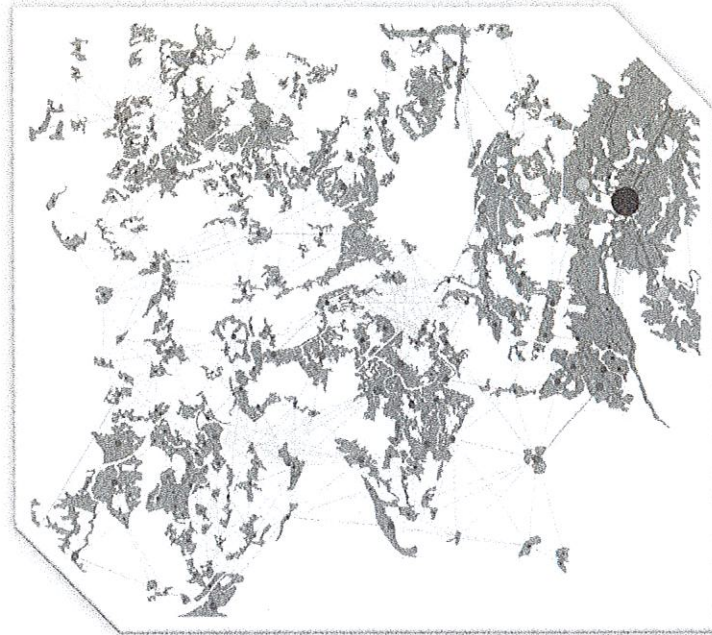


**Koala Corridor Project**  
**Campbelltown City Council & Wollondilly Local**  
**Government Areas: Greater Macarthur Growth Area.**



**Report to NSW Office of Environment & Heritage**  
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## 1. Summary

The Campbelltown City Council (CCC) and Wollondilly Shire (WS) Local Government Areas (LGAs) are located in the Macarthur region of south-western Sydney. While koalas inhabiting the CCC LGA have been the focus of scientific and community interest since the early 1980's, those in the adjoining WS LGA to the south have only recently become the focus of investigation. Available information based on consideration of historical koala records analyses and the aforementioned research imply that the two populations are in fact one and the same, with recent sightings along the eastern edge of the more southerly WS LGA commensurate with a known recovery trend in the north. Koalas in both areas share similar ecological traits such as preferred food tree species.

There is a need build resilience into these recovering koala populations so that they are capable of better withstanding the impacts of future development and stochastic impacts such as fire. One way to achieve such resilience will be to have population cells widely distributed and occupying habitat outliers that are arguably protected to varying degrees from catastrophic fire events. In order to do this, viable linkages and associated habitat patches need to be secured across the landscape. Parts of the Campbelltown and Wollondilly LGAs additionally form the Greater Macarthur Growth Area (GMGA) and are about to undergo a period of further expansion and development. Elements of such expansion in addition to an increased development footprint dedicated to urbanisation, include the upgrading of arterial roads, some of which have seen an increased rate of koala road-kill in recent years.

The *Generalised Approach to Planning Connectivity at Local and Regional Scales* (GAP CLoSR) offers a GIS-based spatial and analytical framework that enables examination of issues associated with landscape-scale habitat fragmentation and connectivity. Analyses such as that offered by the GAP CLoSR process have the capacity to inform future planning decisions by offering objective assessment of the landscape at a key point in ecological time. This report describes the application of GAP CLoSR to examine issues relating to the future impacts of land use change on koala movements in the GMGA and surrounding areas. Working from a baseline connectivity and patch-matrix assessment covering an area of 90,000 ha, analyses considered the fragmentation and connectivity issues arising from full implementation of an envisaged structure plan for the southern part of the GMGA between South Campbelltown and Appin in concert with two options relating to the future upgrading of Appin Road.

A baseline (*status quo*) GAP CLoSR analysis of the current vegetated landscape using a minimum Preferred Koala Habitat (PKH) patch size of 10 ha implied that the study area currently functioned as seven separate landscape components comprised of 218 PKH patches that were notionally

interconnected by 476 least-cost dispersal pathways. The associated delta-Integral Index of Connectivity (d-IIC) graph-metrics confirmed the importance of the consolidated linear linkages of PKH that skirts the eastern parts of the study area along the Georges River from Long Point through Kentlyn and Wedderburn and Appin down to the east of Wilton and Bargo in the south. In the area from Long Point in the CCC LGA to the east of Appin, analysis independently identified the habitat patch matrix that currently connects the Nepean and Georges Rivers catchments in the vicinity of the Beulah biobanking site as amongst the most important, with other east-west linkages also identified at Appin, Rosemeadow South / Noorumba Reserve and Ousedale-Mallaty.

Implementation of the full structure plan within the GMGA results in significant fragmentation of the associated landscape with implications for adjoining areas beyond the GMGA boundary. While the area within the development footprint remained as a single landscape component with no net loss of habitat patches (subject to provisions), at a locally-focussed 10 ha habitat patch level of resolution, implementation of the full structure plan resulted in a 36% reduction in the number of least-cost dispersal pathways. In terms of modelled scenarios, it was additionally determined that the upgrading of Appin Road with a fence along the eastern edge only would result in reduced connectivity options that will achieve little in terms of reducing vehicle-strike potential. Depending on final design, fencing of Appin Road so as to provide an impermeable barrier to koalas would result in the loss of either three or four locally significant least-cost pathways that were independently identified by the analysis as regionally important and currently facilitating the east-west movement of koalas through this area. Consequently, a reliance on pathways that remained to service connectivity at either end of the fence were also deemed likely to result in increased mortality levels due to dispersing koalas having to navigate urban landscapes in south Campbelltown and Appin village.

Resolution of the preceding considerations should involve a fencing program along both sides of the Appin Road as a requirement of any upgrading, in addition to the integrated maintenance of connectivity in key locations. There are at least three opportunities to achieve this latter outcome, involving landscape / traffic managing solution at the northern end where Appin Road enters Rosemeadow South, one or more dedicated fauna overpasses in the vicinity of the Beulah biobanking site and an engineering solution sufficient to enable installation of an elevated road surface, bebo arch or similar structure towards the southern end near the head of Mallaty's Creek. Graph-metric output further implies that consideration should also be given to a re-evaluation of the scale of the final FPSP footprint so as to give some effect to the outcomes in terms of recognising the importance of the habitat linkage network through areas to the west of Appin Road between South Campbelltown and Appin village. Consolidation of the key linkages and effectively integrating associated dispersal pathways into the development footprint will be required to achieve this outcome.