

Rabbits *Oryctolagus cuniculus*



Foreword

The rabbit (*Oryctolagus cuniculus*) is one of the major economic and environmental pests in Queensland and Australia. Brought to this country for sporting purposes by the First Fleet, the rabbit has successfully spread from isolated populations to become one of the most widely distributed mammals in Australia.

The Department of Natural Resources and Mines (and its predecessors) has had a long history of controlling the rabbit population and of undertaking research into rabbit control techniques. As the introduction of myxomatosis and rabbit calicivirus disease has significantly reduced rabbit numbers, it is imperative that everyone involved in rabbit management takes the opportunity to follow up on this success.

The Darling Downs–Moreton Rabbit Board area is the only sizeable area in Australia suitable for rabbits where they have not become widely established. The Board is vigilant about ensuring that this district is kept free from rabbits. Outside this area, landholders are responsible for their control, with local governments and NR&M delegated to ensure that social, economic and environmental impacts are kept to a minimum within their respective jurisdictions.

Given the extensive impact of this problem, a State-wide strategy is necessary to guide landholders, agencies and groups in the preparation of plans and strategies for managing rabbit impacts at local and regional levels.



Mr David Cory
Chairman—Rural Lands Protection Board

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Executive Summary

Rabbits are one of Australia's major agricultural and environmental pest animals, having cost between \$600 million and \$1 billion annually before the introduction of rabbit calicivirus disease in 1995. They destroy the landscape and are a primary cause of soil erosion because they prevent the regeneration of native vegetation. Rabbits also compete with native animals for food and burrow space, and have played a role in reducing the numbers of many native animals—some to extinction by competing for food and burrow space. They also affect the quantity and quality of pasture available for other animals.

Rabbits are distributed throughout Queensland, with high populations found in the granite belt and the south-west. Moderate populations are located in the south-western Darling Downs, Maranoa, southern Warrego, the north-western Darling Downs and North Burnett, with isolated populations found in the remainder of the State.

This strategy has been prepared to take advantage of the current reduction in rabbit numbers from rabbit calicivirus disease (RCD) and to address the public concern regarding the effects of their populations in production and conservation areas. The major challenges of rabbit management are maximising the benefits of RCD and improving the implementation of integrated control programs.

The formation of the Rabbit Research and Control Advisory Group is an important step in achieving coordinated rabbit management across the State. This group is currently made up of research, control, extension, policy and management officers from the Department of Natural Resources and Mines (NR&M), the Darling Downs–Moreton Rabbit Board (DDMRB) and a landholder representative.

The vision outlined in the strategy is that 'rabbits remain excluded from the protected area in south-east Queensland and their impacts elsewhere are minimised'. Following are the desired outcomes and actions on which this strategic approach to rabbit management is based:

Rabbit management in Queensland is fully coordinated.

Plan and coordinate the rabbit management activities of all stakeholders across all levels (State, regional, local and landholder).

Stakeholders are fully aware of and committed to rabbit management activities.

Increase the understanding and commitment of all stakeholders (including the general community) to their roles and responsibilities for rabbit management.

Biocontrol agents are used strategically.

Use biocontrol agents strategically as part of an integrated control program.

Up-to-date information is used as a basis for developing best practice rabbit management.

Increase understanding of the biology, distribution, impact and control of rabbits.

Best practice rabbit management is implemented.

Foster the use of best practice management by all stakeholders.

Adequate resources are available for rabbit management.

Attract and utilise resources for rabbit management in an effective and efficient way.

As part of a five-year cycle of review in which the strategy will be evaluated, its success will be determined by the extent to which these outcomes are met.

1. Introduction

Rabbits have been recognised as a key threatening process to the survival, abundance and evolution of native species and ecological communities. They compete with native animals; destroy the landscape; contribute to the maintenance of predator numbers by providing a food source (and therefore indirectly influencing predation on native species); and are a primary cause of soil erosion. Rabbit distribution is largely limited to the southern third of Queensland and varies in density across this area (see figure 1). Wherever rabbits are found in large numbers, they pose a direct risk to grazing and cropping enterprises.

1.1 Background

1.1.1 Legislative status

Wild or domestic European rabbits (*Oryctolagus cuniculus*) are declared in Queensland under the *Rural Lands Protection Act 1985* (Qld). Under this Act, the introduction of rabbits into the State is prohibited, all rabbits are to be destroyed and the keeping and selling of rabbits is prohibited. This legislation also places a responsibility upon landholders, including State and local governments, to control rabbits on their lands.

Permits are available for approved purposes—exhibition, education and scientific research—and are administered through the Department of Natural Resources and Mines (NR&M). Rabbit farming is not an approved purpose, nor is the keeping of rabbits as domestic pets.

1.1.2 Responsibility for control

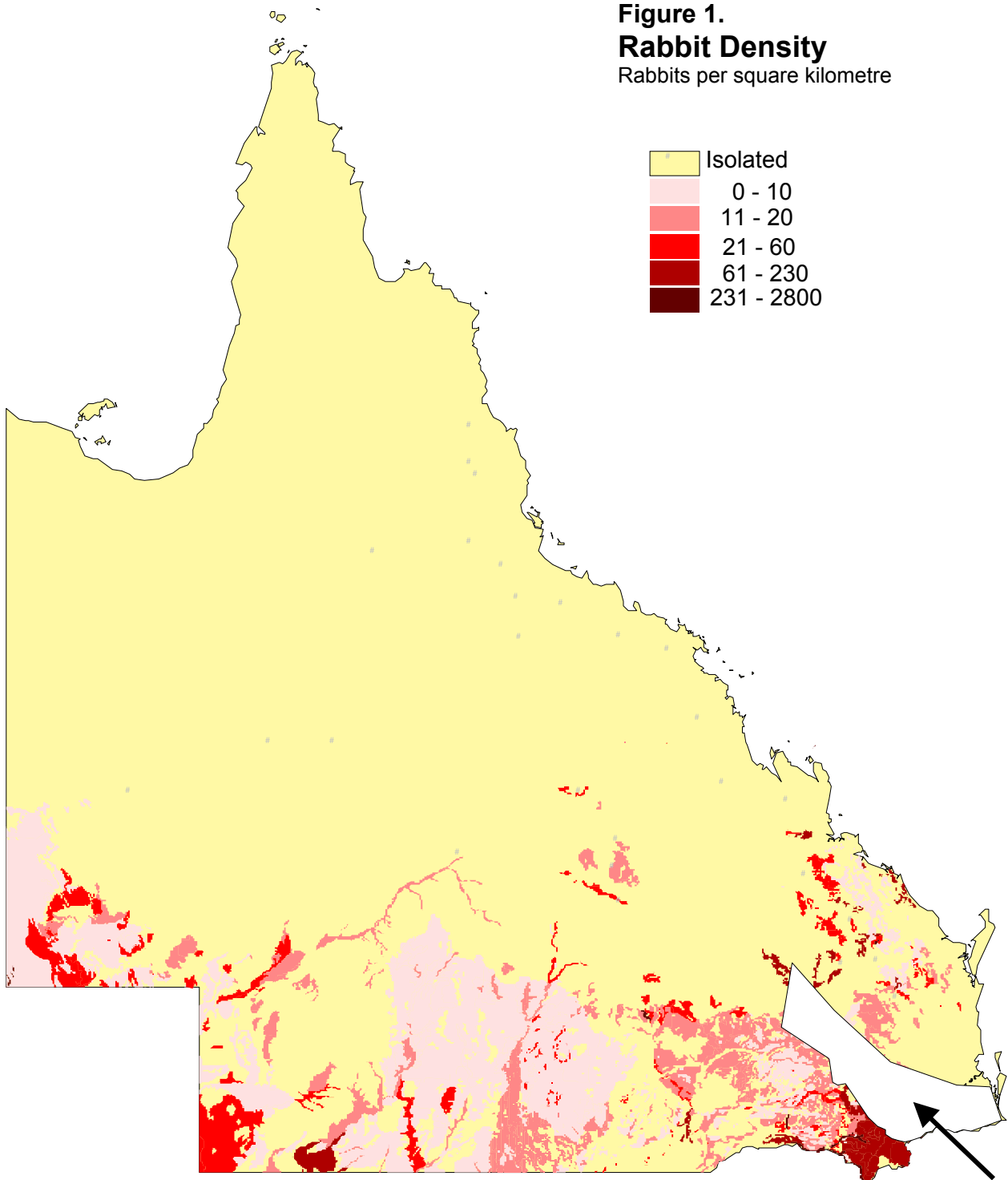
The responsibilities of landholders, local governments, - DDMRB, NR&M and other State agencies are described in section 5. R)

1.1.3 Rabbit distribution

Rabbits are one of the most widely distributed mammals in Australia. Within Queensland, core rabbit populations are found in the southern regions of the State (see figure 1). There is a correlation between their distribution and particular soil types, that is, those that rabbits can burrow within. Through the use of biological control measures, densities within this area have been reduced significantly in recent years and may decrease further if landholders undertake follow-up measures. Above the Tropic of Capricorn, rabbits are at the edge of their range, with populations fluctuating considerably—expanding and contracting according to the season.

The DDMRB area is the only sizeable area in Australia suitable for rabbits where they have never become widely established (see figure 1). This is due to the vigilance with which its officers maintain the rabbit fence and control rabbits within the fenced area. The DDMRB is the only remaining rabbit board within Queensland and includes landholder and local government representatives. It oversees the control of rabbits within its area, including the maintenance and construction of the rabbit fence, and liaises closely with NR&M on rabbit management.

Figure 1.
Rabbit Density
Rabbits per square kilometre



1.1.4 Impacts

Although rabbits are one of Australia's major agricultural and environmental pest animals, few studies have quantified their economic impact. Based on wool production data before and after the introduction of myxomatosis (1952–53), rabbits cost the wool industry in excess of \$590 million (at 1990 prices). The total economic impact may be well in excess of this figure—possibly as high as \$1 billion. As they compete directly with native species and cause land degradation that threatens ecological communities, rabbits have been listed as a 'threatening process' under the *Endangered Species Protection Act 1992* (Cwth). Even low numbers can cause significant damage, particularly to valuable crops and native flora at the seedling stage.

- **Environmental impacts**

- degradation of native vegetation
- degradation of soil from overgrazing
- degradation of water from overgrazing
- direct competition with native animals for food and space
- direct competition with native herbivores
- competition for living space, particularly refuge areas
- provision of a food source for predator species
- changes to the population dynamics of predator species
- indirect impacts on birds, mammals and insects that rely on plants
- costs of direct control.

- **Production impacts**

- contribution to total grazing pressure
- reduced pasture production including reserves for dry seasons leading to reduced livestock and wool production
- reduced pasture quality
- reduced crop production and product quality
- costs of direct control.

- **Social impacts**

- loss of amenity and landscape values
- reduced incomes to rural households
- indirect control costs (rates, taxes)
- positive impact for recreational hunting.

1.1.5 Control techniques

A range of techniques is available for rabbit control in Queensland (table 1). The choice of the best technique is based primarily on rabbit numbers, as well as on an understanding of rabbit behaviour, social structure, habitats and food preferences for any given area. However, the decision is also influenced by concerns for animal welfare and non-target control impacts, and restrictions on where, when, how and by whom some techniques may be applied. The best results are achieved through a combination of complementary techniques and sustained follow-up treatments.

Control option	Using
Poisoning (baiting)	1080 and pindone
Warren fumigation	Chloropicrin, phosphine, carbon monoxide, gas ignition
Biological techniques	Myxomatosis, rabbit calicivirus disease
Shooting	Appropriate firearms by skilled users
Trapping	Soft jaw, cage traps
Warren destruction	Deep ripping, blasting
Exclusion fences	Rabbit-proof fencing
Changed farming practices	Pasture management or alternative crops
Habitat modification	Removal of harbour e.g. logs, thick vegetation

Table 1: Rabbit control techniques

1.2 Purpose of strategy

The purpose of this strategy is to provide a planned approach to the management of rabbits in Queensland. Over the last century rabbits have been a major focus of pest animal control, but—despite commitment by industry and community groups and actions by government agencies—rabbit populations remain established. The distribution and impact of rabbits are such that a coordinated approach to their management is required if the significant progress that has been made in recent years is to be built upon. It is now timely to set the future direction by determining what actions and responsibilities are needed to sustain what has already been achieved and to further reduce their impact.

1.3 Scope

The strategy has been established to address the presence and impact of all rabbit populations within Queensland. The maximisation of resources requires aligning the Queensland Rabbit Management Strategy with other government and community plans (displayed in table 2).

1.3.1 Process

The strategy is based on the knowledge and experience of the Rabbit Research and Control Group as presented at their meeting held at the Robert Wicks Research Centre in February 1999. Members of the group include the NR&M research, extension, operations and policy staff; DDMRB staff and landholders with membership in industry; DDMRB member and landcare groups.

1.3.2 Linkages

The strategy forms part of a planning matrix, as shown in table 2. It is consistent with the State Pest Animal Strategy and draws on activities outlined in the local government area pest management plans.

Scope Scale	Natural Resource Management	Pest Management	Species Management
National	National Strategy for the Conservation of Australia's Biological Diversity; National Policy Statement of Managing Natural Resources in Rural Australia (proposed)	Managing Vertebrate Pests—Principles and Strategies	National Pest Animal Species Threat Abatement Plans (Rabbits)
State	Queensland Biodiversity and Natural Resource Management Strategy (proposed)	Draft Queensland Pest Animal Strategy	Queensland Rabbit Management Strategy
Regional	Regional Strategies for Natural Resource Management and Biodiversity Conservation	Central Highlands Pest Management Plan (draft)	Murray–Darling Carp Strategy
Local	Landcare Plans	Local Government Pest Management Plans	Cooloolo Shire Cat Management Plan
Property	Property Management Plans	Property Pest Management Plans	

Table 2: The relationship between the Queensland Rabbit Management Strategy and other plans.

1.4 Challenges to managing rabbits

Stakeholders face significant challenges to the effective management of rabbit impacts, including how to:

- maximise the success of RCD in reducing rabbit populations
- increase landholder commitment to rabbit control activities
- improve the level of implementation of integrated control
- resolve the conflicting values of rabbits as a pet/resource/pest.

1.5 Principles

The development and implementation of this Strategy is based on the following principles:

- **Consultation and partnership**

Consultation and partnership arrangements between local communities, industry groups, State government agencies and local governments must be established to achieve a collaborative approach to pest management.

- **Commitment**

Effective pest management requires a long-term commitment to pest management by the community.

- **Public awareness**

Public awareness and knowledge of pests must be raised to increase the capacity and willingness of individuals to control pests.

- **Prevention**

Effective pest control is achieved by preventing the spread of pests, and viable parts of pests, by human activity; and early detection and intervention to control their spread and adverse impacts.

- **Ecological processes**
Pest control techniques that have the least impact on ecological processes and reinforce the resilience of the processes must be used to the greatest extent practicable.
- **Integration**
Pest management is an integral part of managing natural resources and productive systems.
- **Planning**
Pest management planning must be consistent at local, regional, State and national levels to ensure that domestic and international obligations about pest management are met; and, that pest management resources are used to target priorities identified under the domestic and international obligations.
- **Research**
Research is necessary to improve pest management practices.
- **Monitoring and evaluation**
Regular monitoring and evaluation of pest control activities is necessary to improve pest management practices.

The primary responsibility for pest animal management rests with the land manager, but sometimes collective action is required when the problem is greater than can be managed by the individual alone. If necessary, enforcement measures may be used to ensure all land managers fulfil their duty of care by controlling declared animals on their lands. Enforcement however, is the last option, and undertaken only after other avenues have failed.

2. Strategic plan

Vision

Rabbits remain excluded from the protected area in south-east Queensland and their impacts elsewhere are minimised.

2.1 Coordinated rabbit management

Desired outcome

Rabbit management in Queensland is fully coordinated.

Background

Rabbit management requires planning and coordination at local, regional, state and national levels. Various agencies have prepared, or are preparing, plans and strategies that include rabbit management (table 2), but it is unclear what coordination there is between them.

At the field level, links between NR&M and the DDMRB are maintained through Land Protection Officers and Rabbit Officers. In addition, NR&M has a nominated representative (District Manager, Border District) on the DDMRB. The Director, Land Protection liaises with the Board by attending one or two meetings per year. The DDMRB has drafted a 5-year management plan for 1999–2004.

Local government area pest management plans that have identified rabbits as an issue for their area discuss rabbit containment, but tend to rely on biological control as the means to achieve this. Buffer zones, integrated management and eradication of isolated populations have also been identified in some plans, but need to be extended to all plans. Few plans recognise the links to other agencies that can provide additional support in both planning and coordinating rabbit management programs.

There is the potential for established rural networks to become more involved in strategic control, especially where their interests and resources overlap. Members of these networks often have access to equipment that can be used for destroying rabbit habitat and reducing infestations of weeds, such as blackberry thickets, which provide shelter and protection for rabbits.

With follow-up treatment to the rabbit calicivirus epidemic, it is now feasible to reduce rabbit populations to minimal levels in many areas. The low level of rabbit numbers and the prevalence of biological control reduce the need for a more structured, broad-scale control program. The emphasis must now be on strategic follow-up treatment of core habitat areas, such as on Bulloo Downs and in the Wallangarra area. RCD is still being released by NR&M staff, but on a needs-only basis, or in response to requests by individual landholders. This additional control should be conducted on a large scale and be coordinated in time to ensure maximum success.

Strategy 2.1—Plan and coordinate rabbit management activities across all stakeholders at all levels (State, regional, local and landholder).

No.	Strategic Action	By Whom	By When
2.1.1	Ensure rabbit management is adequately and consistently addressed in all appropriate plans.	NR&M, LG, DDMRB	ongoing
2.1.2	Foster partnerships in rabbit control especially between NR&M, local government, Landcare and Catchment Management, State landholders and private landholders	All	ongoing
2.1.3	Maintain links between the NR&M and DDMRB	NR&M, DDMRB	ongoing
2.1.4	Continue the Rabbit Research and Control Group	NR&M	ongoing
2.1.5	Establish and maintain existing links with other pest and natural resource management agencies (eg. EPA/QPWS, CSIRO)	NR&M, DDMRB	ongoing

2.2 Stakeholder awareness and commitment

Desired outcome

Stakeholders are fully aware and committed to rabbit management.

Background

There is a growing tendency for landholders to tolerate low rabbit numbers and to rely solely on biological control. Additional control is only undertaken when there is a perceived increase in numbers, or when economic damage is obvious. A small-scale case study in 1995 compared the economic benefit derived from rabbit control inside and outside the DDMRB protected area and found that it resulted in a 10–20 per cent increase in wool production. In 1997, less than 30 per cent of landholders who identified a rabbit problem on their property had spent more than \$500 on rabbit control work in the previous two years. Such evaluations of rabbit control work should provide landholders with an adequate rationale and the incentive landholders to undertake a rabbit management program.

Achieving a change in attitudes towards rabbits is a key step in gaining greater community commitment to their management. The department has developed a Rabbit Extension Plan and a range of extension and education materials in order to achieve this attitudinal change.

The Rabbit Research and Control Advisory Group has a communication role, and there is potential to expand the email group used for internal communications between the NR&M research and operational staff to other agencies and bodies.

Forty-nine local governments currently list rabbits as an issue in their pest management plans; however, few local governments recognise the role that awareness plays in pest management. Those that have identified rabbits as an issue within their plans have also identified necessary actions, including:

- the need for educational materials on pest management (rabbits) in school libraries
- opportunities for local government media releases
- distribution of Pest Facts with rate notices
- displays at local shows
- provision of technical advice.

The DDMRB provides information to ratepayers every two years through the local government rates mail-out.

Considerable expertise and resources can be called upon for field days and joint natural resource management activities. The Easter Bilby campaign, the project to protect remnant native grasslands on the Darling Downs and the Save the Bilby program at Currawinya National Park, all represent opportunities for rabbit management activities to be linked to other campaigns.

Strategy 2.2—Increase the understanding and commitment of all stakeholders, including the community, to their roles and responsibilities for rabbit management.

No.	Strategic Action	By Who	By When
2.2.1	Maintain RABBITS email group	NR&M	ongoing
2.2.2	Increase awareness of: <ul style="list-style-type: none"> • the positive environmental and economic benefits of rabbit control (cost/benefit) • the cost of rabbit damage to landholders and relevant industries • the roles and responsibilities of all stakeholders. 	NR&M, DDMRB, LG, IND	Dec. 2002
2.2.3	Encourage participation in community groups	NR&M, DDMRB, LG	ongoing
2.2.4	Support and link with programs such as Easter Bilby	NR&M, DDMRB, LG	ongoing

2.3 Biological control

Desired outcome

Strategic use of biological control agents.

Background

Rabbit calicivirus disease and myxomatosis are the biological controls currently available for rabbit control.

The release of the myxoma virus in 1950 produced a dramatic reduction in the rabbit population and continues to suppress numbers over large areas. Before the introduction of RCD, the strategic release of laboratory strains of myxoma resulted in substantial reductions in rabbit numbers. The effectiveness of the myxoma virus in the field has decreased, but additional vectors (the European and Spanish flea) have increased its efficacy and appear to have compensated for the loss of field virulence. The Commonwealth Serum Laboratories has recently been privatised and the production of the myxoma inoculant has ceased, which reduces the availability of biological control agents.

RCD produced a dramatic reduction in wild rabbit populations and there has not been a need for its broadscale release since 1996. Although its virulence has not been monitored, there are no signs of RCD attenuating in the field.

RCD reduced Queensland rabbit populations by an average of 71 per cent, with local reductions in the drier pastoral areas (Muncoonie Lakes, 1996) as high as 86 per cent. The combined effect of myxomatosis and RCD is yet to be determined.

Myxomatosis is strategically used as a biocide to knock down local populations as needed, whereas RCD appears to cycle through the general population. Both RCD and myxomatosis are most effective when there are suitable vector populations present and when the rabbits have no, or low, antibodies to the diseases. To maximise the benefits from biocontrol agents in any future control program, regular monitoring for the presence of RCD and myxoma virus antibodies is warranted. In the future, major viral releases and the strategic use of the viruses should be on the basis of blood tests of rabbit populations.

More efficient and safe virus delivery systems that rely on the maintenance of technical expertise, the capacity to breed the vectors and the continual supply of the viruses are being investigated. Pet rabbits and farmed rabbits are susceptible to biological control agents. An effective vaccine is available for RCD, but the vaccine against myxomatosis is not available in Australia because it is made from live material from a closely related virus. Should resistance be transferred into the wild population, introduction of the myxomatosis vaccine could compromise future biological control. The development of Internet marketing provides an avenue for irresponsible introduction of the myxomatosis vaccine.

Collaboration between local, State, national and international biological control agencies can provide mutual benefits for overall rabbit management. To maintain low rabbit numbers, there must be commitment to integrated management programs. NR&M research staff are currently determining protocols for the integration of RCD with other control methods.

It is considered that flea production and introduction is an important component in programs for integrated rabbit control. However, due to an outbreak of mites on the breeding colony of fleas at the RWRC, their production has ceased.

Strategy 2.3—Utilise biological control agents strategically and as part of an integrated control program.

No.	Strategic Actions	By Who	By When
2.3.1	Continue use myxoma RCD	NR&M, DDMRB	ongoing
2.3.2	Investigate efficient/strategic use of RCD, including virus delivery systems	NR&M, DDMRB	ongoing
2.3.3	Coordinate biocontrol activities with agencies in other states	NR&M, DDMRB	ongoing
2.3.4	Provide ongoing training for staff involved in release of biocontrol agents	NR&M, DDMRB	ongoing
2.3.5	Maintain a capability to breed fleas	NR&M	ongoing
2.3.6	Ensure AQIS/Australia Post are alerted to the potential introduction of vaccines through internet marketing and procedures in place to take action against introductions	NR&M	June 2002

2.4 Information collection and collation

Desired outcome

Up-to-date information is used as a basis for developing best practice rabbit management.

Background

Despite extensive studies throughout Australia of the biology and ecology of the rabbit, the impacts identified earlier cannot be readily quantified. In order to justify and direct rabbit control work, a clear understanding of the interactions between rabbits, the environment, community and industry is required. The modelling of existing biological information would improve the ability to forecast changes to rabbit populations and provide information that can be applied to control strategies.

Rabbit population monitoring no longer plays a major part in control work; however, it is still needed to evaluate the impact of rabbits on the environment and on production. A range of parameters needs to be monitored to develop models that describe or predict impacts. Research is to be focused on providing management outcomes and recommendations.

Rabbit distribution is well-documented and can be predicted. Precepts are levied annually on local governments to provide funding for the DDMRB, and part-funding for NR&M research and control activities. However, a population density database would help to support local government precept calculation and direct extension activities. The precept is used as a source of funding for rabbit management that reflects relative rabbit impacts and populations. Rabbit control technologies are yet to be developed to cover all situations. The location of warrens, the scale of the infestation and the proximity to dwellings and human settlement create difficulties or restrictions on the use of many control practices. Additional control technologies are needed particularly for rabbit control in urban areas.

Rabbit research is planned and budgeted for annually, but longer-term planning may enable access to opportunistic external funding sources.

Strategy 2.4—Increase understanding of the biology, distribution, impacts and control of rabbits.

No.	Strategic Actions	By Whom	By When
2.4.1	Develop a year research plan including: <ul style="list-style-type: none"> • review and align research priorities to this strategy • develop project plans for external funding 	NR&M, UNI	June 2002 ongoing
2.4.2	Quantify rabbit impacts including: <ul style="list-style-type: none"> • indicators which partition the causes of degradation • research the economic and environmental relationship rabbit density • compare inside and outside the DDMRB • cost benefit assessment for specific industries and land uses at state, regional and property levels 	NR&M	June 2004
2.4.3	Develop alternative rabbit control technologies for use in areas that are difficult to control (especially urban areas)	NR&M	ongoing
2.4.4	Maintain a population density database	NR&M	ongoing
2.4.5	Communicate operational issues and difficulties to the research program	NR&M, LG, DDMRB	ongoing
2.4.6	Revise and republish the Rabbit Pest Status Assessment	NR&M	June 2004
2.4.7	Develop management practices to follow-up or integrate with		ongoing
2.4.8	Maintain a watching brief for new rabbit control technologies	NR&M	ongoing

2.5 Best practice management

Desired outcome

Best practice rabbit management is implemented.

Background

Best practice management involves the safe and efficient application of the most appropriate rabbit control techniques in a safe and efficient manner, as part of day-to-day land management. This assumes there is adequate information available from which to choose and apply the best possible technique or range of techniques.

There are many occupational health and safety issues associated with aspects of rabbit control and some situations where certain control methods are not practical or publicly acceptable. Community pressure may lead to further restrictions or limitations on the use of some techniques.

Legislation also places restrictions on the conduct of pest animal control for environmental, health and safety reasons. It is becoming increasingly important for users of agricultural and veterinary chemicals or heavy equipment to appreciate the relevance and impact of these various pieces of legislation. Consequently, codes of conduct and best practice manuals are being prepared by a number of industries to give advice and direction to field operators and their supervisors on appropriate conduct.

Some aspects of rabbit control techniques are covered in the department’s publications; however, there is no documentation drawing together the principles and methods of best practice management.

Strategy 2.5—Foster the use of best practice management by all stakeholders.

No	Strategic Actions	By Whom	By When
2.5.1	Complete, implement and review the Rabbit Extension Strategy	NR&M	June 2002
2.5.2	Determine, collate and distribute information on best practice rabbit management for the range of rural and urban circumstances	NR&M	ongoing
2.5.3	Incorporate rabbit best practice management in: <ul style="list-style-type: none">• appropriate training manuals and industry codes of conduct• National Competency Standards for vertebrate pest control	NR&M	ongoing
2.5.4	Promote safe, effective use of each control technology or combination of technologies	NR&M	ongoing
2.5.5	Integrate rabbit control as a component of good production and land management in extension programs	NR&M, CG, DDMRB, IND	ongoing
2.5.6	Incorporate best practice rabbit management recommendations into <i>Futureprofit</i> program	NR&M	June 2002
2.5.7	Document the effectiveness of the DDMRB and its activities	DDMRB, NR&M, LG	June 2002
2.5.8	Provide compliance support where necessary	NR&M, LG, DDMRB,	ongoing

2.6 Management resources

Desired outcome

Adequate resources for rabbit management are available.

Background

Funding for rabbit management is currently derived from State and local governments and, for some specific project work, from external funding agencies. Within the DDMRB protected area, funds for rabbit control work are collected via a precept from the 18 local governments that derive a direct benefit from it. Precepts for rabbit research and control work are also collected from local governments from outside the DDMRB protected area.

The introduction of RCD created a range of unforeseen opportunities for integrated rabbit management. To maximise the benefits, funding and staff are required to undertake additional follow-up control, research and monitoring.

Land-use changes throughout south-east Queensland and the eastern Darling Downs have resulted in an increase in the demand for rabbit control services. Some low priority control activities that have become economically important demand more intensive control and extension services. As resources are too limited to be able to offer one-to-one support, the formation of informal landholder groups is encouraged.

Landholders are the major direct beneficiary of rabbit control and should, therefore, play a vital role in the provision of funds, labour and equipment. Groups of landholders with common issues to address are able to share resources and experiences, and provide the necessary day-to-day support for control work. The department has equipment (bait layers, fumigators, rippers) that groups or individuals can borrow free of charge.

Increasingly, Land Protection Officers and DDMRB Officers are being called upon to confiscate pet rabbits, particularly in the metropolitan regions. It is predominantly local governments that refer complaints or infringements to these officers for action, even though—outside of the DDMRB area—local governments are responsible for dealing with such issues.

While many urban jurisdictions have large tracts of land with above-ground habitat supporting rabbits, only some urban local government area pest management plans adequately focus on the issue of confiscation of illegal pets. These plans should focus on managing rabbits in these situations. Some local governments have overlooked rabbits and other pest animal management within their local government area pest management plans.

Strategy 2.6—Attract and use resources for rabbit management effectively and efficiently.

No.	Strategic Action	By Whom	By When
2.6.1	Maintain local government support for rabbit management including confiscation of pet rabbits	NR&M, LH, DDMRB, LG	ongoing
2.6.2	Review DDMRB precept based on potential impacts and service required	NR&M	June 2003
2.6.3	Access external funds e.g. demonstrate link between rabbits and environmental issues	NR&M, CG, LH, IND	ongoing
2.6.4	Foster partnerships in control and extension programs	All	ongoing
2.6.5	Maintain specialist rabbit research and extension staff	NR&M	ongoing
2.6.6	Train and resource all authorised officers (including local government)	NR&M, LG, DDMRB	ongoing
2.6.7	Identify land-use changes that lead to more requests for service provision	NR&M, LG, DDMRB	ongoing
2.6.8	Prepare a plant and equipment replacement and purchase plan for NR&M hire equipment	NR&M	June 2002
2.6.9	Develop an agreement system for equipment hire that protects all parties, i.e. determine responsibilities and ensure operator competency	NR&M	June 2002

3. Opportunities and constraints

Opportunities that may arise from the successful implementation of the Rabbit Management Strategy include:

- increasing knowledge of, and commitment to, rabbit control
- increasing success of integrated management
- reducing the size and range of rabbit populations
- keep maintaining the DDMRB area free of rabbits
- increasing knowledge of rabbit biology and ecology.

Constraints on the successful implementation of the Rabbit Management Strategy include:

- diminishing government resources
- changing viability of rural industries
- landholder and local government tolerance of low rabbit numbers
- apathy towards rabbit control
- lack of ownership of the rabbit problem
- heavy reliance on biological controls in some areas
- competing stakeholder priorities/commitments (including those of the State Government)
- lack of follow-up control by landholders

- lack of control options that are 100 per cent effective
- further reductions in rural and public sector workforces
- community concern over pesticide use
- animal welfare and non-target impact issues.

4. Responsibilities of stakeholders

4.1 Landholders

The *Rural Lands Protection Act 1985* places responsibility for the control of rabbits on the landholder.

4.2 Local governments

To ensure that the social, economic and environmental impacts of rabbits are kept to a minimum throughout the local government area by:

- administering and enforcing the provisions of the *Rural Land Protection Act 1985*
- ensuring that Local Government Area Pest Management Plans include strategic rabbit control activities
- liaising with community groups, NR&M and the DDMRB (as appropriate) community groups to undertake strategic rabbit control
- ensuring that strategic rabbit control is undertaken on all lands under Councils council control, including stock routes, roadsides and town commons
- ensuring that all private landholders engage in necessary strategic rabbit control activities;
- confiscating pet rabbits
- contributing financially through the precept system to the provision of services (rabbit control and research) by NR&M and DDMRB for NR&M and DDMRB services, (rabbit control and research); and
- providing members for the DDMRB, where required.

4.3 Darling Downs–Moreton Rabbit Board

To ensure that land in the district is kept free of rabbits by:

- constructing the rabbit fence and maintaining it in a rabbit-proof condition
- eradicating rabbits in the district
- evaluating and reviewing the DDMRB Strategic Plan.

4.4 Department of Natural Resources and Mines

To ensure that the social, economic and environmental impacts of rabbits are kept to a minimum throughout the State by:

- coordinating the development of the Queensland Rabbit Management Strategy and contributing to its implementation;
- continuing to develop efficient, effective and appropriate control techniques
- providing extension and education services to both rural and urban communities on the impact of rabbits on the impacts of rabbits;
- facilitating and coordinating integrated rabbit management in areas of high economic and environmental impact outside the rabbit fence
- monitoring rabbit populations and the effectiveness of management programs
- maintaining human resources and skills in rabbit control within the department, and providing training to staff from other agencies

- liaising with community and industry groups, local governments and the DDMRB to coordinate local rabbit control activities
- collecting precepts for the operational budget of the DDMRB, the services contribution, and rabbit control and research
- providing a member for the DDMRB
- coordinating and supporting the Rabbit Research and Control Advisory Group.

4.5 Other State Government departments

To ensure rabbit control is undertaken on all State-managed lands.

4.6 Rabbit Research and Control Advisory Group

To provide strategic guidance for the effective management of rabbits in Queensland through the implementation, monitoring, evaluation and review of this strategy. The group will report to the Rural Lands Protection and Darling Downs–Moreton Rabbit boards.

Group membership is drawn from the Rural Lands Protection Board, Darling Downs–Moreton Rabbit Board, local government, industry and the Department of Natural Resources and Mines.

5. Management arrangements

The Rabbit Research and Control Advisory Group will manage the implementation, monitoring, evaluation and review of the strategy, all aspects of which will be subject to a five-yearly review workshop—to be undertaken next in 2006 and coordinated by NR&M to be next undertaken in 2006. Output from the workshop will be a revised strategy for the next five-year period, incorporating any amendments and additions.

Strategic actions will be monitored and evaluated as they are developed or implemented through the:

- Rabbit Research and Control Advisory Group
- local government area pest management plans
- Rural Lands Protection Board reports
- Darling Downs–Moreton Rabbit Board meetings.

References

Berman, D., Robertshaw, J. and Gould, W. 1998, *Rabbits in Queensland: Where have they been, what have they done and where are they now?*, proceedings of the 11th Australian Vertebrate Pest Conference, Bunbury.

Biodiversity Group Anon 1999, *Threat Abatement Plan for Competition and Land Degradation by Feral Rabbits* Biodiversity Group, Environment Australia, Canberra.

Bureau of Rural Sciences 1999, *Rabbit Calicivirus Disease Program Reports 1-5*, reports on research conducted by participants of the Rabbit Calicivirus Disease Monitoring and Surveillance Program and Epidemiology Research Program, prepared for the RECD Management Group, Canberra.

Williams, K., Parer, I., Coman, B., Burley, J. and Braysher M. 1995, *Managing Vertebrate Pests: Rabbits*, Bureau of Resource Sciences/CSIRO Division of Wildlife and Ecology, Australian Government Publishing Service, Canberra.

Supplementary information

List of Acronyms

AQIS	Australian Quarantine and Inspection Service
CG	Community Group
CSIRO	Commonwealth Scientific & Industrial Research Organisation
DDMRB	Darling Downs-Moreton Rabbit Board
NR&M	Department of Natural Resources and Mines
EPA	Environmental Protection Agency
IND	Industry Organisation
LG	Local Government
LH	Landholder
QPWS	Queensland Parks and Wildlife Service
RCD	Rabbit Calicivirus Disease
RWPARC	Robert Wicks Pest Animal Research Centre
SCARM	Standing Committee on Agricultural and Resource Management

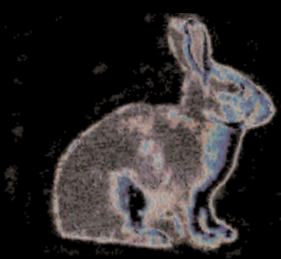
Relevant legislation

Environmental Protection Act 1994

Rural Lands Protection Act 1985

Local Government Act 1993

Health (Drugs and Poisons) Regulations 1996



queensland pest animal strategies

Wild dogs

Rabbits

Locusts

Mice

