

CITY OF CAPE TOWN

THE IDENTIFICATION AND PRIORITISATION OF A BIODIVERSITY NETWORK FOR THE CITY OF CAPE TOWN

Final Report EXECUTIVE SUMMARY



Submitted by

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EXECUTIVE SUMMARY

Introduction

The City of Cape Town's biodiversity¹ is globally unique and its conservation is of international importance. The local variability and uniqueness of vegetation types and species diversity together with processes of urbanisation have resulted in 65% of the remaining natural vegetation in the City being classified as *critically endangered* or *endangered*. No other City in the world harbours as many threatened plant species per unit area.

In 2003, the City of Cape Town committed to implementing a Biodiversity Strategy. This Strategy requires, amongst other, that a Biodiversity Network be established to enable the conservation of Critical Biodiversity Areas. These areas represent the minimum amount of terrestrial and freshwater habitat that is required to meet the City's biodiversity conservation targets. An iterative systematic conservation planning process, which started in 2001, has established biodiversity conservation targets and the identification and prioritisation of the Biodiversity Network.

Over the past six years, the City of Cape Town has engaged international and local partners in implementing the Biodiversity Strategy and Network. These partnership initiatives include *inter alia* the Cape Action Plan for People and the Environment (CAPE), CapeNature, Cape Flats Nature, and more recently, the Local Action for Biodiversity (LAB) Project.

In May 2006, MLA-Sustainability Matters and GISCOE (Pty) Ltd. were appointed to assist the City in a revised desk-top conservation planning analysis to identify and prioritise an updated Biodiversity Network on the basis of:

- A revised vegetation map for the City, compiled in partnership with the South African National Biodiversity Institute (SANBI) and developed by Rebelo and Low, which has aligned the City (Low 2000) and National Vegetation Map (Mucina & Rutherford 2004);
- A revised spatial layer representing the remaining Natural Habitat Remnants (areas of remaining natural habitat) in the City, which was prepared using 2005 aerial imagery in partnership with CapeNature and SANBI.

Purpose and structure of this report

The purpose of this report is to specifically present the results of the revised identification and prioritisation analyses. Detailed descriptions of the concepts of nodes, corridors and the conservation planning methodology processes followed since 2001, are provided as appendices to this report.

The process and participants

The process of the revised desktop biodiversity analyses has focused on the internal stakeholders: City of Cape Town: Environmental Resource Management Department and CapeNature: Cape Metro Business Unit in discussion of revised conservation targets and the results of the identification and prioritisation analyses. However, the principles and criteria underpinning both the revised selection and prioritisation of the network were established with stakeholders in 2003. Key conservation partners, SANBI and CapeNature, have assisted in revising the GIS layer of Natural Habitat Remnants as well as the integration of the national and City vegetation types.

¹ Biodiversity, or biological diversity, refers to "the variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems" National Environmental Management: Biodiversity Act (Act 10 of 2004).

Methodology

The methodology applied in the identification of the City's Biodiversity Network conforms to accepted systematic conservation planning methodology and used C-Plan as well as other GIS (Geographical Information System) software packages designed and adapted for conservation planning.

Identification of the Biodiversity Network

In summary, area-based targets, for representation of vegetation type and species, were set based on the revised City Vegetation Map (habitat type and distribution) and species database (Protea Atlas and SaS species locality data), the revised remnant layer (remaining natural habitat areas or Natural Habitat Remnants - NHRs) and an analysis of areas considered to be conserved within the City (existing protected areas). A GIS-based analysis was undertaken (using agreed key criteria of irreplaceability²; size of NHR; percentage contribution to meeting target; and, vegetation type diversity) to select remnants that would best meet conservation targets for each vegetation type. The extent to which this coarse filter selection, based on vegetation targets, catered for the conservation of the species targets, was then assessed. Additional NHRs were then selected in order to ensure that species targets also were met.

While a previous analysis for the identification and prioritisation of the Biodiversity Network was included, the databases of wetlands and rivers and their ecological assessment were considered not to be comprehensive enough for the purpose. Until such time as an improved basis for decision-making planning exists, all rivers and wetlands are considered as part of the selected Biodiversity Network due to their significant role in both structuring the network, enabling connectivity and providing essential ecological-, engineering-, social- and economic services to the City.

Identification of biodiversity "nodes" and "corridors"

With the understanding that the Biodiversity Network forms the backbone of the City's open space system, the concepts of biodiversity "nodes" and "corridors" were adopted in 2003. "Nodes", the anchors of the Biodiversity Network, were identified using an agreed set of criteria applied to each Biodiversity Network site. "Corridors", were identified using "friction analysis", which is a way of assessing the extent to which current land uses within the City would best support biodiversity pattern and ecological processes thus selecting the optimal pathways or corridors between nodes.

Prioritisation of the Biodiversity Network

The rerun of the prioritisation of the selected Biodiversity Network was undertaken using a decision tree and criteria agreed with stakeholders in 2003. Key decision rules influencing the prioritisation included formal status, irreplaceability and size. This analysis resulted in the assigning of prioritised Biodiversity Network categories A, B and C for each Natural Habitat Remnant selected for the Network. These categories are intended to inform land-use decision-making as well as prioritisation for implementation of the Biodiversity Network.

The *limitations of the study* include the currency of some of the data layers used in the analysis. Specifically, more recent updates of the rivers- and wetlands layer, species data and the remnants layer (based on comprehensive *status quo* assessments for the NHRs) would have improved the accuracy of the analysis, which is based on terrestrial vegetation types. However, with the rate at which internationally significant natural habitats are being converted each day, there are fewer and fewer spatial planning choices remaining to enable the persistence of the remarkable variety of vegetation types and species still present in the City.

The results of the analysis further underscore the need for bold and swift action in securing the Biodiversity Network while continuing to improve data currency.

² Irreplaceability quantifies the contribution of a Natural Habitat Remnant to achieve biodiversity targets. Irreplaceability values range from 0 (site not required to achieve biodiversity targets) to 1 (irreplaceable site, target cannot be achieved without it).

Results of the analyses

Ecosystem status of vegetation types within the City

The new Vegetation Map for the City of Cape Town compiled by Rebelo and Low (2007) includes 43 distinct vegetation types (see Figure 1). Of these 43 types, the distribution of 18 types is entirely limited to within the City's administrative boundary and cannot be conserved elsewhere. Twenty one of the 43 are considered *critically endangered* as there is not enough remaining habitat to meet the City's adopted conservation targets. Of these 21 types, two vegetation types are no longer represented in the City, having been entirely converted into other land uses, and a further six vegetation types have less than 10% area remaining in the City (three of which have less than 3% area remaining).

Of the 22 vegetation types considered not to be *critically endangered*, seven are *endangered*, nine are *vulnerable* and six are considered *least threatened*. More than two-thirds of the vegetation types identified in the City are therefore considered *critically endangered* or *endangered*.

In terms of the National Vegetation Map, of the 18 vegetation types occurring within the City, seven of these vegetation types are *critically endangered*, six are *endangered*, two are *vulnerable* and three are *least threatened*. Six of these vegetation types have distributions entirely limited to within the City's administrative boundary and cannot be conserved elsewhere.

Identification of the Biodiversity Network

Natural Habitat Remnants: On the basis of the 2005 aerial imagery an edited layer has identified Natural Habitat Remnants (NHRs) that are still theoretically available for conserving biodiversity. Together these NHRs make up an area of 45,362.53 ha (Figure 2).

Existing Protected Areas: Protected Areas within the City, for example the Table Mountain National Park, the Blaauwberg Conservation Area, other reserves, conservancies etc, make up a total area of 52,654.57 ha (Figure 2).

Meeting targets for vegetation types and species:

In addition to the habitats conserved within existing protected areas, a further 37,079.71 ha of the identified Natural Remnant Habitats are required to meet the established conservation targets for vegetation types (33,017.37 ha – Figure 3) and species (4,062.34 ha – Figure 4). The Biodiversity Network for the City would therefore require a total of 89,734.28 ha. More than 80% of the area of identified Natural Habitat Remnants is therefore required to meet targets for vegetation types and species.

Identification of Nodes and Corridors

Figure 5 presents the "nodes" and "corridors" identified for the Biodiversity Network. Ten Nodes have been identified Wolfgat/ Macassar Dunes, North West/ Diep River, Blaauwberg, Joostenberg, Tygerberg, Driftsands/ Khayelitsha, Helderberg/ Kogelberg, Zeekoevlei/ Pelican Park, and the Cape Peninsula (including the TMNP).

Prioritisation of the Biodiversity Network

The prioritisation analysis has assigned 96.6% (86,713.10 ha) of the Network as category A, 3% (2,827.81 ha) as category B and 0.2% (193.39 ha) as category C (Figure 6). This emphasises the fact that there are limited choices where conservation targets can still be met within the City. Note that while categories B & C have lower priority, the total amount of land selected in the network (for these two categories) is still required to meet the targets. In category C sites and some category B sites, there may still be limited choices as to where and how the target is met, depending on the irreplaceability of the individual NHRs.

Conclusion

There is a high level of diversity and uniqueness of the biodiversity currently represented in the remaining natural habitats found in the City of Cape Town. This is indicated by the diversity and uniqueness of the vegetation types. This together with the extent of historical habitat transformation within a rapidly growing urban context means that a high proportion (80%) of the remaining intact

Natural Habitat Remnants are required to meet the City's conservation targets. These selected and prioritised Natural Remnants represent the City's last opportunity to conserve an estimated minimum representative area of natural habitat that can enable the conservation of the City's unique biodiversity and its persistence for future generations.

In the context of the competing demands for land in the City, bold action by the City's leadership is required to implement the Biodiversity Network. It is imperative that the City takes convincing and effective strides towards honouring its commitment to the international community under the Biodiversity Convention. Further, the steady growth in tourism and eco-tourism over the past decade has increasingly focused on Cape Town and its environment as a prime tourist destination. This should provide further impetus and incentive to the commitment that the City of Cape Town has already made in conserving its internationally renowned biodiversity.

Recommendations

In order that the Biodiversity Network is secured, a clear programme of action is required. The following are critical initiatives that are recommended for implementation in parallel:

Enabling legal and policy instruments

1. Compilation and submission of a Biodiversity Plan in terms of sections 40 – 50 of the NEM: Biodiversity Act, Act 10 of 2004 in line with the draft Guidelines for Publishing Bioregional Plans and in partnership with SANBI. It is imperative that some form of legal status now becomes attached to the internationally significant biodiversity represented in the Biodiversity Network. Indeed, it may be necessary to investigate further legal options through NEMA that enable a tempering of existing development rights in the context of *critically endangered* and *endangered* habitats.
2. On the basis of the draft submission of the Biodiversity Plan, institute a City protocol through a By-Law in line with the identification of geographic areas requiring EIAs in terms of section 24 of NEMA that would inform specific EIA requirements in relation to the City's fine-scale Biodiversity Plan.

Strategic land use and development frameworks

3. The findings of this study require adequate integration into the Citywide Spatial Development Framework, as well as the eight local District Development Plans that are in the process of being developed. This should also ensure the integration of the Cape Metropolitan Open Space System and the Biodiversity Network at the local level.
4. While biodiversity off-sets will not really be applicable to most of the network sites due to their ecosystem status, alignment is required between the City's draft land use guidelines and draft Biodiversity Off-sets policy and that which has been developed by the Western Cape Provincial Government (2007) in order to provide absolute clarity to decision-makers and land-owners.

Decision-support for land use decision-making:

5. The continued development of a decision-support system for land use decision-making, including the Red-flagging system proposed for the City's internal Land use Information System. This system will enable the implementation of the protocol to be established in Recommendation 2 (above).

Information Management Systems

6. Systematic updating of all data layers (including the rivers and wetlands layer) will be required every three to five years and should focus on integrating the status quo assessment results as well as the SANBI CREW (Custodians of Rare and Endangered Wildflowers) project's database.

7. Ground truthing and *status quo* assessment of all category A sites (including rivers and wetlands), prioritising within this all critically endangered and endangered types will enable the ongoing refinement of the Network.

Planning, implementation and monitoring and evaluation

8. The City requires a plan that enables the implementation of the spatial vision – the Biodiversity Network – on the ground in the medium to long-term. This plan needs to be developed and implemented together with the key CAPE partners. The established prioritisation criteria, together with zoning and ownership information, could be used to inform the plan. Further, the implementation “Toolkit” developed in 2002 provides a range of options for the implementation of the Biodiversity Network.
9. Local communities must be engaged and mobilised in securing and managing identified critical biodiversity areas. Enabling local action for biodiversity will be the single-most important initiative that has the potential to gain the local-level political support for the conservation of the Biodiversity Network. The City’s Local Action for Biodiversity project needs to be focused on driving out this strategy.
10. A Stewardship strategy focusing on the conservation of privately-owned land in the City will need to be developed for the next five years and implemented in partnership with CapeNature.

The most important ingredient of success will be the City’s adoption of a spatial vision that includes the conservation and celebration of its unique and internationally important biodiversity, one that sees future generations enjoying the results of our collective and bold action.

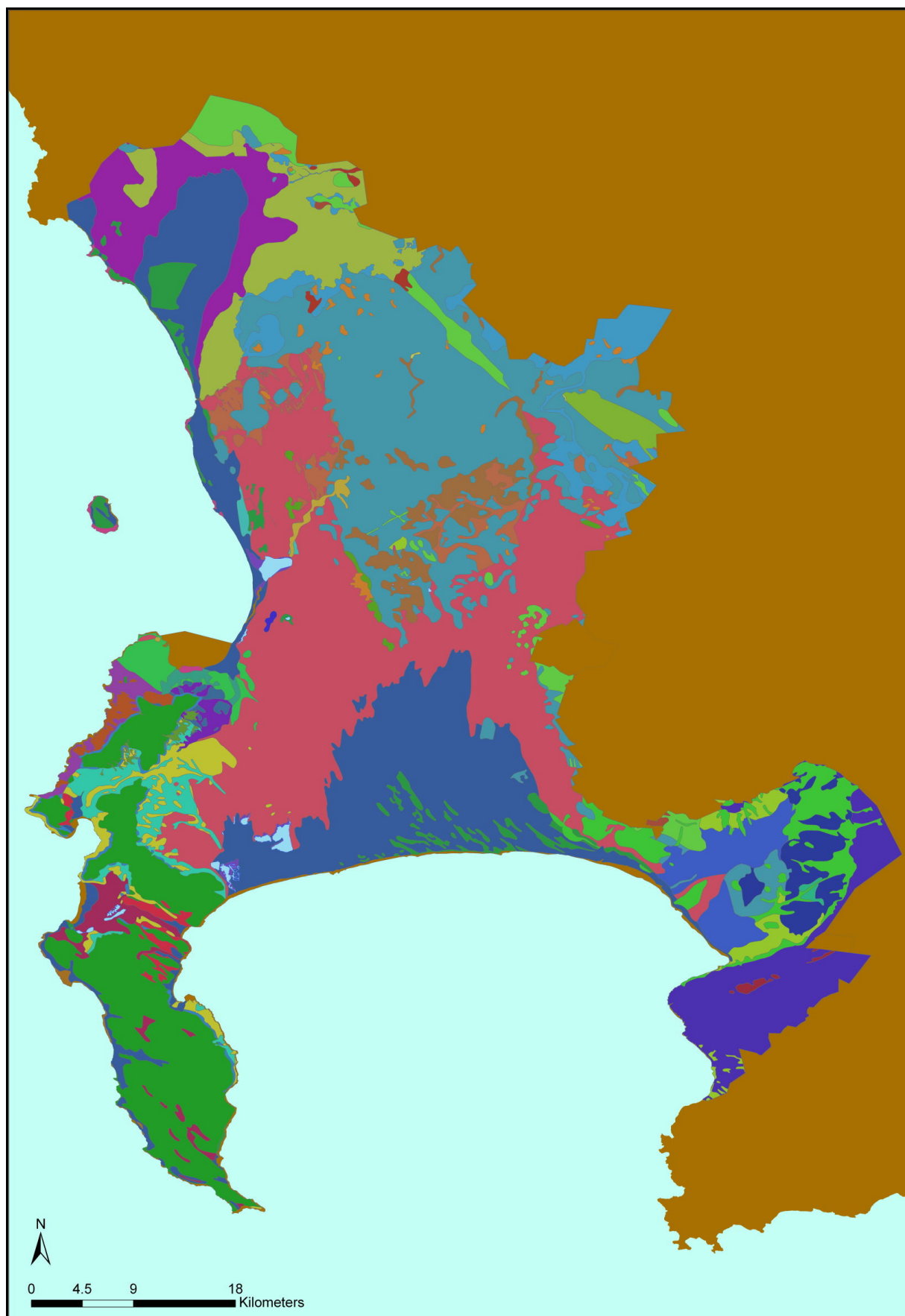


Figure 1: Terrestrial vegetation types of the City of Cape Town (adapted from Rebelo & Low, 2007)

Legend

	Wetlands & Estuaries
	Atlantis Sand Fynbos Strandveld/Fynbos transition (on calcareous/acidic/neutral sands)
	Atlantis Sand Fynbos on marine-derived acid sands
	Atlantis Sand Fynbos on older non-aeolian colluvium
	Atlantis Sand Fynbos on recent non-aeolian colluvium
	Boland Granite Fynbos older non-aeolian colluvium
	Boland Granite Fynbos on Granite
	Boland Granite Fynbos on recent non-aeolian colluvium
	Cape Flats Dune Strandveld on Sandstone
	Cape Flats Dune Strandveld on Shale
	Cape Flats Dune Strandveld on recent non-aeolian colluvium
	Cape Flats Dune Strandveld on sands
	Cape Flats Dune Strandveld on sands over or on limestone
	Cape Flats Sand Fynbos Strandveld/Fynbos transition (on calcareous/acidic/neutral sands)
	Cape Flats Sand Fynbos on marine-derived acid sands
	Cape Flats Sand Fynbos on older non-aeolian colluvium
	Cape Flats Sand Fynbos on recent non-aeolian colluvium
	Cape Lowland Freshwater Wetlands
	Cape Lowland Freshwater Wetlands on recent non-aeolian colluvium
	Cape Winelands Shale Fynbos on Shale
	Cape Winelands Shale Fynbos on recent non-aeolian colluvium
	Elgin Shale Fynbos on Shale
	Hangklip Sand Fynbos on marine-derived acid sands
	Hangklip Sand Fynbos on sands
	Kogelberg Sandstone Fynbos on Sandstone
	Lourensford Alluvium Fynbos on recent non-aeolian colluvium
	North Peninsula Granite Fynbos on Granite
	North Peninsula Granite Fynbos on recent non-aeolian colluvium
	Peninsula Sandstone Fynbos on Mudstone
	Peninsula Sandstone Fynbos on Sandstone
	Peninsula Shale Fynbos on Shale
	Peninsula Shale Fynbos on recent non-aeolian colluvium
	Peninsula Shale Renosterveld on Shale
	Peninsula Shale Renosterveld on recent non-aeolian colluvium
	South Peninsula Granite Fynbos on Granite
	South Peninsula Granite Fynbos on recent non-aeolian colluvium
	Southern Afrotemperate Forest
	Swartland Alluvium Fynbos on Malmesbury Sandstone
	Swartland Granite Renosterveld on Granite
	Swartland Granite Renosterveld on recent non-aeolian colluvium
	Swartland Shale Renosterveld on Shale
	Swartland Shale Renosterveld on older non-aeolian colluvium
	Swartland Shale Renosterveld on recent non-aeolian colluvium
	Swartland Silcrete Renosterveld on recent non-aeolian colluvium

Figure 1: (cont) Terrestrial vegetation types of the City of Cape Town (adapted from Rebelo & Low, 2007)

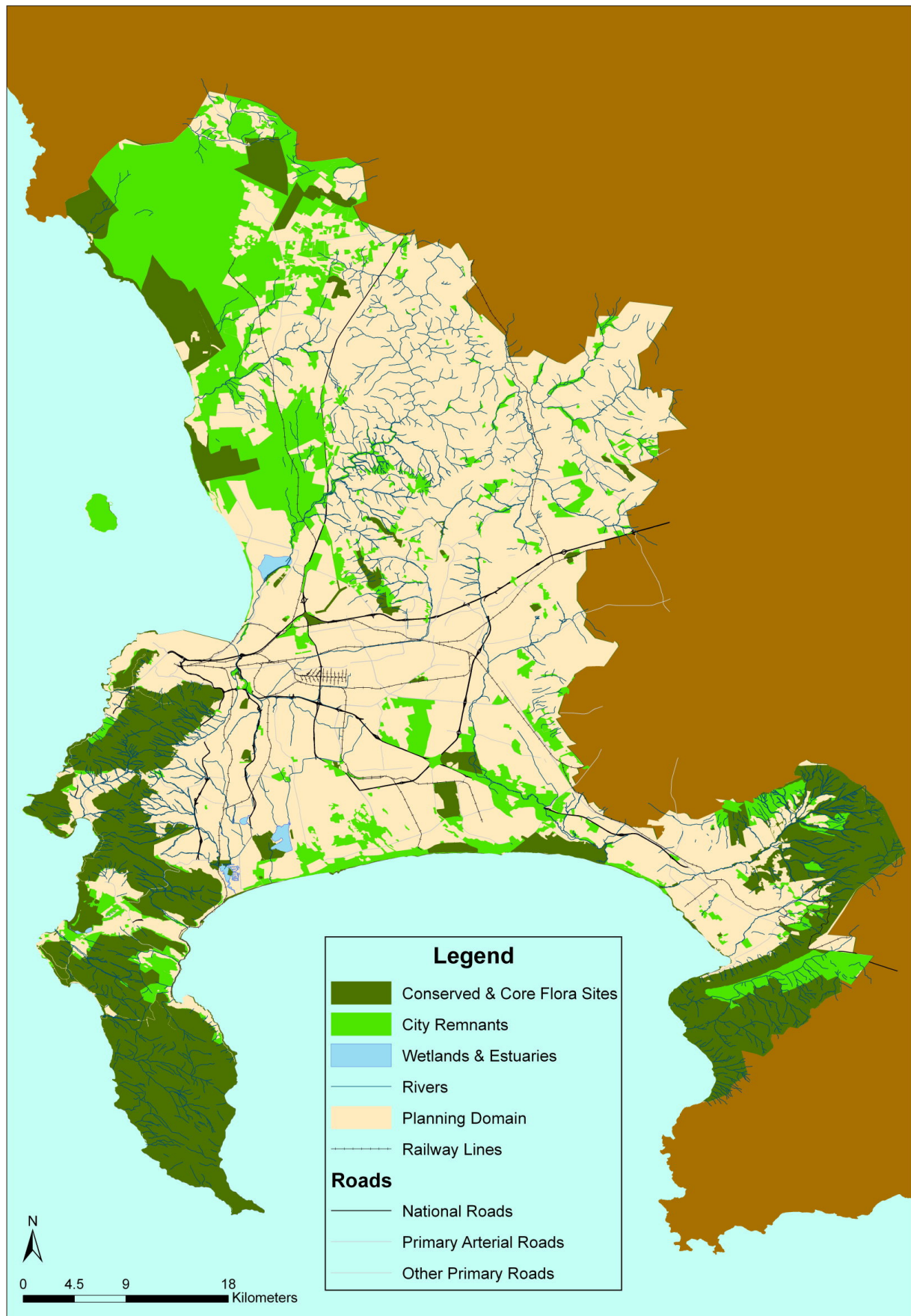


Figure 2: Existing protected areas and natural habitat remnants in the City

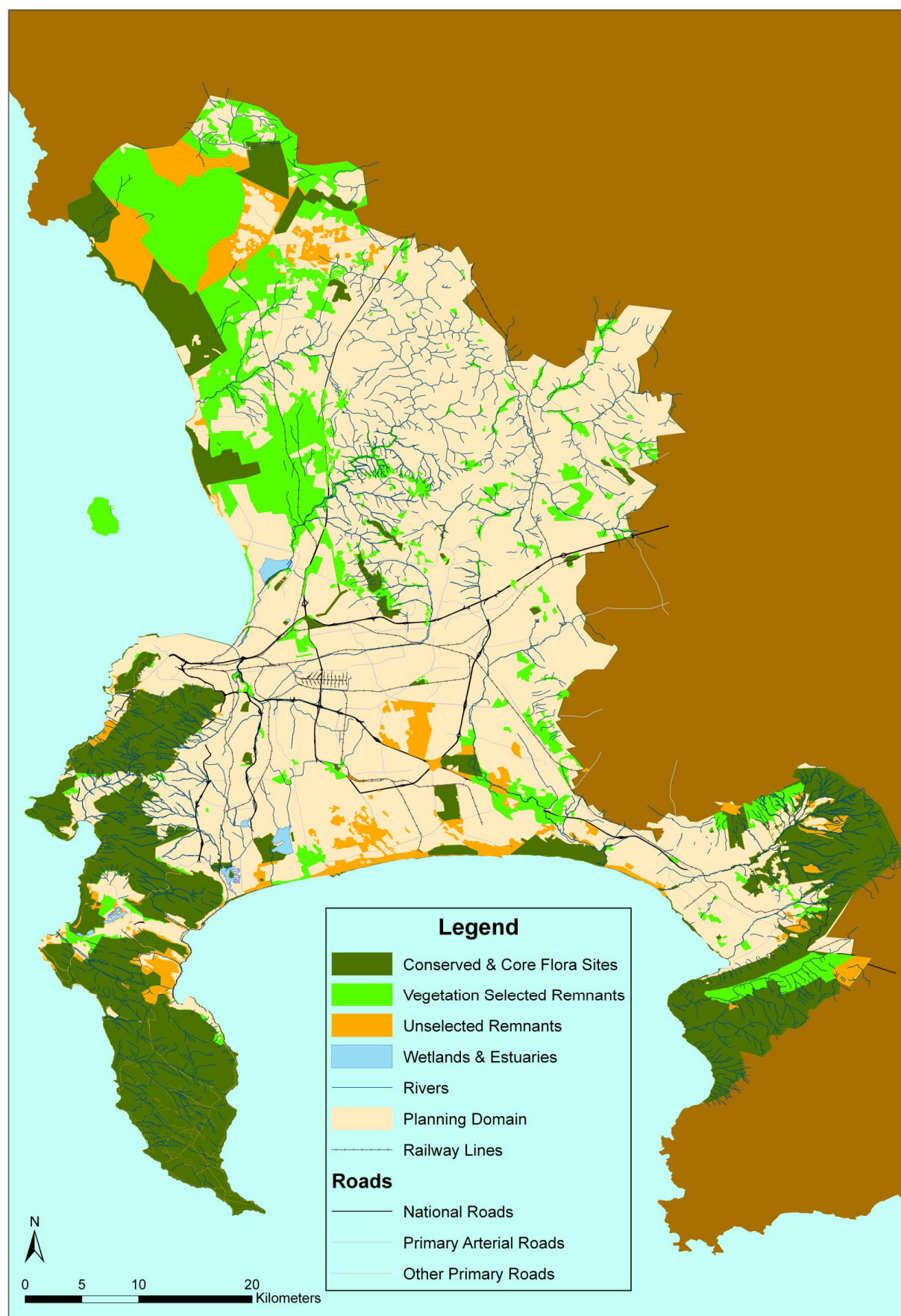


Figure 3: Selection of remnants for terrestrial vegetation type targets

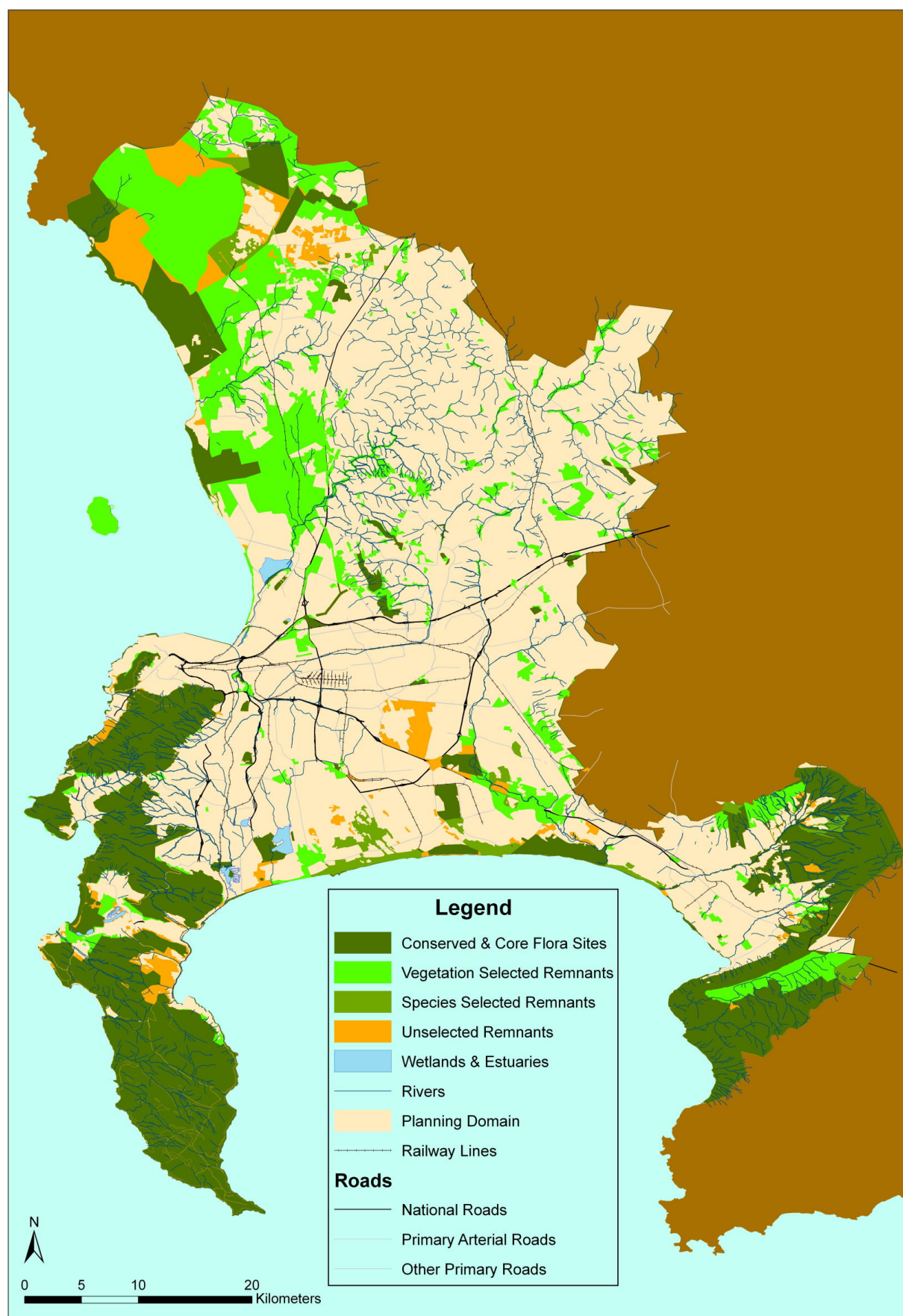


Figure 4: Selection of remnants for species targets

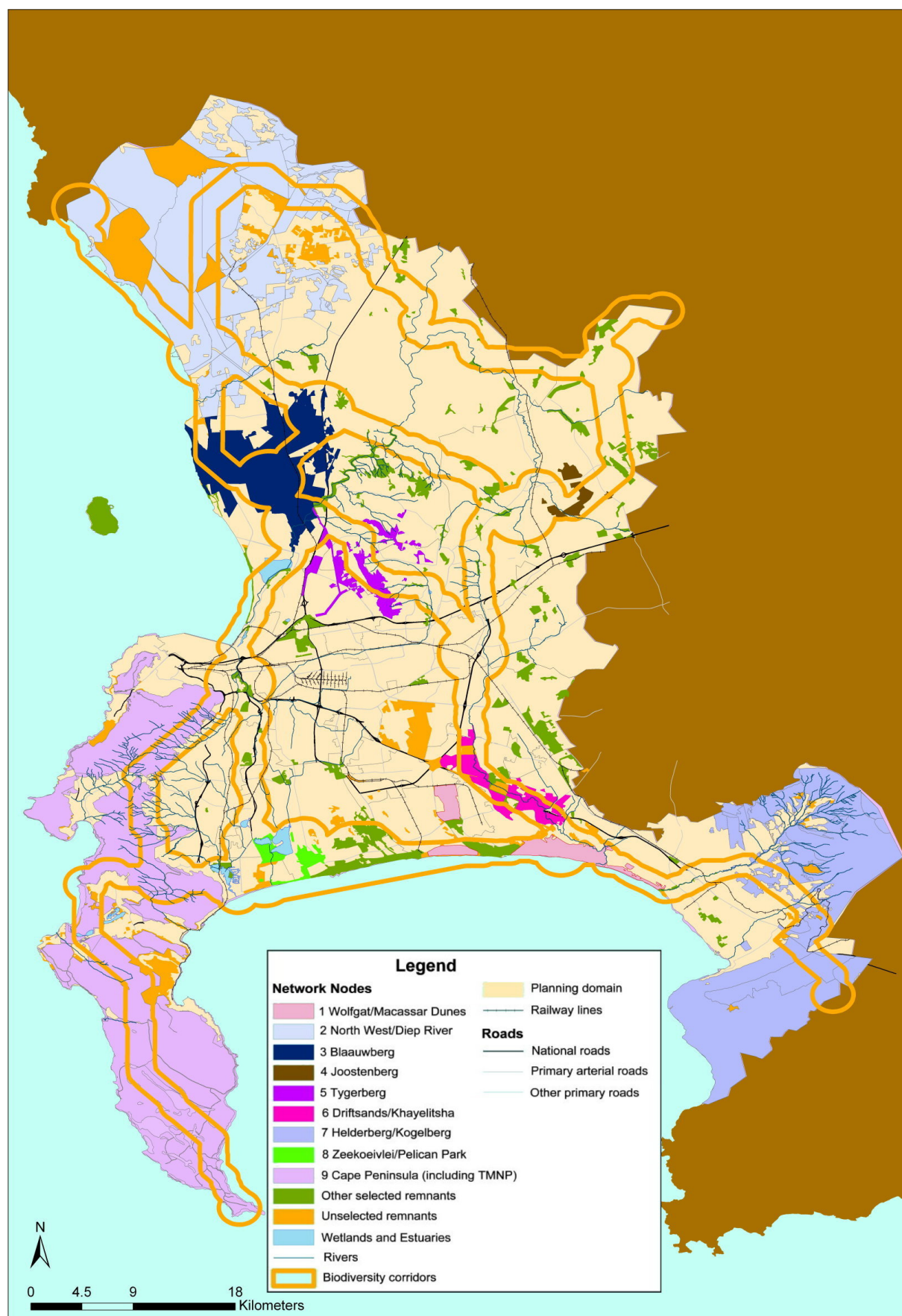


Figure 5: Selected biodiversity nodes and corridors

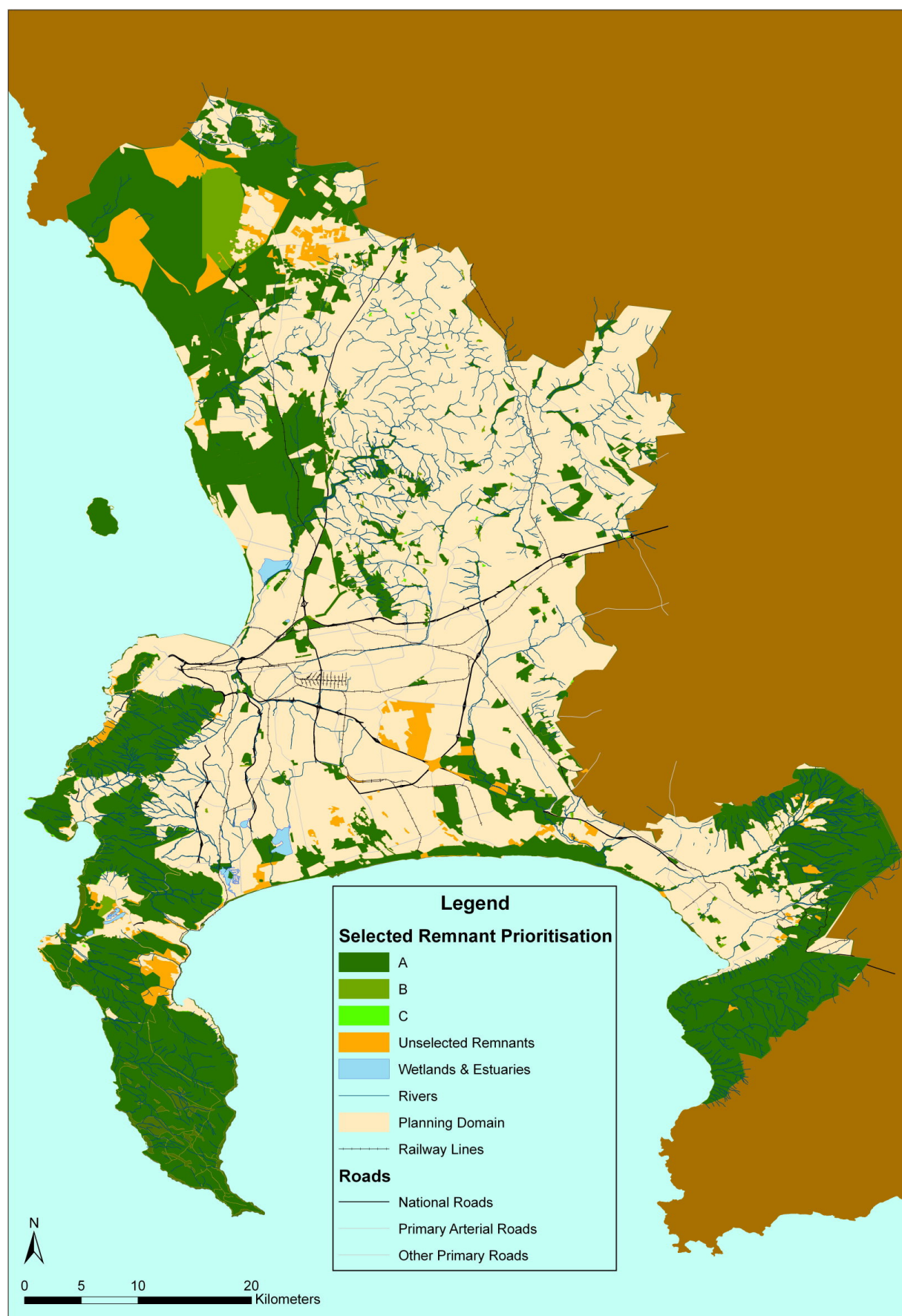


Figure 6: Prioritisation of remnants selected for the biodiversity network