

# Aiming for ecological excellence

Watercare wanted an Excellent ISCA (Infrastructure Sustainability Council of Australia) rating for the Central Interceptor Projects. In rating sustainability performance, the ISCA reviews the project against a set of guidelines and undertakes a thorough evaluation before awarding a certification.

The ISCA ecology rating makes up some 30 percent of the overall rating for the project, and has two components: ecological value and habitat connectivity.

Boffa Miskell devised an ecology quantification method to measure ecological connectivity to individual ecological features. The metrics developed demonstrated an overall net ecological enhancement for the project.

GIS analysis was undertaken to demonstrate improvements in connectivity across habitats within the urban environment. Getting the ecology rating wasn't straightforward.

"As an urban and mainly underground project, the challenge was maximising opportunity for ecological enhancement while achieving sufficient points to get the ecology rating," says project lead Dr Ian Boothroyd.

Ian and senior GIS specialist Sandeep Gangar worked with the Watercare sustainability team, led by Olivia Philpott, to plan what was achievable at each of these sites.

Using information collected for the 'Assessment of Ecological Effects' report, it was possible to build a picture of each site and what enhancements were feasible during and after the construction of the tunnel project.

This also led to the development of an Ecological Management Plan, which Boffa Miskell has refined with the Ghella Abergeldie JV.

"The ecology team collected data through fauna surveys, habitat observation and active searches at various points along the Central Interceptor route," says Ian. "This information



Central Interceptor Project lead  
Dr Ian Boothroyd



Senior GIS specialist Sandeep Gangar

was then laid over the map at five key ecological features. We could then identify locations where ecological enhancements were feasible, and later we can monitor the results of those enhancements."

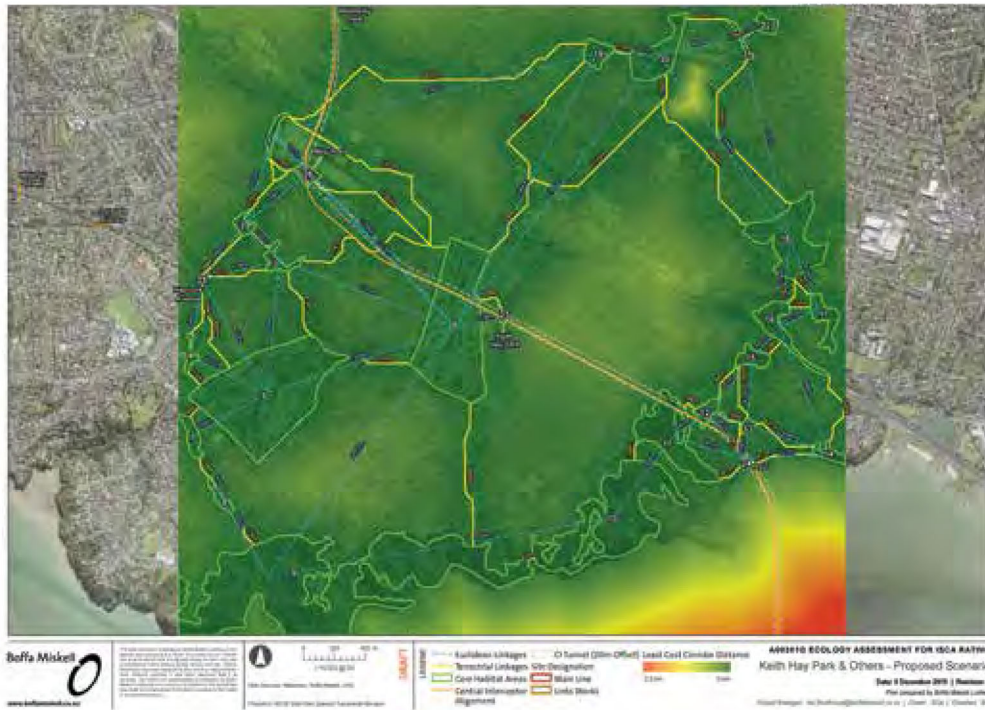
Key ecological enhancements include revegetation, riparian planting, and the development of terrestrial microhabitats and aquatic habitat. The opportunities to provide the ecological enhancements were limited to a small number of surface sites. Analysing the existing connectivity between habitats and the potential enhancements was a major significance for satisfying the ISCA rating conditions.

"Habitat connectivity is an important concern in urban environments. Loss of habitats due to increased development can cause deterioration of healthy, interconnected eco-systems. We used Linkage Mapper software to assess connectivity in the immediate environs of selected priority Central Interceptor sites and within the priority sites," says Sandeep.

The key inputs used by Linkage Mapper are core habitats, dispersal distance and a raster dataset of the underlying land use with resistance values. The connectivity between the core habitats is derived as a line of probable travel direction. A core can be connected to several other core habitats or just

to a single core depending on the maximum dispersal distance of a particular species and the distance between the habitats.

"The initial connectivity analysis for pre-project construction phase helped us to understand how the habitats are interconnected. This in turn helped us identify sites that had the potential of acting as stepping-stones between other habitats,



**Keith Hay Park & Others Proposed Scenario**

thereby helping create new ecological corridors where none existed before.”

The metrics of connectivity improvement were derived using the total number of connections between the core habitats and the total distance of all connections between core habitats. Overall a

greater than 20 percent enhancement in habitat connectivity has been achieved for the Central Interceptor. Enhancing ecological values at a small number of optimal sites, and not decreasing values at remaining sites, resulted in a substantial increase in overall ecological values for the project as a whole.



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