SANBI Team Member: Tsungai Zengeya
Main University Supervisor: John Wilson (Centre for Invasion Biology at Stellenbosch University / SANBI), Andrew Turner (CapeNature)
Location: Stellenbosch University
Level of project: Masters / Doctoral
Working title: Getting the measure of invasions and their control

Background

South Africa spends significant amounts of money to control biological invasions (~ZAR1.5 billion per year, van Wilgen & Wilson, 2018), but data on the outcome of these interventions are lacking. A few case studies have explicitly explored the effectiveness of these control measures (e.g. Fill et al. 2017; Kraaiji eta l. 2017), and while the number of case studies is increasing, the data needed for effective monitoring is costly (Cheney et al. 2018). As part of the recent South African National Status Report on Biological Invasions, a number of indicators were developed to track invasion and the effectiveness of control measures over time (Wilson et al. 2018). The purpose of this project will be to use data from conservation agencies to assess how the level of invasions have changed over time, explore the value of rapid assessments of the extent of invasions and the effectiveness of control, and relate this to impacts, Specifically the project aims to:

- Look at historical data on levels of invasion, score these using the proposed indicators, and assess management effectiveness;
- Evaluate current monitoring on management effectiveness and develop protocols for its improvement;
- Explore how levels of invasions relate to impacts; and potentially
- Model how different management return intervals impact on success.

This project would suit a candidate interested in applied ecology with good skills in managing and analysing data, and an ability to think practically. In addition, a doctoral candidate would need to have experience/interest in using models to address conservation issues.

Contacts

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Further Reading

Cheney, C., Esler, K.J., Foxcroft, L.C., van Wilgen, N.J. & McGeoch, M.A. (2018) The impact of data precision on the effectiveness of alien plant control programmes: a case study from a protected area. *Biological Invasions,* **20,** 3227-3243.

Fill, J.M., Forsyth, G.G., Kritzinger-Klopper, S., Le Maitre, D.C. & van Wilgen, B.W. (2017) An assessment of the effectiveness of a long-term ecosystem restoration project in a fynbos shrubland catchment in South Africa. *Journal of Environmental Management,* **185,** 1-10.

Kraaij, T., Baard, J.A., Rikhotso, D.R., Cole, N.S. & van Wilgen, B.W. (2017) Assessing the effectiveness of invasive alien plant management in a large fynbos protected area. *African Biodiversity and Conservation: Bothalia,* **47,** a2105.

Wilson, J.R.U., Faulkner, K.T., Rahlao, S.J., Richardson, D.M., Zengeya, T.A. & van Wilgen, B.W. (2018) Indicators for monitoring biological invasions at a national level. *Journal of Applied Ecology,* **55,** 2612–2620.

van Wilgen, B.W., Fill, J.M., Baard, J., Cheney, C., Forsyth, A.T. & Kraaij, T. (2016) Historical costs and projected future scenarios for the management of invasive alien plants in protected areas in the Cape Floristic Region. *Biological Conservation,* **200,** 168-177.

van Wilgen, B.W. & Wilson, J.R. (Eds.) (2018) The status of biological invasions and their management in South Africa in 2017. pp. 398. South African National Biodiversity Institute, Kirstenbosch and DST-NRF Centre of Excellence for Invasion Biology, Stellenbosch. https://www.sanbi.org/wp-content/uploads/2018/11/National-Status-Report-web-6MB.pdf