

**Annual Report on Licences Issued
under the DEC Policy and Procedural Guidelines for the
Mitigation of Commercial Crop Damage by Flying-foxes for the 2005/06
Fruit Growing Season**

**Department of Environment and Conservation
Parks and Wildlife Division
September 2006**

Executive Summary and Recommendations

The following is a state-wide summary of licensed activity in 2005/06 under the *National Parks and Wildlife Act 1974* and the 'DEC Policy and Procedures for the Mitigation of Commercial Crop Damage by Flying-Foxes' (the Policy can be downloaded from http://www.nationalparks.nsw.gov.au/pdfs/policy_flyingfox_commercial_crop_damage_2005.pdf).

- The NSW allocation of the national cull limit was 3,040 Grey Headed Flying-foxes (GHFF) harmed. The DEC allocated 2,432 (80% of quota) to the PWD Regions at the start of the season. An additional allocation of 200 GHFF was requested by only one region (Sydney South), due to the high number of applications from fruit farmers in that region.
- Licences were issued to 30 different fruit farmers, with an additional 11 variations to existing licences (eg to increase the numbers). These licences authorised harm to 1,320 Grey-headed Flying-foxes (GHFF), which represents 43 % of the NSW quota.
- The majority of licences were issued between October and December 2005, which is the main time when stone fruit are damaged by flying foxes. 98% of licences were issued in the Central Coast, Sydney North and Sydney South Regions. A smaller number of licences were issued in the Blue Mountains Region.
- Five regions did not issue any of the allocated licences (Northern Rivers, North Coast, Hunter, Sydney, South Coast).
- Flying Fox Record Sheets (FFRS's) were returned for 88% (36) of the 41 licences (including variations). 16 of these 36 FFRS's reported the shooting of significantly fewer animals than permitted. Five licensees reported harming no GHFF at all this season. It is otherwise assumed that the maximum numbers were harmed as permitted under licence.
- The numbers of GHFF actually harmed is estimated to be no more than 954 or 31% of the NSW cull limit

It is recommended that:

1. The national cull limit for the 2006/07 season remain at 3,040 GHFF for NSW as agreed by the National Flying-fox Working Group. 80 % of this limit (2,432 GHFF) should again be distributed across NSW Regions, as outlined in Table 3.
2. A thorough review and update of the Policy be commenced after the national review of GHFF status in December 2006.
3. DEC continue to support research priorities agreed by the Flying-fox Consultative Committee, particularly those commencing over the next 12 months.

1 Introduction

This report presents a state-wide summary of licensed activity over the 2005/06 fruit-growing season under the *National Parks and Wildlife Act 1974* (NPW Act) and the *Policy and Procedures for the Mitigation of Commercial Crop Damage by Flying-Foxes* (the Policy).

The term 'flying-fox' in this report will refer to all three species of *Pteropus* found in NSW (the black, grey-headed and little red flying-fox), except where specified.

Flying-foxes are known to feed on commercial and domestic fruit crops when native food sources are scarce or low quality. All flying-foxes are protected in NSW and it is an offence to harm them under the NPW Act. The Black flying-fox (BFF) was listed on Schedule 2 of the *Threatened Species Conservation Act 1995* in 1995 and the Grey-headed Flying-fox (GHFF) was similarly listed in 2001, giving these species additional protection.

The National Parks and Wildlife Service (NPWS), now part of the Department of Environment and Conservation (DEC), developed a policy in 1998 to assist farmers in mitigating crop damage caused by flying-foxes. This policy advocates full exclusion netting as the only reliable method for protecting fruit crops, but also makes provisions for the issue of licences under s121 of the NPW Act to permit fruit growers to harm a limited number of the two then protected species (GHFF and Little red flying-foxes (LRFF)) by gunshot only in circumstances where netting was not feasible. Under the Policy, farmers were encouraged to shoot to scare, however it was understood that incidental and direct harm were likely to occur.

When the NSW Scientific Committee made a Final Determination to list the GHFF as a vulnerable species in 2001, this created a need to develop a new policy to contain provisions for both threatened and protected species. Further, the Director General, NPWS made the commitment that licensed killing of the GHFF would be phased out over 3 years to ensure the long term sustainability of this species. An interim three-year policy was prepared by the DEC in consultation with the NSW Flying-Fox Consultative Committee (FFCC), a stakeholder group formed to assist the DEC in developing a management strategy that would address all stakeholder needs. The Policy was finalised in October 2001 and an amended version formally adopted in August 2002.

The GHFF was listed as a threatened species by the Commonwealth in 2001. Since that time a national working group has been formed comprising representatives from all States where the GHFF is found. This group is coordinated and chaired by the Department of Environment and Heritage (DEH). The national group has agreed to abide by a national cull limit system for licensed harm to the GHFF whereby each State is allocated a cull limit each year based on a percentage of the most recently established minimum population estimate of the GHFF. It has been agreed that this system will remain current until after the 2006/07 growing season after which the status of the GHFF will have been re-assessed by the Commonwealth Scientific Committee. Under this system NSW has a national cull limit of 3040 GHFF per year (0.95% of the minimum population estimate). Licenses to harm flying foxes are issued under S120 of the NPW Act.

Recovery planning for the GHFF is now co-ordinated nationally and in NSW through the Environment Protection and Regulation Division (EPRD) of DEC. A staff member from EPRD acts as the Executive Officer for the FFCC.

Management of the Policy and review of licensing is conducted by the Wildlife Licensing and Management Unit (WLMU) of Parks and Wildlife Division (PWD) of DEC. Licences are issued by Regions within three Branches of PWD, namely Central, Northern and Southern.

An annual report on licence applications and licences issued has been prepared by the WLMU each year from 2001. This report includes a summary of data and an analysis of trends and comparison with previous years and is made available to stakeholders and the public via the DEC internet site.

Objectives of Annual Report

- To monitor the impacts of licensed harm to flying-foxes across NSW;
- To identify where improvements may be made to the DEC management of the GHFF and other flying-fox species in NSW

2 Licences Issued 2005/06

2.1 Licences Issued

A summary of the s120 licences issued under the Policy during the 2005/06 fruit-growing season is provided in Table 1.

It should be noted that although accurate information is included on the number of licences issued by DEC and the maximum number of flying-foxes permitted to be harmed, a full data set was not available to be analysed for this report on all information requested from licensees. Incomplete information included that on type and area of crop being damaged.

Maximum allocations of cull limits for the 2005/06 season are set out in Table 1. Only one additional allocation was requested, by the Sydney South Region, based on an initially insufficient allocation. Five regions did not issue any licences (Northern Rivers, North Coast, Hunter, Sydney, South Coast), which is a much higher number than during the 2004/05 season, when only two regions (North Coast, Sydney) did not issue any licences.

Licences were only issued to harm GHFF. A total of 30 orchardists were licensed under s120 to harm GHFF in 2005/06 over 4 Regions of DEC (Central Coast Hunter, Sydney North, Sydney South, Blue Mountains). 11 variations to original licences were sought this year, which is a much higher number than in 2004/05, when no variations were sought.

All licences (41 = 100 %) were issued by PWD Central Branch (compared with 97% in 2004/05). Within Central Branch, 39% of licences were issued by Sydney North Region (SN), 44% by Sydney South Region (SS), 7% by Blue Mountains Region (BM) and 10% by Central Coast Hunter Region (CCH). A maximum of 50 flying foxes can be permitted to be killed under one licence, but many licenses issued were for fewer animals. The regions varied in the number of animals they permitted per licence so that SN issued licences that covered 41% of all GHFF harmed in Central while licences issued in SS covered 42%, CCH 15% and BM only 2% of GHFF harmed (see Fig. 1).

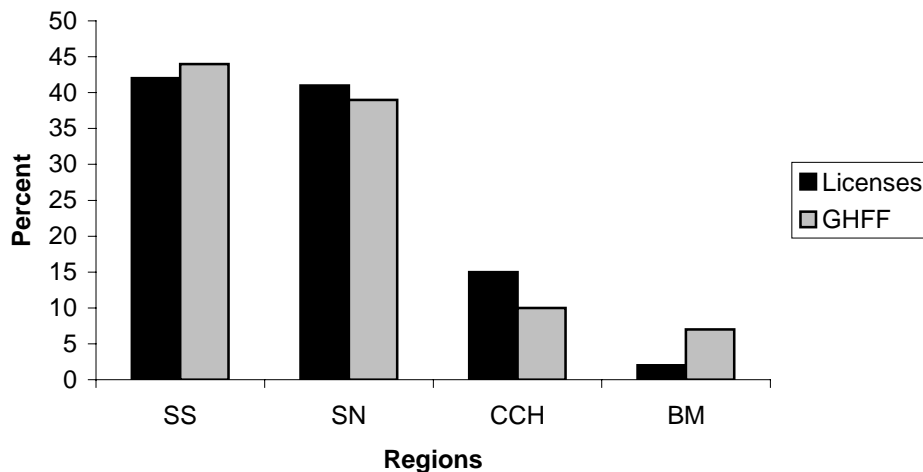


Figure 1. Percent of licences issued per region and percent of GHFF permitted to be harmed per region. SS = Sydney South Region, SN = Sydney North Region, CCH = Central Coast Hunter Region, BM = Blue Mountains Region.

The earliest licence issued was on 7 October 2005 by Sydney North Region to a stonefruit grower and the latest licence was issued on 12 April by northern Sydney North to a persimmon grower.

2.2 Flying-foxes Harmed

A total of 1320 GHFF were permitted to be harmed in NSW under the 41 s120 licences issued in 2005/06 (30 original + 11 variations). No LRFF and 3 BFF were permitted to be harmed.

It is typically assumed that the number of flying-foxes covered by licences will be killed evenly over the season. In fact, it is often likely that a higher number of animals are harmed as the fruit ripening season coincides with the breeding season. In these circumstances, the dependent young of adult females killed in orchards will also likely die. In addition, some orchardists may overshoot the number specified on their licence.

As per condition 5 of the licence, licensees are required to complete a Flying-fox Record Sheet (FFRS) detailing the number of flying-foxes killed each night and return the completed FFRS to the local DEC office when their licence expires. Information from the returned FFRS is used to determine the number of GHFF actually harmed each season. However, not all licensees comply with this condition, and there is typically some data missing each year, making this an inaccurate method of assessing actual harm. Actual numbers harmed, based on FFRS, have not been provided for Blue Mountains and Nattai Areas.

The maximum number of flying-foxes authorised to be harmed throughout the season is that listed on the licences, that is a total of 1320 for 2005/06. As at June 2006, 36 FFRS (88%) had been returned, noting actual harm to 954 GHFF. It is assumed that the maximum number of GHFF were harmed as permitted under the licence (see Table 1).

2.3 Affected Crops

The s120 licence application form requests information on the type and area of fruit crops potentially vulnerable to flying-fox damage and on the area actually damaged.

Crops reported being damaged this season were peaches, plums, nectarines, loquats, apples, persimmon, pears, nashi and cherries. Stonefruit was the most common type of crop affected by flying-foxes.

Crop area ranged from 4-49 ha with an average size of 11 ha. Area of damage per crop ranged from 1-30 ha with an average of 17 ha of damage.

2.4 Enforcement and Legal Action

Limited investigations and compliance checks were undertaken by the DEC due to limited resources. No legal action relating to the licensing of flying-foxes was taken against any licensed grower or other member of the public this season. There was also no action taken against the DEC.

2.5 Discussion and Preparation for 2006/07

The number of flying-foxes killed changes from year to year, as does the locations where damage occurs, and the area affected by such damage. Table 2 shows the changes seen over the last 5 years in the number of licences issued per Region. As has been noted previously, the number of licences issued and the general scope of the problem has decreased dramatically in the northern Regions. This may be due to an increase in netting of crops, or it may be due to changes in flying-fox distribution, foraging strategies or available native food sources.

The annual variability in flying-fox presence and damage to fruit crops presents a significant management challenge. Farmers cannot predict the level of damage they may expect from year to year. This makes it difficult to form a cost effective property management plan. For example, while netting is the only reliable means of excluding flying-foxes and thus providing complete protection to a fruit crop, it is an expensive venture. For a farmer facing significant damage each year, such a cost may be worthwhile. However, when damage is sporadic year to year, the high cost makes this solution less attractive.

In the 2005/06 fruit season flying-foxes were considered by DEC field offices to be of medium level concern – more than in 2004/05, but less than in the years before that. Requests for licences were relatively low - only half of the NSW cull limit (43%) was issued for harming GHFF (see Table 1). Key parts of the debrief are attached in Appendix B.

The low number of licences may reflect a season where native food sources were abundant or may reflect a slight shift in attitude by fruit farmers towards shooting flying foxes or acquiring a licence to do so. Field staff, researchers and conservation groups reported that flying-foxes were present in high numbers at the camp sites. However, many farmers who have applied for licences in the past reported little or short term flying-fox activity in their orchards. Some remarked that the flying-foxes had moved through their area before the fruit was mature enough to be consumed by them, but were not present afterwards.

There was still damage to fruit crops reported by, at least, the 30 farmers who applied for licences this year, some reporting quite extensive damage. This further illustrates the inconsistent nature of damage by flying-foxes.

Table 1: Licence information regarding allocation of cull limits, number of licences and number of GHFF reported to be culled under licence for the 2005/06 fruit growing season.

PWD Branch	Region	Allocation of cull limits at start of 2005/06 Season*	Number of licences issued	Total number GHFF licensed to be harmed	Number FFRS returned	Reported Number GHFF harmed**
Northern	Northern Rivers	47	0	0	-	-
	North Coast	25	0	0	-	-
	Hunter/Mid-North Coast	25	0	0	-	-
Central	Central Coast Hunter Range	700	4	200	4	87
	Sydney North	886	16	535	15	311
	Sydney	25	0	0	-	-
	Sydney South	536 +200*	8 + 10 variations	555	15	536
	Blue Mountains	163	2 + 1 variation	30	2	20
Southern	South Coast	25	0	0	0	0
TOTAL		2,632 = 87% of NSW quota	30 + 11 variations	1,320 = 43 % of NSW quota	36	954** = 72.3 % of licenced numbers

* 200 were allocated additionally, after the start of the season

**Information based on returned FFRS. Where FFRS not returned or not complete it is assumed that the maximum number of GHFF were harmed, as permitted under the licence. These figures are therefore approximate only and are an upper-estimate of actual numbers harmed.

Table 2: Comparison of Licences issued over past 5 seasons, noting the number of licences per Region and, in brackets, the number of GHFF licensed to be harmed.

PWD Branch	Region	2001/02	2002/03	2003/04	2004/05	2005/06
Northern	Northern Rivers	5 (250)	5 (205)	2 (15)	1 (12)	0
	North Coast	1 (10)	0	0	0	0
	Hunter	0	0	1 (30)	0	0
	Northern Tablelands	2 (55)	0	0	0	0
Central						
	Central Coast Hunter Range	10 (616)	11 (900)	12 (923)	3 (150)	4 (200)
	Sydney North	22 (590)	26 (828)	25 (850)	13 (435)	16 (535)
	Sydney	1 (21)	1 (35)	1 (20)	0	0
	Sydney South	4 (155)	9 (380)	7 (389)	6 (195)	18 (555)
	Blue Mountains	7 (115)	9 (107)	6 (121)	4 (60)	3 (30)
Southern						
	South Coast	1 (20)	1 (20)	1 (20)	0	0
	TOTAL	54 (1852)	62 (2358)	53 (2331)	27 (852)	41 (1320)

Effective alternative deterrents to shooting have yet to be identified. Research into decoy feeding sites has demonstrated that there may be some promise in this technique, but more research is required to confirm this and identify a reliable means of supplying such an alternative food source (see research synopsis in Appendix A). Following the flying fox season, a debrief meeting was held in April 2005 – the main issues discussed are summarised in Appendix B.

2.6 Conclusions

The FFCC has concluded after several years of investigation, discussions, and research that the most effective management option currently lies in encouraging farmers to net their crops. Proposals to achieve this generally rely on some reasonable incentive such as government grants or subsidies to offset initial outlay. The FFCC and its members are working towards promoting this suggestion to the NSW and Commonwealth governments.

In the short term, it is proposed that the DEC continues to issue licences as per the DEC Policy in the 2006/07 fruit growing season. The national status of the GHFF is presently being reviewed by the Commonwealth and, pending that decision a full review of the DEC policy will be undertaken. The DEC will then have to consider its commitment to end licensed killing of the threatened GHFF.

It is proposed that the NSW proportions of the national cull limit be distributed as outlined in Table 3 below. Allocation has been based on previous licensing history. Each Region that has issued licences has been given at the very least a nominal number of 25 GHFF each. For those Regions that issued licences in the last year a further allocation has been issued based on the percentage of GHFF for which licences were issued last season. A reserve amount of 608 GHFF is held by the

Manager, Wildlife Licensing and Management Unit, and will be allocated on request to Regions throughout the season as detailed in the DEC Policy.

Table 3: Proposed Allocation of National Cull Limits for 2006/07 Season

PWD Branch	Region	Allocation at End of 2005/06	Number of GHFF licensed to be harmed 2005/06	Allocation for 2006/07*
Northern	Northern Rivers	47	0	25
	North Coast	25	0	25
	Hunter	25	0	25
Central				
	Central Coast Hunter Range	700	200	371
	Sydney North	886	535	936
	Sydney	25	0	25
	Sydney South	536	555	900
	Blue Mountains	163	30	100
Southern				
	South Coast	25	9	25
	TOTAL	2,432	1,320	2,432

* 2432 allocated, 608 maintained in reserve to be allocated as needed by the CWM.

3 Annual GHFF Count

The last national count of GHFF was conducted in May 2005. The main outcome of this count was a more detailed information on the distribution of the species in NSW. Exact population estimates of GHFF could not be obtained, due to an insufficient number of volunteers participating in the count. A more comprehensive count in April 2004 yielded an estimate of 425,000 GHFF. No count was conducted in 2006.

4 Developments in Research

The FFCC, established in August 2001, has developed a list of priority research. Funding that has been made available through the DEC, Commonwealth and other sources has then been channelled into these research projects where possible.

Projects that have been undertaken or completed in the last year include:

- roosting preferences of GHFF
- ranking and mapping of foraging habitat for flying-foxes in NSW
- identification of camps critical to the survival of GHFF
- characteristics of flying-fox camp sites
- details of GHFF damage to orchards

A summary of these projects is contained in Appendix A.

5 References

Eby (2004). National Count of Grey-headed Flying-foxes April 3 & 4 2004. Report to the Department of Environment and Heritage, Queensland parks and Wildlife Service, NSW Department of Environment and Conservation and Victoria Department of Sustainability and Environment.

NPWS (1999). Review of the implementation of the *NPWS Policy on Flying-fox and Mitigation of Commercial Crop Damage*, 1998-99 fruit growing season. NSW NPWS, Hurstville, NSW.

NPWS (2000). Review of the implementation of the *NPWS Policy on Flying-fox and Mitigation of Commercial Crop Damage*, 1990-2000 fruit growing season. NSW NPWS, Hurstville, NSW.

NPWS (2001). NPWS policy and procedures for the mitigation of commercial crop damage by Flying-foxes. NSW NPWS.

NPWS (2001a). Review of the implementation of the *NPWS Policy on Flying-fox and Mitigation of Commercial Crop Damage*, 1990-2000 fruit growing season. NSW NPWS, Hurstville, NSW.

NPWS (2002). Annual review of the NPWS policy on flying-fox and mitigation of commercial crop damage for the 2001-2002 fruit growing season. NSW NPWS, Hurstville, NSW.

Appendix A

Summary of Current Research Projects

- 1) The Grey-headed Flying-fox foraging habitat ranking and mapping project commenced in 2004 and is expected to be completed in 2006. Recently, DEC provided additional funding of \$10,150 for the project to be completed. This project maps significant feeding sites in different habitats. It also includes information on how these sites change during the year, as GHFF choose different sites at different times during the year.
- 2) Sophie Eggleston, Bachelor of Science (Veterinary), University of Sydney, completed her research thesis "The Microclimatic Roosting Preferences of the Grey-headed Flying-fox, *Pteropus poliocephalus*, at a Campsite in Gordon, NSW" DEC provided data loggers (on loan) to Sophie.
- 3) DEC have funded a project to identify the camps critical to the survival of Grey-headed Flying-foxes in Queensland, NSW, the ACT and Victoria using criteria set out in the draft National Recovery Plan for the Grey-headed Flying-fox. This project commenced in 2006 and satisfies one of the recovery actions in the draft national recovery plan.
- 4) DEC have funded a project to update the NSW Flying-fox camp database and to create a Grey-headed Flying-fox database for Queensland, Victoria and the ACT. This project also satisfies one of the recovery actions in the draft national recovery plan. The last update for NSW was in 2003 and currently, no national database exists.
- 5) DEC, DPI and the Hawkesbury-Nepean Catchment Management Authority recently received NHT Strategic Reserve Funding (\$397,000) for the 2006/07 and 2007/08 financial years for the project "Grey-headed Flying-foxes in Orchards: Damage Estimates, Contributing Factors and Mitigation". This project is thus in its early stages.

Appendix B

Main issues discussed in Flying-fox Policy Debrief 28 April 2005

Licence application

- Amendments made to form cutting down on info not used or needed
- Restricting licence to include only 3 shooters per licence (including licensee)
- Form for additional shooters to sign noting they have read and understood the conditions of the licence – check with legal
- Application not to be processed until complete

FFRS

- Continue using this form
- Amend FFRS to include useful information for management and include details on handling flying foxes

Licence

- Review of conditions
- Humane disposal of injured animals and dependent young (check with AWAC on definition of humane disposal) or hand over injured/young to a DEC officer
- Return any bands to the DEC
- Include condition noting licensee responsible for actions of all

Inspections

- Rewording to clarify and provide for interim measures until staff can attend and inspect

Property Management Plans

- No future Property Management Plans considered, continue with those already approved

Law Enforcement/Compliance

- Review section and amend
- Recommend morning inspections for dead/injured animals
- Send copy of licences to local police, suggest they check on up to date gun licences
- Develop flow chart of procedures
- Address need for state wide support and resourcing for compliance/enforcement

Other

- Develop a database for complaints to be maintained by the CWM. Data sent in at the end of the season with licence information
- Develop a Job Safety Analysis for work on flying-foxes
- Facilitate research where possible.
- Note in policy that actual mortality is higher than the quota because of dependent young

Research- priorities noted

- Effectiveness of shooting
- Heat stress
- Levels of lyssavirus