

Radio-tracking of hand-reared flying-foxes released at Gordon Sydney, Australia

A paper detailing the findings of the three years of research titled 'Radio-tracking Studies of Grey-headed Flying-foxes, *Pteropus poliocephalus*, from the Gordon Colony, Sydney' can be found in the proceedings of the Linnean Society of New South Wales, volume 121, 61 - 70, published December 1999.

The Ku-ring-gai Bat Conservation Society (KBCS), led by Denise Ford, undertook a three year research project from 1995 - 1997 in conjunction with Dr. Michael Augee from the University of NSW, radio-tracking hand-reared and wild juvenile flying-foxes that had come into care. These studies were designed to determine whether the behaviour after release of hand-reared flying-foxes corresponded to that of their wild counterparts and what impacts this would have on their survival. In the past, survival has remained largely unknown for the majority of released native animals.

In the first year of our study 28 hand-reared flying-foxes were released and monitored with seven (7) dying within a short period after leaving the flight aviary. This was one quarter of the study group. It is significant that all these animals could only be located by the radio-transmitters attached to their backs. In the past the fate of such animals would have been unknown, as their bodies would never have been located in the dense undergrowth of the valley.

Plotting of their movements in the valley revealed that less than 8% spent any time within the colony of wild flying-foxes. They did not integrate into the colony and were found to be roosting individually in separate trees usually around the support feeding area. The KBCS found these results very disturbing.

We reviewed the literature which documented observations made earlier by a number of scientists on wild juvenile behaviour. This research revealed that our previously used time of release coincided with the peak time for mating. Males in particular are very territorial and may identify hand-reared animals as intruders preventing them from entering the colony. Wild juveniles have also been observed flying out of the colony in late January and February, at least a month earlier than the hand-reared animals had been released. We thought that releasing them later, could possibly disadvantage them with their integration into the juvenile pack and secondly, the development of adequate flight skills and muscle tone for flying.

In 1996, the second study was undertaken with 47 hand-reared flying-foxes. Some of the parameters were changed. The timing of the release was moved forward one month after accelerating the weaning time. The majority of hand-reared animals managed the change adequately. Instead of gluing the transmitters to the shoulder fur of the flying-foxes as was

done in 1995, transmitters were attached using hollow rubber tubing collars. The collars were tested before the study and were found to perish within 3 - 4 months.

The results of the 1996 study were more promising. No hand-reared animals were found dead within the valley. Compared to the 1995 study, 44% of the animals were located within the boundary of the resident flying-fox colony within the first month after release. Two surveys of metropolitan Sydney and areas to the north and south of Sydney using a National Parks and Wildlife Service plane fitted with radio-tracking equipment revealed three flying-foxes in melaleuca forest near the Williamstown Airforce Base north of Newcastle (123 kilometers north of Sydney) and one located south of Nowra (130 km south of Sydney). These findings indicate a much more dynamic interchange between other colonies than previously known and greater abilities of juveniles to access alternative food sites considerable distances from Sydney.

In 1997, the final year of our study, 31 hand-reared and 4 wild juvenile Grey-headed flying-foxes were fitted with radio-collars prior to release in February. Two weeks later 10 juvenile and 5 adult wild animals were fitted with radio-collars and immediately released during a trap session conducted by Dr. Chris Tidemann (Australian National University) at the Cabramatta Creek colony site.

The specific radio frequencies for all fifty radio-collars were checked frequently at the Gordon site to determine if the bats were present and, if they were, their position was determined by triangulation from the edge of the valley. Frequencies were also checked at Cabramatta Creek, the Botanic Gardens in Sydney and in the valleys around Hornsby, Wahroonga and Berowra. With the help of Dr. Peggy Eby, three flights were made in the National Parks and Wildlife Service aircraft to monitor any movements north and south of Sydney.

Surveys from the air detected no flying-foxes north of Sydney. Six flying-foxes were detected south of Sydney at the time spotted gum, *Eucalyptus maculata* began to blossom in that area. Two of these flying-foxes had been released at Gordon and four had been radio-collared at Cabramatta Creek. Two bats had been detected in the Botanic Gardens, one collar was returned from Sea Acres at Port Macquarie, a known flying-fox colony site and one animal was shot under license in an orchard at Glenorie.

Analysis of this data indicated that in 1997 hand-reared flying-foxes integrated into the colony and began independent foraging much sooner than in the studies carried out in 1996 and 1995. This was interpreted as a result of the earlier release date and the cessation of support feeding after four weeks at the release site adopted in 1997.