



# Investing in ecological infrastructure to enhance water security in the uMngeni River catchment



environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA





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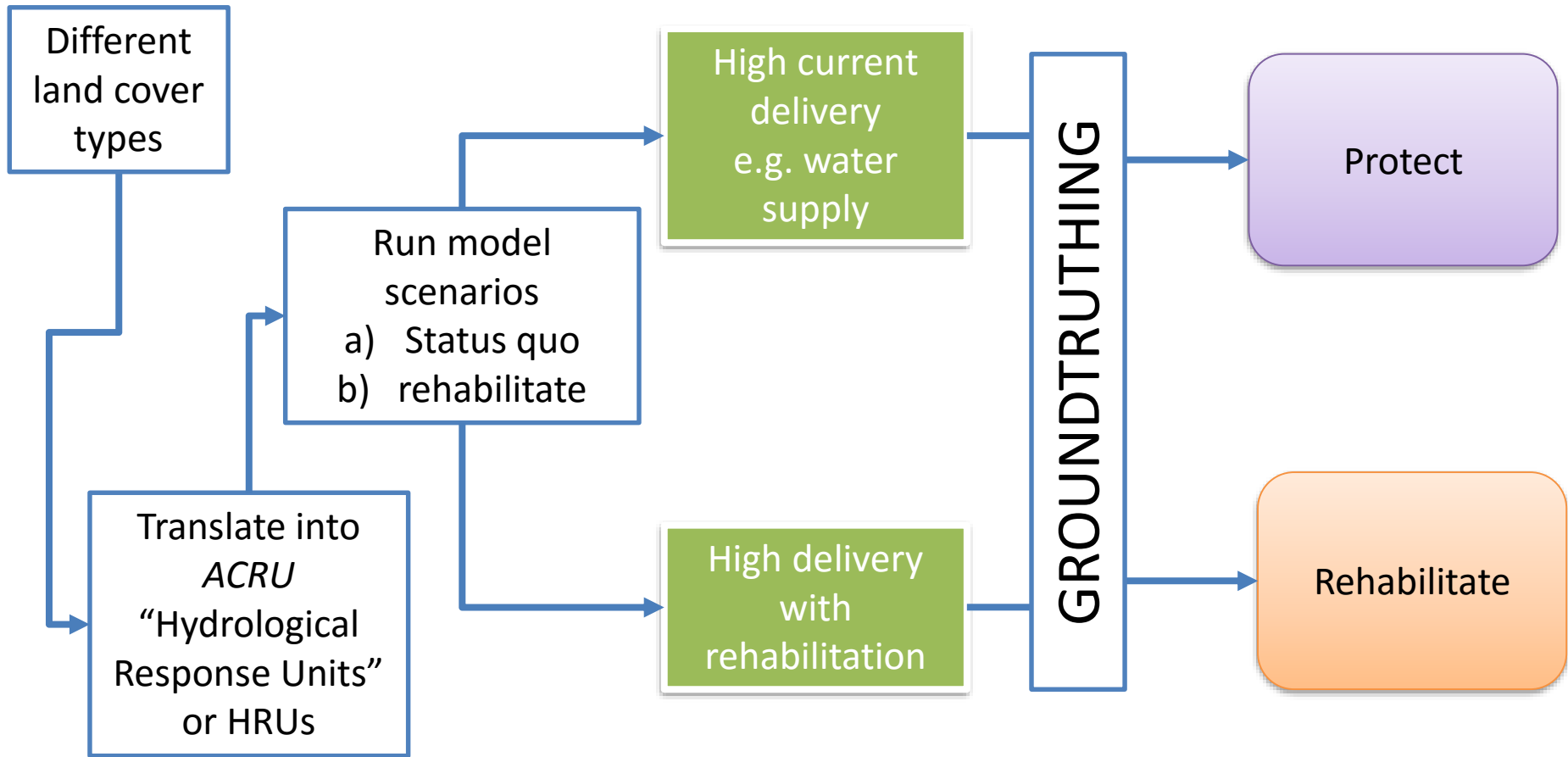
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**Duncan Hay, Catherine Pringle, Jon McCosh, and Ian Bredin**

# The project set out to...

1. map water-related ecological infrastructure;
2. determine its current condition;
3. identify priority ecological infrastructure;
4. identify best interventions to rehabilitate and maintain these priorities;
5. identify required governance, institutional and financial mechanisms;
6. determine monitoring needs; and
7. make policy recommendations.

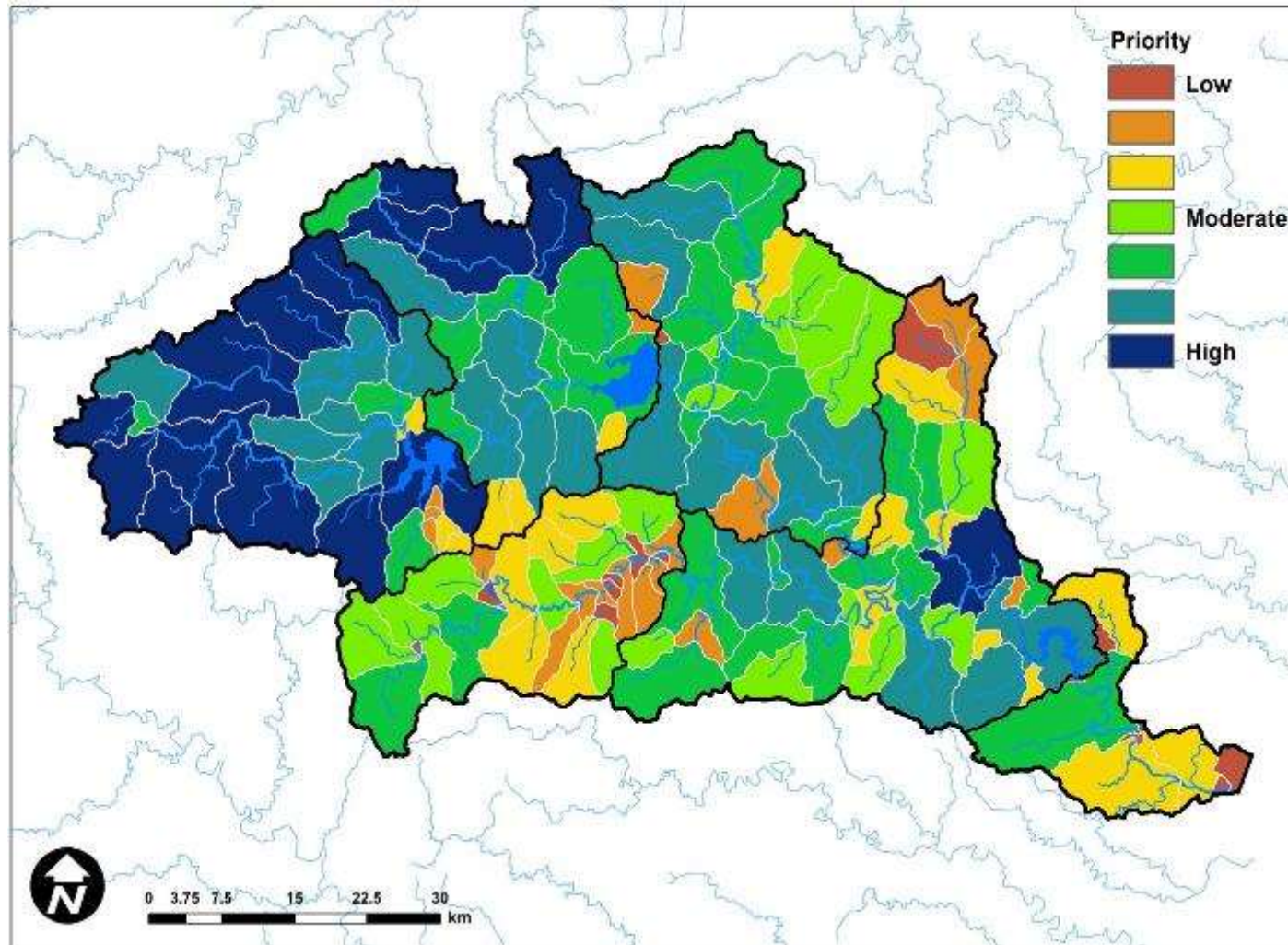


# Findings

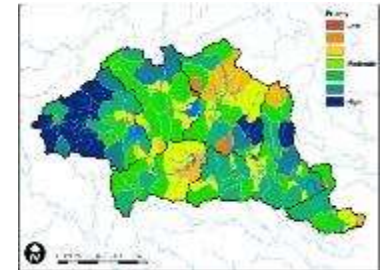
1. Per hectare, dry-season baseflow highest from areas of natural vegetation
2. Per hectare, surface runoff is higher from areas of degraded vegetation
3. Degraded and wattle-infested areas produce the highest sediment yield per hectare
4. Catchments with large, continuous areas of natural vegetation are a priority for maintaining intact ecological infrastructure



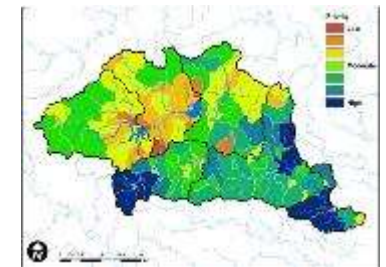
# Priority catchments to secure intact natural vegetation to maintain streamflow, dry-season baseflow and sediment retention



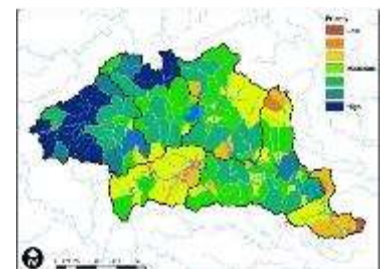
### Baseflow



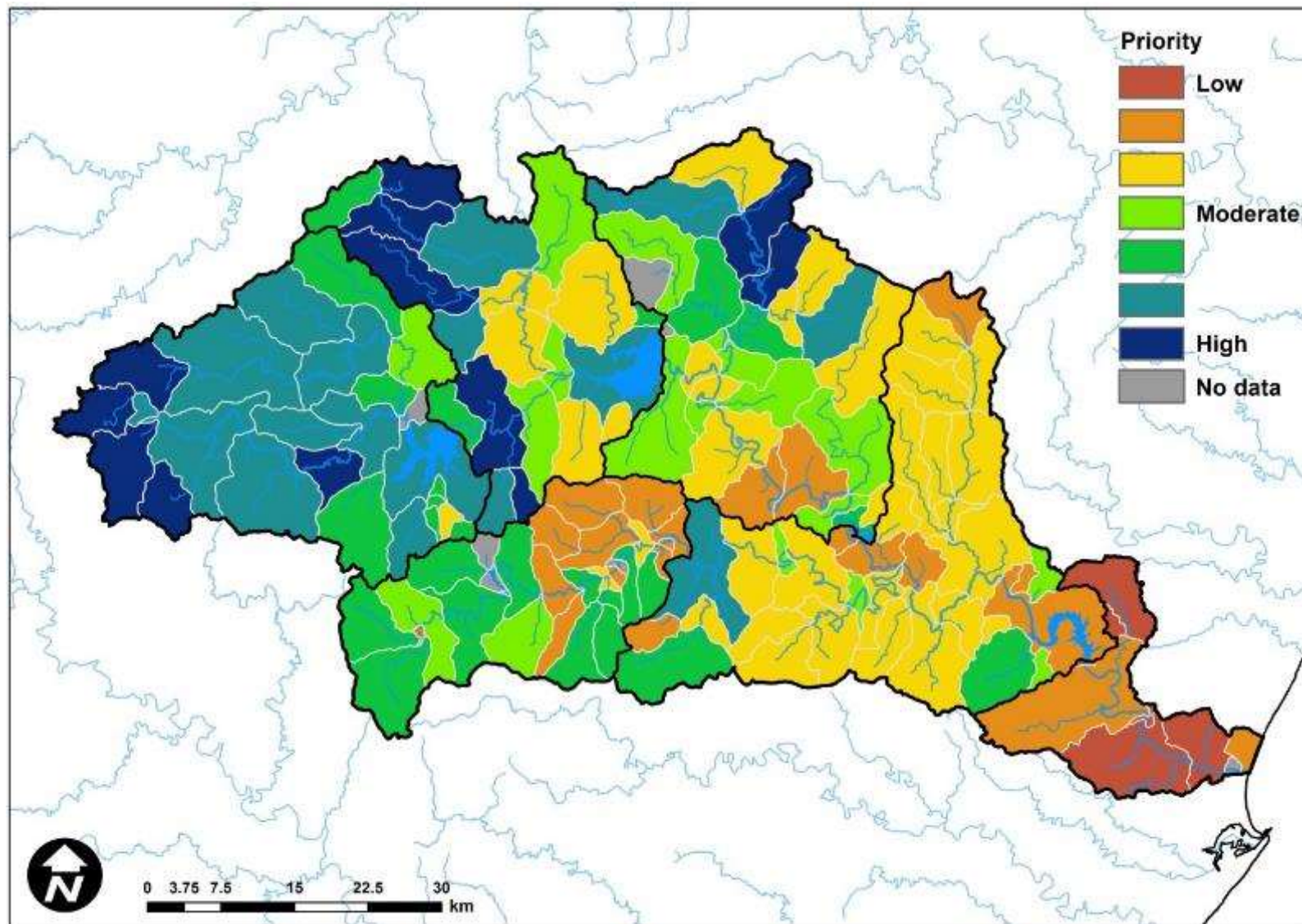
### Streamflow



### Sediment

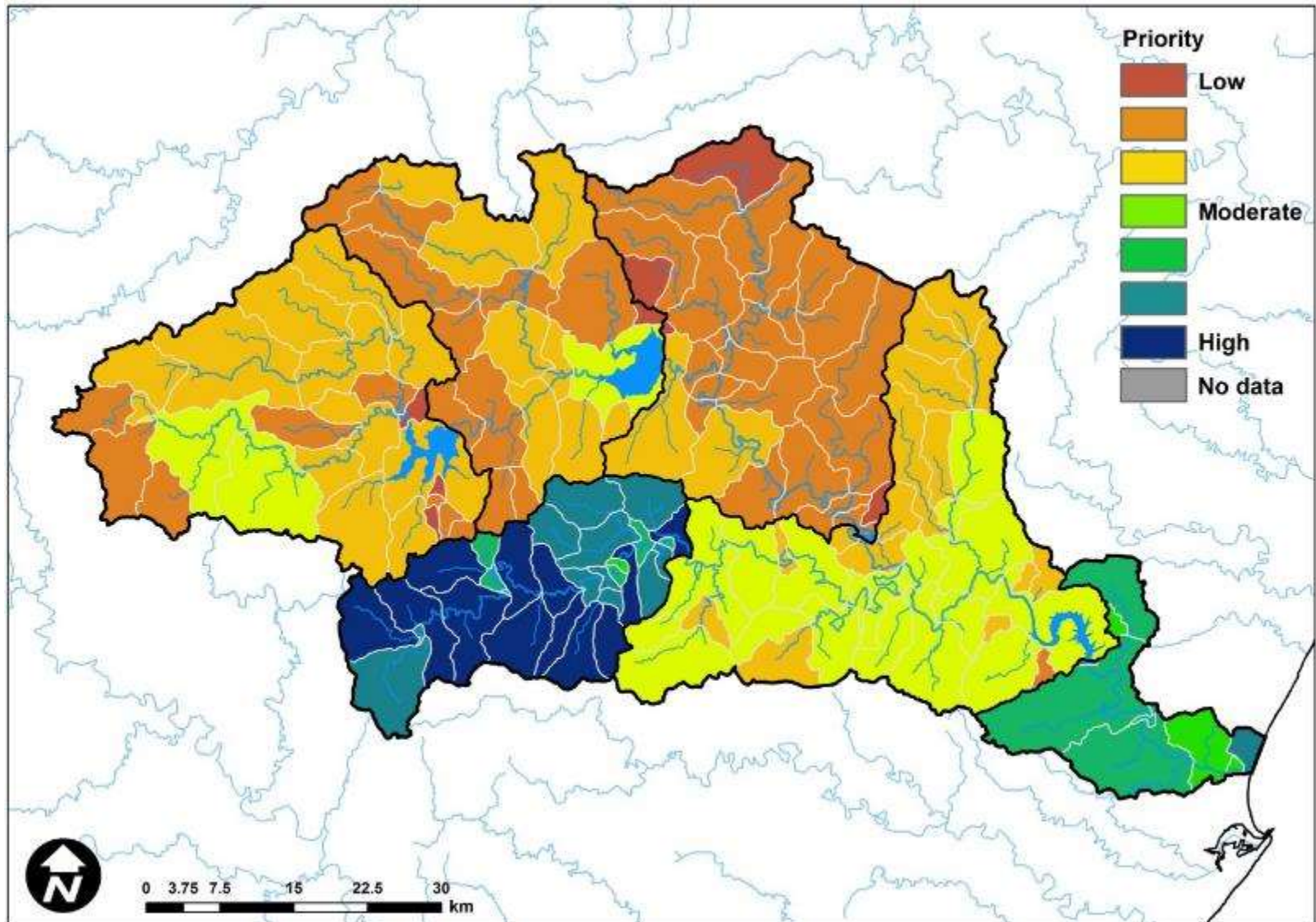


# Priority catchments to rehabilitate degraded natural vegetation and remove invasive alien wattle to maintain streamflow, dry-season baseflow and sediment retention





## Priority catchments to enhance flood attenuation and reduce flood risk





# The numbers

## Over 50 year period

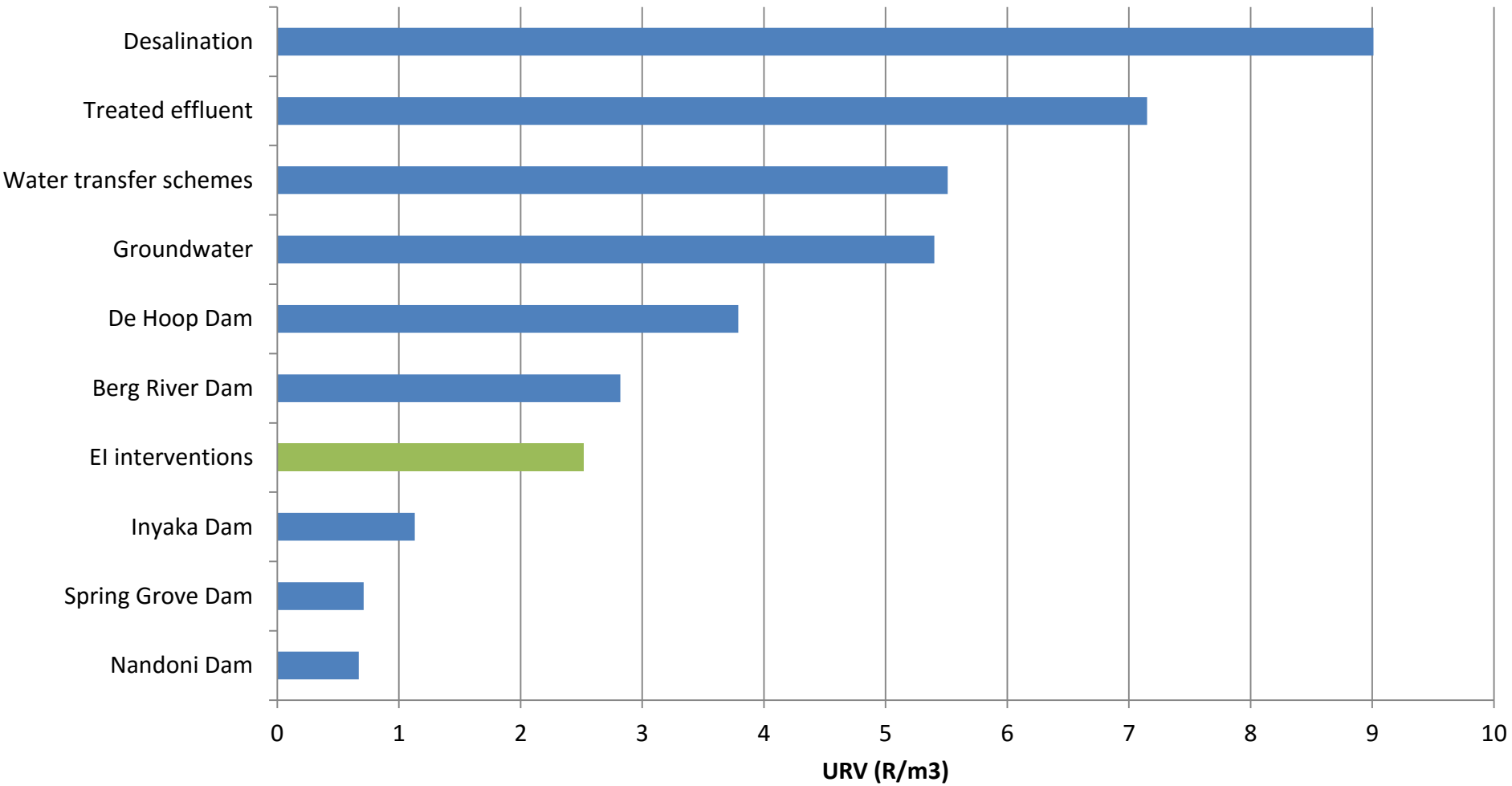
Net present value (in 2015 Rand) of identified rehabilitation and maintenance interventions	R268 million
Reduction in sediment loads	50,5 million tons
Increase in streamflow	359,4 million m <sup>3</sup>
Increased baseflow component	82,7 million m <sup>3</sup>

Unit Reference Value



**R2.52**

# Unit Reference Values for built and ecological infrastructure options for water resource management





# Products

Downloadable from [www.sagreenfund.org.za/wordpress/researchpolicy](http://www.sagreenfund.org.za/wordpress/researchpolicy)

## INVESTING IN ECOLOGICAL INFRASTRUCTURE TO ENHANCE WATER SECURITY IN THE UMNGENI RIVER CATCHMENT

FINAL REPORT

EDITED BY

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NOVEMBER 2015

RESEARCH AND POLICY DEVELOPMENT TO ADVANCE A GREEN ECONOMY IN SOUTH AFRICA

GREEN ECONOMY RESEARCH



## An Investment Plan for securing ecological infrastructure to enhance water security in the uMngeni River Catchment

Pringle, C., Bredin, L., McCosh, J., Jewitt, G., Hughes, C., de Winnaar, G., Mander, M., Blignaut, J., Zinckel, K., and J. Dini



**POLICY BRIEF 15**  
**GREEN ECONOMY POLICY BRIEF SERIES**  
**RESEARCH AND POLICY DEVELOPMENT TO ADVANCE A GREEN ECONOMY IN SOUTH AFRICA**  
DECEMBER 2015



### BENEFITS OF INVESTING IN ECOLOGICAL INFRASTRUCTURE TO ENHANCE WATER SECURITY IN THE UMNGENI RIVER CATCHMENT

#### KEY FINDINGS

- As the nature-based equivalents of built infrastructure, ecological infrastructure (EI) has the potential to supplement, sustain and, in some cases, substitute for built infrastructure solutions for water resource management.
- Choosing to utilize ecosystems to provide water-related services to people also generates a range of other benefits that extend beyond the water sector, such as contributing to food security, the creation of long-term green jobs, resilience to climate change and biodiversity conservation.
- Investing in EI in the uMngeni catchment is financially competitive, given the costs of other alternatives, the additional high value services generated and the unaffordable cost to society of allowing ecosystem degradation to continue.
- EI is particularly useful in providing water-related services to people who are not served by built infrastructure, and can assist in mitigating the impacts of droughts and floods in these areas.
- Water reconditioning strategies and large-scale built water infrastructure projects should incorporate EI options, such as grassland rehabilitation and removal of invasive alien plants.

#### INTRODUCTION

South Africa is a water-stressed country in which available surface water yields are approaching full utilization, security of supply is a growing concern and water quality is declining. Built infrastructure, such as dams, water treatment plants and inter-basin transfers, remains essential for addressing these challenges. However, there is also a growing recognition of the role of EI in supplementing, sustaining and, in some cases, substituting for built infrastructure solutions for water resource management. Defined as "naturally functioning ecosystems that produce and deliver valuable services to people", EI can be considered the nature-based equivalent of built infrastructure. Water-related services produced by EI include the supply of water, maintenance of river flows (or baseflow) and access to water during the dry-season, erosion control and trapping of sediment, water quality enhancement and flood attenuation.

#### WATER CHALLENGES IN THE UMNGENI RIVER CATCHMENT

The uMngeni River catchment (Figure 1) covers less than 5% of KwaZulu-Natal but supplies 42% of the province's population with water, including the major economic hub of Durban.

The catchment is no longer able to meet the demand for water. Substantial investments are being made, and more are planned, for built infrastructure to address this growing demand. At the same time, the extent of ongoing ecosystem degradation within the uMngeni catchment is also compromising the catchment's ability to deliver vital water services.



**Figure 1: Overview of the uMngeni River catchment.**

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