FLORA & FAUNA GUARANTEE

FLORA AND FAUNA GUARANTEE - SCIENTIFIC ADVISORY COMMITTEE

FINAL RECOMMENDATION ON A NOMINATION FOR LISTING

Reduction in biomass and biodiversity of native vegetation through grazing by the Rabbit *Oryctolagus cuniculus*

(Potentially Threatening Process)

Date of receipt of the nomination: 25 October 2002 **File No.:** FF/54/0238
Date of preliminary recommendation: 26 November 2002
Date of final recommendation: 11 February 2003

Validity: The nomination is for a valid item

Prescribed Information: The prescribed information was provided.

Name of the Nominator is adequately provided.

Name and Description of the process:

In the opinion of the SAC the process is adequately defined and described.

The nominated process is 'Reduction in biomass and biodiversity of native vegetation through grazing by the Rabbit *Oryctolagus cuniculus*.'

The introduced European Rabbit was successfully introduced into Australia in 1858. It has since spread broadly across the southern two thirds of the continent, and its area of occupancy is now approximately 4.5 million square kilometres (Myers *et al.* 1989). The European Rabbit is one of the most widely distributed mammals in Australia and, except for the House Mouse (*Mus musculus*), the most abundant (Williams *et al.* 1995).

The loss of vegetation as a result of grazing by the European Rabbit threatens the survival of a number of native birds, mammals and insects that rely on plants for food and shelter. Rabbits have contributed to the extinction of many native plant and animal species throughout Australia. Wild rabbits compete with livestock for available pasture and kill young trees and shrubs. Their warrens contribute to soil erosion by removing vegetation and disturbing soil.

Since its introduction, the rabbit has profoundly affected Australia's flora and fauna. Rabbits inhibit the regeneration of native vegetation, compete with native fauna for food and shelter, support populations of introduced canids and felids and cause soil erosion. The decline and extinction of many of Australia's terrestrial mammals that weigh between 35 and 5 500 grams (sometimes referred to as 'critical weight range' species), particularly in the arid and semi-arid zones, was associated with the rabbit's introduction (Maxwell *et al.* 1996).

Rabbit grazing seriously affects native flora and fauna by a combination of processes including:

(a) elimination of some plant species
(b) prevention of regeneration of palatable trees, shrubs and grasses and altering the composition of plant communities
(c) consuming vegetation by ringbarking, grazing and browsing
(d) permitting weed species to become established in disturbed areas.

Menkhorst (1995) gives the following account (in part) for the rabbit in Victoria:

'In Victoria, rabbits spread with remarkable speed and built up into huge numbers. By the late 1890s they occupied all the suitable habitat in the state and had been introduced to many islands to provide food for shipwrecked people. Rabbits now occur throughout Victoria from sea level to at least 1 600 m. They occupy most habitats, wherever soils are suitable for burrowing and where there are palatable native grasses and herbs, or where disturbance allows for the growth of introduced grasses. They are absent only from the extensive tracts of roadless forest or mallee heath. In the Mallee, distribution is limited largely by a summer lack of nutritious, succulent herbage.'

'The Diet of European Rabbits has been little studied in Australia. Myers and Poole (1963) found that rabbits inhabiting sheep grazing paddocks were highly selective in their diet. During Autumn and winter, newly germinated seedlings were preferred without strong bias towards any particular species. During spring, a the height of the breeding season, the rabbits increasingly ate seed heads of grasses and the fleshy green leaves of broad-leaved weeds...'

The range of flora or fauna affected or potentially affected was adequately stated in the nomination.

Significance of the threat which the potentially threatening process poses or has the potential to pose was adequately stated in the nomination.

Eligibility for listing as a potentially threatening process under the Flora and Fauna Guarantee

The nominated item satisfies at least one criterion of the set of criteria prepared and maintained under Section 11 of the **Flora and Fauna Guarantee Act 1988**, and stated in Schedule 1 of the Flora and Fauna Guarantee Regulations 1991.

Evidence that criteria are satisfied:

Criterion 5.1 *The potentially threatening process, in the absence of appropriate management, poses or has the potential to pose a significant threat to the survival of a range of flora or fauna.*

Evidence:

Grazing by feral rabbits reduces survival and recruitment of several species of threatened plants. These include *Thesium australe* and *Lepidium hyssopifolium*. Grazing by feral rabbits appears also to have marked effects on the structure and composition of vegetation communities in many parts of Victoria. At least 12 listed communities are threatened to some degree by rabbit grazing (table 4).

Sub-criterion 5.1.1 *The potentially threatening process, in the absence of appropriate management, poses or has the potential to pose a significant threat to the survival of two or more taxa.*

Evidence:

There is evidence that feral rabbits impact negatively on a number of indigenous species via competition for resources, alteration of the structure and composition of vegetation, and land degradation. Rabbits are grazers that prefer green grass and herbage. They may also feed on seeds and, during drought, browse the bark and roots of shrubs. Several indigenous mammal species overlap in diet with the feral rabbit, and are impacted negatively by competition for food.

Threatened species that suffer in dietary competition with the feral rabbit include ground feeding birds and mammals such as the Bush Thick-knee *Burhinus magnirostris* and Eastern Barred Bandicoot *Perameles gunni*. The Plains Wanderer *Pedionomus torquatus* and Malleefowl *Leipoa ocellata* also appear to be adversely affected by the feral rabbit, through competition for food and/or by alteration and reduction of suitable habitat (Baker-Gabb 1990, Garnett 1992).

The following Victorian flora are threatened by rabbit grazing *Ballantinia antipoda, Borya mirabilis, Caladenia (Arachnorchis) amoena, C. thysanochila C. audasii, C. versicolor C. hastata, C. xanthochila, C. lowanensis, C. robinsonii, C. rosella, Calochilus richiae, Pterostylis basaltica.*

Sub-criterion 5.2.1 *The potentially threatening process poses or has the potential to pose a significant threat to the evolutionary development of two or more taxa*

Evidence:

By contributing to the extinctions of local populations, grazing by rabbits has the potential to lead to further habitat fragmentation and consequently reduced gene flow between remnant populations. Consequently, grazing by rabbits poses a significant threat to the evolutionary development of numerous listed species, e.g. *Caladenia (Arachnorchis) amoena, C. audasii, C. xanthochila, C. rosella, Pterostylis cucullata, P. despectans.*

Additional Information

- 'Competition and land degradation by feral rabbits' is listed as a Key Threatening Process on Schedule 3 of the Commonwealth **Environment Protection and Biodiversity Conservation Act 1999**. A Threat Abatement Plan for this item has been published by the Commonwealth Government (Environment Australia 1999).
- Over 40 FFG-listed fauna taxa are adversely affected as a result rabbit grazing (Table 1).
- Over 70 FFG-listed orchids are adversely affected by rabbit grazing (Table 2).

Common name	Scientific name	Conservation status NRE (2000)
Apostlebird	*Struthidea cinerea*	v
Australian Bustard	*Ardeotis australis*	ce
Baw Baw Frog	*Philoria frostii*	ce
# Bridled Nailtail Wallaby	*Onychogalea fraenata*	x
Brush-tailed Bettong	*Bettongia penicillata*	x
# Brush-tailed Rock-wallaby	*Petrogale penicillata*	ce
Bush Thick-knee	*Burhinus magnirostris*	e
Chestnut-rumped Heathwren	*Calamanthus pyrrhopygius pyrrhopygius*	-
Corangamite Water Skink	*Eulamprus tympanum marnieae*	ce
Crested Bellbird	*Oreoica gutturalis*	-
Diamond Dove	*Geopelia cuneata*	v
Diamond Firetail	*Stagonopleura guttata*	-
# Eastern Barred Bandicoot	*Perameles gunnii*	e
Eastern She-oak Skink	*Cyclodomorphus michaeli*	nt
Grey-crowned Babbler	*Pomatostomus temporalis*	e
Ground Cuckoo-shrike	*Coracina maxima*	e
Ground Parrot	*Pezoporus wallicus*	v
Heath Skink	*Egernia multiscutata*	ce
Hooded Robin	*Melanodryas cucullata*	-
King Quail	*Coturnix chinensis*	ce
legless lizard	*Aprasia aurita*	nt
Lined earless Dragon	*Tympanocryptis lineata lineata*	e

# Long-nosed Potoroo	*Potorous tridactylus tridactylus*	nt
Mallee Emu-wren	*Stipiturus mallee*	nt
# Malleefowl	*Leipoa ocellata*	e
Millewa Skink	*Hemiergis millewae*	v
# Mountain Pygmy Possum	*Burramys parvus*	e
Mueller's Skink	*Lerista muelleri*	e
Night Parrot	*Pezoporus occidentalis*	x
# Painted Snipe	*Rostratula benghalensis*	e
Paucident Planigale	*Planigale gilesi*	v
Pink-tailed worm-lizard	*Aprasia parapulchella*	e
Plains-wanderer	*Pedionomus torquatus*	e
Port Lincoln Snake	*Suta spectabilis*	v
Red-naped Snake	*Furina diadema*	v
Redthroat	*Pyrrholaemus brunneus*	ce
Red-chested Button-Quail	*Turnix pyrrhothorax*	v
Rosenberg's Goanna	*Varanus rosenbergi*	v
Rufous Bettong	*Aepyprymnus rufescens*	x
Samphire Skink	*Morethia halmaturorum*	e
Slender-billed Thornbill	*Acanthiza iredalei hedleyi*	nt
Speckled Warbler	*Chthonicola sagittata*	v
Spotted Bowerbird	*Chlamydera maculata*	ce
Striated Grasswren	*Amytornis striatus*	nt
Striped legless Lizard	*Delma impar*	e
sun moth	*Synemon nais*	-
sun moth	*Synemon theresa*	-
Turquoise Parrot	*Neophema pulchella*	nt
Western Whipbird	*Psophodes nigrogularis leucogaster*	dd

Table 1: FFG-listed fauna known or likely to be affected by rabbit grazing.

Conservation status in Victoria: x=Extinct, ce= Critically Endangered, e=Endangered, v=Vulnerable, nt=near threatened dd = data deficient, # = rabbits attract predators to these native species

Scientific name	**Common name**	**Conservation status** Aust./Vict.
Acianthus collinus	Inland Pixie Caps	r
Caladenia amoena	Charming Spider-orchid	Ee
Caladenia audasii	Audas' Spider-orchid	Ee
Caladenia brachyscapa	Short Spider-orchid	Xx
Caladenia calcicola	Limestone Spider-orchid	Ve
Caladenia carnea var. *subulata*	Striped Pink Fingers	Ex
Caladenia colorata	Painted Spider-orchid	Ek
Caladenia concolor	Maroon-red Spider-orchid	Ve
Caladenia cruciformis	orchid sp	e
Caladenia formosa	Blood-red Spider-orchid	Vv
Caladenia fragrantissima ssp. *fragrantissima*	Scented Spider-orchid	Re
Caladenia fragrantissima ssp. *orientalis*	Cream Spider-orchid	Ee
Caladenia fulva	Tawny Spider-orchid	Ee
Caladenia hastata	Melblom's Spider-orchid	Ee
Caladenia insularis	French Island Spider-orchid	Vv
Caladenia lowanensis	Wimmera Spider-orchid	Ee
Caladenia magnifica	Magnificent Spider-orchid	Kx
Caladenia pilotensis	Mount Pilot Spider-orchid	e
Caladenia pumila	Dwarf Spider-orchid	Xx
Caladenia robinsonii	Frankston Spider-orchid	Ee
Caladenia rosella	Rosella Spider-orchid	Ee
Caladenia sp. aff. *rosella* (Violet Town)	Violet Town Spider-orchid	e
Caladenia sp. aff. *venusta*	Kilsyth South Spider-orchid	e
Caladenia thysanochila	Fringed Spider-orchid	Ex

Caladenia toxochila	Bow-lip Spider-orchid	v
Caladenia valida	Robust Spider-orchid	Re
Caladenia versicolor	Candy Spider-orchid	Vv
Caladenia xanthochila	Yellow-lip Spider-orchid	Ee
Caleana sp. aff. *nigrita*	Grampians Duck orchid	e
Calochilus richiae	Bald-tip Beard-orchid	Ee
Chiloglottis seminuda	Bare-tip Bird-orchid	-
Corybas despectans	Coast Helmet-orchid	v
Corybas sp. aff. *diemenicus* (coastal)	Late Helmet-orchid	e
Cryptostylis erecta	Bonnet Orchid	e
Cryptostylis hunteriana	Leafless Tongue-orchid	e
Dendrobium speciosum	Rock Orchid	e
Dipodium hamiltonianum	Yellow Hyacinth Orchid	e
Diuris cuneata	Wedge Diuris	-
Diuris fragrantissima	Sunshine Diuris	Ee
Diuris ochroma	Pale Golden Moths	Vv
Diuris palustris	Swamp Diuris	v
Diuris punctata	Purple Diuris	v
Diuris sp. aff. *lanceolata*	Small Golden Moths	Ee
Diuris tricolor	donkey orchid	e
Prasophyllum aff. *odoratum*	Scented Leek-orchid	-
Prasophyllum chasmogamum	Spreading Leek-orchid	e
Prasophyllum diversiflorum	Gorae Leek-orchid	Ee
Prasophyllum fitzgeraldii	Fitzgerald's Leek-orchid	e
Prasophyllum fosteri	Foster's Leek-orchid	e
Prasophyllum frenchii	Slaty Leek-orchid	Ee
Prasophyllum litorale	Coastal Leek-orchid	v
Prasophyllum morganii	Cobungra Leek-orchid	Ve
Prasophyllum niphopedium	Marsh Leek-orchid	e
Prasophyllum species (Nagambie)	Swamp Leek-orchid	e
Prasophyllum suaveolens	Fragrant Leek-orchid	Ee
Prasophyllum subbisectum	Pomonal Leek-orchid	Ee
Prasophyllum suttonii	Buffalo Leek-orchid	x
Pterostylis aenigma	Enigmatic Greenhood	Ee
Pterostylis baptistii	King Greenhood	v
Pterostylis basaltica	Greenhood	Ee
Pterostylis cheraphila	Floodplain Rustyhood	Vv
Pterostylis cucullata	Leafy Greenhood	Vv
Pterostylis despectans	Lowly Greenhood	Ee
Pterostylis sp. aff. *boormanii* *	Beechworth Rustyhood	e
Pterostylis truncata	Brittle Greenhood	e
Pterostylis valida	Robust Greenhood	Xx
Pterostylis woollsii	Long-tail Greenhood	Re
Pterostylis xerophila	Desert Greenhood	Ve
Sarcochilus falcatus	Orange-blossom Orchid	e
Thelymitra epipactoides	Metallic Sun-orchid	Ee
Thelymitra gregaria	Basalt Sun-orchid	e
Thelymitra hiemalis	Winter Sun-orchid	e
Thelymitra mackibbinii	Brilliant Sun-orchid	Ve
Thelymitra matthewsii	Spiral Sun-orchid	Vv
Thelymitra media var. *carneolutea*	sun-orchid	e
Thelymitra merraniae	Merran's Sun-orchid	e
Thelymitra sp. aff. *pauciflora* (Anglesea)	Slender sun-orchid	v

Table 2: FFG-listed orchids affected by rabbit grazing and their status in Victoria
(**Note**: Most of the genus *Caladenia* has now been changed to *Arachnorchis*,
Scientific names above are the names each item was originally nominated under the FFG Act)
Codes: * = nominated for listing, Xx = extinct, Ee= Endangered, Vv=Vulnerable, Rr = rare, k= insufficiently known

Community	Nomination no.
1. Northern Plains Grassland Community	210
2. Forest Red Gum Grassy Woodland Community	242
3. Central Gippsland Plains Grassland Community	243
4. Plains Grassland (South Gippsland) Community	243
5. Red Gum Swamp Community No. 1	251
6. Creekline Grassy Woodland (Goldfields) Community	368
7. Semi-arid Shrubby Pine - Buloke Woodland Community	430
8. Semi-arid Northwest Plains Buloke Grassy Woodland Community	431
9. Semi-arid herbaceous Pine Woodland Community	432
10. Semi-arid herbaceous Pine – Buloke Woodland Community	433
11. Grey Box – Buloke Grassy Woodland Community	434
12. Coastal Moonah Woodland Community	460

Table 3: FFG-listed communities threatened by rabbit grazing
(**source**: SAC Database 2002)

Advertisement for public comment

In accordance with the requirements of Section 14 of the **Flora and Fauna Guarantee Act 1988**, the preliminary recommendation was advertised for a period of at least 30 days.

The preliminary recommendation was advertised in:
'The Age' - on 25 December 2002
'The Weekly Times' - on 25 December 2002
The *Government Gazette* - on 27 December 2002
Submissions closed on 31 January 2003.

Further evidence provided:

No submissions were received and no evidence was provided to warrant a review of the Scientific Advisory Committee's preliminary recommendation that the taxon is eligible for listing.

Documentation

The published information provided to the SAC has been assessed. Based on the available evidence, the SAC believes that the data presented are not the subject of scientific dispute and the inferences drawn are reasonable and well supported.

Final Recommendation of the Scientific Advisory Committee

The Scientific Advisory Committee concludes that on the evidence available the nominated item is eligible for listing in accordance with Section 11 of the Act because primary criterion 5.1 has been satisfied. The SAC also concludes that sub-criteria 5.1.1 and 5.2.1 have been satisfied and that no evidence exists to suggest that primary criterion 5.2 cannot be satisfied as a consequence of sub-criterion 5.2.1 being satisfied.

The Scientific Advisory Committee recommends that the nominated item be supported for listing on Schedule 3 of the **Flora and Fauna Guarantee Act 1988**.

Selected references:

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---------- (1991) Rabbits - indefensible on any grounds. *Search* **22** (6): 193-194.

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Menkhorst, P. W. (1995) European Rabbit, pp. 278-280 *in* Menkhorst, P. W. [ed] *Mammals of Victoria: Distribution, ecology and conservation.* Department of Conservation and Natural Resources. Oxford University Press: Melbourne.

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Myers, K., Parer, I. & Richardson, B.J. (1989) Leporidae, pages 917-931 in *Fauna of Australia*, Volume **1B**, *Mammalia.* (Eds D.W. Walton and B.J. Richardson). Australian Government Publishing Service: Canberra.

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Relevant websites:

Biological control of rabbits in Australia
http://duke.usask.ca/~misra/virology/stud2002/rabbits/australia.html

Biological Invasion: rabbits, an Australian way of life (National Museum) –
http://www.nma.gov.au/exhibitions/museum_themes/tangled_destinies/biological_invasion_rabbits,_an_australian_way_of_life

Case Study - *European rabbits in Australia* –
http://www.biotechnology.gov.au/biotechnologyOnline/environment/PestSpecies/e_EuropeanRabbit.htm

Environmental damage by wild rabbits (CSIRO site) – http://www.csiro.au/communication/rabbits/qa2.html

Feral animals – European rabbit - http://www.ea.gov.au/biodiversity/invasive/pests/rabbit.html

Impact of the rabbit in Australia – http://rubens.anu.edu.au/student.projects/rabbits/impact.html

Threat abatement plan for competition and land degradation by feral rabbits (Environment Australia 1999)

http://www.ea.gov.au/biodiversity/threatened/tap/rabbits/index.html

Rabbits and their impact (NRE Victoria) – http://www.nre.vic.gov.au, then 'Plants & animals' then 'Pest plants & animals' then 'Pest animals' then 'Pest animals Notes'

Submission to the draft Threat Abatement Plan (above), Environment Institute of Australia – http://www.eia.asn.au/submissions/scrabbit.html

The rabbit (NRM Facts), Queensland Government - http://www.nrm.qld.gov.au/factsheets/pdf/pest/PA11.pdf

Endorsement by the Convenor of the Scientific Advisory Committee **Date**

19/2/03

M.F. Clarke

Dr Michael Clarke
Convenor