

# *Assessing the Risk of Off-airport Bird Hazards*

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&  
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# Risk Score Card 2009/10

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ITEM	2007/08	2008/09	2009/10 target	2009/10 actuals	Next Years Target
Total Strikes	11	8	6	5	5
Damaging strikes	1	1	0	0	0

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## Damaging Strike Benchmark?

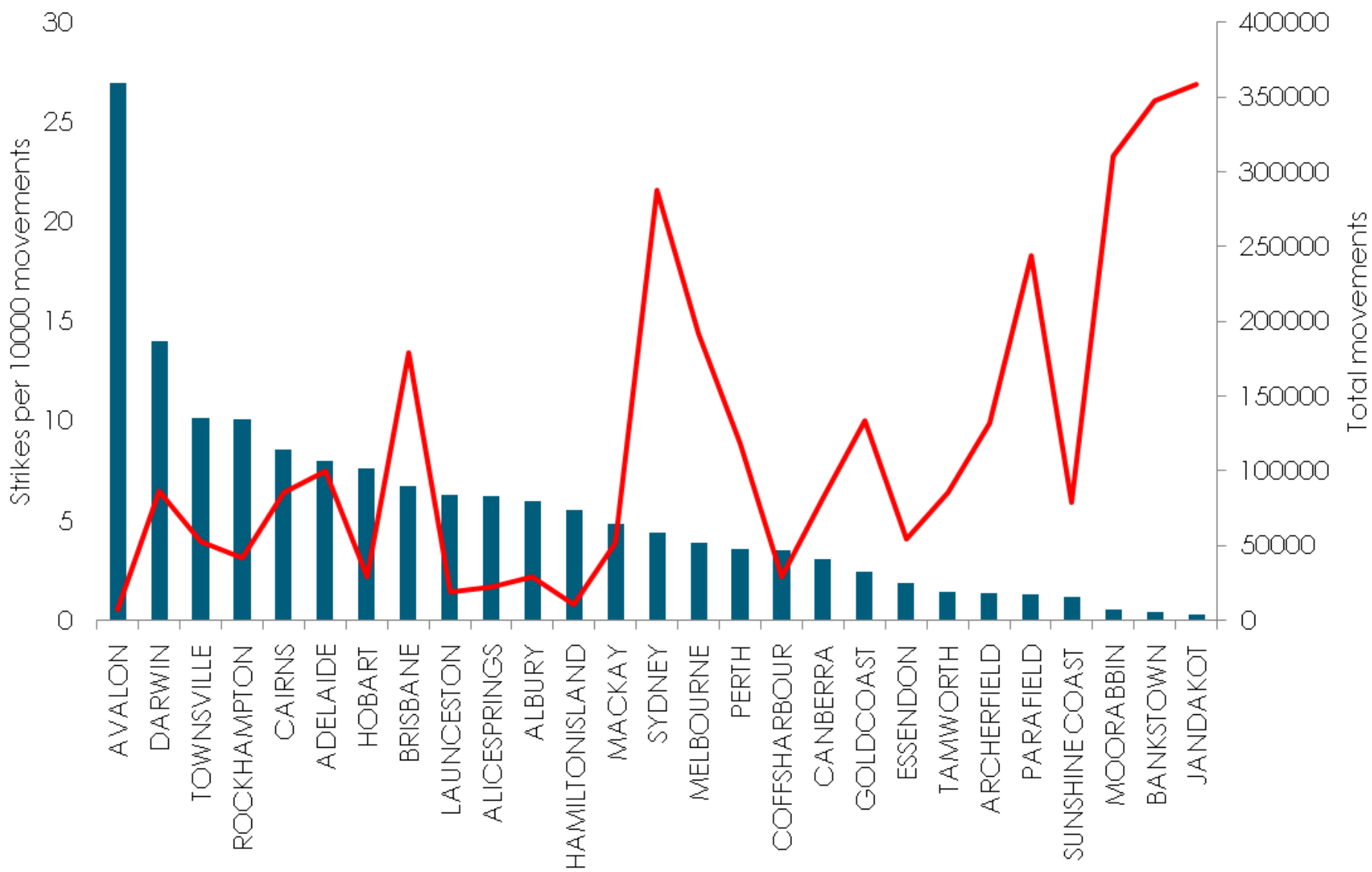


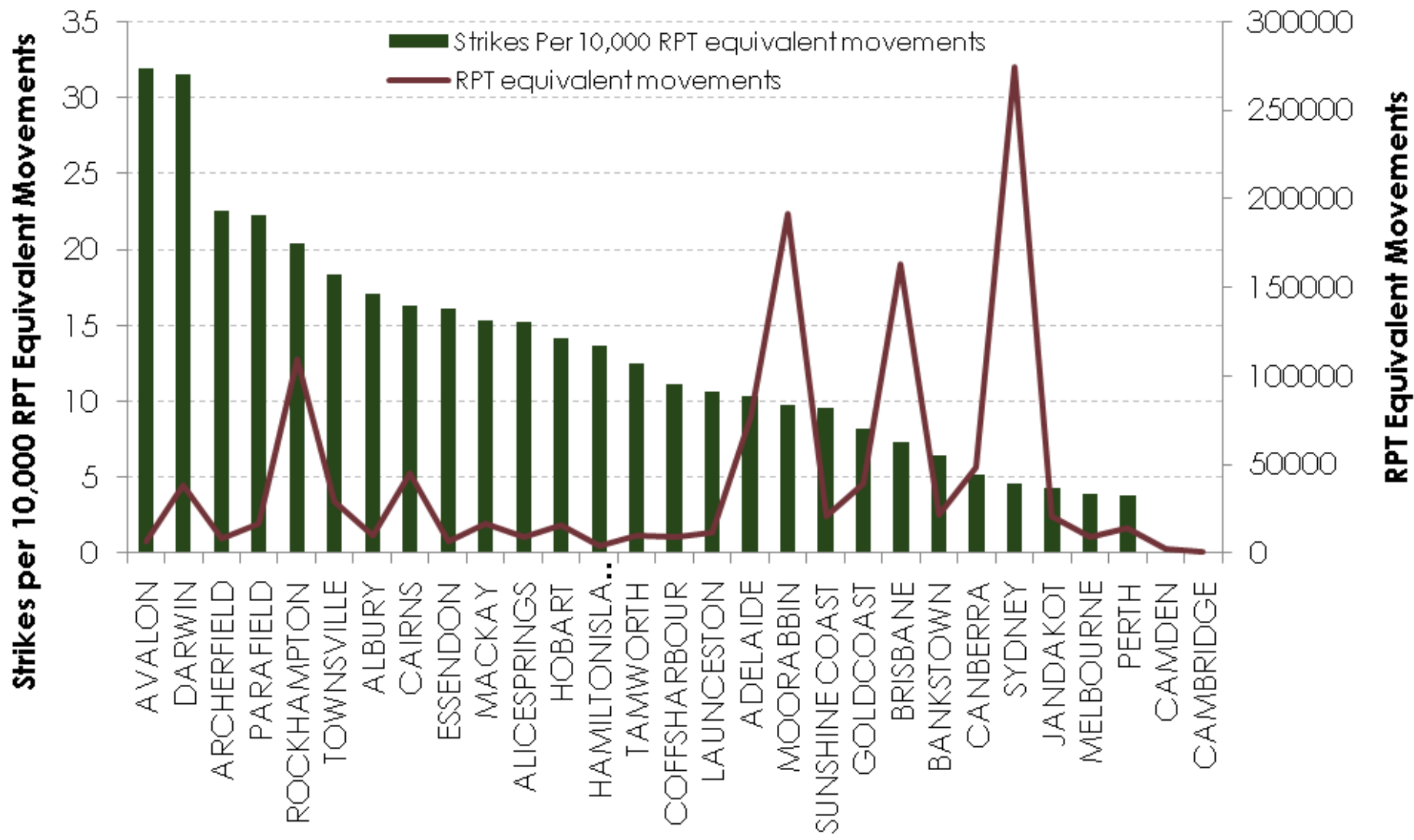
1 per 100,000  
aircraft movements

(Dolbeer 2008)

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<b>Strikes affecting planned flight</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>
<b>Strikes Rate per 10,000 Movements (RSR)</b>	<b>16.1</b>	<b>9.6</b>	<b>8</b>	<b>5.5</b>	<b>6</b>
<b>Strikes per 10,000 RPTEM Corrected (CSR)</b>	<b>47.1</b>	<b>32.5</b>	<b>30</b>	<b>21.1</b>	<b>25</b>





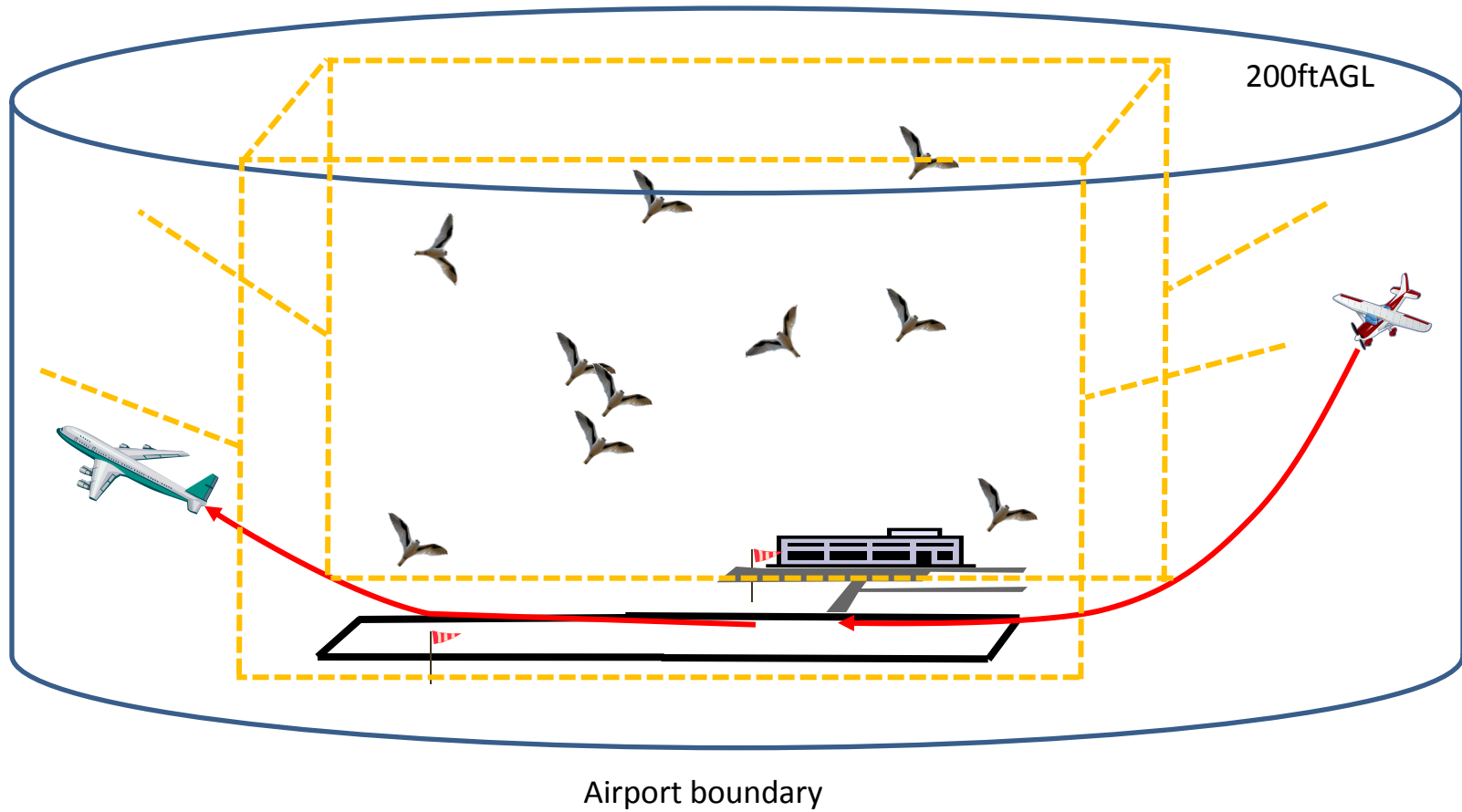
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<b>Ranking at Australian Airports</b>	<b>2</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>6</b>
<b>Total Mass Struck (g)</b>	<b>5861</b>	<b>1935</b>	<b>2000</b>	<b>2691</b>	<b>2000</b>
<b>Mass Struck per RPTEM (g)</b>	<b>2.5</b>	<b>0.83</b>	<b>0.86</b>	<b>1.16</b>	<b>0.86</b>

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Total Mass Struck (g)	5861	1935	2000	2691	2000
Mass Struck per RPTEM (g)	2.5	0.83	0.86	1.16	0.86
<b>Infringement Rate - Risk species in CA/hour</b>	<b>15</b>	<b>14</b>	<b>10</b>	<b>18</b>	<b>10</b>

# Infringement Rates



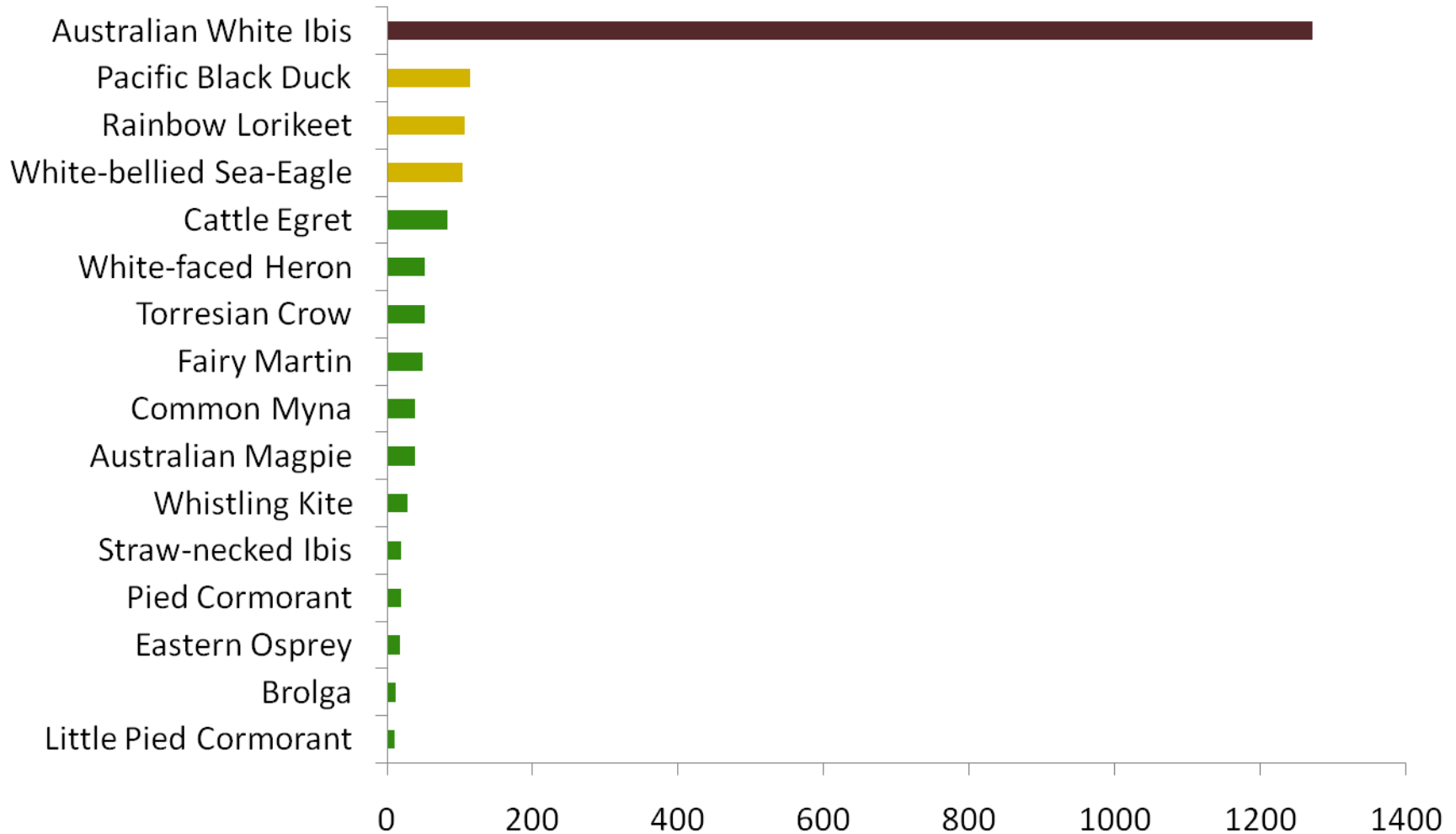
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Infringement Rate - Risk species in CA/hour	15	14	10	18	10
<b>Very high risk species</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>
<b>High risk species</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>4</b>	<b>3</b>
<b>Moderate risk species</b>	<b>16</b>	<b>13</b>	<b>13</b>	<b>14</b>	<b>13</b>
<b>Airport Survey Risk Index</b>	<b>2590</b>	<b>953</b>	<b>900</b>	<b>2130</b>	<b>1000</b>

## Risk by species from the survey record

<b>Risk Characteristic</b>	
Population	Probability of a strike
Ability to avoid aircraft	
Location on airport	
Time spent in air	
Mass	Consequence of a strike
Flock Size	

# Risk by species from the survey record



# Risk by species from the strike record

		Probability of strikes (5 year strike average for each species)				
		Very Low	Low	Moderate	High	Very High
Probability of damage	Very Low	Green	Green	Green	Green	Green
	Low	Green	Green	Green	Yellow	Yellow
	Moderate	Green	Green	Yellow	Dark Red	Dark Red
	High	Yellow	Yellow	Dark Red	Dark Red	Dark Red
	Very High	Yellow	Dark Red	Dark Red	Dark Red	Dark Red

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

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

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

# Risk by species from the strike record

(% Damage = 0.014 x mass in grams)

		Probability of strikes (5 year strike average for each species)				
		Very Low	Low	Moderate	High	Very High
Probability of damage	< 140g Very Low	Green	Green	Green	Green	Green
	140-414g Low	Green	Green	Green	Yellow	Yellow
	415-696g Moderate	Green	Green	Yellow	Dark Red	Dark Red
	697-1407g High	Yellow	Yellow	Dark Red	Dark Red	Dark Red
	> 1408g Very High	Yellow	Dark Red	Dark Red	Dark Red	Dark Red

Low Risk: no further action beyond current management is required

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

High Risk: immediate action required to reduce the current risk

# Risk by species from the strike record

Probability of strikes (5 year strike average for each species)							
Probability of damage		Very Low	Low	Moderate	High	Very High	
	Very Low	House Sparrow Nankeen Kestrel Richard Pipit Tree Martin Welcome Swallow	Unknown Small Bird				
	Low	Australian Hobby Silver Gull	Australian Magpie Unknown Medium Bird Masked Lapwing	Unknown Bird			
	Moderate		White-faced Heron				
	High	Nankeen Night Heron	Cattle Egret Whistling Kite	Unknown Flying-fox			
	Very High	Australian White Ibis	Black Duck Wood Duck				

Low Risk: no further action beyond current management is required

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

High Risk: immediate action required to reduce the current risk

# Combined risk species

COMBINED Risk Category	Species	TREND
<b>Very High</b>	<b>Australian White Ibis</b>	<b>Increase</b>
<b>High</b>	<b>Flying-fox</b>	
<b>High</b>	<b>Pacific Black Duck</b>	
<b>High</b>	<b>Rainbow Lorikeet</b>	<b>Increase</b>
<b>High</b>	<b>White-bellied Sea-Eagle</b>	<b>Increase</b>
<b>High</b>	<b>Cattle Egret</b>	<b>Increase</b>
<b>High</b>	<b>Wood Duck</b>	<b>Increase</b>
<b>Moderate</b>	<b>White-faced Heron</b>	
<b>Moderate</b>	<b>Torresian Crow</b>	
<b>Moderate</b>	<b>Fairy Martin</b>	<b>New addition (SRI)</b>
<b>Moderate</b>	<b>Common Myna</b>	<b>New addition (SRI)</b>
<b>Moderate</b>	<b>Australian Magpie</b>	
<b>Moderate</b>	<b>Whistling Kite</b>	<b>Decrease</b>
<b>Moderate</b>	<b>Straw-necked Ibis</b>	
<b>Moderate</b>	<b>Pied Cormorant</b>	<b>New addition (SRI)</b>
<b>Moderate</b>	<b>Eastern Osprey</b>	<b>New addition (SRI)</b>
<b>Moderate</b>	<b>Brolga</b>	<b>New addition (SRI)</b>
<b>Moderate</b>	<b>Little Pied Cormorant</b>	<b>New addition (SRI)</b>
<b>Moderate</b>	<b>Nankeen Night Heron</b>	<b>New addition (strike)</b>

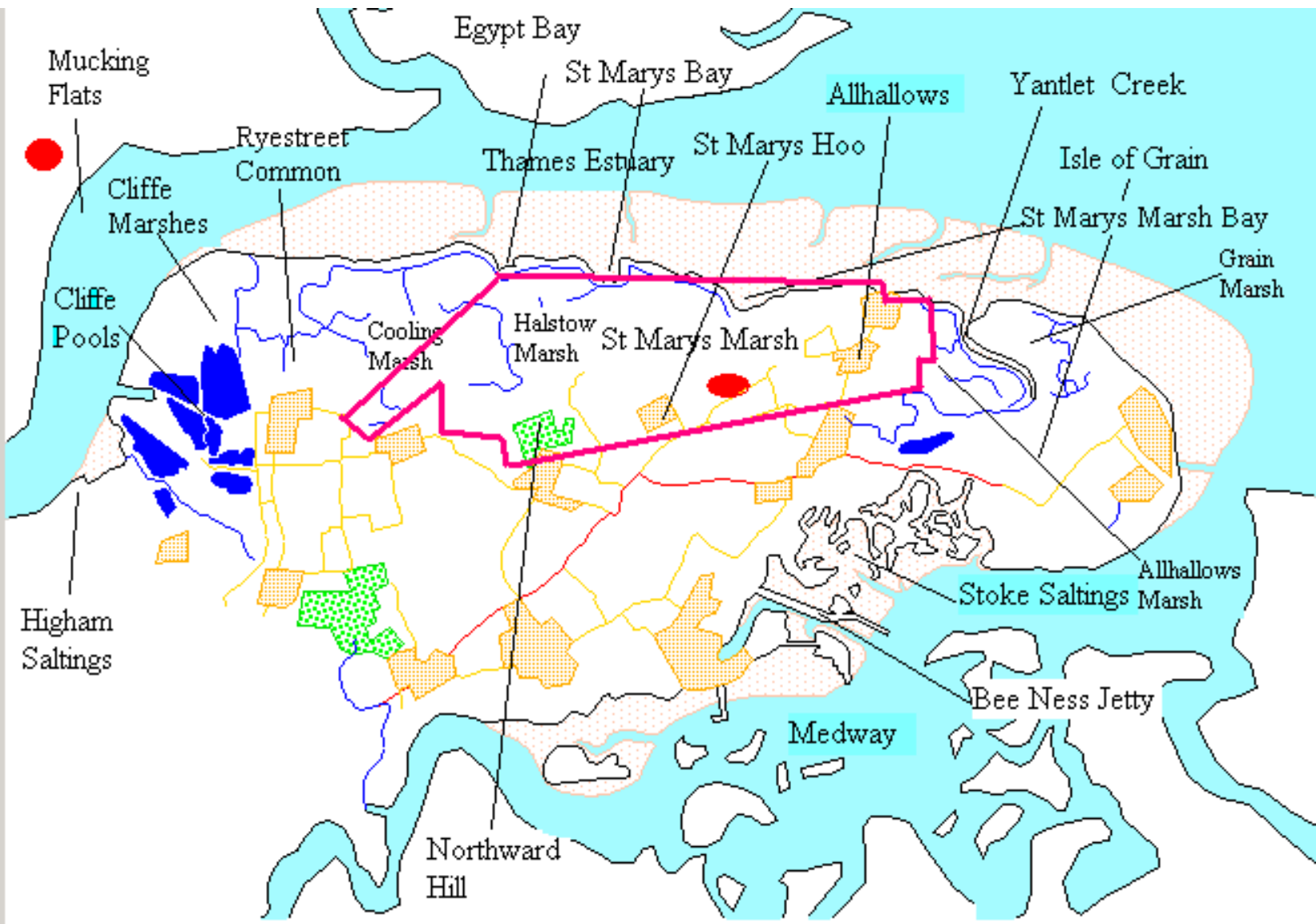
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Very high risk species	1	0	0	1	0
High risk species	5	4	3	4	3
Moderate risk species	16	13	13	14	13
Airport Survey Risk Index	2590	953	900	2130	1000

## Off-airport bird/bat hazards

- Transiting birds/bats to and from roosting, nesting or foraging sites
- Build up of populations off airport
  - Airport
  - Approaches
  - En-route







## Off-airport bird/bat hazards

<b>Consequence</b>		
<b>Mass</b>		
> 1408g	5	Very High
697-1407g	4	High
415-696g	3	Moderate
140-414g	2	Low
< 140g	1	Very Low

Add 1 to score if in multiple strikes

## Off-airport bird/bat hazards

Likelihood		
<b>Total Strikes Past 5 Years</b>		
> 50	5	Very High
15-50	4	High
5 - 14	3	Moderate
2 - 4	2	Low
1	1	Very Low
0	0	Very very low

## Off-airport bird/bat hazards

Likelihood		
<b>Numbers per Ha</b>		
>50	5	Very High
31 - 50	4	High
16 - 30	3	Moderate
5 - 15	2	Low
<5	1	Very Low

## Off-airport bird/bat hazards

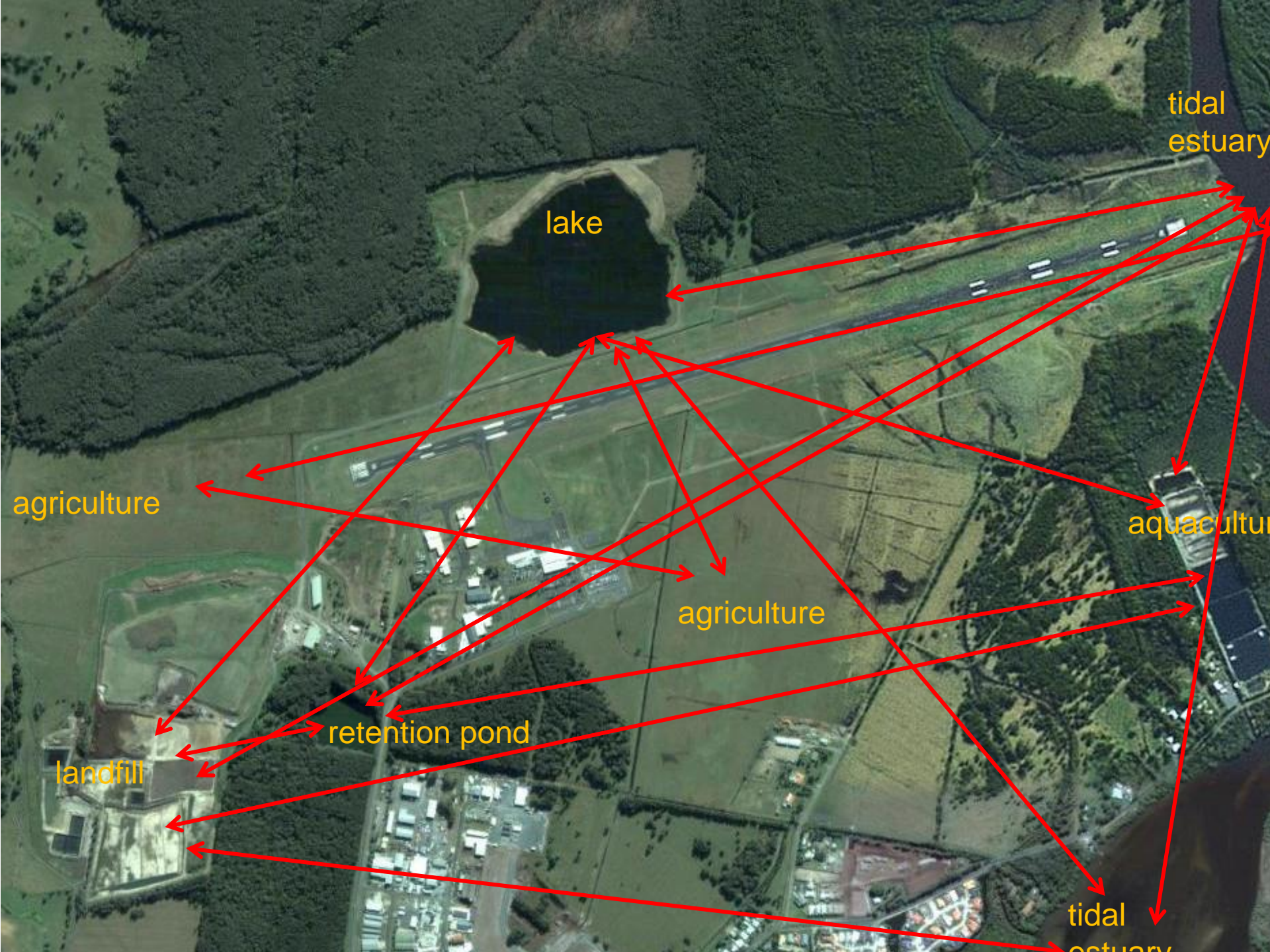
<b>Likelihood</b>		
<b>Distance from airport</b>		
<0.8km	5	Very High
0.8-1.6km	4	High
1.6-8km	3	Moderate
8-13km	2	Low
>13km	1	Very Low

## Off-airport bird/bat hazards

<b>Likelihood</b>		
<b>Likely frequency of crossing airspace</b>		
Multiple times per day	5	Very High
Once per day	4	High
Weekly	3	Moderate
Monthly	2	Low
Almost never	1	Very Low

# Likely frequency of crossing airspace

- Location of strikes
- Altitude of bird mvts
- Proximity to aircraft flight paths
- Complimentary habitats
  - Number
  - Location
  - Habitat quality



lake

tidal estuary

agriculture

aquaculture

agriculture

retention pond

landfill

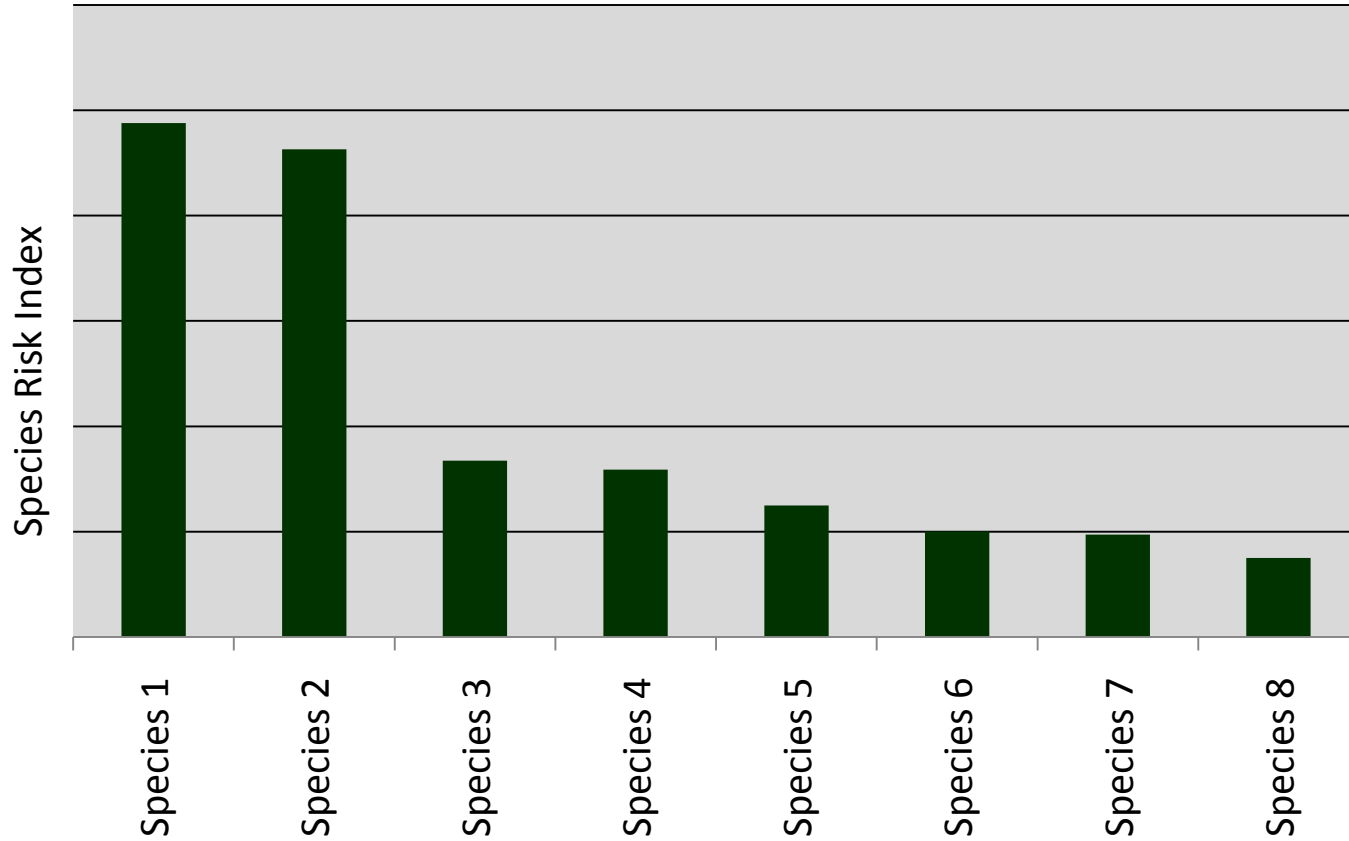
tidal estuary

Site Risk = Consequence x Likelihood

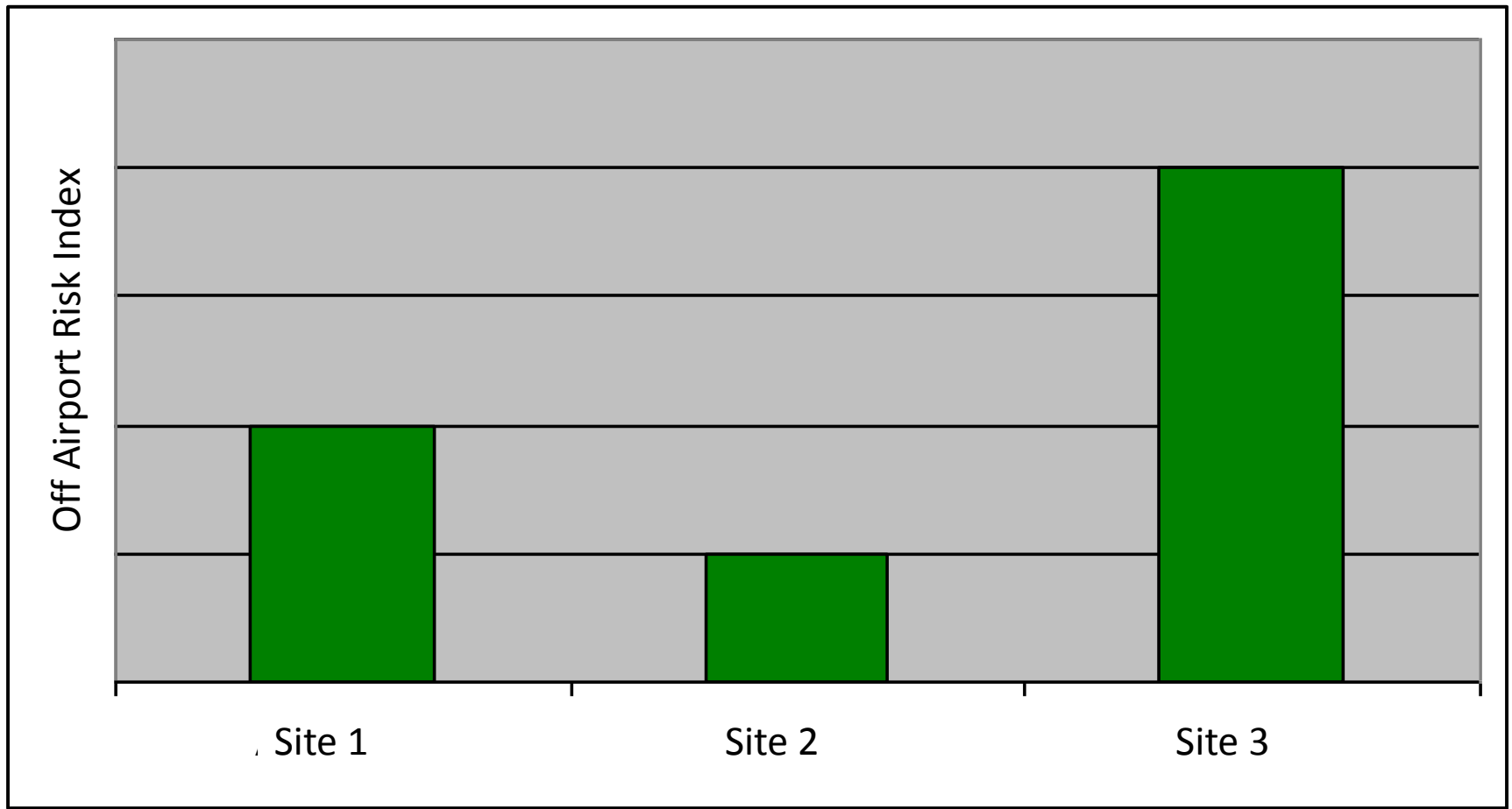
= Mass x

(Strikes + Number + Distance + Cross Airspace)

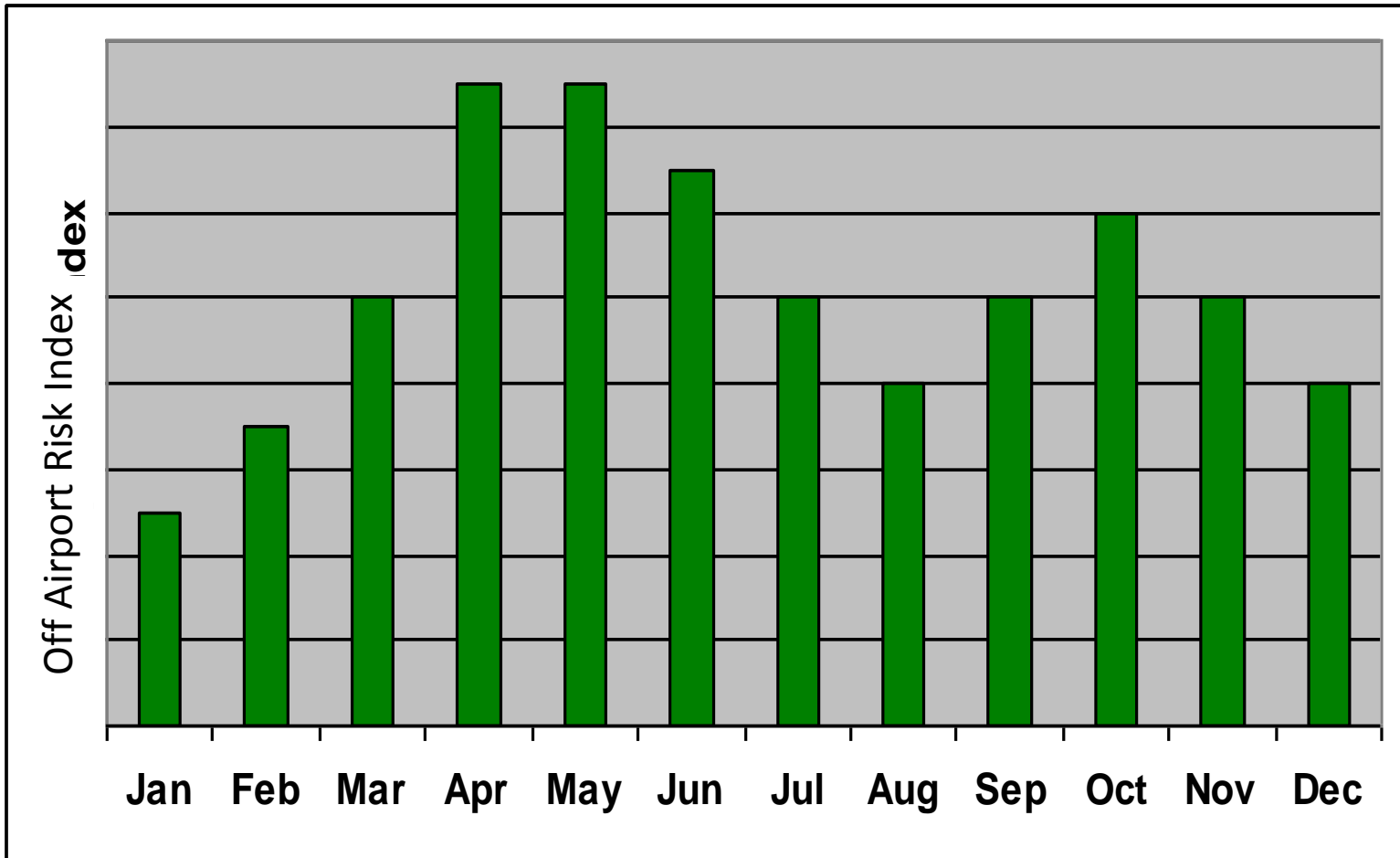
# Compare risk by species



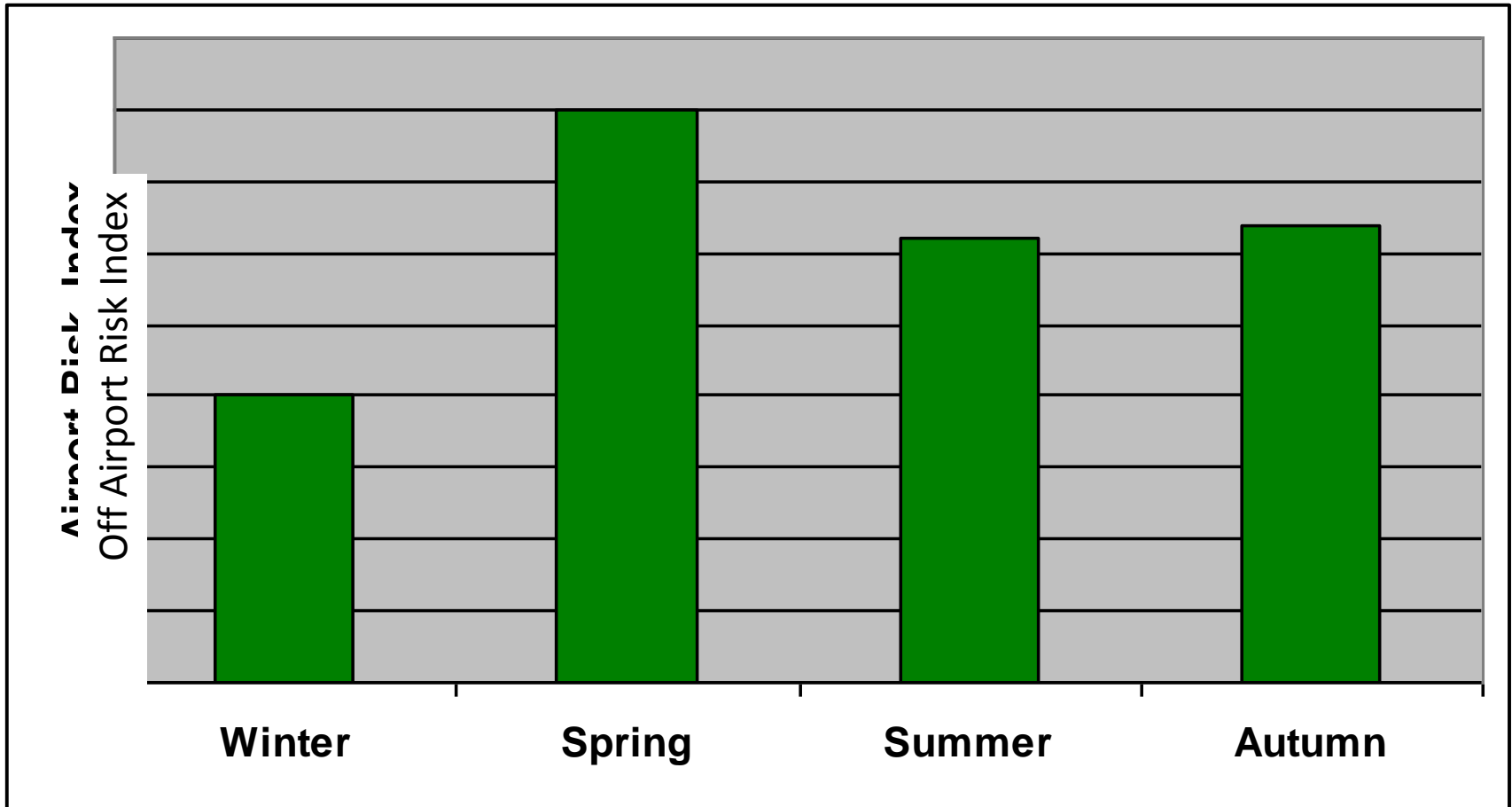
# Compare risk by sites



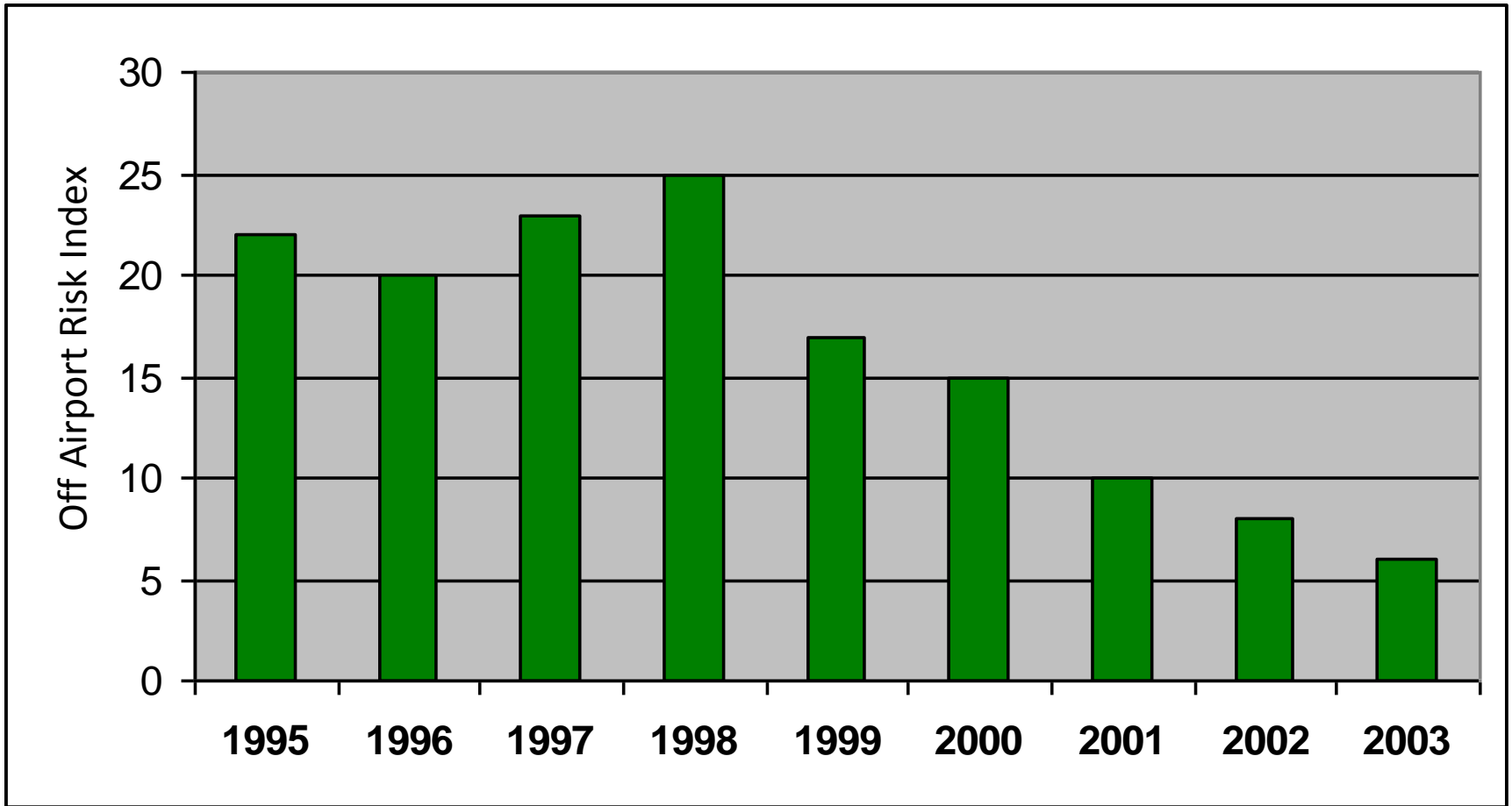
## Compare risk over months



## Compare risk over seasons



## Compare risks over years



# Managing off-airport risk

## Setting thresholds for action

### Low risk sites

- Annual monitoring

### Moderate risk:

- Seasonal monitoring

### High risk sites monitored:

- Weekly/Monthly monitoring
- Action Plan required

### Very High Risk:

- Daily Monitoring
- Immediate Management required

## Points for consideration

- Stakeholder engagement
- Existing sites
- Can be used modified for new airports
- Airport expansions
- New land use proposals

QUESTIONS?

