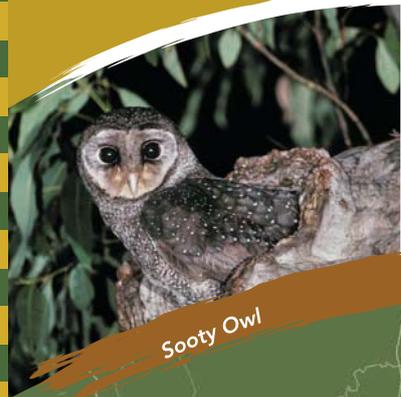
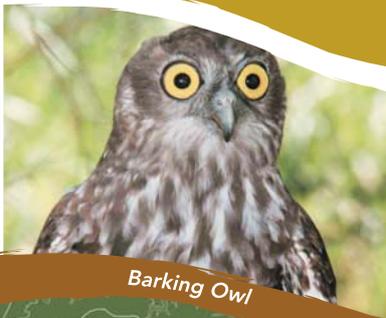


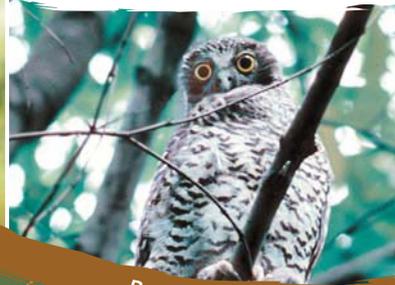
# LARGE FOREST OWLS



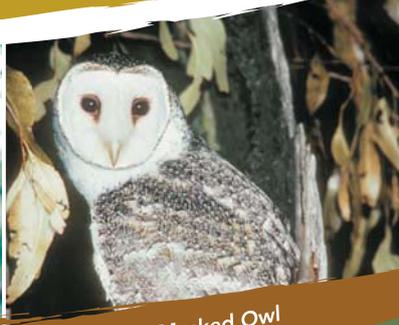
Sooty Owl



Barking Owl



Powerful Owl



Masked Owl

## CONSERVATION ACTION STATEMENT

June 2005



*Dedicated to a better Brisbane*

# LARGE FOREST OWLS

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# LARGE FOREST OWLS



## 1.0 Introduction

Brisbane is recognised as one of the most biologically diverse capital cities in Australia, supporting some 1500 plant species, 523 vertebrate animal species and innumerable invertebrate species.

Brisbane is also part of one of the fastest growing urban regions in Australia. This growth is placing significant pressure on the ecosystems and wildlife of the city. Population pressures and urban development, resulting in the loss and fragmentation of habitat, continue to be the greatest threats to the protection of biodiversity (Brisbane SOE 2001). Since 1990 the rate of clearing has decreased markedly. However, even with no further loss of habitat, some existing flora populations within the city are at risk of local extinction because the small, isolated, remaining habitat areas cannot support them. Other significant threats include pest animals and plants and inappropriate fire regimes. The challenge is to maintain and restore the city's biodiversity while accommodating urban growth.

Brisbane City Council has responded to this challenge with the Brisbane City Biodiversity Strategy, an important part of Council's *Living in Brisbane 2010* vision for a clean and green city. The strategy outlines a range of initiatives designed to secure the long-term conservation of the city's outstanding biodiversity values using available public, community and industry resources. Conservation Action Statements are among these initiatives.

Conservation Action Statements clearly state Council's management intent for the city's most threatened species, and outline key strategies and actions for their management in Brisbane. This Conservation Action Statement addresses the following large forest owls, which are identified as significant species within Brisbane as per Council's Natural Assets Planning Scheme Policy (Brisbane City Council 2000, *Brisbane City Plan*, vol 2, schedule 4):

- ① powerful owl (*Ninox strenua*)
- ② barking owl (*Ninox connivens*)
- ③ masked owl (*Tyto novaehollandiae*)
- ④ sooty owl (*Tyto tenebricosa*).

This Conservation Action Statement will be updated every two to five years to reflect new information and progress on conservation actions. For more information about this or any other Conservation Action Statement, visit Council's website at [www.brisbane.qld.gov.au](http://www.brisbane.qld.gov.au) or phone Council on 3403 8888.

## 1.0 Introduction continued..

### Aims

This Conservation Action Statement details Council’s management intent for long-term protection and conservation of significant forest owls within Brisbane by:

- collating **existing information** on the distribution, ecology and management requirements of these species within Brisbane and surrounds
- identifying **key threats** that significantly impact upon these species within Brisbane
- identifying **gaps in existing knowledge** of the habitat and management requirements of these species and research priorities
- detailing **practical and affordable strategies and actions** that support the long-term protection and conservation of these species within Brisbane.

## 2.0 Conservation Status

The conservation status of a species will influence how it is managed. ‘Threatened’ species are typically accorded a more stringent management regime than ‘common’ species. Various conservation registers identify the status of fauna species at local, state and national levels. The current conservation status of the large forest owls is provided in **Table 1**.

**Table 1: Official Conservation Status of Brisbane City’s Large Forest Owls**

Species	Brisbane City <sup>1</sup>	Queensland <sup>2</sup>	National <sup>3</sup>
Powerful Owl	Significant	Vulnerable	Not listed
Barking Owl	Significant	Common	Not listed
Masked Owl	Significant	Common	Not listed
Sooty Owl	Significant	Rare	Not listed

<sup>1</sup> Brisbane City Council 2000, *Brisbane City Plan 2000*, Natural Assets Planning Scheme Policy, vol. 2

<sup>2</sup> *Queensland Nature Conservation (Wildlife) Regulations 1994* under the *Nature Conservation Act 1992*

<sup>3</sup> *Environment Protection Biodiversity Conservation Act 1999*

## 3.0 Distribution<sup>1</sup>

### National/State

#### Powerful Owl

- Extends from western Victoria to the north of Eungella in Queensland through the sub-tropical and temperate climatic zones of eastern Australia (Garnett and Crowley 2000; Bureau of Meteorology 2003).
- Occurs mostly on the coastal side of the Great Dividing Range and adjacent inland slopes (Pavey 1993; Higgins 1999; Garnett and Crowley 2000).
- Historical range is thought to coincide with the species’ current distribution despite extensive areas of range no longer providing suitable habitat.
- Occupies habitat in suburban Brisbane, Melbourne and Sydney (Garnett and Crowley 2000).

## 3.0 Distribution<sup>1</sup> continued...

### National/State continued...

#### Barking Owl

- Sparsely distributed from about Cooktown in Queensland to the Flinders Ranges in South Australia and extending inland to the Lake Eyre, Bulloo and Murray/Darling basins.
- Distribution coincides with the tropical, subtropical, temperate and grassland climatic zones of eastern Australia (Bureau of Meteorology 2003).
- A separate population is believed to exist in the temperate climatic zone of south-west Western Australia (Higgins 1999) but no birds were located in a recent survey of 100 sites (Garnett and Crowley 2000).
- Current distribution accords with the historical range, but local declines and extinctions have been recorded in north Queensland, and much of NSW, Victoria and South Australia.

#### Masked Owl

- Sparsely distributed through the subtropical and temperate climatic zones of sub-coastal mainland Australia from the Fraser Island area in Queensland to Carnarvon in Western Australia.
- Occurs inland of the Great Dividing Range.
- Has largely disappeared from about Spencer's Gulf in South Australia to the south-west corner of Western Australia (Schodde and Mason 1980; Smith et al. 1995; Higgins 1999). Recorded recently in only five of 100 sites in the southern forests between Margaret River and Manjimup in Western Australia (Garnett and Crowley 2000).

#### Sooty Owl

- Found throughout the sub-tropical and temperate climatic zones of coastal eastern Australia between the Clarke Range in central Queensland and the Dandenong Ranges in Victoria (Higgins 1999; Bureau of Meteorology 2003).
- The disjointed historical distribution coincides with the present range despite local declines and extinctions principally from the Big Scrub area of northern NSW, and probably central Gippsland.
- Range in north-east NSW is estimated at 80% of pre-European extent (Garnett and Crowley 2000).

### Local

#### Powerful Owl

Most sightings of the powerful owl occur within the southern and western suburbs, including records from Mt Coot-tha, Toohey Forest, and Burbank/Sheldon.

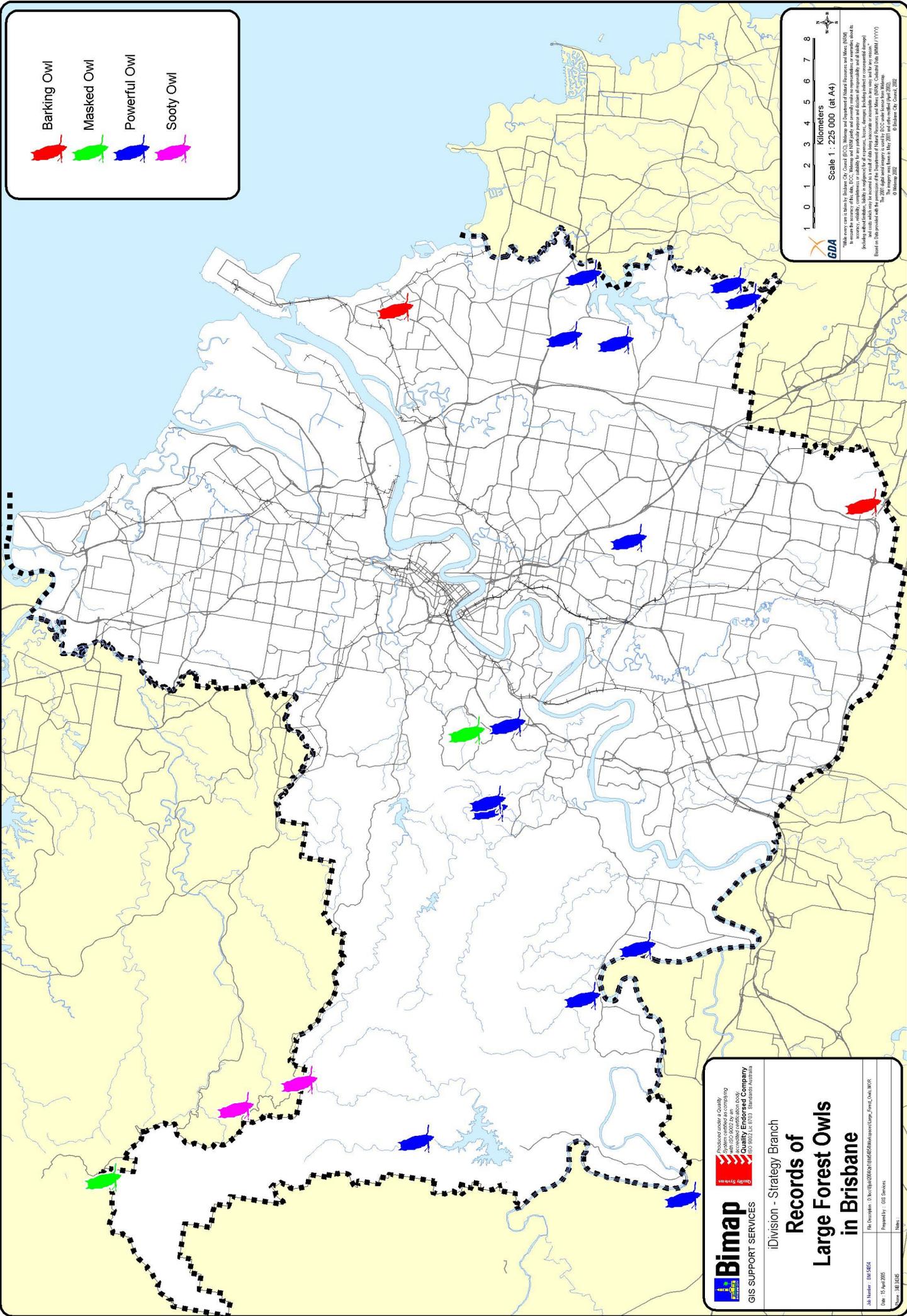
#### Barking Owl

The small number of records of the barking owl are associated with heavily vegetated areas such as riparian vegetation at Kedron Brook and Barellan Point/Karana Downs.

#### Masked Owl and Sooty Owl

Most sightings of these species are from the western suburbs including records from Mt Nebo and Mt Glorious (Brisbane Forest Park).

Verified records of large forest owls in Brisbane are shown on **Map 1**.



**Barking Owl**  


**Masked Owl**  


**Powerful Owl**  


**Sooty Owl**  



**GDA**  
 Scale : 225 000 (at A4)  
 1 0 1 2 3 4 5 6 7 8  
 Kilometers  

 This map was prepared by Bimap Pty Ltd. under license from the Queensland Government. It is based on data provided to Bimap by the Queensland Government. The 2011 State of Queensland (SoQ) is the most up-to-date version of the SoQ. The 2011 State of Queensland (SoQ) is the most up-to-date version of the SoQ. The 2011 State of Queensland (SoQ) is the most up-to-date version of the SoQ.


**Bimap**  
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 Brisbane, Australia

iDivision - Strategy Branch  
**Records of Large Forest Owls in Brisbane**

Job Number: BM-5824	File Description: D:\GIS\BIMAP\GIS\BIMAP\Records of Large Forest Owls in Brisbane
Date: 15 April 2025	Prepared by: GIS Services
Drawn: 18/11/24	Map:

## 4.0 Ecology<sup>2</sup>

### Habitat

#### Powerful Owl

- Occupies large areas.
- Inhabits eucalypt forests and prefers tall wet sclerophyll forests with densely vegetated rainforest gullies.
- Also inhabits marginally lower or drier forests that contain prey and large hollows (Morcombe 2000).
- Often roosts in dense closed forest vegetation, eg. rainforest, mangroves and pine plantations (Chafer 1992; Kavanagh and Jackson 1997; Higgins 1999).
- Mt Coot-tha birds are known to roost in denser vegetation along creek lines.
- A NSW study indicates that the species can persist in harvested forest mosaics by nesting in unharvested patches and hunting within harvested patches (Garnett and Crowley 2000).
- Some research indicates the species is absent in forests less than 70 years old but other research indicates that the species is likely to occur at similar frequencies in harvested and unharvested forests (Pavey 1993; Kavanagh et al. 1994, 1995, cited in DNR 1999). Absence/presence may be linked to availability of hollow habitat trees which partly depends on forest management practice.

#### Barking Owl

- Occupies open forested areas with stands of trees, densely vegetated waterlines and paperbark swamps in north and north-west Australia (Morcombe 2000).
- Southern subspecies occurs primarily in dry sclerophyll woodlands, particularly associated with riparian vegetation in the south-west, and with forest edges in the south-east (Garnett and Crowley 2000).

#### Masked Owl

- Southern subspecies inhabits a diverse range of wooded sub-coastal habitats that provide large hollow-bearing trees for roosting and nesting (Kavanagh and Murray 1996; Higgins 1999).
- Habitats include forests, remnants within agricultural land or almost treeless inland plains and watercourses. Nest and roost sites are often located in riparian forest (Garnett and Crowley 2000).

#### Sooty Owl

- Inhabits tall wet eucalypt forests in coastal and near coastal ranges and prefers steep densely vegetated areas (Morcombe 2000; Higgins 1999).
- Mt Nebo birds roost in rainforest with dense vine understorey (Beruldsen 1980).
- Uses hollows in eucalypts, figs and rainforest trees (DNR 1998). Also nests in caves (Morcombe 2000).

## 4.0 Ecology<sup>2</sup> continued...

### Diet

#### Powerful Owl

- Hunts mostly in open forest or woodland and may hunt in regrowth forest, or even suburban areas next to forests (Chafer 1992; Pavey 1993; McNabb 1996).
- Preys mainly on medium-sized mammals such as gliders, possums and flying foxes (Pavey 1995; Higgins 1999). Common ringtail possums constitute the major prey item throughout the species' range (DNR 1999).
- Mt Coot-tha birds' diet consists of common ringtail possums (23%), birds (28%) and fruit-bats (28%) whereas in 1987, Toohey Forest birds' diet consisted of sugar/squirrel gliders (52%) and common ringtail possums (33%) (Pavey 1993; Pavey 1995).
- Prey is captured from branches of trees in the canopy and from shrubs of the understorey (Higgins 1999).

#### Barking Owl

- Mostly forages amongst trees or in woodland edges or clearings (Higgins 1999).
- Diet during the non-breeding season is predominantly insects, which is supplemented with birds and mammals (particularly small gliders and rabbits) during breeding season (Kavanagh et al. 1995; Higgins 1999).

#### Masked Owl

- Usually hunts in open country or adjoining woodlands (Debus 1993; Peake et al. 1993; Kavanagh and Murray 1996). Also hunts in closed forest such as rainforest and vine forest (DoE 1999; Kavanagh and Murray 1996).
- Prefers areas that have a mosaic of dense and sparse groundcover. Also frequents the transitional area between forest/woodland and disturbed areas or clearings (Higgins 1999).
- Prey consists principally of ground-dwelling mammals (eg. rodents and marsupials); occasionally takes arboreal mammals and birds (Higgins 1999).

#### Sooty Owl

- Usually forages in dense forest, particularly rainforest gullies (Debus 1994).
- Sometimes forages in drier forest surrounding gullies and will occasionally use open habitats next to wet forests (Kavanagh and Jackson 1997).
- Prey includes terrestrial and arboreal mammals, birds, reptiles and insects (Higgins 1999).

## 4.0 Ecology<sup>2</sup> continued...

### Reproduction

#### Powerful Owl

- Breeds from April to September in open or closed sclerophyll forests (Debus and Chafer 1994) (**Table 2**).
- Often nests in hollows of large forest trees below the living foliage; may reuse nests annually (Pavey 1993).
- Hollows are typically 50–150 centimetres in diameter. Suitable tree hollows may be in trees up to 500 years old (Garnett and Crowley 2000).
- A male prepares a wood dust floor in the hollow; then the female lays 1-2 eggs (54 by 45 millimetres in size).
- Incubation takes 36-38 days, during which time the male feeds the female at the nest. Juveniles first fly at around eight weeks of age, but are dependent on the parents for several months (Morcombe 2000).

#### Barking Owl

- Breeds from July to September across northern Australia and from August to October in the south (Morcombe 2000) (**Table 2**).
- Nests in hollows mainly in large live eucalyptus, in woodland or open forest, usually near watercourses or wetlands, and occasionally nests in other large trees such as paperbarks (*Melaleuca* spp.) (Kavanagh et al. 1995). Hollows are usually an unlined shallow depression.
- Clutches consist of 2-3 eggs (48 by 38 millimetres), incubated by the female for 36 days. Fledging occurs at 5-6 weeks (Morcombe 2000).
- Home territories are aggressively defended all year round (Higgins 1999).

#### Masked Owl

- Usually breeds from March to July, but may breed at other times if prey is abundant (Morcombe 2000) (**Table 2**).
- Nests in hollows in trunks and near vertical sprouts of large trees.
- Usually nests in living eucalyptus trees (Kavanagh and Murray 1996; Peake et al. 1993).
- Nests are often in prominent trees, either isolated or emergent, in forest, woodland and remnant patches (Kavanagh and Murray 1996; Higgins 1999).
- Clutches consist of 2-4 eggs (47 by 40 millimetres), incubated by the female for 38-42 days.
- Chicks leave the hollow at about 10-12 weeks of age but stay near the nest site and are fed by the adults for several months (Morcombe 2000).

## 4.0 Ecology<sup>2</sup> continued...

### Reproduction continued...

#### Sooty Owl

- Breeds mainly in winter, with courtship from March to April, incubation from June to July, and nestlings found until October (Table 2).
- Nests in the hollows of tall emergent tree trunks, mainly eucalyptus, usually within wet sclerophyll forest or rainforest, sometimes at the edge of rainforest (Debus 1994; Higgins 1999).
- Nests are used repeatedly (Garnett and Crowley 2000).
- Roosts and nests in high hollows and caves (Morcombe 2000).
- Clutch size is 1-2 eggs; eggs are 47 by 40 millimetres in size and incubation is about six weeks.
- Chicks leave the hollow at about six weeks of age but stay near the nest site and are fed by the adults for several months (Morcombe 2000).

Table 2: Breeding Seasons (green shading indicates breeding months)

Species	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Powerful Owl												
Barking Owl												
Masked Owl												
Sooty Owl												

### Movement Patterns

#### Powerful Owl

- Sedentary, occupying home ranges (300-1500 hectares) within open eucalyptus, casuarina or callitris forests and woodlands. Birds have been recorded further inland than the Great Dividing Range (NSW National Parks and Wildlife Service 1999), revealing this species' ability to travel large distances.

#### Barking Owl

- Sedentary or resident species; no evidence of regular long distance movement.
- Little detail available about the size of its home range and estimates are only speculative (Higgins 1999).

#### Sooty Owl

- Sedentary throughout its range.
- Considered strongly territorial with apparently permanent territories which range in size from about 300-3000 hectares (Higgins 1999).

#### Masked Owl

- Mainland subspecies considered sedentary or resident (Higgins 1999)
- Pairs have a home territory in the range 500-1000 hectares.

## 5.0 Threats<sup>3</sup>

### Habitat Loss, Fragmentation and Simplification

- Loss of preferred habitat is the main threat to the large forest owls (Garnett and Crowley 2000). The predominate threat to the barking owl is reduction in dry sclerophyll forest. Clearing, particularly for agriculture, has contributed to the present status of both sooty and masked owl species (Garnett and Crowley 2000).
- Since European settlement, an estimated 67,000 hectares, or two-thirds, of the original woody vegetation in Brisbane has been cleared. This includes approximately 90% of lowland forests and more than 80% of all lowland vegetation (below 100 metres elevation). Habitat fragmentation is extensive; around 80% of bushland remnants remaining in the city are less than 20 hectares (BCC 2001).
- Smaller remnants of habitat typically present sub-optimal breeding habitat conditions and potentially lead to increased nesting failures, reduced recruitment rates and possible population collapse. Important factors here are competition, predation and nest site disturbance by human-related activities.
- Smaller habitat patches, especially in urban landscapes are more prone to inappropriate fire regimes, weed invasion and subsequent changes to structural and floristic diversity and prey species composition. These changes create sub-optimal breeding and foraging conditions. Typically, smaller remnants support fewer species and smaller average sized prey.
- Remaining habitat patches are increasingly exposed to more disturbances from human-related activities and can lead to nest abandonment and breeding failure.

### Loss of Old Growth Trees and Wildfire

- Garnett and Crowley (2000) identify loss of old growth trees and wildfire as national threats for the powerful owl.

## 6.0 Conservation

Several Brisbane City Council biodiversity initiatives are contributing to the protection and management of large forest owls and their habitat across the city. Key initiatives include:

- **Bushland Acquisition Program:** Through this program more than 1900 hectares of the city's most significant lowland habitats have been purchased and protected to date.
- **Conservation Partnerships:** More than 240 private properties have established conservation partnerships with Council, covering some 750 hectares of principally lowland habitats in significant raptor habitat areas.
- **Conservation Reserve Estate:** More than 12,500 hectares of parkland including 7000 hectares of bushland and wetland reserves are managed and protected. This reserve network provides habitat for Brisbane's significant species.
- **Natural Assets Local Law:** Under the Natural Assets Local Law 42% of the city area is now better protected from pre-emptive clearing.
- **Brisbane City Council City Plan:** The City Plan designates a green space system throughout the city to recognise and protect the contribution of open space areas to ecological functions. The City Plan's Biodiversity Code and supporting Ecological Assessment Guidelines provide performance criteria and acceptable solutions to protect significant biodiversity values on, or adjacent to, proposed development. The City Plan also includes statutory schedules of flora and fauna species considered significant in Brisbane, recognising species significant at a city-wide or regional level.

## 7.0 Research

Two contemporary investigations have been undertaken interstate:

- Kavanagh (1997) conducted an eight-year field study researching the status of the powerful owl, sooty owl and masked owl in New South Wales. The owls were found to 'partition their environment spatially and temporarily in terms of their preferences for forest floristic types and structural characteristics (macrohabitat), their preferences for types of tree-hollow nests and roosting locations (microhabitat), and their dietary preferences (foraging habit)' (Kavanagh 1997).
- Natural Resources and Environment in Victoria (2001) have undertaken potential habitat modelling for large forest owls. Results of the modelling were used by forest and fauna managers to determine special protection zones for large forest owls.

Collection of bird data is ongoing for the Atlas of Australian Birds project coordinated by Birds Australia (2004). Other community-based data collection activities include those undertaken for NatureSearch through the Environmental Protection Agency.

## 8.0 Management Intent

### Strategies

Brisbane City Council intends to contribute to the long-term conservation of large forest owls in the city by:

- adopting and encouraging innovative voluntary and statutory mechanisms that protect important habitats and movement corridors
- ensuring appropriate ecological assessment, reporting and survey procedures are adopted in the development, planning and management activities
- encouraging land management practices that avoid, or minimise, direct and indirect impacts on large forest owls and their habitats on both public and private lands
- ensuring the timely availability of accurate, adequate and contemporary information for policy, planning and management decisions
- facilitating research that targets priority information gaps and contributes positively to the conservation of Brisbane's large forest owls and their habitats
- providing the Brisbane community with appropriate information and opportunities to contribute in a practical way to better understanding and protecting Brisbane's large forest owls.

## 8.0 Management Intent continued...

### Actions

**Table 3** describes priority conservation actions that Brisbane City Council will pursue with its partners to address the stated strategies. These priority actions have been drawn from studies undertaken for Council by recognised owl experts and consultation with a range of stakeholders. Actions will be undertaken as funds become available through Council's budgetary process. It should be recognised that Council must consider the timing of these actions against other priorities across the whole of the city.

**Table 3: Management Actions**

Management Aspect	Action	Timing	Lead Agent and Key Stakeholders
Habitat Protection	Conserve and protect important large forest owl habitat on privately owned land within Brisbane, through Council acquisition of significant habitat (Bushland Acquisition Program) and conservation partnerships (Voluntary Conservation Agreements and Land for Wildlife).	Ongoing	Brisbane City Council (BCC)
Habitat Management	Undertake pilot project to monitor and refine nest site and habitat management guidelines.	Commence 2006	BCC; Queensland Museum; Universities
Information Management	Establish nest site register for monitoring large forest owl population trends and habitat preferences.	Establish 2005	BCC
	Develop cost-effective method for monitoring the distribution and abundance of large forest owls.	Commence 2006	Environment and Parks (BCC); Birds Australia; Queensland parks and Wildlife Service; Universities
Community Involvement	Support one large forest owl ID workshop/training event each year.	Commence 2005	BCC; Queensland Museum
	Trial community-based large forest owl survey.	Commence 2005	BCC; Community conservation groups

## 8.0 Management Intent continued...

### Guidelines

The habitat protection and management guidelines detailed in **Table 4** are provided to better assist land owners, land managers, the development industry and the broader community in planning and undertaking land use activities that may otherwise disturb large forest owls and/or their habitat. These guidelines are preliminary and will be refined as more information about these species and their habitat requirements becomes available.

**Table 4: Habitat Management Guidelines**

Issue	Guideline	Explanatory Notes
Nest Site Disturbance	Establish and maintain a 100-metre protective zone that excludes clearing around nest sites. Protect active nests from other activities during the breeding season.	Nest site buffers are an established management tool designed to protect breeding birds and nest sites from unnecessary disturbance, especially during the breeding season. A nest site buffer should be maintained in, or restored to, its natural (pre-clearing) state. Maintenance of nest site buffers may include protection of nest sites deemed vulnerable to wildfire through removal of fuel loads from the base of trees (see Fire Management section for specific fire regime information).
	Pre-start surveys of known or likely habitat to be undertaken prior to work commencing.	Prior to any works commencing, regardless of season, a suitably qualified and/or experienced professional should undertake an inspection of known or likely habitat. This will establish whether large forest owls are still active and whether any specific work design or scheduling considerations are needed to avoid or mitigate significant impacts.
	Works are to occur outside the breeding season.	Large forest owls may be highly sensitive to any disturbance near an active nest site during the breeding season. Maintenance of existing infrastructure or new works should be scheduled so as to avoid the breeding season. Where this is not possible, works should be timed to occur after nestlings have fledged. The broad breeding season for each species is shown in <b>Table 2</b> .
	Nest site locality information to be confidential and made available on a need-to-know basis.	Public identification of known nest sites may introduce the threat of illegal collection. The taking of eggs or nestlings is an illegal act. Prosecution provisions are provided through the <i>Nature Conservation Act 1992</i> .

continued over page >>

## 8.0 Management Intent continued...

### Guidelines continued...

**Table 4: Habitat Management Guidelines continued...**

Issue	Guideline	Explanatory Notes
Fire Management	Adopt controlled burn regimes that minimise threat to raptor nest sites and breeding birds where possible.	<p>Planned or unplanned fires may place an active nest and/or breeding birds at risk. The presence of a fire and associated smoke and noise may cause adult birds to abandon eggs, chicks, or potential nest sites. Depending on fuel loads, weather and other factors, fire may destroy a nest site completely or render the site and surrounding habitat unsuitable. Following fire, eggs or nestlings may be at greater risk of predation from opportunistic species attracted to the area by the fire event.</p> <p>The intensity, frequency and timing of prescribed burns should be consistent with specific guidelines but must primarily take into account the requirements of vegetation types and ecosystems as functional and integrated ecological entities.</p>
	Reduce fuel loads around known nest trees prior to planned burns occurring.	To minimise the chance of a nest tree being damaged or destroyed by fire, fuel reduction around the tree should occur prior to any planned fire occurring. This may involve simply raking fuel away from around the tree, up to a distance equivalent to that of the outer canopy.
Water Course Protection	Implement as appropriate the nominated water course protection zone prescriptions for all areas identified as roosting/nesting sites for large forest owls.	The Species Management Profile for the sooty owl recommends the application of water course protection zones to provide undisturbed breeding habitat for this species in wet sclerophyll areas (DNR 1998). Kavanagh et al. (1995) identify watercourses and wetlands as important areas for barking owl nest sites. Powerful owls are known to nest along creek lines at Mt Coot-tha and in Toohey Forest. Schodde and Mason (1980) identify hollows in large trees near watercourses as important for the masked owl.

## 9.0 Further Information

### Agencies

- Australian Raptor Association ([www.ausraptor.org.au](http://www.ausraptor.org.au))
- Birds Australia ([www.birdsaustralia.com.au](http://www.birdsaustralia.com.au))
- Birds Queensland ([www.birdsqueensland.org.au](http://www.birdsqueensland.org.au))
- Brisbane City Council ([www.brisbane.qld.gov.au](http://www.brisbane.qld.gov.au))
- Department of Environment and Heritage ([www.deh.gov.au](http://www.deh.gov.au))
- Environmental Protection Agency/Queensland Parks and Wildlife Service ([www.epa.qld.gov.au](http://www.epa.qld.gov.au))
- Handbook of Australian, New Zealand and Antarctic Birds ([www.birdsaustralia.com.au/hanzab](http://www.birdsaustralia.com.au/hanzab))
- Queensland Museum ([www.qmuseum.qld.gov.au](http://www.qmuseum.qld.gov.au))

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