

## The National Flying-fox Monitoring Program

### Report on the November 2015 survey

#### Background

Data on population size and distribution is essential to inform the conservation management of any species. Monitoring programs are essential to enable the collection of these data and, over time, to identify trends. The aim of this project is to provide estimates of the size and distribution of flying-fox populations in Australia, and in the long-term to provide estimates of population trends to inform public discussion and management decisions.

The need for flying-fox monitoring stems from the fact that they are so often the focus of conflict with humans –they impact our lifestyles and our industries. At the same time, however, flying-foxes are iconic examples of our biological heritage and two species, the grey-headed flying-fox (GHFF) and the spectacled flying-fox (SFF), are listed as threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and legislation in some states. This program will provide data to inform decision making for flying-fox conservation and will also help inform responses to public concerns about the impact of flying-foxes on industry, agriculture and public health, including Hendra outbreaks.

Monitoring flying-fox populations is not a straightforward task. The large size of flying-fox aggregations (or camps), the complex habitats in which camps occur, the extreme mobility of all flying-fox species and the vast areas that must be surveyed all combine to complicate data collection and its interpretation. The National Flying-fox Monitoring Program (NFFMP) uses a method that is specifically designed to collect data on the abundance and distribution of flying-foxes in eastern Australia. This method has been developed to:

- i. be appropriate for the spatial ecology and behaviour of flying-foxes, and,
- ii. allow estimation of the errors associated with counting animals.

This last point is critical as all monitoring methods have errors and without quantifying these it is impossible to determine the degree of confidence that we have in any population estimate.

In the NFFMP, the flying-foxes at small camps are counted directly while area-based methods are used at larger camps, e.g. distance sampling where the animals tolerate counters and area sampling where they don't. Distance sampling uses estimated flying-fox density and the area of the camp to provide an estimate of the number of animals present at a camp. It uses changes in the detection of flying-foxes with distance from the observer to estimate detection error, a key type of error. The NFFMP is attempting to simultaneously monitor all known camps of both EPBC-listed species each quarter. The program also aims to monitor as many camps of little-red (LRFF) and black flying-foxes (BFF) that occur in eastern Australia as resources allow.

#### The November 2015 Survey Results - a Summary.

The November 2015 survey was the 13<sup>th</sup> count of the project and marks the start of the fourth year of monitoring. During this survey 299 camps were surveyed, 96 in NSW, 181 in Qld, 18 in Vic and one each in ACT & SA.

The estimate for the total GHFF population in these camps was 658,000 animals from 105 active camps. The majority of the animals were found in NSW (73%), with Qld having 22% and Victoria 3%. Seven camps were reported as having more than 30,000 animals, and 3 camps were reported as having more than ~40,000 animals (Glenreagh, MacLean & Wingham).

SFF numbers totalled 100,000 animals and these were distributed across 10 active camps, with the largest numbers being at Tolga, Pt Douglas and Goldsborough.

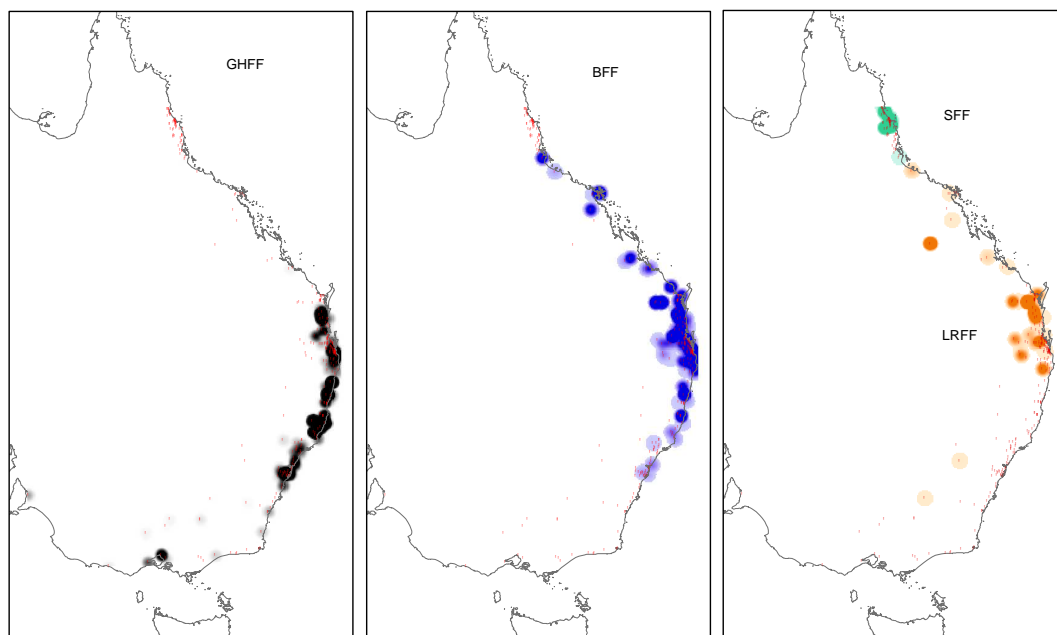
The NFFMP covers only part of the range of the BFF and LRFF, and much of the area that is monitored is very different to tropical savannas that comprise much of the range of these species. This makes it difficult to extrapolate to those areas. As a consequence, while we present results from the area we monitor, it needs to be remembered that these are not estimates of the total population size for these two species. To derive such estimates would require much broader coverage across northern Australia than we are currently able to achieve. In total 193,000 BFF were recorded along the eastern seaboard, with 77% of those in Qld. Almost 530,000 LRFF were recorded across the counted camps, with the largest numbers being found in the Wet Tropics, and a large camp at Woocoo in SE Qld.

For the first time there was a count conducted around Katherine in the NT. This resulted in 3,078 BFF and 1,000 LRFF being counted in 7 camps.

A map of the camps covered in the NFFMP surveys can now be viewed at <http://www.environment.gov.au/node/16393>. Clicking on a camp icon will show a plot of species composition and numbers recorded at that camp during NFFMP surveys.

### Where were the flying-foxes in November?

As usual, to provide a picture of how flying-foxes were distributed across the NFFMP's survey area, we have produced heat maps. The darker the colour plotted the higher the abundance of flying-foxes in that area. Black shading refers to GHFFs, blue to BFFs, green to SFFs and orange to LRFFs.



The aim of the program is to establish a robust baseline estimate of the flying fox populations and over time to estimate trends. Analysis of data from this and previous flying-fox monitoring suggests that robust estimates of population trends will take as much as 10-13 years to collect since each quarterly count will be subject to various factors which will influence the results, making assessment of population size difficult. We are currently in the fourth year of the counts.

In order to achieve the best possible estimate it is important that surveys are performed using the methods correctly. We are continuing to conduct training sessions and the CSIRO urges any counters who have any questions or concerns about count methodology to contact Dr David Westcott at [david.westcott@csiro.au](mailto:david.westcott@csiro.au) or Mr Adam McKeown at [adam.mckeown@csiro.au](mailto:adam.mckeown@csiro.au).

We are continually updating the database and adding new camps as we are made aware of them. If you know of camps that are not being counted please contact us at the CSIRO.

Thank you to all the counters who put in the hours to assist the program. Your effort is greatly appreciated.

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If you would like to participate please contact:

New South Wales – [Mike.Roache@environment.nsw.gov.au](mailto:Mike.Roache@environment.nsw.gov.au)

Queensland — [Pauline.Fitzgibbon@ehp.qld.gov.au](mailto:Pauline.Fitzgibbon@ehp.qld.gov.au)

If you know of additional camps or have questions about the counts please contact:

[david.westcott@csiro.au](mailto:david.westcott@csiro.au) or [adam.mckeown@csiro.au](mailto:adam.mckeown@csiro.au)

Additional information about the program can be found at:

[www.environment.gov.au/biodiversity/threatened/species/flying-foxes-monitoring-program.html](http://www.environment.gov.au/biodiversity/threatened/species/flying-foxes-monitoring-program.html)

The National Flying-fox Monitoring Program is collaboration between the Australian Government, the South Australian, Victorian, New South Wales, Australian Capital Territory and Queensland governments, CSIRO, local governments and volunteers in New South Wales and Queensland. The CSIRO was contracted by the Rural Industries Research and Development Corporation to undertake this research project. This research was funded by the Commonwealth of Australia, the State of New South Wales, the State of Queensland and RIRDC under the National Hendra Virus Research Program.