

# **THE POTENTIAL FOR BIOLOGICAL CONTROL OF FERAL CATS IN AUSTRALIA**

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**March 1995**

Funded by the Australian Nature Conservation Agency

## **PREFACE**

This report was funded by the Australian Nature Conservation Agency under contract to the New South Wales National Parks and Wildlife Service. Its purpose was to assess the potential for biological control of feral cats in Australia and develop a strategy for future research. An extensive literature review was undertaken and numerous experts consulted between July 1993 and June 1994 in order to produce the report. It is hoped that it will provide a useful reference document for future work on the subject of biological control of cats.

## **DISCLAIMER**

The views expressed in this report are not necessarily those of the New South Wales National Parks and Wildlife Service or of the Australian Nature Conservation Agency.

## SUMMARY

There is a need to clarify the impacts of feral cats on wildlife populations and thus set clear objectives for their control.

No method of biological control is available for immediate use. Fertility control using a contraceptive vaccine is the option with the most promise. This approach and two other broad strategies (a mortality approach using lethal disease and environmental manipulation) are discussed in detail.

Although Feline Parvovirus has been used in attempts to control feral cats elsewhere, animal welfare concerns and probable immunity are likely to prevent its use in mainland Australia. No other feline diseases would cause rapid death in a relatively humane manner to a large enough proportion of a cat population to be useful for biological control.

The diseases and ecology (including population dynamics, reproduction and behaviour) of cats, and community attitudes to their control are discussed in depth. Relatively little information was available on feral cats. Most is derived from studies of domestic cats. Research currently underway is described. More information is needed on the ecology and epidemiology of diseases in feral cat populations in order to develop predictive models for specific biological control agents. Serological surveys for viral diseases in feral populations are given highest priority.

A fertility control approach using an immunocontraceptive vaccine probably has a reasonable chance of success in relation to public acceptability if the technical hurdles can be overcome. These include ensuring that the vaccine is cat specific, that it induces sterility without affecting social behaviour and that its effects last long enough to be worthwhile. No effective chemical sterilants are available.

Results of research programs on immunocontraception of rabbits and foxes should indicate whether it is a feasible option for vertebrate pest control. Non-transmissible agents are more likely to be publicly acceptable because of concerns over the safety of other species and pet cats.

Attributes of successful pest control programs (for cats and other vertebrate pest species) are discussed. Refinement and combined use of conventional control methods will be essential for future cat control, whether or not biological control is used.

## RECOMMENDATIONS

1. The impact of cats on wildlife at the level of populations rather than individuals is still unclear. **It is important to clarify impacts on populations before the necessary resources for research into and implementation of biological control can be justified. It would be useful to develop predictive models to determine where and when feral cats are likely to pose a severe threat to native wildlife.**
2. **Presently there is no biological control method available that would be acceptable for immediate implementation for feral cat control.** Feline Parvovirus has been used for cat control in the past. However, animal welfare considerations and probable immunity in many cats weigh against the use of this pathogen in the future. No other cat disease would cause a sufficient number of deaths in a humane manner to be useful for a lethal disease approach to biological control. It is highly unlikely that there are undiscovered disease agents affecting cats that could be used for a mortality approach to biological control.
3. **The most promising avenue for future research on biological control is in the development of a contraceptive vaccine to render feral cats infertile.** A contraceptive vaccine could possibly be incorporated in a transmissible vector such as one of the non-lethal viral diseases of cats, or delivered in a bait. **This approach has yet to prove an effective means of population control and it is recommended that research on immunocontraception of cats be delayed until results are available from the programs on immunocontraception of foxes and rabbits.**
4. **Serological surveys of viral diseases in feral populations should be carried out while waiting for results on fox and rabbit immunocontraception.** Serological surveys would help to indicate whether a viral vector for such a vaccine was technically feasible by providing information on the viral diseases feral populations have been exposed to, levels of immunity to these diseases, and levels of contact between cat populations. Possible candidates for genetic engineering as transmissible vectors include Feline Herpes Virus (FHV) and Feline Calici Virus (FCV). There is substantial doubt whether adequate transmission of FHV would occur in feral populations at low density. Recombinant vaccines have not yet been manufactured using calici viruses, but it is thought to be possible.
5. **If the immunocontraceptive approach proves feasible for rabbit and fox control, then further research on the reproductive physiology, population dynamics and behaviour of cats would be necessary.** This research should provide the data necessary to predict whether sterilisation of a sufficient proportion of any cat population could be achieved and identify the vaccination rate required to reach negative population growth.
6. **The safety of pet cats, species other than cats, and endemic felids in other countries must be guaranteed before any transmissible biological agent is used to control feral cats.** All of the 36 species of felid other than *Felis catus* are listed as threatened or endangered in their countries of origin. This factor favours the use of non-transmissible biological control agents incorporated in baits.
7. **If an immunocontraceptive approach does not appear feasible, the remaining options for biological control of cats are not very encouraging.** It may be possible in the future to genetically manipulate feline viruses or other pathogens so they become more virulent and cause rapid death, such as occurs with Myxomatosis and Rabbit Haemorrhagic Disease. However, this is in the realm of pure speculation. Reduction in virulence and increase in resistance to disease, such as occurred with myxomatosis, would be expected. It would be more practical to refine existing methods of conventional control, in particular, baiting methods.
8. **Biological control methods must be humane.** If they are not, strong objections from concerned groups and individuals in the community can be expected. This factor alone weights future research in favour of using a fertility control approach rather than using lethal disease.

9. **Biological control would never be sufficient by itself to control populations of feral cats.** Experience from past eradication or control programs for vertebrate pests has shown that combinations of methods in particular optimum sequences are necessary to achieve success.
10. **The degree of interchange between feral, stray and domestic cat populations should be clarified.** Genetic research would help to do this. There is no point in putting substantial resources into feral cat control if feral populations are continually being supplemented by stray and domestic cats. If there is a substantial degree of interchange, as is suspected, domestic and stray cat control would be an essential adjunct to feral cat control.
11. **Specific legislation aimed at cat control should be developed.** Feral, stray and domestic cats have no well-defined legal status at present, making it difficult to effectively implement cat control measures.