TWEED
SHIRE COUNCIL

EVIRON ROAD QUARRY & LANDFILL NEST BOX PLAN

TWEED SHIRE COUNCIL DESIGN UNIT

JULY 2016

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1.0 INTRODUCTION

1.1 Eviron Quarry and Landfill

Tweed Shire Council (TSC) has concept plan approval (#08_0067) under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to establish two new quarries, three landfills and a haul road at Eviron, in the far North Coast of NSW (Eviron Rd Q&L). Refer to Figure 1.

Project approval has also been attained for Stage 1 of the project, which involves landfill within the existing Quirks Quarry and development of the new West Valley Quarry and associated infrastructure (including haul road) (#08_0068).

One of the Biodiversity offset conditions listed under Schedule 4 – Specific environmental conditions for West Valley Quarry, requires implementation of a Landscape Management Plan, which includes a requirement to install nest boxes within Conservation Area 1 to offset a reduction in hollow recruitment resulting from future clearing.

It is recognised that nest boxes are not a substitute for natural hollows due to their typically shorter life span and sometimes different thermo-regulation properties. However, they will provide nesting and roosting resources for hollow-dependent fauna in the short to medium term.

The subject Nest Box Plan is intended to guide nest box installation, monitoring and maintenance. The proposed nest box program includes five years of maintenance and monitoring. Beyond the five year maintenance/monitoring period, management of the nest boxes will be incorporated into general site management in accordance with a site-wide Environmental Management Plan (EMP).

2.0 HOLLOW ASSESSMENT

2.1 Preliminary hollow survey results

Field surveys undertaken by GHD (2010) as part of the environmental assessment component of the Part 3A planning application opportunistically recorded hollow bearing trees throughout the site.

GHD (2010) noted that the majority of the native bushland on site is regrowth from historical clearing and a subsequent low number of hollow bearing trees provides limited denning or nesting opportunities for hollow-dependent fauna. TSC field surveys confirmed the majority of the regrowth vegetation has not yet reached hollow bearing age. GHD did identify some habitat trees scattered throughout the site, particularly in association with the more mature vegetation in Conservation Area 1 and north of the proposed haul road. The following habitat trees were opportunistically recorded by GHD (2010):

- 2 hollow bearing trees,
- 1 dead stag,
- 6 large eucalypts.

No hollow bearing trees are subject to removal as part of the Eviron Quarry and Landfill, however, four of the large eucalypts identified are subject to removal from within West Valley Quarry.

Figure 1: Eviron Quarry and Landfill Site Plan

Eviron Road Quarry and Landfill Nest Box Plan

Legend

- Conservation Area 1
- Conservation Area 5
- North Valley development footprint
- West Valley development footprint
- Quirks quarry / landfill fooprint
- Site Boundary
- Parcel Boundary

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Boundaries shown should be considered approximate only.

Coordinate System
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2.2 Likely hollow dependent fauna on site

Based on past fauna and habitat surveys at the site (GHD, 2010; TSC, 2013; TSC, 2016), the following hollow-dependent fauna are known and/or considered likely to use hollows at the site:

- Small scansorial mammals such as Antechinus
- Microchiropteran bats
- Small gliding marsupials including the Feather-tail Glider (*Acrobates pygmaeus*) and Sugar Glider (*Petaurus breviceps*). Note: The Squirrel Glider (*P. norfolcensis*) is not considered to occur within the study area based on past surveys and NSW Wildlife Atlas records.
- Arboreal herpetofauna including Eulamprus skinks along with most of the hylid tree frogs known from the area
- Possums
- Medium sized parrots and lorikeets
- Smaller owls such as the Southern Boobook (*Ninox novaehollandiae*) and Barn Owl (*Tyto alba*)
- Black cockatoos and Australian King Parrot (*Alisterus scapularis*).

Larger gliders including the Yellow-bellied Glider (*Petaurus australis*) and Greater Glider (*Petauroides volans)* and large forest owls such as the Masked Owl (*Tyto novaehollandiae*) or Powerful Owl (*Ninox strenua*) are not expected to occur at the site based on a lack of hollows and, in the case of the owls, limited prey resources.

The GHD (2010) ecological assessment recommended nest boxes specifically targeting petaurid gliders are installed.

3.0 NEST BOX PLAN

3.1 Nest box quantities

A total of nine nest boxes are proposed to be installed at the site. Hollow assessments undertaken at the site and the adjoining Stotts Creek Resource Recovery Centre (RRC) identified the hollow density of hollow bearing trees in the area to be approximately 2 hollows per hollow bearing tree. Based on the local hollow density (2/HBT) and the number of large eucalypts proposed to be removed (4 within west valley quarry footprint), nine nest boxes is considered adequate to replace the future hollow recruitment which would have likely been provided by the large eucalypts to be removed.

It is noted that another nest box program is being run in the same locality to mitigate the clearing of habitat trees in the adjoining Stotts Creek RRC, as part of a landfill cell expansion. The host trees for the Stotts Creek RRC nest boxes occur along the spur which runs from Condong Range (Eviron Road) in the south in a north-north-westerly direction towards Stotts Creek RRC. The host trees for this nest box program occur in habitat adjacent Conservation Area 1 (the receiving site for the Eviron nest box program). The total sum of nest boxes provided by both these programs are considered appropriate for the type and extent of habitat available to hollow dependent fauna in the area.

All nine boxes to be installed under the Eviron Q&L program are designed for petaurid gliders, as per the GHD (2010) recommendation. Six are large glider boxes (with flat base and hinged roof with front entry hole) and three are small glider boxes (with open base access and front entry hole).

3.2 Nest box locations

Nest boxes are to be installed within the Blackbutt Open Forest of Conservation Area 1 and Conservation Area 5 (refer to Figure 2).

Final tree selection for nest box installation is to be determined in the field during installation, however, preliminary surveys identified potential host trees (as depicted in Figure 2). The majority of the nest boxes (six) are to be installed in Conservation Area 1 and the remainder (three) are to be installed in Conservation Area 5.

Actual nest box locations and corresponding details on box type, aspect and location coordinates are to be recorded and included in Appendix A of this plan, post-installation.

3.3 Nest box installation

Nest boxes are to be installed by an experienced contractor. Boxes are to be installed >3 <6 meters above ground level and attached to trees using wire covered with a protective sleeve of polyurethane tubing (to protect trees from tissue damage). The attachment wire is to be pleated in sections to allow for expansion with tree growth.

All nine nest boxes are to be installed prior to clearing of the West Valley Quarry footprint.

3.4 Nest box monitoring and maintenance

Nest boxes are proposed to be monitored at the following times:

- Year 1: at the end of the first year after installation
- Year 2: during spring of the second year of installation
- Year 5: during spring of the fifth year of installation.

Nest box monitoring would be undertaken by a qualified ecologist and would include recording details on the box type and location, an assessment of box condition and subsequent maintenance requirements, evidence of fauna occupation, and pest activity (e.g. Indian Myna's, termites, bees etc). Records of fauna activity and/or occupation of boxes would involve recording species, age class, number, sex, and fauna evidence such as nesting material, scats, hair/feathers etc. In the event that pest activity is precluding occupation of the box by native fauna, then the box would be modified or relocated to an appropriate site.

Maintenance of boxes, if required, would be undertaken at the time of inspection. Irreparable boxes would be replaced with a new box in the same tree or as close to the host tree as possible. Replacement of any damaged boxes would be undertaken during the same monitoring event.

Figure 2: Nominated nest box trees

Eviron Road Quarry and Landfill Nest Box Plan

Legend

- Nominated nest box trees
- Conservation Area 2 - Northern Riparian Corridor
- Conservation Area 5
- Conservation Area 6
- North Valley development footprint
- Site Boundary
- Parcel Boundary

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Gibbons, P. and Lindenmayer, D. (2002). T*ree Hollows and Wildlife Conservation in Australia*, CSIRO Publishing, Collingwood.

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APPENDIX A: HOLLOW VALIDATION REGISTER

Data to be included post clearing

Table A.1: Hollow data recorded during tree clearing

Tree species	GPS coordinate	Size class*	Hollow type			
			Branch	Trunk	Spout	Fissure
		Small				
		Medium				
		Large				
		Small				
		Medium				
		Large				
		Small				
		Medium				
		Large				
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		Small				
		Medium				
		Large				
		Small				
		Medium				
		Large				

*Small =<5cm diameter opening; Medium = >5 - <10cm diameter opening; Large = >10cm diameter opening.

APPENDIX B: NEST BOX LOCATION AND TYPE DATA

Table B.1: Installed nest box data (#boxes installed 29 July 2016)

Location	Id.	Box type	Height above Gnd. (m)	Aspect	Tree species	GPS coordinate
Conservation Area 5 (Southern end of north valley)	Tree 1	Small Glider (silver top)	6.0	SSE	Blackbutt	23.30066, 153.50279
as above	Tree 1	Bat Box wedge	7.0	E	Blackbutt	23.30066, 153.50279
as above	Tree 2	Small Glider (silver top)	8.0	SSE	Blackbutt	28.30062, 153.50279
as above	Tree 2	Bat Box Wedge	7.0	W	Blackbutt	28.30062, 153.50279
as above	Tree 3	Bat Box Wedge	7.0	SSW	Blackbutt	28.30096, 153.50299
as above	Tree 3	Small Glider (silver top)	5.0	ESE	Blackbutt	28.30096, 153.50299
Conservation Area 1 (boxes along ridgeline road to Hawkins house)	Tree 4	Bat Box (HLH)	5.5	N	Brushbox	28.29826, 153.49902
as above	Tree 4	Parrot (HLH)	7.0	ESE	Brushbox	28.29826, 153.49902
as above	Tree 5	Small Glider Wedge	5.0	NW	Bloodwood	28.29798, 153.49881
as above	Tree 5	Parrot (HLH)	6.5	SE	Bloodwood	28.29798, 153.49881
as above	Tree 6	Large Parrot	7.0	W	Blackbutt	28.29774, 153.49855
as above	Tree 6	Small Glider wedge	8.0	S	Blackbutt	28.29774, 153.49855

Note – Hollow Log Homes (HLH) boxes were constructed of recycled plastic and Cypress Pine (30yr structural life) with timber shavings in box. All other boxes (except silver tops) were hardwood construction (approx. 8yr structural life). Boxes referred to as 'silver tops' had pine lids and therefore, aluminium flashing was tech screwed to lids for weather proofing. HLH boxes were secured to trees using the HLH provided Habisure system. All other boxes were secured to trees using 8 guage wire with protective plastic tubing (garden hose).

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