Bird Risk Assessment Tool for Airports

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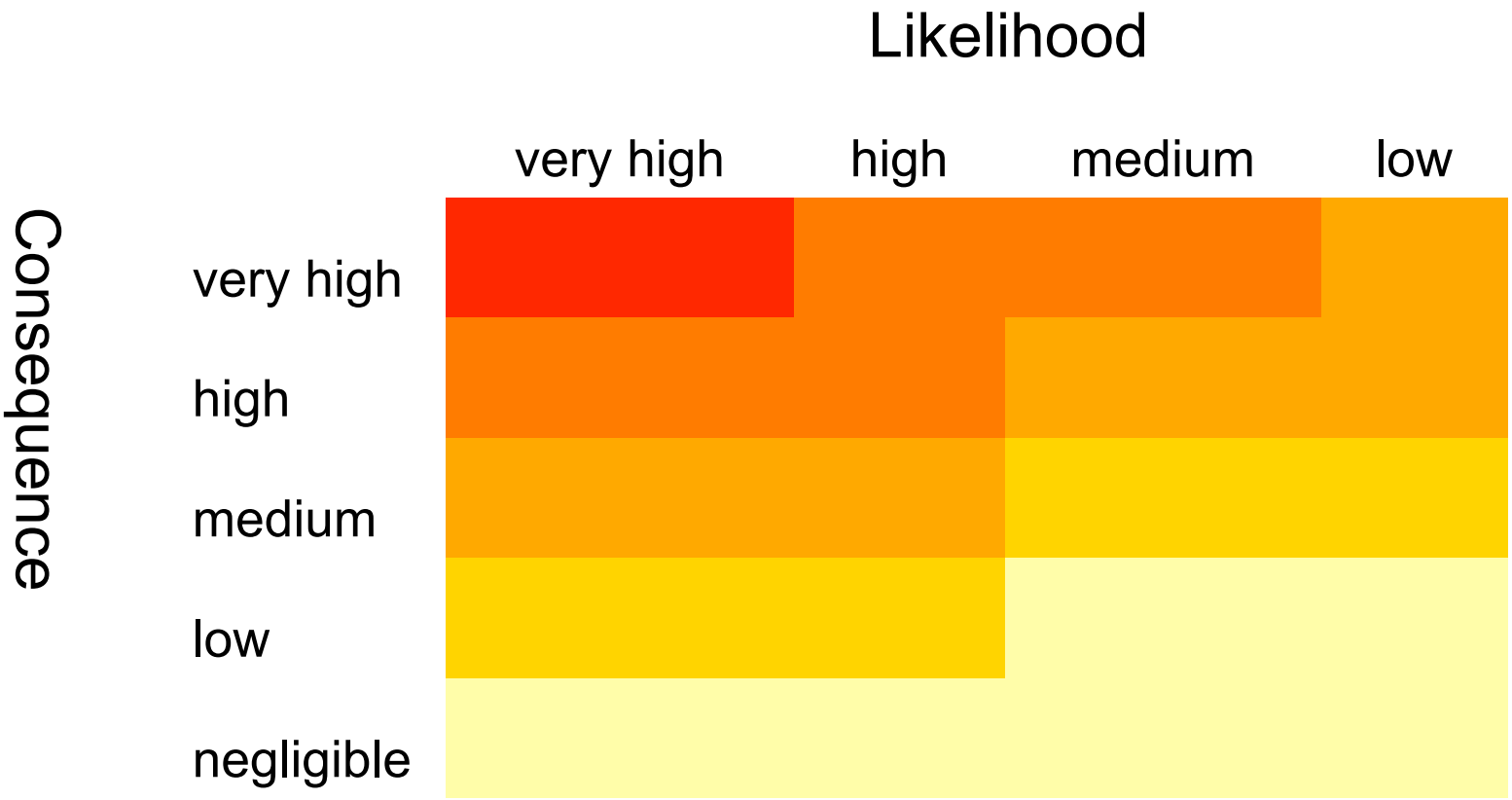
SUB CRUCE LUMEN

Australian Aviation Wildlife Hazard Group

Consequence x Likelihood matrix



Consequences of a strike

- Related to attributes of the birds
  - body mass
    - larger bird, larger impact
  - flocking behaviour
    - larger and more dense (birds/volume) flocks greater likelihood of multiple strike
  - flying behaviour
    - slow, erratic flight, not easily harassed - increased dwell time in aircraft air space

CONSEQUENCE SCORE

Body mass (g)	**Flock x Fly <4**	**Flock x Fly > 4**
<50	NEGLIGIBLE	LOW
50-100	LOW	MEDIUM
100-300	MEDIUM	HIGH
300-1000	HIGH	VERY HIGH
>1000	VERY HIGH	VERY HIGH

Species	Body mass (g)	Flocks	Flight behav	Consequence
Australian Pelican	5,500	2	2	VH
Australian White Ibis	1,800	4	2	VH
Pacific Black Duck	1,050	3	1	VH
Hardhead	850	3	1	H
Little Pied Cormorant	750	2	1	H
White-faced Heron	600	1	2	H
Little Corella	540	5	3	VH
Little Raven	530	2	1	H
Masked Lapwing	360	1	3	H
Galah	330	5	3	VH
Australian Magpie	330	2	1	H
Domestic Pigeon	310	5	2	VH
Silver Gull	305	3	2	VH
Crested Pigeon	200	3	1	M
Nankeen Kestrel	175	1	3	M
Magpie-lark	85	2	2	L
Common Starling	80	5	2	L
Skylark	38	1	3	N
House Sparrow	29	3	1	N
Willie Wagtail	18	1	1	N
Welcome Swallow	15	2	2	N

Likelihood of a bird strike

- Airport specific
  - environment in which the airport is located
    - determines numbers and types of birds in area
  - management programs implemented at the airport
    - determines attractiveness of airport hence numbers of birds on airport
  - quantity, type and timing of aircraft movements
    - More aircraft movements higher likelihood

LIKELIHOOD SCORE

Abundance (%)	**% of recorded strikes**		
	<0.5	**0.5 -10**	**>10**
<1	LOW	MEDIUM	VERY HIGH
1-10	MEDIUM	MEDIUM	VERY HIGH
11-20	MEDIUM	HIGH	VERY HIGH
>20	HIGH	HIGH	VERY HIGH

Other likelihood assessments usually based on bird strike statistics alone

- still poorly recorded in Australia
- strike statistics identify hazards retrospectively
- abundance estimates and changes in abundances can identify species before the strikes become prominent

Species	Abundance	% overall abundance	# strikes	% of strikes	Likeli-hood
Australian Pelican	0.10	0.02			L
Australian White Ibis	0.55	0.10	3	0.6	M
Straw-necked Ibis	2.28	0.42	1	0.2	L
Pacific Black Duck	0.94	0.17	2	0.4	L
Little Pied Cormorant	0.09	0.02	1	0.2	L
White-faced Heron	2.19	0.40			L
Little Corella	2.6	0.47	2	0.4	L
Little Raven	13.1	2.39	2	0.4	M
Masked Lapwing	0.29	0.05	8	1.5	M
Galah	27.5	5.01	130	24.9	VH
Australian Magpie	27.3	4.97	27	5.2	H
Domestic Pigeon	27.8	5.06	46	8.8	H
Silver Gull	6.38	1.16	72	13.8	VH
Crested Pigeon	12.01	2.19	2	0.4	L
Nankeen Kestrel	4.45	0.81	107	20.5	VH
Magpie-lark	60.4	11.0	54	10.3	VH
Common Starling	286.6	52.2	15	2.9	H
Skylark	37.2	6.77	2	0.4	M
Welcome Swallow	20.8	3.78	15	2.9	H

Likelihood

Consequence	Very High	High	Medium	Low
Very High	Galah Silver Gull	Domestic Pigeon	Aust White Ibis	Australian Pelican Cape Barren Goose Mallard Straw-necked Ibis Pacific Black Duck Little Corella
High		Australian Magpie	Brown Falcon Masked Lapwing Australian Hobby Little Raven	Hardhead Brown Goshawk Little Pied Cormorant Peregrine Falcon White-faced Heron Grey Teal Barn Owl Black-shouldered Kite
Med	Nankeen Kestrel			Crested Pigeon Banded Lapwing Rainbow Lorikeet
Low	Magpie-lark	Common Starling		Australian Pratincole Brown Songlark
Negl.		Welcome Swallow	Skylark	Black-fronted Dotterel Australian Pipit Fairy Martin

Likelihood

Consequence	Very High	High	Medium	Low
Very High	Galah Silver Gull Domestic Pigeon			Australian Pelican Australian White Ibis Pacific Black Duck Mallard
High	Australian Magpie		Brown Goshawk	Australian Hobby Masked Lapwing Little Raven Black Falcon Brown Falcon White-faced Heron Black-shouldered Kite
Medium		Crested Pigeon	Nankeen Kestrel	Banded Lapwing Spotted Turtle-Dove Rainbow Lorikeet
Low	Magpie-lark	Common Starling	Whiskered Tern	Little Wattlebird Brown Songlark Common Blackbird
Negligible				Skylark House Sparrow Australian Pipit New Holland Honeyeater Willie Wagtail Welcome Swallow Fairy Martin

Benefits of detailed counts

- Patterns to distribution and abundance
- Identify key resources or processes
- Identify specific areas to target on the airport
- Test management techniques
- Identify changes in patterns of use

How well does Adelaide Airport do at reducing bird use of the airport?

Location	Habitat type	Density of birds (birds/ha)
Patawalonga Basin	Wetland	36.2
Patawalonga Creek	Wetland	23.9
Ovals, playing fields	Watered grassland	7.9
Golf Courses	Watered grassland with trees	5.0
Golf Links	Watered grassland, few trees	3.6
Disused Paddocks	Rank grassland	2.8
Adelaide Airport	**Grassland**	**1.3**

Summary

- Long-term data sets are informative
- Detailed (fine scale) monitoring important
- Can develop simple risk assessment tools
- Need improvements in reporting of strikes
- Need to improve monitoring of on ground works
- Need on-going monitoring of birds and resources
- Bird strike mitigation may be compromised by needs of other airport operations