Managing Vertebrate Pests: Rabbits

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This publication, which is one in a series, provides land managers with ‘best practice’ national guidelines for managing the agricultural and environmental damage caused by rabbits. Others in the series include guidelines for managing feral horses, foxes, feral goats, feral pigs and rodents. The publication was developed and funded jointly by the Vertebrate Pest Program which is administered by the Bureau of Resource Sciences, and by the CSIRO Division of Wildlife and Ecology.

To ensure that the guidelines are widely accepted as the basis for rabbit management, comment has been sought from government including state, territory and Commonwealth agriculture, environmental and resource management agencies, and from other land managers, and community organisations, including the Australian Conservation Foundation, the National Farmers’ Federation, the National Consultative Committee on Animal Welfare, and the Anangu Pitjantjatjara Aboriginal Land Council. The Standing Committee on Agriculture and Resource Management has endorsed the approach to managing rabbit damage set out in these guidelines.

There are strongly held conflicting views among people interested in the management of rabbits. Some scientists judge rabbits as Australia’s most pernicious environmental problem, and wish to see more resources allocated to their management. People involved in commercial or subsistence use of rabbits are alarmed at the prospect of rabbits being managed to levels too low to allow such uses to continue. Economists argue the spending on rabbit management should be fully justified in terms of the economic or environmental returns on such investments, and are concerned that the information necessary for this does not exist. People holding strong animal welfare concerns hope to see rabbit management and better control techniques reduce the level of suffering in rabbits subjected to control operations. Farmers would like to be sure that expenditure on rabbit control is not wasted by rapid reinvasion from adjacent areas. The authors have had a difficult task in considering these competing views in the preparation of these guidelines but believe they are a significant step forward in the management of rabbits.

The principles underlying the strategic management of vertebrate pests have been described in Managing Vertebrate Pests: Principles and Strategies (Braysher 1993). The emphasis is on the management of pest damage rather than on simply reducing pest density. A major difficulty faced by the authors was that despite numerous historical accounts and studies of rabbits in Australia, their impact on the environment
and on agricultural production is poorly documented. Nevertheless, the weight of scientific and other information collected over many decades reinforces the belief that rabbits are a serious vertebrate pest for agricultural production and the natural environment. Demonstration projects funded under the Vertebrate Pest Program administered by the Bureau of Resource Sciences are helping to document the impact of rabbits in Australia and to test the effectiveness of different approaches to management.

The guidelines recommend that, wherever practicable, management should concentrate on reducing rabbit density to low levels and holding it there by routine maintenance control. The evidence suggests that, if undertaken as part of a local or regional group scheme, this is the most cost-effective way of managing rabbit damage. While there is hope that rabbit populations will in the future be controlled by new or modified micro-organisms acting as mortality or sterility agents, we cannot depend on such developments. Until they are proven it is essential that strong efforts to control rabbits by conventional means be maintained.

These guidelines will help land managers to reduce agricultural losses and environmental damage through the use of scientifically-based management that is humane, cost-effective and integrated with ecologically sustainable land management.

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ACKNOWLEDGMENTS

The Vertebrate Pests Committee’s Strategic Vertebrate Pest Working Group, which is overseeing the preparation of the guidelines — Kevin Heinrich, Neil Hogstrom, John Hicks, Don Pfitzner and John Auty — provided valuable input and comments.

Special acknowledgment is given to Mr Bunny Fennessy and Dr Barney Foran of the Division of Wildlife and Ecology, CSIRO, Dr Glen Saunders of NSW Agriculture and Dr Brian Cooke of the Animal and Plant Control Commission, South Australia, for critically reviewing the manuscript. The late Dr Graeme Caughley advised on the method of calculating estimates and standard errors of density and number of warrens from transect counts.

Several individuals from the Bureau of Resource Sciences deserve mention. Dr Peter O’Brien was a continuing source of advice. Quentin Hart and Hazel Small helped edit the manuscript. Deborah McLeod, Joy Manly, Cass Coleman and Sarah Martin all helped at various stages in the preparation of the document. Dr Richard Williams helped collate the report and provided input to improve the quality of the document. Henryk Dekker redrew many of the figures.

Dr Mary Bomford provided extensive scientific and other editorial comment and organised the final collation and publication of the guidelines.

Many other people and organisations, too numerous to acknowledge individually, gave us the benefit of their experiences by commenting on the manuscript at various stages of its evolution. The document was sent for comment to:

- Commonwealth Department of Primary Industries and Energy Divisions
- Standing Committee on Agriculture and Resource Management (SCARM)
- Australian and New Zealand Environment Council
  - Standing Committee on Conservation
  - Standing Committee on the Environment
- Land and Water Research and Development Corporation
- Meat Research Corporation
- Rural Industries Research and Development Corporation
- Australian Wool Research and Promotion Organisation
- Australian Conservation Foundation
- National Consultative Committee on Animal Welfare
- National Farmers’ Federation
- Murray Darling Basin Commission
- Australian Veterinary Association
- Anangu Pitjantjatara Land Council

We wish to thank all these groups for their contributions.

The families of the authors deserve praise for remaining sane and helpful during its extended gestation.

Throughout the preparation of this report, the authors were reminded of the enormous contribution made by Dr Ken Myers, previously of CSIRO Division of Wildlife and Ecology, to our understanding of the rabbit in Australia. The research which he led with foresight, dedication and enthusiasm has in large measure made this report possible.
| ACF | Australian Conservation Foundation |
| ACT | Australian Capital Territory |
| AEDP | Aboriginal Employment and Development Program (now ARRI) |
| AHC | Australian Heritage Commission |
| ANCA | Australian Nature Conservation Agency (formerly ANPWS) |
| ANZECC | Australian and New Zealand Environment Conservation Council |
| APB | Agriculture Protection Board (Western Australia) |
| APCB | Animal and Plant Control Board (South Australia) |
| APCC | Animal and Plant Control Commission (South Australia) |
| ARRI | Aboriginal Rural Resources Initiative |
| BRS | Bureau of Resource Sciences |
| CaLM | Department of Conservation and Land Management (New South Wales) |
| CALM | Department of Conservation and Land Management (Western Australia) |
| CCNT | Conservation Commission of the Northern Territory |
| CRC | Cooperative Research Centre (Vertebrate Biocontrol Centre) |
| CSIRO | Commonwealth Scientific and Industrial Research Organisation |
| DCNR | Department of Conservation and Natural Resources (Victoria) |
| DPIF | Department of Primary Industry and Fisheries (Tasmania) |
| DSE | Dry sheep equivalent |
| ERIN | Environmental Resources Information Network |
| ESD | Ecologically Sustainable Development |
| ESP | Endangered Species Program |
| GIS | Geographic information system |
| GMAC | Genetic Manipulation Advisory Committee |
| Landcare | Commonwealth Landcare Program |
| LandCare | Victorian Landcare Program |
| NCA | Nature Conservation Authority |
| NCCAW | National Consultative Committee on Animal Welfare |
| NFF | National Farmers' Federation |
| NLP | National Landcare Program |
| NPWS | National Parks and Wildlife Services (various states) |
| NRIC | National Resource Information Centre |
| NRMS | National Resource Management Strategy |
| NSCP | National Soil Conservation Program |
| NSWAF | NSW Agriculture and Fisheries Personal communication |
| PMIS | Pest management information system |
| PPB | Pastures Protection Board |
| ppm | Parts per million |
| RCD | Rabbit calicivirus disease (RCD) also called rabbit haemorrhagic disease (RHD) |
| RLPB | Rural Lands Protection Board (New South Wales) |
| SCARM | Standing Committee on Agriculture and Resource Management |
| SCB | Soil Conservation Board of South Australia |
| SCS | Soil Conservation Service of New South Wales |
| SSC | Strategic, sustained control |
| SSSCAW | Senate Select Committee on Animal Welfare |
| TAFE | Technical and Further Education |
| VPC | Vertebrate Pests Committee of SCARM |
| VPP | Vertebrate Pest Program |
active entrance: a warren entrance that is being used as distinguished by obvious rabbit sign
active warren: an occupied warren
acute poison: a substance that kills an animal quickly, usually within hours, and after a single dose
anticoagulant: a substance that slows or prevents blood clotting. Anticoagulants may be used as poisons to kill pest animals
antigen: a substance, usually foreign to the body, that stimulates an animal’s immune system to make antibodies. Antibodies react with antigens in the body and can prevent the development of disease
biomass: the weight of living material in a specified area; often the amount of plant material covering an area of ground
cadastral data: usually includes property boundaries, land tenure and roads
calcareous: containing or like calcium carbonate
canids: members of the dog family
cementum: a thin, bonelike tissue that covers the root of a tooth
conservation values: aspects of the natural environment that society wants to protect, such as endangered species, wilderness and biological diversity
coumarins: a class of chemical compounds; some of which are used as vertebrate poisons (anticoagulants)
coupe: a forest plantation management unit containing trees of the same age
cumulative poison: a poison that builds up in an animal’s body with successive doses or continued exposure. Usually more than one dose is required to cause death
discount rate: difference in value between present and future benefits. Calculating discount rates involves using the reverse equation to that used for calculating interest rates on invested money
dry sheep equivalent (DSE): the number of animals that eat the same amount of pasture as a non-breeding, non-pregnant ewe. For example, 12–16 rabbits are usually considered to be one DSE
ecotone: boundary region between different ecosystems, such as between forest and grassland
ectoparasite: a parasite that lives on the outside of an animal’s body. Examples are fleas, ticks and lice
El Niño: name of a warm ocean current that appears intermittently off the coast of Ecuador and Peru. This is now recognised as part of a global climatic event that happens about every 3–6 years and typically lasts 12–15 months. It is associated with abnormally dry weather in much of eastern Australia
enclosure: an area of land fenced round to keep in wanted animals
endoparasites: parasites that live inside an animal’s body, such as tapeworms and the bacteria in the digestive tract
enzyme: a substance that promotes natural chemical reactions in the body without itself being used up or changed in the process
epizootic: the occurrence or outbreak of a disease in a population or region at a much higher level than normally expected
exclosure: an area of land fenced round to keep out unwanted animals
felids: members of the cat family
fibrin: an insoluble fibrous protein produced during blood clotting
forb: a soft herb-like plant with a non-woody stem, especially a pasture plant that is not a grass
geographic information system (GIS): a computer-based system for displaying, overlaying and analysing geographic information such as vegetation, soils, climate, land use and animal distributions
gross margin: the difference between the returns from the sale of a product from a farming enterprise minus the running costs. It excludes capital components such as the purchase of machinery
hypothermia: unnaturally low body temperature in warm-blooded animals
immunocontraceptive: same as immunosterilant
immunocontraceptive virus: a virus that causes an immune response leading to temporary or permanent sterility in infected animals
immunosterilant: a substance that triggers an immune reaction that causes sterility in a treated animal; acts as a contraceptive
knockdown: a control action that markedly reduces population size over a short time
LD_{50}: the quantity of a poison that will kill 50% of treated animals
leporids: animals of the rabbit and hare family
macropores: spaces in the soil that improve water penetration
mediterranean regions: regions with a climate similar to Mediterranean Europe, with hot, dry summers and cool, wet winters. In Australia these regions are around Adelaide and south of Perth
metabolic poison: a substance that is toxic to an animal’s basic body functions through interfering with biochemical processes, such as oxygen transport
micro-arthropods: small insects, mites etc.
mustelids: weasels, ferrets etc.
myxomatosis: a disease caused by the myxoma virus that was introduced to Australia as a biological control agent for rabbits. The disease is effective in reducing rabbit populations in areas of moderate and high rainfall
neophobia: fear of new objects in the environment
net present value: discounted present value of all financial benefits produced by a project, minus the discounted value of the costs incurred
one-off control: a control measure that is implemented only once although it may have long-term or ongoing effect
parenchyma: essential or specialised supporting tissue of an organ
phosphorylation: attachment of a phosphate molecule to sugar groups. An essential biochemical reaction in plants and animals
primary poisoning: the death of animals that ingest the poison (see secondary poisoning)
quadrats: small plots of land used for sample measurements of such items as plants or dunes
rabbit calicivirus disease: an exotic viral disease that causes high death rates in rabbits. It is presently being investigated as a potential biological control agent for rabbits in Australia. Also called rabbit haemorrhagic disease
run-on areas: places where water tends to accumulate and which are moister and more productive than surrounding areas
scat: faeces
second generation anticoagulant: a new class of anticoagulant poison developed to control pests that have developed resistance to first generation anticoagulants. Warfarin and pindone are first generation. Bromidialone and brodifacoum are second generation. In contrast to first generation anticoagulants repeated ingestion may not be necessary to cause death
secondary poisoning: intoxication or death of animals caused by ingestion of other poisoned animals
senescent: post-reproductive age
sign: any evidence of the recent presence of an animal such as dung, scratch and dig marks etc.
spotlight transect counts: a count of the number of nocturnal animals seen in the beam of a spotlight along a set or random
transect. An estimate of population density can be extrapolated from this based on the length/width of the transect

**squat:** a shallow depression in long vegetation or under fallen timber where a rabbit takes shelter

**sterilising agent:** a substance that causes treated animals to become sterile; a contraceptive

**stop:** a shallow burrow dug by a pregnant female rabbit in which to have her litter. The entrance to a stop is covered with soil and is difficult to detect

**tarbaby:** a technique for killing rabbits where 1080 poison in grease is squirted into a rabbit warren. The rabbit dies from ingesting the poisoned grease while grooming the grease from fur and paws

**thermoregulation:** control of body temperature using a combination of external (e.g. the sun) and internal heat sources (metabolism)

**total grazing pressure:** the amount of pasture removed by all grazing animals present, including wildlife, domestic stock and insects. In practice, insects are usually not included in the calculation

**transect:** a rectangular plot in which data collection occurs

**type locality:** site at which the original specimen used to describe a species was collected

Note: All money values throughout the guidelines are in 1993-94 Australian dollars unless otherwise indicated.