

Survey Standards: Masked Owl, *Tyto novaehollandiae*

1 Purpose

This document outlines the standards required for surveying fauna species listed under the *Flora and Fauna Guarantee Act 1988* (FFG Act). These standards detail acceptable survey methods and the minimum survey effort to determine the likelihood of the species' presence or absence at a site. They also detail appropriate record keeping and reporting standards.

There are two main purposes of these standards.

1. To document the information required to determine if a record is valid – i.e. determining presence only. The standards provide the information that is required to enable an assessment to be made as to whether a record can be accepted as a valid record. All records, irrespective of how they are obtained, need to adhere to these standards.
2. To document the information required for surveys that aim to determine both presence and absence – i.e. outlining the acceptable level of survey effort required to provisionally infer absence if a species is not detected during a survey. These minimum standards are required to be met by any organisation/group undertaking a presence/absence survey. They will also be useful for an organisation/group to assess if an area is unlikely to provide core habitat for a wide-ranging species.

Executing and reporting a survey to these standards will support the Department of Sustainability and Environment (DSE) to make an assessment of the validity of a claim to species presence or absence at a site. Subject to DSE approval, alternative survey methods may be applied where the proponent provides an evidence-based rationale for the approach and a detailed description of the survey technique(s) and where the standards are considered to exceed those set out below.

These standards should be read in conjunction with threatened species Action Statements. In the context of timber harvesting operations they should be read in conjunction with the Code of Practice for Timber Harvesting and Forest Management Plans. As further information about the species and survey techniques becomes available, these standards will be reviewed and updated. Recent technological advances in automated recording systems (e.g. Songmeter) may prove useful for assessing the use of specific sites by Masked Owls and nocturnal birds in general, allowing data to be collected efficiently over many nights.

2 Introduction

The Masked Owl *Tyto novaehollandiae* is listed under the FFG Act, and categorised as Endangered in Victoria (DSE 2007). An Action Statement has been published (DSE 1996). There are forest management prescriptions for this species under Forest Management Plans.

The species is widely but sparsely distributed in Victoria, mainly south of the Great Divide. It is much more rarely reported than other forest owls, and relatively little is known about its ecology and habitat requirements. Its major stronghold in Victoria is in the heathy coastal forests of East Gippsland (Peake *et al.* 1993), with other scattered populations

across the central and western Gippsland foothills and in the Otway Ranges and nearby coastal forests extending to the south-west (Emison *et al.* 1987, Loyn *et al.* 2004). The species uses mosaics of forest and cleared farmland (McNabb *et al.* 2003) and is sometimes considered an edge specialist. Many records refer to road-killed individuals.

3 Requirements to demonstrate presence

Four main survey methods can be applied to detect Masked Owls:

1. Evening (dusk) or morning (dawn) watches to listen for an owl calling from or near its daytime roost or nest.
2. Daytime searching for owls and signs of owls such as feathers, faeces, regurgitated pellets or prey remains beneath day roosts.
3. Searching at night, using a vehicle and spotlight.
4. Call playback. Pre-recorded territorial 'shriek' calls are broadcast at ~ 110% of natural volume to elicit an audible or visual response from Masked Owls. Listening is continued after playback whilst a spotlighting search is conducted to search for owls that have responded by flying quietly to the playback site.

3.1 Acceptable records

Masked Owls can be mistaken for other owls with similar appearance or calls, especially Eastern Barn Owl *Tyto javanica* and Sooty Owl *Tyto tenebricosa*. Hence it is extremely important to document the basis on which positive identifications are made. All records of Masked Owl should be supported by a detailed description, preferably with supporting evidence in the form of photographs or recordings of the call. Credible records lacking sufficient detail should be followed up by experienced observers where possible.

Acceptable records are as follows.

1. Clear visual observations of birds by day or night, with good views of the birds showing a combination of diagnostic features. Masked Owls can be easily confused with Eastern Barn Owls, and less easily with Sooty Owls. Masked Owls are larger and more heavily built than Eastern Barn Owls, with stronger feet, more fully feathered tarsi and darker plumage especially on the upperparts and facial mask. Pale individual Masked Owls can look very like Eastern Barn Owls, and dark individuals can look a bit like Sooty Owls (especially at night when the warm honey tones of the plumage are not evident). Photographs will be very valuable supporting evidence.

2. Clear aural observations of birds, including responses to playback. The most distinctive call is described as chattering or cackling, and is sometimes given by birds in circling flight above the forest canopy, perhaps as a display. The harsh shriek is louder and more intense than the similar call of Eastern Barn Owl, and usually given as a single call (whereas Eastern Barn Owls often give long series of calls). Young Sooty Owls give a very similar shriek, but often repeat it many times. Inexperienced observers may mistake nocturnal shrieks of cockatoos or Brush-tailed Possums as Masked Owl. Some of the many alternative calls of Masked Owl (including the chatter) are more distinctive, but variable. Confidence in identification increases with the experience of the observer. Combinations of different calls, or calls and visual observations, can be regarded as diagnostic.

3. Collections of owl pellets or feathers. Pellets and feathers of Masked Owl have some distinctive features compared with other owls, including size and a preponderance of ground-dwelling prey items. However, there is much overlap and large numbers of pellets would need to be available to make a definitive judgement.

3.2 Non-acceptable records

Brief glimpses of Masked Owls or distant detections of a single call cannot be regarded as positive records, even when made by experienced observers. Small numbers of owl pellets or feathers may not be distinguishable with certainty from those of other owls.

3.3 Reporting standards for presence records

The following data are required to support a record of a Masked Owl:

- name and contact details of the observer;
- details of the species present, number of individuals detected or number of observations;
- date and time of sighting;
- precise geographic location of sighting (written location and GPS coordinates);
- details of weather, wind (Beaufort scale – see appendix) and night-light (for nocturnal observations);
- method of observation, including the sampling effort (e.g. duration and sequence of calls used in playback, number of nights, area searched and ground traversed);
- supporting evidence such as photographs, recordings, feathers, owl pellets or road-killed specimens;
- if no material supporting evidence is available, written details of the observation need to be provided. These should include precise information about what was actually seen or heard, and what were the circumstances including duration of observation, quality of light and optical aids used (spotlight, binoculars, etc);
- details of the experience or qualifications of those who made the observation.

This is the core information required for records to be entered onto the Atlas of Victorian Wildlife (or its successor the Victorian Biodiversity Atlas). Records of all other species observed at the site should also be submitted to the Atlas of Victorian Wildlife.

4 Requirements to demonstrate presence or effective absent

While it is relatively straightforward to document if a species is present, it is more difficult to determine if a species is truly absent if it was not recorded during a survey, or if the survey was not adequate to reliably record the species if it was present. The following section outlines the survey requirements for there to be confidence that if a species is not recorded it is effectively absent, or at least the area does not represent core habitat. These include call playback on five nights with good conditions, and duskwatch or dawnwatch sessions if there are reasons for suspecting that Masked Owls are likely to occur.

4.1 Survey effort and resulting level of uncertainty

No explicit estimates have been made of the detectability of Masked Owls in Victoria. However, there is evidence that they are less detectable than Powerful Owls *Ninox strenua*

and Sooty Owls. Work on those species showed that the single-visit detection probability of Powerful Owls is 9-18% in south-eastern NSW or central Victoria (Wintle *et al.* 2005, M. Scroggie *et al.* unpubl.), and the single-visit detection probability of Sooty Owls is 20-33% in south-eastern NSW (Wintle *et al.* 2005) or 7.5 to 10.3% in central Victoria (M. Scroggie *et al.* unpubl.), using 95% confidence limits. It is likely that the single-visit detection rate of Masked Owl is much less than 10%. Based on the mean of 9% for Sooty Owls in central Victoria, 27-38 surveys would be needed to be 95% sure that Masked Owls were absent from a site, or 21-29 surveys to be 90% sure. For owls generally, we expect higher levels of detectability close to the core of the owls' territory or close to the nest site or regular roost sites, and suggest that if five surveys are conducted at a site on different nights, under good conditions, with no success, it is unlikely that those owls would be nesting or roosting regularly close to that site. This concept may or may not be valid for Masked Owl, and data are needed to address the question.

From a management perspective, the most useful information is when nest sites or regular roost sites are located. These require special management (20 ha SMZ or SPZ) under the Action Statement. They may also be used to argue for revisions and additions to the system of protected Masked Owl Management Areas (including Special Protection Zones in State Forest) that have been developed using records of Masked Owls from multiple sources, combined with habitat models. For Masked Owl in particular, any records are useful (not just breeding or roosting site records) in advancing our knowledge and improving the system of MOMAs.

4.2 Reporting standards for presence/absence surveys

The data required for the "presence only" reporting (refer section 3.3), also needs to be provided for the presence/absence surveys, with this information provided for all surveys, including those that did not detect the species. Additional data required to document presence/absence surveys is outlined below.

- date, time and location of all surveys;
- for call playback surveys, it is important to record the sequence of calls used and the times and locations of each survey, including those where no responses were obtained. The time spent spotlighting and distance traversed should be recorded;

5 Survey methods

5.1 Call playback

Call playback surveys can be effective at any time of year, with little seasonal variation in effectiveness. They are best conducted during calm, dry weather, although they can be conducted during light rain. Once an owl is detected, the playback should be discontinued to allow the owl to resume its normal activities as soon as possible. A compass bearing is taken and distance is estimated to plot the location of the owl. Call playback approximately doubles the chance of detecting an owl at night, compared with passive listening. Masked Owls are notoriously difficult to detect during call playback surveys and often utter only one brief shriek in response. Males will occasionally respond by circling high over the canopy making soft chattering sounds.

Masked Owl calls can be heard during calm, fine weather from up to 1 km away. Therefore, when sampling extensive areas, it is recommended that sites should be at least 2

km apart. Care must be taken to avoid repeat counts of the same owl from two sites. However, when sampling smaller areas (such as proposed logging coupes), it may be necessary to conduct several playback surveys from different parts of the area, especially where complex topography may inhibit detection of calls across ridges or gullies. When surveying for multiple owl species, sites are <3 km apart because other species may be audible at greater distances than Masked Owls.

Call playback sessions include playing the 'shriek' six times at ~30 sec intervals over 2 min. A 2 min period of silence (listening) follows before a session (~1 minute) of chattering is played. This chattering may evoke a response from an owl that has approached but otherwise been silent. The recommended method for call playback surveys for Masked Owl comprises the following sequence:

1. Masked Owl --- 'shriek' call once per 30 sec., total 2 mins
2. Silence (listening) --- 3 mins
3. Masked Owl --- 'shriek' call once per 30 sec., total 2 mins
4. Silence ---- 2 mins
5. Masked Owl --- chatter, ~1 minute
6. Silence --- 2 mins
7. Spotlight searching --- 15 mins/~200m

If conducting simultaneous surveys for other owl species (e.g. Sooty Owl, Powerful Owl and Barking Owl *N. connivens*), the playback sequence may include calls of these species punctuated with listening periods between each species. The Masked Owl calls should come at the end of the sequence so that if birds respond with a single shriek (as they typically do) the response is not obscured by further playback.

5.2 Dusk or dawn watch

Daytime searching and dusk or dawn watches are the appropriate methods for determining the accurate locations of day roosts or nests when Masked Owls are already known to occupy a tract of forest or woodland.

Dusk or dawn watch should be conducted only during calm, fine weather when ambient noise levels are low. Masked Owls often call prior to settling at their daytime roost, thus providing a clue about the location of a roost or nest. Morning dawn watch is conducted from one hour before sunrise until sunrise. On hearing the last predawn calls, a compass bearing is taken. When full daylight comes, the searcher can follow the compass bearing searching for roosting owls, signs or a nest.

Similarly, the first evening call is often made from at or near the roost or nest. Evening dusk watch should commence before sunset, in calm, fine weather when ambient noise is low. The dusk watch should continue until an owl is detected or for half an hour after daylight has completely faded. A compass bearing to the calling owl provides a direction in which the observer can search during the following day.

This technique while useful to record the presence of the species can not be used reliably to infer species absence or that the area does not represent core habitat.

5.3 Daytime searching

Searches are conducted on foot during daylight hours, to locate roost or nest sites. When conducted in random sites, this method is labour-intensive and impractical because of the Masked Owl's scarcity, cryptic habit and use of difficult terrain. However, success rates are substantially improved when skilled and vigilant observers target searches on key habitats near known locations for this species.

This technique while useful to record the presence of the species can not be used reliably to infer species absence or that the area does not represent core habitat.

5.4 Searching at night

This method is not generally recommended for owls, except in conjunction with call playback, because call playback is more efficient. However, some casual records of Masked Owl arise from random observations by observers who are driving or spotlighting in the forest at night. There is some evidence that Masked Owls may be attracted to feeding along edges such as roads, so vehicle-based surveys may have more merit than for species that hunt mainly within the forest. We recommend that observers remain alert for Masked Owls whenever they are in the forest at night, but use call playback as the main survey method.

5.5 Timing considerations

All four survey approaches can be useful at any time of year. The species is known to breed in spring in Victoria and may be more detectable at that time. However, the breeding season is likely to be variable, and this limits the value of any suggestions about times to avoid (to reduce disturbance) or to focus efforts (to increase effectiveness).

In terms of time of day, dusk watch followed if necessary by call playback in the early hours of darkness offers an efficient combination for detecting Masked Owls close to their roost or nest site, whereas later at night they may move far from the core of their territory. However, Masked Owls call less than other species, and it will be wise to include some surveys at later times of night to improve chances of detection and guard against the possibility that some birds may tend to call more often at later times.

5.6 Expertise required

Skilled observers have a much greater chance of finding Masked Owls than unskilled observers, using any of these methods. Misidentifications are likely with inexperienced observers. Call playback is arguably the most amenable for use by less experienced observers, but they must be sharp-eyed and sharp-eared or they will miss distant calls and glimpses of flying birds, and they must know or learn the calls of nocturnal birds and mammals. This is especially true for Masked Owl, which typically respond with just a single call. Surveyors should become familiar with the appearance and calls of Masked Owl, including the shriek and chatter, and the calls of similar-sounding species such as Eastern Barn Owl and young Sooty Owl. Signs such as feathers and owl pellets require specialist identification.

Appendix

6 Other considerations

6.1 Multi species large owl playback

Recommended multi-species owl playback sessions comprise the following sequence:

1. Powerful Owl --- 2 mins
2. Silence --- 2 mins
3. Barking Owl --- 2 mins
4. Silence --- 2 mins
5. Southern Boobook--- 2 mins
6. Silence --- 2 mins
7. Sooty Owl --- 2 mins (6 territorial screams at 30 sec intervals)
8. Silence --- 2 mins
9. Sooty Owl --- 1 min (trilling)
10. Silence --- 2 mins
11. Masked Owl --- 2 mins (6 territorial screams at 30 sec intervals)
12. Silence --- 2 mins
13. Masked Owl --- 1 min (chattering)

The Masked Owl calls are last in this sequence because a single, distant answering shriek may go un-noticed during the playback of the other species. During spotlighting, the observer should watch/listen for an owl that may be circling overhead.

Recent technological advances in automated recording systems (e.g. Songmeter) may prove useful for assessing the use of specific sites by Masked Owls and nocturnal birds in general, allowing data to be collected efficiently over many nights.

6.2 Beaufort wind scale

0: calm (< 1 km/h); smoke rises vertically; 1: light air (1-5 km/h); wind direction shown by smoke-drift, but not by wind vanes; 2: light breeze (6-11 km/h); wind felt on face; leaves rustle; ordinary vanes moved by wind; 3: gentle breeze (12-19 km/h); leaves, twigs in constant motion; wind extends light flag; 4: moderate breeze (20-28 km/h); raises dust and loose paper; small branches are moved; 5: fresh breeze (29-38 km/h); small trees in leaf begin to sway; crested wavelets form on inland waters. Conditions > '5' are unsuitable to conduct surveys.

References

- DSE (2007). *Advisory List of Threatened Vertebrate Fauna in Victoria – 2007*. Department of Sustainability and Environment, Melbourne.
- Emison, W. B., Beardsell, C. M., Loyn, R.H. and Bennett S. (1987). *Atlas of Victorian Birds*, Department of Conservation, Forests and Lands and the Royal Australasian Ornithologists Union, Melbourne.
- Loyn, R., McNabb, E. G., Volodina, L. and Willig, R. (2004). 'Predicting owl distribution: Spatial modelling as a tool for conserving owls in ecologically sustainable forest

- management in Victoria , Australia '. *Spatial Analysis in Raptor Ecology and Conservation*. R. Rodriguez-Estrella and L. A. Bojorquez-Tapia. Mexico, Cibnor-Conabio: 111-132.
- McNabb, E. G., McNabb, J. and Barker, K. (2003). Post-nesting home range, habitat use and diet of a female Masked Owl *Tyto novaehollandiae* in western Victoria. *Corella* **27**(4): 109-117.
- Peake, P., Conole, L.E., Debus, S.J.S., McIntyre, A. and Bramwell, M. (1993). The Masked Owl in Victoria. *Australian Bird Watcher* **15**: 124-136.
- SAC (1991) Final recommendation on a nomination for listing: *Tyto novaehollandiae* Masked Owl (Nomination Number 73). Scientific Advisory Committee, Flora and Fauna Guarantee. Department of Conservation and Environment: Melbourne.
- Wintle, B.A., Kavanagh, R.P., McCarthy, M.A. and Burgman, M.A. (2005). Estimating and dealing with detectability in occupancy surveys for forest owls and arboreal marsupials. *Journal of Wildlife Management* **69**: 905-917.