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# Vertebrate Pest Management in Victoria – Managing Community Expectations

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**Abstract:** The impact of mammal pest animals, including the rabbit, fox, wild dog, feral pig, and feral goat, is one of the most significant threats to biodiversity, community values, and the economy in Victoria, Australia. The management of these pests is a complex issue involving all land types and land tenures. Both the Victorian Government and the community have expectations relating to the management of these pests; sometimes these expectations differ and finding solutions is difficult.

To overcome this, the Victorian Government, through the Department of Natural Resources and Environment (NRE), has provided constructive debate on animal welfare issues and developed the Victorian Pest Management Framework (VPMF) to provide a consistent, strategic, and partnership-based approach to pest management, including mammal pests, on both private and public lands and waters. A key principle of the VPMF is that pest management is the responsibility of each land and water manager. Government only becomes involved where the action results in public benefit, incorporates shared investment principles, meets “duty of care” responsibilities, involves all stakeholders, and is consistent with State or Regional Catchment Strategies or Regional Action Plans. Government involvement also includes an accepted responsibility by public land managers to address damage caused to the community by pests that originate on public land and disperse onto adjacent private land. This responsibility is met through the Government’s “Good Neighbour Program.”

The clear definition of expectations of community and Government detailed in the document has provided an agreed basis for all land and water managers to work together to develop and implement long-term, effective, safe and integrated management processes that protect and improve Victoria’s biodiversity and natural values and protect its productivity base.

**Key Words:** Victoria, vertebrate pest management, vertebrate pests, animal welfare, community expectations, Natural Resources and Environment (NRE), Victorian Pest Management Framework (VPMF), partnerships, shared investment approach, Good Neighbour Program (GNP), Catchment Management Authorities (CMAs)

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## INTRODUCTION – THE PROBLEM

### Australia

Past attitudes have resulted in Australia having one of the most unenviable records in the world in relation to the number of introduced vertebrate pests, and today the consequences of this are still very detrimental.

The Australian landscape has been changing for millions of years in response to climatic, geological, and biological factors. Since European settlement the rate of change has been extensive and rapid. Invasion by introduced vertebrate species has been a significant component of this change. Australia is particularly susceptible to the establishment of introduced pest populations because of its isolation from other lands over millions of years. As Australian fauna and flora did not co-evolve with the introduced vertebrate pests, susceptible native prey species have few adaptive strategies to avoid predation by these pests. In addition, many introduced vertebrate species were released from natural population constraints normally placed upon them by endemic diseases, natural predators, limited food resources, and short breeding cycles imposed by climatic conditions.

In the two hundred years of European settlement, many species of vertebrate pests have become established in Australia as a result of deliberate or accidental releases.

Their impact has also been exacerbated by habitat fragmentation and modification since European settlement. The most dominant of these species are mammals, birds, and fishes. These pests reduce productivity, displace native species and contribute significantly to land and water degradation.

For example, in Australia the impact of the European red-fox (*Vulpes vulpes*) has been proposed as an important mechanism that has contributed to the decline of native species (Burbidge and McKenzie 1989). Similarly, since its introduction the European rabbit (*Oryctolagus cuniculus*) has significantly affected Australia’s flora and fauna. The decline of many of Australia’s terrestrial mammals that weigh between 35 and 500 grams (sometimes referred to as the critical weight range for these native species), particularly in the arid and semi-arid zones, was associated with the rabbit’s introduction (Calaby 1969). Currently in Australia there are 30 species of native plants and 14 species of native wildlife for which rabbits are a known or perceived threat. For these reasons the fox, rabbit, along with the feral pig (*Sus scrofa*), feral goat (*Capra hircus*), and the feral cat (*Felis domesticus*) are listed as key threatening processes under the Endangered Species Act 1992 (Commonwealth of Australia). Exotic invasive species, including vertebrate pest animals, are now recognised interna-

tionally as the second greatest threat to natural ecosystems.

Vertebrate pest species, particularly the fox and rabbit, also have a serious economic impact. It has been estimated that rabbits may cost the Australian wool industry \$A115 million annually in lost production through competition with stock (Williams et al. 1995), prior to the introduction of Rabbit Haemorrhagic Disease. While the impact of foxes on livestock is not yet fully understood, foxes are known to kill livestock, particularly the young. Some studies indicate foxes may account for up to 30% of the deaths of all new born lambs (Saunders et al. 1995).

In addition, some vertebrate pests may either be a prime vector if serious diseases were introduced to Australia (rabies/fox and foot and mouth/feral pig and feral goat) or play a role in maintaining reservoirs of other diseases harmful to wildlife and humans and/or domestic pets or livestock. These diseases include canine distemper, parvovirus, canine hepatitis, tularaemia, leptospirosis, heartworm (fox), hydatids (fox; dingo, *Canis familiaris dingo*; and wild dog, *Canis familiaris familiaris*), and toxoplasmosis (fox and feral cat).

## Victoria

Victoria is located on the south east of Australia (see Figure 1). It is Australia's most closely settled and intensively farmed state with two-thirds of its 23.4 million hectares comprising freehold or private land. There is a relatively fine-grained mosaic of human settlements and varying size blocks of public and private land and vegetation. Changes in jurisdictions and land management responsibilities across this mosaic adds further complexity to this situation (Friend et al. 2001).



**Figure 1. Location of Victoria with reference to the map of Australia.**

Victoria has 16 of the 20 most dominant pests found in Australia (Wilson et al. 1992). However this discussion focuses on Victorian vertebrate pests, in particular mammal species, of which the most significant are the rabbit, fox, dingo, wild dog, feral pig, and the feral goat.

Feral cats occur across Victoria but the extent of damage is relatively unknown. House mouse (*Mus domesticus*) numbers may reach plague proportions as often as 2-3 times in a decade, and there are concerns that wild deer (*Cervus* spp.) are extending their range and increasing in numbers aided by accidental and deliberate releases from commercial deer farms.

The harmful effects of vertebrate pests such as the rabbit, fox, wild dog, feral goat, and feral pig cost many millions of dollars each year in Victoria, and further millions are spent by landholders and Government authorities in attempts to control them. The impact that vertebrate pests have on natural ecosystems is also very serious; pests such as foxes and rabbits have the potential to destroy the biodiversity values of highly prized ecosystems. Of the 90 species of non-marine mammals known to have inhabited Victoria upon European arrival, 19 are now extinct in Victoria; 5 of these are now extinct Australia-wide. Many other species have much-diminished populations and distributions.

Invasion by vertebrate pests has been a significant component of this change. For example, the fox was a major factor in the extinction of 6 mammal species in the Victorian Mallee – western barred bandicoot (*Perameles bougainville*), pig-footed bandicoot (*Chaeropus ecaudatus*), eastern hare-wallaby (*Lagorchestes leporides*), bridled nail-tail wallaby (*Onychogalea fraenata*), brush-tailed bettong (*Bettongia penicillata*), and desert mouse (*Pseudomys deserto*) (Bennett et al. 1989). In Victoria, 91 species of vertebrates have been identified for which predation by foxes is a known or potential threat. These comprise 53 bird, 15 mammal, 19 reptile, and 2 amphibian species.

The adaptability of vertebrate pest species has resulted in many of them becoming established in both rural and urban environments, and on privately owned and publicly managed land. Despite considerable government and private sector investment, invasion of vertebrate pests still represent a major threat to both the productive capacity of land and the integrity of Victoria's natural ecosystems. As a result of these direct impacts, there is also considerable social impact through hindrance of the long-term sustainability of rural communities.

However, various segments in the community see vertebrate pests either as appealing characters from cartoons and literature (rabbit and fox), a commercial resource (feral pigs, feral goats, foxes, and rabbits), a subsistence food resource (rabbits), an animal welfare concern, a harmless or even beneficial component of the ecosystem, an honoured object of the chase (foxes), or major killers, rogues, and pests (wild dogs and foxes). It is unlikely that these deeply-held attitudes can be changed quickly, but the public needs to understand the damage caused by these pests and their implications. In addition, a sector of the community holds the unrealistic expectation that Government can and will undertake all management activities at little cost. It is essential that this

expectation is changed and a common set of shared priorities developed.

## **PEOPLE, POPULATION, PERCEPTIONS, AND EXPECTATIONS**

Like its USA counterpart, the Australian Government has, historically, been reluctant to invoke legislation in response to land degradation, preferring instead to place the emphasis on voluntary action and attitudinal change. One of the most significant changes, and one that has impacted upon vertebrate pest management in Victoria over the past decade, has been the development of "Landcare." The rhetoric of Landcare relies upon the ethic of stewardship and upon voluntary cooperation between landholders (Ewing 2000). Landcare is a community-based approach to address environmental problems and the long-term viability of agricultural production. It has been described as a mixture of "top down" government direction and "bottom up" grass roots initiative (Boundy 1997). This community driven, "whole of catchment" approach to natural resource management has harnessed Victoria's unique blend of economic, environmental, and social strengths, and provided a powerful means of dealing with natural resource management issues at a catchment scale. The World Bank has recognised Victoria's approach to integrated catchment management as world's best practice.

However, the rise of environmental consciousness through successful community schemes (such as Landcare) during the last decade has occurred at the same time that the urbanised population has increased (of the 4.8 million people in Victoria 78% reside in urban areas), become more cosmopolitan (approximately 30% of Victorian residents were born outside Australia), and become more physically and culturally isolated from rural issues. For example, as with most of the south east coast of Australia, the majority of the population in Victoria resides along the coastal strip and in major regional centres. There is a close correlation between population and political representation in these areas. As a result, there is a perception among many of the rural communities that they are being unfairly blamed for environmental degradation and politically alienated by the larger urban communities. Changes in vertebrate pest management approaches are necessary to cope with changes in demographics (Korn et al. 1998). The often contrary expectations of rural and urban communities are a major problem affecting a consistent approach to statewide vertebrate pest management.

## **ANIMAL WELFARE**

Concurrent with the increase in environmental consciousness has been an associated increase in awareness of animal welfare, which has resulted in the strengthening demand by animal welfare groups and the

community in general for the use of non-lethal forms of vertebrate pest management.

A major issue for vertebrate pest management is how to balance the concerns for animal welfare with the need to protect whole ecosystems. There has been the tendency to downplay the ethical philosophies advanced by animal welfare groups and the increasing concern from the community in regards to humaneness in vertebrate pest management, as they were often directly opposed to those of pest controllers. There is an increasing expectation in many sectors of the community that all animals, including pests, will be treated humanely (Olsen 1998). Aside from the moral obligation, failure to adequately consider animal welfare can cause major problems for pest control. Increased public concern has brought into question the continued use of poisons and current techniques, such as trapping, for the control of vertebrate pests (McIlroy 1996). However, while humaneness of control is the primary concern, there is often a general reluctance by those advocating animal welfare philosophies to consider the impact the pest is having on the environment.

While some of the ethical philosophies advanced by animal welfare groups may be opposite to those held by farming communities and the Government agencies supporting them, they cannot be ignored. In the past there has been little or no engagement between parties on this issue. This lack of debate was recognised at a national level when the animal welfare perspective was a major theme at the Australian Vertebrate Pests Conference in 1994. The need for debate was best summed up by the following:

*"The Australian and New Zealand Federation of Animal Societies is concerned about the interest of all non-human animals and is amazed at the treatment of these animals once they have been labelled by our community as pests. A lack of public debate enables much of this treatment to persist when reform is possible and well overdue"* (Oogjes 1995).

An animal welfare philosophy versus pest management techniques is an example of polarised expectations. There is a need to encourage various perspectives and to promote understanding between groups involved in pest management. The potential identification of common ground between the groups can help revise expectations: animal welfare advocates in accepting specific techniques to manage pests, and the pest controllers accepting the need to use more humane techniques. This did occur in Victoria in 1996 and has resulted in the Department of Natural Resources and Environment (NRE) defining research directions into humane, effective, and attainable vertebrate pest control techniques. Animal welfare is also a key issue within the Victorian Pest Management Framework (VPMF).

## **PUBLIC LAND MANAGEMENT**

In addition to the differing community attitudes to vertebrate pest management, the community also has high

expectations for Government management of public land across Victoria, including the public and private land boundary. Approximately one-third of the state is Crown (public) land (7.8 million hectares). This land is managed for a variety of uses: 49% as parks and reserves, 45% as forests, and the remaining 6%, incorporating thousands of small parcels, is managed for community, conservation, or operational uses. There is a widespread expectation within the urban and rural communities for Government to minimise the impact of pests on the conservation values of the public land, and within the rural communities for Government to prevent vertebrate pests from invading adjoining private land. The need for control on the latter has been further heightened by the perception that public land remains a major source of infestation and reinfestation onto adjoining private land. Alternatively, there is concern among some groups regarding relatively pest-free areas of public land being infested or reinfested by pests from private land.

## **THE VICTORIAN PEST MANAGEMENT FRAMEWORK**

The differing expectations between many in the community, as well as the unrealistic expectations that Government can do everything at little cost, has meant that finding solutions is somewhat difficult. Recently, considerable effort has been invested in Victoria to ensure there is a clear understanding by the rural and urban community of the level and focus of Government involvement and support. At a state level this has been clearly articulated in the VPMF, which provides the principles and directions for the management of existing and potential pests in Victoria for the next 5 years. At a regional level, and consistent with the principles of the VPMF, community based Action Plans indicate the agreed community priorities to which Government investment will be directed. The following are the key approaches within the VPMF used to provide this definition.

### **Partnerships and the Shared Investment Approach**

In Victoria, the management of vertebrate pests is to minimise their impact on the economic, social, and environmental values of the local and broader community. While responsibility for such management in Victoria is principally with each land manager, NRE has a strong culture of working in partnerships with the community in recognition that the management of Victoria's natural resources is not sustainable unless stakeholders and local communities participate in decision-making and "own" the outcomes.

A shared investment approach is the basis by which genuine partnerships are developed and implemented in Victoria. Shared investment in vertebrate pest management is based on agreed guidelines for natural resource management in the state. Basic principles were nationally developed for these guidelines in 1998. The principles recognise that natural resource management can only be

achieved through a clear understanding by all stakeholders of their respective roles and responsibilities and a sharing of both the benefits and costs in a partnership approach.

The term "shared investment" rather than "cost sharing" was used, as the former was perceived to give equal emphasis to costs and benefits and could encompass any sort of resource commitment – not limited to financial cost – that would result in a benefit for more than just one individual or group. For example, "shared investment" could more readily recognise the many factors considered in making investments, for example, in-kind work, education, research and development, and planning (Leybourne and Crawford 2000).

In Victoria the following principles within the VPMF are used to determine the most appropriate shared investment arrangements for pest management activities, (including vertebrate pests).

### ***Duty of Care***

All private landowners and public land managers have a "duty of care" to ensure that they do not damage the land. Therefore, landowners and public land managers are expected to meet the costs of pest management in reaching and maintaining an acceptable condition of their land and ensuring pests do not impact on other land. In addition, people who use the land are responsible for meeting the costs of repairing any damage that results from their actions.

### ***Private Benefit***

People or organisations that use land are expected to pay for activities that provide them with a private benefit. For example, if pest management will provide an increase in income or property value for a landowner, then the landowner is expected to meet the cost of the work. Poor enterprise viability or management is not a justification for Government to substitute public funding for landholder funding of remedial works.

### ***Public Benefit***

The Government may contribute to the cost of activities that produce a public or community benefit. The Government may also contribute to activities where there is market failure. For example, Government may meet the cost of eradication of serious new pest vertebrate species on private land in order to prevent widespread impacts on local communities. Public benefit alone is not a sufficient reason for Government investment, particularly in cases where there is a clear responsibility or duty of care for particular activities. Public benefit is a condition of Government funding, not a purpose.

The building of strong partnerships, under which these shared investment principles are implemented, is assisted by the relatively robust and straightforward institutional arrangements for pest management in Victoria. NRE has a statewide policy interpretation and legislative responsibility for pest management, including

its responsibilities as a land manager. Ten Catchment Management Authorities (CMAs) covering the state provide a regional community focus to enable priorities for pest management activities to be developed within a catchment and landscape context.

Regional rabbit and other vertebrate pest animal Actions Plans have been developed by CMAs, in consultation with the community and in partnership with NRE, to provide an agreed community and government prioritisation and investment process in pest management. This arose from the need to indicate to the community that Government cannot deal with all vertebrate pest issues at little cost. The shared development of the plans between the community and Government has greatly assisted in developing a far better understanding of expectations by both parties and has forged stronger working partnerships, although this is not to say that all are aware of or agree with the priorities in the Plans. As part of their implementation, continuing effort is still required to ensure full community ownership and acceptance of the Plans.

### **The Good Neighbour Program**

As part of the Government's responsibilities relating to effective vertebrate pest management on public land, the need to be an effective "Good Neighbour" is acknowledged and accepted within the VPMF. This responsibility is met through the Good Neighbour Program (GNP).

The GNP is an essential element in the Government's approach to pest management on the public and private land boundary in Victoria. Under the GNP, NRE works in partnership with the community to address damage caused by pests that originate on public land and disperse onto adjacent private land. The GNP provides the mechanism for a coordinated and prioritised approach to treating pest problems on the public land/private land boundaries according to the CMA Regional Catchment Strategies and Action Plans.

The Program's aims are to:

- Make real gains in the control of priority pest plants and proclaimed pest animal infestations within defined project areas of public land frontages;
- Enhance the productivity of primary production enterprises through the control of pest plants and animals on adjoining public land;
- Promote the Government as a "Good Neighbour" when it comes to pest control on public land;
- Ensure that pest management on public land takes account of community priorities and actions; and
- Integrate pest management with other natural resource management objectives, including:
  - revegetation;
  - protection of rare and endangered species of flora and fauna;

- conservation of native plant communities;
- forests production;
- soil conservation; and
- salinity management.

The GNP is composed of the following:

1. Good Neighbour projects on public lands (state forests, national parks, and other public land) to address boundary issues where pests from public land adversely affect adjacent private land.
2. Cooperative roadside projects, which provide support for landholder groups to undertake coordinated and cooperative approaches to roadside pest control.
3. Group facilitation projects, which involve the employment of local community-based landholders to coordinate pest management along public land frontages involving groups of landholders sharing common pest management problems and a common boundary with public land. Facilitators also ensure coordination of pest management works between public and private land managers.

In the development of Good Neighbour projects, the community has an opportunity to nominate priority areas for management. Projects are formulated by NRE to reflect both public land managers' and community input, consistent with priorities of CMA Regional Action Plans. Under the VPMF, community involvement is enhanced by making the prioritisation of projects the responsibility of the CMAs.

To address the public land manager's concern regarding private land infesting adjoining public land, complementary private land vertebrate pest programs are encouraged and coordinated by local landholder facilitators funded through the GNP.

While there remain concerns from some in the rural community that the GNP is not as effective as it could be, the Program is a real attempt by Government to meet community expectations.

### **CONCLUSION**

Human behaviour resulted in the introduction of vertebrate pests in Victoria, and ultimately only human intervention will reduce their long-term impacts. It is now recognised that good landscape management, including a reduction from the impacts of vertebrate pests, requires land managers, the community, and Government to work together to develop and implement long-term, effective, safe, and integrated management processes that protect and improve biodiversity, natural values, and the productive capacity of land. However, the management of vertebrate pests within the Victorian landscape is a resource-hungry and complex issue because it involves all land types and tenures, with often different and sometimes opposing community expectations.

The challenge facing Victoria now and in the future is to influence these expectations through clearly defined and understood Government and community vertebrate pest management responsibilities. This will remain difficult as community attitudes are constantly evolving and at the same time many small rural communities are shrinking as Government services recentralise to larger regional centres.

Many issues surrounding community expectations have still to be resolved. The approach taken by NRE has been to constructively engage both the rural and urban community through stakeholder debate on pest management outcomes, including animal welfare, and by providing clear definition of community and Government expectations. These expectations are defined and detailed in the VPMF at a state level, and Action Plans at a regional level. This has provided a basis for all pest managers to work together to develop and implement agreed long-term, effective, safe, humane and integrated management processes that protect and improve Victoria's biodiversity, natural values, and productive capacity of land. It is a genuine attempt at providing a strong basis for community and Government agreement and involvement in vertebrate pest management on both public and private lands.

However, there is still significant work to be done to move forward so that the momentum generated by debate is not lost. Implementation of the VPMF will be closely monitored over the next 5 years and adjustments made to the new management approach to meet inevitable evolution of community attitudes.

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