

Survey Standards: Sooty Owl, *Tyto tenebricosa*

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.

2 Introduction

The Sooty Owl *Tyto tenebricosa* has been listed as threatened under the FFG Act (SAC 1991) and is considered Vulnerable in Victoria (DSE 2007). An Action Statement was published in 2003 and is currently being reviewed.

In Victoria, the Sooty Owl occurs from the north-eastern and eastern outskirts of Melbourne, east and north-east to the border with New South Wales. Within that area, the Sooty Owl is numerically rare (1-9 individuals per 100 km²) and Robinson (1989) estimated that there were fewer than 500 pairs in Victoria.

Sooty Owls prefer wetter forest types, including rainforest, especially where there is a high proportion of senescent growth stages (Loyn *et al.* 2001, 2002, 2004) although they also occur in drier habitats. In East Gippsland they make extensive use of drier forest for

foraging, while roosting and nesting mainly in gullies (Bilney *et al.* 2006). They are sedentary, strongly territorial and occupy a large home-range. Recent work in Gippsland by Bilney (2009) showed home range sizes of between 3400 and 4300 ha for adult males and smaller areas for adult females (e.g. 874 ha pre-breeding). Sooty Owls roost in tree-hollows, dense shrubby vegetation, tree-fern crowns, caves, and ledges or crevices on rock faces; and they nest in large tree-hollows and occasionally in caves.

Adults have a piercing downscale territorial call, known commonly as the 'falling bomb-whistle', and insect-like trilling and churring calls, which can be used to detect the species. Owlets utter a noisy, monotonous and insistent rasping call when soliciting food.

3 Requirements to demonstrate presence

Three survey methods are commonly used to detect the presence of Sooty Owls:

1. Call playback. Pre-recorded territorial 'falling bomb-whistle' calls are broadcast at ~ 110% of natural volume to elicit an audible or visual response from Sooty Owls.
2. Evening dusk watches or morning dawn watches to listen for an owl calling from near its daytime roost or nest.
3. Daytime searching for owls and signs of owls such as feathers, faeces, regurgitated pellets or prey remains beneath day roosts.

3.1 Acceptable records

Sooty Owls are distinctive birds, and cannot easily be confused with other species if they are seen well or their whistling (falling-bomb) or trilling calls are heard clearly. Rasping calls of young birds can be confused with Masked Owl *T. novaehollandiae*, and trills of adult birds can potentially be confused with trilling calls of young owls of other species. A much quieter downscale whistle is sometimes given at night by Shining Bronze-Cuckoos *Chalcites lucidus*, but is unlikely to cause confusion except perhaps for inexperienced observers. The main criteria for accepting a record should be based on how well an observer has seen or heard the bird, and their experience and confidence in the identification. This is best gauged in conversation or by asking for written details. Signs such as feathers and owl pellets require specialist identification.

3.2 Non-acceptable records

Brief glimpses of Sooty 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 record of a Sooty Owl.

- name and contact details of the observer;
- details of the species present, number of individuals detected or number of observations, whether those detections were seen or heard;
- 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 surveys) should be recorded;

- method of observation, including the sampling effort (e.g. duration of call playback and number of nights of call playback, sequence of calls used in playback, area searched and ground traversed, the sequence of calls used, quality of light and optical aids used [spotlight, binoculars, etc]);
- details of the experience or qualifications of those who made the sighting/observation;
- 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.

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 absence

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.

4.1 Survey effort and resulting level of uncertainty

With all survey approaches, there is a high risk that some Sooty Owls will remain undetected. We can quantify that risk for call playback, though not for the concept that they may be more detectable in core parts of their territory.

Using call playback, the chance of detecting Sooty Owls at a site where the species is “present” may be quite low, e.g. 26% in lowland forests of southern NSW (Wintle *et al.* 2005) or 9% based on surveys in central Victoria where the species is more sparsely distributed (M. Scroggie *et al.* unpubl.; Fig. 1). However, the concept of presence-absence has different implications for wide-ranging birds such as owls than it does for sedentary species with small home ranges. There is evidence that in extensive forests almost every part of the forest will be visited by owls at some time, so the challenge is to identify areas of forest that are of more or less importance to owls, rather than seek a non-existent dichotomy between areas where they are present or absent.

The best way to minimise the risk of failing to detect a core part of the owls’ territory is to focus on spring surveys where possible, and to conduct multiple duskwatch and call playback surveys (five recommended) combined with daytime searches. Current thinking suggests that if five surveys are conducted at a site on different nights under good conditions, with no success, it is unlikely that Sooty Owls would be nesting or roosting regularly close to that site. This suggestion needs to be tested with empirical data. However, until then, DSE will accept, for planning purposes, that the species is effectively absent if the species is not recorded during five surveys undertaken to the following specifications for call playback, dusk and dawn watch and daytime searching.

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.

Sooty Owl calls can be heard during calm, fine weather from 1-2 km away. Therefore, when sampling extensive areas, it is recommended that sites should be at least 3 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.

The recommended method for call playback surveys comprises the following sequence:

1. Sooty Owl --- 'falling bomb-whistle' call once per 30 sec., total 2 mins
2. Silence (listening) --- 3 mins
3. Sooty Owl --- 'falling bomb-whistle' call once per 30 sec., total 2 mins
4. Silence ---- 2 mins
5. Sooty Owl --- trilling, 2 mins
6. Silence --- 2 mins
7. Spotlight searching --- 15 mins/~200m

5.2 Dusk or dawn watch

Conduct dusk or dawn watch during calm, fine weather when ambient noise levels are low. Sooty Owls often call prior to settling at their daytime roost, thus providing a clue about the location of a roost or nest. Conduct dawn watch from one hour before sunrise until sunrise. On hearing the last predawn call, a compass bearing is taken. When full daylight comes, the searcher can follow the compass bearing searching for roosting owl/s, signs (such as pellets) or a nesting hollow.

Similarly, the first evening call is often made from on or near the roost or nest. Commence evening dusk watch before sunset, in calm, fine weather when ambient noise is low. Continue dusk watch 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 searcher 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 seldom successful because of the Sooty Owl's cryptic habit and use of difficult terrain. However, success rates are substantially improved when skilled and vigilant observers target searches on key habitats such as rainforest patches in wet gullies in East Gippsland. In those situations, Sooty Owls may flush silently from their roosts in dense vegetation and perch in nearby trees, peering curiously at the human observer.

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 Timing considerations

All three survey approaches can be useful at any time of year. Breeding can occur at various times of year, and this variability limits the value of any suggestions about times to avoid (to reduce disturbance) or to focus efforts (to increase effectiveness).

Nevertheless, young birds are often found in spring in East Gippsland (October to December), and young birds often roost among vegetation (shrubs and tree-fern crowns) rather than in hollows. Hence daytime searches can be most productive in that season.

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 Sooty Owls close to their roost or nest site, whereas later at night they may move far from the core of their territory. Sooty Owls often give a single call close to their roost site, after dark.

5.5 Expertise required

Skilled observers have a greater chance of finding Sooty Owls than unskilled observers, using any of these methods. 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. Daytime searches are much more likely to be successful when conducted by experienced and skilled observers with well-honed search image and instincts for finding these birds, which can be remarkably inconspicuous when roosting among vegetation and impossible to find when roosting in hollows. Signs such as feathers and owl pellets require specialist identification. Observers should be known to be capable of providing objective data.

Appendix

6 Other considerations

If conducting simultaneous surveys for other owl species (e.g. Powerful Owl *Ninox strenua*, Masked Owl *T. novaehollandiae*, Barking Owl *N. connivens*), the playback sequence may include calls of these species punctuated with listening periods between each species.

Playback of trilling calls can also elicit a response from a Sooty Owl that has approached silently into close range. 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.

It is useful to record arboreal mammals heard or seen during the playback session, and also (separately) during the subsequent spotlighting, as they form an important prey of Sooty Owls and are also subject to forest prescriptions in their own right.

Call playback surveys close to known nest or roost sites will be useful in assessing the extent to which detectability is improved in core parts of the owls' territory.

6.1 Multi species large owl playback

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

Powerful Owl --- 2 mins
Silence ---2 mins
Barking Owl --- 2 mins
Silence --- 2 mins
Sooty Owl --- 2 mins (5 territorial screams at 30 sec intervals)
Silence --- 1 min
Sooty Owl --- 2 mins (conversation trilling)
Silence --- 2 mins
Masked Owl --- 2 mins (4 territorial screams at 30 sec intervals)
Silence --- 2 mins
Masked Owl --- 1 min (chattering)

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.

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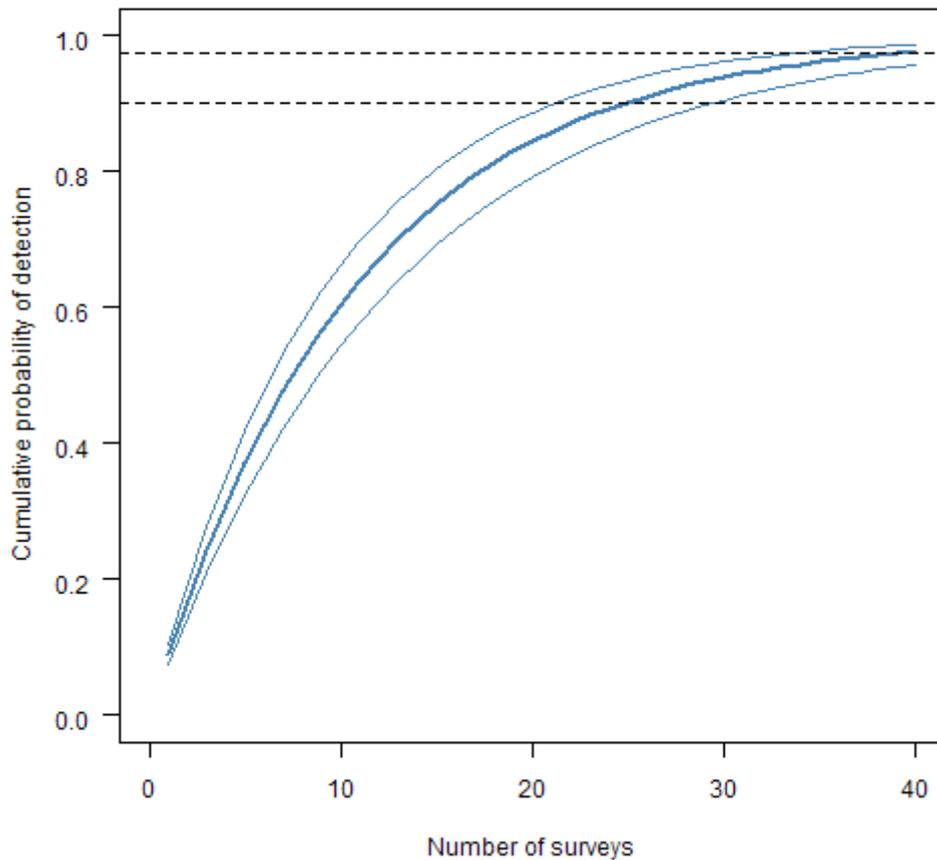


Figure 1. Cumulative detection probability using call playback for Sooty Owls at sites where the species is “present” based on surveys in central Victoria (M. Scroggie *et al.* unpubl.). The central line shows the mean probability, and the outer lines show the 95% confidence interval. It is expected that higher detection probabilities apply to core parts of their home range including the vicinity of nest sites, regular roost sites and favoured foraging areas: this idea needs to be verified and quantified.