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**University Supervisor:** tbc

**Location:** Free State (either University of Free State or Central University of Technology )

**Level of project:** Masters

**Working title:** Detection and risk analysis of the most common unlisted alien cacti in South Africa

## Background

Many alien plant species have been introduced around the world, both accidentally and intentionally for agriculture, forestry, and ornamental purposes (Mack, 2003). Subsequently, many of these alien species have naturalised and some have become invasive in South Africa (Blackburn et al., 2011). South Africa has legislation and policy dedicated to the management of biological invasions—the National Environmental Management: Biodiversity Act (NEM:BA, Act 10 of 2004) and its Alien and Invasive Species Regulations (Department of Environmental Affairs, 2014). To guide the listing of species under these regulations, South Africa has developed and developed and started implementing a risk analysis framework (Kumschick et al. 2020).

It has been predicted that cacti species are likely to invade most parts of the world (Masocha and Dube, 2018), and thus alien species detection and analysis of risk posed by different cacti species in South Africa are important. Invasion of natural ecosystems and grazing lands by the Cactaceae family threatens native biodiversity and reduces economic achievements (Guareschi and Wood, 2021). For example, at the peak of its invasion in Australia in the 1930s, *Opuntia stricta* (sour prickly pear) infested 24 million ha of farming and grazing lands, causing land desertion and affecting rural development (Freeman, 1992). In parts of Eastern Africa, valuable grazing land has been invaded by *O. stricta* causing ill-health and death of livestock with economic losses of US\$ 500–1000 per household per year for 48% of households (Shackleton et al., 2017). Mokotjomela et al. (2022) have also recently reported a general predominance of cacti species in transformed arid areas such as dump sites.

The project aims to: a) detect and analyse the records of unlisted cacti species from iNaturalist and the Southern African Plant Invaders Atlas (SAPIA); b) validate the occurrence records and describe the populations of unlisted cacti species; c) conduct risk analyses for the 3–4 most prominent unlisted cacti species; and d) develop species-specific management plans for selected cacti species.

## Contacts

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## Further Reading

Freeman, D.B. (1992) Prickly pear menace in eastern Australia 1880-1940. *Geographical Review*, pp.413-429.

Guareschi, S. and Wood, P. (2021) Biological invasions of river ecosystems: A flow of implications, challenges, and research opportunities.

Kaplan H, Wilson JRU, Klein H, Henderson L, Zimmermann HG, Manyama P, Ivey P, Richardson DM, Novoa A (2017) A proposed national strategic framework for the management of Cactaceae in South Africa. *Bothalia: African Biodiversity and Conservation* 47: a2149. doi:10.4102/abc.v47i2.2149

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. <https://dx.doi.org/10.3897/neobiota.62.51031>

Masocha, M. and Dube, T. (2018) Global terrestrial biomes at risk of cacti invasion identified for four species using consensual modelling. *Journal of Arid Environments*, 156, pp.77-86.

Mokotjomela, T.M., Nemurangoni, T., Mundalamo, T., Jaca, T.P. and Kuhudzai, A.G. (2022) The value of dump sites for monitoring biological invasions in South Africa. *Biological Invasions*, 24(4), pp.971-986.

Novoa A, Brundu G, Day MD, et al., Wilson JRU (2019) Global actions for managing cactus invasions. *Plants* 8: 27. doi:10.3390/plants8100421

Shackleton, R.T., Witt, A.B., Piroris, F.M. and van Wilgen, B.W. (2017) Distribution and socio-ecological impacts of the invasive alien cactus *Opuntia stricta* in eastern Africa. *Biological Invasions*, 19(8), pp.2427-2441.