

Action Statement

Flora and Fauna Guarantee Act 1988

No. 116

Barking Owl *Ninox connivens*

Description and distribution

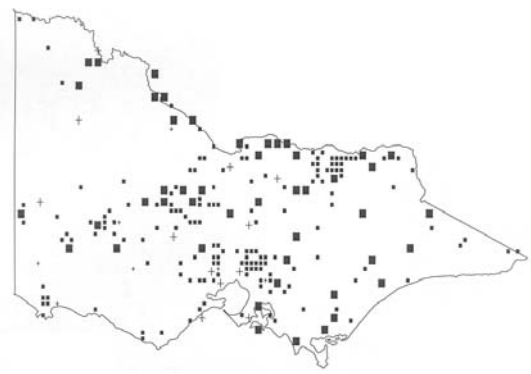
The Barking Owl *Ninox connivens* (Latham, 1802) belongs to the family Strigidae (Hawk Owls). It has large, brilliant yellow, forward-directed eyes in an indistinct facial mask. It is a medium-sized brown owl with white spots on the wings and a streaked breast. The forehead, crown, nape and facial mask are various shades of brown, whilst the throat may be brown, white or white streaked with brown. The upper parts of the wings and back are brown with large white spots. The species attains a length of 35-45cm, a wing span of 85-100cm, and a weight of 425-510g (Hollands 1991). It has a dog-like barking call, and will occasionally emit a blood-curdling screech, likened to that of a 'screaming' or 'wailing' woman (Schodde and Mason 1980, Hollands 1991, E. McNabb *pers. comm.*).

The Barking Owl occurs in New Guinea and adjacent islands and mainland Australia, where an endemic race (*N. c. connivens*) occupies a disjunct distribution throughout much of the continent, although it is absent from the arid, treeless expanses of Western Australia, Northern Territory, Queensland and South Australia.

Within Victoria, the species has been recorded from scattered localities throughout the state, although it is largely absent from unforested areas such as the volcanic plains and the semi-arid north-west (NRE 2001). The species predominantly occurs in the 400-700 mm rainfall zone north of the Great Dividing Range (Emison *et al.* 1987).



Barking Owl *Ninox connivens*
(Image: © Natasha Schedvin)



Distribution in Victoria

+ before 1970, ■ since 1970

[source: *Atlas of Victorian Wildlife*, NRE 2001]

Habitat

Within Victoria the Barking Owl occurs in open woodlands and open forests, including Box-Ironbark and riparian River Red Gum *Eucalyptus camaldulensis* habitats, as well as some foothill habitats on granitic slopes. The species has been recorded more frequently in edge habitats such as the interface between woodlands and wooded farmland, than in forest interiors (Robinson 1994, Kirsten and Taylor 1999). This perceived preference is likely to be due to the foraging behaviour of the species, the abundance of European Rabbits *Oryctolagus cuniculus* (a common prey item), and possibly the preponderance of larger, hollow-bearing trees on freehold land compared to public forests (Robinson 1994). Hydrological features such as rivers and swamps are often a conspicuous component of Barking Owl habitat (Kavanagh *et al.* 1995, Taylor *et al.* 1999).

Live hollow-bearing trees are favoured for nesting over dead ones in Victoria, and species used include: Red Box *E. polyanthemos*, Grey Box *E. microcarpa*, White Box *E. albens*, Apple Box *E. bridgesiana*, Red Stringybark *E. macrorhyncha*, River Red Gum and Blakely's Gum *E. blakelyi* (Robinson 1994).

Life history and ecology

The Barking Owl is an obligate hollow-nester, and pairs, which usually mate for the life of a partner, may re-use the same nest hollow for many years (Robinson 1994). Preferred hollows are usually large, with entrance diameters between 25-45cm, and internal depths of 20-250cm (Schodde and Mason 1980). The species nests between July and October (Robinson 1994), usually producing two or three eggs that take approximately 36 days to hatch (Hollands 1991). The young frequently remain with the parents until the following autumn or winter. Breeding success is apparently variable and probably low (Robinson 1994).

The Barking Owl takes a variety of vertebrate and invertebrate prey, the proportions of which appear to vary in relation to the breeding season of the species; mainly insects are taken outside of the breeding season, and more birds and mammals are taken during the breeding season. European Rabbits are the dominant prey for some southern populations (Hollands 1991, Robinson 1994); however, some populations rarely take Rabbits (Higgins 1999). Other important prey species include Sugar Glider *Petaurus breviceps*, Squirrel Glider *P. norfolcensis*, Common Brushtail Possum *Trichosurus vulpecula*, rodents, Lesser Long-eared Bat *Nyctophilus geoffroyi* and a range of birds, including Common Starling *Sturnus vulgaris*, Magpie *Gymnorhina tibicen*, Eastern Rosella *Platycercus eximius* and Blue Bonnet *Northiella*

haematogaster (Hollands 1991, Kavanagh *et al.* 1995, Kirsten and Taylor 1995). Waterbirds such as grebes (Podicipedidae) are also taken (E. McNabb *pers. comm.*). Barking Owls sometimes begin hunting before dark and continue after dawn, presumably taking diurnal prey such as birds at these times. The species is also known to call during daylight hours (E. McNabb *pers. comm.*).

The Barking Owl defends a small territory within a much larger home range (Schodde and Mason 1980). Home range estimates vary from approximately 100 to 1 000ha (Schodde and Mason 1980, Robinson 1994).

Conservation status

Australia

Near Threatened Garnett and Crowley (2000)

Victoria

Endangered NRE (2000)

The Barking Owl is listed as threatened under the **Flora and Fauna Guarantee Act 1988**.

Decline and threats

The Barking Owl is the most threatened owl in Victoria. The population has been estimated to be fewer than 50 breeding pairs (Silveira *et al.* 1997), though recent work in north-eastern Victoria (Taylor *et al.* 1999; N. Schedvin *pers. comm.*) suggests that this estimate will need to be revised upwards. Existing records of Barking Owls on the *Atlas of Victorian Wildlife* database (NRE 2001) are unlikely to give an accurate representation of the current distribution and abundance of the species. Many of these records are dated, occurring in areas where once-suitable habitat has been lost or degraded. Extensive surveys in Victorian forests have shown the species to be rare, localised and mainly found in north-eastern Victoria (Loyn *et al.* 2001). Targeted surveys (Taylor *et al.* 1999) have failed to record Barking Owls from the majority of sites in western Victoria where they had been previously recorded. Many historical records may be erroneous, especially in southern Victoria, resulting from the misidentification of the calls of other birds or mammals (R. Loyn and E. McNabb *pers. comm.*).

The primary threat to the Barking Owl in Victoria is loss of habitat, particularly the deterioration or loss of the large, hollow-bearing trees on which the species depends for nesting. Hollows suitable for nesting for owls do not form in eucalypts until they are at least 150-200 years old (Parnaby 1995). Similarly, hollows are an important resource for many prey species of the Barking Owl, e.g. gliders and possums. Such trees are not being regrown rapidly enough to exceed expected losses in the

next century. The removal of dead, standing trees and stags for firewood is also likely to remove nesting sites for the species (E. McNabb *pers. comm.*).

Native prey species such as arboreal mammals and hollow-nesting birds have declined in some areas through clearing of native vegetation, loss of hollows and the impact of introduced predators. These declines may also have contributed to the decline of the Barking Owl, although in some areas European Rabbits have become a substitute prey, and local populations of the Barking Owl have become heavily dependent upon them.

It is not known how the owls will fare through periods of Rabbit decline due to climate fluctuations, control programs or disease such as calicivirus. Where poisons are used to control Rabbits, secondary poisoning of owls may be an issue.

Existing conservation measures

- The Midlands Forest Management Plan (FMP) (NRE 1996a) states that conservation of the Barking Owl in this region will follow an appropriate management regime as outlined in this Action Statement. As an interim conservation measure, a 250m Special Protection Zone (SPZ) is to be established around nesting or residency sites as they are discovered. Within this Zone nest trees and all trees within a radius of 100m from the nest tree will be protected, and logging operations, road construction and other activities likely to disturb breeding activity will be excluded. This strategy is to be reviewed when 20 SPZs have been established in the Midlands FMA for the species.
- The Central Highlands FMP (NRE 1998) provides for a 100m buffer to be reserved around any nest tree used during the last five years, and no timber harvesting to occur within 250m of a nest tree during the breeding season.
- The North East FMP (NRE 2001) states that, within a 3.5km radius of a confirmed Barking Owl record, approximately 300-500ha of suitable forest, including the detection site where possible, will be reserved from harvesting. This may be in the form of existing conservation reserves, or where necessary, areas of Special Protection Zone (SPZ) and/or Special Management Zone (SMZ).
- Other FMAs that contain Barking Owls do not have completed FMPs. The development of these plans should include conservation measures for the species, in consultation with experts on owl biology.
- A research project on the ecology of Barking Owls is currently being conducted by Charles

Sturt University, with support from NRE. Surveys of forest owls have been conducted by NRE through most of Victoria's forests.

Conservation objectives

Long term objectives

1. Protecting all Barking Owls and remnant Barking Owl habitat, and promoting the restoration of Barking Owl habitat on public and private land;
2. Generating community awareness regarding the conservation of Barking Owls and their habitat, and encouraging community support and involvement in the protection and restoration of owl habitat;
3. Improving knowledge of habitat requirements and developing new management approaches to providing those requirements.;

Objectives of this Action Statement

1. Identifying and protecting Barking Owl habitat on public land (and private land where possible) to ensure protection of 150 breeding pairs of Barking Owls across the range of the species in Victoria in the next five years.;
2. Conducting research on Barking Owl populations and habitat use, to help refine management practices in future. Investigating habitat dynamics (e.g. phylogeny of nest hollow) of Barking Owls and their prey, as an aid to developing new habitat as opportunities arise. Modelling habitats and testing models mainly as an aid to efficient survey work;
3. Implementing management prescriptions for designated habitat areas within state forest and conservation reserves, and encouraging similar actions by private landholders;
4. Monitoring population size to determine if management prescriptions are effective. Liaising with New South Wales National Parks and Wildlife Service (NSW NPWS) to determine the wider population viability of populations occurring close to the border.

This strategy follows the approach developed for Powerful Owls (*Ninox strenua*) by Webster *et al.* (1999).

Intended management actions

Identification and protection of Barking Owl sites

1. Conduct surveys to locate as many resident pairs of Barking Owls as possible across land tenures throughout the main range of the species, focusing mainly on Box-Ironbark and River Red Gum forests and woodlands north of the Great Divide.

Responsibility: NRE (Parks, Flora and Fauna Division; Forests Service), Parks Victoria

2. Select areas of suitable habitat to be managed for the protection of Barking Owl up to a target of 150 resident pairs on public or private land in the next five years. Such protected areas will be termed Barking Owl Management Areas (BOMAs) and may overlap with management areas established for other species. Priority should be given to locating and protecting nest sites or probable breeding areas based on the occurrence of owlets or adult roosting pairs. Selection of BOMAs should be based both on the strength of evidence for existence of a resident pair, and on the need for BOMAs to be distributed throughout the main range of the species with a reasonable spread across habitats and land tenures. Preference will be given to the protection of suitable habitat within conservation reserves, especially in large reserves where the entire home range can be protected within the reserve.

Responsibility: NRE (Parks, Flora and Fauna Division; Forests Service), Parks Victoria

Modelling

3. As more information becomes available from current or future research projects, it may prove feasible to model the distribution of Barking Owls (as already done for Powerful and Sooty Owls) and use these models to predict where Barking Owls are most likely to occur. Because of the apparent rarity of the species, such models will need to be used mainly as a survey tool to help locate suitable habitat where survey effort may be most usefully applied. Protection would be afforded to such sites where practical if they were found to support Barking Owls in the course of model testing and further survey work. Research information will also be used to help restore habitat for Barking Owls over time in areas where this proves practical. An adaptive approach will be needed as new information becomes available.

Responsibility: NRE (Parks, Flora and Fauna Division; Forests Service)

Protection in State forest

In State forests, the requirements of this Action Statement will be implemented through the development of forest management plans to ensure effective integration of owl conservation measures with other forest values and uses. Conservation strategies for Barking Owls established in existing plans are generally consistent with this Action Statement, and will be maintained until the plans are reviewed. NRE will ensure that conservation measures for the Barking

Owl are made consistent across all FMAs where the species occurs in Victoria.

4. Barking Owl Management Areas (BOMAs): Where clear-fell or seed-tree systems are used, delineate and protect a core area of suitable habitat of 300-500ha as Special Protection Zone (SPZ). Where BOMAs are based on specific records (rather than habitat modelling), the SPZ will fall within a 3.5km radius (approximate area of 3,800ha) of the record.

Responsibility: NRE (Forests Service; Regions)

5. Barking Owl Management Areas (BOMAs): Where selective harvesting (NRE 1996a) is used, manage areas of 600-1 000ha to maintain habitat capable of supporting adequate populations of terrestrial and arboreal prey mammals to support breeding owls. Where BOMAs are based on specific records they will comprise 3ha SPZs around the records plus SMZs of about 600-1 000ha which will allow for modified timber harvesting practices that retain sufficient levels of habitat trees. BOMAs based on habitat modelling will comprise solely the 600-1 000ha SMZs.

Responsibility: NRE (Forests Service; Regions)

6. All confirmed nesting and roosting sites utilised recently and frequently (based on reliable observation or physical evidence such as pellets or wash) **located outside BOMAs** will be protected by a 3ha SPZ around the site and a 250-300m radius (or equivalent linear area) SMZ buffers around identified localities, unless they are already protected.

Responsibility: NRE (Forests Service; Regions)

7. Timber harvesting will be excluded from SPZs, and prescriptions will be applied within SMZs to protect hollow-bearing trees for owls and prey species along with younger trees that may provide hollows in future. These areas will be managed to maintain habitat capable of supporting adequate populations of birds and arboreal prey mammals to support breeding owls. Special Management Zone Plans will be prepared specifying the prescriptions to be applied within SMZs for Barking Owl and will become part of the relevant Regional prescriptions.

Responsibility: NRE (Forests Service; Regions)

Protection in conservation reserves

8. Locate, monitor and protect all known Barking Owl sites within the parks and reserves system. In larger parks and reserves, identify BOMAs of at least 500ha of continuous suitable habitat that can be managed to be free

of significant disturbances. In smaller conservation reserves, protect as much suitable habitat as possible and endeavour to obtain co-operative management from adjoining landowners.

Responsibility: Parks Victoria

9. Avoid the development of intensive recreational facilities near known nesting and roosting trees and discourage public access to breeding areas.

Responsibility: Parks Victoria

Protection on other Crown land

10. Other Crown land having owl conservation value and suitable habitat will be identified as part of the assessment process and exempted from disposal, or sold with a caveat that includes site protection measures equivalent to those in Point 4 (above) as a minimum, dependent on land size, location and reservation status.

Responsibility: NRE (Parks, Flora and Fauna Division; Regions)

Protection on private land

11. Through the local planning scheme, encourage and assist Municipal Councils to incorporate protection overlays for owl habitat and breeding sites across private land.

Responsibility: NRE (Regions), local government authorities

12. Ensure, using provisions of local planning schemes, the **Flora and Fauna Guarantee Act 1988** and the **Planning and Environment Act 1987**, that Municipal Councils meet objectives and obligations to protect owl habitat on private land when considering land-use change. Municipal Councils should be encouraged to liaise with NRE over owl conservation matters.

Responsibility: NRE (Regions), local government authorities

13. Encourage private landowners to enter into voluntary agreements (e.g., *Trust for Nature* covenants, *Land for Wildlife* scheme) to protect owl sites on private land across the range of the species. Planning permit applications (subdivision, native vegetation clearing, mining etc.) will be assessed to evaluate and prevent or minimise loss or deterioration of Barking Owl habitat. Private landowners will be encouraged to protect scattered trees on farmland.

Responsibility: NRE (Parks, Flora and Fauna Division; Regions), Trust for Nature, Catchment Management Authorities, local government authorities

Community involvement and extension

14. Prepare and distribute an information pamphlet and record card to reach potential observers through established networks such as *Birds Australia*, *Bird Observers Club of Australia*, *Field Naturalists Club of Victoria*, *Land for Wildlife* scheme, *Victorian National Parks Association* and the *Trust for Nature*, to encourage the community to report known nest sites, roosting sites and general sightings of the Barking Owl.

Responsibility: NRE (Parks, Flora and Fauna Division)

Research

15. Encourage universities, Birds Australia and the Arthur Rylah Institute for Environmental Research to collect data for habitat modelling and conduct research into the habitat requirements, dynamics and density of Barking Owl populations, impacts of forest management practices on nest site availability, prey density, recruitment, hollow ontogeny, home range requirements and dispersal capabilities throughout Victoria.

Responsibility: NRE (Parks, Flora and Fauna Division; Forests Service), Parks Victoria

16. Assess effectiveness of alternative management strategies, using empirical research where possible and (if appropriate) analytical tools such as Population Viability Analysis. Devise strategies for developing new habitat.

Responsibility: NRE (Parks, Flora and Fauna Division; Forests Service), Parks Victoria

Monitoring and review

17. Monitor selected pairs of Barking Owls to determine details of habitat use, population trends and site fidelity. Monitor populations to determine success of management actions.

Responsibility: NRE (Parks, Flora and Fauna Division; Forests Service), Parks Victoria

18. Review and apply the results of research findings to the management prescriptions determined above, especially in relation to home range and population viability.

Responsibility: NRE (Parks, Flora and Fauna Division)

Other desirable actions

19. Trial the use of Barking Owl nest-boxes as temporary substitutes for tree hollows at selected sites, particularly in box-ironbark forests and on private land. Trials should commence in areas currently occupied by owls to determine their efficacy with this species.

20. Conduct diet studies for the Barking Owl in all major habitat types occupied by the species. Densities and population dynamics of main prey items in each habitat should be used to refine territory size estimates.
21. Undertake telemetry studies to determine dispersal and recruitment of young birds into the established population, and movements and home range size of breeding adults.

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Compiled by Nick Clemann and Richard Loyn, Arthur Rylah Institute, Department of Sustainability and Environment.

Further information can be obtained from Department of Sustainability and Environment Customer Service Centre on 136 186.

Flora and Fauna Guarantee Action Statements are available from the Department of Sustainability and Environment website: <http://www.dse.vic.gov.au>

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