| Wingspan (cm): | 51 |

## STRIKE HISTORY (2012/13 - 2016/17)

| | |
|---|---|
| Total Strikes: | 3 |
| Multiple Strikes: | 0 |
| Strikes/10000 RPT Mvts: | 1.03 |
| Damaging Strike Rate: | 0% |

## AIRSIDE ATTRACTANTS

**Food:**

Mostly invertebrates, mainly small insects and their larvae; occasionally small vertebrates and seeds of grasses.

**Habitat:**

A wide variety of open and lightly timbered habitats and grasslands, almost always near or associated with water.

**Activity Hotspots:**

Forages in short grass airport-wide.

## HAZARD DESCRIPTION

Because of their preference for short-grass to establish foraging territories, airports are very attractive to Magpie Larks. Airports not only offer large areas of short-grass where they can safety forage whilst keeping an eye out for predators, they also offer a relatively predator-free environment thanks to the tall perimeter fence and general activity of aircraft and vehicles. They are highly territorial during the breeding season, and will aggressively defend their nests and young against all potential predators.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for individuals and report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.
- Consider employing the use of a dog trained to disperse larks if conventional dispersal methods are ineffective.

### Passive Management:

- Maintain airside grass height at 200-300mm.
- Mow at night, at least in the flight strip, to reduce the insect attraction.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

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PRESENT ON AIRPORT

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AVISURE
MITIGATING BIRD STRIKE RISK

# Feral Pigeon

*Columbia livia*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Typically blue-grey, with purplish/ green sheen on neck. However colours and patterns can be varied.

## CONSERVATION STATUS

Introduced pest

## SIZE

| | |
|---|---|
| Weight | 308g |
| Length | 33—36 cm |
| Wingspan | 50-67cm |

## STRIKE HISTORY (2012/13 - 2016/17)

| | |
|---|---|
| Total Strikes: | 1 |
| Multiple Strikes: | 0 |
| Strikes/10000 RPT Mvts: | 0.3 |
| Damaging Strike Rate: | 0% |

## AIRSIDE ATTRACTANTS

**Food:**

Predominantly granivorous, however in an urban setting a large proportion of food can be derived from human waste.

**Habitat:**

Buildings, grain installations, bridges, rail yards, wharves, streets, parks, open woodlands, paddocks, dunes, beaches, cliffs.

**Activity Hotspots:**

RWY 14 approach

## HAZARD DESCRIPTION

Feral Pigeons are a hazard to aircraft primarily due to their flocking tendency which can result in large numbers transiting airport flight paths. They fly in dense flocks up to several hundred birds, high above the ground as a territorial display to other groups of pigeons. They have history of being kept and released for sport, escaped or lost animals have been the major source for wild populations which are now well developed in most major cities. Buildings with ledges and perches, aircraft hangers, and other built structures can provide attractive areas for birds to shelter and breed.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for flocks and report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.
- Locate and destroy ground nests.
- Consider employing the use of a dog trained to disperse pigeons if conventional dispersal methods are ineffective.

### Passive Management:

- Maintain airside grass height at 200-300mm.
- Limit the availability of irrigated and manicured grassland.
- Install anti-perching devices on airport infrastructure such as signs, light poles and buildings.
- Remove non-essential infrastructure (e.g. posts and poles) to limit perching opportunities.
- Implement a roost management program for any identified roosts. Program may consist of dispersal, habitat modification, and egg and nest removal.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

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PRESENT ON AIRPORT

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# Unidentified Flying-fox

*Pteropus* species

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Medium - large bats with fox-like facial features.

## CONSERVATION STATUS

N/A (depends on species)

## SIZE

| | |
|---|---|
| Weight (g): | 300-1000 |
| Length (cm): | 100-290 |
| Wingspan (cm): | up to 1000 |

## STRIKE HISTORY (2012/13 - 2016/17)

| | |
|---|---|
| Total Strikes: | 2 |
| Multiple Strikes: | 0 |
| Strikes/10000 RPT Mvts: | 0.69 |
| Damaging Strike Rate: | 0% |

## AIRSIDE ATTRACTANTS

**Food:**
Primarily fruits and nectar of native trees and shrubs, particularly eucalypts and fig species.

**Habitat:**
Rainforest, mangroves, paperbark swamps, open forests.

**Activity Hotspots:**
Transits over YBMK between foraging habitats and camps.

## HAZARD DESCRIPTION

Their large body mass and flocking behaviour present a considerable strike risk which is exacerbated by their nocturnal behaviour, making detection difficult. Airports themselves are rarely a source of attraction, however flocks of flying-foxes transiting through airport air space and aircraft flight paths, particularly during the nightly exodus from their daytime camps, are a serious hazard.

## HAZARD MANAGEMENT

### Active Management:

- NIL

### Passive Management:

- Monitor flight strips for individuals or flocks and report hazard to aircraft operators.
- Remove trees and shrubs from airside and landside areas whose fruits and flowers attract flying-foxes.
- Develop a landscaping policy that provides guidance on appropriate plant species use.
- During high risk periods encourage delayed take-offs and landings.
- Monitor flying-fox camps in the vicinity of the airport to identify local population trends.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

J F M A M J J A S O N D

PRESENT ON AIRPORT

J F M A M J J A S O N D

# Torresian Crow

*Corvus orru*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

All black plumage and black bill. Light blue eye.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 440-670 |
| Length (cm): | 46-51 |
| Wingspan (cm): | 100-110 |

## STRIKE HISTORY (2012/13 - 2016/17)

Total Strikes: 0

## AIRSIDE ATTRACTANTS

**Food:**
Omnivorous: fruit, seeds, insects, carrion, putrescible waste, invertebrates and small vertebrates.

**Habitat:**
Forests and woodlands. Common in urban parks and gardens.

**Activity Hotspots:**
Common throughout YBMK, forages in grass, perches on fences and built environment. Often transits across YBMK through critical areas.

## HAZARD DESCRIPTION

Torresian Crows are generally observed singularly or in pairs and small groups, however large flocks can form during the non-breeding season. Although generally wary of aircraft moving on airfields, crows can cause a strike risk and their relatively large body can result in aircraft damage.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for individuals and flocks and report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal.
- Immediately remove carcasses from airfield and roads on or around the airport.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.

### Passive Management:

- Install anti-perching devices on airport infrastructure such as signs, light poles and buildings.
- Remove non-essential infrastructure (e.g. posts and poles) to limit perching opportunities.
- Restrict access to airside and landside waste receptacles (bins and skips).
- Maintain airside grass height at 200-300mm.
- Mow at night, at least in the flight strip, to reduce the insect attraction.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

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AVISURE
MITIGATING BIRD STRIKE RISK

# Pacific Black Duck

*Anas superciliosa*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Facial stripes around the eye.
Green-blue speculum feathers (located on the posterior side of the wing).

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 1045 |
| Length (cm): | 47-60 |
| Wingspan (cm): | 80-100 |

## STRIKE HISTORY (2012/13 - 2016/17)

Total Strikes: 0

## AIRSIDE ATTRACTANTS

**Food:**
Variety of water plants, insects, crustaceans and molluscs.

**Habitat:**
Any suitable water, temporary or permanent. Prefers large, permanent, well-vegetated waterbodies and waterways.

**Activity Hotspots:**
Transits over YBMK between off-airport habitats. Forages on grass in the north-western corner of the airfield.

## HAZARD DESCRIPTION

Drains, water retention areas, access to food, and lack of predators, make airports particularly attractive to Pacific Black Ducks. Their relatively large body size, coupled with their tendency to form small groups, create a serious strike risk when left unmanaged. Short grassed areas adjacent water bodies provide safe loafing areas with easy access to water when disturbed. Densely vegetated waterbodies provide an additional refuge.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for individuals, report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal and disperse during early morning periods to prevent them settling for the day.
- Consider employing the use of a dog trained to disperse ducks if conventional dispersal methods are ineffective.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.

### Passive Management:

- Remove, or restrict access to, permanent or semi-permanent water sources on-airport (e.g. retention ponds, drains etc.).
- Locate and fill low-lying areas on the airfield that temporarily accumulate water after rainfall.
- Maintain airside grass height at 200-300mm, including the regular removal of seed heads.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON (varies in response to rainfall and food availability)

J F M A M J J A S O N D

PRESENT ON AIRPORT

J F M A M J J A S O N D

AVISURE
MITIGATING BIRD STRIKE RISK

# Australasian Figbird

*Sphecotheres vieilloti*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Males have red, bare skin around the eye, and a black cap. Females have streaks on the throat and chest.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 128 |
| Length (cm): | 28 |
| Wingspan (cm): | 45-51 |

## STRIKE HISTORY (2012/13 - 2016/17)

| | |
|---|---|
| Total Strikes: | 0 |

## AIRSIDE ATTRACTANTS

**Food:**

Figs, but also a range of other soft fruits and berries, as well as insects.

**Habitat:**

Usually rainforest rainforests and wet sclerophyll forests, but often in urban parks and gardens, particularly those with figs and other fruit-producing trees.

**Activity Hotspots:**

Transits over YBMK at various heights and bearings during the morning and late afternoon.

## HAZARD DESCRIPTION

Although relatively small in size, figbirds can be hazardous to aircraft because they can form flocks of up to forty birds, and their flight can be erratic. They are attracted to fruiting trees and shrubs on airports, and in off-airport areas, and it's their flight between foraging areas that can place them in aircraft airspace.

## HAZARD MANAGEMENT

### Active Management:

- Monitor the airfield and report hazards to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow figbirds to settle, apply persistent dispersal.
- Apply lethal control in circumstances where individuals are presenting a serious or immediate strike risk. Ensure appropriate permits are in place.

### Passive Management:

- Remove trees and shrubs from airside and landside areas whose fruits attract figbirds.
- Develop a landscaping policy that provides guidance on appropriate plant species use.
- Install anti-perching devices on airport infrastructure such as signs, light poles and buildings.
- Remove non-essential infrastructure (e.g. posts and poles) to limit perching opportunities.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

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PRESENT ON AIRPORT

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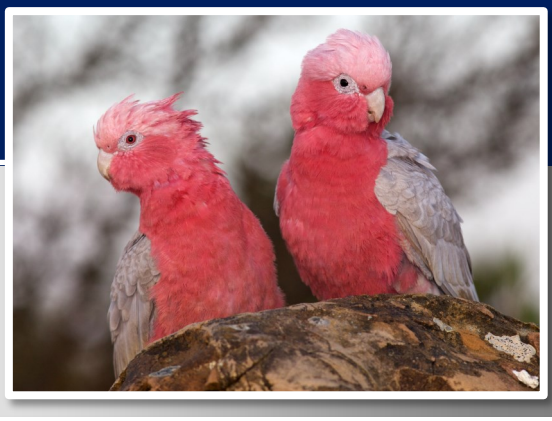
AVISURE
MITIGATING BIRD STRIKE RISK



# Galah
*Eolophus roseicapillus*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Pink and grey plumage.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 300-350 |
| Length (cm): | 34-38 |
| Wingspan (cm): | 50 |

## STRIKE HISTORY (2012/13 - 2016/17)

Total Strikes: 0

## AIRSIDE ATTRACTANTS

**Food:**
Seeds mostly from grasses and weeds. Also fruits and nuts from trees.

**Habitat:**
Short grass to forage and loaf. Buildings and other airport infrastructure to perch and roost.

**Activity Hotspots:**
Flies over YBMK between adjacent habitats.

## HAZARD DESCRIPTION

Although relatively small in size, Galah are particularly hazardous to aircraft because they can form flocks of hundreds of individuals. They are attracted to short grass on airports, particularly where it has seeded, and their erratic flight whilst on-airport creates serious hazards for aircraft.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for flocks and report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.
- Consider employing the use of a dog or raptor trained to disperse galahs if conventional dispersal methods are ineffective.

### Passive Management:

- Maintain airside grass height at 200-300mm.
- Limit the availability of irrigated and manicured grassland.
- Monitor airport habitat for emerging weeds that may attract large numbers of galahs.
- Install anti-perching devices on airport infrastructure such as signs, light poles and buildings.
- Remove non-essential infrastructure (e.g. posts and poles) to limit perching opportunities.
- Implement a roost management program for any identified roosts. Program may consist of dispersal, habitat modification, and egg and nest removal.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

| J | F | M | A | M | J | J | A | S | O | N | D |
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PRESENT ON AIRPORT

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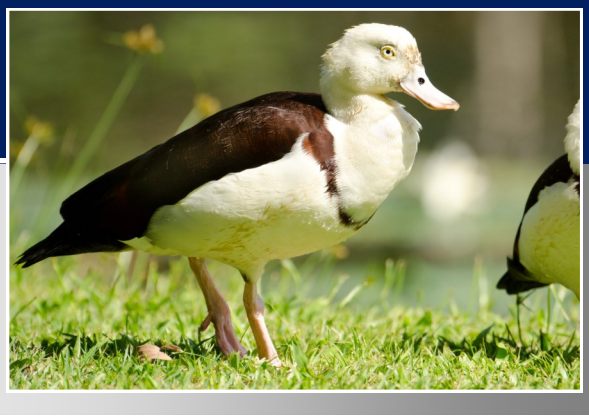

# Radjah Shelduck

*Tadorna radjah*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Mostly white, dark wing tips, distinctive dark collar.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 930 |
| Length (cm): | 49-61 |
| Wingspan (cm): | 90-99 |

## STRIKE HISTORY (2012/13 - 2016/17)

Total Strikes: 0

## AIRSIDE ATTRACTANTS

**Food:**
Molluscs, insects, sedges and algae.

**Habitat:**
Prefer mangrove and paperbark swamps, but will also utilise lagoons, billabongs and other waterbodies and flooded grassland.

**Activity Hotspots:**
Small flocks (<5) fly south over YBMK to access foraging and roosting habitats.

## HAZARD DESCRIPTION

Drains, water retention areas, access to food, and lack of predators, can make airports attractive to ducks. Their relatively large body size, coupled with their tendency to form small groups, create a serious strike risk when left unmanaged. Short-grassed areas adjacent to water bodies provide safe loafing areas with easy access to water when disturbed. Densely vegetated waterbodies provide an additional refuge.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for individuals, report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal and disperse during early morning periods to prevent them settling for the day.
- Consider employing the use of a dog trained to disperse ducks if conventional dispersal methods are ineffective.

### Passive Management:

- Remove, or restrict access to, permanent or semi-permanent water sources on-airport (e.g. retention ponds, drains etc.).
- Locate and fill low-lying areas on the airfield that temporarily accumulate water after rainfall.
- Maintain airside grass height at 200-300mm, including the regular removal of seed heads.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

J F M A **M J J A** S O N D

PRESENT ON AIRPORT

**J F M A M J J A S O N D**

# Little Black Cormorant

*Phalacrocorax sulcriostris*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

All black bird with dart-like flying pose, often seen with wings extended for drying.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 520-1210 |
| Length (cm): | 55-65 |
| Wingspan (cm): | 95-105 |

## STRIKE HISTORY (2012/13 - 2016/17)

Total Strikes: 0

## AIRSIDE ATTRACTANTS

**Food:**
Mostly fish and crustaceans caught by diving.

**Habitat:**
Wetlands, sheltered coast waters, mangroves, rives, dams, fish farms and sewage treatment banks.

**Activity Hotspots:**
Infrequently flies over YBMK en route to wetland habitats.

## HAZARD DESCRIPTION

Little Black Cormorants are known to form large flocks for flights and where food resources are abundant near large water sources with high fish populations. This flocking behaviour presents a high hazard to aircraft operations, especially at dawn and dusk. For airports that support water bodies on, and adjacent to, the airfield, cormorant activity can be high.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for individuals, report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal.

### Passive Management:

- Remove, or restrict access to, permanent or semi-permanent water sources on-airport (e.g. retention ponds, drains etc.).
- Maintain airside grass height at 200-300mm.
- Remove non-essential infrastructure (e.g. posts and poles), fallen trees and logs, to limit perching opportunities.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

J F M A M J J A S O N D

PRESENT ON AIRPORT

J F M A M J J A S O N D

# Silver Gull

*Chroicocephalus novaehollandiae*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Light grey wings with black tips. Bright orange-red legs and bill.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 265-315 |
| Length (cm): | 36-44 |
| Wingspan (cm): | 91-96 |

## STRIKE HISTORY (2012/13 - 2016/17)

Total Strikes: 0

## AIRSIDE ATTRACTANTS

**Food:**
Will scavenge on a wide range human derived food and rubbish, and will also eat worms, fish insects and crustaceans.

**Habitat:**
Any watered habitat; natural or man-made, permanent or temporary.

**Activity Hotspots:**
Occasionally transits over YBMK.

## HAZARD DESCRIPTION

Silver Gulls are considered hazardous to aircraft primarily due to their flocking tendency which can result in large numbers transiting the airport or flight paths. They will often use airfields as a temporary refuge during inclement weather, occasionally congregating in hundreds. Grasslands inundated with water following rainfall is also a significant attractant on airports.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for flocks and individuals, report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.
- Consider employing the use of a dog trained to disperse gulls if conventional dispersal methods are ineffective.

### Passive Management:

- Remove, or restrict access to, permanent or semi-permanent water sources on-airport (e.g. retention ponds, drains etc.).
- Maintain airside grass height at 200-300mm.
- Install anti-perching devices on airport infrastructure such as signs, light poles and buildings.
- Restrict access to airside and landside waste receptacles (bins and skips).
- Monitor weather activity for off-shore stormy weather to proactively anticipate their arrival over the airfield.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

| J | F | M | A | M | J | J | A | S | O | N | D |
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PRESENT ON AIRPORT

| J | F | M | A | M | J | J | A | S | O | N | D |
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Source: D. Hobern 2016

# Greater Sand Plover

*Charadrius leschenaultii*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Relatively robust body and long grey-brown legs. White 'eyebrow' and forehead. Brown breast band.

## CONSERVATION STATUS

EPBC Migratory: JAMBA, CAMBA and ROKAMBA
NT/ WA / NSW: Vulnerable
VIC: Critically Endangered
SA: Rare

## SIZE

| | |
|---|---|
| Weight (g): | 75-100 |
| Length (cm): | 22-25 |
| Wingspan (cm): | 53-60 |

## STRIKE HISTORY (2012/13 - 2016/17)

Total Strikes: 0

## AIRSIDE ATTRACTANTS

**Food:**
Insects, crustaceans, molluscs, worms and invertebrates.

**Habitat:**
Intertidal mudflats and sandflats, estuaries, mangrove swamps, bays, harbours lagoons.

**Activity Hotspots:**
Large flocks can use various areas of the airfield to loaf and forage, particularly in areas of ponded water following rainfall. Sand plovers are more likely to use the airfield as a high tide roost.

## HAZARD DESCRIPTION

This large migratory wader, who generally occupy coastal areas, can be problematic for airports located close to intertidal areas. Waders, including plovers, occasionally use coastal airports as high tide roosts. At these times, large flocks may be loafing on the airfield, presenting a serious strike risk. This species is similar to the smaller Lesser Sand Plover.

## HAZARD MANAGEMENT

### Active Management:

- Monitor flight strips for flocks and individuals, particularly during high tide, report hazards to aircraft operators.
- Remove the immediate hazard using active dispersal techniques.
- Do not allow individuals to settle, apply persistent dispersal and disperse during early morning periods to prevent them settling for the day.
- Consider employing the use of a dog trained to disperse plovers if conventional dispersal methods are ineffective.

### Passive Management:

- Remove, or restrict access to, permanent or semi-permanent water sources on-airport (e.g. retention ponds, drains etc.).
- Remove any refuges, such as small islands in the middle of water bodies.
- Where possible, schedule flight operations to avoid peak activity.
- Change, or close, runways until temporary hazards can be dispersed.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the AIP to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

| J | F | M | A | M | J | J | A | S | O | N | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ■ | ■ | ■ | | | | | | | |

PRESENT ON AIRPORT

| J | F | M | A | M | J | J | A | S | O | N | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ■ | ■ | ■ | ■ | | | | | ■ | ■ | ■ | ■ |

AVISURE
MITIGATING BIRD STRIKE RISK

# Black Kite

*Milvus migrans*

**MODERATE RISK**

## KEY IDENTIFICATION FEATURES

Black wing tips. Forked tail.

## CONSERVATION STATUS

Common / Least Concern

## SIZE

| | |
|---|---|
| Weight (g): | 570-600 |
| Length (cm): | 45-55 |
| Wingspan (cm): | 120-140 |

## STRIKE HISTORY (2012/13 - 2016/17)

| | |
|---|---|
| Total Strikes: | 7 |
| Multiple Strikes: | 0 |
| Strikes/10000 RPT Mvts: | 2.41 |
| Damaging Strike Rate: | 0% |

## AIRSIDE ATTRACTANTS

**Food:**
Opportunistic scavenger who forages on carrion, but will also hunt insects, reptiles, other birds and small mammals.

**Habitat:**
A variety of urban and natural habitats.

**Activity Hotspots:**
Flies over YBMK between adjacent habitats, occasionally thermals and forages above airport grasses and sealed areas.

## HAZARD DESCRIPTION

Black Kites are a strike risk because of their large body mass, their aerial hunting and thermalling activity, and their tendency to occupy urban areas, particularly locations close to farming activities and landfill operations. They will also follow mowers on airfields to forage on disturbed insects.

## HAZARD MANAGEMENT

### Active Management:

- Monitor critical airspace for thermalling, hunting or transiting individuals, report hazard to aircraft operators.
- Remove the immediate hazard using active dispersal techniques, including the use of long-range pyrotechnics.
- Immediately remove carcasses from airfield and roads on or around the airport.
- In a vehicle, cicle under thermalling kites to obscure the area.
- Apply lethal control in circumstances where individuals are presenting a serious and immediate strike risk.
- Do not allow individuals to settle, apply persistent dispersal.
- In cooperation with local environment authorities, relocate nests from airport structures.

### Passive Management:

- Install anti-perching devices on airport infrastructure such as signs, light poles and buildings.
- Remove non-essential infrastructure (e.g. posts and poles) to limit perching opportunities.
- Implement airside vertebrate pest control to manage populations of rodents, rabbits and hares.
- Create a ‘false burn’ to attract birds away from the airspace. Consider wind direction to avoid visual problems for aircraft.
- Mow at night to reduce the insect attraction.
- Where possible, schedule flight operations to avoid peak activity.

### Additional Responses:

- Issue a Wildlife Hazard Notification or NOTAM if the hazard is likely to remain high for a definable period.
- Where regular monitoring identifies a defined or seasonal trend, update the ERSA to include hazard details, time of hazard, location, expected duration, and general hazard avoidance advice for pilots.

BREEDING SEASON

| J | F | M | A | M | J | J | A | S | O | N | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ■ | ■ | ■ | ■ | ■ | | | ■ | ■ | ■ | ■ | ■ |

PRESENT ON AIRPORT

| J | F | M | A | M | J | J | A | S | O | N | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

# 6. Policies and Procedures

This section details YBMK's updated policies and procedures to best manage the wildlife strike risk.

No policies or procedures required updating.

# Appendix A: Review Checklist

| Component | Task | Responsibility | Timeframe | Requirement | Compliance |
|---|---|---|---|---|---|
| **Administration** | | | | | |
| Bird strike reporting | All bird strikes reported to ATSB. | YBMK, AROs<br>Air operators | As required - ongoing | All strikes recorded with all available information and forwarded to the appropriate parties. | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| Permits and licensing | All permits for bird and animal management activities held and kept valid. | YBMK | As required - ongoing | All permits held and valid | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| Records of activities | All records of activities kept (i.e. counts, ammunition, cull etc.) and where necessary entered into an electronic database. | AROs and YBMK | Ongoing | All records maintained | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| Committee meetings | Agenda to cover wildlife issues and management actions. Relevant on and off-airport stakeholders must be included. | YBMK, Aviation Administration Officer (AAO) | Bi-annually | Meetings held on a quarterly basis.<br>Minutes taken to record achievements and progress | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| Review of proposed land use changes- on airport land | All proposed land use changes within YBMK controlled land with potential to increase the risk of bird strike must be scrutinised appropriately. | Manager Aviation Operations (MAO) | As required - ongoing | Where risk increase is likely, modification to proposals is sought or the development is refused. | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |

| Component | Task | Responsibility | Timeframe | Requirement | Compliance |
|---|---|---|---|---|---|
| Review of proposed land use changes – off airport land | Ensure a mechanism exists with relevant councils within 13km of YBMK to refer land use changes or developments that have potential to impact on wildlife hazards at YBMK. | MAO | As required - ongoing | Where risk increase is likely, YBMK should formally object to the development and request modification to proposals. | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| **Training** | | | | | |
| Wildlife management training | Ongoing advance practical wildlife survey and hazard assessment training. | AROs and Wildlife Consultant | Quarterly | Ongoing as part of current quarterly program – Training completed with Avisure site visit. | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| Wildlife management training | 2-day formal Wildlife Hazard Management Training Course. | AROs MAO and AAO | Once | Formal classroom and field based training covering 11 modules on the topic of wildlife strike mitigation. | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| Wildlife management training | Once-yearly competency based assessment for bird control staff. | AROs and Consultant | Once-yearly – ongoing | Assessment as part of annual audit.<br>To be completed in November 2017.<br>Avisure 2-day Wildlife Hazard Management Training conducted in February | ☐ N/A<br>☑ Non-compliant<br>☐ Compliant |

| Component | Task | Responsibility | Timeframe | Requirement | Compliance |
|---|---|---|---|---|---|
| Firearm safety training | Firearm safety training undertaken biennially. | AROs | 5-yearly external safety course<br>3-monthly internal safety competency check | 1 training session every 5-years years attended by all relevant personnel.<br>3-monthly internal safety competency check | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| **Monitoring Risks** | | | | | |
| Wildlife counts | Counts undertaken monthly and recorded in the electronic database. | AROs and AAO | Monthly – ongoing | All data collected and entered into database. | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| Risk based surveys | Professional wildlife surveys undertaken quarterly on and off airport. | Wildlife Consultant | Quarterly – ongoing | Surveys conducted, results presented in annual updates. | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| **Detecting Hazards and Active Management** | | | | | |
| Perimeter fence inspections | Daily perimeter fence inspections. | AROs | Daily – ongoing | Nil breaches of fence by medium and large sized mammals. | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| Discouraging breeding on airport | Nest removal or destruction animal breeding place<br>Egg destruction<br>Other airside habitats. | AROs and Consultant | As required - ongoing | Once nesting is detected YBMK humanely remove via relocation or destruction | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| Recording activities | Logging bird/animal monitoring and management efforts. | AROs and AAO | As required - ongoing | Records kept for counts inspections dispersal and patrol. | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |

| Component | Task | Responsibility | Timeframe | Requirement | Compliance |
|---|---|---|---|---|---|
| **Passive Management** | | | | | |
| Vegetation management | Identification and removal of vegetation that attracts significant birds/wildlife as specified in plan. | AROs and MAO<br>General Aviation Tenants | As required - ongoing | No additional attraction of birds due to vegetation and landscaped areas of YBMK. | ☑ N/A<br>☐ Non-compliant<br>☐ Compliant |
| Ponded water | Areas of ponded water to be filled as required to reduce bird hazard as specified in plan. | MAO | As required - ongoing | No areas of ponded water on airport attracting birds. | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| Waste management | Ensure waste on airport land is disposed of effectively to reduce bird attraction. | MOA | As required - ongoing | Ensure bin lids remain closed and waste is not accessible for wildlife to feed. | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| **Review** | | | | | |
| Technical inspection | Technical inspection in accordance with MOS 139 Section 10.14.1.5 | Consultant | Yearly - ongoing | Conducted annually | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| Major review of plan | Undertake major review 5 yearly | MAO and Wildlife Consultant | 5 yearly - ongoing | Major review every 5 years or when triggered, scheduled November 2017 | ☑ N/A<br>☐ Non-compliant<br>☐ Compliant |
| Update plan | Update Bird and WHMP annually | Wildlife Consultant | Yearly - ongoing | Plan updated annually | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |
| Records of review | Records of review and audits kept | MAO and Wildlife Consultant | Yearly - ongoing | Records kept yearly in Plan | ☐ N/A<br>☐ Non-compliant<br>☑ Compliant |

# Appendix B: Scorecard

| Measure | 2012/2013 | 2013/14 | 2014/25 | 2015/16 | 2016/17 | |
|---|---|---|---|---|---|---|
| | | | | | Target | Actual |
| Confirmed, On-airport, Vicinity Strikes | 16 | 20 | 14 | 16 | 12 | 11 |
| Suspected, On-airport, Vicinity Strikes | 5 | 21 | 21 | 18 | 15 | 8 |
| Near Miss | 0 | 0 | 1 | 0 | 0 | 0 |
| Total Strikes (all strikes) | 21 | 41 | 36 | 34 | 26 | 19 |
| On-airport Damaging Strikes | 2 | 1 | 0 | 0 | 0 | 0 |
| No. Strikes affecting planned flight | 2 | 0 | 0 | 1 | 0 | 0 |
| Mean Mass Struck (kg) | 0.34 | 0.51 | 0.28 | 0.35 | 0.19 | 0.36 |
| Total Mass Struck (kg) | 5.4 | 10.2 | 3.86 | 5.67 | 5 | 4.01 |
| No. Very High Risk Species | 0 | 0 | 2 | 0 | 0 | 0 |
| No. High Risk Species | 6 | 2 | 5 | 7 | 5 | 6 |
| No. Moderate Risk Species | 16 | 16 | 15 | 18 | 15 | 16 |
| Average Survey Risk Index | 1594 | 608 | 4381 | 1600 | 900 | 398 |
| Total confirmed, on-airport strikes per 10,000 a/c movements | 3.80 | 4.87 | 4.11 | 4.96 | 3.15 | 3.79 |

**Blue** = target achieved
**Orange** = better than previous year but target not achieved
**Black** = not better that previous year and target not achieved

# Appendix C: Risk Assessment Methods

Management of bird and other wildlife hazards at airports requires an understanding of wildlife populations, their behaviour, and the risk management process. The process outlined in Australian and New Zealand Standard 31000:2009 Risk Management has been followed for this assessment:

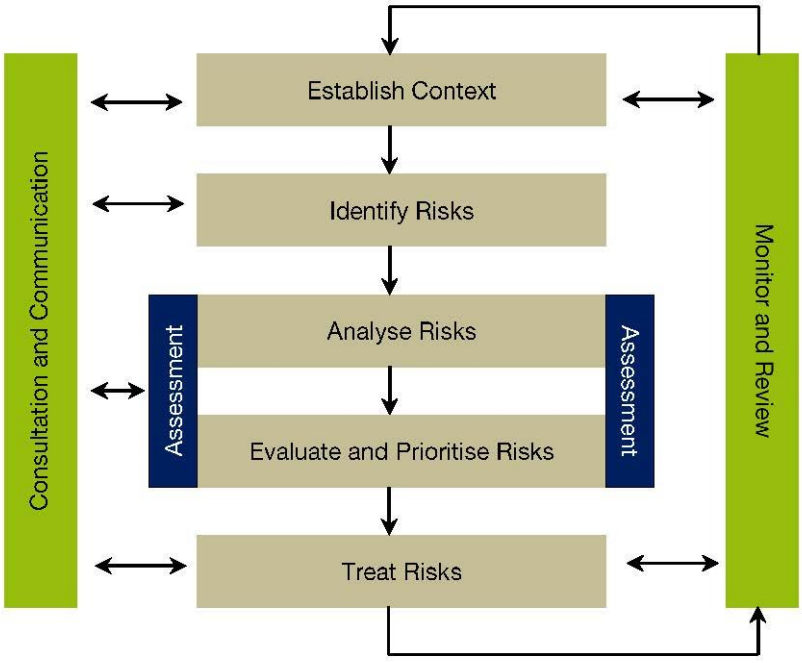


**Figure C1.** The risk management process (Source: AS/NZS 31000:2009 Risk Management).

Previous efforts to rank species according to risk level have involved one of the following:

1. Using national databases to indicate risk level across a country (Dolbeer et al., 2000). This lacks the resolution required to determine risk at a particular airport, although may be useful as a guide.
2. Subjective assessment based on knowledge of bird species present, interpretation of the strike history and professional judgement. This is the primary methodology used by advisors to airports worldwide.
3. A more formalised, yet still subjective assessment of risk based on scoring a species for categories such as population size, bird mass, flock size, time of day, location on airport, time spent in air, etc. (Carter, 2001; Morgenroth, 2003). This assessment is open to the vagaries of professional interpretation and cannot be easily used to compare one airport with another, or objectively compare one year to the next.

4. A determination of probability of strike based on bird strike history at the airport over the previous five years to determine a yearly average for each species and using percentage of strikes causing damage for each species in a national bird strike database to determine consequence levels (Allan et al., 2003). This methodology does not consider the effect of differences in numbers of aircraft movements both between airports and across the same airport for different time periods. It also cannot categorise species which have not been struck in the previous five-year period, yet may still remain a significant risk. It is also dependent on effective bird strike reporting which is consistent over time.

## Strike Risk Assessment (Allan, 2006)

The assessment phase of the risk management process involves categorising risks. To do this, a hazard needs to be measured in terms of its probability of occurring and the consequence should it occur. This allows it to be placed into a risk matrix as outlined below:

| | | Probability of Strikes (5yr average) | | | | |
|---|---|---|---|---|---|---|
| | | Very Low | Low | Moderate | High | Very High |
| Probability of damage | Very Low | | | | | |
| | Low | | Species A | | | |
| | Moderate | | | | | |
| | High | Species B | | | Species C | |
| | Very High | | | | | |

**Figure C2.** Strike risk assessment matrix (Allan 2006).

Risks which fall into the green section are classified as “low” and require no further action beyond current management; yellow is “moderate” and requires a review of current management practices and options for additional action, and; red is “high” and requires immediate action to reduce the current risk.

Risk assessment procedures based on historical strike data are limited, as they cannot easily accommodate real time changes in bird species composition or distribution.

## Survey Risk Assessment (Shaw, 2004)

Avisure has developed a model for determining risk categories using professional bird survey data. The survey data is used to derive probability factors (population size, position on airport, time spent in air and the species ability to avoid) and consequence factors (bird mass and flock size) for all species recorded. The combination of these probability and consequence factors give a numerical risk index, the Species Risk

Index (SRI). This provides a real-time method of risk assessment as it is able to react to observed changes in airside bird assemblages and movement patterns.

The following tables outline the risk rating for wildlife species according to calculated SRI, and the risk ranking of an airport.

**Table C1**. Species Risk Index and Airport Survey Risk Index for determining risk categories based on survey data.

| **SRI ranges used to rate risk for each species** | | **ASRI ranges used to rate risk of an airport** | |
|---|---|---|---|
| SRI | Risk rating | ASRI | Risk rating |
| >1000 | Very high | >10000 | Very high |
| 100 to 999.9 | High | 1000 to 9999.9 | High |
| 10 to 99.9 | Moderate | 100 to 999.9 | Moderate |
| 1 to 9.9 | Low | 10 to 99.9 | Low |
| < 1 | Very low | < 10 | Very low |

The process intends to provide a transparent, logical and systematic approach to the identification and treatment of wildlife related risks at the airport. The risk assessment identifies high risk species, which allows suitable management practices to be targeted in areas where the maximum reduction in risk may be achieved.

## References

Allan, JO 2006, *A Heuristic Risk Assessment Technique for Birdstrike Management at Airports*. Risk Analysis, Vol. 26, No. 3, pp. 723-729, June 2006.

Allan, JR, Orosz, A, Badham, A and Bell J 2003, *The development of birdstrike risk assessment procedures, their use on airports, and the potential benefits to the aviation industry*, in Proceedings of the 26th International Bird Strike Committee Meeting, 5–9 May 2003, Warsaw, Poland.

Carter, NB 2001, *All birds are not created equal: risk assessment and prioritisation of wildlife hazards at airfields.* In Bird Strike 2001, Calgary, Canada.

Dolbeer, RA, Wright, SE and Cleary, EC 2000, *Ranking the hazard level of wildlife species to aviation*. Wildlife Society Bulletin 28:372–378.

Morgenroth, C 2003, *Development of an index for calculating the flight safety relevance of bird species for an assessment of the bird strike hazard at airports*. Bird and Aviation 23.

Shaw, PP 2004, *A model for determining risk categories for birds at airports using bird survey data*. Bird Strike Conference 2004, Baltimore, USA.

Standards Australia/Standards New Zealand 2009, *Risk management – principles and Guidelines*. Sydney, New South Wales, Australia.

# Appendix D: Quarterly Report Recommendations

**Table D1**. 2016/17 Seasonal reporting period recommendations

| Reporting Period | Recommendation | Achieved | Evidence |
|---|---|---|---|
| Winter 2016 | ARO's to conduct intense dispersal on Plumed Whistling-Ducks as soon as detected airside, culling persistent individuals. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Dispersal procedure, and increased nocturnal patrols on RWY |
| | YBMK to increase communications with Manzelmann's Farm regarding the poor management of a food source attracting large numbers of a high-risk species to the YBMK airspace; specifically noting the presence of Plumed Whistling-Ducks in YBMK strike history and the potential for this species to damage an aircraft. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Continually inviting to attend Wildlife Hazard Committee meetings – no attendance to date |
| | ARO's to be vigilant to flocks of Straw-necked Ibis transiting critical airspace in the afternoon, reporting real-time hazards to ATC. YBMK to consider releasing a NOTAM describing this hazard. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Dispersal procedure |
| | ARO's to set up Gas Cannon on areas of temporarily short manicured grass to deter flocks of foraging Cattle Egrets and Magpie Larks. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Increase dispersal effort |
| Spring 2016 | YBMK to manage the grass in the field immediately adjacent to the western perimeter fence abeam ATC. Maintaining grass heights of 30cm is recommended, removing grass seed head. Close monitoring of the area following mowing should be maintained by ARO's, with intense harassment of any high risk species. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Harassment of high-risk species as per dispersal procedure. Grass height and seed head still an issue. |

| | | | |
|---|---|---|---|
| | YBMK to invite Manzelmann's Farm to attend wildlife hazard management meetings. If attendance is confirmed, YBMK should incorporate specific information about the National Airports Safeguarding Framework (Attachment C) and QLD State Planning Policy to highlight the risk posed by his operations. Alternatively, or in addition to the meeting, YBMK should consider compiling a short report for Mr Manzelmann that outlines the nature of risk presented by his property and the legislatively and regulatory requirements of off-airport hazard management in Australia. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Continually inviting to attend Wildlife Hazard Committee meetings – no attendance to date |
| | ARO's to be vigilant to flocks of migratory waders and terns following severe weather and high tides. Where the response of migratory waders to these natural events result in them using the airport, particularly in large flocks, issue a NOTAM, increase dispersal effort, and increase the frequency of runway patrols. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Dispersal procedure |
| | ARO's to disperse resident Cattle Egret to the closed runway west of the active runway and not engage in routine dispersal once relocated. Intense harassment should be maintained on and adjacent to the active runway and if numbers increase significantly due to mowing. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Dispersal procedure |
| Summer 2017 | YBMK to continue its excellent airside wildlife management and to investigate Tap Forms or other digital data capture to enable greater oversight of airside risks. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Ongoing research into data capture technology |
| | YBMK to establish a notification system to enable efficient communication between local farmers and YBMK prior to adjacent paddocks being harvested which attracts large numbers of hazardous species. | ☑ Not Achieved<br>☐ On-going<br>☐ Achieved | |
| | Daily ARO counts should be conducted in Manzelmann's Farm due to the severity of the risk. Wildlife Hazard Notifications should be distributed to stakeholders describing the hazard as required. | ☑ Not Achieved<br>☐ On-going<br>☐ Achieved | |
| | YBMK to prioritise the risk that Manzelmann's Farm is presenting to flight safety and expedite a formal hazard assessment and mitigation as soon as possible. | ☑ Not Achieved<br>☐ On-going<br>☐ Achieved | |
| | AROs to disperse flocks of migratory waders using the airside area, particularly at night. Culling of these species should be restricted as they are listed as migratory under the *Environment Protection and Biodiversity Conservation Act* 1999. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Dispersal procedure |

| | | | |
|---|---|---|---|
| | YBMK to ensure all strikes are being reported by all stakeholders and should request wildlife strike data from all RPT airlines. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Strike reporting procedure |
| Autumn 2017 | Aerodrome grass height to be reduced to 20-30cm as soon as possible. Mowing works in and adjacent to the runway should not be undertaken during peak movement periods with AROs conducting runway inspections and bird harassment prior to all movements. Consideration should be given to mowing at night. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Dispersal procedure<br>And passive management procedure |
| | YBMK to trial the use of alternate and varied harassment techniques to reduce the presence of Plumed Whistling-Ducks on the aerodrome. Intensive harassment should commence at last light as the Plumed Whistling-Ducks arrive, with zero tolerance shown for birds in and adjacent to the runway. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | Dispersal procedure |
| | YBMK to trial the use of alternate and varied harassment techniques including dispersal dog, stock whip, lasers, h-class pyrotechnics. Risk assessments for these tools need to be completed prior to the trials. | ☑ Not Achieved<br>☐ On-going<br>☐ Achieved | |
| | YBMK to discuss with Avisure the inclusion of a number of additional off-airport monitoring sites identified during the recent visit as part of routine quarterly off-airport monitoring surveys as part of the upcoming 2017/18 management program. | ☐ Not Achieved<br>☐ On-going<br>☑ Achieved | Identified in this report |
| | YBMK to invite a representative from the Thomas Borthwick and Sons Meatworks to attend the Bird and Wildlife Hazard Committee meeting. | ☐ Not Achieved<br>☑ On-going<br>☐ Achieved | To be invited to the next Wildlife Hazard Committee 9th August |

Revision History

| Rev. No | Rev. Date | Details | Prepared by | Reviewed by | Approved By |
|---|---|---|---|---|---|
| 00 | 02/08/2017 | Mackay Airport WHMP Supplement 1.5 July 2017 | Chris Perry Wildlife Biologist | Kylie Patrick Principal Consultant | Jeff Follett General Manager |
| 01 | 15/08/2017 | Mackay Airport WHMP Supplement 1.5 July 2017.R1 | Chris Perry Wildlife Biologist | | |
| 02 | 11/09/2017 | Mackay Airport WHMP Supplement 1.5 July 2017.R2 | Chris Perry Wildlife Biologist | Jeff Follett General Manager | Jeff Follett General Manager |

Distribution List

| Copy No. | Date | Format | Issued to | Name |
|---|---|---|---|---|
| 1 | 11/09/2017 | E-COPY | Mackay Airport Pty Ltd | Phil Clark |
| 2 | 11/09/2017 | E-COPY | Avisure | Administration |

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