

Main University Host & SANBI Team Member: Tsungai Zengeya

Location: Kirstenbosch Research Centre, Cape Town

Level of project: Post-doc

Working title: From biodiversity observations to national-level reports to action

Background

South Africa has set up a process of reporting on the state of biological invasions every three years (Zengeya & Wilson, 2023). A post-doctoral position is available to conduct research in support of the report, with specific topics identified as priorities, noting that additional research that will assist with producing the next status report will be strongly encouraged.

Biodiversity monitoring requires access to rapid, reliable, and repeatable monitoring data that can be used to inform policy, decision-making, and interventions. The status report is one of four case studies for the Biodiversity Building Blocks for Policy project (<https://b-cubed.eu/>). The overarching objective of the B-Cubed project is to develop pipelines to improve the integration of biodiversity data into data cubes that are then used as the basis for models and indicators to monitor biodiversity status and change. The data cubes, models and indicators developed under the B-Cubed project will feed into status report on biological invasions in South Africa and show the usefulness of the B-Cubed project from an end-user perspective (SANBI). The B-Cubed project will provide information on indicators that are used to monitor biological invasions and the information will help address three of the six identified key gaps in previous reports (Zengeya and Wilson 2023) on invasive alien species (alignment of indicators; mobilization of spatial data; mobilization of impact data); and assist the automation and standardization of the process and how reports are communicated (i.e., including workflows and dashboards). This project will focus on research that will assist address the gap in the status of alien species in South Africa. Potential research aspects include:

- Developing lists of taxa legally in the country. A major challenge facing decision-makers is to understand which alien species are legally in the country. Using a range of approaches from biodiversity informatics, the project would focus on collating information across taxonomic groups and in different environments to determine which alien species are present in the country; and ensuring there are robust data pipelines to ensure the link from observation to action is closed.
- Mobilisation of spatial data on the extent and abundance of alien species in the country. Data on the distribution and abundance of alien species need to be integrated into national and global databases to facilitate the planning of interventions. The project will aim to demonstrate how data cubes generated by the B-Cubed project meet the needs of South Africa and can link to current indicators (6, 7, 9, and 10 in Wilson et al. 2018). It will also be important to assess how data cubes can be applied at different scales (from local protected areas to neighbouring countries to SADC).
- Developing workflows to assess the introduction status of alien species in the country. To what degree are the taxon where they are alien in South Africa surviving, reproducing, and expanding (cf. Blackburn et al. 2011, Wilson et al. 2018, Groom et al. 2019). Previous reports have provided estimates that a least a third of alien species in South Africa are invasive (available at <https://iasreport.sanbi.org.za/>). There is a need to update these estimates and develop improved workflows to make sure the work is properly documented and repeatable.

Key contacts

Tsungai Zengeya T.Zengeya@sanbi.org.za

John Wilson jrwilson@sun.ac.za

Katelyn Faulkner K.Faulkner@sanbi.org.za

Further Reading

- Blackburn TM, Pyšek P, Bacher S, Carlton JT, Duncan RP, Jarošík V, Wilson JR, Richardson DM. 2011. A proposed unified framework for biological invasions. *Trends in Ecology & Evolution*, 26(7): 333-9. <http://dx.doi.org/10.1016/j.tree.2011.03.023>
- Groom Q, Desmet P, Reyserhove L, Adriaens T, Oldoni D, Vanderhoeven S, Baskauf SJ, Chapman A, McGeoch M, Walls R, Wicczorek J, Wilson JR, Zermoglio PFF, Simpson A (2019). Improving Darwin Core for research and management of alien species. *Biodiversity Information Science and Standards* 3: e38084. <http://dx.doi.org/10.3897/biss.3.38084>
- Wilson JR, Faulkner KT, Rahlao SJ, Richardson DM, Zengeya TA, van Wilgen BW (2018) Indicators for monitoring biological invasions at a national level. *Journal of Applied Ecology* 55: 2612–2620. <http://dx.doi.org/10.1111/1365-2664.13251>
- 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>