Main University Host & SANBI Team Member: John Wilson
Location: Centre for Invasion Biology, Stellenbosch University
Level of project: Post-doc
Working title: Tree invasions in South Africa: understanding risks and managing incursions

Background

South Africa is both a global hotspot of tree invasions and a global leader in research on invasive trees and their management (see Chapters 1, 3, 21 among others and in van Wilgen et al. 2020). The post-doctoral position would look at a variety of study systems (pines and wattles in particular) linking data to action, i.e. they would work closely with managers tasked with alien plant clearing to develop best practices guidelines; and with those involved in developing regulations to ensure recommendations are taken up.

- Evaluating the risk of pine taxa to South Africa. At a basic level the project would focus on taxa listed under South African regulations and provide systematic evidence underpinning the listings (https://dx.doi.org/10.5281/zenodo.10809766; Kumschick et al. 2020). More broadly it would focus on the efficacy of current exemptions and prohibition in the regulations and evaluating whether and how using pines in South Africa can be compatible with preventing invasions (cf. Brundu et a. 2020).
- How has improved knowledge improved our decisions? The project would revisit classic analyses of tree invasions (e.g., Richardson et al. 2004, 2011) to evaluate the degree to which improved information on which taxa are invasive where affects the robustness of historical predictions.
- Various decision support models have been developed to understand the costs and benefits of eradicating alien species from South Africa (e.g., Moore et al. 2011). Building on over fifteen years of managing various species of wattle (*Acacia* sp.) with small, naturalised populations, the project would estimate the likelihood of achieving eradication, what resources would be required to do this, and how current efforts can be improved. The project will develop recommendations for how monitoring of control effect can better feed into planning, i.e. adaptive management.
- Evaluating and improving detection. A major gap identified in the latest national status report on biological invasions (Zengeya & Wilson, 2023) is that of measuring the effectiveness of management. The project would work closely with teams contracted to clear sites of plants to evaluate how much area is covered (using GPS technology to track where clearing teams have been) and at what intensity (using physical models as a test of ability to find plants). Various real case-study systems would be used, ensuring that such experiments would directly contribute to the goal of alien plant clearing.

Key contacts

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Further Reading

Brundu G, et al., Wilson JRU, Richardson DM (2020) Global guidelines for the sustainable use of non-native trees to prevent tree invasions and mitigate their negative impacts. NeoBiota 61: 65–116. http://dx.doi.org/10.3897/neobiota.65.58380

Kumschick S, Wilson JRU, Foxcroft LC (2020) A framework to support alien species regulation: the Risk Analysis for Alien Taxa (RAAT). NeoBiota 62: 213–239. http://dx.doi.org/10.3897/neobiota.62.51031

Moore JL, Runge MC, Webber BL, Wilson JRU (2011) Contain or eradicate? Optimizing the management goal for Australian acacia invasions in the face of uncertainty. Diversity and Distributions 17: 1047–1059. http://dx.doi.org/10.1111/j.1472-4642.2011.00809.x

Richardson DM et al. Wilson JRU (2011) Human-mediated introductions of Australian acacias – a global experiment in biogeography. Diversity and Distributions 17: 771–787. http://dx.doi.org/10.1111/j.1472-4642.2011.00824.x

Richardson DM, Rejmánek M (2004) Conifers as invasive aliens: a global survey and predictive framework. Diversity and Distributions 10: 321-331. http://dx.doi.org/

van Wilgen BW, Measey GJ, Richardson DM, Wilson JR, Zengeya T (2020) Biological invasions in South Africa. Springer, Berlin, 975 pp. http://dx.doi.org/10.1007/978-3-030-32394-3

Zengeya TA, Wilson JR (Eds) (2023) The status of biological invasions and their management in South Africa in 2022. South African National Biodiversity Institute, Kirstenbosch and DSI-NRF Centre of Excellence for Invasion Biology, Stellenbosch. 122 pp. http://dx.doi.org/10.5281/zenodo.8217182