PESTSMART

Glovebox Guide for Managing Rabbits

Annette Brown

An Invasive Animals Cooperative Research Centre Project

CENTRE FOR INVASIVE SPECIES SOLUTIONS

NSW GOVERNMENT Department of Primary Industries

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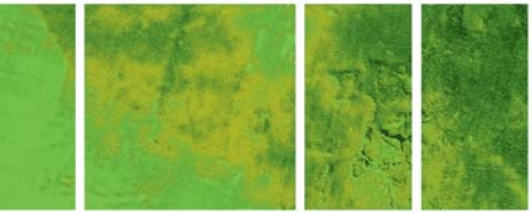

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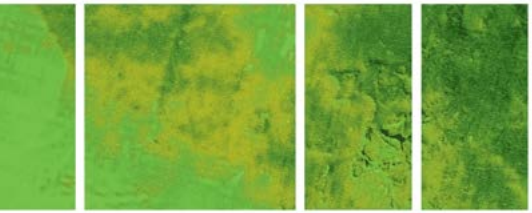


Contents

1. About this guide

This glovebox guide is part of the PestSmart Toolkit for Rabbits, produced by the Invasive Animals CRC. It is designed to provide current information on best practice rabbit management for land managers, pest animal officers and others involved in the management of rabbits. This includes general information on:

- rabbit biology and impacts
- identifying damage and costs
- management tools and strategies
- policy and legislation.

The advice provided in this publication is intended as a source of information only. Always read the label before using any of the products mentioned. It is important that the information provided is adapted by each individual in accordance with their own environmental, financial and social circumstances.

For further information about rabbits and other pest animals in Australia, visit the website: www.pestsmart.org.au/pestsmart

Wild European rabbit
Image: Neil Schultz

2. Rabbit ecology and impacts

Taxonomic name:
Oryctolagus cuniculus

Common name:
European rabbit (wild)

Typical wild Eurpoean rabbits. Image: Chris Cox

Ecology

Appearance

Wild European rabbits commonly have grey-brown back fur and a white-grey belly, but pelt colour can vary from sandy light brown to ginger, black and occasionally, white. More colour variation generally indicates a higher population density, as the occurrence of genetic traits (eg. albino characteristics) increases in proportion to the size of the population. They are characterised by their long ears, long hind legs, short fluffy tail and feet that are well-furred beneath, with large straight claws. Males and females are similar in size and appearance. Adults weigh between 1–2.25 kg
and range in length from 35–45 cm.

Reproduction

Wild rabbits can begin breeding at four months old and may produce five or more litters in a year, with up to five young per litter. Rabbits have a gestation time of 28-30 days. The main breeding season typically follows good rainfall during late winter/spring and the early growth of high-protein plants. However, they can breed at any time of year when food is in good supply. During this time, wild rabbits form territorial groups containing 1–3 males and 7–10 females, led by a dominant pair.

Diet and behaviour

Rabbits are herbivores that eat a wide variety of plants, including crops, roots, pastures, young trees and vines. They prefer soft, short and succulent plants such as grasses and herbs. They

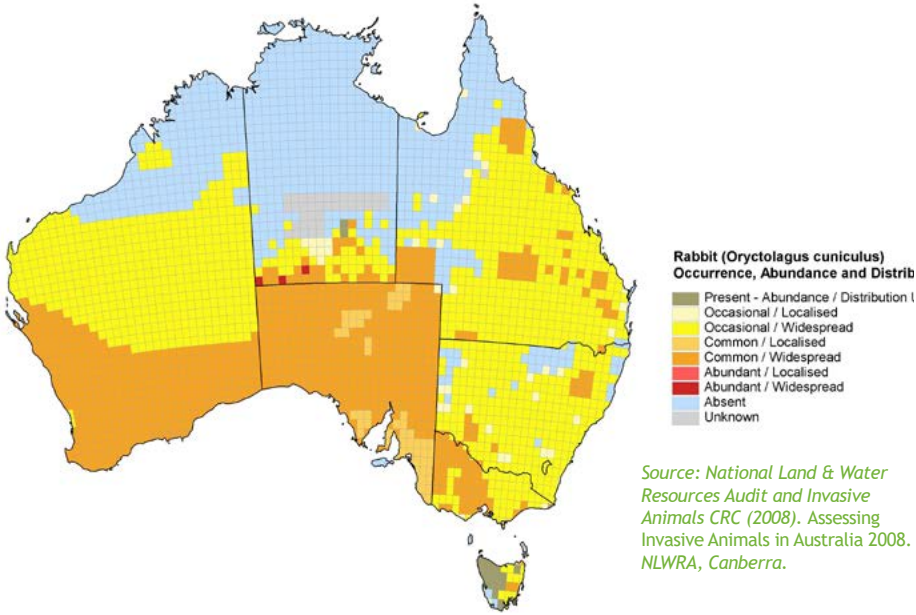
can graze plants to ground level and may consume up to one-third of their own body weight daily, although their average daily intake is between 100–150 g. In arid areas rabbits need access to water, but elsewhere they get enough moisture from their food.

Rabbits construct large warrens up to 3 m deep and 45 m long. Warren complexes are generally larger in more open country. Warrens provide cover and protection from predators and extreme temperatures, and allow rabbits to live in open grasslands, grazed pasture and arid land.

Destruction of warrens will greatly reduce the local rabbit population. But where there is abundant surface cover, rabbits may live above the ground.

Distribution

Rabbits are widely distributed in Australia and occur in a variety of habitats, including urban and coastal areas, agricultural areas, deserts, natural forests, planted forests, grass and rangelands, disturbed habitats and shrublands. They prefer areas of low vegetation; well-drained, deep sandy soils where they can build warrens; and refuge such as scrub, blackberry bushes or fallen logs.



Source: National Land & Water Resources Audit and Invasive Animals CRC (2008). Assessing Invasive Animals in Australia 2008. *NLWRA, Canberra.*

Impacts

Economic

Rabbits cost Australian agriculture $206 million in production losses each year (Gong 2009). Rabbits graze on native and introduced vegetation, crops and pastures. Rabbit grazing can prevent regeneration of seedlings and reduce crop yields, as well as increase competition for feed with livestock. This may affect the carrying capacity of livestock on a property, resulting in lower weight gain, lower wool production, reduced births and higher mortality during drought. In general, about 9-12 rabbits/ha is equivalent to one DSE (dry sheep equivalent).

Environmental

Rabbits directly compete with native wildlife for food and shelter. There are at least 156 threatened species of native plants and animals that may be adversely affected by this competition and the land degradation caused by rabbits (which is listed as a key threatening process under Commonwealth legislation). They also impact on native plants by ringbarking, grazing and browsing, and preventing revegetation of seedlings. Their digging and browsing leads to a loss of vegetation cover which can result in slope instability and soil erosion.

Warrens provide cover and allow rabbits to live in open grasslands, grazed pasture and arid land. Image: Brian Lukins

Social

Harvesting wild rabbits can benefit regional employment and provides a recreational opportunity for local shooting clubs and hunters. However, rabbits can also damage lawns, gardens, golf courses, sportsgrounds, and regional parkland reserves, and may undermine buildings, garages and sheds. Indirect impacts include disease transmission, which can present human and animal health concerns – particularly where rabbits are farmed or kept as pets. Vaccinations against RHDV are available from vets for domestic breeds only.

Further information

PestSmart Factsheet RABFS1: ***European rabbit***, Invasive Animals CRC (2011)

www.pestsmart.org.au/pestsmart-factsheet-european-rabbit/

PestSmart Factsheet RABFS3: ***Economic and environmental impacts of rabbits in Australia***, Invasive Animals CRC (2012)

www.pestsmart.org.au/pestsmart-factsheet-economic-and-environmental-impacts-of-rabbits-in-australia/

3. Identifying rabbits and their impacts

Large populations of rabbits are relatively easy to detect as the damage they cause is usually widespread and highly visible. However the damage caused by low density rabbit populations can be much harder to identify – and may be more serious (eg preventing regeneration of an endanagered plant species). Rabbit numbers, and changes in their impact, can vary dramatically in a short period of time. Without ongoing monitoring and control, these changes can go unnoticed and the problem can get out of hand, resulting in higher management costs.

Monitoring rabbits

Rabbit density is a practical indicator of a potential rabbit problem and can be measured easily, quickly and cheaply. Rabbit density can be estimated directly by counting rabbits or indirectly by counting warrens, active warren entrances or signs of rabbits (eg tracks, dung).

Instructions on how to rapidly assess a rabbit problem using a simple, visual-based technique can be found in the booklet *Rabbits: a threat to conservation and natural resource management* by Brian Cooke, Steve McPhee and Quentin Hart. Detailed descriptions of other monitoring methods can be found in the books *Monitoring techniques for vertebrate pests: rabbits* and *Managing vertebrate pests: rabbits*. These are available for download from www.pestsmart.org.au / pestsmart/rabbits/

Is it a rabbit, hare or bilby?

In some situations, it may be difficult to identify what animal you are dealing with, particularly if you are using indirect monitoring methods (see footprints; Figure 1). There are animals of similar size and appearance to rabbits, such as hares and bilbies. Hares are an introduced species from the same genetic family as rabbits (Leporidae). They live in similar habitat types but are usually solitary, and do not build large warrens like rabbits. Greater bilbies are small, protected native animals that have similar sized tracks to rabbits, and also live in warrens.

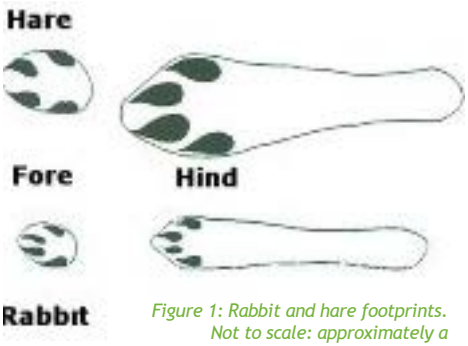


Figure 1: Rabbit and hare footprints. Not to scale: approximately a quarter of actual size (Scale 1:4)

Other key differences between the three species are:

- hares are noticeably larger than rabbits, with a head and body length of 55 cm while rabbits are about 40 cm in length
- a hare can weigh twice as much as a rabbit
- a hare's hind legs are relatively larger than a rabbit's
- hares can run faster than rabbits
- hares have relatively longer ears than rabbits, with distinct black tips
- rabbit warrens often have more entrances than bilby burrows, and entrances are usually larger
- rabbit diggings are generally shallower than bilby diggings, and tend to be long and narrow.

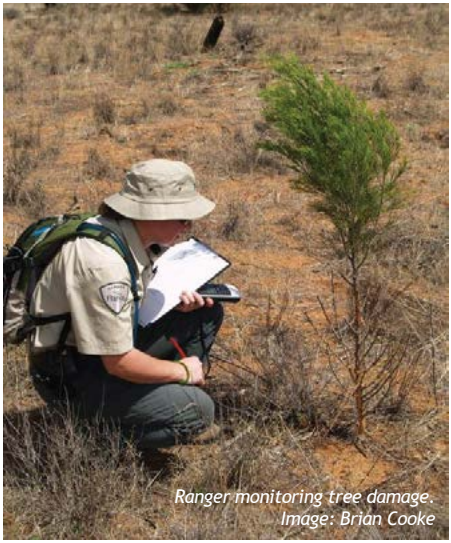
Greater bilby
Image: SEWPaC

European brown hare

Eurpoean rabbit
Image: Neil Schultz

Measuring damage and costs

Simple damage assessments can also be used to identify a serious rabbit problem. These include visual assessment of crops eaten out 50 m from warrens, distinct 'browse-lines' 500 mm above the ground on shrubs and foliage within reach of the rabbits, increased presence and spread of invasive weeds, and scratching and soil disturbance. Quantifying rabbit impacts using other measures can be difficult, costly and time-consuming, and are generally not practical for many land managers. When assessing suspected rabbit damage to vegetation, crops or pastures, it is important to remember that other animals such as grasshoppers, hares and wallabies might cause similar damage.



Ranger monitoring tree damage. Image: Brian Cooke

Further information

PestSmart Factsheet RABFS3: Economic and environmental impacts of rabbits in Australia, Invasive Animals CRC (2012)

www.pestsmart.org.au/pestsmart-factsheet-economic-and-environmental-impacts-of-rabbits-in-australia/

4. Best practice rabbit management: tools and strategies

Best practice rabbit management is more than just controlling rabbits. It requires a structured and consistent strategic plan of action using the range of tools available to achieve long-term and cost-effective outcomes.

Control tools

There are a range of physical, chemical and biological tools to control rabbits.

A combination of these tools is essential for effective rabbit control, as no single technique will provide adequate long-term results.

Poison baiting

Poison baits are made by mixing bait material (chopped carrot, oat grains or pellets) with poison, which is then laid along a trail or spread through rabbit-infested areas. Commonly used poisons include sodium monofluoroacetate (compound 1080) and pindone. Poison baiting is an effective and relatively inexpensive way to reduce rabbit populations before applying other techniques. Poison and chemical use is managed by state and territory authorities, and purchase, handling and use restrictions usually apply. Check with your pest local authority before starting a poison baiting program and always read the product label before use.

Warren ripping and harbour removal

Warren ripping is the total destruction of rabbit warrens using tools, heavy machinery (eg bulldozer) or explosives. In areas where rabbits build and rely on warrens for shelter, ripping warrens with heavy machinery is a highly effective way of removing rabbits and minimising their impacts over the long term. It is also recommended that any nearby above-ground surface harbour (shelter), such as logs, weeds — especially blackberries — and disused building materials, is removed.

Bulldozer ripping warrens
Image: SAMDBNRM

Exclusion fencing

Rabbit-proof fencing can provide long-term protection for crops, pastures, and native bush remnants by completely preventing rabbits from entering the protected area. Although fences are expensive to construct and require ongoing maintenance, if all rabbits are removed from within the fenced area (using complementary techniques) and breaches are promptly repaired, then no further control action may be needed.

Exclusion fending between native bush remnant and canola crop in Western Australia
Image: S Wheeler

Fumigation

Fumigation involves the use of toxic gas which is either forced into a rabbit warren under pressure (pressure fumigation) or generated inside the warren and left to diffuse throughout the burrow (diffusion fumigation), leading to the death of rabbits inside the warren. Fumigation is an effective technique to use in areas where it is not possible or desirable to rip or use poison bait; or for treating small, isolated infestations, or 'missed' warrens that are discovered in an area after baiting and ripping. A new portable fumigator device that uses carbon monoxide is currently being developed by the Invasive Animals CRC.

Shooting, trapping and ferreting

These techniques require a high-skill level and may be useful when rabbit numbers are already low or in situations where other techniques cannot be used. However they are labour-intensive and generally not an effective way of controlling rabbit populations.

Cage trap
Image: Brian Lukins

Aversion techniques

There are a range of tools and devices available that are designed to deter rabbits from a small area (eg ornamental garden or vegetable patch). These typically include liquid spray repellents, specialised sounding alarms or flashing lights.

Biological control

Biological control is the deliberate use of one organism (eg virus, predator) to regulate the population size of a pest organism. Although there are introduced and native rabbit predators (eg foxes, cats and eagles) in Australia, these animals can cause additional problems in the landscape, and the level of predation is generally not enough to control rabbit numbers (except where rabbits occur at low densities).

Currently there are two biological control agents used in Australia: myxoma virus (which causes myxomatosis) and rabbit haemorrhagic disease virus (RHDV, previously known as Calicivirus). These viruses were introduced in past decades and now occur naturally in many wild rabbit populations.

Myxoma virus is no longer produced commercially but RHDV is still manufactured and can be deliberately released in some areas (subject to state and territory legislation). A new freeze-dried RHDV product is also expected to be available in the near future. However these viruses cannot be solely relied upon to effectively control rabbits because outbreaks are too unpredictable in frequency and virulence (strength).

RHDV vial
Image: John Kovaliski

Other factors to consider when using biological control are extreme climates or weather events, and the presence of juvenile rabbits.

The most effective approach uses a combination of control techniques applied in a strategic manner.

Management strategies

Rabbit management in Australia aims to reduce the damage caused by rabbits by decreasing the population to a level where their impacts are minimal and numbers cannot quickly build up. As each situation is different, it is important to consider what type of rabbit management approach is appropriate. The four main options are:

1. Take no action

Although this option means there is no cost outlay for rabbit control, it is likely to result in higher costs in lost production and ongoing damage to the environment. However it may be a viable option if the damage is not significant enough to warrant control, or where actions are not likely to be cost-effective.

2. Reactive management

Responding to a rabbit infestation when numbers are high and damage is obvious or unacceptable is likely to result in high costs for minimal, short-term benefits. Control applied at this time is likely to be less effective and more temporary than control when rabbit numbers are low.

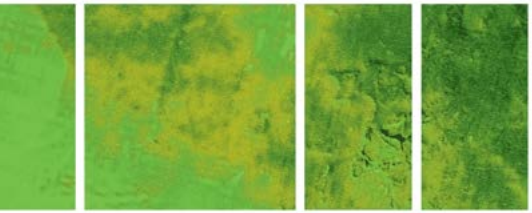
3. Adaptive management (planned, ongoing control)

This option is likely to produce positive, long-term outcomes and maximum benefits, as control is applied when rabbit populations are small and most vulnerable (eg during the hot, dry season). Initial costs may be high (including equipment, labour), and an ongoing commitment is necessary to keep rabbit numbers low.

4. Local eradication

A broadscale, coordinated attack to remove all rabbits from an area is a feasible, long-term management option if there is a concerted effort between neighbouring stakeholders. However effective landscape-scale control is only possible if all rabbit-prone areas are treated. Costs may be high initially, but ongoing and future costs are substantially reduced. Participating landholders need to monitor the area over time to ensure there is no reinvasion, however benefits are high given that no further action should be necessary.

Repetitive poisoning year after year is not effective for landscape-scale rabbit control



Adaptive management

In most cases, the best strategy is to develop an adaptive step-by-step plan which maximises the effect of control efforts and seeks to reduce the detrimental effects of rabbits. The typical planning process broadly involves: defining the problem, developing a plan of action with achievable and measureable goals (eg set timeframe), putting the plan into action, monitoring progress, evaluating the plan, and making adjustments and improvements as required along the way.

A rabbit management plan also needs to take into account other social, economic and environmental factors such as the skill level of those involved, key stakeholders (including neighbours), costs and budget, and other native and pest animals present.

Rabbit management should not be an isolated activity. Rabbits share complex relationships with other animals and plants (both native and introduced), so rabbit control should be just one aspect of the overall management of production and natural resource systems. Other herbivores, including feral goats and kangaroos, can contribute to overgrazing and land degradation problems. It is necessary to determine the impact of each herbivore so that appropriate action can be taken in conjunction with rabbit control.

It might also be useful to plan rabbit control in conjunction with other pest control activities. As rabbits are a major food source for foxes, feral cats and other predators, controlling rabbits without also controlling foxes might lead to an increase in native animal predation. When rabbit numbers are low, fox numbers are also generally low. Take into account the whole system when planning your rabbit control program, as this can increase the effectiveness of control, and lead to better production and conservation outcomes.

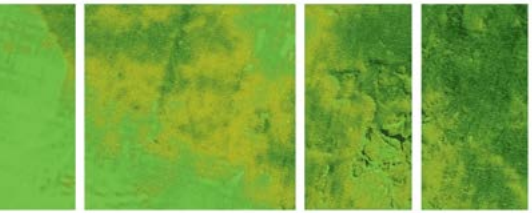
A rabbit control program should be regularly evaluated and adapted as costs and conditions change. Regular and effective monitoring of rabbit numbers is crucial to ensure the population does not build up again. Control is not effective if rabbit numbers have to be continually reduced to manageable levels. New information discovered along the way or a change in circumstances (eg financial crisis, natural disaster) may call for changes to be made to the program. Also, if the goals of the program are not met in a suitable timeframe, then it may be necessary to modify the approach or seek further assistance from your local pest management authorities.

Progress in rabbit control must be monitored to ensure that objectives are met, and to allow management options to be adapted to changing circumstances.

Trapped rabbit
Image: Karen Joynes

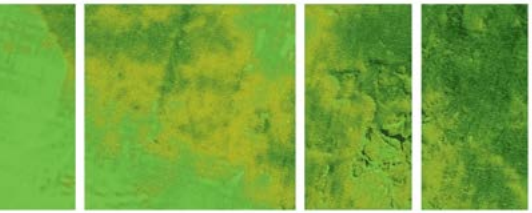
Choosing the right control tools

Rabbit control needs to be appropriate to the number of rabbits, the level of damage, and the size and location of the affected area (see *Monitoring techniques for vertebrate pests: rabbits*). Each control method has its advantages and disadvantages: some techniques should only be used as the last remaining option while others may not be practical for every situation. Some control methods may not be permissible in all areas. Specialised techniques (eg shooting) are best used in conjunction with more commonly used methods (eg poison baiting). Important factors to consider when choosing control methods are: cost-effectiveness, efficacy, skills and equipment available, and time of year (including the rabbit breeding season and high rainfall periods). Climate, terrain and land use (eg agricultural production, endangered ecological community) may also influence the type of control used. It is important to use local knowledge and seek advice from local pest control authorities when deciding on the best techniques to use. The table below shows the major benefits and precautions of some rabbit control options.



Control technique	When to use	Benefits	Precautions
1080 baiting	• late summer during the non-breeding season • when there is little other feed available	• most cost-effective control method • large areas are treated quickly • can be applied on-ground or from the air • many native animals have a high tolerance of 1080	• no effective antidote • humans, livestock, pets (cats/dogs), native animals can be at risk • restrictions on its use (eg cannot be used in built-up areas or close to dwellings) • approval process varies across states/territories • specific skills/qualifications needed eg current 1080 handling certificate • uneaten baits need to be buried • loses toxicity on exposure to rain • dry weather required • needs to be followed up with other methods
Pindone baiting	• late summer during the non-breeding season • before seeding, planting or regeneration activities • when alternative feed is least available	• moderate cost • less hazardous to domestic animals because antidote is available	• must not be used in presence of some native animals (toxic to kangaroos, birds of prey and bandicoots) • only useful in built-up areas close to dwellings • relatively expensive compared to 1080
RHDV suspension (via bait or injection) or freeze-dried RHDV *(Pending APVMA approval, freeze-dried RHDV is expected to be available in 2013)*	• during autumn when fewer young rabbits are present (to maximise results)	• works well in low rainfall areas • target specific • can be used in urban areas or where the virus has not spread naturally • best used in areas where it will be supported by other control methods	• variable effectiveness • cannot be used in extreme weather or when juvenile rabbits are present • needs large rabbit numbers for it to successfully spread • must be followed up with another control method to be effective • only authorised persons can prepare and use RHDV on bait (contact local pest authorities for more information)

Control technique	When to use	Benefits	Precautions
Warren ripping	• summer for sandy soils • winter for clay soils • before planting/ seeding • after initial reduction from poisoning or disease • after breeding when young are dispersing (Sept - Oct)	• cost-effective and long-lasting control • can be carried out by a contractor • minimal ongoing control required after ripping	• appropriate equipment is needed: usually heavy machinery with multiple ripping tines and appropriate track type for terrain • skilled operator required • labour-intensive: need to map warrens before ripping • high initial cost • need to take care not to damage sensitive areas or promote erosion
Explosives (warren blasting)		• long term control • can destroy deep warrens effectively • useful for warrens among rocks and boulders or hard-to-access areas	• operators must be trained and licensed • relatively expensive, compared to ripping • labour intensive
Harbour destruction/ removal		• best used in areas where it will be supported by other control methods	• labour intensive • may not be practical or feasible to remove all harbour
Exclusion fencing		• humane alternative • good for small areas or high value crop/ pastures eg market garden • excludes rabbits from a certain area	• expensive (materials plus labour costs) • costs vary with terrain/soil type/size of area • must be built to a minimum standard • fence requires regular maintenance • can prevent movement of other animals • rabbits need to be removed from within fenced area using other techniques • does not reduce rabbit numbers • impractical for broadscale application



Control technique	When to use	Benefits	Precautions
Fumigation **1) pressure fumigation (gases generated outside and pumped into the warren)** **2) diffusion fumigation (gases generated and diffused inside the warren)**	• during breeding season • after poisoning or warren ripping • when the soil is damp	• good option in sensitive areas • can be carried out by a contractor • useful in areas where ripping is not practical • can be used near urban areas • relatively target-specific • dogs can be used to drive rabbits into their warrens • most effective as a follow-up technique	• skilled operator required (eg current chemical handling certificate) • must strictly follow poison label and take safety precautions (eg do not touch tablets with bare hands, avoid breathing the fumes, work upwind of gas) • labour intensive • expensive • only small areas treated at a time • some animal welfare concerns • does not stop remaining rabbits reopening warrens
Shooting		• humane and target-specific if used correctly	• should only be used as a follow-up technique • can only be used over limited areas • does not give long term control
Trapping		• can be used as a follow-up technique • non-target animals can be released • can be effective in small, targeted areas where other techniques are not practical or permitted (eg vegie patch, ornamental garden)	• skill required • risk of catching non-target animals • not cost-effective • not effective for reducing rabbit numbers • must meet animal welfare and ethics standards (eg steel jaw traps are illegal in most states)

Further information

PestSmart Factsheet:

Poison baiting for rabbit control (RABFS8). Invasive Animals CRC (2012).

www.pestsmart.org.au/pestsmart-poison-baiting-for-rabbit-control/

PestSmart Factsheet:

Warren and harbour destruction (RABFS6). Invasive Animals CRC (2012).

www.pestsmart.org.au/pestsmart-warren-and-harbour-destruction/

PestSmart Case Study:

Warren ripping on Thackaringa Station (RABCS3). Invasive Animals CRC (2011).

www.pestsmart.org.au/warren-ripping-on-thackaringa-station/

PestSmart Factsheet:

Using RHDV for rabbit control (RABFS4). Invasive Animals CRC (2012).

www.pestsmart.org.au/pestsmart-factsheet-using-rhdv-for-rabbit-control/

PestSmart Factsheet:

RHD Boost – Enhancing RHDV effectiveness (RABFS5). Invasive Animals CRC (2012).

www.pestsmart.org.au/pestsmart-rhd-boost/

PestSmart Case Study:

Bounceback — rabbit control in the Flinders Ranges (RABCS2). Invasive Animals CRC (2011).

www.pestsmart.org.au/bounceback-rabbit-control-in-the-flinders-ranges/

PestSmart Case Study:

Effective rabbit control in pine-buloke woodlands (RABCS1). Invasive Animals CRC (2012).

www.pestsmart.org.au/rabbit-control-in-pine-buloke-woodlands/

Monitoring techniques for vertebrate pests: Rabbits. NSW DPI (2007).

www.pestsmart.org.au/monitoring-techniques-for-vertebrate-pests-rabbits/

5. Rabbit action plan!

Three steps to effective rabbit control

Effective rabbit control involves three essential steps. Long-lasting, broadscale control of rabbits is possible – by applying a well-planned and timely regime of poisoning, warren ripping and fumigation. Rabbit population reduction can be more effective following a drought or disease event after rabbits have been reduced by drought or disease.

Rabbit population reduction can be more effective following a drought or disease event

Each technique does a slightly different job: baiting kills rabbits and reduces the overall population; ripping warrens where possible and destroying all the places where rabbits live reduces the rabbits' ability to survive in an area; fumigation is used to kill any remaining rabbits that might be living in warrens that are inaccessible to ripping or that were 'missed' during ripping (eg not clearly marked or not identified during the pre-ripping search). Sometimes rabbits can also dig back in and 're-open' warrens if ripping is not done thoroughly (deep or wide enough).

Step 1: population knockdown

The first step is to reduce the rabbit population from medium – high densities down to a manageable level. This is usually done by chemical control (ie a poison baiting program) during the non-breeding season, and/or biological control (via natural outbreak or deliberate release). If myxomatosis or RHD is already present, then poison baiting should be delayed to allow the disease to reduce rabbit numbers.

If rabbit density is low then extensive control can be started straight away.

Appropriate safety gear must be worn when handling chemicals, such as Phostoxin tablets when fumigating rabbit warrens

Rabbit warren
Image: John Borg

Step 2: extensive control

The second part of the control program is the most important because it should destroy all source areas (where rabbits are living) and reduce rabbits to very low numbers. Extensive control ensures that the rabbit population cannot recover quickly but it must be done thoroughly to ensure success. If any warrens or harbour are not destroyed, rabbit numbers will simply build up again. This step includes control activities such as harbour destruction, warren ripping, and removal of blackberries, fallen logs or other shelters. Where the use of heavy machinery is not an option, alternative techniques such as explosives and fumigation may be used.

Step 3: mop-up activities

There are usually small numbers of rabbits that survive extensive control so advanced control is necessary for long-term management. This is where follow-up techniques such as fumigation, shooting and trapping are used in rabbit-active areas.

Extensive control and mop-up activities should be repeated only as required, and where possible, included as part of routine land management. If the process is followed correctly, then the rabbit population should not increase to levels where another huge knockdown is necessary (except in extreme circumstances, eg drought) and only minimal ongoing control will be required.

Reducing the threat of rabbits is a matter of developing, applying and integrating a number of control methods, not relying on one method.

Image: Tarnya Cox

Policies and legislation

Successful rabbit control depends on a high level of cooperation between landholders, community groups, local and federal government, and state and territory conservation and pest management agencies. Rabbit legislation is important in allowing state and federal governments to facilitate integrated management of the rabbit problem.

Competition with native animal species and land degradation by feral rabbits are listed as a key threatening process under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Australian Government has also developed the *Threat Abatement Plan for Competition and Land Degradation by Feral Rabbits* (TAP). This plan lists 156 threatened species that may be adversely affected by rabbits and provides a framework to make the best possible use of the resources available for wild rabbit management.

Laws are in place in all Australian states and territories that require landowners to take reasonable actions to control rabbits on their land. 'Control' is defined as taking action to minimise the species' impact and limit its spread. It is important to check with the relevant authorities before proceeding with rabbit control measures, as the legislation governing rabbit management and the use of chemicals, poisons or firearms varies between states and can change when Acts are amended.

Sample management plans

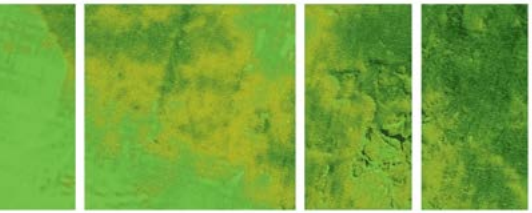
- Plan for the Eradication of Rabbits and Rodents on Subantarctic Macquarie Island
- Sydney North Regional Rabbit Management Plan 2007 - 2012
- Wimmera Rabbit Action Plan 2000 – 2005

Further information

PestSmart Factsheet RABFS2: Rabbit legislation in Australia. Invasive Animals CRC (2012).

www.pestsmart.org.au/pestsmart-factsheet-rabbit-legislation-in-australia/

Rabbit control is a major responsibility for land managers.



6. Key publications

There are a number of key publications and websites that expand upon the information provided in this guide and may be useful in helping you understand and manage your rabbit problem. It is important to remember that the information presented in these publications might not be applicable to all situations. Landholders should always discuss rabbit control with their local land and pest management authority.

Books and reports

Australian Government (2008). *Threat Abatement Plan for Competition and Land Degradation by Rabbits.* Department of the Environment, Water, Heritage and the Arts (DEWH), Canberra.

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Australian Government (1999). *Environment Protection and Biodiversity Conservation Act 1999.* Department of Sustainability, Environment, Water, Population and Communities (SEWPaC), Canberra.

Cooke B (2003). *Making the most of rabbit haemorrhagic disease.* CSIRO Sustainable Ecosystems, Canberra.

Cooke BD and Fenner F (2002). Rabbit haemorrhagic disease and the biological control of wild rabbits, *Oryctolagus cuniculus*, in Australia and New Zealand. *Wildlife Research* 29(6): 689-706.

Gong W, Sinden J, Braysher M and Jones R (2009). *The economic impacts of vertebrate pests in Australia.* Invasive Animals Cooperative Research Centre, Canberra, Australia

Hart Q (2003). *Conventional Rabbit Control: Costs and Tips.* Bureau of Rural Sciences, Canberra.

Lowe TJ, Wheeler SH and Twigg LE (2003). Impact of rabbits on native bush remnants. *Journal of the Royal Society of Western Australia* 86:97-105.

McLeod R (2004). *Counting the Cost: Impact of Invasive Animals in Australia, 2004.* Cooperative Research Centre for Pest Animal Control, Canberra.

National Land and Water Resources Audit (NLWRA) and Invasive Animals Cooperative Research Centre (2008). *Assessing Invasive Animals in Australia 2008.* NLWRA, Canberra.

NSW Department of Primary Industries (2007). *Vertebrate Pest Control Manual: Rabbit Biology and Control.* Vertebrate Pest Research Unit, NSW Department of Primary Industries, Orange, NSW.

Queensland Department of Primary Industries and Fisheries (DPI&F, 2008). *Rabbit Control in Queensland: A Guide for Land Managers.* Queensland Government DPI&F, Brisbane.

Sharp T and Saunders G (2005). *Rabbit warren destruction by ripping* (RAB006). NSW Department of Primary Industries, Orange, NSW.

South East Natural Resources Management Board (2009). *Rabbit Control: Best Practice Information for Land Managers in the South East*. South East Natural Resources Management Board, Mount Gambier, South Australia

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

Websites

Australian Wool Innovation and Meat and Livestock Australia (2008)

Module 5: Protect your farm's natural assets. 'Making more from sheep'

www.makingmorefromsheep.com.au/protect-your-assets/tool_5.10.htm

PestSmart Toolkit for Rabbits

www.pestsmart.org.au/pestsmart/rabbits/

RabbitScan

www.feralscan.org.au/rabbitscan


PESTSMART