

NSW SCIENTIFIC COMMITTEE

Black Flying-fox *Pteropus alecto*

Evidence of changes to the extent and abundance of Black flying foxes in New South Wales
1990-2007

October 2007

Current status:

There is clear evidence that both the extent and abundance of the Black Flying-fox *Pteropus alecto* in New South Wales have increased in the years since the species was assessed as threatened. The southern limit to the range of Black Flying-foxes has shifted south by approximately 600 kilometres since 1990; and the movement of Black Flying-foxes into new areas of the state has consistently been followed by an increase in their local abundance resulting in substantial increase in the state-wide estimate. Based on information contained in this report and other information available for the species, the NSW Scientific Committee therefore recently determined that the Black Flying-fox does not meet criteria for listing in NSW under the *Threatened Species Conservation Act 1995* (TSC Act),

Evidence of increase in extent in NSW:

Extensions to the southern limit of Black Flying-foxes can be traced through studies conducted in the 1920s (Ratcliffe 1931), 1960s (Nelson 1965), 1988-1991 (Eby & Palmer 1991; Eby 1995), and through a series of range-wide surveys of Grey-headed Flying-foxes *Pteropus poliocephalus* conducted from 1998 to 2004 (Eby 2004). In each study, range boundaries were defined by inspecting populations of communal roosts. Extra-limital sightings or vagrancy can confound assessments of range boundaries in highly mobile, migratory species such as flying foxes. In this summary, extra-limital sightings are defined by number of individuals, reproductive status and duration of stay. Sightings of less than 50 non-breeding individuals; or a single sighting of greater than 50 individuals of less than 4 weeks duration are considered extra-limital and are not included in the assessment.

Between 1930 and 1960 the known range of Black Flying-foxes expanded south by approximately 300 km from the Mary River in Queensland to the Tweed River in NSW. In 1990, the southernmost camp used by Black Flying-foxes was located 40 km further south at the mouth of the Richmond River. However, it is unclear whether this represented a change in range, as camps located between the Richmond and Tweed rivers were not surveyed in the 1960s. At the time of the first range-wide survey of Grey-headed Flying-foxes in July 1998, Black Flying-foxes occupied camps along the Clarence River (~100 km sth), including the Susan Island and Maclean camps that had been searched repeatedly during the 1988-1991 study and found not to contain Black Flying-foxes. The rapid, progressive movement of Black Flying-foxes from 1998 to 2004 was documented by the range-wide surveys (see map below). By 2004, the species was found in camps on the Manning River (~250 km sth). A dead neonate was found in Newcastle in 2005, and greater than 50 reproductive adults and

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dependent young of both sexes were repeatedly sighted in the Newcastle camp in 2006. In that year, approximately 75 individuals were also observed roosting in the Royal Botanic Gardens Sydney. In 2007 the estimate in this population increased to 120. Breeding females and dependent young were present in Sydney in both years. The southern limit of the species had therefore shifted a further 250 km in two years.

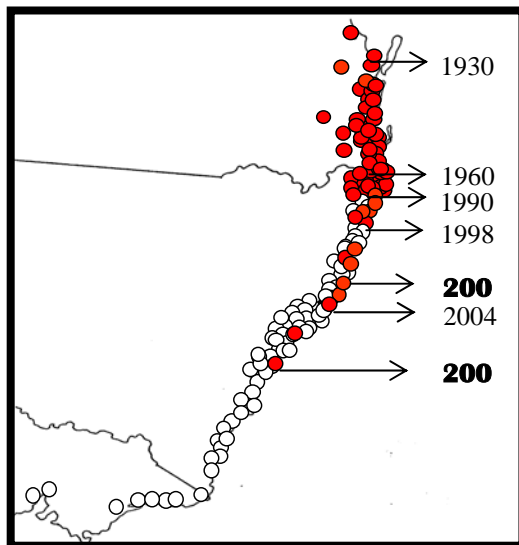


Figure 1. Map showing the timing and extent of southern shifts to the range of Black Flying-foxes.

This map shows all camps used by Black Flying-fox during the 1998-2004 surveys (red circles) and also includes the sightings in Newcastle & Sydney in 2006.

Open circles = camps occupied by Grey-headed Flying-foxes, where Black Flying-fox have not been recorded. Within the area of overlap of the two species, all camps used by Black Flying-fox are also used by Grey-headed Flying-foxes.

Evidence of increase in abundance in NSW:

The population estimates below were made using exit counts (visual estimates by multiple observers of the number of animals exiting camps at dusk). The number of Black Flying-foxes in shared camps was approximated using one of two methods. Camps were inspected prior to exit counts and where less than 2 000 Black Flying-foxes were present, their numbers were estimated by counts of roosting individuals; where larger numbers were present, the proportion of Black Flying-foxes was estimated from transects and the abundance estimate was derived using the result of the exit count.

A caveat is that there is no measure of error for this method (Pople 2003). Nonetheless, it is adequate for monitoring substantial shifts in camp populations. The differences described here are so great as to arguably provide evidence of an increase in abundance regardless of the absence of error estimates.

Two lines of evidence are presented: estimates of the total NSW population of Black Flying-foxes and a comparison of repeat estimates taken at individual camps.

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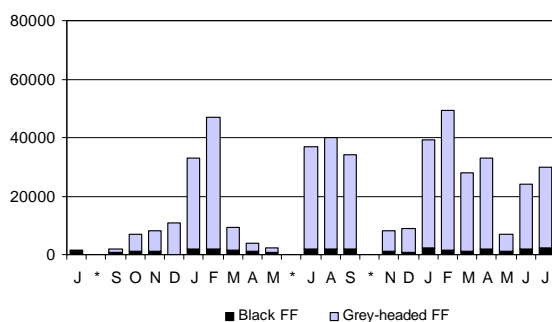
State-wide estimates:

In 1960, Black Flying-foxes were found in small numbers (50 –500) in two camps on the Tweed River, and the total abundance for the state was expected to be less than 1 000 (Nelson 1965). Six camps used by Black Flying-foxes were monitored during the 1988-1991 study. They did not comprise the complete complement of camps occupied by the species at that time and therefore the data cannot be used to calculate a state-wide level of abundance. However, the maximum estimate of Black Flying-foxes from any camp over the three year period was less than 2 000, suggesting a relatively low population size (Eby & Palmer 1991).

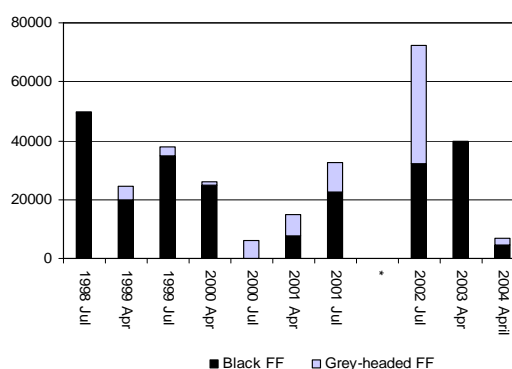
Population estimates made as part of the range-wide surveys provide evidence that a substantial increase in abundance occurred between 1990 and 1998 (Eby 2004). Seasonal patterns of migration influence the numbers of flying foxes present in NSW. The range-wide surveys were conducted in autumn, when numbers were relatively high and in winter, when they were relatively low. State-wide estimates of Black Flying-foxes from nine surveys ranged from 26 000 in July 2000 to 142 000 in April 2003 – winter mean = 45 000 \pm 9 500 (n=4); autumn mean = 95 000 \pm 16 000 (n=5).

Additional evidence of a substantial increase in abundance comes from comparing data collected in 1988-1990 and 1998-2004 at individual camps. The relative proportion of Black Flying-foxes occupying each of the six camps monitored in the late 1980s has increased substantially. Data from a camp with a long history of use are presented by way of example.

Monthly population estimates of Black Flying-foxes at Currie Park, Lismore 1988-1990



Autumn and winter population estimates of Black Flying-foxes at Currie Park, Lismore 1998-2004



References:

Eby P (1995) 'Biology and Management of *Pteropus* in New South Wales. Species Report.' NSW National Parks and Wildlife Service, Hurstville, NSW.

Eby P (2004) 'National Count of Grey-headed Flying-foxes - April 3 & 4, 2004.' Department of Environment and Heritage, Canberra.

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Eby P, Palmer C (1991) Flying foxes in rainforest remnants in northern New South Wales. In 'Rainforest Remnants' (Ed S. Phillips) pp. 48-56. (NSW National Parks and Wildlife Service: Lismore)

Nelson JE (1965). Movements of Australian flying-foxes (Pteropodidae: Megachiroptera). *Australian Journal of Zoology*. 13, 53-73.

Pople AR (2003) 'Monitoring grey-headed flying foxes.' Biodiversity Group, Environment Australia, Canberra.

Ratcliffe FN (1931) The flying-fox (*Pteropus*) in Australia. *Bulletin of the Council for Scientific and Industrial Research* 53, 1-80.

Explanatory note

Between 2007 and 2009 the NSW Scientific Committee undertook a systematic review of the conservation status of a selection of plant and animal species listed under the Threatened Species Conservation Act. This species summary report provides a review of the information gathered on this species at the time the Review was undertaken.

The Scientific Committee's report on the Review of Schedules project and final determinations relating to species that were either delisted or had a change in conservation status can be found on the following website: www.environment.nsw.gov.au .

The Committee gratefully acknowledges the past and present Committee members and project officers who ably assisted the Committee in undertaking the Review of Schedules Project. Information on the people involved in the project can be found in the Acknowledgement section of the project report entitled "Review of the Schedules of the *Threatened Species Conservation Act 1995*. A summary report on the review of selected species" which is available on the abovementioned website.

This species summary report may be cited as:

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