Urban concentration of large-mass flocking species: management strategies for a new airport in Australia

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North American Bird Strike Conference
Halifax, August 2019

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Overview

1. Western Sydney Airport
2. Off-airport development planning
3. Australian White Ibis and Flying-fox

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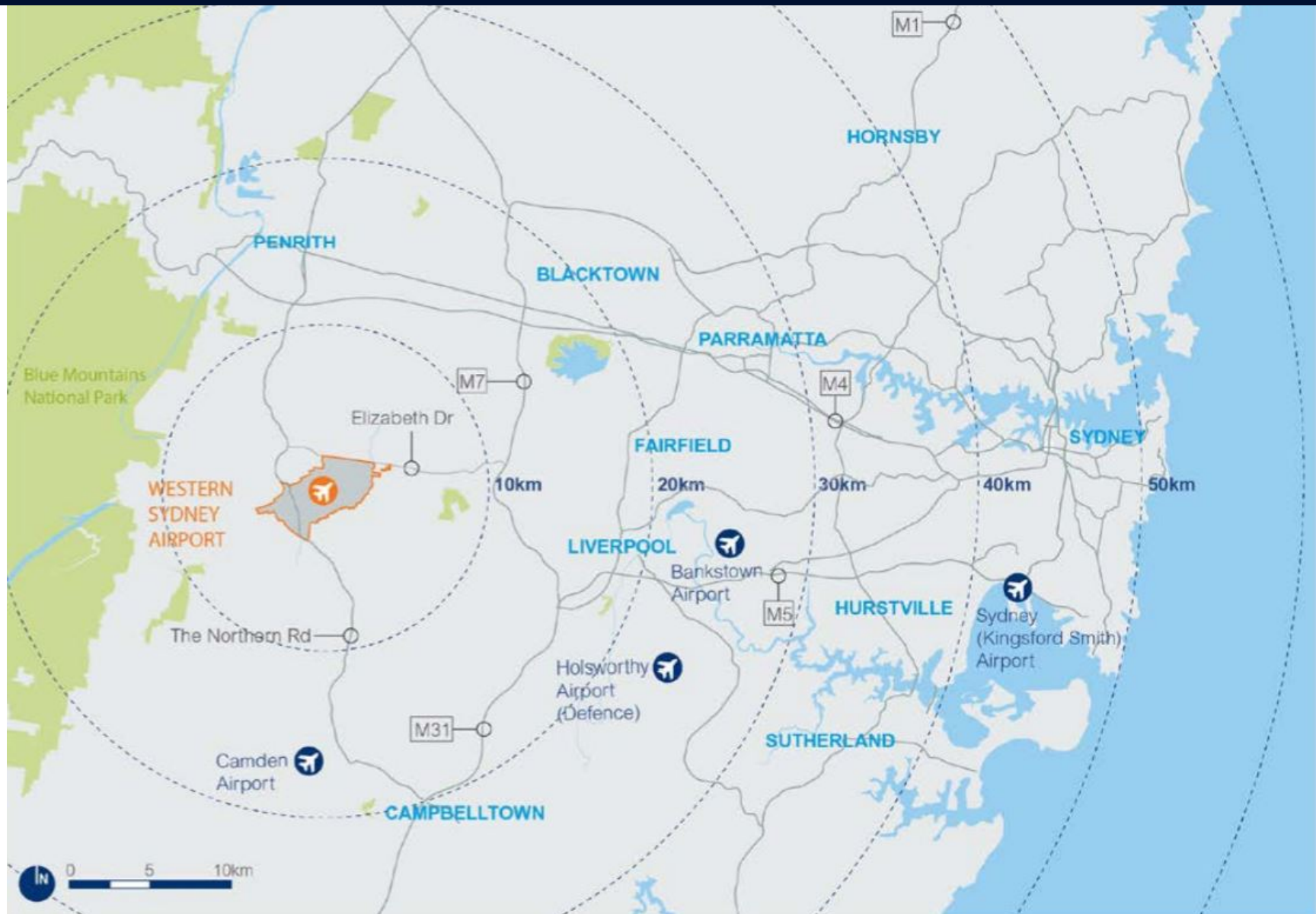
Western Sydney Airport

- By 2027, existing airport in Sydney will not be able to support new flights
- Passengers to double by 2035 and double again by 2060
- Western Sydney population to be 2.9 million by 2036 (50% of overall Sydney population)



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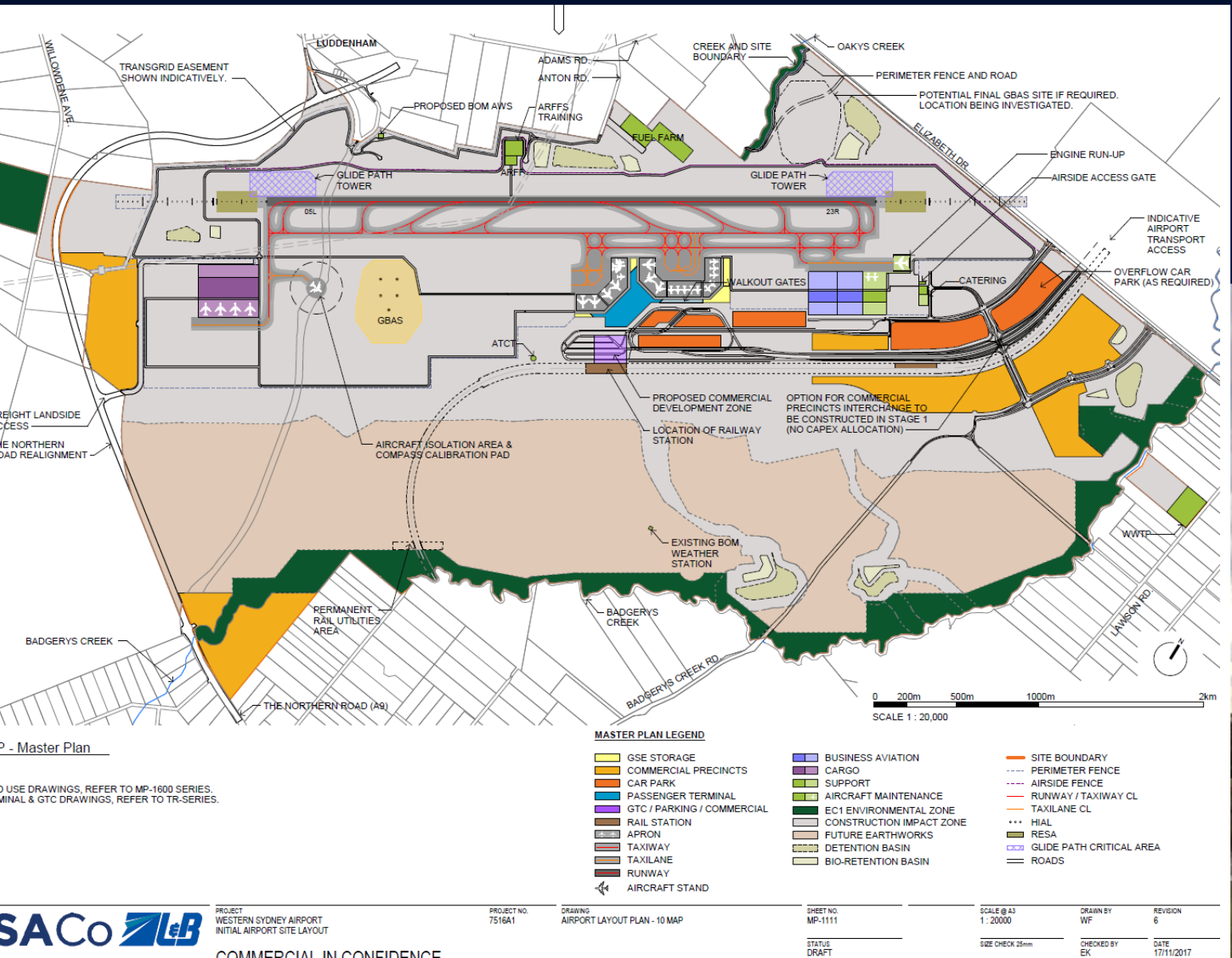
Western Sydney Airport



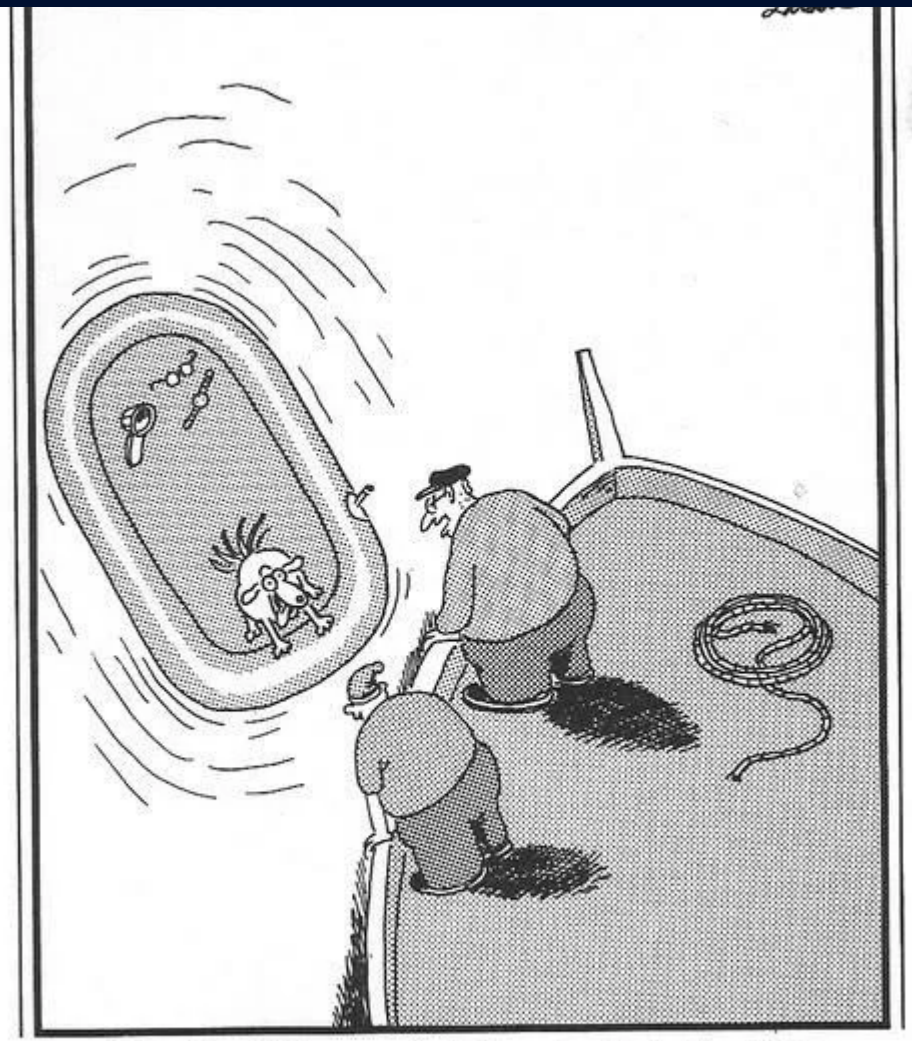
Western Sydney Airport Environmental Impact Statement

Preliminary Bird and Bat Strike Risk Assessment

September 2015

Western Sydney Airport – Working with Limited Data

- Aircraft movements and strikes:
  - Based on projected movements and assuming a similar strike rate to other major Australian airports, WSA can expect:
    - 30 strikes per year in 2026
    - 43 strikes per year by 2035
    - 89 strikes per year by 2050
    - 184 strikes per year by 2063
  - A nocturnal strike risk is likely if flying-fox transit paths infringe aircraft airspace.



"Hey, boy! How ya doin'? … Look at him, Dan. Poor guy's been floating out here for days but he's still just as fat and happy as ever."

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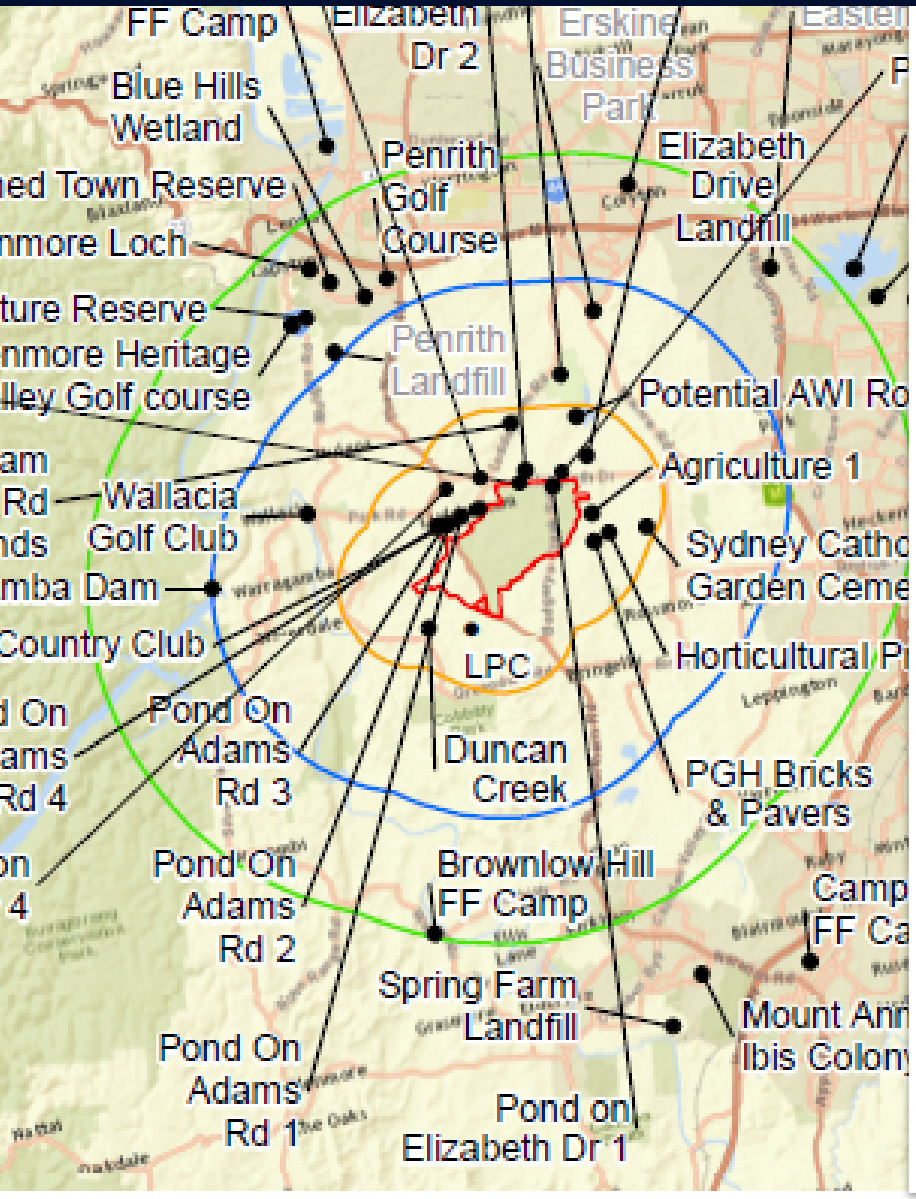
Western Sydney Airport – Off-airport Wildlife Surveys



Prepared by the Australian Aviation Wildlife Hazard Group

Guideline C
Attachment 1 to Wildlife Strike Guidelines

Land Use	Wildlife Attraction Risk	Actions for Existing Developments			Actions for Proposed Developments/ Changes to Existing Developments		
		3 km radius (Area A)	8 km radius (Area B)	13 km radius (Area C)	3 km radius (Area A)	8 km radius (Area B)	13 km radius (Area C)
Agriculture							
Turf farm	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Piggery	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fruit tree farm	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fish processing /packing plant	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Cattle /dairy farm	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Poultry farm	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Forestry	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Plant nursery	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Conservation							
Wildlife sanctuary / conservation area - wetland	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Wildlife sanctuary / conservation area - dryland	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Recreation							
Showground	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Racetrack / horse riding school	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Golf course	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sports facility (tennis, bowls, etc)	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Park / Playground	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Picnic / camping ground	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Commercial							
Food processing plant	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Warehouse (food storage)	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Fast food / drive-in / outdoor restaurant	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Shopping centre	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Office building	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Hotel / motel	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Car park	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Cinemas	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Warehouse (non-food storage)	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Petrol station	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Utilities							
Food / organic waste facility	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - landfill	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - transfer station	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Non-putrescible waste facility - landfill	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Non-putrescible waste facility - transfer station	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sewage / wastewater treatment facility	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Potable water treatment facility	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action

Western Sydney Airport – Establish Baselines

Risk Assessment

Duncan Creek — High

Elizabeth Drv Pond 7 — High

Moderate

Elizabeth Drv Landfill — High

Point 18 Pond — High

Hubertus Country Club — High

Longleys Rd Pond 2 — High

Taylors Rd Retention — High

- Pond on Elizabeth Dr 1-6
- Jackson Road Pond
- Glenmore Loch
- Ched Town Reserve
- Luddenham Rd Pond 1-2
- Blue Hills Wetland
- Fire trails pond 4
- Taylor's Rd Pond 1
- Pond on Adams Rd 1, 2, 4
- Agricultural 1
- IGA Pond
- Sydney Catholic Garden Cemetery
- Ropes Creek Flying-fox Camp
- Fire trails Pond 5, 7, 6
- Wolstenholme Avenue Pond
- Survey point 15 pond
- Macquarie Fields Flying-fox Camp
- Longleys Rd Pond
- Horticultural Production
- Twin Creeks Golf Course
- Great Northern Rd Pond 2
- Cabramatta Flying-fox Camp
- Cobbitty, Brownlow Hill Flying-fox Camp
- Emu Plains Flying-fox Camp
- Campbelltown Flying-fox Camp

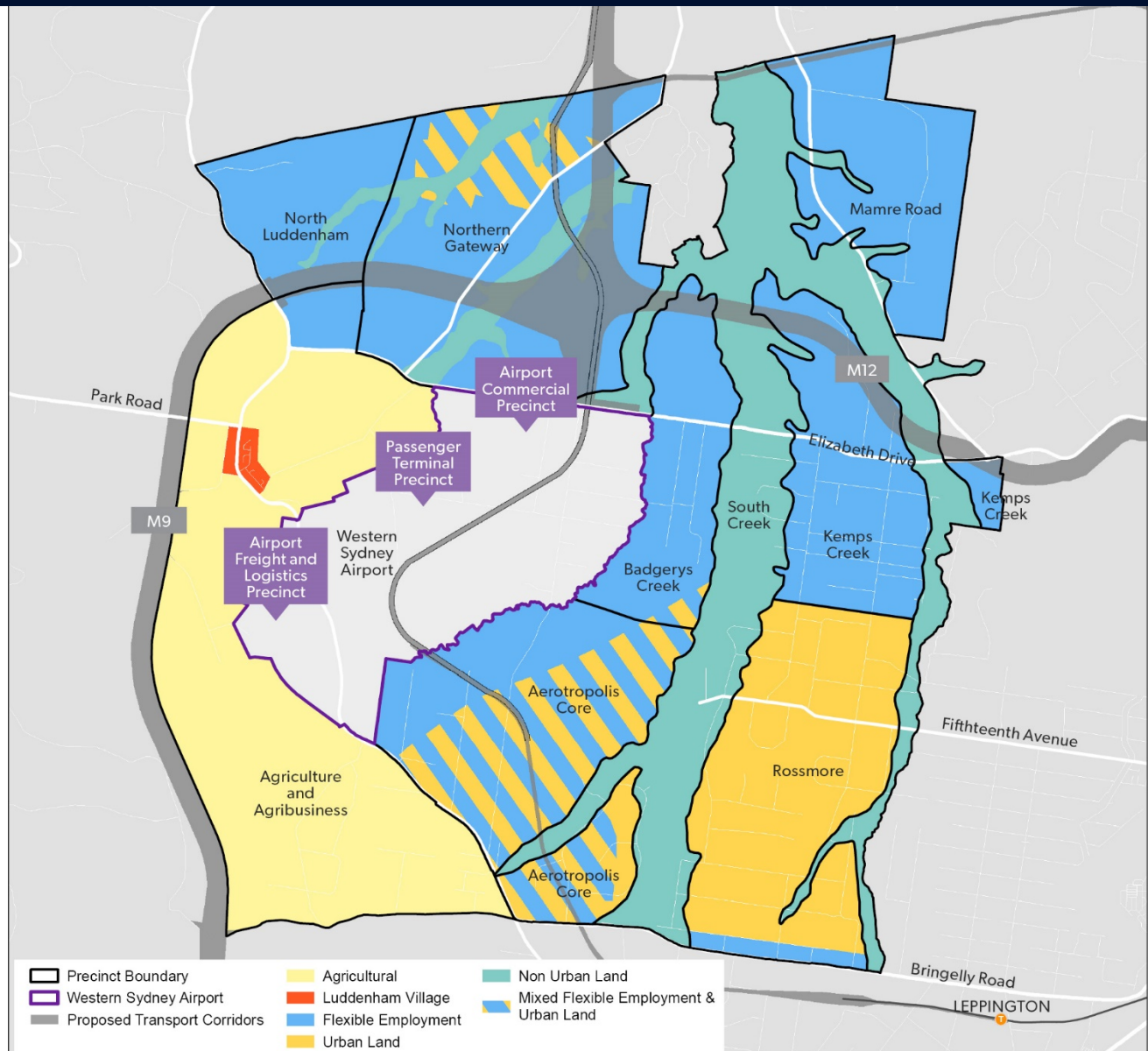
Western Sydney Airport – Establish Baselines

Why do we need to establish baselines?

Create agreed starting point for risk assessments

How will it benefit an operation starting in 2026?

Inform land use planning decisions proactively



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Legislation Does Not Solve Conflict

Image source: CASA


Image source: nea.gov.sg

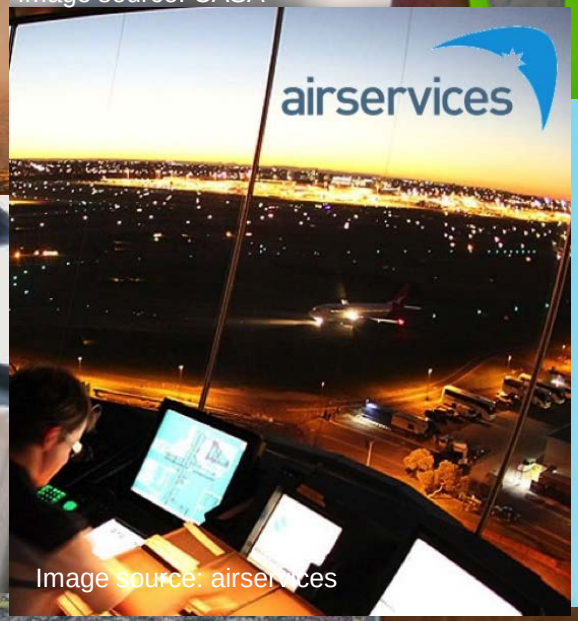

Image source: airservices


Image source: workchron.com

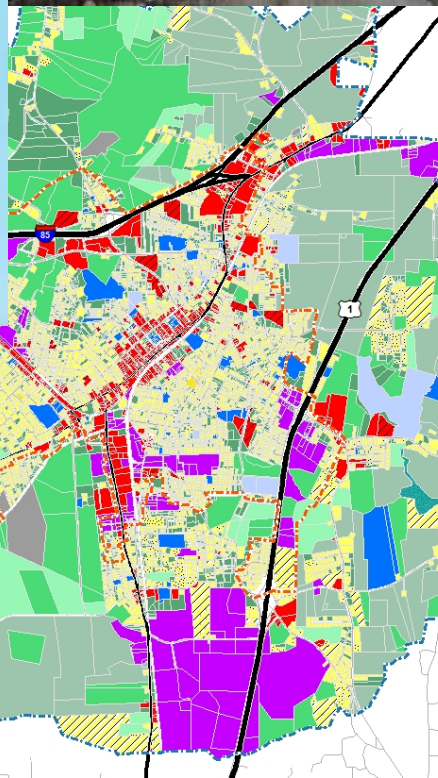

Image soure: adelaidealrport.com.au


Image source: providertrust.com

Off-airport Contribution to Strike Risk – The Rules

Rule #1

An issue is **ALWAYS** considered worth addressing after there is an accident.

Rule #2

The **PROBABILITY** of wildlife in the vicinity of your aerodrome infringing **CRITICAL AIRSPACE** (flight paths) at the **SAME TIME** as aircraft is more important than the absolute number of wildlife at the off-airport site.

Rule #3

Legislation and guidelines set out the **MINIMUM** requirements.

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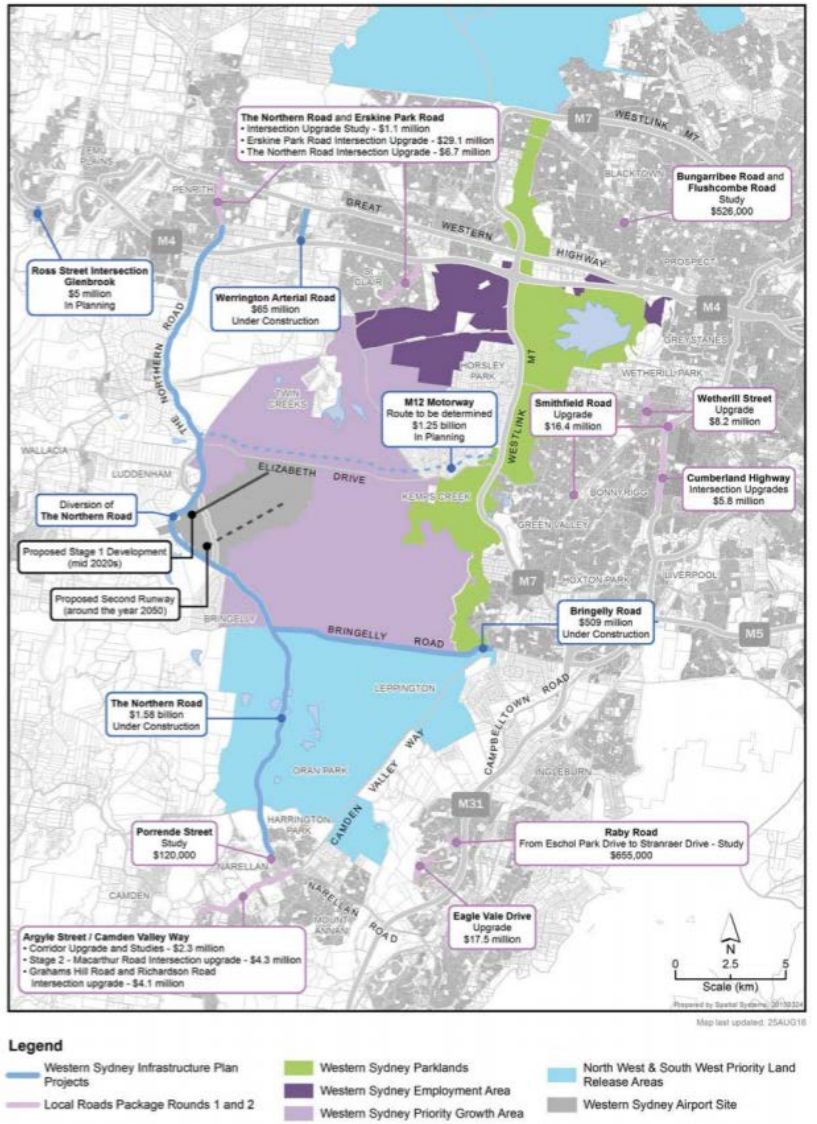
Western Sydney Airport – Land Use Planning

Figure 10:Western Sydney Infrastructure Plan



Australian White Ibis – Transient Wetland Specialist

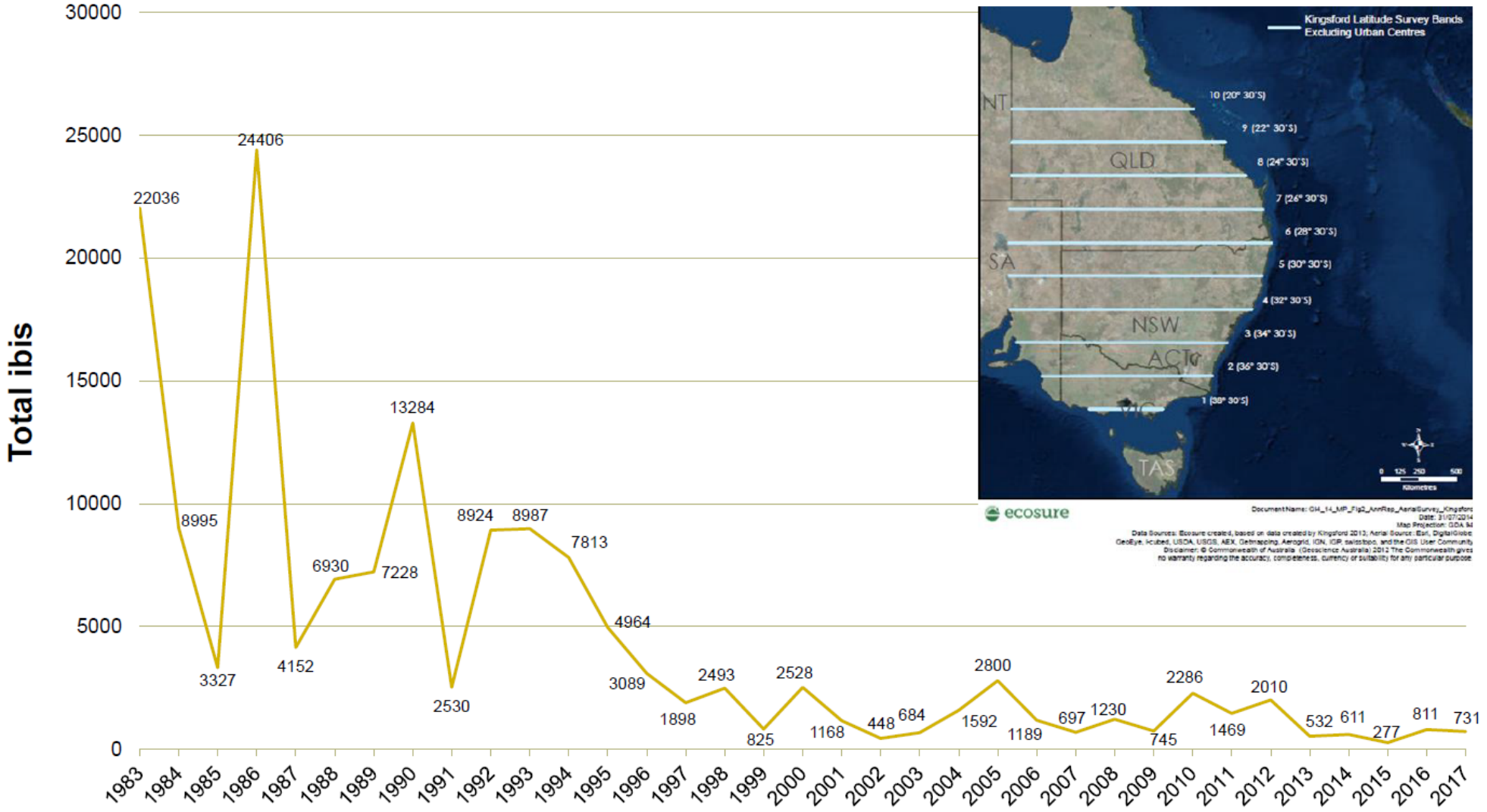


Figure 2 Eastern Australia waterbird survey bands. Inserted graph shows the number of ibis counted at these inland wetlands (October) 1983 – 2017 (Eastern Australia Aerial Survey Kingsford, R.T. and Porter J.L. 1983-2017)

Australian White Ibis – Urban Generalist

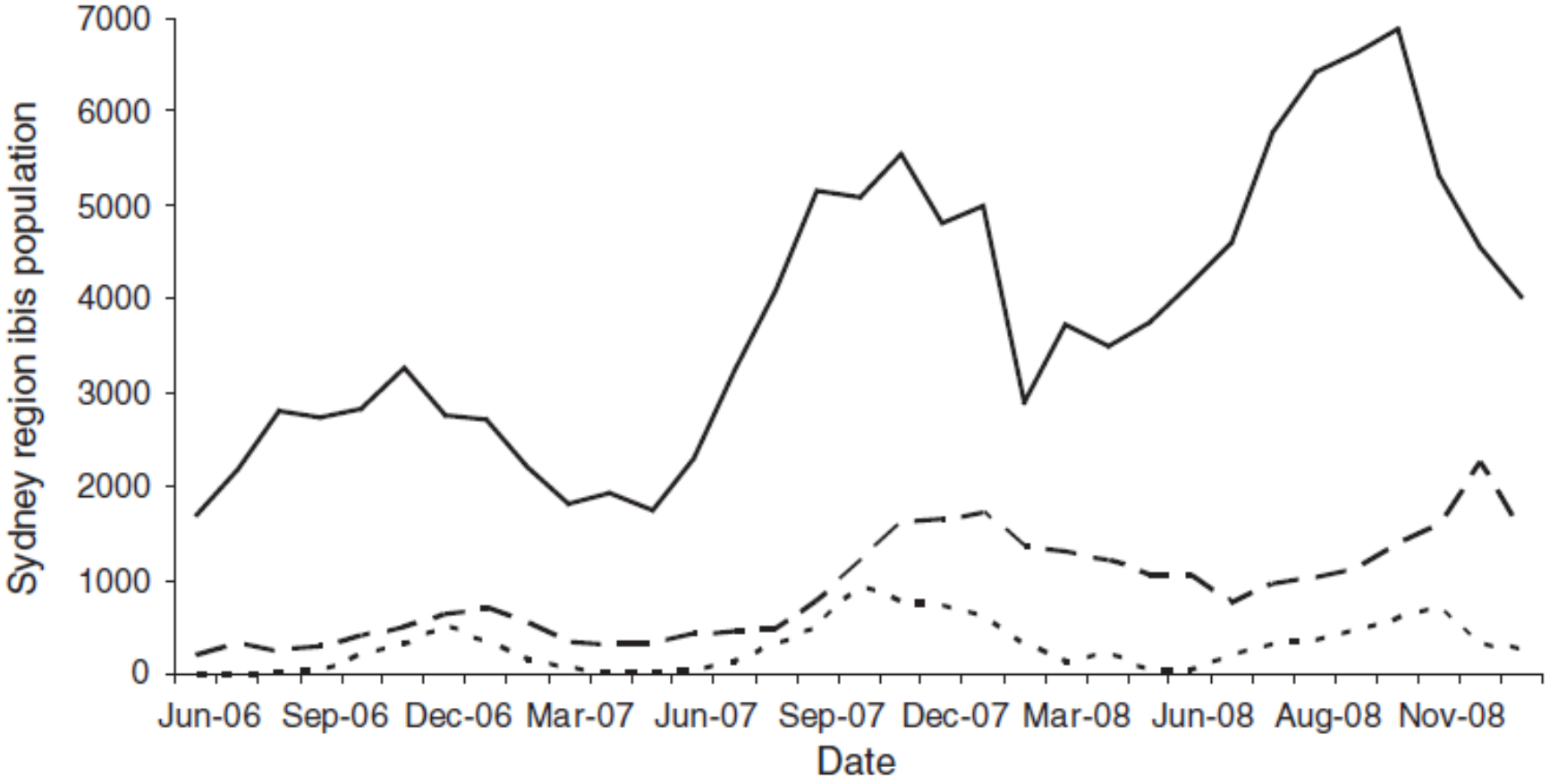


Fig. 1. Australian white ibis population in the Sydney region by age class: adults (solid line), juveniles (dash) and nestlings (dots) across three breeding seasons (July–December) and two non-breeding seasons (January–June). Regional surveys were conducted over three consecutive days.

Martin, J., French, K. & Major, R. (2010). Population and breeding trends of an urban colonizer: the Australian white ibis. Wildlife Research, 37 (3), 230-239.

Australian White Ibis – Urban Generalist

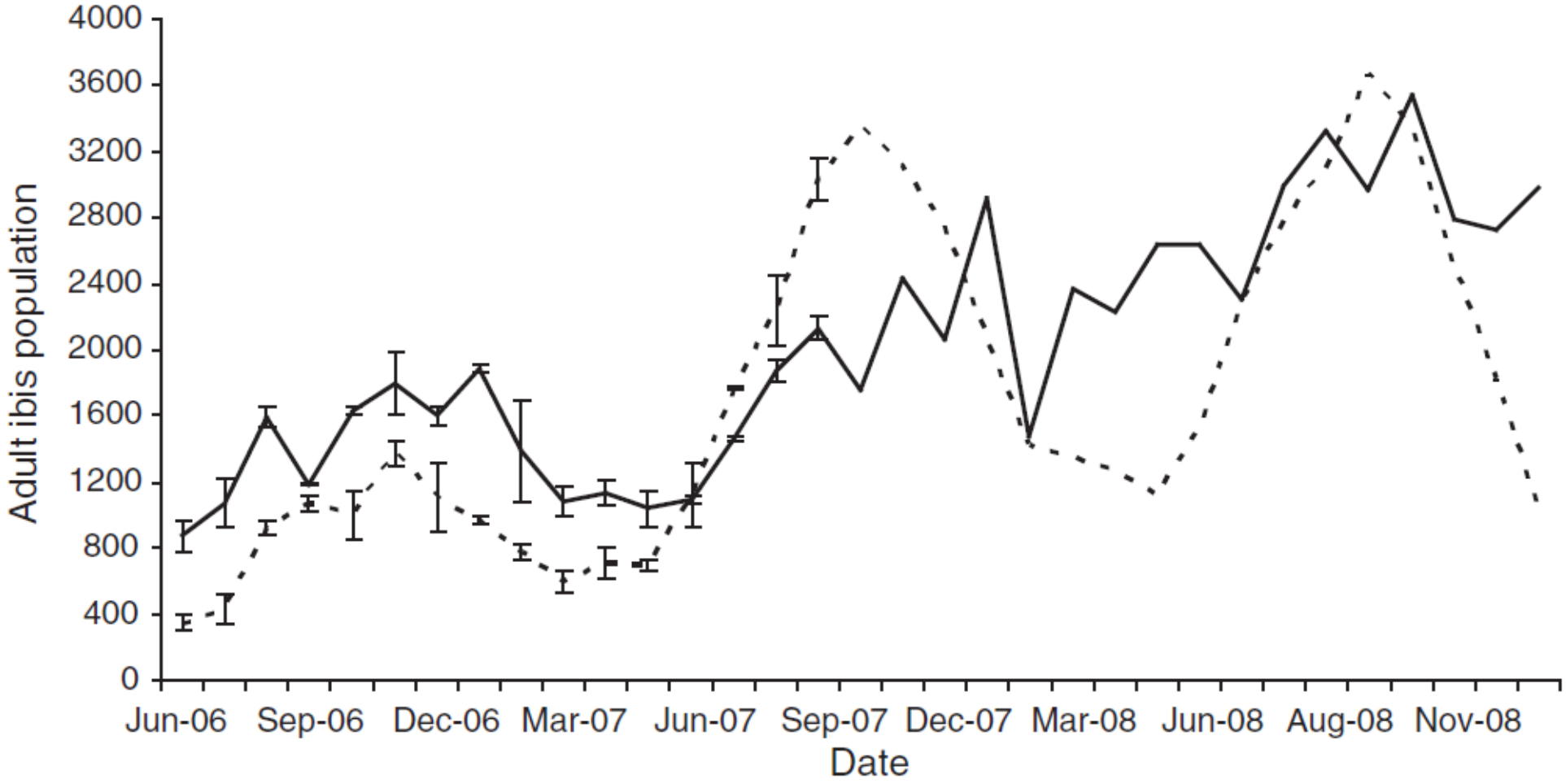
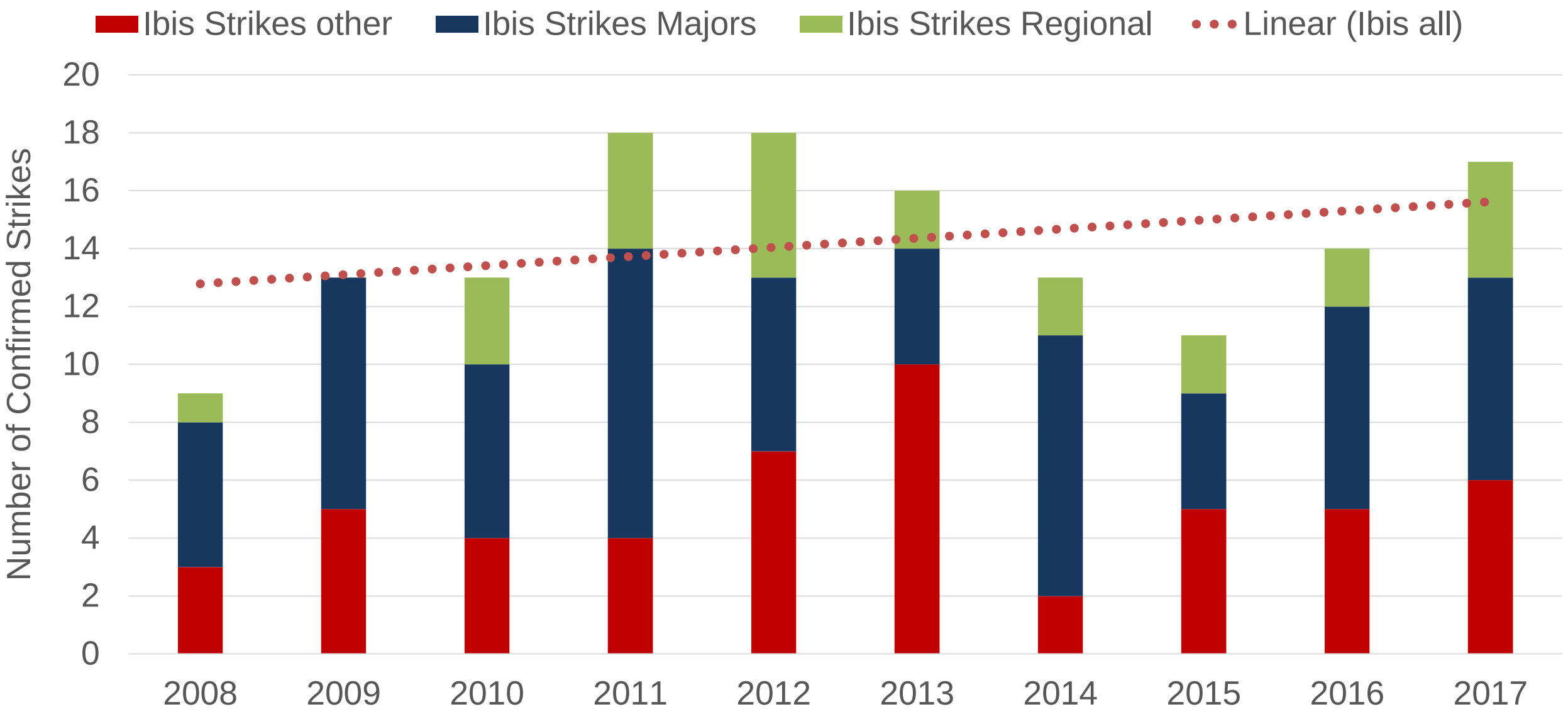


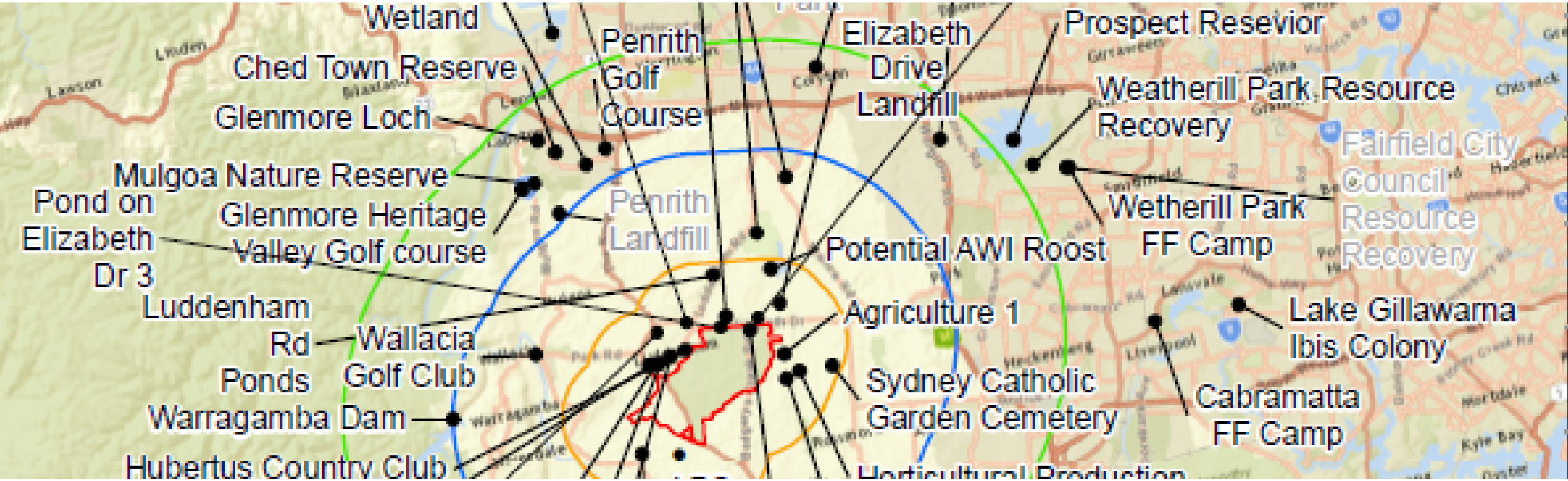
Fig. 2. The number of adult ibis recorded in the Sydney region at landfills (solid line) and colonies (dots) across three breeding and two non-breeding seasons. Months with greater than one survey are presented as an average (±s.e.).

Martin, J., French, K. & Major, R. (2010). Population and breeding trends of an urban colonizer: the Australian white ibis. Wildlife Research, 37 (3), 230-239.

Ibis – Strike History



Australian White Ibis – Urbanizing and Unpredictable



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Western Sydney Airport – Flying-fox Strike Risk

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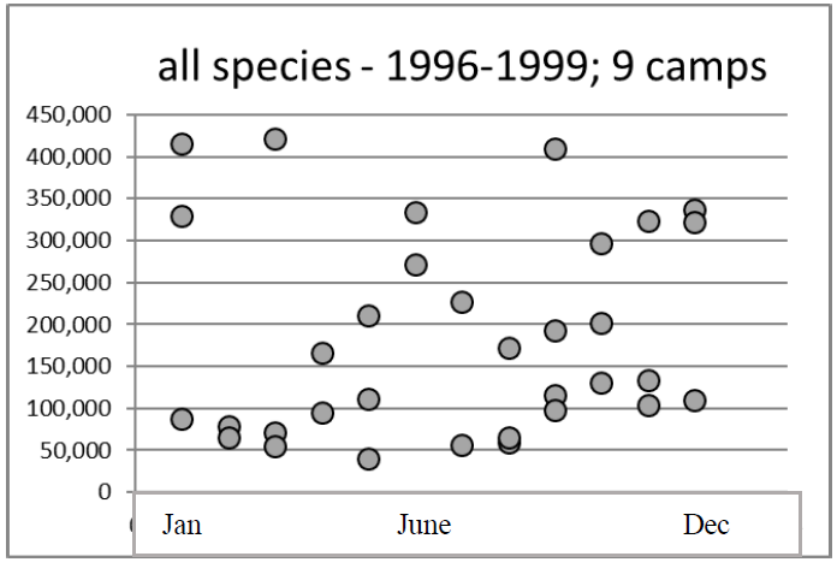
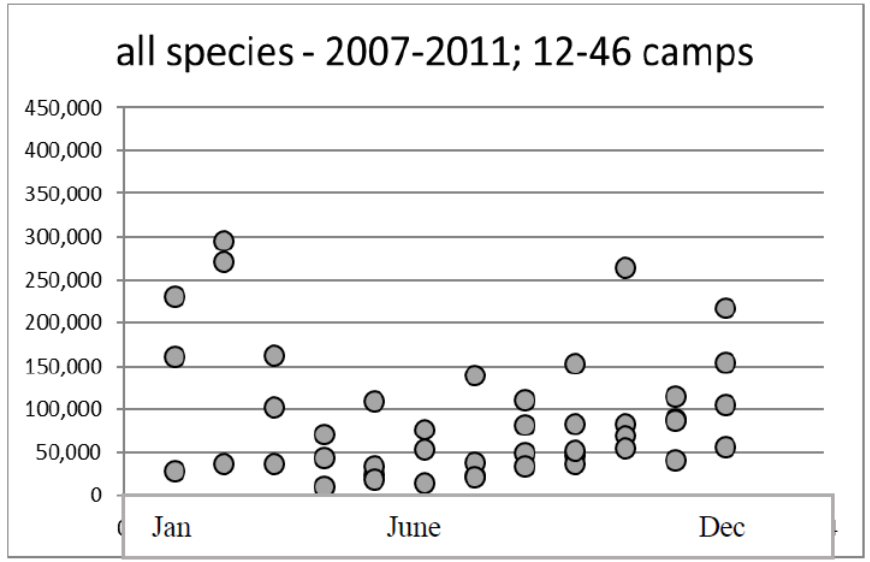
Flying-fox Strike Risk – Urbanizing Species

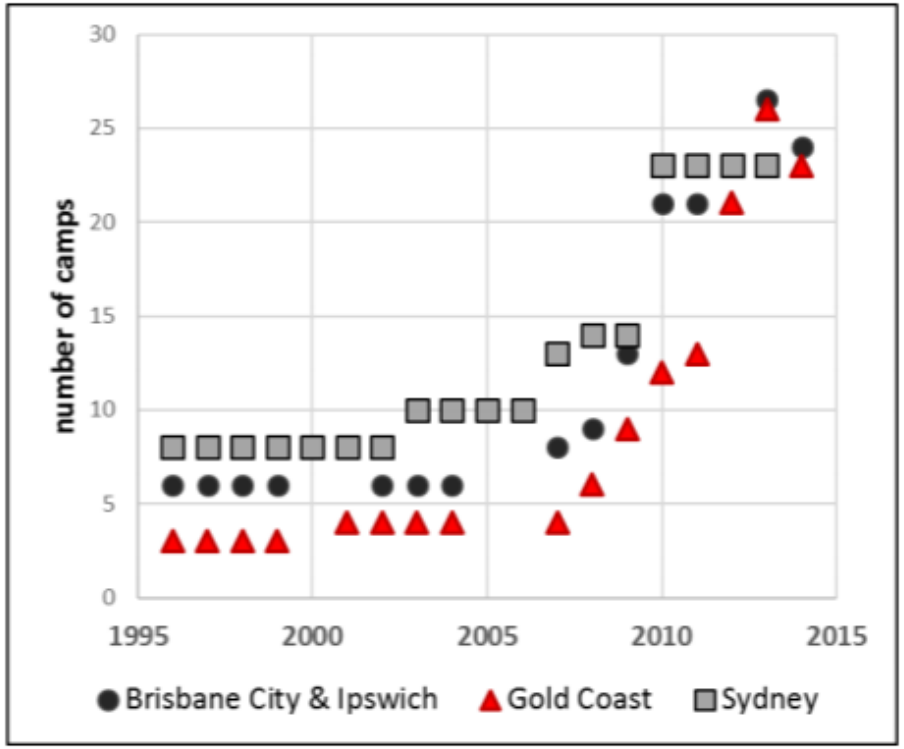
SEQ

The plots below show estimates of the total number of flying-foxes present in camps in the combined Brisbane City, Ipswich and Gold Coast LGAs during 1996-1999 when 9 camps were present (left graph) and 2007-2011 when the number of camps increased from 12-46 (right graph). Dots indicate monthly population estimates for each year. (Birt 2005; DEHP 2015)





Flying-fox Strike Risk – Urbanizing Species



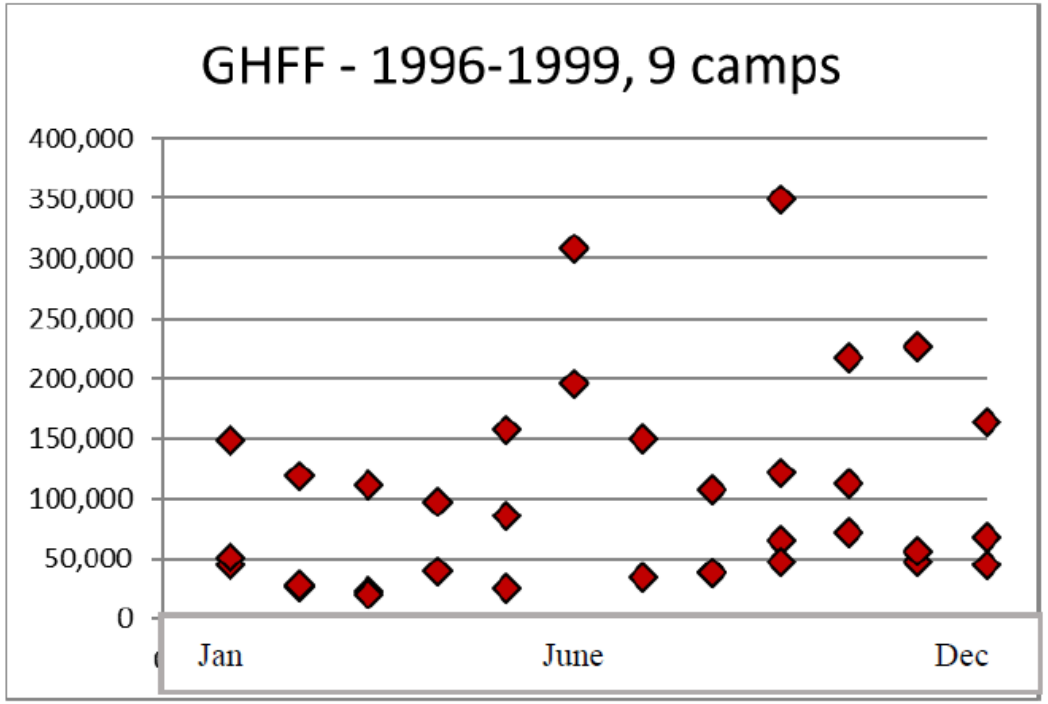
Patterns of increase in the number of flying-fox camps in the combined Brisbane City-Ipswich LGAs, the Gold Coast LGA and Greater Sydney 1996-2014.

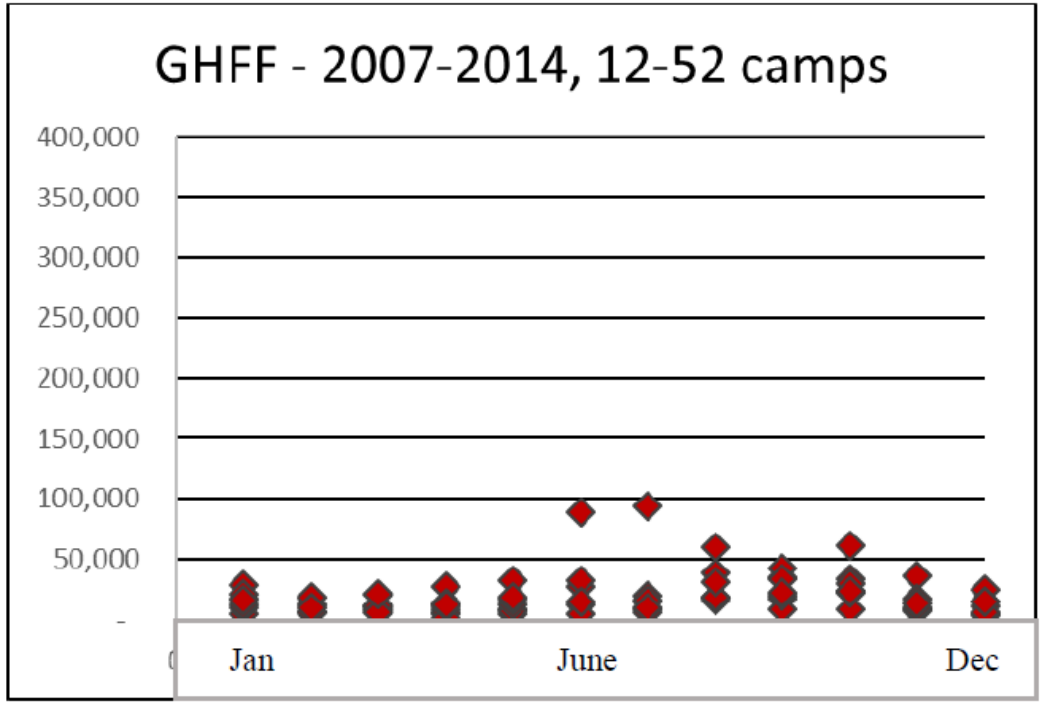
The available evidence indicates the increase in roosts has not been associated with an increase in the number of flying- present in these areas.

Supplementary submission to the House of Representatives Standing Committee on Environment and Energy inquiry on the impact of nationally protected flying-foxes on communities in the eastern states of Australia – Submission 62, Dr Peggy Eby

Flying-fox Strike Risk – Overall Population Decline

There is strong evidence that the population of GHFFs in these areas of SEQ has declined sharply during the period of rapid increase in camps.





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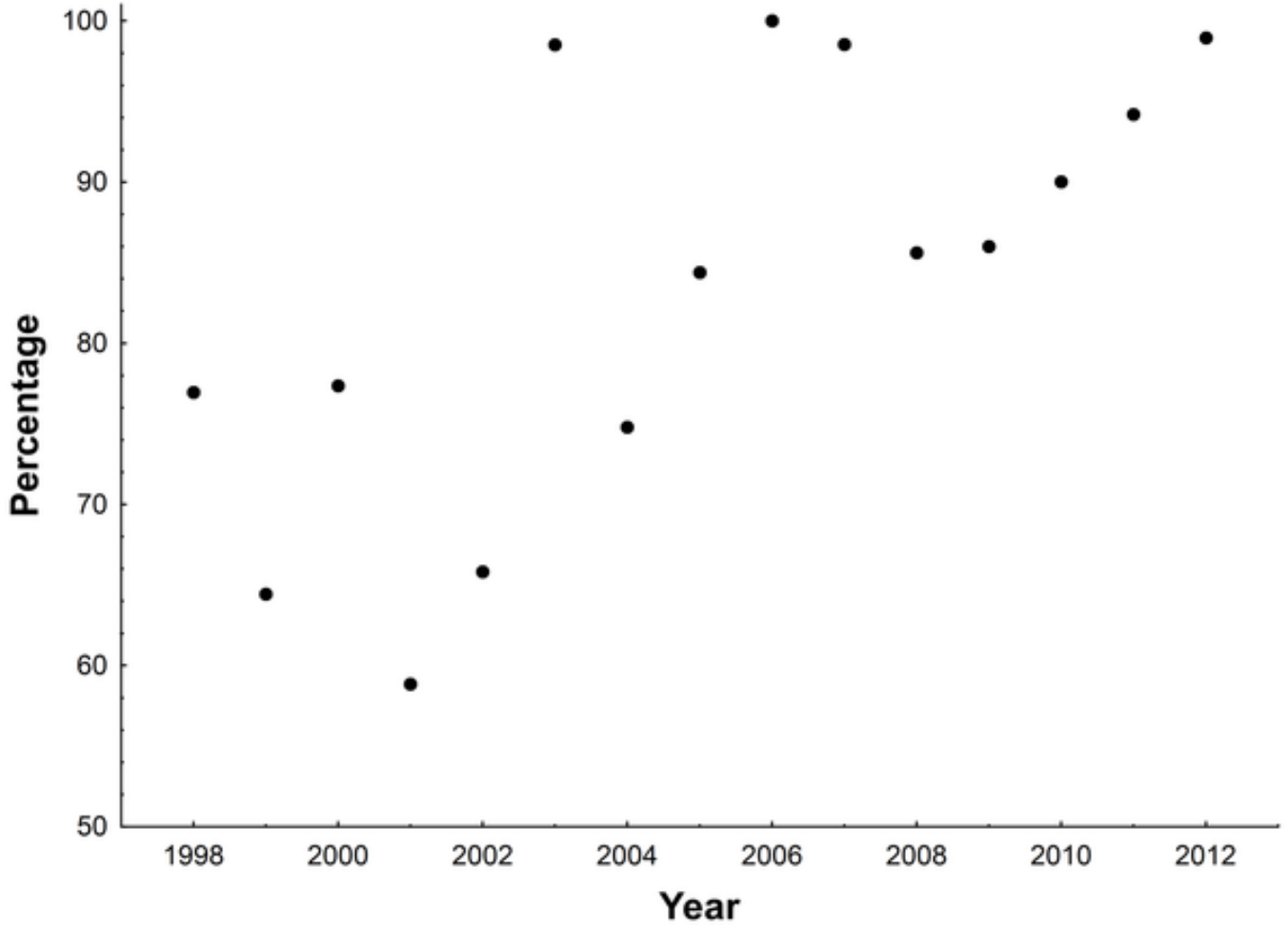
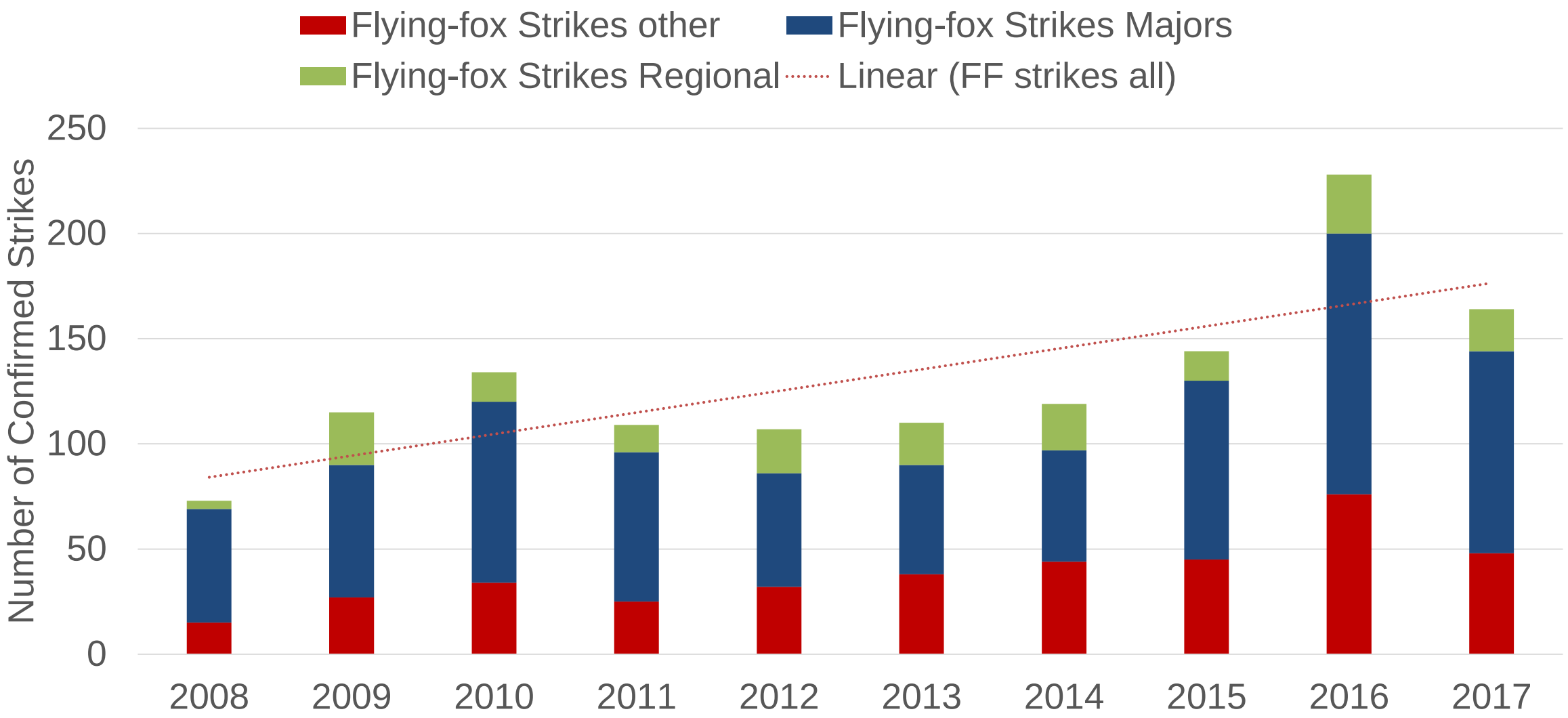
Flying-fox Strike Risk – Urbanizing Species



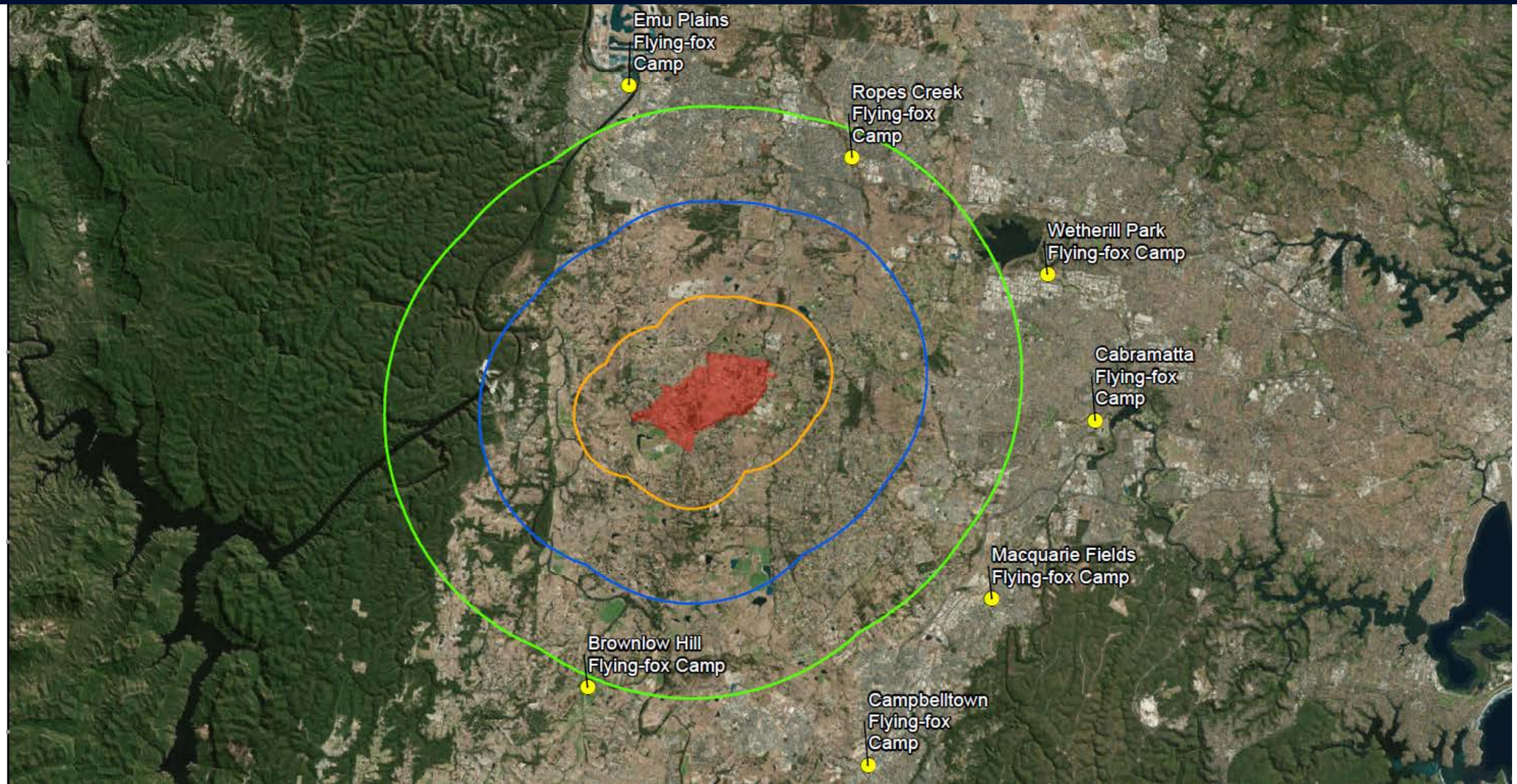
Tait J, Perotto-Baldivieso HL, McKeown A, Westcott DA (2014) Are Flying-Foxes Coming to Town? Urbanisation of the Spectacled Flying-Fox (Pteropus conspicillatus) in Australia. PLOS ONE 9(10): e109810. https://doi.org/10.1371/journal.pone.0109810 https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0109810

Figure 2. The percentage of the spectacled flying-fox population of the Wet Tropics found in urban associated camps during November surveys in each year of the study.

Flying-fox – Strike History



Flying-fox – Urbanizing and Unpredictable



Managing Urbanizing Species around Airports - Key Takeaways

- A work in progress for Western Sydney Airport, but benefit of 8 years of planning prior to an aircraft movement
- Requirements for standardized data collection and risk assessment
- Western Sydney Airport - forward-looking approach based on previous and current similar projects (Istanbul new airport, Gold Coast Airport runway extension and Tugun Bypass, SeaTac third runway development, Brisbane new parallel runway)
- Opportunity to think as an industry how we should approach situations with limited or unknown data
- Other presentations that will contribute to discussion: Richard Dolbeer population increases of large birds, Sarah Handrigan avian radar at Vancouver International Airport, Gary Searing long-term monitoring, John Weller and Nick Yearwood standardized metrics

Questions?

1995: QANTAS A320 engine ingestion aborted TOFF with estimated cost of $8M due to a strike with Australian White Ibis