

# Survival, inquiry and sophistication in managing Grey-headed Flying-foxes

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## ABSTRACT

Humane Society International (HSI) is the largest animal protection organisation in the world. One of its campaign focuses in Australia is the Grey-headed Flying-fox. Of concern to HSI are high rates of habitat reduction for the species, and the killing that occurs where they come into conflict with humans. HSI believes the Grey-headed Flying-fox should be listed as threatened federally and in each state it occupies. The organisation has nominated the species for threatened status under various jurisdictions. Recently, HSI obtained from NSW National Parks and Wildlife Service information on the licences it issues to cull flying-foxes in orchards. The licences covered a wide range of crops, and the area of crops covered under individual licences ranged from 0.5 hectares to 53 hectares. The total licensed kill for a two-month period in 1998 was 255 Little Red Flying-foxes and 1330 Grey-headed Flying-foxes. HSI believes that culling and other negative reinforcement methods are inappropriate for managing flying-fox issues. We need to become more sophisticated in our response to human-animal conflicts and less reliant on lethal methods. Our focus has been on stopping an animal's innate response to a beneficial resource, be it food or shelter. It is time to consider encouraging the responses we want through positive reinforcement. Positive reinforcement is efficient, effective and supportive of population conservation. In order to use positive reinforcement we need some background information, some we know all ready, much we don't know. This information will enable us to manipulate Grey-headed Flying-fox behaviour with a much greater degree of sophistication. There is a lot known about how animals learn. We need to accept that learning occurs, apply the relevant information, and develop some win-win strategies for both animals and humans in conflict situations. Grey-headed Flying-foxes are a great place to start.

## Introduction

Humane Society International (HSI) promotes species survival. One of the statements of objectives of our organisation is "to assist and persuade and, if necessary through legal means, to compel government bodies and agencies to further the protection of animals and the environment through appropriate regulations and enforcement." HSI is the largest animal protection organisation in the world with over seven million supporters globally. The Asia Pacific branch was established in Australia in May 1994. It already has one of the fastest growing memberships of any non-government conservation organisation in Australia.

One of the many campaign focuses of HSI in Australia is the Grey-headed Flying-fox. HSI has

used a variety of legal methods to gain information and to attempt to get recognition for the plight of the Grey-headed Flying-fox. One of the threats to the Grey-headed Flying-fox is habitat reduction. Also of concern to HSI is the killing of Grey-headed Flying-foxes where they come into conflict with humans.

## Survival

HSI believes the Grey-headed Flying-fox should be listed as threatened both federally and in each state it occupies. *The Action Plan for Australian Bats* (Duncan *et al.* 1999) provided HSI with the background and supporting information necessary to apply for listing Grey-headed Flying-fox and some other bat species as

threatened under Federal Legislation. On the 26<sup>th</sup> November 1999, HSI nominated the Grey-headed Flying-fox for threatened species protection under the *Endangered Species Protection Act 1992*. The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) came into force on the 16<sup>th</sup> July 2000 and the Threatened Species Scientific Committee formed under that Act took over the review of the nominations. A nomination in NSW had already been made under the *Threatened Species Conservation Act 1995*. HSI then nominated the Grey-headed Flying-fox for threatened species protection in Victoria under the *Flora and Fauna Guarantee Act 1988*. Although Queensland does not have a formal listing process, HSI has written to the Queensland Minister requesting consideration of the Grey-headed Flying-fox's need for protection in Queensland. It is hoped that it will be listed for protection under the Queensland *Nature Conservation Act 1992*.

The nomination under the federal EPBC Act has been successful. In December 2001, the Grey-headed Flying-fox was listed as Vulnerable under that Act.

In January 2001, the Victorian Scientific Committee recommended to the responsible minister that the Grey-headed Flying-fox be listed as Vulnerable under the Victorian legislation. Despite the recommendation of the Victorian Scientific Committee, the Minister in Victoria chose not to list the Grey-headed Flying-fox. To the best of our knowledge this is the only time a Minister has not listed as threatened a species recommended by a scientific advisory group.

When the Royal Botanic Gardens in Melbourne announced its intention to shoot Grey-headed Flying-foxes within the gardens, HSI sought an injunction to stop death by shooting, which we believed to be in contravention of the authority that the Gardens held at that time. Due to the fact that a new authorisation specifically allowing an as yet unknown number of Grey-headed Flying-fox to be shoot had been issued by the Department of Natural Resources and Environment, this action failed. Currently HSI is attempting to use Freedom of Information legislation to get access to operational and management plans referred to in the authorisation. This will give us some insight into how significant an impact the Department was prepared to authorise.

## Inquiry

In December 1998, HSI lodged a Freedom of Information request for access to applications and licences to shoot flying foxes in NSW. The aim was to see how many stonefruit growers had issues with Grey-headed Flying-foxes and where these conflicts were occurring. Obtaining access to the data was a long process requiring an appeal to the Administrative Decisions Tribunal (ADT). Finally, in October 2000, the ADT released information on the locations of licences and applications as originally applied for by HSI. This gave us a snap shot of where flying-foxes caused conflict resulting in licences to shoot during October and November 1998.

Our FOI request for the information relating to licences issued in NSW during October and November 1998 provided access to some interesting information which has received some preliminary assessment. We received 64 applications for Section 120 licences, and 56 approved licences. It was a slow process matching the applications to the licences granted, as NPWS did not appear to annotate applications, as to their success or failure, and location descriptions did not always match between application and licence.

The licences covered a wide range of crops (Figure 1). The descriptions of crops on the applications were not standardised, making evaluation difficult. The application descriptions covered Banana, Cherry, Grapes, Loquat, Lychee, Mango, Mulberry, Nectarine, Peach, Plum, Stone-fruit, "Trees" and no crop listed. The area of crops covered under individual licences ranged from 0.5 hectares to 53 hectares (Figure 2). The total licensed kill for this two-month period was 255 little Red Flying Foxes and 1330 Grey-headed Flying-foxes.

## Sophistication

HSI believes that we need to become more sophisticated in our response to human-animal conflicts. Too often we reach into our box of conflict resolution tools and select a lethal method. These methods are often repetitive, require allocation of high levels of resources and don't fully meet the aims of the project. Any non-lethal method usually involves punishment of the animal in an attempt to get it to move away. We appear to focus on refining historical methods rather than developing new responses. It is time we stopped repeating history in our attempts to manage these conflicts, and started looking for fresh responses that give better outcomes.

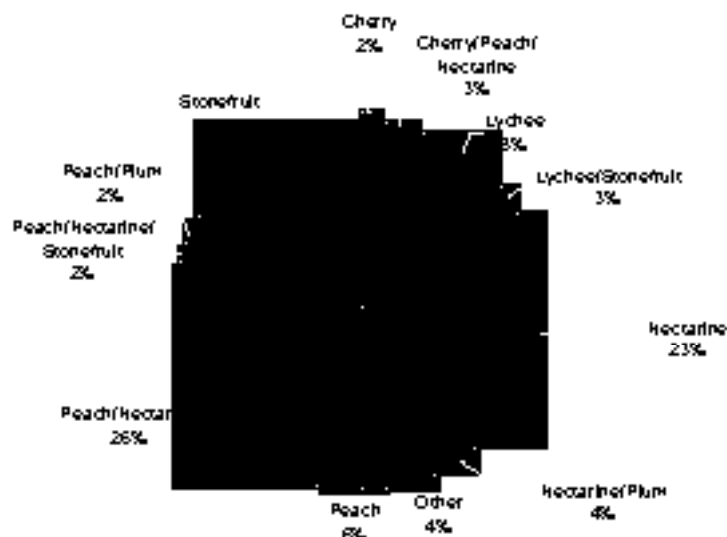


Figure 1. The percentage of the crop area (hectares) covered by 120 Licences for culling flying-foxes in November and December 1998 that was allocated to various fruit types on licence applications.

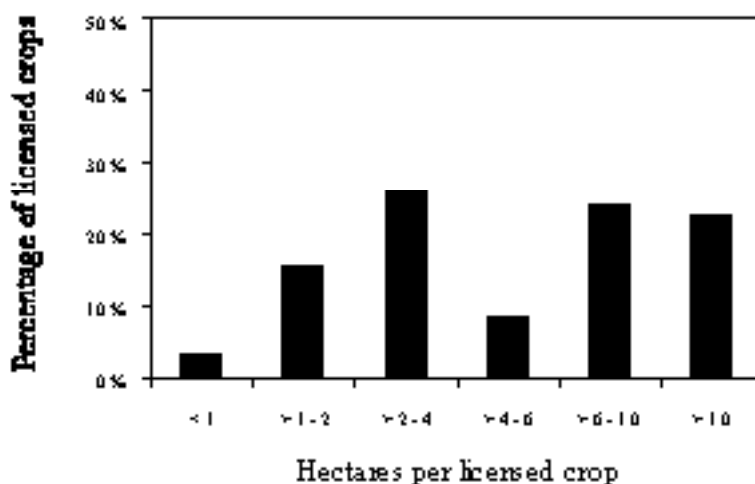


Figure 2. The size (hectares) of fruit crops covered by 120 Licences to cull flying-foxes in November and December of 1998. Crop size ranged from 0.5 ha to 52.6ha; mean crop size = 8.6ha, median crop size = 5ha. Crop size did not influence the numbers of animals licensed to be killed.

Learning theory teaches us a lot about how all species learn and interact with their environment to meet their needs (see Lieberman 1993). Learning theory provides a wide range of approaches, which could be applied to elicit a change in behaviour.

In crop protection conflicts the results we are looking for reflect closely the technical definition of learning - any relatively permanent change in response that occurs as a result of experience (Lieberman 1993). Learning allows animals to use information about the world to tailor their responses to environmental change. We manipulate animal's experiences to train them. Training generally means drawing out desirable and suppressing undesirable innate behaviours to institute novel responses (McGreevy 2001).

Animals learn in a variety of ways, by imprinting, habituation, sensitisation and associative learning. We would like flying-foxes to learn not to use stonefruit crops as a food supply. We would like flying-foxes to learn not to camp in areas that are not suitable to us. We use an aversive stimulus (loud sounds, bright lights, smoke, and electric shock) to manipulate Grey-headed Flying-foxes away from camps and food supplies that are in conflict with humans. A number of factors work against the aversive stimulus. We are trying to move animals away from locations of great significance to them. An animal's drive to survive is incredibly strong and food and shelter (camps) are of primary importance. Animals also learn to cope with aversive stimuli. They habituate to in order to meet their primary needs (McGreevy 2001).

Aversives are a type of positive punishment and there are a number of problems relating to their effectiveness. The use of aversives is an incredibly inefficient learning strategy. The stimuli must be constantly present and constantly effective, in any location you wish the animal to leave alone. A successful gain of a resource in any location reinforces the chance that the animal will return. In order to be effective against an animal trying to meet a primary need for survival, the aversive must be extremely strong (often fatal) and it can impact on population numbers through direct animal deaths, or death from starvation or exhaustion if the primary need can not be met.

Our focus has been on stopping an animal's innate response to a beneficial resource. It is time to consider another aspect of learning theory, that of encouraging responses we want through positive reinforcement (McGreevy 2001). For example, if we encouraged Grey-headed Flying-foxes to move to other suitable food supplies instead of the stone-fruit crop, we could train them away from conflict zones. Another aim would be to develop a super stimulus reinforcer, some taste or smell that attracts flying-foxes and that they would find rewarding. The animals could meet their need for food, and increase their survival rates.

An advantage of this strategy was neatly expressed by a British farmer, "They are there because they are hungry and if we chase them around by scaring them they will go to our neighbours. Should we be looking for a cheap means of feeding them to keep them off an expensive crop rather than an expensive means of chasing them off our farm onto the next farm?"

Using positive reinforcement is efficient, effective and supportive of population conservation. In order to use positive reinforcement we will need some background information on flying-foxes. Some of the essential information we know all ready, much we don't know. Taste and camp preferences are important factors. We also need

to know how they locate food and camp sites, and their communication strategies.

This information would enable us to manipulate Grey-headed Flying-fox behaviour with a much greater degree of sophistication. We could select and create suitable food supplies and camp sites for them. This would locate them where conflict would be minimal. In setting aside areas suitable for Grey-headed Flying-foxes other native animals would also benefit from access to more habitat. Instead of driving them out of multiple areas we should investigate luring them to areas suitable to them and us.

Two very simple examples of where this has been used with other species come from New Zealand. Kiwi fruit crops were successfully protected from silvereye birds by placing honey troughs (a preferred food) throughout the crop (Parliament of Victoria Environment and Natural Resources Committee 1995). Grape crops were protected from House Sparrows by scattering stale bread over nearby rough ground. Another much more complicated program has been demonstrated in Victoria. Here by-products of almond processing were used to lure crows, galahs and sulphur-crested cockatoos some two kilometers from an almond crop. Aversives were also used in the form of one shooter employed to reduce the attractiveness of the crop. After the harvest, the birds were lured back to the orchard with attractive baits such as offal for the crows so they would eat unharvested almonds that harbour pests.

HSI would like to see research undertaken to look at some new options for managing wildlife. Our reliance on the old lethal and aversive methods of dealing with human animal conflicts needs to change. Both species survival and community values demand a more sophisticated response. There is a lot known about how animals learn. We need to accept that this does occur, apply the information, and develop some win-win strategies for both animals and humans in conflict situations. Grey-headed Flying-foxes are a great place to start.

## References

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