

**PART L30**  
**TREE HOLLOW RELOCATION**

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**1. GENERAL**

- .1 This Part specifies the requirements for tree hollow inspection and relocation.

**2. FAUNA HABITAT**

- .1 Natural tree hollows are valuable and often essential for many wildlife species. They provide refuge from weather and predators, and safe sites for breeding. The destruction of living or dead hollow-bearing trees displaces or kills wildlife dependent on those hollows.
- .2 Removal or pruning of trees, particularly in rural or remote areas, may result in removal of tree hollows. Where hollows are encountered during tree removal or pruning projects, the Contractor shall not disturb native fauna occupying them. In the event of the discovery of occupied hollows, the Principal shall be notified immediately, and the Contractor shall make every effort to leave the hollow and its occupant undisturbed. The Contractor will be directed as to the course of action to be taken.

**3. INSPECTING FOR TREE HOLLOW****Tree Hollow Inspection Requirements and Responsibilities**

- .1 The Contractor shall meet the following tree hollow inspection requirements and responsibilities:
  - (a) **Inspection by the Contractor:** Prior to undertaking vegetation clearance or pruning within the construction site, the Contractor shall undertake a fauna inspection.  
Signs suggesting hollows are occupied by fauna include freshly rubbed bark around a well-scuffed tree hollow entrance or staining or apparent greasiness. In dead trees, there will be some obvious entrance wear or polish. Should signs of fauna occupancy be discovered, the Contractor shall advise the Principal and a joint inspection may be required.
  - (b) **Inspection by Others:** In certain situations, the fauna inspection may be carried out by an independent zoologist or person with tertiary qualifications in natural resource management or similar.
  - (c) **Identification of Hollows:** Trees containing occupied or unoccupied tree hollows or nests shall be clearly identified by means of an aluminum tag nailed to the trunk. All tags shall be numbered with the vegetation survey tree number and hollow number and recorded on the "Existing Tree Hollow Location Schedule" noting all pertinent details.

**4. HABITAT CREATION**

- .1 Tree hollow entrance (or aperture size), location, and orientation largely determine which species are able to make use of a hollow. Specific rare species may be targeted by relocating tree hollows of a particular aperture size.
- .2 Aperture sizes are generally classed as Large (150 to 200 mm), Medium (50 to 150 mm), and Small (50 mm or less). Refer Attachment L30A "Hollow Requirements for Particular Species" at the end of this Part. The Contractor will be advised if any targeted habitat creation applies.

**5. TREE HOLLOW HARVESTING AND RELOCATION****Hollow Type**

- .1 The Contractor shall conform to the following hollow types:
  - (a) **End of a Natural Tree Hollow:** The opening at the end of a natural tree hollow shall be used as the aperture. The length of the hollow shall be a minimum of 400 mm and a maximum of

1000 mm long (unless the targeted species is the Yellow-tailed Black Cockatoo which requires a hollow length of 2400 mm).

The cut end of the hollow shall be capped using a galvanised, perforated end plate, and fixed with 8 g x 30 mm galvanised self-drilling screws at 150 mm centres. Nesting material 200 mm deep, such as leaf litter that would naturally fall into hollows, shall be placed inside the hollow.

- (b) **Section of a Natural Tree Hollow:** A section of hollow branch that has both ends cut may have one or both ends capped. Where both ends are capped, an aperture is to be drilled or a slit formed at the top of the limb, depending on which species is targeted.

The length of the hollow shall be a minimum of 400 mm and a maximum of 1000 mm long (unless the targeted species is the Yellow-tailed Black Cockatoo which requires a hollow length of 2400 mm).

The top cut ends of the hollow shall be capped using a galvanised end plate and fixed with 8 g x 30 mm galvanised self-drilling tech screws at 150 mm centres. The bottom cut end shall be capped using a galvanised, perforated end plate, and fixed with 8 g x 30 mm galvanised self-drilling screws at 150 mm centres. Nesting material 200 mm deep, such as leaf litter that would naturally fall into hollows, shall be placed inside the hollow.

- (c) **Natural Hollows:** A natural tree hollow shall need no modification prior to relocation, i.e. the saw cut shall be made after the extent of the hollow. The length of the hollow shall be a minimum of 400 mm and a maximum of 1 000 mm long (unless the targeted species is the Yellow-tailed Black Cockatoo which requires a hollow length of 2 400 mm).
- (d) **Entire Trees with Hollows:** Where entire trees are identified for relocation, the tree shall be retained or stockpiled until a suitable site has been selected. The tree shall be handled with care so as not to diminish its habitat value.
- (e) **Manufactured Hollows and Nesting Boxes:** Manufactured hollows and nesting boxes shall be appropriate for the species encountered.

### Hollow Relocation Sites

.2 The Contractor shall use the following tree hollow relocation sites.

- (a) **Arboreal:** The Contractor shall select suitable host trees for the relocation of hollows. The host trees shall be mature, in good health, and will be part of a vegetated area conducive to habitat development. The host trees shall have sufficient height and branch structure to enable positioning hollows in positions that conform to the hollow requirements as shown in Attachment L30A. No more than two hollows shall be placed in one tree.

In certain situations, the Principal may require arboreal relocation sites to be selected by a zoologist or person with tertiary qualifications in natural resource management.

- (b) **Terrestrial:** Where directed, the Contractor shall place designated hollows on the ground in areas that are targeted for terrestrial fauna habitat creation. In certain situations, the relocation sites to be selected by an independent zoologist or person with tertiary qualifications in natural resource management.
- (c) **Hollow Orientation:** Hollows shall be mounted vertically or as close as possible to their original orientation. Hollows shall be mounted a minimum of 5 m from ground level or at a similar height and angle to where it was in the original tree. The aperture shall be faced away from prevailing weather to reduce entry of rain.

### Hollow Attachment

.3 The Contractor shall use the following tree hollow attachment types.

- (a) **Chain Attachment:** The hollow shall be attached to the host tree at bifurcations of a suitable height as per Attachment L30A. The hollow shall be attached by means of two 6.3 mm galvanized chains bolted to the either side of the log with 7.6 x 90 mm galvanized coach bolts and washers. The chains shall be wrapped around the host tree above the bifurcation and joined using a galvanized "D" shackle.
- (b) **Rod Attachment:** The hollow shall be attached to the host tree at a suitable height as per Attachment L30A. The hollow shall be attached by means of two 10 mm stainless steel (316 grade) threaded rods, nuts and washers inserted through holes drilled through the host tree limb. The hollow shall be spaced off the limb by 100 mm by means of lock nuts.

## **6. EQUIPMENT FOR INSTALLATION OF HOLLOWES**

### **Tree Hollow Sections**

.1 The Contractor shall conform to the following tree hollow installation requirements:

- (a) **Use of Climbers:** Tree hollows shall be fixed by climbing the tree. The Contractor shall ensure that all climbers and supervising staff meet approved accreditation standards and that all climbing equipment complies with relevant standards, is fit for purpose and is in good working order.

- (b) **Elevated Platform:** This method is to be used where machinery access is available, with one or two operators in a basket traveling up into the crown to install hollows. The Contractor shall ensure all operating staff has received approved training and qualifications in the use of this equipment.
- (c) **Equipment Recommended by Contractor:** The Contractor shall examine the site conditions and recommend preferred methods of hollow installation for the project.

#### **Whole Trees**

- .2 The Contractor shall conform to the following whole tree requirements:

#### **Use of Crane and Back-hoe with Auger**

- .3 Whole trees to be sawn off at ground level and relocated into excavated holes and backfilled. The Contractor shall ensure all operating staff has received approved training in the use of this machinery.

#### **Equipment Recommended by Contractor**

- .4 The Contractor shall examine the site conditions and recommend preferred methods of hollow installation for the project.

### **7. REMOVAL OF MATERIAL FROM SITE**

- .1 Any timber, branches, leaves, stumps and debris resulting from tree hollow relocation activities, which has not been specified for disposal, shall be removed from the site and disposed of by the Contractor. No other material of any other kind shall be removed from the site.

### **8. MAINTENANCE**

- .1 The location of installed hollows shall be recorded using approved GPS equipment. The hollows shall be maintained for a period of 12 months from the Date of Practical Completion. The Contractor shall submit a program of maintenance based on site inspections at two monthly intervals.
- .2 At each site inspection the Contractor shall check each installed hollow for safety, including re-fastening, re-orientation, tightening of fixings, and re-fixing of end caps if necessary. All activities shall be logged and a copy of the logbook shall be provided upon request.
- .3 Where installed hollows are occupied, the Contractor shall make every effort to avoid disturbing the fauna. A record shall be kept of hollows that are, or have been, occupied by fauna.

### **9. HOLD POINTS**

- .1 There are no Hold Points referenced in this Part.
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**1. ATTACHMENT L30A – HOLLOW REQUIREMENTS FOR PARTICULAR SPECIES**

Species	Interior Diameter	Depth/Length	Entrance Diameter	Vertical/ Horizontal	Height Ground	off	Breeding Season	Reference
<b>LARGE HOLLOWES – 150 to 200 mm</b>								
Black Cockatoo, Red-Tailed	300 mm	870–1000 mm	160 x 200 mm	V	> 7 m		Varied	Grant (1997)
Black Cockatoo, Glossy	300 mm	870–1000 mm	160 x 200 mm	V	> 7 m		Mar–Aug	Pedler (1996)
Black Cockatoo, Yellow-tailed	300–400 mm	600–2400 mm						
Boobook , Southern	-	-	150 mm	H	-		Sept-Nov	Trainor (1995)
Cockatoo, Sulphur –crested	300 mm	1000 mm	150 mm	V	> 7 m		Aug-Jan	Trainor (1995)
Corella, Little	300 mm	1000 mm	150 mm	V	> 7 m		Jun-Oct	Trainor (1995)
Corella, Long-billed	300 mm	1000 mm	150 mm	V	> 7 m		Aug-Dec	Trainor (1995)
Kookaburra, Laughing	150–300 mm	> 400 mm	80–120 mm	H	5–10 m		Sept-Jan	Elliott (1994)
Owl, Barn	400 mm	750 mm	150 mm (open)	H	5 m		Autumn-Spring	Adams (1980) & Trainor (1995)
Shrike – thrush, Grey	150 x 300 mm	150–300 mm	90–150 mm (open)	H	> 2-5 m		Jul–Feb	BFNC (n.d.) & Elliott (1994)
Swallow, Welcome	130 mm	-	Open	H	3 m		Aug-Dec	Adams (1980)
<b>MEDIUM HOLLOWES – 50 to 150 mm</b>								
Brush-tail Possum	210–320 mm	400 mm	100-150 mm	V	4–8 m		Autumn	RSPCA (n.d.) & MZES (n.d.)
Duck, Australian Wood	200 mm	500 mm	120 mm	V	> 1.5–2 m		Sept–Nov	Trainor (1995)
Duck, Pacific Black	450 x 300 mm	-	120 mm	-	> 1.5–2 m		Jul-Oct	Elliott (1994)
Galah	200 mm	650 mm	120 mm	V	6 m		Aug–Nov	Adams (1980)
Glider, Squirrel	-	-	60 mm	-	-		May-Dec	Trainor (1995)
Kestrel, Nankeen	400 mm	750 mm	100 mm	V	5 m		Aug-Nov	Adams (1980)
Kingfisher, Sacred	130 mm	600–900 mm	75 mm	H	5–10 m		Sep-Mar	Adams (1980)
Lorikeet, Rainbow	130 mm	800 mm	80–100 mm	V-H 45° angle	> 5 m		Aug-Jan	Grant (1997)
Lorikeet spp.	120 mm	600 mm	60 mm	H	5 m		Aug-Jan	Adams (1980)
Owlet-nightjar, Australian	150 mm	300 mm	50–80 mm	V	> 5 m		Sep-Dec	Adams (1980) & Elliot (1994)
Parrot, Red-rumped	100–150 mm	400–600 mm	70–120 mm	V/H	5 m		Aug-Jan	Adams (1980) & Elliot (1994)
Ringtail-Possum sp.	250 mm	350–400 mm	60–90 mm	V	4-8 m		Apr-Nov	Trainor (1995) & MZES (n.d.)
Rosella spp.	120–180 mm	> 400 mm	70–120 mm	V/H	5 m		Aug-Jan	Elliott (1994) & MZES (n.d.)

Rosella, Crimson	150–200 mm	350–800 mm	75–100 mm	V/H	5–6 m	Sep-Jan	Adams (1980)
Rosella, Eastern	135–240 mm	350–800 mm	60–100 mm	V/H	5–6 m	Aug-Jan	Adams (1980)
Teal, Chesnut	200–450 mm	450–750 mm	80–120 mm	V	1.5 m	Sep-Dec	Adams (1980) & Elliot (1994)
Teal, Grey	400–450 mm	450–750 mm	80–120 mm	V	1.5 m	All year	Adams (1980) & Elliot (1994)
Treecreeper spp.	90–150 mm	100–400 mm	50–80 mm	V	-	-	Elliot (1994)
Treecreeper, White-throated	75–100 mm	300–400 mm	50 – 70 mm	V	5 m	Aug-Jan	Adams (1980)

**ATTACHMENT L30A cont'd- HOLLOW REQUIREMENTS FOR PARTICULAR SPECIES**

<b>SMALL HOLLOWES – 50 mm or less</b>							
Antechinus, Yellow footed	-	-	20–25 mm	-	-	Jun-Oct	Trainor (1995)
Bat spp.	70–100 mm x 150–240 mm	200–250 mm	15-20 mm slit	V	2-4 m	-	BFNC (n.d.)
Bat, Chocolate Wattled	-	-	10 mm slit	V/H	2-4 m	Nov-Dec	Trainor (1995) & Grant (1997)
Bat, Gould's Wattled	-	-	10 mm slit	V/H	2-4 m	May	Trainor (1995) & Grant (1997)
Bat, Lesser Long-eared	-	-	10 mm slit	V/H	2-4 m	Sept-Dec	Trainor (1995) & Grant (1997)
Glider, Feather-tailed	150 mm	150 x 450 mm	20–30 mm	H	> 2 m	Aug-Feb	Trainor (1995) & Grant (1997)
Glider, Sugar	200–250 mm	200-300 x 500 mm	25–50 mm	V	4-8 m	Jun-Dec	MZES (n.d.) & Grant (1997)
Lorikeet, Little	-	-	25–30 mm	V/H	4-10 m	Aug-Jan	Trainor (1995)
Lorikeet, Musk	-	-	25–30 mm	V/H	4-10 m	Aug-Jan	Trainor (1995)
Lorikeet, Purple-crowned	-	-	25–30 mm	V/H	4-10 m	Aug-Dec	Trainor (1995)
Pardolate spp.	120 mm	400–500 mm	30–45 mm	H	5 m	Jun-Jan	Adams (1980)
Pardolate, Striated	90–200 mm	200 mm	25–35 mm	H	6 m	Jun-Jan	BFNC (n.d.)
Phascogale, Brush-tailed	180 mm	180-500 mm	25-40 mm	H	> 4 m	Jun-Sep	Trainor (1995) & Grant (1997)

(a)

(b) Source: Adapted from 'Supplement to Birds Australia Information Sheet 5: Nestboxes for Natives (July 2001)' and from the SA Native Vegetation Council fact sheet