

Integrated rabbit control in urban and semi-urban areas

This page provides advice on European rabbit (rabbit) control methods in urban and semi-urban areas where many of the traditional methods of control are not suitable.

- Why manage rabbits?
- Before you begin: Rabbit biology and behaviour
- Management of rabbits on your property.

Why manage rabbits?



Key points

- In Victoria feral or wild populations of European rabbits (*Oryctolagus cuniculus*) are declared as established pest animals under the *Catchment and Land Protection Act 1994*.
- Under the *Catchment and Land Protection Act 1994* land owners have a responsibility to take all reasonable steps to prevent the spread of, and as far as possible eradicate, established pest animals from their land.

Rabbits have been significant pests in Australia since they were released near Geelong, Victoria in 1860. Rabbits are one of Australia's most serious pest animals and typically:

- destroy pasture, crops and plant communities impacting on agriculture and the environment;
- cause soil erosion and associated sedimentation of waterways;
- compete with native fauna for food and habitat; and
- are well suited to Australian conditions and breed prolifically.

In 2004 rabbits were estimated to have an annual economic impact of over \$113 million dollars nationally.

Before you begin

Rabbit biology and behaviour

Before designing your rabbit control program, it is important to understand rabbit behaviour and characteristics. Following are some points that should be considered in the design of your program:

- Rabbits have a hierarchy in which dominant males mate with dominant females. Non-dominant rabbits will disperse and seek alternative feeding areas and establish other warrens or territories.
- Rabbits are territorial. Adventurous rabbits generally feed further from the warren; shy rabbits feed closer to the warren. Rabbits may not find (and therefore not eat) bait placed outside their feeding areas.
- Rabbits are naturally wary of new things in their environment. Free-feeding is essential to encourage rabbits to feed on rabbit bait before the poison baits are applied.
- Rabbits are prolific breeders, able to produce numerous litters per year. Two rabbits can breed to over 180 rabbits in just 18 months!
- Rabbits are stimulated to breed by the presence of nutritious green growth. This usually occurs during the wetter months but can include wet summers.
- Survival of young is substantially increased when rabbits have safe harbour, especially breeding burrows and warrens. The destruction of warrens is the key to achieving long-term rabbit control.

Further information on rabbit characteristics and behaviour.

Management of rabbits on your property

Points to remember

- Effective rabbit control is achieved by using a combination of control measures, not just one. There is no one quick-fix solution. Land owners must be more persistent than the rabbits!
- One rabbit is one too many. Leaving a pair of rabbits or just one burrow will lead to re-infestation, undermining your control work and investment.
- Be aware that native wildlife may also be using rabbit harbour. Ensure your rabbit control program doesn't affect native wildlife.
- If any rabbit control work is to be undertaken which may result in disturbance of native vegetation, culturally significant areas and/or waterways, contact should be made with the responsible authorities prior to works being conducted. The responsible authorities may include Local government, Department of Sustainability and Environment, Aboriginal Affairs Victoria or the local Registered Aboriginal Party, and the local Catchment Management Authority.
- If you are planning to use dogs for pest animal control, be mindful that

there are specific requirements for the use of dogs for hunting. Under Section 28 of the Domestic Animals Act 1994, a person must not set or urge a dog to attack, bite, rush at or chase any animal except when hunting in accordance with the Prevention of Cruelty to Animals Act 1986 (POCTA). Refer to the POCTA Code of Practice for the Welfare of Animals in Hunting for specific information on the use of dogs in hunting.

- If you are planning to use chemicals to treat rabbits, all applicable requirements of the Agricultural and Veterinary Chemicals (Control of Use) Act 1992 and Agricultural and Veterinary Chemicals (Control of Use) Regulations 2007 must be met. This includes adhering to the directions for use on the chemical label, keeping the relevant chemical use records and only using 'restricted use chemicals' if you hold the required Agricultural Chemical User Permit or other relevant permit. Chemical use record sheets and further information regarding agricultural chemical use can be found on [the Agricultural Chemical Use page](#).

Planning your program

Planning can maximise the effectiveness of rabbit control while minimising damage to other animals. Consider rabbit density, distribution and the habitat in which the rabbits are living as this will determine what actions are appropriate. The following steps will help in planning.

1. Work together

Coordinate control work with your neighbours. The best results are achieved when neighbours conduct simultaneous rabbit control at a landscape scale, rather than on individual properties. Work on your property can be undermined by the inactivity of your neighbours. Talk to your neighbours and local Landcare group to work out a plan for coordinated action.

2. Aim to be rabbit free

Create a detailed rabbit management plan that has a specific aim and objectives to meet that aim. Remember:

- Just one warren entrance and a pair of rabbits can re-infest your property.
- Rabbits at densities as low as one active entrance per two hectares can seriously impact the regeneration and recruitment of sensitive plant communities.

3. Conduct monitoring

- Identify rabbit feeding and activity areas in and around your property. Map these areas for future reference. Rabbits are often found around rocky outcrops, buildings, wood heaps, fence lines,

waterways and weedy areas.

- Assess the number of rabbits on your property. Conduct night time spotlight counts, map the location of warrens and rabbit activity.

Use the information you have gained from monitoring to:

- 1 Target your control effort;
- 2 Monitor the progress and success of your control program; and
- 3 Vary and improve your program.

It is important to continue monitoring on an ongoing basis to detect and treat any re-infestation of your property.

4. Time of year

Rabbit control is most cost-effective in late summer and early autumn as breeding has generally ceased in the rabbit population. biological control and conditions leading to natural mortality have also reduced the rabbit population, therefore likelihood of achieving long-term control can improved by reducing next season's breeding stock.

Controlling rabbit populations when they are low is most effective in achieving long term control as there are less rabbits to put pressure on your control effort and investment and the population reduction is more likely to be sustained.

5. Use all the tools!

Effective rabbit management utilises all the available control measures that are feasible and available on your property. Every rabbit should be exposed to as many control measures as possible. Make your property a rabbit hostile environment. The order in which control measures are implemented is important to maximise the effectiveness of your control program, ideally follow this sequence of control:

- 1 Allow biological control and natural mortality to reduce the rabbit population.
- 2 Bait to reduce numbers prior to ripping if numbers are still high
- 3 Remove harbour and destroy warrens (ie. ripping).
- 4 Follow up with fumigation and further warren destruction.
- 5 Be persistent, remain vigilant and monitor regularly.

6. Evaluate your success

Conduct a second round of monitoring after your control program.

- Have you destroyed all rabbit warrens and entrances?
- Are all the warren entrances closed and inactive?
- Are there still signs of rabbit activity?
- Are rabbits still visible?
- What is working well? What could be improved?
- Were the correct controls selected, applied accurately at the optimum times?

- Do you need to change your plan?

7. Follow up

Continue monitoring on an ongoing basis. Any sign of rabbit activity should trigger an immediate control response.

It is your responsibility to control rabbits on your property.

Management techniques

Biological Control

Rabbit numbers were radically reduced in the 1950's with the introduction of the myxoma virus (myxomatosis) but since then the virus has become much less effective, as the genetic make-up of the virus has changed and rabbit resistance has built-up. Myxomatosis is spread by biting insects such as fleas and mosquitoes.

Rabbit Hemorrhagic Disease (RHD also know as Rabbit Calici Disease or RCD) was introduced to Australia in 1996. It is an infectious and lethal disease that only affects rabbits. An RHD vaccine is available for use with pet rabbits and commercially farmed rabbits. RHD is transmitted to rabbits through direct contact, most likely from infected rabbits, birds, insects and other animals but only if the virus particles move from the carrier to the rabbit within a few hours. The disease may also spread in rabbit droppings or on vehicles, clothing and footwear.

Both Myxomatosis and RHD are "wild" diseases capable of spreading without the need for human assistance.

Points to note about biological control:

- RHD and myxomatosis alone will not provide effective rabbit control.
- RHD and myxomatosis must be used in conjunction with traditional control methods.
- Susceptible rabbits exposed to RHD and myxomatosis are likely to die. Some exposed rabbits, especially those under 8 weeks, old will live a full life span and breed as normal.
- A large proportion of adult rabbits carry antibodies to RHD and myxomatosis and if exposed to the disease are likely to survive.
- Offspring of female rabbits carrying the RHD or myxomatosis will receive maternal antibodies.

Poison baiting

Baiting is effective in quickly reducing rabbit numbers but must be followed by warren and harbour destruction.

Bait type



1080: The poison '1080' is a restricted Schedule 7 poison and can only be used by authorised persons who must comply with the Directions for the Use of 1080 Pest Animal Bait Products in Victoria and the product label. In urban areas its use is likely to be limited by the minimum-distance restrictions stated in the Directions for the Use of 1080 Pest Animal Bait Products in Victoria. Read more about [Victoria's 1080 pest animal bait system](#).

Pindone: Pindone is suitable for use in most urban areas as it has an antidote (vitamin K1), where non target animals such as domestic dogs may be at risk. Pindone is a registered rabbit poison in Victoria and may be bought as either pre-mixed carrot or oat bait.

The product label provides specific directions for use and must be read, understood and followed.

Always read the label, heed the label.

Preparation and planning for baiting

In planning your control program, you must know:

- density and distribution of rabbits on your property and adjoining properties
- if rabbits are moving across your boundaries

- the type of harbour rabbits are using
- where the rabbits are feeding on your property and adjoining properties
- What non-target animals are present (native/domestic) and are they at risk from eating poison bait or poisoned carcasses?

Do the job well:

- Consider using free-feeds (unpoisoned baits) before baiting, This will help you calculate the amount of poisoned feed required which will help increase uptake of poisoned baits. Make sure the free-feeds are available to every rabbit on your property.
- Check free-feed, or poisoned baits each day to assess the amount of bait taken. If all the bait is eaten, increase the baiting rate. If excess bait remains, reduce the baiting rate.
- Make sure rabbits can feed undisturbed on your free-feed bait or poisoned bait (do not shoot or hunt during baiting).
- Always remember to free-feed and bait according to the manufacturers instructions.
- All of the rabbit population must be exposed to the poison program.

When to bait

Rabbits can be poisoned at anytime that they will readily take oat or carrot bait.

Most rabbit poisoning occurs in the late summer/early autumn period because:

- myxomatosis, RHD and natural mortality have reduced rabbit numbers
- feed is at a minimum and rabbits are foraging for food
- rabbits are old enough to emerge from the burrow (21-25 days) and be exposed to the bait
- breeding is usually over and so rabbits range over greater distances.

Where to bait

Place the bait in the feeding areas

- Most rabbits feed within 25 m of the burrow. Rabbit feeding areas are characterised by short grazed vegetation, rabbit dung, dung heaps and scratchings.
- It is important that bait is presented to the whole rabbit population where they feed maximising the exposure to the baiting program.

Baiting safety

- Keep children, livestock, dogs and other animals away from baits and poisoned carcasses to reduce the chance of non target poisoning; consider muzzling dogs for the duration of poisoning programs.
- **Safety is your responsibility.** Notify your neighbours before

conducting baiting and erect warning signs as per the product label. Follow directions for use and handling as specified on the product label. Ensure all bait material and carcasses are removed and disposed of as per product label.

Essential knowledge

For best results follow the product label. For example, rabbits must feed on Pindone baits on up to 3 successive occasions.

Baiting methods

Trail baiting method

A bait trail is a furrow cut into the ground that is approximately 2 cm deep and 10 cm wide. The trail can be cut by hand using a hoe; a disc pulled behind a vehicle or a purpose-built baitlayer. Bait (cut carrots or oats) is laid into the trail, firstly as free-feed and later as poisoned bait. The freshly turned earth also attracts rabbits to the trail.

Bait laying equipment for a poisoning program can be obtained or hired from most Landcare groups, some equipment hire firms and some pest control contractors.

Pindone carrot baits

It is essential to use good quality bait material. Best results are achieved with quality fresh carrots, fed to rabbits the same day as they are cut. Feeding at dusk ensures the carrots don't dry out in the sun, reduces potential harm to non-target animals and helps carrots stay fresh and attractive to rabbits for a longer time.

Pindone oat baits

Oats must be clean and free of impurities. Pindone oat bait is commercially manufactured as pre-prepared poisoned bait material that is shelf-stable.

How to conduct a Pindone poisoning program

Detailed instructions for conducting a Pindone baiting program can be found on the product label and must be adhered to at all times. Wear appropriate personal protective equipment as specified on the product label.

Cleaning up

On each day of the control program, the baited area and surrounding areas must be thoroughly searched for dead rabbits. Carcasses must be collected and properly disposed of to lessen the risk to non-target species as per the product label. Uneaten poison bait should also be removed and disposed of as per the product label.

Safety

"Safety is your responsibility". Inform your neighbours before conducting baiting and erect warning signs as per the product label.

Follow directions for use and handling as specified on the product label. Ensure all bait material and carcasses are removed and disposed of as per product label.

Ripping to destroy warrens

Rabbit prone areas

Some areas are more suitable for rabbit warrens than others. Rabbits prefer soils which are easy to dig and are well drained. Granitic and sandy soils are particularly suitable to rabbits, but these soils are also often highly erodible so **precautions with earthworks may be necessary.**

Ripping is implemented with the intent of destroying the warrens where rabbits live and shelter. **A rabbit control program will fail unless all burrows and other harbour are destroyed.**

Before you begin



- Make sure all rabbits are driven underground, either by running dogs over the area or by making enough noise to flush rabbits into their warren.
- Locate, map and mark all warrens.
- Employ a spotter to direct the machine to each warren and ensure all warrens are completely destroyed.
- Mechanical equipment including bulldozers, excavators, backhoes, and tractor-mounted rippers are highly efficient in destroying warren systems. Generally the bigger machines, the better the job.
- A tined ripper mounted on a bulldozer, or an appropriate tractor, is commonly used to rip burrows in open areas.
- Where minimal disturbance is important, excavators, traxcavators, and backhoes are more appropriate. They can be used successfully on rocky sites, along fence-lines, and where removal of woody weeds is necessary. They can also be successfully used to minimise disturbance to areas of native vegetation where warrens are interspersed with remnant vegetation.

- Digging warrens out with a shovel, mattock or pick is labour intensive and not as effective compared to mechanical ripping.

Ripping

- You must rip at least four metres out from the outermost warren opening.
- Rip lines should be not greater than 50 cm apart.
- Interline ripping between the rip lines after the first pass, will help destroy the warren structure.
- Wherever possible cross rip by ripping in one direction and then rip again at an angle of 90 degrees to the original ripping.
- Rip to a depth of at least 70cm or deeper if possible. The deeper the ripping the better the result.
- Ripped warrens should be back-bladed and track-rolled to leave a flat and compacted site, decreasing its attractiveness to re-invading rabbits. Track rolling will also help compact the soil surface and reduce the risk of erosion. The site should be revegetated with appropriate vegetation as soon as possible.

Fumigation to destroy warrens

Fumigation only works when the burrow is sealed.

Select a fumigant

Aluminium phosphide is the most commonly used fumigant; it comes in a tablet form and releases poisonous phosphine gas when activated by moisture.

All fumigants are Schedule 7 poisons therefore an Agricultural Chemical Users Permit (ACUP) is required to purchase them. Schedule 7 poisons can only be used by holder of an ACUP or under the direct supervision of an ACUP holder.

Read the label

Detailed instructions for conducting fumigation can be found on the product label and must be adhered to at all times. Wear appropriate personal protective equipment as specified on the product label.

Put the rabbits in the warren

Fumigation will only be effective on those rabbits that are in the warren when it is fumigated. Use dogs to roam the area to flush rabbits into the warrens prior to fumigation.

Find all entrances

Use a smoking device to locate all entrances to the warren; these can often be hired from your local Landcare group.

Clear the entrance

Cut the entrance back using a shovel to get easy access to the warren entrance and ensure effective fumigation. Find the shallow openings to

the burrows, (the ones that usually cave in when you stand on them) and then dig the openings back to solid ground. This helps seal the warren during fumigation and reduces the chance of the rabbits escaping after treatment.

Apply fumigant



Apply fumigant to each entrance as per product label

Seal the entrance

Seal the entrance with soil and any other appropriate material that will help prevent rabbits digging in or out. Compact and flatten the soil to reduce the likelihood of re-opening. Be careful not to cover the fumigant tablet with soil.

Treat every entrance individually

Every entrance must be treated as per product label.

Follow up

Regularly check all warrens, re-treat any openings immediately.

Above-ground harbour removal

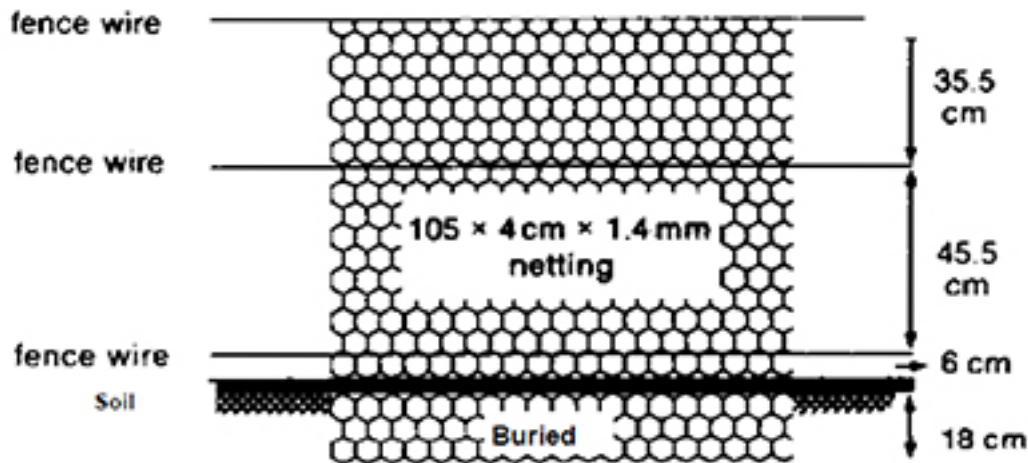
Rabbits use a variety of shelter such as heaps of debris, patches of woody weeds, buildings and some forms of native vegetation as harbour. Above-ground harbour aids rabbit survival by protecting them from the elements or predators.

To limit the use of above-ground harbour:

- Trim under all hedges and thickets of scrub, remove low branches and destroy possible shelter.
- Remove prickly and woody weeds (such as gorse, boxthorn and blackberries), rubbish piles and old machinery.
- Fence off rock piles, building materials, hay bales and wood piles or store them in a manner that does not create a hiding place for rabbits. Fence off the underneath of buildings, water tanks and other areas rabbits may hide.
- Remember fallen timber may provide harbour for rabbits and habitat for native wildlife. If you are planning to remove fallen timber you

must ensure that you do not affect native wildlife.

Exclusion fencing



Exclusion fencing involves constructing a fence around a rabbit-prone area to exclude rabbits. Ask for 'rabbit-proof fencing' when making enquiries as this is fencing material specifically designed for the purpose of excluding rabbits.

A minimum of 17cm of the fencing wire netting should be buried in the ground, or angle the lower section of the wire netting to lie on the ground facing the direction of possible rabbit entry. The wire must be held down securely with pegs, rocks or timber. The remainder of the mesh must be securely fixed to a suitable support fence so that it reaches a minimum of 88cm above ground.

Rabbit-proof fencing is a one-off process however fences are expensive and require regular maintenance to ensure there are no gaps. With proper maintenance fences should last up to 20 years.

Baiting, ripping and fumigation works need to be completed before or after you have "rabbit-proofed" your area. Well built and well maintained fences can keep properties free of rabbits once successfully treated.

One consequence of such fences is that the movement of some native animals may be limited by rabbit-proof fencing.

Minimum specifications

- Use of '105 x 4 x 1.4' standard rabbit netting. That is, 105 cm width, 4 cm mesh diameter, 1.4 mm wire diameter.
- The support fence should be able to withstand stock or native animal forces.
- Rabbit netting should be fixed so that it reaches at least 88cm above the ground.
- Where netting is buried, it should be buried to a minimum of 17 cm.
- Where netting is bent to lay on the ground surface, it must be held down with pegs, rocks or timber.

- Suitable rabbit-proof gates should be placed at all breaks in the fence.

General support fencing specifications

- Use sturdy posts driven at least 45 cm into the ground (either rammed, or dug in).
- Spacing between posts and star pickets should be determined by soil type, topography and required strength of the fence.
- It is best to have fences erected by experienced or professional fencers.

Other management techniques

There are repellents and deterrents available that may provide some level of protection to gardens, crops and pasture. Repellents and deterrents do not reduce rabbit populations.

Explosives are not suitable for use in urban areas but may be suitable in semi-urban areas. Explosives can be used to implode warrens that can't be ripped. The process involves using an explosive charge to cause sufficient sub-surface disturbance to collapse the warren system whilst creating minimal disturbance on the surface.

Permits are required to use explosive materials. Explosives should ONLY be used by appropriately accredited operators.

The use of LPG devices for rabbit control is not recommended by the department as they have not been independently tested and approved to ensure that they are effective and humane.

Shooting is not suitable for urban areas. This technique is labour intensive, requires appropriate licences and warrens remain open for re-infestation.

Ferretting and trapping are not effective methods of control as the techniques are labour intensive and warrens remain open for re-infestation. Trapping also has animal welfare implications.

Any trapping of rabbits MUST be carried out in accordance with the requirements of the Prevention of Cruelty to Animals Act 1986 (POCTA) and associated regulations.

Trapping has several animal welfare implications and anyone considering trapping should read important further information. [Humane Vertebrate Pest Control](#)

Related links

[A-Z of pest animals](#)

[Victoria's 1080 Pest Animal Bait System](#)

[Humane Vertebrate Pest Control](#)

External links

[Invasive Animal Cooperative Research Centre](#)

References

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