Our Ref: 18OD02FUNC-L

8 November 2019

Optima Developments PO Box 3136 UNIMA BEACH NSW 2250

Attention: Mr C Oliver

Dear Chris

Re: Habitat Corridor Functional Analysis at 15 Mulloway Road, Chain Valley Bay

Travers bushfire and ecology has been requested to prepare a functional corridor analysis of the proposed wildlife corridor, traversing the western and the northern boundaries of the as part of a Planning Proposal seeking rezoning from E3 Environmental Management to part E2 Environmental Conservation and R2 Low Density Residential. The corridor is proposed to be included in the proposed E2 zone.

Background

The corridor is intended as a wildlife corridor to provide connectivity from the southern EEC conservation area to national parks land to the north east. By virtue of the sites proximity this land is a partial connection from the north to south.

It is noted that whilst this corridor has been designed with Squirrel gliders as the target species, they have not been observed or recorded in recent times within this site. They may be present to the north and to the south of the site within the main regional corridor. Consequently this functional corridor analysis has assessed the ability of Squirrel Gliders to physically cross the landscape.

It is also noted that OEH, in consultation with Central Coast Council have confirmed that the proposed 60m width corridor is a functional corridor width for this location. Previous correspondence on the habitat comparison between the two corridors options demonstrated that the proposed corridor is the most diverse with structurally mature vegetation to support foraging, with large mature trees in addition to also containing similar species diversity and habitat structure.

The habitat comparison also supports the enrichment of foraging habitat through revegetation works and protection measures to ensure that the corridor remains mostly free of human interference. The primary function of the corridor is wildlife movement between two larger parcels of significant vegetation extent and consequently with exception to a cycleway/fire trail along the western boundary the corridor is to exclude recreational activity.

Purpose of the functional corridor analysis

The purpose of the functional corridor analysis is to undertake an assessment of arboreal connectivity for Squirrel Gliders and to identify any features or lack of important elements necessary to maintaining the function of the corridor.

38A The Avenue Mt Penang Parklands Central Coast Highway Kariong NSW 2250



Of key importance to this functional corridor analysis is the following tasks.

- An analysis of the ability of gliders to traverse across the existing and proposed road linkages.
- To examine which trees will be retained and removed as a result of these proposed future subdivision works.
- To provide recommendations as to what mitigation might be needed to improve or maintain connectivity for a functional corridor.

Assessment of glide capability across the main existing roads and proposed road linkages

For the purposes of this assessment it has been assumed that there is no limitation to the movement of Squirrel Gliders through vegetated portions of the corridor. An investigation of the existing dam was undertaken to prove that enough trees were present to the east of its main body and the adjoining proposed road. A GPS survey of the trees in this location established that a decent row of trees were present and hence movement is possible around the dam on its eastern and western sides.

Fauna ecologist Mr Corey Mead has undertaken an assessment of the glide distances and angles from existing launch points, on trees immediately adjoining and within 15 to 20 metres of Mulloway Road, the proposed entrance to the site and to the proposed extension to Teraglin Drive on the southern end of the site. The results of this glider connectivity is shown on the attached figure (figure 1) and this identifies the following outcomes.

In addition, an Arboriculture assessment of the trees was conducted by Mr Robert Sansom and Mr Nathan Stewart to provide an indication of trees to be impacted by the proposed works to either side of the road corridors. Only trees of good condition were assessed based on a basic SULE assessment.

Mulloway Road is the existing main road providing access to the main urban zoned area of Chain Valley Bay at the northern boundary of the site and the analysis has identified that the glider connectivity across Mulloway Road whilst currently physically possible, is somewhat tenuous in mostly a northern direction. The connectivity at this location relies on the presence of four Melaleuca trees that have been retained along the pathway within the road reserve. Without these four Melaleuca trees arboreal connection across Mulloway Road will effectively be severed.

This is demonstrated by the green arcs and green dashed arcs (Figure 1). The green dashed arcs indicates where gliders can effectively reach based on the physical gliding capability known for squirrel gliders. I note that only trees of good condition have been considered and the assessment has excluded poor condition trees that may be removed or fall. The green and red arcs indicate to which side of the road corridor that gliding is currently feasible. The red arcs demonstrate the impact on glide distance as a result of the proposed roads based on the trees to be removed effectively resulting in the loss of gliding capability.

This clearly indicates is that the connectivity across Mulloway Road is tenuous and marginal. To ensure that this connectivity maintains and retains the functionality it would be necessary to ensure that trees are present in either side of the pavement of Mulloway Road that allow gliders to climb to a suitable height and glide across the road corridor. Consequently, glider poles are recommended to be installed and planting of additional rapid growing tall trees on either side of Mulloway Road with the permission of the adjoining landholders which is believed to be National Parks and Wildlife Services. These measures will allow the effective width of the corridor connection across Mulloway Road to increase from 20 to 40m.

The second point of glider connectivity analysis is the main entrance into the proposed residential subdivision. The glider connectivity analysis shows once the trees impacted as a result of the proposed future entry road, are considered, connectivity is disrupted from east to west. An option to shift the road corridor is shifted slightly to the west was considered, to conserve selected trees then connectivity is maintained in both direction without the need for Glider poles. However we have confirmed that this slight shift is not supportable to meet current road design requirements. Consequently we advise that the road entrance either remains with additional pole installation or the road is entrance is moved to the west or east to identify another location that results in better arboreal/glider connectivity.

The remaining aspect of the functional connectivity analysis is at the southern end of the proposed corridor in the vicinity of Teragalin Drive. The analysis shows that the glider connectivity to the south of the corridor is tenuous, because the existing water main and access roadworks have already cleared significant trees from this locality which would otherwise be present under natural circumstances. There are two or three pre-existing trees present in the proposed road that crosses the corridor to access the development that provide potential glider connectivity. As the proposed road will remove these trees and the road connection in this location is essential, measures to maintain a functional corridor will need to include modification of the road alignment and pavement position, the planting of additional tall growing trees and installation of telephone poles.

The final point is concerning terrestrial or on ground connectivity. The installation of roads will present a threat to wildlife movement due to the potential for road kills. Whilst residents would be asked to drive slowly through these corridors and appropriate signage could reinforce this point, a preferred mitigation measure is to install a sub pavement culvert to enable wildlife to move under the roads. This element can also be addressed at the engineering design and DA stage of the subdivision.

Consequently, as recommended in the Biodiversity Certification Assessment (2019) *Travers bushfire* & *ecology* recommend that culverts are placed under these roads to allow ground dwelling animals to traverse through the road corridor without risk of being run over by cars accessing the future lots. Therefore, mitigation measures are required to ensure a functional corridor include a road culvert as well as arboreal planting measures.

Impact of tree retention and removal

In the glider connectivity analysis, trees to be retained and removed are critical to ensuring that these corridors remain functional, so consequently the current layout will need to be modified at the DA stage, to enhance arboreal connectivity. Additionally, the southern end is already unavoidably impacted by existing infrastructure and the future need to connect the proposed development to Teragalin Drive will necessitate the removal of some further trees from that corridor. Consequently, recommendations are proposed for all three road crossings to ameliorate impacts caused by tree loss on the functionality of the proposed corridor.

Conclusion and recommendations

The functional corridor analysis concludes that the existing connectivity across Mulloway Road is tenuous but able to be improved with additional street planting and installation of glider poles. The corridor connectivity across the main road entrance is partly disrupted by the road design and can be enhanced by relocating the road marginally to the west. The southern corridor crossing is also disrupted and can be improved with a realignment of the road corridor.

The following mitigation measures are recommended to result in an improved outcome for the future corridor functionality:

- In the Mulloway Road reserve *Travers bushfire & ecology* recommend:
 - a) The planting of tall fast-growing foraging tree species that would grow tall in the next 10-20 years.
 - b) In the short term a minimum of four glider poles (eight options provided), two on the southern side of Mulloway Road and two on the northern side of Mulloway Road be installed preferably to the east of the existing melaleuca trees.
 - c) That both sides of the road reserve are planted with Melaleucas such as the existing shrubbery for protection to potential gliders moving through the site.



In regards, to the entrance to the site off Mulloway Road, *Travers bushfire & ecology* recommends terrestrial culverts be included beneath the road as part of the subdivision design works. We recommend 2-3 gilder poles are installed at the Mulloway entrance road on the western side to facilitate glider movement from west to east. Planting of Tall growing trees would assist connectivity in the long term. The road corridor, services and pathway may be able to be moved to the west or east to enhance tree retention. The main entrance may require more detailed investigation at subdivision stage.



For the Teraglin Drive access road *Travers bushfire & ecology* recommend the installation of a minimum of 2 glider poles to the south of the pavement, together with the installation of culverts under the road to facilitate the movement of wildlife to the north and south without crossing the pavement. Additionally, enhancement of the corridor in this location by planting of fast-growing tall tree species and the road alignment adjusted to retain the identified trees.



 All Glider poles are to have signage attached to identify them as glider poles and not to be removed. The glider poles will need to be maintained until the planted tree canopy is fully established.

Travers bushfire & ecology concludes that with the above mitigation measures the corridor should retain its functionality and in fact improve existing connectivity for arboreal gliders to the north and to the south.

Should you have any questions regarding his functional corridor analysis do not hesitate to contact the undersigned on (02) 4340 5331 or at <u>info@traversecology.com.au</u>.

Yours faithfully

se

Michael Sheather-Reid – Managing Director *Travers bushfire & ecology*

Attachment 1 – Functional Corridor Analysis



Attachment 1 – Functional Corridor Analysis