Image: Simon Zhu

On-site guide for land managers

Protecting Habitat for Powerful Owls

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This document was developed by BirdLife Australia, with the support of the IFM Community Grants Program. It is intended as a tool to help land managers identify significant Powerful Owl habitat and take appropriate risk mitigation measures for the species when working at those sites.

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Image: Andrew Silcocks

Trees with hollows are important

A huge number of Australian species rely on tree hollows to live in and raise their young. Hollows can take hundreds of years to form in trees, and unfortunately we are losing tree hollows faster than they can regrow. Because hollows take so long to form, it makes it all the more important to protect hollows and surrounding habitat that already exist.

Powerful Owls and tree hollows

Powerful Owls are one of many species that rely on hollows to raise their young. Because Powerful Owls are so large, the hollows they use also need to be. The hollow opening might be deceptively small, but the cavity inside must hold not only an adult Powerful Owl, but two growing nestlings as well. This means that Powerful Owls tend to use the oldest, largest trees as their homes. Powerful Owls are listed as vulnerable in NSW under the Threatened Species Conservation Act 1995 and are at risk from a number of threatening impacts from humans.

For land managers, understanding times of the year that Powerful Owls are particularly vulnerable to disturbance is an important way to reduce impacts on nesting Powerful Owls. More generally, identifying and preserving significant hollow bearing trees and roost sites is necessary to reduce impacts on significant habitat and habitat features from infrastructure and land management activities.

There is significant variation in the habitat used by Powerful Owls across their range. This guide is based on current ecological knowledge and surveys at a subset of known nest sites across Greater Sydney.

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What to look for in a potential nest tree

Following are several factors that, when combined, may provide suitable habitat for Powerful Owls. Whilst the presence of hollows is essential for breeding habitat, it's generally most effective to consider the following features in conjunction with each other, as opposed to in isolation or ranked.

Species

Sydney Red Gums are commonly used as nest trees, but other species, like Messmate and Cottonwood Poplar are used in the area- it's **likely more about tree size and location than species.**

A Sydney Red Gum nest tree

A non-native Cottonwood Poplar nest tree

Location

Nest trees are often along or within a couple of hundred metres of waterways, but they can occur further away from water, more than a kilometre- this is especially true in built-up areas. There are a variety of different location types that nest trees can occur in, from national parks through to public gardens and residential properties. Trees can occur within a few metres of buildings, roads or paths.

A Eucalyptus nest tree with healthy foliage

A dead, or 'stag' nest tree

Size and condition

These trees are large. Known nest trees in Greater Sydney generally have diameters greater than 50cm at chest height, but most are more than a metre across. Trees will typically be greater than 10m tall. Some nest trees look healthy and will have good foliage cover, but others can be dead with no foliage, or can be deciduous trees that lose foliage during breeding season

What to look for in a potential nest tree

Hollows

Hollows need to be large enough to fit a Powerful Owl adult and chicks as they grow to adult size, but entrances can be as small as 15-20cm across. This can be difficult to tell from looking at the opening. Hollows tend to be high up in the tree, generally more than five metres above ground. They can occur on the main trunk or in branches, and nest trees can have multiple hollows that support a range of species, not just Powerful Owls.

Upwards facing hollow can't be easily seen from the ground

Visible hollows in a Sydney Red Gum (top) and Manna Gum (bottom)

Habitat

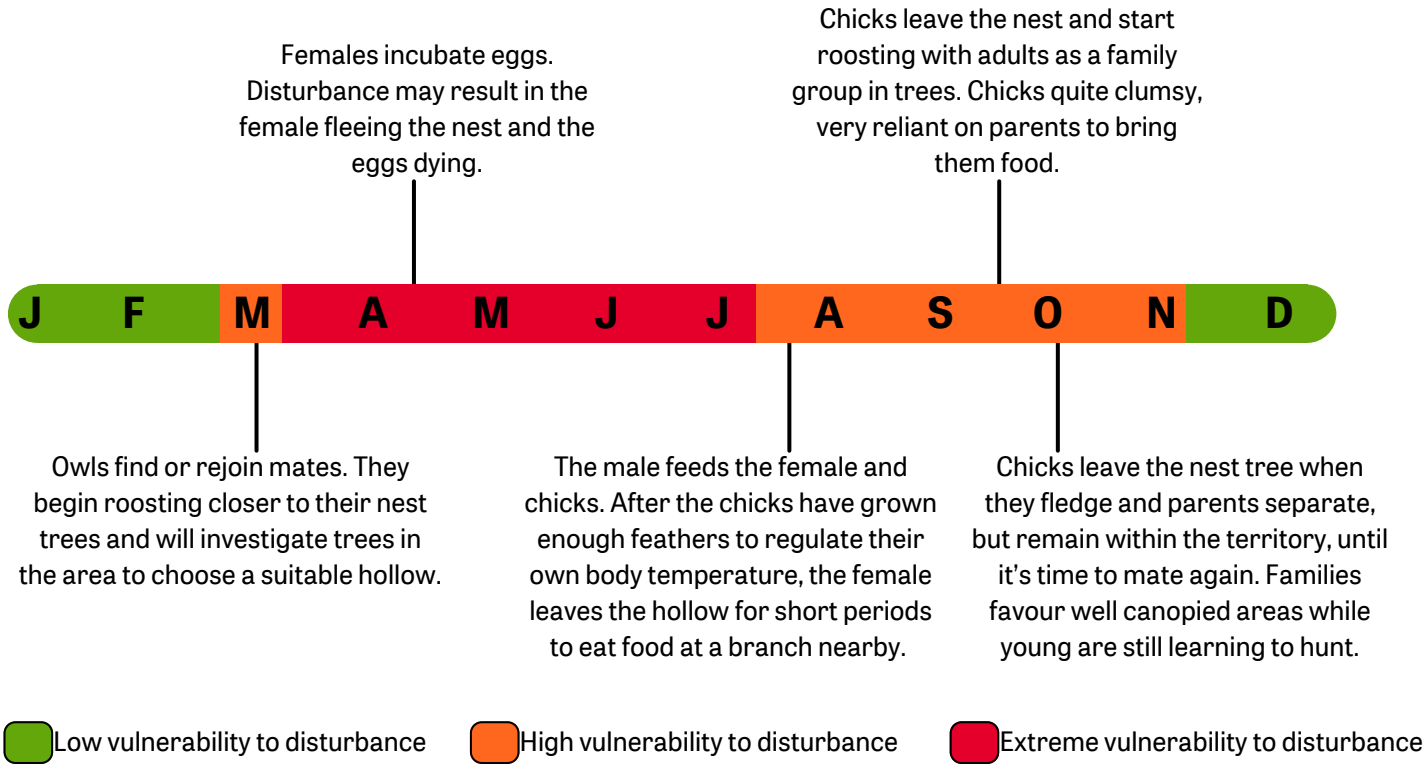
Trees used for nesting are not normally lone-standing trees, you can expect more than 15 other trees within a 30 metre radius of the nest tree, this is because the adult male will spend the days roosting within eyeline of the nest tree. You can also expect trees within 10 metres that young Powerful Owls can get to when they leave the hollow, as they are weak fliers for weeks after they fledge from the hollow. Young Owls are susceptible to disturbance close to and after fledging and are at risk of coming to the ground and being unable to fly. If they can't clamber up a tree they will remain on the ground. There's large variation in the types of habitat surrounding a nest tree- from open lawns to understory too thick to easily walk through. More open areas mean more risk of being unable to get back up into the canopy for owlets. Maintaining refuges and vegetated corridors is also important to enable wildlife including Powerful Owl prey species to move through areas.

Open understory in a public garden

Dense understory in a national park

Considering time of year is vital

Powerful Owls have an annual breeding cycle , and are more vulnerable to disturbance at certain times of the year. During periods where eggs are being incubated or hatchlings are very young, disturbance can result in parents abandoning the nest and chicks dying. More disruptive works, like burning and tree lopping, should be performed outside the breeding period wherever possible.




Pellets including fur and teeth of prey


Whitewash

Look for Whitewash and Pellets

Look for these signs to indicate that Powerful Owls are frequently in the area. Indigestible body parts of prey are regurgitated as pellets. Spreads of faeces, referred to as whitewash, can be seen on the ground and beneath trees that Owls commonly roost in. Whitewash looks like splashes of yoghurt on the ground under a perching point.

Steps to minimise disturbance

For roosting Powerful Owls

If roosting owls are present, breeding or otherwise, check to see if you are making the owl uneasy - they tend to fluff their feathers out under threat and will look agitated. They may also kick one talon out. Dropping prey is another sure sign of disturbance. You should not stay in range of the owl if it shows visible signs of being disturbed by your presence. Owls do attack people to defend nesting sites. If the owl is showing no signs of agitation it should be fine to continue to be there but monitor the owl at all times and move on as soon as possible.

Powerful Owls roost in canopy during the day. They can be easy to miss from the ground.

Minimise lights at night

Nocturnal species like the Powerful Owl are adapted to hunting at night. To minimise the impact of artificial lights on Powerful Owls and other wildlife, avoid night lighting around nest and roost trees wherever possible. When necessary, opt for shielded, low-intensity lighting directed downward. Motion sensors and timers can be used to reduce light duration.

Minimise noise disturbance

Duration and intensity of noise can disturb Powerful Owls and interrupt their communication. Avoid activities that result in noises above 100 db (e.g. slashing, shouting) within 50 m of nest sites between May to end-September.

Use an owl spotter

Walk through all sites before commencing works. Before major planned works, early evening listening surveys in the lead up to and during breeding season (March to end-September) provide the most valuable and accurate information on breeding sites. Have a team member on the lookout for Powerful Owls while heavy machinery is being used. Playback should only be used with appropriate scientific licences or approvals and should not be used in known or suspected breeding sites from May to end-September due to disturbance to breeding.

Steps to minimise disturbance

Maintain buffer zones around habitat

Nest Sites	100 m
Roost Sites	50 m
Connectivity	Corridors are important, particularly riparian corridors and foraging habitat. Maintain at least 100 m wide corridors between large remnants of habitat.
Planned Burns	Always keep a 10 m buffer around known nest sites, including slashing, trittering and tree removal. Keep a 50 m exclusion zone when fire is necessary, do not burn between May and September. Outside these times, check for location of breeding pair and young.
Development	Proposals to remove >1 ha of foraging habitat within 2 km of a nest site (including staged proposals), where the remaining habitat in this area is below the minimum 450 ha vegetation retention threshold, need to be carefully considered and justified with regard to significance assessment. Section 5A, Environmental Planning and Assessment Act 1979.

Maintaining continuous habitat is important for Powerful Owls

Make an emergency plan

Know what to do if Powerful Owls are disturbed by works. If Powerful Owls are flushed from the area, let the Powerful Owl Project know the time and location via powerfulowl@birdlife.org.au. Any injured wildlife can be reported to WIRES on 1300 094 737 or Sydney Wildlife Rescue on 9413 4300.

Fuels around nest trees should be minimised during planned burns

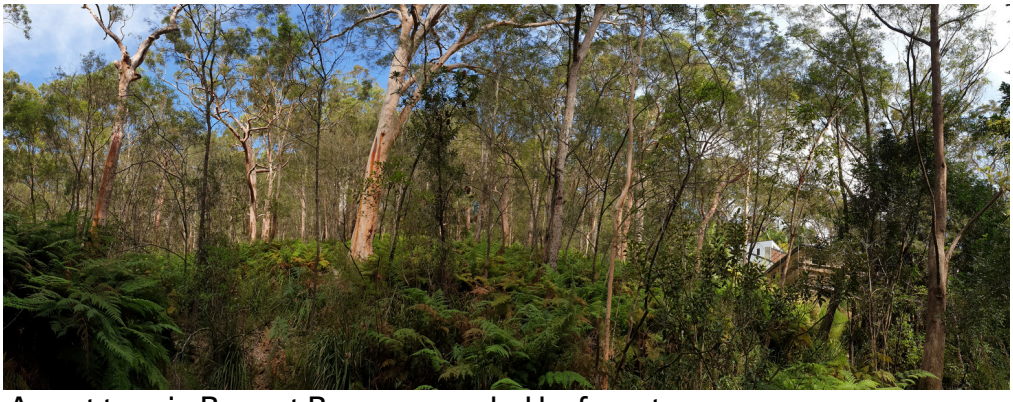
Considerations when burning

The timing of burns is critical in areas with known Powerful Owl nest trees. Inappropriate burns can cause adults to abandon nests and mortality of chicks. Burns must not take place at active nesting sites during the breeding season, from the end of March to mid September. Between October and the start of March, burns can proceed at nest sites with appropriate risk mitigation measures. Care should be taken particularly when the season's young are newly fledged.

We advise that mitigation measures are taken to protect hollow bearing trees and recruitment trees. Finer fuels in a 10m radius of such trees should be minimised (through raking, leaf-blowing etc.) prior to burning. The protection of nest trees is paramount and where possible impacts on the mid story surrounding the nest tree should also be minimised. The midstory provides important habitat for fledging owlets.

Protect future homes for wildlife

Trees with hollows that are not yet large enough to accommodate species as large as Powerful Owls are also vital to conserve. These are called 'recruitment trees' and are large and vigorous, for example with a diameter at breast height of 40cm or greater. Factors like time of year and noise disturbance are less relevant when doing works around trees like these, but preserving as many trees as possible during land management is generally a good way to conserve existing habitat. Powerful Owls also need many trees surrounding their nest trees, for roosting and for guarding the nest, so maintaining as many trees as possible in the vicinity is essential.



A nest tree in Bonnet Bay surrounded by forest.

Think about Powerful Owls before starting work

Season

Is it a sensitive time of year? If so, take extra care identifying Powerful Owl habitat.

Suitability

Is there suitable habitat around? Large trees likely to have hollows?

Signs

Look for signs of Owls: whitewash, pellets, food items, even a roosting Owl.

Use this checklist

Before starting work at a site, always think season, suitability, signs to make a quick inspection. We've included a more thorough checklist over the next two pages.

Feature	Action
Apply for data from Powerful Owl project for latest site information.	This will alert you to any active pairs or known nest trees in the area. This information is shared with bionet, but live data direct from the Powerful Owl Project will provide current-season information.
Is it between March and November?	Breeding season runs April to October, so extra caution needs to be taken. Disruptive activities (that do not damage the hollow) can be undertaken between December and the start of March. March and November are also sensitive times for the species. In March, Owls are inspecting hollows to choose a suitable site, and in November young are still clumsy flyers and reliant on parents, so care should also be taken between these months.

Use this checklist

Feature	Action
Is the tree a known nest tree?	Avoid high disturbance activities like felling limbs, burning, climbing and slashing around the base as much as possible between March and November, especially between April and July. Avoid all works within 10 m of active nest trees during incubation and early hatching period, from April to June.
Do trees in the area have the features to be potential Powerful Owl nest trees?	Avoid any activities that could damage or reduce the number of available hollows, including the removal of branches. Use mitigation measures around hollow bearing trees when burning.
Is it a known roost site?	Avoid clearing around known roost trees when owlets are young. At all times, avoid removing branches and clearing areas around known roost sites.
Do a walkthrough to check for signs of Powerful Owls.	Before commencing works, look for whitewash or pellets on the ground and check branches for roosting powerful owls. Avoid damage to areas with signs of Powerful Owls and avoid works anywhere
Have a plan for if owls are disturbed.	If Powerful Owls are flushed from the area, let the Powerful Owl Project know the time and location via powerfulowl@birdlife.org.au. Report any injured wildlife to WIRES on 1300 094 737 or Sydney Wildlife Rescue on 9413 4300.

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