

Table of contents

	1.	Introduction										
		1.1	Background	1								
		1.2	Purpose of this Plan	1								
		1.3	Relevant Environmental Management Strategy Measures	1								
		1.4	Limitations	2								
	2.	Exist	ing environment	4								
		2.1	Site location and context	4								
		2.2	Vegetation									
		2.3	Fauna habitats									
		2.4	Fauna species	7								
	3.	Hollo	Hollow surveys									
		3.1	Methods									
		3.2	Results	8								
	4.	Mana	agement measures									
		4.2	Monitoring of nest boxes	13								
	5.	Sum	mary of management actions	16								
	6.	Refe	rences	17								
	Table		ndex Relevant Environmental Management Strategy conditions	2								
	Table	2-1	Threatened fauna species with potential to utilise tree hollows recorded at the site									
	Table	3-1	Summary of number of hollows recorded on the development site									
	Table	3-2	Summary of number of hollows recorded in the proposed nest box locations									
	Table	4-1	Nest box requirements at the site	11								
	Table	4-2	Staged nest box requirements	12								
	Table	4-3	Nest box dimensions	12								
	Table	5-1	Management actions	16								
Fi	gui	'e i	index									
	Figure	e 1-1	Site location	3								
	Figure	e 3-1	Location of hollow bearing trees	10								
	Figure	e 4-1	Proposed nest box locations	15								

Appendices

Appendix A – Tree Hollow Register

Appendix B – Registers

1. Introduction

1.1 Background

GHD has been engaged by Newman Quarrying Pty Ltd to prepare a Nest Box Management Plan (the Plan) for the proposed staged expansion works (the proposal) at the existing Slys Quarry located on Tullymorgan-Jackybulbin Road, Moro, NSW (the site).

The proposal involves the expansion of the existing sandstone quarry by 11.1 hectares and an increase in the extraction rate up to 500,000 tonnes per annum that would be carried out in stages. Stage 1 already has approvals in place under an existing development application and is predominantly cleared, except for a portion in the north of the site and a few scattered trees. This Plan relates to actions required prior to proposal commencing further Stages 2 and 3.

A Biodiversity Assessment Report (BAR) (GHD, 2016) was undertaken to support an Environmental Impact Assessment (EIS) (GHD, 2015) for the site that addressed the potential biodiversity impacts of the proposed quarry expansion. The EIS was approved by the Minister for Planning on 5 May 2016 and conditions of consent were issued for the project (SSD 6624). A Biodiversity and Rehabilitation Management Plan (BRMP) (GHD, 2017a) was prepared for the project in accordance with the consent condition 31 and the Environmental Management Strategy (GHD, 2017b) which described the rehabilitation and biodiversity management strategies, procedures, controls and monitoring programs to be implemented to prevent or minimise impacts and facilitate effective rehabilitation of Slys Quarry during operational and post operational phases. The preparation of a Nest Box Management Plan was identified as an additional requirement from the EIS (GHD, 2015) and Biodiversity and Rehabilitation Management Plan (GHD, 2017a) (see Section 1.3).

1.2 Purpose of this plan

This Plan sets out the framework for mitigating the loss of hollow-bearing trees (HBTs) associated with clearing activities required for the proposal and has been prepared in accordance with Condition B9 and B10 of the Environmental Management Strategy (EMS) (GHD, 2017b) as detailed in Section 1.3. The primary objective of this Plan is to detail suitable nest box requirements to minimise impacts on native hollow-dependant fauna species at the site during the proposal in accordance with the project consent conditions (detailed in Section 1.3).

Specifically, the aims of this Plan are to:

- Provide a description of the existing vegetation and ecological values within the site.
- Minimise impacts on native biodiversity, particularly hollow-dependent arboreal fauna, by
 outlining an appropriate number of nest boxes to be installed within the adjacent
 vegetation prior to clearing to mitigate the associated loss of HBTs. This is to occur in a
 staged approach, as per the quarry expansion.
- Outline monitoring and reporting requirements and responsibilities.

1.3 Relevant environmental management strategy measures

Specific measures and requirements to address nest box installation within the adjacent vegetation were detailed in the EIS (GHD, 2015) and BRMP (GHD, 2017a). The relevant environmental management strategy (EMS) measures are outlined in Table 1-1.

Table 1-1 Relevant Environmental Management Strategy conditions

EMS Ref.	Environmental Management Measure	Section addressed in document
B9	Six months prior to clearing, engage an experienced ecologist to undertake a preclearing survey and prepare a Nest Box Management Plan (NBMP), in consultation with OEH.	This Plan
	Identifying the number and size of hollows to be lost within the clearing footprint	Section 3 – Results of nest box surveys
	Determining the number, size and location of	Section 3 – Results of nest box surveys
	nest boxes to be installed	Table 4-1 - Nest box requirements at the site
B10	Nest boxes specified in the Plan are to be installed prior to removal of hollow-bearing trees	Section 4.1.1 – Nest box installation
		Section 5 – Summary of management actions

1.4 Limitations

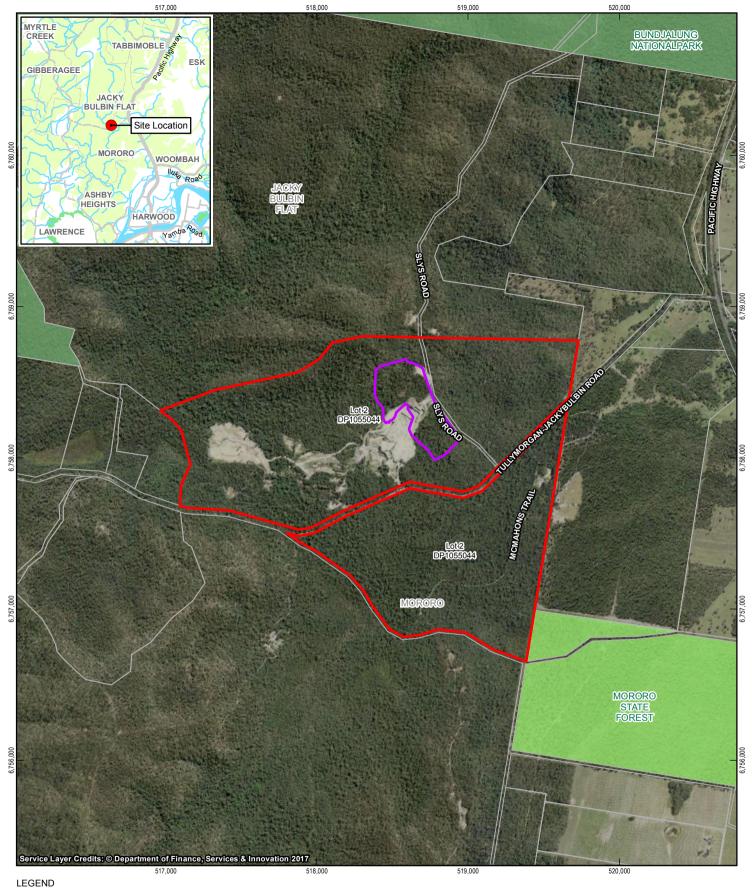
This report: has been prepared by GHD for Newman Quarrying Pty Ltd and may only be used and relied on by Newman Quarrying Pty Ltd for the purpose agreed between GHD and the Newman Quarrying Pty Ltd as set out in section 1 of this report.

GHD otherwise disclaims responsibility to any person other than Newman Quarrying Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.



Cadastre

Lot 2 DP1055044

State Forest

Subject Site

Paper Size A4 190

Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

380

570

760





Newman Quarrying Pty Ltd Sly's Quarry Nest Box Management Plan Job Number 22-17528 Revision

Date | 15 Sep 2017

Site Location

Figure 1-1

2. Existing environment

2.1 Site location and context

The site is located at Lot 2 DP 1055044 along Tullymorgan-Jackybulbin Road, north of Yamba and approximately 2 kilometres west of the Pacific Highway on the NSW Mid-North Coast, in the Clarence Valley Shire Council (Council) Local Government Area (LGA). For the purpose of this report, the site is defined as the existing quarry inclusive of the expansion stages 1, 2 and 3 (see Figure 1-1).

The site is 18.1 hectares in size and contains a previous area of disturbance that is currently being used as a quarry, several recently cleared access tracks and areas of regrowth native vegetation.

An adjacent area south of Tullymorgan-Jackybulbin Road has been nominated as Slys Quarry Biobank and forms part of a large extant of native vegetation that extends to the north, and south of the site. To the west the site is bound by Slys Road. Several forested reserves are located in the surrounding locality. These include Bundjalung Crown Reserve, Devils Pulpit State Forest, Gibberagee State Forest and Mororo State Forest.

2.2 Vegetation

GHD (2016) mapped two Plant Community Types within the study area, neither of which are consistent with any threatened ecological community (TEC) listings under either the *Threatened Species Conservation Act 1995* (TSC Act) or *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). These communities are described below. Appendix A shows vegetation distribution across the site.

2.2.1 Blackbutt - Bloodwood dry heathy open forest on sandstones of the northern North Coast (PCT ID NR115)

Blackbutt-Bloodwood dry heathy open forest is a tall open forest that occurs on deep sands of old dune systems along the NSW North Coast.

This community is dominated by Pink Bloodwood (*Corymbia intermedia*), Tallowwood (*Eucalyptus microcorys*), Blackbutt (*Eucalyptus pilularis*) and *Angophora paludosa* to 25 metres tall. Over a tall shrub layer to 10 metres dominated by *Acacia leiocalyx*, Red Ash (*Alphitonia excelsa*), Logon Apple (*Acronychia imperforata*) and Salwood (*Acacia disparrima*). A lower layer of shrubs includes Coffee Bush (*Breynia oblongata*), Cheese Tree (*Glochidion ferdinandi*) and Tree Heath (*Trochocarpa laurina*). The ground storey consists of a dense layer of leaf litter with a sparse cover (< 3%) of herbs and grasses. Common species within the ground layer include Many-flowered Mat-rush (*Lomandra multiflora*), Blue Flax Lily (*Dianella cerulea var. producta*), Rough Saw Sedge (*Gahnia aspera*), Spear Grass (*Austrostipa pubescens*) and Creeping Beard Grass (*Oplismenus imbecillis*).

This vegetation type covers approximately 4.23 hectares of the site.



Plate 1 Blackbutt - bloodwood dry heathy open forest in the south west of the site

2.2.2 Blackbutt - Turpentine dry heathy open forest on sandstones of the lower Clarence of the North Coast (PCT ID NR123)

Blackbutt-Turpentine dry heathy forest is a tall open forest that occurs on sandstone geologies of the Clarence-Moreton Basin from the southern Richmond Range east to the Coast Range.

Within the study area this plant community is dominated by Blackbutt (*Eucalyptus pilularis*), Turpentine (*Syncarpia glomerata*), Red Mahogany (*Eucalyptus resinifera*) and *Angophora woodsiana* to 25 metres tall with a cover of approximately 40%. The midstorey consists of a tall shrub layer to 8 metres dominated by *Acacia leiocalyx*, Red Ash (*Alphitonia excelsa*), Tree Heath (*Trochocarpa laurina*), Flaky-barked Tea-tree (*Leptospermum trinervium*), *Persoonia conjuncta*, Cheese tree (*Glochidion ferdinandiana*) and Blackthorn (*Bursaria spinosa*) over a dense low shrublayer to 2 metres dominated by Handsome Flat Pea (*Platylobium formosum*), *Hibbertia marginata*, *Leucopogon lanceolatus* and Coffee Bush (*Breynia oblongata*). The groundlayer is dominated by Wire Grass (*Entolasia stricta*), Grass Trees (*Xanthorrhoea sp*), Spiny-headed Mat-rush (*Lomandra longifolia*), Rough Saw-sedge (*Gahnia aspera*), Common Bracken (*Pteridium esculentum*), Crinkle Bush (*Lomatia silaifolia*), Blue Flax-lily (*Dianella cerulea*) and *Lepidosperma laterale*. This community also contains a variety of vines and climbers including Wonga Vine (*Pandorea pandorana*), Lawyer vine (*Smilax australis*), Sweet Sarsaparilla (*Smilax glyciphylla*), Molucca Bramble (*Rubus moluccanus var. trilobus*) and Stiff Jasmine (*Jasminum volubile*).

This vegetation type covers approximately 6.27 hectares of the site.



Plate 2 Blackbutt - Turpentine dry heathy open forest in the north of the site

2.3 Fauna habitats

The site represents a pre-existing disturbance area of the operational quarry that is surrounded by an area of bushland. Vegetation is continuous and has good connectivity to the north and south of the site. The main fauna habitats that occur within the site are associated with the dry open forest communities. Habitat within these vegetation communities are described in detail below.

The site would be expected to support a moderately high diversity of native fauna species. Habitat values are somewhat lower than would be present at an undisturbed site, given the previous selective logging that has occurred, however a number of mature-age trees have been retained that now support hollows. There are also other ongoing habitat disturbances such as noise from quarry operations.

The site contains a range of habitat features which would provide shelter and foraging resources for a variety of native fauna, including the following features of particular relevance to this Plan:

- A moderate density of hollow-bearing trees with a range of hollow sizes and positions, including trees with hollows at ground level, limb hollows, trunk fissures and dead trees (stags). These would provide potential roost sites for several native birds, arboreal and terrestrial mammals and microbats.
- A moderate density of fallen hollow logs, woody debris and leaf litter that would provide
 potential foraging and shelter habitat for ground-dwelling mammals, reptiles and
 insectivorous birds.
- Resin producing species such as Pink Bloodwood (Corymbia intermedia) also occur and provide potential foraging habitat for gliders, including the threatened Squirrel Glider (Petaurus norfolcensis) and Yellow Bellied Glider (Petaurus australis).

• The quarry face itself, which is uneven and may provide basking, shelter and foraging resources for native reptiles, and potential shelter habitat for small terrestrial mammals or birds as well as diurnal roosts for microbats.

2.4 Fauna species

A range of common fauna species are likely to shelter and nest in vegetation at the site. Various hollow-dependent fauna are known to occur in the site (i.e. recorded during surveys for the project) or could potentially occur (based on records in the locality). These include fauna groups such as possums and gliders, microbats, owls, cockatoos, parrots, and other birds. Fauna species that have been recorded or are likely to utilise hollow-bearing trees within the site, which may be encountered during clearing activities, are summarised below in Table 2-1.

Table 2-1 Threatened fauna species with potential to utilise tree hollows recorded at the site

Scientific name	Common name	TSC Act	EPBC Act	Habitat
Calyptorhynchus lathami	Glossy Black- Cockatoo	V	-	Tree hollows
Glossopsitta pusilla	Little Lorikeet	V	-	Tree hollows
Ninox connivens	Barking Owl	V	-	Tree hollows
Ninox strenua	Powerful Owl	V	-	Tree hollows
Tyto novaehollandiae	Masked Owl	V	-	Tree hollows
Chalinolobus nigrogriseus	Hoary Wattled Bat	V	-	Tree hollows
Dasyurus maculatus	Spotted-tailed Quoll	V	Е	Ground habitat and tree hollows
Mormopterus norfolkensis	Eastern Freetail-bat	V	-	Tree hollows
Nyctophilus bifax	Eastern Long-eared Bat	V	-	Tree hollows
Petaurus australis	Yellow-bellied Glider	V	-	Tree hollows
Petaurus norfolcensis	Squirrel Glider	V	-	Tree hollows
Phascogale tapoatafa	Brush-tailed Phascogale	V	-	Tree hollows
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	Tree hollows
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	Tree hollows

The codes used in this table are: E - endangered; V - vulnerable;, M- migratory

Note: The above table lists species which have been recorded or which may utilise the site. The list is not intended to be definitive and additional native species, not listed above, may also be present at the site.

Hollow surveys

3.1 Methods

3.1.1 Development site

Prior to the commencement of any clearing activities, a nest box survey of the site was undertaken by two suitably qualified ecologists on the 22 – 24 August 2017.

During the nest box survey all hollow-bearing trees and other significant habitat features, such as fallen logs, were identified with a "H" in high visibility spray paint and high visibility flagging tape. Each feature was also identified with a GPS.

Trees were inspected visually, and with binoculars where required. Details of identified hollow-bearing trees included GPS position, tree species, tree height, diameter at breast height (DBH), number and size of trunk hollows, number and size of limb hollows, and evidence of fauna usage were recorded.

A detailed tree hollow register is provided in Appendix A which details the information obtained during surveys and assists with next box requirements and later pre-clearing surveys.

3.1.2 Proposed nest box installation locations

On the 1 November 2017, two ecologists conducted further surveys within the proposed nest box installation location areas immediately adjacent to the site to assess hollow density and sizes in these areas (Figure 4-1). A total of three transects were completed, one within each vegetation zone. All HBTs within a 20 x 200 m area were recorded and details are provided in the tree hollow register in Appendix A. This information was collected to assist with determining the number and type of nest boxes required to be installed.

3.2 Results

3.2.1 Development site

A total of 245 trees supporting visible hollows were identified across all three stages of the site (Appendix A). The number of small, medium and large hollows, along with their position on the tree is provided in Table 3-1 below. See Appendix A for full tree hollow register.

Table 3-1 Summary of number of hollows recorded on the development site

Type of hollow		mall cm	Medi 5-15		Lar >15	Ĭ.	Total (percentage)
	Trunk Hollow	Limb Hollow	Trunk Hollow	Limb Hollow	Trunk Hollow	Limb Hollow	
Stage 1	0	47	4	15	10	10	86 (7.7%)
Stage 2	13	232	34	158	39	76	552 (49.9%)
Stage 3	19	199	24	140	40	47	469 (42.4%)
Total	32	478	62	313	89	133	1,107

3.2.2 Proposed nest box installation locations

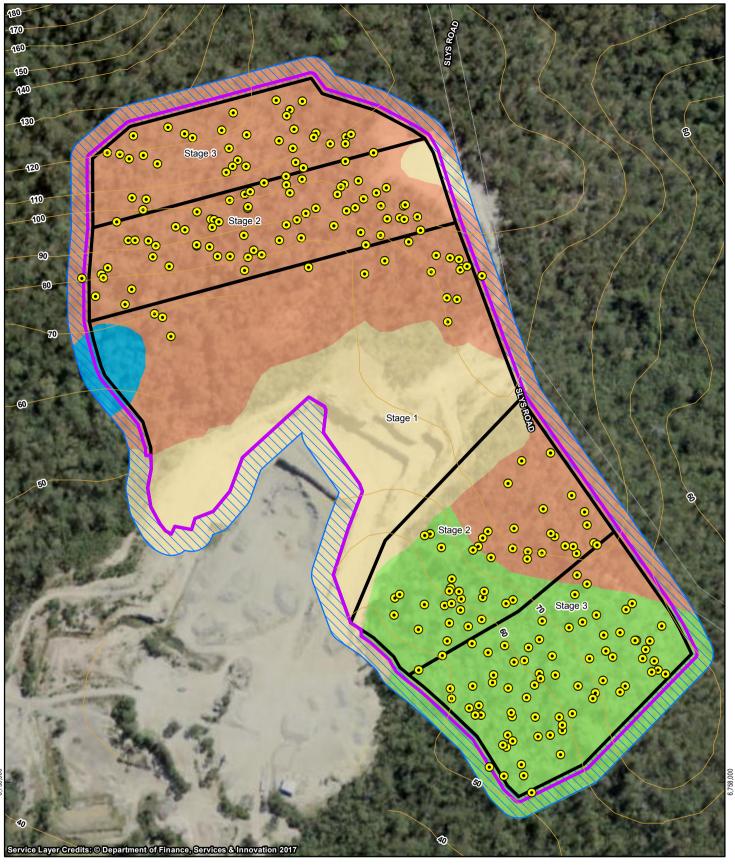
Three vegetation types are present within the proposed nest box location areas:

- Spotted Gum Grey Ironbark Pink Bloodwood open forest of the Clarence Valley lowlands of the North Coast (NR246)
- Blackbutt Bloodwood dry heathy open forest on Sandstone of the northern NSW North Coast Bioregion (NR 115)
- Blackbutt Turpentine dry heathy open forest on sandstones of the lower Clarence of the NSW North Coast Bioregion (NR 123)

Transects completed in each of these vegetation zones found the abundance and density of hollows to be largely consistent with the vegetation to be removed from the site (see Table 3-2). Small hollows make up 47% of hollows overall, medium make up 38% of hollows overall and large hollows make up 15% of hollow overall. There is some variation between transects, but these general ratios are mostly similar.

Table 3-2 Summary of number of hollows recorded in the proposed nest box locations

Hollow Type	Size Class	T1 (NR246)	T2 (NR123)	T3 (NR115)	TOTAL
Trunk Hollows	Small	1	8	7	16
	Medium	7	12	1	20
	Large	4	4	1	9
Limb Hollows	Small	24	26	18	68
	Medium	15	20	12	47
	Large	4	6	8	18
	TOTAL	55	76	47	178





Cadastre

Stages

20m buffer

Subject site

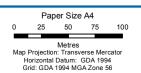
Blackbutt - Turpentine dry heathy open forest on sandstones of the lower Clarence of the NSW North Coast Bioregion (NR 123)

Blackbutt - bloodwood dry heathy open forest on Sandstone of the northern NSW North Coast Bioregion (NR 115)

Cleared

Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion (NR 254)

• Hollow bearing tree







Newman Quarrying Pty Ltd Sly's Quarry Nest Box Management Plan Job Number 22-17528

Date | 15 Sep 2017

Location of hollow bearing trees

Figure 3-1

4. Management measures

4.1.1 Nest box installation

Nest box requirements

Nest boxes will be installed in the adjacent native vegetation to provide a safe location for release of any hollow-dependent fauna captured during clearing operations and to help compensate for the loss of tree-hollows identified at the site (see Figure 4-1). The number of nest boxes required has been calculated based on the number of hollows and hollow-bearing trees identified within the site. A total of 245 hollow-bearing trees were identified within the development footprint which contained a total of 1,107 hollows. Similar hollow densities and ratios of hollow sizes were found to occur in the adjacent habitat where nest box placement is proposed.

Given the high density of hollows identified within and adjacent to the site and to avoid oversaturating the emplacement vegetation with nest boxes, the installation of up to 150 nest boxes of various sizes is recommended. These would be installed in stages into the proposed nest box locations outlined in Figure 4-1. The following factors were taken into consideration in determining the number and type of nest boxes:

- The number of hollow-bearing trees being removed
- The ratio of hollow sizes being removed
- The tree hollow preferences of native hollow-dependant fauna known or likely to occur in the area
- The sizes and quantities of hollows in the proposed nest box location areas
- Feasibility of installing nest boxes and suitability of trees

The number of specific types of nest boxes required has been calculated by the number of each hollow size category recorded at the site and taking into account the various fauna groups that use that size class. Different nest box shapes are used by different fauna groups.

The number and sizing requirements for compensatory nest boxes based on these calculations are provided in Table 4-1.

Table 4-1 Nest box requirements at the site

Size category	Number of hollows identified	Percent of total HBTs in proposed nest box locations	Percent of total HBTs in development site	Target species group	Number of nest boxes required
Small (<5	510	47%	46% of 150	Microbats	34
cm)			(69)	Small Gliders	35
Medium (5-15 cm)	375	38%	34% of 150	Lorikeets/Rosell as	25
			(51)	Possums	26
Large	222	15%	20% of 150	Cockatoos	15
(>15 cm)			(30)	Owls	15
Grand total	1,107				150

Installation of nest boxes would be staged based on timing of clearing. The numbers required for each stage is provided in Table 4-2 and are based on the ratios detailed in Table 4-1. Prior to each stage, the total number to be installed may be revised by the project ecologist based on evidence of usage and presence of suitable trees for installation.

Table 4-2 Staged nest box requirements

Stage	Number of nest boxes required Small (<5 cm)	Number of nest boxes required Medium (5-15 cm)	Number of nest boxes required Large (>15 cm)	Total nest boxes to be installed*
Stage 1	5	4	2	12
	(3 microbat, 2 glider)	(2 lorikeet, 2 possum)	(1 cockatoo, 1 owl)	
Stage 2*	34	25	15	75
	(17 microbat, 17 glider)	(12 lorikeet, 13 possum)	(7 cockatoo, 8 owl)	
Stage 3*	29	22	13	64
	(14 microbat, 15 glider)	(11 lorikeet, 11 possum)	(7 cockatoo, 6 owl)	
	69	51	30	150

^{*} Total number required to be reassessed if needed following monitoring of initial nest boxes installed.

Recommended nest box types and dimensions are detailed in Table 4-3. Nest box dimensions are based on information contained in Franks and Franks (2011), Birds Australia (2001) and Birdlife Australia (undated) and advice from nest box specialists (Hollow Log Homes). Note that a range of dimensions are recommended for specific fauna species in the literature and specifications can be subject to change over time based on the results of published monitoring surveys.

Nest boxes will be sourced from a suitable nest box manufacturer such as Hollow Log Homes.

Table 4-3 Nest box dimensions

Target group	Entrance diameter (mm)	Approximate dimensions (mm)	Approximate Depth (mm)
Microbats	10-30	200 x 200	400
Small Gliders	40-50	200 x 200	300
Lorikeets/Rosellas	50-70	200 x 200	400
Possums	58-100	250 x 300	400
Glossy Black Cockatoo	100-170	550 x 500	650-800
Owls	100-170	550 x 500	650-800

Nest box installation

Nest boxes are to be installed by an arborist or qualified tree climber within areas of intact native vegetation adjacent to the site under supervision of a suitably qualified ecologist. The following protocol is recommended for installing nest boxes:

 Nest boxes will be installed at least one months prior to commencement of clearing operations, and may be undertaken in a staged approach corresponding to each quarry expansion stage as detailed in Table 4-2.

- Nest boxes are to be installed in trees that do not already have hollows.
- All nest boxes are to be set at least 3 m above the ground.
- Nest boxes should be placed on the north-eastern side of the tree or most-shaded area to avoid the hot afternoon sun.
- All nest boxes should be attached to the tree using the 'Habisure' system (Franks and Franks 2011) or similar durable external grade fixing system that does not damage the tree:
 - Where the wire is in contact with the tree trunk or branch it must be plastic-coated or threaded through a length of garden hose to protect the tree
 - Wire must be folded to allow for tree growth
 - Where possible the wire around the tree should pass over a branch behind the trunk,
 although nest boxes can be installed directly on a straight-stemmed tree
- Details of each nest box installed should be recorded for future monitoring and should include:
 - GPS location
 - Tree species
 - Next box type

A template nest box register is provided in Appendix B.

4.1.2 Timing

Nest boxes are to be installed one month prior to clearing of hollow-bearing trees in each stage. The installation of nest boxes for Stage 1 and 2 comprises a total of 87 nest boxes. It is recommended that prior to the installation of final nest boxes for Stage 3 clearing, the project ecologist would assess the continued suitability of the proposed nest box locations and remaining trees within that area to determine if the final total number of nest boxes required.

4.2 Monitoring of nest boxes

4.2.1 Monitoring

Nest boxes are to be monitored by the project ecologist and arborist to determine their usage and to assess whether any repairs or replacement is required. Monitoring is to be conducted twice a year for a minimum period of five (5) years following installation. Monitoring can coincide with pre-installation checks for later stages.

The following inspection procedure is recommended:

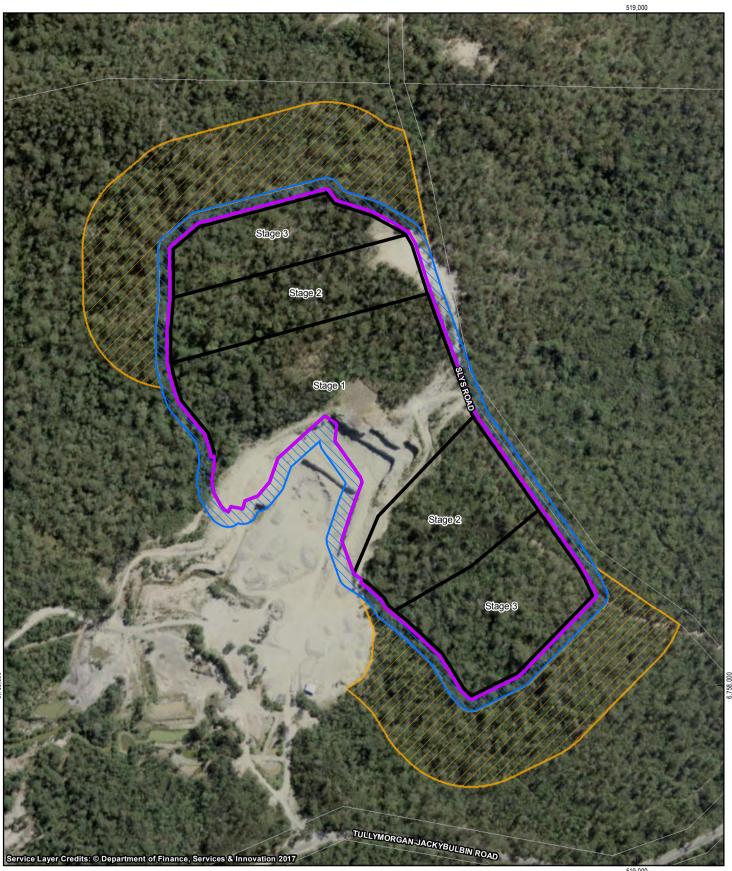
- A fibre-optic camera should be used to check nest boxes for signs of use and to minimise
 disturbance of any resident fauna. Visual inspections should be made if the exact species
 cannot be determined using the fibre optic camera.
- A record of the species present, numbers of individuals, and any breeding activity (eggs, nestlings etc.) should be kept.
- If nest boxes show evidence of being occupied by feral animals (e.g. Honey Bees, Common Mynas) the nest box should be removed and/or modified to prevent occupation by such species.

Any damaged nest boxes or nest boxes containing feral animals are to be taken down and repaired on site where possible. Any feral animals captured are to be removed and euthanized humanely by a qualified veterinarian or ecologist/wildlife rescuer with appropriate animal ethics approval.

A nest box monitoring template is provided in Appendix B.

4.2.2 Reporting

Monitoring reports are to be prepared by the project ecologist and included in the Annual Review along with any recommendations. The monitoring report will note fauna species using the nest boxes (or evidence of recent usage), and any requirements for maintenance, replacement or changes to the total number to be installed. The nest box register is to be updated following any changes to nest boxes as a result of feral habitation or maintenance requirements.





Cadastre

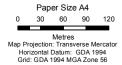
Proposed nest box locations

Stages

Subject site



20m buffer







Newman Quarrying Pty Ltd Sly's Quarry Nest Box Management Plan Job Number | 22-17528 Revision | 0 Date | 15 Sep 2017

Proposed nest box locations Figure 4-1

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 T 61 2 4979 9999 F 61 2 4979 9988 Entlmail@ghd.com www.ghd.com.au

5. Summary of management actions

A summary of management actions arising from this Plan is detailed in Table 5-1.

Table 5-1 Management actions

Management action	Timing	Responsibility	Reporting	Status
Pre-construction				
Identification of the number and size of hollows to be removed	At least 6 months prior to clearing	Project ecologist	Tree hollow map and Hollow Register to be provided to Newman Quarrying Pty Ltd and contractor	Complete
Preparation of Nest Box Management Plan that outlines the number, size and location of nest boxes to be installed.	At least 6 months prior to clearing	Project ecologist	Nest Box Management Plan	Complete
Ordering of required nest boxes	At least 2 months prior to clearing of each stage	Newman Quarrying	NA	Outstanding
Installation of required nest boxes as per Nest Box Management Plan prior to commencement of each stage of clearing.	At least 1 month prior to clearing of each stage	Project ecologist	Include in routine weekly monitoring on Environmental Inspection Checklist	Outstanding
Post-installation				
Monitoring of nest boxes	Twice a year for 5 years	Project ecologist	Report to DPE and OEH in the Annual Review.	Outstanding

6. References

Birdlife Australia (undated). Nest Boxes – technical information. http://birdlife.org.au/education-publications

DPI (2001). Code of practice for the welfare of wildlife during rehabilitation

Franks, A. and Franks, S. (2011). Nest Boxes for Wildlife, a practical guide

GHD (2015). *Environmental Impact Statement*. Prepared for Proposed Quarry Expansion at Lot 2 DP 1055044, Tullymorgan-Jackybulbin Road, Mororo

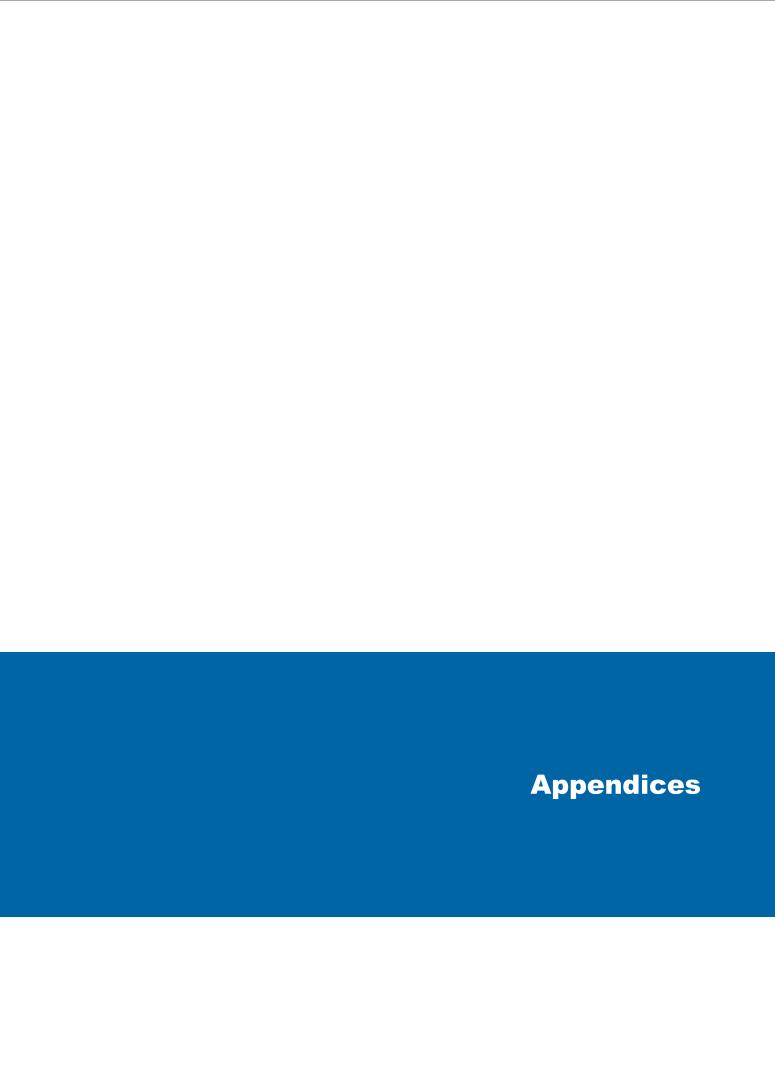
GHD (2016). *Biodiversity Assessment Report*. Prepared for Slys Quarry Environmental Impact Statement

GHD (2017a). *Biodiversity and Rehabilitation Management Plan*. Prepared for Quarry Expansion at Lot 2 DP 1055044, Tullymorgan-Jackybulbin Road, Mororo

GHD (2017b). *Environmental Management Strategy*. Prepared for Quarry Expansion at Lot 2 DP 1055044, Tullymorgan-Jackybulbin Road, Mororo

NHMRC (2004). Australian code of practice for the care of animals for scientific purposes

RTA (2011). Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects. Roads and Traffic Authority



Appendix A – Tree Hollow Register

Development site

Tree	Species (if	Estimated	Trunk Hollow Estimated			L	imb Hollow	S	Faction	Neglite	Otava	
ID	known)	Height (m)	DBH (cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm	Easting	Northing	Stage
1	Eucalypt sp.	20	80			1	8	4	1	518581	6758631	Stage 3 - North
2	Stag	12	45			4	1			518557	6758631	Stage 3 - North
3	Stag	10	45			1	3	1	1	518570	6758623	Stage 3 - North
4	Eucalypt sp.	13	45				3	1	1	518567	6758617	Stage 3 - North
5	Stag	12	40				2			518574	6758605	Stage 3 - North
6	Stag	20	85			2	3	4	2	518594	6758601	Stage 3 - North
7	Eucalypt sp.	16	50		1		1	1		518607	6758591	Stage 3 - North
8	Stag	20	50				2	1		518622	6758598	Stage 3 - North
9	Stag	18	55				4			518626	6758600	Stage 3 - North
10	Stag	17	45				1	2		518621	6758591	Stage 3 - North
11	Stag	12	45					2		518621	6758575	Stage 2 - North
12	Stag	20	115			1	2	4	3	518647	6758583	Stage 2 - North
13	Stag	14	55				3			518633	6758557	Stage 2 - North
14	E. pilularis	21	70		1		4	2		518620	6758554	Stage 2 - North
15	Stag	13	8	1			3	1		518617	6758552	Stage 2 - North
16	Stag	12	35		1			1		518614	6758544	Stage 2 - North
17	E. pilularis	21	90		1		3	2		518622	6758529	Stage 2 - North
18	Eucalypt sp.	13	90			1				518630	6758532	Stage 2 - North
19	Stag	12	20				3			518635	6758509	Stage 2 - North
20	Stag	14	65		2	1		1	1	518654	6758506	Stage 2 - North
21	Stag	12	35				2			518640	6758498	Stage 2 - North
22	Eucalypt sp.	20	85			1	2		1	518660	6758522	Stage 2 - North

Tree	Species (if	Estimated	Estimated		Trunk Hollov	W	ı	_imb Hollow	/S			
ID	known)	Height (m)	DBH (cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm	Easting	Northing	Stage
23	Eucalypt sp.	15	45	1	1		2	1		518671	6758523	Stage 2 - North
24	Eucalypt sp.	14	50		1			1	2	518676	6758522	Stage 2 - North
25	Eucalypt sp.	19	80			1	1	2	1	518638	6758540	Stage 2 - North
26	E. pilularis	17	45		1		1			518650	6758546	Stage 2 - North
27	Stag	16	30				7	1		518390	6758450	Stage 2 - North
28	Eucalypt sp.	21	105		1	1	1	1	1	518377	6758466	Stage 2 - North
29	Eucalypt sp.	19	55		1	1	2	1	1	518395	6758471	Stage 2 - North
30	Stag	17	50			1	1	1	2	518397	6758467	Stage 2 - North
31	Eucalypt sp.	17	50			2	1			518401	6758476	Stage 2 - North
32	Eucalypt sp.	19	65				4	2		518420	6758502	Stage 2 - North
33	Stag	9	45	1			2	1		518410	6758519	Stage 2 - North
34	Eucalypt sp.	11	50		1					518400	6758583	Stage 3 - North
35	Eucalypt sp.	13	55					2	1	518413	6758581	Stage 3 - North
36	Stag	12	50				4	4		518421	6758578	Stage 3 - North
37	Eucalypt sp.	9	40					2	1	518434	6758580	Stage 3 - North
38	Stag	6	40			1				518425	6758598	Stage 3 - North
39	Eucalypt sp.	6	50		1		1	1		518457	6758606	Stage 3 - North
40	Eucalypt sp.	15	60				1	2		518472	6758601	Stage 3 - North
41	Stag	6	30					1		518480	6758597	Stage 3 - North
42	Stag	10	45					3	1	518507	6758603	Stage 3 - North
43	Eucalypt sp.	15	65				3			518517	6758620	Stage 3 - North
44	Stag	10	45				3			518530	6758600	Stage 3 - North
45	Eucalypt sp.	12	45				2	1		518560	6758594	Stage 3 - North
46	Eucalypt sp.	14	48				2	3		518573	6758587	Stage 3 - North

Tree	Species (if Estimate		Estimated	Trunk Hollow Limb			imb Hollow	/S		Northing	Stage	
ID	known)	Height (m)	DBH (cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm	Easting	Northing	Stage
47	Stag	17	70					2	3	518575	6758574	Stage 3 - North
48	Stag	12	35				1	2		518582	6758569	Stage 3 - North
49	Eucalypt sp.	19	75				1	1	2	518592	6758597	Stage 3 - North
50	Stag	16	85						4	518566	6758561	Stage 2 - North
51	Stag	6	45			1				518546	6758555	Stage 2 - North
52	Eucalypt sp.	9	30		1					518529	6758570	Stage 3 - North
53	Eucalypt sp.	10	45					1		518521	6758576	Stage 3 - North
54	Eucalypt sp.	11	55		1			1		518517	6758570	Stage 3 - North
55	Stag	10	50		1		1	1		518511	6758565	Stage 3 - North
56	Eucalypt sp.	18	85				2	1	1	518513	6758587	Stage 3 - North
57	Eucalypt sp.	13	70	1	1		1			518447	6758573	Stage 3 - North
58	Eucalypt sp.	16	90					1	3	518437	6758540	Stage 3 - North
59	Eucalypt sp.	18	85			1	1	1	2	518434	6758530	Stage 3 - North
60	Eucalypt sp.	16	80			1				518424	6758541	Stage 3 - North
61	Stag	9	45						1	518473	6758511	Stage 2 - North
62	Stag	11	60		2			1	4	518484	6758528	Stage 2 - North
63	Eucalypt sp.	7	50	2	1			1		518497	6758521	Stage 2 - North
64	Stag	12	70		1	1	1	7	2	518464	6758514	Stage 2 - North
65	E. pilularis	19	90				2	3	1	518446	6758497	Stage 2 - North
66	Stag	6	35	1	1					518439	6758501	Stage 2 - North
67	Eucalypt sp.	8	75			1		2	1	518443	6758486	Stage 2 - North
68	E. pilularis	15	75				4	1		518427	6758502	Stage 2 - North
69	Eucalypt sp.	15	70					3	1	518458	6758478	Stage 2 - North
70	Eucalypt sp.	12	120			1				518423	6758456	Stage 2 - North

Tree	Species (if	Estimated	Estimated		Trunk Hollov	N	ı	_imb Hollow	/S			
ID	known)	Height (m)	DBH (cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm	Easting	Northing	Stage
71	Eucalypt sp.	22	90		1					518417	6758443	Stage 2 - North
72	E. pilularis	25	200			2			2	518445	6758434	Stage 1
73	Eucalypt sp.	17	95						2	518484	6758497	Stage 2 - North
74	E. pilularis	13	70					3	1	518500	6758520	Stage 2 - North
75	Stag	6	50			1	1	2	2	518498	6758514	Stage 2 - North
76	Stag	12	55	1				1	4	518504	6758519	Stage 2 - North
77	E. pilularis	20	90				3	2	2	518495	6758496	Stage 2 - North
78	Eucalypt sp.	14	80		1			1		518484	6758498	Stage 2 - North
79	Eucalypt sp.	15	65		1			1		518503	6758487	Stage 2 - North
80	Eucalypt sp.	16	45				2	1		518514	6758487	Stage 2 - North
81	Eucalypt sp.	12	55				1	1		518527	6758506	Stage 2 - North
82	Stag	10	50			1		1		518536	6758493	Stage 2 - North
83	Stag	12	70				1	2	2	518531	6758531	Stage 2 - North
84	Eucalypt sp.	17	70				1	2	2	518531	6758533	Stage 2 - North
85	Stag	12	60			2	2	2		518514	6758539	Stage 2 - North
86	Eucalypt sp.	18	75		1		1	6	1	518528	6758545	Stage 2 - North
87	Eucalypt sp.	9	50				1	2	1	518533	6758547	Stage 2 - North
88	Stag	8	45		1		2	3	3	518567	6758553	Stage 2 - North
89	Eucalypt sp.	9	50				2	1	1	518570	6758546	Stage 2 - North
90	Stag	12	75			1	2	2		518581	6758558	Stage 2 - North
91	Stag	6	60				3	1		518585	6758527	Stage 2 - North
92	Stag	17	70		2		2	1		518576	6758521	Stage 2 - North
93	Stag	16	110			2	1	2	6	518580	6758504	Stage 2 - North
94	Eucalypt sp.	15	80				3	2		518560	6758502	Stage 2 - North

Tree	Species (if	Estimated	Estimated		Trunk Hollo	N	ı	_imb Hollow	/S			
ID	known)	Height (m)	DBH (cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm	Easting	Northing	Stage
95	Stag	14	65		1	2	2	3		518566	6758516	Stage 2 - North
96	Stag	5	12		1		3			518544	6758489	Stage 2 - North
97	Eucalypt sp.	14	60			1				518531	6758486	Stage 2 - North
98	Eucalypt sp.	12	50			1				518528	6758474	Stage 2 - North
99	Eucalypt sp.	13	100		1	1				518452	6758431	Stage 1
100	Stag	8	45	1			4	3		518896	6758115	Stage 3 - South
101	Stag	15	31	1			6	3		518880	6758089	Stage 3 - South
102	Corymbia sp.	12	50				1	2		518875	6758083	Stage 3 - South
103	Eucalypt sp.	15	50					4		518860	6758094	Stage 3 - South
104	Eucalypt sp.	17	32				4			518853	6758082	Stage 3 - South
105	E. pilularis	18	10				2	1		518850	6758078	Stage 3 - South
106	Stag	18	40	1			1	4		518822	6758048	Stage 3 - South
107	Eucalypt sp.	15	45				3	2		518831	6758064	Stage 3 - South
108	Stag	7	45			1				518820	6758026	Stage 3 - South
109	Eucalypt sp.	15	70						2	518786	6758006	Stage 3 - South
110	Stag	12	40	1			2	1		518794	6757990	Stage 3 - South
111	Eucalypt sp.	15	45				1		1	518768	6758006	Stage 3 - South
112	Eucalypt sp.	18	40			1		1		518755	6758014	Stage 3 - South
113	Eucalypt sp.	20	45	1			1			518771	6758044	Stage 3 - South
114	Eucalypt sp.	15	75				2	2		518776	6758038	Stage 3 - South
115	Eucalypt sp.	17	90					2		518784	6758016	Stage 3 - South
116	Eucalypt sp.	12	45		1		2			518799	6758042	Stage 3 - South
117	Eucalypt sp.	15	70					2		518822	6758053	Stage 3 - South
118	Eucalypt sp.	15	60				3			518811	6758044	Stage 3 - South

Tree	Species (if	Estimated	Estimated		Frunk Hollov	W	ι	imb Hollow	/S			
ID	known)	Height (m)	DBH (cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm	Easting	Northing	Stage
119	Eucalypt sp.	10	130			2	3			518819	6758061	Stage 3 - South
120	Eucalypt sp.	14	65					2	3	518837	6758089	Stage 3 - South
121	Stag	12	20		1					518862	6758122	Stage 3 - South
122	Eucalypt sp.	12	45		1		2			518869	6758116	Stage 3 - South
123	Stag	15	45	1			5			518890	6758132	Stage 3 - South
124	Stag	12	40	1			3			518889	6758131	Stage 3 - South
125	Stag	12	43	1			5			518899	6758123	Stage 3 - South
126	Stag	12	28	1			3			518875	6758139	Stage 3 - South
127	Stag	6	25	1			1			518860	6758137	Stage 3 - South
128	Stag	8	45		1			3		518847	6758114	Stage 3 - South
129	Eucalypt sp.	17	45				3			518816	6758099	Stage 3 - South
130	E. microcorys	22	75			1	2	1		518801	6758101	Stage 3 - South
131	Eucalypt sp.	20	62			1	2	1		518797	6758060	Stage 3 - South
132	Stag	7	32			1				518776	6758061	Stage 3 - South
133	Stag	7	40			1				518789	6758079	Stage 3 - South
134	Corymbia sp.	20	70			2	1	3	2	518775	6758064	Stage 3 - South
135	Stag	11	40		1		1	1		518770	6758032	Stage 3 - South
136	Stag	10	85			1				518767	6758034	Stage 3 - South
137	Eucalypt sp.	23	75		1		4	2	1	518747	6758062	Stage 3 - South
138	Stag	10	90			1			1	518741	6758062	Stage 3 - South
139	E. microcorys	21	110		1	1	2			518772	6758087	Stage 3 - South
140	E. microcorys	14	43				3	1		518796	6758090	Stage 3 - South

Tree	Species (if	Estimated	Estimated		Trunk Hollov	N	ι	imb Hollow	/S			
ID	known)	Height (m)	DBH (cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm	Easting	Northing	Stage
141	Eucalypt sp.	14	40				3			518802	6758096	Stage 3 - South
142	Stag	15	60				3	2		518813	6758117	Stage 3 - South
143	Stag	13	62			1		1	3	518828	6758143	Stage 3 - South
144	Stag	9	45		1		4	3	1	518887	6758165	Stage 3 - South
145	Stag	8	50	1			4	2		518881	6758160	Stage 3 - South
146	Eucalypt sp.	6	55			1	1			518903	6758131	Stage 3 - South
147	Stag	7	47		1		1	4		518914	6758145	Stage 3 - South
148	Stag	15	55	1			3	1		518911	6758104	Stage 3 - South
149	Corymbia sp.	14	36				4			518917	6758100	Stage 3 - South
150	Stag	12	40	1	1		1	3		518905	6758102	Stage 3 - South
151	Eucalypt sp.	13	50	1				3		518907	6758113	Stage 3 - South
152	Eucalypt sp.	14	35				1			518853	6758155	Stage 3 - South
153	Eucalypt sp.	22	85			2	4	2	2	518841	6758149	Stage 3 - South
154	Stag	13	50				6	4	1	518803	6758149	Stage 3 - South
155	Eucalypt sp.	18	51				1	1		518801	6758132	Stage 3 - South
156	Stag	20	65		1		10	4	1	518787	6758113	Stage 3 - South
157	Eucalypt sp.	18	60	1				1		518791	6758125	Stage 3 - South
158	Stag	16	33				4			518777	6758111	Stage 3 - South
159	Eucalypt sp.	23	95	1		2	2	3	3	518757	6758093	Stage 3 - South
160	Stag	19	70			2	11	4	1	518758	6758099	Stage 3 - South
161	Eucalypt sp.	16	75			1				518745	6758071	Stage 3 - South
162	Eucalypt sp.	22	65		1	1		1		518739	6758089	Stage 3 - South
163	Eucalypt sp.	24	120		2	2	2	2	1	518736	6758069	Stage 3 - South
164	E. pilularis	20	120		1	1	2	4	1	518720	6758077	Stage 3 - South

Tree	Species (if	Estimated	Estimated	-	Trunk Hollov	W	ı	imb Hollow	/S			
ID	known)	Height (m)	DBH (cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm	Easting	Northing	Stage
165	Eucalypt sp.	18	45				2	1		518718	6758087	Stage 3 - South
166	Eucalypt sp.	17	50			1	1	3	1	518753	6758120	Stage 3 - South
167	Eucalypt sp.	16	80			2	1	2	3	518738	6758128	Stage 3 - South
168	Corymbia sp.	17	55				2	2		518769	6758127	Stage 3 - South
169	Eucalypt sp.	14	40	2	1		1	2		518834	6758174	Stage 3 - South
170	Eucalypt sp.	15	50		1		1			518845	6758184	Stage 3 - South
171	Eucalypt sp.	10	40				1			518836	6758192	Stage 3 - South
172	E. pilularis	15	80	1	3		1			518835	6758212	Stage 2 - South
173	E. pilularis	16	90				1	3		518832	6758219	Stage 2 - South
174	Eucalypt sp.	18	50			1	4			518825	6758219	Stage 2 - South
175	Eucalypt sp.	20	60			1	4			518815	6758228	Stage 2 - South
176	Eucalypt sp.	21	55				5	1		518811	6758230	Stage 2 - South
177	Eucalypt sp.	20	65				1		1	518790	6758214	Stage 2 - South
178	Stag	12	50			2	2			518803	6758212	Stage 2 - South
179	Stag	15	70	2		1	7			518777	6758169	Stage 2 - South
180	Eucalypt sp.	20	65				2			518770	6758165	Stage 2 - South
181	Eucalypt sp.	18	62				2	3		518747	6758151	Stage 2 - South
182	Eucalypt sp.	17	55			1				518735	6758144	Stage 2 - South
183	Stag	15	70			1				518718	6758148	Stage 2 - South
184	Eucalypt sp.	18	100				2	5	7	518711	6758117	Stage 2 - South
185	Eucalypt sp.	12	70			1	1	5		518689	6758104	Stage 3 - South
186	Eucalypt sp.	15	70			1	2			518689	6758142	Stage 2 - South
187	Eucalypt sp.	20	45					1		518715	6758131	Stage 2 - South
188	Eucalypt sp.	25	70				2	3		518713	6758164	Stage 2 - South

Tree	Species (if	Estimated	Estimated	-	Trunk Hollov	W	ı	imb Hollow	/S			
ID	known)	Height (m)	DBH (cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm	Easting	Northing	Stage
189	Eucalypt sp.	25	70				1	2		518719	6758166	Stage 2 - South
190	Stag	15	60		1		3	4		518719	6758180	Stage 2 - South
191	Stag	15	60			1				518717	6758177	Stage 2 - South
192	Stag	10	75				4	4		518728	6758170	Stage 2 - South
193	E. pilularis	25	75				1	2		518728	6758159	Stage 2 - South
194	Eucalypt sp.	20	80				1	2		518726	6758177	Stage 2 - South
195	Eucalypt sp.	15	55				1	1		518748	6758171	Stage 2 - South
196	Eucalypt sp.	15	50		1		3			518750	6758177	Stage 2 - South
197	Stag	10	55		1		4	1		518789	6758207	Stage 2 - South
198	E. pilularis	15	95				4			518804	6758253	Stage 2 - South
199	Stag	10	35				2			518811	6758305	Stage 2 - South
200	Stag	15	45				6	3		518831	6758265	Stage 2 - South
201	Stag	12	45				4			518843	6758250	Stage 2 - South
202	Eucalypt sp.	10	65				1	2	1	518845	6758238	Stage 2 - South
203	Stag	12	40				4	4		518851	6758222	Stage 2 - South
204	E. pilularis	22	50				4			518854	6758220	Stage 2 - South
205	Stag	12	35				3			518784	6758298	Stage 2 - South
206	Eucalypt sp.	15	60				5			518772	6758277	Stage 2 - South
207	Stag	10	60				8	2		518777	6758235	Stage 2 - South
208	Eucalypt sp.	20	65				3			518776	6758216	Stage 2 - South
209	E. pilularis	20	60				3			518753	6758233	Stage 2 - South
210	Eucalypt sp.	25	65						1	518748	6758226	Stage 2 - South
211	E. pilularis	20	150				8	7	7	518744	6758219	Stage 2 - South
212	Eucalypt sp.	17	120				1	4	3	518739	6758215	Stage 2 - South

Tree	Species (if	Estimated	Estimated		Trunk Hollov	N	ı	_imb Hollow	/S			
ID	known)	Height (m)	DBH (cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm	Easting	Northing	Stage
213	Stag	17	100			1				518756	6758208	Stage 2 - South
214	Eucalypt sp.	21	90					2		518710	6758218	Stage 2 - South
215	Stag	10	20					1		518700	6758230	Stage 2 - South
216	Eucalypt sp.	12	60					2		518695	6758228	Stage 2 - South
217	E. pilularis	25	95			1	1			518720	6758188	Stage 2 - South
218	Eucalypt sp.	30	75		1		4			518694	6758165	Stage 2 - South
219	Eucalypt sp.	12	55			1				518667	6758170	Stage 2 - South
220	Stag	8	45				4			518666	6758155	Stage 2 - South
221	Eucalypt sp.	15	105				3	2		518671	6758174	Stage 2 - South
222	Eucalypt sp.	8	40			1	2			518748	6758469	Stage 1
223	Eucalypt sp.	9	40				1			518716	6758426	Stage 1
224	Eucalypt sp.	17	85				4	2		518724	6758447	Stage 1
225	Eucalypt sp.	9	25		1			1		518700	6758473	Stage 1
226	Stag	20	90		1	1	12	4	4	518718	6758486	Stage 1
227	Eucalypt sp.	12	40				4			518705	6758488	Stage 1
228	Eucalypt sp.	10	40				3	1		518715	6758448	Stage 1
229	Eucalypt sp.	17	50				3			518729	6758477	Stage 1
230	Stag	9	30		1					518726	6758484	Stage 1
231	Stag	8	20				3			518728	6758474	Stage 1
232	Stag	8	40				3			518734	6758478	Stage 1
233	Stag	10	100			1			1	518459	6758413	Stage 1
234	Eucalypt sp.	12	45		1		3			518659	6758550	Stage 2 - North
235	Stag	13	50			1	2	3		518675	6758534	Stage 2 - North
236	Stag	11	35					1		518654	6758534	Stage 2 - North

Tree	Species (if	Estimated	Estimated	1	Trunk Hollov	N	L	imb Hollow	'S			
ID	known)	Height (m)	DBH (cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm	Easting	Northing	Stage
237	Stag	10	35				3			518677	6758535	Stage 2 - North
238	Stag	8	45	2			5			518688	6758523	Stage 2 - North
239	Stag	12	75	1			7	4		518691	6758511	Stage 2 - North
240	Stag	15	90				3	4	3	518680	6758500	Stage 1
241	Stag	28	110			2	6			518658	6758483	Stage 1
242	E. pilularis	20	85				2	1		518639	6758471	Stage 1
243	E. pilularis	18	135			2	1	2		518587	6758477	Stage 1
244	Stag	15	55		2					518610	6758515	Stage 2 - North
245	E. pilularis	20	100				6		3	518594	6758531	Stage 2 - North

Proposed nest box locations

	Species (if known)	Estimated	Estimated DBH		Trunk Hollow			Limb Hollows	
Transect ID	Species (if known)	Height (m)	(cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm
T1	Stag	12	70		1		5	3	
T1	Stag	11	65				3	2	
T1	Angophora	9	40						1
T1	E. microcorys	10	65	1			2	2	
T1	Stag	11	60		1		3	3	
T1	Stag	10	40				3	1	
T1	Spotted Gum	22	120						1
T1	Stag	8	35				3	1	
T1	Eucalypt sp.	13	75		1			1	1

		Estimated	Estimated DBH		Trunk Hollow			Limb Hollows	
Transect ID	Species (if known)	Height (m)	(cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm
T1	Stag	9	110		1	2			
T1	Eucalypt sp.	10	70			1			
T1	E. pilularis	20	110		2	1	1	2	1
T1	Stag	8	40				4		
T2	E. pilularis	21	1.4		1	3	7	3	1
T2	E. pilularis	15	80				1		
T2	E. pilularis	15	90		2			2	
T2	Corymbia sp.	14	90		2			2	1
T2	Eucalypt sp.	13	60				2	1	
T2	Eucalypt sp.	12	35		1				
T2	Angophora	11	50					1	
T2	E. pilularis	14	75				2	3	3
T2	Eucalypt sp.	12	55		1		3		
T2	E. pilularis	15	60		1		2	3	
T2	E. pilularis	-	140				1	2	1
T2	E. pilularis	-	120		1		3	1	
T2	Angophora	-	90				2	2	
T2	Turpentine	-	90	2	1	1			
T2	Stag	-	40	2					
T2	Stag	-	30	1					
T2	Red Mahogany	-	60	1			1		
T2	Angophora	-	60		1				
T2	Casuarina	-	30	1					
T2	Red Mahogany	-	60	1	1				

		Estimated	Estimated DBH		Trunk Hollow			Limb Hollows	
Transect ID	Species (if known)	Height (m)	(cm)	Small <5cm	Med 5-15cm	Large >15cm	Small <5cm	Med 5-15cm	Large >15cm
T2	Red Mahogany	-	60				2		
Т3	Stag	10	45		1		3		
Т3	E. pilularis	22	160	1	1		1	4	3
Т3	Stag	8	30				5		
Т3	E. pilularis	15	70				2		
Т3	E. pilularis	15	70					1	1
Т3	E. pilularis	20	120					2	1
Т3	E. propinqua	25	90				2		1
Т3	E. propinqua	17	40				3		
Т3	Stag	15	100			1			
Т3	E. propinqua	16	70				1	1	
Т3	E. propinqua	14	55	1			1	2	
Т3	Angophora	12	50	1					
Т3	Angophora	16	60	1	1				
Т3	3 Corymbia sp. 19 100		1				2	2	
Т3	L. suaveolans	12	60	2					

Appendix B – Registers

Date	Nest Box Number	Nest Box Size (Small, Med, Large)	Location	Easting	Northing	Zone	Tree Species	Other

Nest box monitoring sheet

Date	Nest Box Number	Easting	Northing	Zone	Evidence of fauna usage	Feral animal activity	Nest box condition	Maintenance requirements

GHD

230 Harbour Drive Coffs Harbour NSW 2450

T: (02) 6650 5600 F: (02) 6650 5601 E: cfsmail@ghd.com

© GHD 2017

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

N:\AU\Coffs Harbour\Projects\22\17528\WP\17094.docx

Document Status

Rev	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	J. Sharp	K. Crosby	K. Crosby	S Lawer	S Lawer	15/09/17
1	J. Sharp	K. Crosby	K. Crosby	S Lawer	S Lawer	24/11/17
2	B Luffman	K. Crosby	# Gnoky	S Lawer	fa	14/12/17

www.ghd.com

