Environmental Threats of National Significance

EUROPEAN RABBITS

THREATS TO NATURE PROJECT

The European rabbit (Oryctolagus cuniculus) imperils 321 nationally listed threatened species, 21% of Australia's total, more than any other invasive species. It also threatens 9 ecological communities.

Rabbits were released in Australia for sport hunting in the late 1800s. They are one of the fastest and most successful colonising mammals in the world, aided by their prolific reproduction rate, an ability to live in a wide range of habitats – deserts, grasslands, woodlands, forests, heaths and urban areas – and their use of warrens for protection from predators and climate extremes. Rabbits occur over approximately 70% of Australia, where they destroy native plants, degrade landscapes and outcompete native wildlife.

WHY RABBITS ARE A THREAT TO NATURE

'Competition and land degradation by rabbits' was first listed as a threatening process under the Endangered Species Protection Act 1992 more than 25 years ago and then under the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 based on the following:

- **Rabbits compete with native animals for food and shelter,** especially small to medium-sized mammals such as yellow-footed rock wallabies and bilbies. This is particularly harmful when food is scarce during droughts or after fires.
- **Rabbit grazing reduces native plant diversity, grass and shrub cover, and total plant biomass.** The presence of just 0.5 rabbits per hectare can inhibit regeneration, leading to local extinction of some species. Plants unpalatable to rabbits, including weeds, then take over, further restricting the regeneration of palatable plants. Rabbits also ringbark small trees and shrubs, and spread weed seeds.
- **Rabbits cause significant land degradation** leading to erosion, loss of soil fertility and reduced water holding capacity. They denude large areas of plants by their digging to build warrens and in their search for food.
- **Rabbits exacerbate the predation risks of feral cats and foxes** by serving as a major food source for these predators and sustaining their high numbers.

IMPACTS ON OTHER SECTORS

The impact of rabbits costs agricultural businesses considerably more than $200 million a year (2002 estimate). Without biological control the cost would likely exceed $2 billion a year. Rabbits reduce pasture productivity for livestock, particularly sheep, and destroy crops. Rabbits also threaten the forestry sector by grazing in new tree plantations.

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A density of 0.5 rabbits/ha is a critical conservation threshold. Only below this density (less than one warren per 10–12 ha) can palatable native plants recruit or regenerate. Rabbits tend to live in social groups of about 5 (3 adult females and 2 males) and have a home range of about 10–12 ha. During summer they rely on seedlings of trees and shrubs as a source of water and so, even at extremely low numbers, they prevent regeneration of sensitive plants such as buloke (Allocasuarina luehmannii).

THREAT ABATEMENT EFFORTS

Abatement planning

A threat abatement plan (TAP) for rabbits was produced in 1999, 2008 and 2016. The main objective in the most recent TAP is to reduce the environmental impacts of rabbits in priority areas by suppressing their populations to low densities (less than 0.5 rabbits per hectare). TAP implementation is mainly dependent on action by state and territory governments. Most states and territories have produced strategies over the past 2 decades that support the environmental priorities of the TAPs as well as agricultural priorities.

State and territory legislation

Rabbits are listed as pests in all state and territories, requiring public and private landowners to take all reasonable actions to control rabbits on their land. In NSW rabbits were listed in 2002 as one of 39 key threatening processes under the Threatened Species Conservation Act (1995), now the Biodiversity Conservation Act (2016). In Victoria rabbits were listed as a potentially threatening process in 2016 under the Flora and Fauna Guarantee Act (1988).

Abatement techniques

Eradication of rabbits is only feasible in small areas, such as islands and enclosed reserves. Elsewhere, it is possible to substantially reduce damage by suppressing rabbit populations using a variety of methods that include biological control, poison baiting, warren ripping and fumigation, fencing, harbour removal and shooting. It is important to manage interacting invasive species—such as foxes, feral cats and weeds—at the same time.

Abatement research

The main research priority has been improving the effectiveness of current biological control agents, including through the introduction of new strains of the rabbit haemorrhagic disease virus.

THREAT ABATEMENT PROGRESS

The most recent review of the rabbit TAP (in 2013), found that rabbit control programs 'have often been ad hoc, lacked strategic prioritisation, and have rarely been initiated in order to promote threatened species or ecological community recovery'. Some good progress has been made, however, on deploying biological control agents and on eradicating rabbits from islands:

- **Population suppression by biological control:** The release of pathogens has been by far the most effective technique for controlling rabbits, but their effectiveness has declined as resistance has evolved. Myxoma virus, released in 1950, dramatically reduced rabbit populations, but rabbits gained resistance within 15 years. The release of rabbit haemorrhagic disease virus (RHDV) in 1996 succeeded in reducing populations by over 90%, allowing substantial recovery of habitats and threatened species. For example, the dusky hopping‐mouse and plains mouse more than doubled their extent and that of the crest‐tailed mulgara increased 70‐fold. Unfortunately, since 2002 rabbit numbers have started climbing again due to RHDV resistance.
- **Island eradications:** Rabbits have been removed from several offshore islands. In Australia's most ambitious island eradication project, rabbits (as well as cats and rodents) were removed from Macquarie Island by aerial baiting and shooting. This has led to vegetation recovery and improved reproduction by threatened seabirds.

FUTURE PRIORITIES

Suppressing rabbit numbers to less than 0.5/ha to protect threatened species and ecological communities will require large-scale abatement integrating a variety of methods. The priorities over the next decade should include the following:

1. Optimise control options: It will be important to maintain a focus on monitoring and improving the effectiveness of biocontrol agents, and to investigate other control options, with high priority given to humaneness.

2. Assign a clear value (and a budget) for the protection of native plants and animals: With no clearly defined system for valuing Australia's native species, the financial losses incurred by agriculture have been given greater priority in rabbit control programs. An assured budget is critical for the delivery of long-term best-practice rabbit management.

3. Conduct abatement strategically across landscapes: Effective control programs need to be applied regionally, across all land tenures, using a variety of techniques and applying adaptive management. Abatement cannot be achieved by relying just on biological control.

4. Re-establish public awareness of rabbits as a major threat: The profile of rabbits as a threat has declined due to community perceptions that biocontrol has solved the problem. Wider public recognition that rabbits are still a major threat is crucial for generating abatement effort.

5. Increase the number of graduates, researchers and practitioners in rabbit ecology: More conservation-focused experts are needed to investigate the ecological impacts of rabbits and strengthen ecosystem restoration efforts by deploying readily available rabbit control technology (such as warren destruction) to complement reductions achieved by biological control.

Sources & further reading

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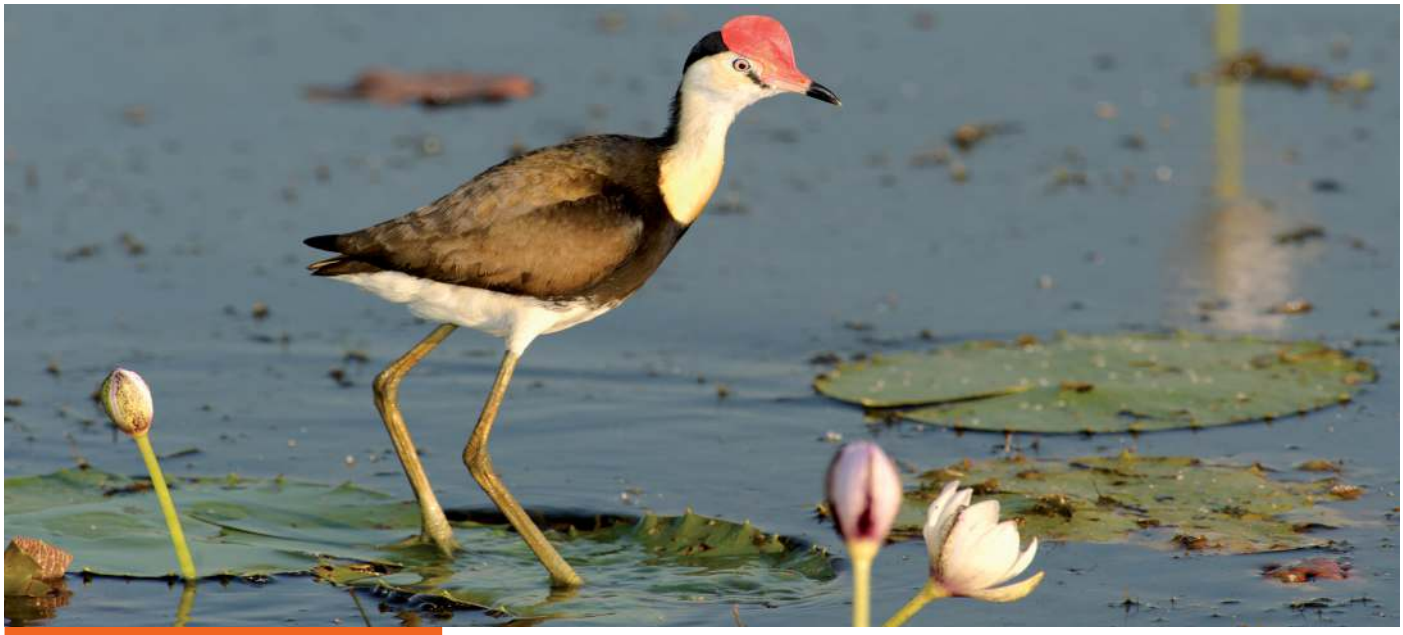

If Australians are to protect what is most distinctive about this country – our unique plants, animals and ecological communities – we urgently need to overcome the key threats facing them.

It is not possible to recover all of our threatened species one by one through species-focused efforts. We also need a concerted national focus to overcome the major threats our native plants and animals have in common – in particular **invasive species**, **climate change**, **habitat destruction**, **adverse fire regimes** and **changes to natural water flows**.

Australia's threat abatement system needs to be more ambitious, better funded and nationally coordinated.