
BUILDING OUR **COMMUNITIES**
**BUSINESSES** AND **PRIDE**

# Explanation behind the approach to OM 02.02 Biodiversity Corridors Overlay map

***Environmental Management and Conservation area***

The Environmental Management and Conservation Area corresponds to the Environmental management and conservation zone as shown on the zoning maps.

***Biodiversity Corridors***

a) The initial phase of the mapping was to identify the existing major, medium and minor habitat areas remaining within Logan City. Remnant vegetation was used as the base layer for habitat patches.

The type of habitat was not considered to be a significant issue as the aim was to address habitat connectivity for the majority of fauna species found in the area.

i. Step 1: Combine all the remnant vegetation polygons into a single object.

ii. Step 2: Disaggregate this polygon to create many individual patches of remnant vegetation

***Assumption:*** *Patches within close proximity, 40m, were considered to be contiguous. Forty meters was considered an appropriate size as most species would not consider this a significant distance to cross, specifically most glider species will be able to cross this distance in a single glide. Note: It is acknowledged that this gap may be a significant gap to cross for some small fauna species and species which are obligates of dense habitat.*

iii. Buffer each patch by 20m.

iv. Combine and disaggregate the buffer layer. This result identifies patches within 40m of each other.

v. Combine the patches of remnant vegetation based on the buffer polygon they are within. This creates multiple habitat patches.

vi. Add an area field to the habitat patch table and update it with the area in hectares.

vii. Select patches greater than 100 ha and classify as "large Habitat Patches"

viii. Select patches between 10 ha and 100 ha and classify as "medium habitat patches"

ix. Select patches less than 10 ha and classify as "small habitat patches"

***Assumption**: The size classification of patches is arbitrary and not based on specific species requirements. Due to the general species approach this classification was considered appropriate.*

b) Wildlife Corridors to be mapped are designed to link major habitat patches. The preferred route between large habitat patches, where possible and appropriate, included medium and small habitat patches within the corridor.

c) The alignment of corridor centrelines was undertaken using visual alignment. In most cases, waterways were followed as these are natural wildlife corridors for both terrestrial and aquatic fauna, and generally contained the most intact habitat areas. To maximise the habitat diversity and connectivity ridgelines were also included. This ensures that specific habitats for some specialist species such as Brush Tailed Rock wallabies and Spotted Tailed Quolls were included into the network. These ridgeline terrestrial corridors are also designed to link lowland habitats with the upland habitats allowing season migration.

d) The generally accepted principal is that corridors must be wide enough to provide shelter, resources and facilitate passage between habitat patches (Fleuery and Brown, 1997). This can be made simpler when the number of species the corridor is designed for is small. In these cases specific habitat requirements such as the resilience to edge effects, can be identified and considered in the design.

However, due to the non species specific nature of the Logan corridors this was not appropriate. Determining corridor width is based on providing functional movement and habitat areas for multiple species with multiple habitat requirements. It is also important to try and separate incompatible species by offering multiple habitat types for movement. For example bird requirements vary from species to species. Some species prefer areas on the edge of forests and more open areas, including Noisy Miners, Magpies and Butcherbirds. Many of these species are intolerant of other species and will kill or harass intruders and smaller birds. Other species, eg Tree Creepers, Noisy Pitta, Pale Yellow Robins, Spectacled Monarchs and others, are intolerant of edge effects and will only occupy internal parts of the habitat patches. These edge effects can be significant up to 100m from the edge of the habitat patch. Therefore corridor design should provide multiple habitat types, aim to separate incompatible species and provides habitat for species that are intolerant of edge effects.

Cook (2002) identified that the average width of a corridor designed for multiple functions and species was 245m. Lees et al (2008) showed that species richness for multiple cohorts of tropical birds ie understorey and midstorey obligates, primary forest species, species able to tolerate high level of disturbance and those which prefer non-forest habitat was greatest when corridor widths were between 300m to 400m. Catteral (et al, 1993) suggested that for south-east Queensland corridors should "avoid having less than 100m width, the wider the better". However Harris and Scheck (1991) suggested that a simple width is inadequate except for in homogenous landscape. As the Logan corridors are designed for multiple species and heterogeneity is required, a simple width of 100m would be insufficient.

Therefore considering Catteral suggestion that a 100m homogeneous corridor would be a minimum corridor width and taking into account the impacts of edge effects, a corridor which provides habitat for multiple species including edge species and core species needs to provide 100m buffer either side of a 100m wide section of core habitat. Therefore a minimum width to achieve the requirement of a corridor designed to cater for multiple species is 300m

Based on these findings the minimum nominal width for Logan's Regional Wildlife Corridors was set at 300m. This is likely to provide suitable habitats for multiple species while separating incompatible species and allowing movement.

Land owned by Council, State or Federal Government and either designated as parklands or reserves or containing large tracts of remnant vegetation offer opportunities to maximise the width of the corridor network and provide significant habitat patches within the network. Therefore parks, reserves and other publically owned land with high biodiversity values which connect to the corridor network were included as part of the network.

e) The corridor centrelines were buffered by 150m either side, except along the Logan River (including Teviot Brook) and Albert River (including Flagstone Creek) where in places the width from bank to bank can be over 100m. Along these 2 corridors the river banks were buffered by 200m from the low bank.

f) Corridor functionality is increased when the length is kept to a minimum. However it is important that the corridor include suitable habitat for movement and resources. For this reason the shortest distance between habitat patches which included remnant vegetation was chosen.

g) In order to further verify the appropriateness of the wildlife corridor location a second analysis using Marxan[1] was carried out. This analysis included a number of Conservation Targets based on the percent captured within Logan. The targets included:

i. Wetland Buffers (70%)

ii. Waterway Buffers (80%)

iii. Remnant Endangered Vegetation (50%)

iv. Remnant Of Concern Vegetation (50%)

[1] Marxan is freely available conservation planning software created by the University of Queensland. It provides decision support for conservation planning problems around the world including reporting on the performance of existing reserve networks and the design of new reserve systems.

v. Remnant Least Concern (20%)

vi. Regrowth Vegetation (20%)

vii. Threatened Species Buffers (20%)

The analysis was based on 250m x 250m grid cells with a clumping factor (BLM) of 0 (meaning clumping of patches was not required) and costs incorporated using the following:

i. Flood Plain Management Area - $1

ii. Rural and Residential Living zones - $2

iii. Emerging Communities $4

iv. All other zones -$10

All of the grid cells with 50% or more of the cell covered by Park were "locked in" and therefore required by Marxan to be included in the corridor network.

Marxan then ran the above model 100 times aiming for a conservation network that captured all 7 conservation targets, all parks and was the cheapest based on the cost variables input. The resulting conservation network only missed 2 of the conservation targets set by very small margins. The Marxan conservation network showed a high degree of correlation with the vector analysis methodology. This further supports the outputs from the original analysis.

***Koala Corridors***

Two Koala Corridors at Springwood and Hideaway Mountain were incorporated into the Biodiversity Areas and Corridors Overlay as a supporting map. These koala corridors strategically link large intact koala habitat areas across small properties within the urban footprint. Without these corridors the high quality koala habitat in these areas would not be protected due to exemptions under the South East Queensland Koala Conservation State Planning Regulatory Provisions.

The Koala Corridors and some of the Biodiversity corridors align to the property cadastre and with every change in the property cadastre the corridors need to be realigned. The following process was followed to ensure accuracy of the corridor mapping by removing slivers of corridor on properties not intended to contain corridors:

a) Remove all corridor slivers <= 200m$^2$ from properties in the urban footprint and

b) Remove all corridor slivers <= 200m$^2$ or <= 5% of the property size from properties outside the urban footprint.