

Invasive plants have a much bigger impact than we imagine

By [Susana Clusella-Trullas](#) and [Raquel A Garcia](#)

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Most people would agree that [invasive plants](#) are unwanted. Invasive plants are plants that are intentionally or accidentally introduced by humans into areas outside of their natural habitat. These species can spread rapidly with negative consequences for native species.



Invasive pine trees in the Western Cape have affected lizards causing their numbers to drop significantly. Author supplied

Invasive plant species have an impact on the diversity of local species, they affect water availability and damage the quality of soil nutrients. Once an alien plant has invaded a habitat, it changes the conditions of that environment. It does so by changing the light, solar radiation and temperature levels in the invaded patches. The quality and availability of food, shelter, nest sites, basking sites and perches are changed for a number of animals.

They can also inflict big changes on native vegetation, altering the frequency of fires, nutrient cycling, water availability and soil erosion. For example, pine trees in the Western Cape Province of South Africa [have spread beyond forestry plantations and invaded](#) native fynbos habitat. In these invaded landscapes, the temperatures available to lizards for functioning optimally are generally cooler and the number of lizard species greatly reduced.

In a few cases, some benefits of alien plants have been reported. For example, they can provide fire wood for local communities or add resources for animal species. But these benefits typically do not surpass the negative effects. Invasive plants have an impact on native species through complex interactions and processes. Unless these factors are properly understood, it is difficult to predict what sort of impact invasive plants will have.

How much is known about these processes in South African habitats, where invasive alien plants are a key concern? To find the answer, we read all the studies on the impact of alien plant on animals that we could find from South Africa and presented these findings in [a recent study](#). We focused on ectothermic animals (reptiles, amphibians and invertebrates), known as “cold blooded”. They [require heat exchange](#) from the environment to function, grow and reproduce. These animals typically move smaller distances than mammals or birds, which increase their vulnerability to alien plant invasions.

A South African perspective

Habitats that have invasive plants in South Africa have a poorer diversity of animal species than whole native habitats. There are multiple reasons for this poorer animal diversity, like reduced availability of food resources or thermal conditions that are essential for animal survival. These effects can also occur in tandem or accumulate in time and space. This echoes similar findings in other regions [of the world](#). There are however many gaps.

Existing studies focus on a few areas of South Africa and look at a small number of alien plants including Acacia, Hakea and Pinus species. Most studies examine the impact of alien plants on invertebrates, especially insects, but we have little data of how they impact reptiles and amphibians. South Africa is unique in its numbers of endemic [tortoises](#), lizards, [snakes](#) and [amphibians](#). But there are not many [studies](#) that address these species.

A nice example of how alien plants impact native animals comes from a [study](#) in Lake St. Lucia, on the eastern part of South Africa. Alien vegetation has shaded Nile crocodile nests. Since being invaded, nests are much cooler than normal sunny nests which female crocodiles prefer. Temperature dictates the sex of embryos in reptiles, so this finding implies that development of eggs under these conditions will result in more females. These nest temperature changes could therefore affect the population's demographics in the long-term and alter higher levels of organisation, like communities and species. So, invasive plant species might affect the environment in more ways than we can imagine.

The Nile crocodile study and [a few other studies](#) in South Africa are the exception rather than the rule. Most attention to date has gone into comparing numbers of species or individuals between native and invaded areas rather than investigating how these changes take place. Most authors report about the potential impact invasive plants have but very few actually test potential causes of these impacts.

This gap is possibly because of the difficulty to experimentally test the ways these impacts develop or record data in the long-term. For example, monitoring and collecting data on native species in the long run would enable comparing processes before and after an alien plant invasion has taken place.

Where to now?

Without understanding what causes the potential impact these aliens plants can have, we cannot project the impact of introduced alien species into new regions or into the future. Management practices need to be shaped by the knowledge of these causes. [Scientists and citizens](#) can keep a fairly good record of newly introduced invasive plant species and the spread of established ones.

It becomes a huge challenge to keep comprehensive records of the ways alien plants affect local plants and animals. This difficulty is mostly because [these processes](#) are often multiple and can change across time and geographic regions.

So, we face a challenge to capture these processes. But in an era of [big data](#), [data sharing](#), cross-country collaborations and [public participation](#), it is a task that can be handled.

This article is the fifth in a [series](#) The Conversation Africa is running on invasive species.

ABOUT THE AUTHOR

Susana Clusella-Trullas is a physiological ecologist at the CIB, Stellenbosch University. Raquel A Garcia is a postdoctoral fellow at the CIB, Stellenbosch University.