Managing contentious flying-fox camps

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At its core this is a land use / wildlife management issue which must be addressed with consideration to various legislative and policy constraints.
But it’s a management nightmare!

HOWEVER...
Neighbours expect that the impacts of flying fox camps can be, and therefore should be, resolved.

But it’s a management nightmare!

The frustrations of neighbours can trigger vigorous reactions from the media and politicians. Considered responses to the underlying management issues and sound decision-making are often lost in the uproar.
Neighbours expect a quick fix (dispersal)

Most affected parties expect the animals can be moved quickly.

In general:

1. **animals do not abandon the local area** (100%)

2. **number of flying foxes in a local area is not altered**
   (94%; 16 of 17)

3. **dispersed animals do not move far** (<600m - 69%)
   - new camps are often established (92% - 12 of 13)

4. it is **not possible to pre-determine** where any replacement camps will form (100%)

**Outcomes of 17 dispersals – 1990-2013**
Outcomes of 17 dispersals – 1990-2013

5. *conflict is often resolved for immediate neighbours (71%), but not for wider community (23%)*

6. *repeat actions are generally required* (all cases except complete vegetation removal)

7. *financial and social costs are high*

Observation:
The outcomes of dispersals are often not known for several years.

It is important for lines of responsibility for poor outcomes to be established in advance.
A flying-fox view of dispersal

Fidelity to roost
Fidelity to feeding area
Position in migration structure

A flying-fox view of dispersal – Outcome 1

Fidelity to roost
Fidelity to feeding area
Position in migration structure

Assumes complete flexibility
A flying-fox view of dispersal – Outcome 2

Fidelity to roost
Fidelity to feeding area
Position in migration structure

Assumes commuting distances are flexible

10 km

A flying-fox view of dispersal – Outcome 3

Fidelity to roost
Fidelity to feeding area
Position in migration structure

Assumes commuting distances are NOT flexible

10 km
Outcomes of 17 dispersals – 1990-2013  
(an interpretation)

Flying-foxes can be excluded from roosts (in the absence of vegetation removal). However, long-term fidelity to the site is retained within the population.

Migration status of residents is not sufficiently flexible to be altered by dispersals.

Fidelity to local feeding areas is not broken by exclusion from roosts.

Commuting distances between roosts and feeding areas are not as flexible as we had assumed.

Maclean, NSW (a cautionary tale)  
Location of Maclean FF camp 1886 - 1998

Roberts et al. 2011
**Maclean, NSW** (a cautionary tale)

High school and TAFE building programs - 1962 - 1997

(West 2002)

Location of Maclean FF camp after multiple dispersals commencing 1998 (at maximum population)
Maclean, NSW
There has always been a long-term option

The list of contentious camps is growing
Some observations:

1. The distribution of flying fox camps in subtropical Australia is changing rapidly.

2. These changes are consistent with the behavioural responses of flying foxes to food shortages; and may indicate chronic nutritional/metabolic stress in some individuals.

1.) Evidence of change

Locations of roost sites used by Black and Grey-headed flying foxes, with indications of their patterns of use

Eby (2003)
1.) Evidence of change

Locations of roost sites used by Black and Grey-headed flying foxes, with indications of their patterns of use

1. expanding range boundary
2. new areas of continuous presence
3. increased density of roost sites
4. increased number of roosts in urban & peri-urban areas

The distribution of camps is changing

camps in Greater Sydney - pre-1989 (n=7)
The distribution of camps is changing

camps in Greater Sydney – 1989-2003 (n=8)

The distribution of camps is changing

camps in Greater Sydney - 2015 (n=22)
WHY??

Why more camps?
Increasing number of FFs?
Population estimates – eastern Sydney

Data sources: M Beck (KBCS), D. Bidwell, J. Martin (RBGDT)
Why more camps? 
Increasing number of FFs?

Population estimates – eastern Sydney

Data sources: M Beck (KBCS), D. Bidwell, J Martin (RBGDT), T. Pearson (Macq U), D. Little (WCPS), A. Divlijan (U Syd); Parramatta City Council

Why more camps? 
Increasing number of FFs?

Population estimates – Ku-ring-gai Flying-fox Reserve

Data sources: M Beck (KBCS), J Martin (RBGDT)
1. The distribution and patterns of occupation of flying fox roost sites in south east Australia are changing rapidly.

2. These changes are consistent with the behavioural responses of flying foxes to acute food shortages.

**Change**

**Acute food shortages in south-east Australia**

- not uncommon – 5 in 18 years
- generally of relatively short duration (<6 wks)
- occur in winter or spring (limited feeding opportunities)
- associated with gap in nectar from key plants
Markers of acute food shortages: population parameters

- Reduced body mass

Markers of acute food shortages: behavioural responses

- Shifts in diet
  - Low nutritional value
  - Low density
  - Reduced feeding height

- Incursions into new habitats

- Reduction in energy expenditure
  - Disperse into smaller aggregations
  - Increase roost density
  - Decrease feeding commutes
Incursions into new habitats

Flying-fox camps in south-east Australia
pre-2010 food shortage

Data sources:
monitoring programs; field ecologists; public reports; media; web surveillance
Change in camp distribution
Camps formed in 2010 that persisted

[Map of camps with markers indicating new camps]
Increased density of roost sites

establishment of new camps in Greater Sydney

Eby (2003); Smith (2007); ARCUE (2009); Eby et al. unpublished

Increased density of roost sites

establishment of new camps in Greater Sydney relative to the timing of food shortages (arrows)

Eby (2003); Smith (2007); ARCUE (2009); Eby et al. unpublished
Why more camps?  
Reduced energy expenditure?

Monthly counts of flying-foxes encountered by WIRES groups in the inner suburbs of Sydney, weighted by the estimated population size of camps in the area.

150.718 - male

16/6 to 18/6/2010

RBG Sydney  
pop est = 6,500

8.5 km
20/6 to 20/7/2010

Centennial Park
pop est = 800

3.7 km

24/7 to 27/8/2010

Fred Hollows Reserve
pop est = 6 GHFF

1.4 km
September – November 2010

We are ill-equipped to deal with this.
I suggest we focus on improvements in these areas

- Legislation & policy
- Land use / wildlife management issue
- Community impact & expectations
- Media interest
- Political involvement

A wish list

**better support for managers**
- provide ready access to up-to-date information
- establish systematic monitoring programs with standard methods
- maintain a central repository for information and formal processes for describing and reporting results of actions

**better and more diverse management tools /options**
- improve on current set (based on experience)
- improve on and expand *in situ* management options
- explore new ideas
- share information
A wish list

change the public conversation about flying-foxes
• adjust understanding of disease, amenity issues, realistic management options
• adjust the public’s expectations of camp management options and improve understanding of the risks and possible consequences

better information to feed into public discourse and education
• build better and stronger arguments based on evidence (make material available to managers)
• work toward better informed conversations with the general public, media, politicians and policy makers

A wish list

involve people with different skill sets
• conflict management
• negotiation
• public education
• pertinent technical expertise (e.g. noise mitigation)

consider and monitor the impact of management actions on flying-foxes, particularly long-term impacts on fitness
• reproductive output
• exposure to heat stress