

Roads and Maritime Services

Foxground and Berry bypass Princes Highway upgrade

Nest Box Management Plan

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1. Introduction

1.1 Background

New South Wales (NSW) Roads and Maritime Services (Roads and Maritime) is upgrading 11.6 km of the Princes Highway between Toolijooa Road north of Foxground, to Schofields Lane south of Berry. The resulting upgrade will be a four lane divided highway (two lanes in each direction) with median separation. The Project includes bypasses of Foxground and Berry localities.

The Project was assessed under Part 3A of the *Environmental Planning and Assessment Act 1979* and approval granted on 22 July 2013 with Conditions of Approval (CoA).

1.2 Purpose

Vegetation clearing will remove all natural habitats within the construction zone. As a consequence, some local native animals may be displaced during both the construction and operation phases of the Project. In order to compensate for habitat removed, particularly including hollow-bearing trees, nest boxes will be installed in adjacent areas of existing habitat to provide supplementary sites for fauna release and compensatory habitat for displaced native fauna.

1.3 Management plan objectives

The objectives of this management plan are to:

- Identify target species that are likely to utilise nest boxes
- Identify the number and type of nest boxes required
- Provide nest box specifications for target species
- Identify target localities for nest box installation
- Describe nest box installation procedures
- Describe nest box maintenance.

1.4 Relevant legislation and guidelines

The main legislation relevant to nest box management for the proposal is:

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *National Parks and Wildlife Act 1974* (NPW Act)
- *Threatened Species Conservation Act 1995* (TSC Act)
 - ▶ Vulnerable fauna species listed under the TSC Act that were observed during fauna surveys and which might use nest boxes provided for the Project include; Powerful Owl, Gang-Gang Cockatoo, Yellow-bellied Sheath-tail Bat, Eastern Freetail Bat, Greater Broad-nosed Bat and Eastern False Pipistrelle.

The main guidelines, specifications and policy documents relevant to this management plan include:

- Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (Guide 8: Nest boxes) (Roads and Traffic Authority 2011).

1.5 Limitations

This nest box management plan has been prepared based upon the current knowledge, research and best practices for nest boxes, current design footprint and on the results of the hollow-bearing tree survey for approximately 70% of the lands containing hollow-bearing trees that have been surveyed prior to writing this report. This nest box management plan should be updated as new information is identified including design changes, resulting in more or less nest boxes required and results obtained from the final hollow-bearing tree and stag-watching surveys, where possible.

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2. Nest box specifications and target species

2.1 Design and species

Nest boxes are to be specifically designed for each target species (refer Table 2-1). The specifications for each target species have been developed by reviewing the findings of previous projects, current research studies and those considered consistent with best practice design.

Nest boxes should be constructed:

- With aluminium angles around the edges of the nest box lid to discourage chewing.
- Using plantation hardwood on the front face of each nest box to discourage chewing.
- With slots cut into the inside face of the nest box to assist with internal access to the exit hole.
- Using stainless steel piano hinges on nest box lids to inhibit rusting and assist waterproofing. Hinged lids are also useful for monitoring and maintenance purposes.
- The lid should overhang the front and sides of the nest box (by approximately 25 mm) to prevent water damage.
- To aid drainage, several small holes should be drilled in to the base of the nest box.
- With a 40 mm to 50 mm thick layer of non-toxic sawdust in the base of the nest box to replicate the inside of decaying hollows.
- To deter habitation by feral bees; e.g. the use of carpet attached to the underside of the nest box lid to is a technique that has been used with varying degrees of success. Advice should sought from the nest box designer and manufacturer regarding the best methods of feral bee deterrence.

Although the recommended height of nest box position for some species, such as cockatoos, is in the 8-10 m range, the RTA Biodiversity Guidelines (2011), pg. 63 under the sub-heading Height, states that nest boxes should be placed as high as possible to avoid predation, but low enough to allow monitoring and maintenance. The easiest and most cost-effective means of monitoring is with a camera on a pole, due to accessibility to nest box location, avoidance of ladders for safety considerations and monitoring budget constraints, Pole camera monitoring methodology is restricted to 6m maximum, due to constraints in pole handling and camera tether limitations and so the maximum height of all nest boxes required for the Project have been capped at 6 m.

In addition to the above constraints, there were some nest box dimensions recommended by the RTA (2011) Biodiversity Guidelines that are less than suitable for some species, such as Forest Owl entrance diameter. Higgins (1999) records Powerful Owl entrance hollow range to be some 17x13 cm to 45x76 cm in size while the recommended opening for large forest owls in Table 8.1 of the RTA (2011) document is only 10-15 cm. In such instances, the dimensions in Table 2-1 for target species has been revised to more suitable dimensions for the species targeted.

Table 2-1 provides suitable approximate dimensions for the target species. Nest box suppliers may however already have preferred design dimensions for nest boxes for these species and any such deviations from the provided dimensions is acceptable. Numbers of each nest box type has been derived from the number of hollows to be displaced by the Project (Table 2.2), with adjustments made to ensure that there is sufficient diversity in the smaller hollow range for local fauna species.

In replacing large hollows on a 1:1 basis 42 large forest owl boxes will be required. Although such a number may exceed the density of nest boxes required for forest owls at the recommended spacing across the site, this is not considered to be a problem since owl sized boxes are likely to be taken up by a range of more common fauna species, such as, Common Brushtail Possum, Sulphur-crested Cockatoo, Australian Wood Duck and Eastern Rosellas. It is considered likely that a greater number of large hollow boxes would be required if large forest owls, such as the Powerful Owl, which has been recorded on site, are to have sufficient hollow opportunities to find a suitable nest box for breeding purposes.

Table 2-1 Nest box dimensions for target species

Nest box type	Internal dimensions (mm)	Depth of chamber (mm)	Entrance diameter (cm)	Installation height range (m)	Number of nest boxes suggested
Large Forest Owls	400 x 400	600 - 750	20	4 - 6	46
Cockatoo	300 x 400	1200	10-15	5 - 6	16
Galah / Corella	250 x250	500	10-15	3 - 6	16
Kookaburra	250 x 300	60	11	3 - 6	20
Modified King-parrot	250 x 250	1000	10	4 - 6	20
Shrike-thrush	150 x150	60	10	2 - 6	9
Brushtail Possum	250 x 250	300	10	2 - 4	15
Yellow-bellied glider	250 x 300	400	9	4 - 6	13
Greater Glider	250 x 250	400	8	4 - 6	6
Dollarbird	150 x 200	400	7	4 - 6	7
Ringtail Possum	200 x 250	300	6.5	2 - 4	21
Owlet Nightjar	150 x 150	300	6.5	2 - 6	5
Lorikeet	150 x 150	400	6.5	3 - 6	5
Rosella	150 x 200	400	6.5	2 - 6	11
Kingfisher				2 - 6	6
Treecreeper	150 x 150	350	6	2 - 6	5
Squirrel Glider ¹	150 x250	300	4.5	3 - 5	5
Antechinus				2 - 6	10
Sugar Glider ¹	150 x 200	300	4	3 - 5	8
Microbats	n/a	400	3 hole / 2 slot	3 – 5 or under bridge	28
TOTAL					272

Note 1 – Nest boxes for sugar gliders and squirrel gliders will have a rear-facing entrance hole to discourage pest use.

2.2 Nest box numbers

A ratio of 1:1 (hollows to nest boxes) has been recommended in the approved EA (Thompson & Sharp 2003). A hollow-bearing tree survey was conducted prior to the completion of this report. The hollow-bearing tree locations are shown in Figure 3.1 in section 3. The total number of hollows likely to be removed for the

project is shown below in Table 2.2. These numbers have been determined based on the results of the survey and the construction footprint for the project. Details of tree hollows likely to be removed in the construction footprint are provided in Appendix A. Some hollow-bearing trees may be removed from the ancillary sites however it is likely that some of these hollow-bearing trees will be retained. Detailed tree hollow data was not collected for trees within the ancillary sites. For the purposes of calculating the likely number of hollows affected, it was assumed that each hollow-bearing tree in the ancillary areas contains a single hollow and that the size distribution of hollows is similar to that recorded in the remainder of the project area.

Table 2-2 Numbers and sizes of tree hollows likely to be removed for the project.

Hollow size (cm)	Total hollows in impact area (rounded up)	Sizing Class numbers
5	19	19 Small hollows
10	103	151 Medium hollows
15	48	
20	25	42 Large hollows
25	8	
30	5	
40	2	
50	2	

The numbers of hollows available within the Project area as reflected in Table 2.2 above (a much larger number of medium hollows to small hollows), are unlikely to be a true representation of the distribution of size requirements by fauna in the area, since larger animals are less dense in a given area of environment than smaller animals. Furthermore, the greatest proportion of hollow-dwelling threatened fauna species recorded for the approved EA was microchiropteran bats. It is likely that the ratios of hollow-dwelling threatened fauna species recorded are relative to the ratios of hollow-dwelling threatened species occurring locally. Microchiropteran bats that use hollows require small sized hollows to protect them from predators. There is also likely to be an observation bias towards larger hollows as they are more readily visible. Therefore it is considered appropriate to redistribute the allocation of nest box size more toward the smaller opening group than is reflected in distribution of hollow size in Table 2.2. A suggested redistribution of hollow size classes is shown in Table 2-3.

Table 2-3 Recommended distribution of hollow sizes

Size class	Recommended number of hollows
Small hollow - <10 cm	84
Medium hollow - 10 cm to < 20 cm	84
Large hollows – 20 cm and > 20 cm	41

Records of threatened fauna observed within the Project study area and locality, as reported in the approved EA and from State government datasets, suggest that threatened microchiropteran bats make up a significant proportion of threatened species records associated with the Project. Therefore it is considered prudent that some bias in allocation of nest box resources be apportioned to this fauna guild. It is known that an important population of Southern Myotis (*Myotis macropus*) exists in the locality. It is considered appropriate to provide an increased distribution of nest boxes for this species by installation in retained forest and underneath newly-constructed or retained bridges.

In addition, spotlighting and stag-watching surveys have commenced in accordance with the methodologies outlined in the Ecological Monitoring Program for the Project (Parsons Brinckerhoff 2014). The baseline surveys conducted to date have indicated that arboreal mammal species likely to use large tree hollows (e.g. Common Brushtail Possum) are not common or widespread in the project area. Due to the fragmented nature of the vegetation present, other animals likely to use large tree hollows (e.g. owls) are also unlikely to occur in high enough numbers to warrant the installation of a large number of large nest boxes.

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3. Nest box location and installation procedures

3.1 Timing for nest box installation

Nest boxes would be installed in two stages:

- Stage 1 – At least 70 % of nest boxes will be installed (at least one month) prior to the commencement of clearing activities to provide alternative habitat for fauna displaced from trees proposed to be cleared.
- Stage 2 – the remaining 30 % of nest boxes will be installed during the construction phase, either as required for releasing rescued fauna or once the total number of hollows removed has been calculated.

3.2 Nest box locations

The Project's hollow-bearing tree survey determined suitable areas for nest box placement. Key criteria for determining nest box locations were:

- Proximity to removed hollows.
- Target areas where hollow quantities are low to improve habitat availability.
- Presence of existing hollows to prevent or minimise resource competition (e.g. territorial fauna).
- Size of removed hollows and likely animal species supported by removed hollows.
- Habitat locations where hollow-dwelling fauna are most likely to occur.
- Habitat locations where sufficient cover is present to avoid exposure to the elements and predators.
- Extent of RMS land available adjacent to location where hollows to be removed are situated.
- Private land next to the road project can be used to install nest boxes. It is required that the residents agree to allow access for five years of monitoring.

Appendix A contains the tree hollow data recorded during completed hollow-bearing tree surveys. This data has been used as part of the nest box requirement calculations in Section 2.

The primary locations identified for the installation of nest boxes consist of:

- Existing remnant forest areas and
- Underneath bridges and culverts (for Southern Myotis)

The existing hollow-bearing tree locations and nominated nest box locations are shown in Figure 3.1.

Section 2.2 and Table 2-2 outline the type and approximate number of nest boxes required for the Project. The exact numbers and diversity in each area should be determined during installation depending on the expert opinion of the ecologist. The ecologist will review the results obtained from pre-clearance stag-watching surveys to aid further in refining the appropriate type, number and location of nest boxes. If the numbers and/or types of nest boxes indicated above cannot be met or the site ecologist recommends a reduction or increase of nest boxes numbers or type then the information provided above may be amended.

Nest boxes should be installed in general accordance with the recommended spacing identified in Table 8.2 of Guide 8: Nest boxes (Roads and Traffic Authority 2011). However these spacing recommendations only cover specific target species and groups of species and will be used as a general guide only. Actual spacing will be determined based on consideration of the characteristics of available habitat including density of appropriate trees, existing hollows and target species for particular remnant vegetation patches. Approximately 43 hectares of remnant native vegetation is found within the RMS acquired lands in the project area. This area of vegetation is considered to be of sufficient size to support the installation of the number of nest boxes required for the project.

Figure 3-1 Hollow-bearing tree and nest box installation locations

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3.3 Nest box installation procedures

With reference to NSW Roads and Traffic Authority (2011), nest boxes will be located and installed as follows:

- All nest boxes will be located outside the construction footprint and within Roads and Maritime property. Where possible, nest boxes would be installed near overpass and underpass structures.
- Private land next to the road project can be used to install nest boxes. It is required that the residents agree to allow access for five years of monitoring.
- Nest boxes should be installed as close as reasonably possible (and outside construction footprint) to original hollow-bearing tree(s).
- Nest boxes for insectivorous bats (particularly Southern Myotis) will be located along creek lines, near water sources or adjacent to potential flyways in riparian vegetation (particularly where the Project traverses or dissects Broughton Creek).
- Nest boxes will be located in close proximity to potential food sources of the target species to reduce travelling distances and conserve energy.
- Nest boxes for possums would ideally be located in portions of habitat with a dense interconnecting canopy, mid-storey stratum or tall shrub layer to provide safer ingress and egress to the nest boxes by reducing the need for possums to descend to ground level.
- Nest boxes for gliders and possums would ideally be located on rough-barked trees.
- Nest boxes would ideally be located on healthy and robust trees that lack natural hollows (presence of other hollow-dependent fauna may reduce the efficacy of nest box position).
- Nest boxes will be attached to trees using the Habisure system (Franks 2003), or equivalent. The fixing arrangements for nest boxes with rear facing entrance holes will allow spaces between the nest boxes and trees for the fauna to access the nest box.
- Nest boxes will generally be installed between 3m and 6m. Some nest boxes will be installed above 6m for targeted species.
- Nest boxes will be positioned on the north-west to east sector of tree trunks to avoid hot afternoon sun and predominant aspects of severe storms.
- Following installation of each nest box, a pro-forma field data sheet will be completed with details on relevant site information recorded, including:
 - ▶ Nest box identification number
 - ▶ Nest box type
 - ▶ GPS location (WGS 84)
 - ▶ Topographic position
 - ▶ Tree species and diameter of host tree at breast height (DBH)
 - ▶ Nest box height and orientation.

4. Nest box monitoring and maintenance

4.1 Monitoring requirements

During nest box monitoring surveys boxes will be checked for wear and tear and the following maintenance provisions may be required:

- Implement any pest management techniques recommended or required by the Project Ecologist, which may include modification to nest box designs to preclude troublesome species or relocation of nest boxes to alternative sites.
- Maintenance of damaged nest boxes is to be undertaken, where possible, on-site at the time of inspection so that nest boxes remain available for use. In the event that a nest box needs to be removed for repair or replaced with another nest box, then an alternative nest box will be installed concurrently with the removal of the damaged nest box.
- If a nest box is damaged, but is currently occupied, another nest box is to be installed in the same tree to provide an alternative nest box in the event that the occupied nest box fails prior to the next monitoring and maintenance event.

Monitoring observations are to be recorded on a pro-forma field data sheet, including for each monitoring event:

- Name of observer
- Date
- Prevailing weather conditions
- Nest box number
- Nest box type
- Nest box location (fixed by GPS)
- Host tree species and diameter at breast height
- Nest box height
- Nest box orientation
- Assessment of nest box condition, including structural integrity
- Evidence of fauna occupancy
- Where possible, if occupied, the identity of the species, age (adult/juvenile) and number of individuals
- Presence of pest activity.
- Any changes in surrounding habitat

A brief report will be prepared after each of the inspections, comprising:

- A covering letter summarising the conduct and outcome of the monitoring survey
- A spreadsheet containing data collected on pro-forma field sheets
- Recommendations for replacements or repair of nest boxes.

- At the conclusion of the monitoring period, a more comprehensive qualitative summary of the monitoring survey will be provided. This summary will provide recommendations for any future continuation and/or frequency of future best box monitoring after the three year period.

4.2 Timing of monitoring

In accordance with the NSW Roads and Traffic Authority (2011) guidelines, if construction extends for longer than 6 months, the first inspection of installed nest boxes should be undertaken 6 months after their installation. Thereafter, inspections should occur twice a year to match breeding cycles until construction is completed.

Once construction has been completed and the operational phase is entered into, inspections will occur on an annual basis for a period of at least three years. Nest box monitoring should ideally occur during late spring and be undertaken using a flexible inspection camera pole. All nest boxes (excluding bat boxes) should be installed between 3 and 6 m from the ground however some nest boxes will be installed above 6m for targeted species and have hinged lids with an overhang of 25 mm to protect the box sides from the weather. These characteristics will aid in minimising disturbance whilst conducting monitoring as the camera pole is easily able to enter the nest box opening or quietly open the lid to take photos of occupants, if present, without direct disturbance. The results of the monitoring shall be included in the Annual Monitoring Report.

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5. References

Franks, A 2003, *Nest boxes for wildlife- a practical guide*, Blooming Books, Melbourne.

Parsons Brinckerhoff 2014, *Princes Highway Upgrade - Foxground and Berry Bypass Project - Ecological Monitoring Program* Sydney.

Roads and Traffic Authority 2011, *Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects*, RTA - Environment Branch, Sydney.

Thompson, D & Sharp, D 2003, *Regional ecosystems of the Desert Uplands: 10.3.15 Grasslands, sedgeland, ephemeral herblands and open-woodlands in depressions on sand plains*, Queensland Environmental Protection Agency.

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Appendix A - Recorded hollow-bearing tree data

Table A1.1 Recorded hollow-bearing tree data

GPS ID	Easting	Northing	Tree Species	Height (m)	Hollow position	Hollow size (cm)
87	293917	6151529	Stag	3	Stump	20
87	293917	6151529	Stag	3	Stump	10
89	293858	6151533	Eucalyptus saligna x botryoides	13	Trunk	10
90	293858	6151534	Eucalyptus saligna x botryoides	14	Branch	10
91	293895	6151525	Eucalyptus saligna x botryoides	8	Trunk	10
92	293824	6151490	Eucalyptus saligna x botryoides	14	Trunk	15
92	293824	6151490	Eucalyptus saligna x botryoides	14	Trunk	20
92	293824	6151490	Eucalyptus saligna x botryoides	14	Sprout	15
92	293824	6151490	Eucalyptus saligna x botryoides	14	Sprout	10
93	293253	6151312	Eucalyptus saligna x botryoides	10	Trunk	20
94	293219	6151262	Eucalyptus saligna	12	Trunk	20
94	293219	6151262	Eucalyptus saligna	12	Trunk	10
94	293219	6151262	Eucalyptus saligna	12	Sprout	10
95	291542	6150812	Eucalyptus saligna	16	Sprout	5-10
95	291542	6150812	Eucalyptus saligna	16	Sprout	5-10
95	291542	6150812	Eucalyptus saligna	16	Sprout	5-10
95	291542	6150812	Eucalyptus saligna	16	Trunk	10
96	291590	6150838	Eucalyptus saligna x botryoides	20	Sprout	5-10
96	291590	6150838	Eucalyptus saligna x botryoides	20	Sprout	5-10
96	291590	6150838	Eucalyptus saligna x botryoides	20	Sprout	5-10
97	219595	6150852	Eucalyptus tereticornis	14	Sprout	5-10
97	219595	6150852	Eucalyptus tereticornis	14	Sprout	5-10
97	219595	6150852	Eucalyptus tereticornis	14	Sprout	10
97	219595	6150852	Eucalyptus tereticornis	14	Sprout	5

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100	291773	6150909	<i>Eucalyptus saligna</i>	12	Trunk	20
101	291691	6150938	<i>Eucalyptus pilularis</i>	15	Sprout	5-10
101	291691	6150938	<i>Eucalyptus pilularis</i>	15	Sprout	5-10
101	291691	6150938	<i>Eucalyptus pilularis</i>	15	Sprout	5-10
233	288246	6149590	<i>E. saligna</i> x <i>botryoides</i>	15	stump	5-10
233	288246	6149590	<i>E. saligna</i> x <i>botryoides</i>	15	trunk	5-10
234	288154	6149515	Stag	14	trunk	10-15
234	288154	6149515	Stag	14	trunk	10-15
234	288154	6149515	Stag	14	trunk	10-15
235	288130	6149484	<i>E. saligna</i> x <i>botryoides</i>	16	stump	10-15
235	288130	6149484	<i>E. saligna</i> x <i>botryoides</i>	16	stump	5-10
236	288103	6149467	<i>E. saligna</i>	14	stump	10-15
237	288096	6149446	<i>E. pilularis</i>	18	branch	5-10
237	288096	6149446	<i>E. pilularis</i>	18	branch	5-10
237	288096	6149446	<i>E. pilularis</i>	18	branch	5-10
238	288103	6149419	Stag	5	stump	15-20
239	288082	6149381	<i>E. saligna</i>	12	trunk	5-10
239	288082	6149381	<i>E. saligna</i>	12	trunk	5-10
240	288071	6149365	<i>E. saligna</i>	8	trunk	20
241	288068	6149361	<i>E. botryoides</i>	18	trunk	10-15
242	291421	6150748	<i>E. botryoides</i>	8	stump	15-20
243	291410	6150715	<i>E. pilularis</i>	14	stump	10-15
243	291410	6150715	<i>E. pilularis</i>	14	trunk	15-20
244	291361	6150622	<i>E. saligna</i> x <i>botryoides</i>	20	trunk	>20
245	291314	6150598	<i>E. saligna</i>	18	stump	10-15
245	291314	6150598	<i>E. saligna</i>	18	stump	10-15
245	291314	6150598	<i>E. saligna</i>	18	stump	10-15
245	291314	6150598	<i>E. saligna</i>	18	stump	10-15
245	291314	6150598	<i>E. saligna</i>	18	stump	10-15
246	295345	6152977	Stag	6	trunk	>20
247	295424	6152971	<i>E. saligna</i>	12	stump	10

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248	295451	6152947	E. saligna	5	trunk	10-15
249	295456	6152946	E. saligna	5	trunk	5-10
249	295456	6152946	E. saligna	5	trunk	5-10
250	295503	6152998	E. radiata	16	stump	10-15
250	295503	6152998	E. radiata	16	stump	10-15
250	295503	6152998	E. radiata	16	stump	10-15
250	295503	6152998	E. radiata	16	stump	10-15
250	295503	6152998	E. radiata	16	stump	10-15
251	295501	6153012	E. tereticornis	15	trunk	5-10
252	295503	615030	E. tereticornis	16	trunk	5-10
253	295501	6153041	E. tereticornis	18	trunk	5-10
254	295251	6152985	E. saligna	16	stump	10-15
254	295251	6152985	E. saligna	16	stump	10-15
254	295251	6152985	E. saligna	16	stump	10-15
255	295205	6153008	E. saligna	12	stump	10-15
255	295205	6153008	E. saligna	12	stump	10-15
255	295205	6153008	E. saligna	12	stump	10-15
255	295205	6153008	E. saligna	12	stump	10-15
256	295146	6152984	Stag	8	stump	15-20
256	295146	6152984	Stag	8	stump	15-20
256	295146	6152984	Stag	8	stump	15-20
257	296010	6152910	E. saligna	16	trunk	15-20
257	296010	6152910	E. saligna	16	trunk	15-20

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257	296010	6152910	E. saligna	16	stump	10-15
257	296010	6152910	E. saligna	16	stump	10-15
257	296010	6152910	E. saligna	16	stump	10-15
257	296010	6152910	E. saligna	16	stump	10-15
257	296010	6152910	E. saligna	16	stump	10-15
258	295990	6152893	E. saligna	14	trunk	10-15
258	295990	6152893	E. saligna	14	trunk	10-15
258	295990	6152893	E. saligna	14	trunk	10-15
259	295825	6152944	Stag	6	trunk	10-15
259	295825	6152944	Stag	6	stump	10-15
260	295751	6152947	Stag	4	trunk	15-20
261	295760	6152956	E. saligna x botryoides	16	trunk	5-10
262	295759	6152960	Stag	5	trunk	15-20
263	295746	6152954	E.saligna	14	stump	5-10
263	295746	6152954	E.saligna	14	stump	5-10
263	295746	6152954	E.saligna	14	stump	5-10
264	295738	6152989	E.saligna	10	trunk	10-15
264	295738	6152989	E.saligna	10	trunk	10-15
264	295738	6152989	E.saligna	10	stump	5-10
264	295738	6152989	E.saligna	10	stump	5-10
265	295751	6152987	E. saligna	16	stump	10-15
265	295751	6152987	E. saligna	16	stump	10-15
265	295751	6152987	E. saligna	16	stump	10-15
346	288195	6149478	E. pilularis	19	trunk	
188	290494	6150154	Stag	14	trunk	15-20
188	290494	6150154	Stag	14	trunk	15-20
188	290494	6150154	Stag	14	trunk	15-20
188	290494	6150154	Stag	14	stump	10-15
188	290494	6150154	Stag	14	stump	10-15
189	290750	6150243	E. bosostana	12	nest	N/A
190	290765	6150240	E. pilularis	14	trunk	5-10
190	290765	6150240	E. pilularis	14	trunk	5-10

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191	290772	6150250	E. pilularis	14	trunk	10-15
191	290772	6150250	E. pilularis	14	trunk	10-15
192	290782	6150257	E. pilularis	18	trunk	15-20
192	290782	6150257	E. pilularis	18	trunk	15-20
192	290782	6150257	E. pilularis	18	trunk	15-20
192	290782	6150257	E. pilularis	18	trunk	15-20
192	290782	6150257	E. pilularis	18	trunk	15-20
192	290782	6150257	E. pilularis	18	trunk	15-20
193	290805	6150257	E. pilularis	20	trunk	10-15
193	290805	6150257	E. pilularis	20	trunk	10-15
194	290824	6150266	E. pilularis	16	trunk	10-15
194	290824	6150266	E. pilularis	16	trunk	10-15
194	290824	6150266	E. pilularis	16	trunk	10-15
195	294151	6151762	C. glauca	8	trunk	10-15
196	294145	615781	C. glauca	16	trunk	5-10
196	294145	615781	C. glauca	16	trunk	5-10
197	294187	615822	C. glauca	14	trunk	15-20
197	294187	615822	C. glauca	14	trunk	15-20
197	294187	615822	C. glauca	14	trunk	15-20
197	294187	615822	C. glauca	14	stump	10-15
198	294186	615808	C. glauca	16	stump	10-15
198	294186	615808	C. glauca	16	stump	10-15
199	294184	6151795	C. glauca	14	trunk	10-15
199	294184	6151795	C. glauca	14	trunk	10-15
199	294184	6151795	C. glauca	14	stump	10-15
201	296195	6152733	E. saligna	16	stump	15-20
202	296200	6152745	E. saligna x botryoides	18	trunk	10-15
203	296196	6152751	Stag	5	stump	15-20
204	296208	6152749	E. saligna	18	branch	10-15
205	296219	6152720	E. saligna	15	trunk	15-20
205	296219	6152720	E. saligna	15	trunk	15-20
205	296219	6152720	E. saligna	15	trunk	15-20

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205	296219	6152720	E. saligna	15	trunk	15-20
205	296219	6152720	E. saligna	15	trunk	15-20
205	296219	6152720	E. saligna	15	trunk	5-10
206	296223	6152718	E. saligna	14	trunk	5-10
207	296250	6152715	E. saligna	20	branch	10-15
207	296250	6152715	E. saligna	20	branch	10-15
208	289595	6149886	C. cunninghamia	20	trunk	10-15
209	289596	6149887	Stag	8	trunk	15-20
210	289624	6149889	C. cunninghamia	20	stump	10-15
210	289624	6149889	C. cunninghamia	20	stump	10-15
210	289624	6149889	C. cunninghamia	20	stump	10-15
211	289630	6149888	Stag	9	trunk	15-20
212	289647	6149879	Stag	8	trunk	15-20
213	289641	6149914	C. cunninghamia	30	trunk	15-20
213	289641	6149914	C. cunninghamia	30	trunk	15-20
213	289641	6149914	C. cunninghamia	30	stump	10-15
213	289641	6149914	C. cunninghamia	30	stump	10-15
213	289641	6149914	C. cunninghamia	30	stump	10-15
214	289453	6148974	Cinnamomum camphor	18	trunk	10-15
232	290037	6149837	Stag	8	Stump	10-15
232	290037	6149837	Stag		trunk	10-15
232	290037	6149837	Stag		trunk	>20
267	292663	615007	E. saligna	14	3 x Branch	5-10
268	292568	6150975	E. pilularis	18	2 x Stump	10-15
269	292558	6150974	E. pilularis	18	3 x Stump	10-15
270	292552	6150977	E. pilularis	10	stump	15-20
271	292540	6150964	E. pilularis	8	2x stump	15-20
272	292530	6150970	E. pilularis	20	Trunk	10-15
273	292519	6150978	E. pilularis	22	branch	10-15
274	292509	6150973	E. pilularis	20	2 x Branch	10-15
275	292503	6150967	Stag	6	Trunk	15-20
276	292508	6150973	E. pilularis	21	Trunk	>20

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277	2922411	6150964	E. pilularis	16	2 x Branch	5-10
278	292288	6150928	E. pilularis	30	2 x Stump	15-20
279	292198	6150908	E. pilularis	25	2 x Trunk	>20
280	292131	6150925	E. pilularis	18	Trunk	10-15
281	292048	6150917	E. saligna x botryoides	20	Branch	5-10
282	292078	6150904	E. saligna x botryoides	25	2 x Branch	10-15
283	292121	6150902	E. pilularis	14	Branch	5-10
284	292147	6150893	E. pilularis	15	Trunk	5-10
285	292181	6150895	E. pilularis	18	2 x Stump	5-10
286	292220	6150890	E. pilularis	10	Trunk	15-20
287	292255	6150886	E. saligna	28	2 x Branch	5-10
288	292265	6150877	E. saligna	14	2 x Stump	15-20
289	292278	6150874	E. pilularis	20	2 x Branch	10-15
290	292302	6150871	E. saligna	20	1 x Trunk	5-10
290	292302	6150871	E. saligna		1 x branch	5-10
356	292095	6150864	E. saligna x botryoides	14	1 x branch	<10
357	292068	6150874	E. saligna x botryoides	12	1 x branch	<10
258	292045	6150889	E. saligna x botryoides	16	1 x branch	<10
359	292014	6150872	E. saligna x botryoides	14	1 x branch	<10
360	291992	6150879	E. saligna x botryoides	14	2 x Branch	10-20
361	291970	6150912	E. saligna x botryoides	16	2 x Branch	10-20
362	291956	6150915	E. saligna x botryoides	22	2 x Branch	10-20
363	291948	6150887	Stag	10	3 x Branch	10-20
364	291923	6150905	E. saligna x botryoides	15	2 x Branch	10-20
365	291917	6150914	Stag	20	1 x branch	10-20
366	291905	6150919	E. saligna x botryoides	21	1 x branch	10-20
366	291905	6150919	E. saligna x botryoides	21	1 x branch	>20
367	291866	6150926	E. saligna x botryoides	22	1 x branch	10-20
368	292012	6150845	E. pilularis	18	1 x branch	10-20
352	290579	6150130	E. tereticornis	8	1 x branch	<10
353	290120	6149925	E. saligna x botryoides	22	1 x branch	<10
354	290049	6149974	E. saligna x botryoides	20	4 x Branch	<10

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355	290047	6149973	<i>E. saligna</i> x <i>botryoides</i>	20	3 x Branch	<10
300	288089	6149123	<i>E. pilularis</i>	24	1 med, 1 large Branch	10-20, <20
301	288061	6149169	<i>E. pilularis</i>	18	1 med, 1 large Branch	10-20, <20
302	288058	6149176	<i>E. pilularis</i>	15	1 med, 1 large Branch	10-20, <20
303	287986	6149172	<i>E. pilularis</i>	14	1 med, 1 large Branch	10-20, <20
306	287973	6149165	<i>E. pilularis</i>	24	2 large Branch	<20
307	287966	6149157	<i>E. pilularis</i>	15	1 large Branch	<20
308	287954	6149127	<i>E. pilularis</i>	22	1 small, 1 med Branch	10-20, <20
309	287948	6149123	<i>E. pilularis</i>	15	1 small Branch	10-20
310	287939	6149110	<i>E. pilularis</i>	16	3 small, 1 med Branch	<10
311	287930	6149091	<i>E. pilularis</i>	18	3 small, 1 med Branch	<10
312	287922	6149085	<i>E. pilularis</i>	13	1 x branch	<10
313	287915	6149067	<i>E. pilularis</i>	19	1 x branch	10-20
314	287908	6149055	<i>E. pilularis</i>	14	2 x Branch	<10
315	287912	6149048	<i>E. pilularis</i>	14	1 x branch	<10
316	287898	6149043	<i>E. pilularis</i>	18	2 x Branch	<10
318	287897	6149040	<i>E. pilularis</i>	21	3 small, 1 med x Branch	<10, 10-20
319	287877	6149020	Stag	20	2 x Branch	<10
320	287876	6149019	<i>E. pilularis</i>	20	2 medium x Branch	10-20
321	287881	6149008	<i>E. pilularis</i>	14	1 x Branch	<10
322	287871	6149007	<i>E. pilularis</i>	16	1 small, 1 med x Branch	<10, 10-20
323	287854	6148981	<i>E. pilularis</i>	16	4 small, 1 medium x Branch	<10, 10-20
324	287798	6148900	<i>E. botryoides</i>	18	1 x Branch	<10
325	287792	6148898	<i>E. botryoides</i>	18	1 x Branch	<10
326	287930	6149066	<i>E. pilularis</i>	17	1 x Branch	10-20
266	294878	6152777	<i>Casuarina glauca</i>	22	4 small, 2 medium x Branch	<10, 10-20
267	294877	6152796	<i>Casuarina glauca</i>	18	3 x Branch	<10
268	294879	6152807	<i>Casuarina glauca</i>	18	2 x Branch	<10
269	294871	6152808	<i>Casuarina glauca</i>	18	2 x Branch	<10
270	294848	6152799	<i>Casuarina glauca</i>	22	4 small, 1 medium x	<10, 10-20

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					Branch	
271	294853	6152782	Casuarina glauca	17	2 x Branch	<10
272	294855	6152782	Casuarina glauca	16	3 x Branch	<10
273	294853	6152779	Casuarina glauca	16	3 x Branch	<10
274	294856	6152781	Casuarina glauca	15	1 x Branch	10-20
275	294843	6152771	Casuarina glauca	24	4 x Branch	<10
276	294834	6152776	Casuarina glauca	16	1 x Branch	<10
277	294841	6152792	Casuarina glauca	20	10+ x Branch	<10
278	294879	6152828	Casuarina glauca	16	2 x Branch	<10
279	296496	6152504	E. saligna	18	2 x Branch	<10
280	296619	6152442	E. saligna	20	4 x Branch	<10
281	296642	6152432	E. saligna	18	2 x Branch	<10
282	296650	6152431	E. saligna	15	4 x Branch	<10
283	296663	6152426	E. saligna	14	2 x Branch	<10
284	296661	6152445	E. saligna	16	3 x Branch	<10
285	296665	6152443	E. saligna	16	2 x Branch	<10
286	296665	6152443	E. saligna	15	1 x Branch	<10
287	296672	6152443	E. saligna	18	3 x Branch	<10
288	296699	6152438	E. saligna	10	1 x Branch	<20
289	296708	6152435	E. saligna	14	2 x Branch	10-20
290	296721	6152435	E. saligna	19	4 x Branch	10-20
291	296722	6152434	E. saligna	16	1 x Branch	<10
292	296497	6152503	E. saligna	16	2 x Branch	<10
293	296442	6152574	E. saligna	18	2 x Branch	<10
294	296434	6152613	E. saligna	18	2 x Branch	<10
296	287933	6149094	E. pilularis	18	2 medium x Branch	10-20
304	287496	6148535	E. saligna	25	trunk	10-15
305	287495	6148533	E. pilularis	20	2 x trunk	10-15
306	287499	6148531	E. saligna x botryoides	18	trunk	15-20
307	287502	6148536	E. pilularis	25	Nest	N/A
2	6149957.904	290023.0682	Casuarina glauca	80	Branch	<10
3	6149953.487	290015.7925	Casuarina glauca	100	Branch	<10

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4	6151871.036	294185.2792	E. saligna	170	Branch	<10
5	6152203.551	294405.9225	Casuarina glauca	90	Branch	<10
6	6152205.901	294400.3268	Casuarina glauca	70+100	Branch	<10
7	6152207.257	294375.2752	Casuarina glauca	80	Branch	<10
7	6152207.257	294375.2752	Casuarina glauca	80	Branch	<10
7	6152207.257	294375.2752	Casuarina glauca	70	Branch	<10
7	6152207.257	294375.2752	Casuarina glauca	60	Branch	<10
39	6149348.334	288097.0859	Eucalyptus camaldulensis	120	Branch	35
40	6149352.209	288095.3155	Eucalyptus camaldulensis	70	Branch	15
41	6149349.032	288094.2834	Eucalyptus camaldulensis	70	Branch	15
42	6149305.655	288070.5146	Eucalyptus camaldulensis	100	Branch	30
43	6149303.949	288067.146	Eucalyptus camaldulensis	120	Branch	30
44	6149293.904	288059.9323	Eucalyptus camaldulensis	90	Branch	10
45	6149272.221	288040.2456	Eucalyptus camaldulensis	110	Branch	25

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