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IDEAS THAT WORK

8-9 October 2015 | CSIR ICC

**Two decades of fighting aliens:
exploring Working for Water successes**

Phumza Ntshotsho

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What is the problem?

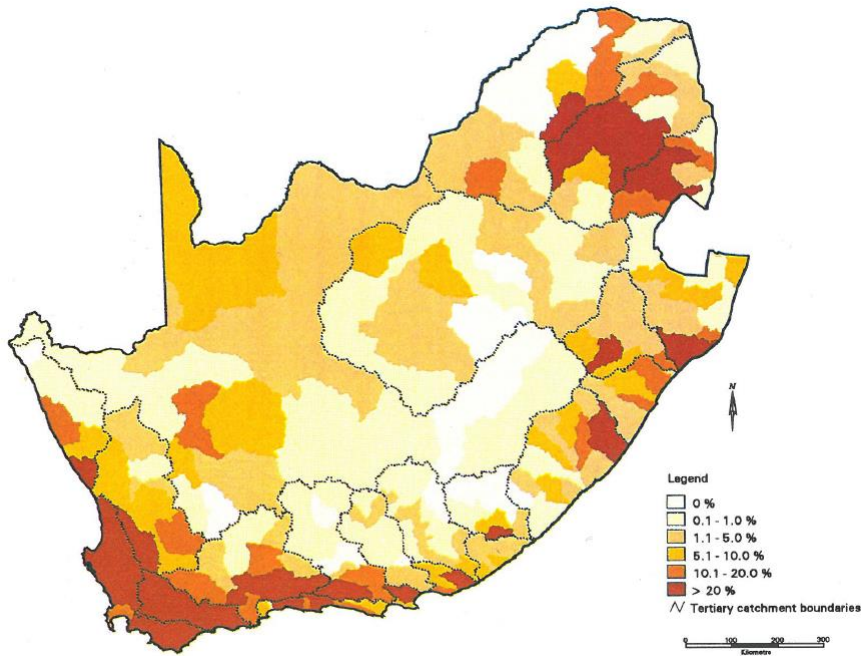
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Invasive alien plants

- Global problem
- Growing in severity and extent
- Over 8% of South Africa invaded

Why is it a problem?



- loss of land potential
- loss of biodiversity
- poisoning of humans and livestock
- increasing damage of wildfires
- increasing soil erosion following fires in heavily invaded areas
- siltation of dams
- **reduction in stream flow and available water**

How is it a problem?

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Working for Water

South African Journal of Science 100

Recent research on alien plants and their management in South Africa: the inaugural research symposium of the Working for Water programme

Ian A.W. Macdonald*

This paper reviews the 40 verbal presentations and 14 poster papers from the inaugural research symposium of the Working for Water programme, held at Kirstenbosch, Cape Town, in August 2003. Papers and posters were presented under six themes: hydrology [8 papers and posters], ecology (including the ecology of wetlands) [19], biological control [5], operations management [10], social development [6], and natural resource and development economics [6]. The research reported on is generally of a high standard and is highly relevant to the practical issues that managers of invasive alien plants face in South Africa. The biological control, hydrology, and ecology fields are particularly strong. Although already showing much promise, resource economics in this field is still in its infancy and requires further investment to realize its undoubted potential to help improve the management of invasive alien plants. Improved research is required on the operational management and social development aspects of research in this area. It is recommended that particular attention

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South Africa has a long history of concern about, research into and management of invasive alien plants. At the symposium, for example, we learned that in an area of commonage adjacent to the city of Grahamstown in the Eastern Cape province, concern

by analyzing natural experiments created by the widespread planting of a small number of species in different parts of the world. The species that cause the greatest problems are generally those that have been planted most widely and for the longest time. The most affected areas have the longest histories of intensive planting. Pinus spp. are especially problematic, and at least 19 species are invasive over large areas in the southern hemisphere, where some species cause major problems. The most invasive Pinus species have a predictable set of life-history attributes, including low seed mass, short juvenile period, and short interval between large seed crops. Pine invasions have severely impacted large areas of grassland and scrub-brushland in the southern hemisphere by causing shifts in life-form dominance, reduced structural diversity, increased biomass, disruption of prevailing vegetation dynamics, and changing nutrient cycling patterns. The (unavoidable) negative

Technical note

The impact of invading alien plants on surface water resources in South Africa: A preliminary assessment

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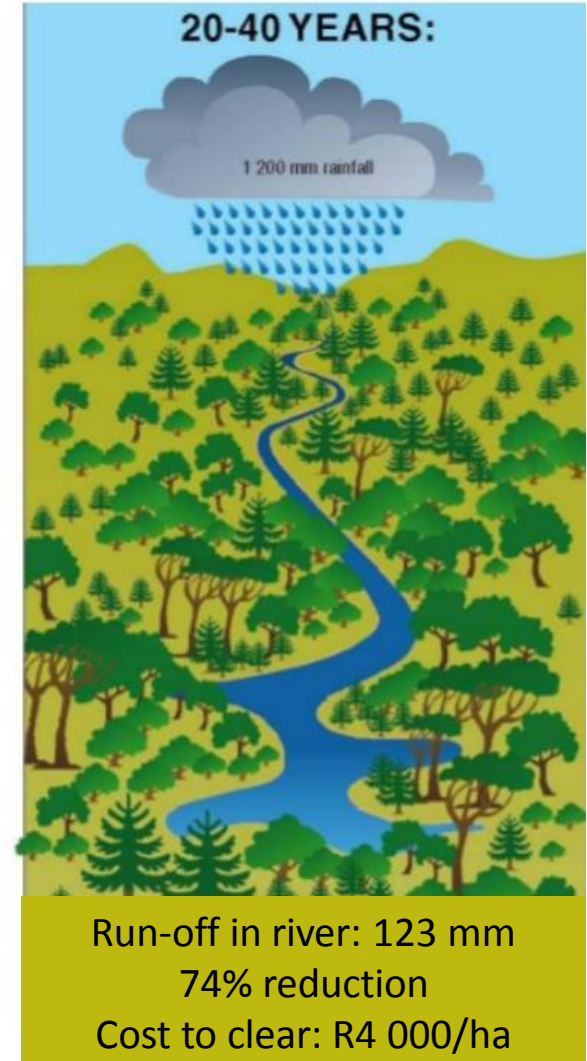
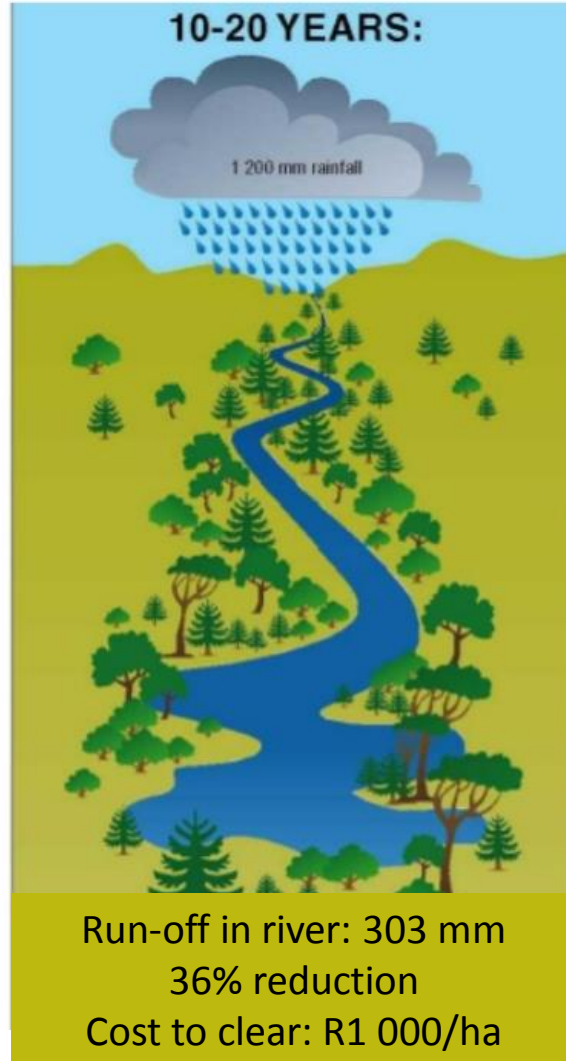
Abstract

The impacts of the widespread invasions by alien plants in South Africa are increasingly recognised. Most of the past concern has been about the impacts on conservation areas, other areas of natural vegetation, and on agricultural productivity. The potential impact of invading alien woody plants on water resources was known to be serious but there has been no information available to evaluate the significance of these water losses across the whole country. This paper reports on the results of a preliminary survey aimed at obtaining an overview of the extent, impacts and implications of alien plant invasions at a national and regional level for South Africa and Lesotho. Data on the extent and location of the invaded areas were obtained from a variety of sources including detailed field mapping, mainly at a 1:250 000 scale with some at 1:50 000 and 1:10 000, and generalised information on species and densities. The density class of each species in each polygon was mapped and used to derive the condensed areas (the equivalent area with a canopy cover of 100%). Each of the invading species was classified as a tall shrub, medium tree or tall tree - based on growth form and likely water use - and its biomass was estimated from a function based on vegetation age. The incremental water use (i.e. the additional water use compared with the natural vegetation) was calculated using the following equation: Water use (mm) = 0.0238 x biomass (g/m²) which was derived from catchment studies.

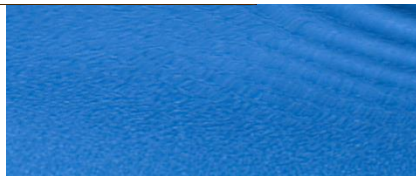
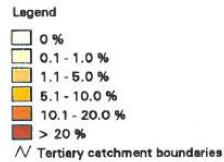
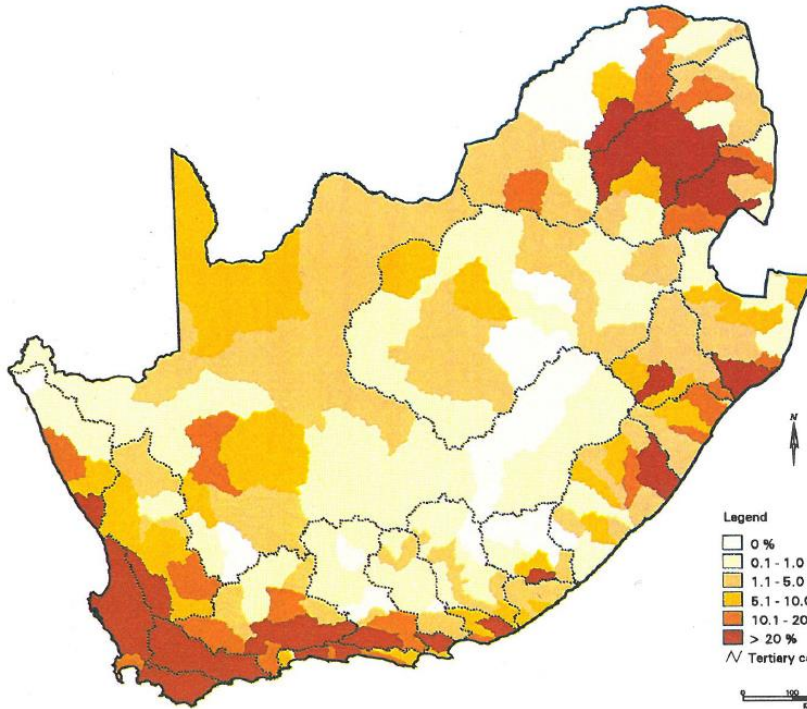
Alien plants, mainly trees and woody shrubs, have invaded an estimated 10.1 million ha of South Africa and Lesotho, an area larger than the province of KwaZulu-Natal. The equivalent condensed area is 1.7 million ha which is greater than the area of Gauteng Province. The Western Cape is the most heavily invaded at about a third of the total area, followed by Mpumalanga, KwaZulu-Natal and Northern Province. The catchments of the Berg and Breede Rivers are the most heavily invaded followed by the George-Tsitsikamma region, Port Elizabeth coastal region and the Drakensberg escarpment in Mpumalanga. The total incremental water use of invading alien plants is estimated at 3 300 million m³; of water per year, equivalent to about 75% of the virgin MAR of the Vaal River system. About a third of the estimated total water use, by volume, is accounted for by alien invaders in the Western Cape, followed by KwaZulu-Natal (17%), the Eastern Cape (17%) and Mpumalanga (14%). The greatest reduction, as a percentage of

major problems as
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A growing threat



A serious threat



rear)



Home-grown solution

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A few wise men and women

- Scientific insight
- Foresight
- Innovation
- Political buy-in

16 October 1995: WfW launched

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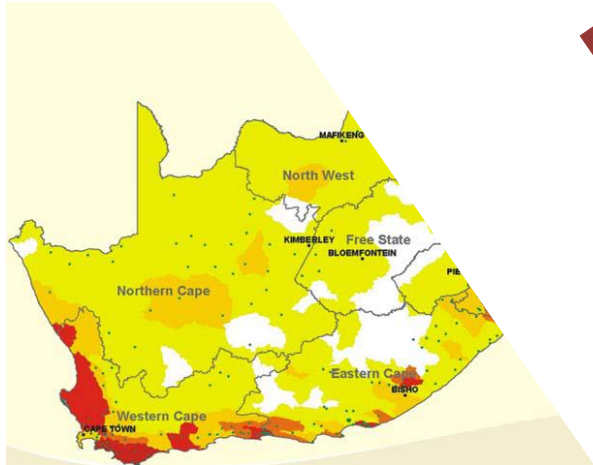
WfW goals

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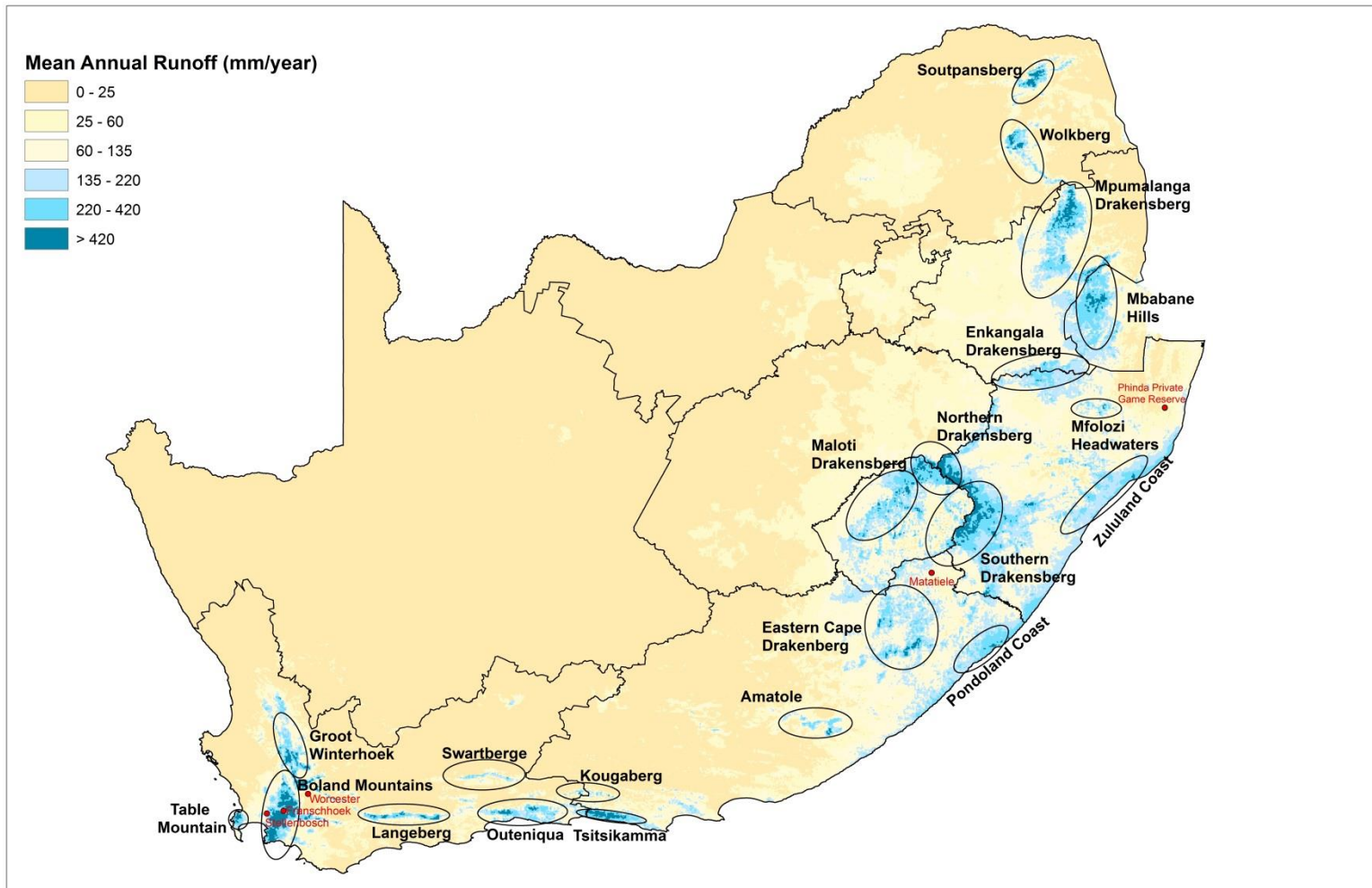
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Success stories

Model	Implementing agent	Herbicide assistance	Land user incentive
Case study	Berg River Dam	Phinda Private Game Reserve	Upper uMzimvubu
Extent of project (ha)	11 600	13 000	4 000
Project duration	2001-present	2001-present	2013-present
Major problem species	<i>Acacia spp.</i> ; <i>Eucalyptus spp.</i> ; <i>Pinus spp.</i>	<i>Chromolaena odorata</i> ; <i>Lantana camara</i>	<i>Acacia mearnsii</i>
Land ownership	State and private	Private	Communal
Biophysical benefits gained	Increase in water quality and quantity; biodiversity	Increase in tourism potential	Increase in grazing capacity; soil retention; reduce sedimentation downstream

Location



Berg River Dam

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Berg River Dam

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Berg River Dam

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Phinda Private Game Reserve

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Upper uMzimvubu Catchment

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Critical success factors

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1. *“If you fail to plan, you plan to fail”*

Critical success factors

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2. *“Where there is no commitment there is no success”*

Critical success factors

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3. *“Do it with passion or not at all”*

Time to reflect

- Critical to hold on to the gains
- Long-term sustainability
- Data management

The research team



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Thank you

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