# 5 Bio-Linkages for protection & connectivity

## Biodiversity Objective 2

*Identify areas within and adjacent to the GreenWay catchment with high biodiversity values that require protection and improve the connectivity between these areas.*

## 5.1 Bio-Links

The challenge of the participating councils and the community is to increase the green footprint within the heavily urbanised catchment. It is proposed that one of the ways to achieve the objectives stated in Section 1.3 is through the on ground development of Bio-links.

The creation of opportunistic Bio-links within the urban landscape, in conjunction with providing functional ecological communities in restricted areas, is potentially more realistic and achievable than creating corridors. By providing food species and shelter by planting appropriate native species in close proximity, the distance between these islands is reduced and by providing connectivity, movement between islands is facilitated.

A Bio-Link is opportunistic urban land use to increase the green foot print and provide connectivity for flora and fauna in the absence of true corridors. Bio-Links connect small parks and vegetation remnants or islands using streets and residential backyards forming terrestrial linkages between ecological areas.

Bio-links serve a purpose in providing opportunities for a variety of species to exist, move, forage, breed and shelter within urban areas where habitats are fragmented and discontinuous. In these environments bio-links can form an essential component of a City's biodiversity network and green footprint.

Bio-linkages can increase the green footprint of the GreenWay catchment by improving the condition of ecosystems through an increase of native vegetation cover through targeted ecological restoration works.

This approach involves identifying high conservation value vegetation, habitats and wildlife linkages that could form bio-links (including ecosystems, habitats and species they contain) that require protection, ecological restoration and/or threat abatement. Bio-links can also prevent the further degradation of biodiversity values in core habitat areas.

## 5.2 Identification of Bio-Linkages

Remote sensing, aerial photographs and on-ground surveys were used to identify Bio-Linkages and this is detailed in Appendix 12: Methodology and Assessment Criteria for Bio-Links.

## 5.3 Classification and Prioritisation of Linkages

To assist in prioritisation of the rollout of strategies and actions proposed, all bio-links surveyed were assessed and prioritised according to a number of value-based criteria, based on their condition, values and functionality. The classification system developed was based on similar classification systems that have been developed in Australia to rank sites according to their conservation value, including Blanch (2003), Chenoweth (2001) and Scotts (2003). 'Bio-links' have somewhat different values compared with habitat corridors in the conventional sense, due to their urbanised context and the range of discontinuities, or barriers, present in the form of transport routes and developed areas. Thus in developing a system to assess the value of bio-links, it was necessary to consider both the existing ecological values of the linkage (eg. connectivity of threatened species habitat) and also the potential of the linkage to be enhanced to improve ecological functionality (eg. whether or not there are barriers that irreversibly prevent development of future linkages). Additionally, social factors, such as the recreational significance of a linkage and local community interest were considered, as within an urbanised context these are likely to be key factors in the successful implementation of proposed linkages.

Table 5-1 and the table in Appendix C indicate the assessment methodology used to prioritise linkages within the catchment. Bio-links were categorised based on ecological and social values and degree of threat and potential for enhancement according to a number of assessment criteria listed in Appendix C. Values were then combined to derive a priority ranking from 1-3 using the matrix shown in Table 5-1. There is a level of subjectivity associated with some of the assessment criteria however; it is considered that the number and diversity of criteria used, in combination, provide an efficient and therefore cost effective method of assessing significance and priority of linkages, which is appropriate within the scope and objectives of this strategy.

Bio-links are different from habitat corridors due to their urbanised context and the range of discontinuities, or barriers, present in the form of transport routes and developed areas.

We have provided a non-categorised, fourth priority linkage also. It is important to look at the catchment in its context and not in isolation. Priority 4 linkages look at potential bio links outside the catchment that can significantly increase connectivity.

Table 5-1 – Prioritisation of Assessment Criteria

| **Vulnerability & Enhancement Potential[1]** | **Linkage Values: Ecological & Social[2]** | | |
|---|---|---|---|
| | **HH** | **MM** | **LL** |
| **HH** | 1 | 1 | 2 |
| **MM** | 1 | 2 | 3 |
| **LL** | 2 | 3 | 3 |

Notes:

[1] Combine the low (L), medium (M) and high (H) rankings for indices for vulnerability to threats and linkage enhancement potential given in the Table in Appendix C (in any order) to obtain the combined index descriptor for vulnerability and potential.

[2] Combine the low (L), medium (M) and high (H) rankings for indices for ecological value and social potential given in Appendix C (in any order) to obtain the combined index descriptor for linkage values.

## 5.4 Bio-link Masterplan

The Masterplan illustrates the prioritisation of linkages and connectivity of significant sites within the catchment (refer Figure 5-1, Figure 5-2, Figure 5-3, and Figure 5-4). Joining the identified areas are bio-links that show the optimal path for works to encourage connectivity and are numbered 1-3, with 1 being the highest priority and 3 the lowest.

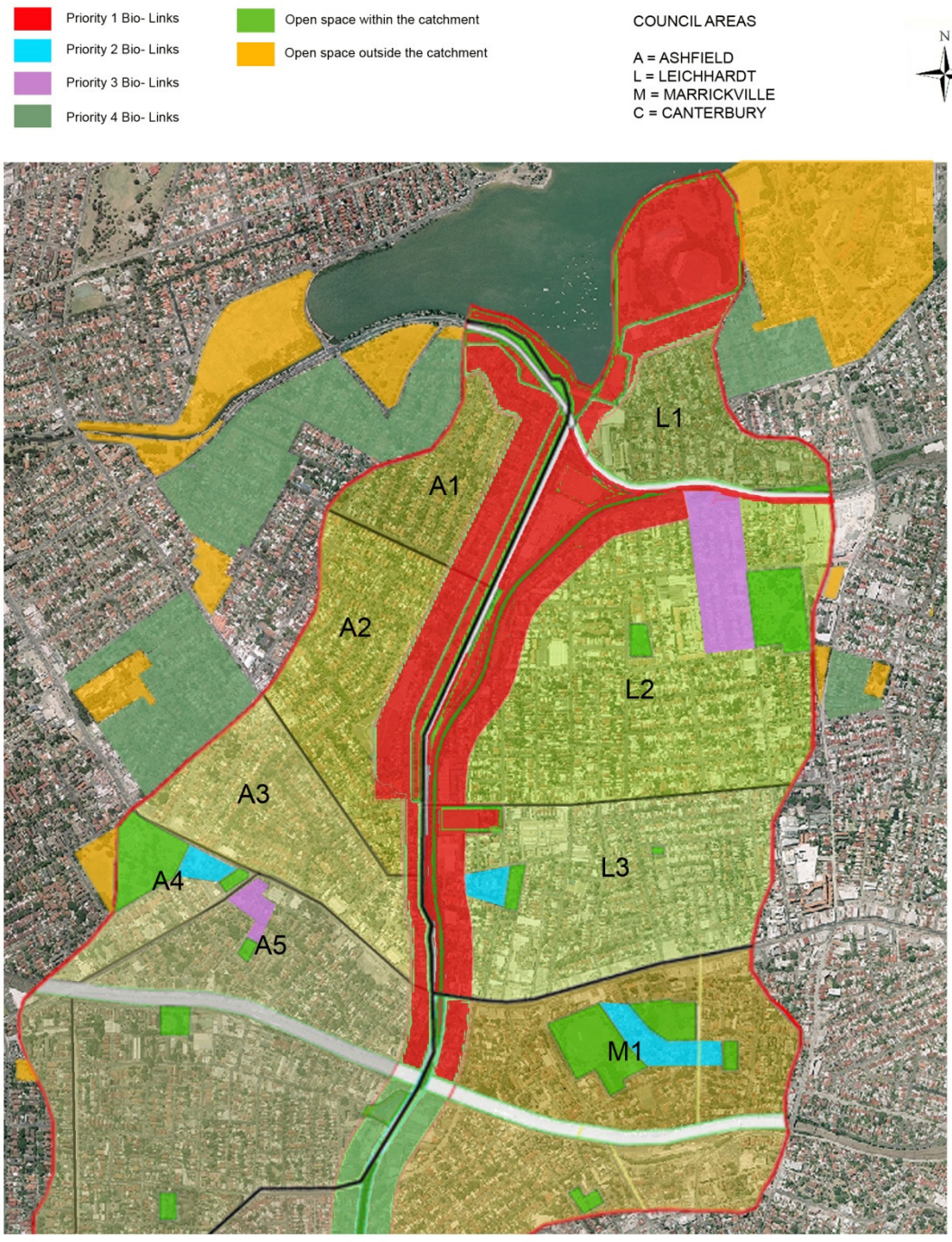
In the following maps the GreenWay corridor provides the most significant ecological area to which all the other open spaces, remnants and linkages relate. The bio-links identified connect areas increasing the overall 'green' footprint within the catchment, increase 'island' size and reduce the distances between these islands.

The highest priority linkages are located adjacent to the disused freight rail corridor and adjacent to open space areas. A line was transposed onto the maps along the rail alignment and offset 100m either side to establish a core corridor. Where this offset line crossed parks or open space (as with Hawthorne Park) an additional 100m was offset from the park boundary to include adjacent residential houses and streets. A line was transposed on to the maps at the outer boundaries of Beaman Park, Ewen Park, Marrickville golf course and the Cook's River and again offset 100m to include residential houses and streets.

Although there is no rule of thumb for the width of a corridor, a minimum total width of 200m from the centre line of the rail corridor and a 100mm offset from park boundaries has significantly increased the corridor footprint. Figure 7-1 shows specific areas in which broad scale community involvement will assist Councils' in creating and providing the core corridor and bio-links. These areas have been identified or broken down geographically, primarily using major roads to demarcate boundaries. This provides the participating LGAs with manageable sized and targetable communities rather than viewing the catchment in its entirety.

Priority 2-3 linkages generally link parks and other open space areas outside the core corridor area but within the catchment while priority 4 linkages connect areas outside the catchment. Looking at the Figure 5-4, priority 4 linkages provide potential bio links outside the catchment that can significantly increase connectivity. This is clearly evident to the north and south of the catchment with significant opportunities along the Iron Cove (Sydney Harbour) foreshore and the Cook's River respectively.

Figure 5-1: Bio Links - North

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AWC

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Figure 5-2: Bio Links - Central