

New tool to help fight war against **ALIEN INVADERS**

Three organisations have teamed up to curb the spread of alien invasive plants in the Kruger National Park.

Article by Rob Taylor and Dr Dave Thompson.

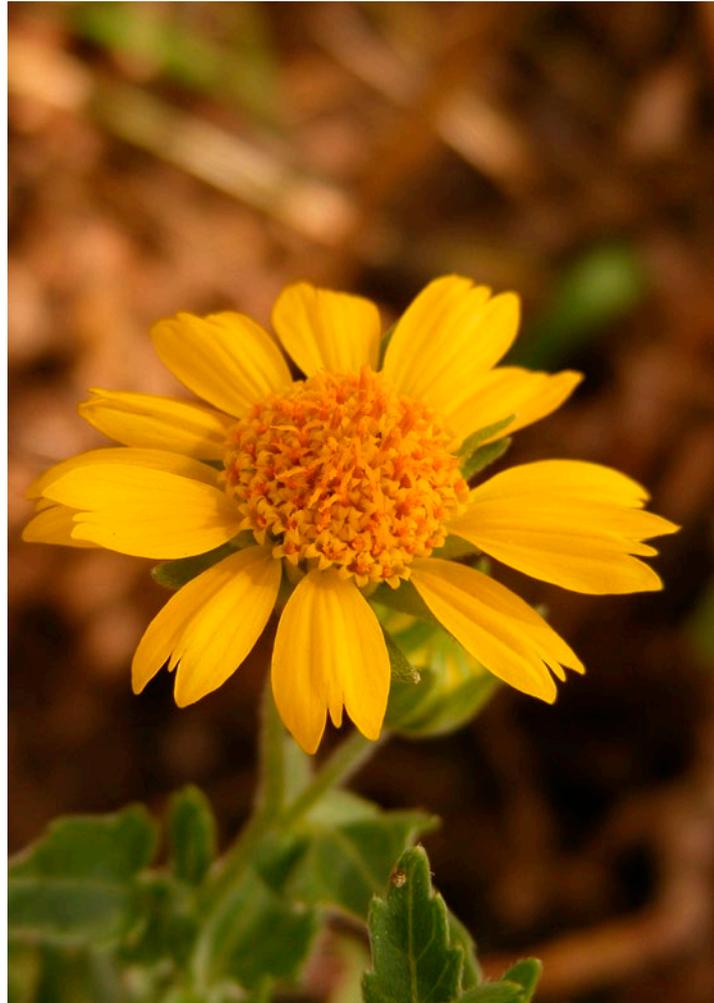
Invasion biology has become a hugely important scientific field worldwide as invasive species increasingly threaten to decrease biodiversity and modify ecosystems. The same is true in South Africa, where plants establishing outside of their natural distribution ranges represent one of the major threats to ecosystems and their functions.

For these reasons, the South African Environmental Observation Network (SAEON) considers alien organisms – both plant and animal – to be among the most important agents of anthropogenic change.

Areas dedicated to the protection and conservation of natural ecosystems and biodiversity, such as the Kruger National Park, are particularly threatened by alien plants which establish along watercourses, ‘escape’ into the protected area from adjacent gardens and are inadvertently introduced through road hardening. It is therefore imperative that more be done to recognise and prevent the spread of alien plants in this, and other national parks.

SAEON’s Ndlovu Node is collaborating with members of South African National Parks Scientific Services and the French Centre for International Cooperation in Agronomic Research for Development (CIRAD) in compiling a database of the 400 plus alien plant species – from notorious Category 1 invaders to ornamentals currently restricted to gardens – which are known to occur in the Kruger National Park. The outcomes of this collaboration will be detailed

“This ‘one-stop’ product will assist managers, conservationists, and technical crews in Kruger and beyond, to identify alien plants and will suggest appropriate methods for eradication *in situ*.”



Just five of the estimated 400 alien invasive plant species that have been identified in the Kruger National Park.

descriptions of as many of these alien plants (including their invasiveness, habitat, origin, vernacular names and documented control methods) as is possible, supported by clear photographs and illustrations of various diagnostic plant features.

INTERACTIVE IDENTIFICATION TOOL

Unique to this project will be the Phase 2 development of an interactive identification tool from the 400-odd species accounts. The tool technology (a multimedia approach to computer-aided identification) was developed by members of the CIRAD team and uses an identikit to reconstitute species identity. This process has already been used to produce similar resources for the weeds of the Indian Ocean islands and for other places such as Central Africa, Laos, Cambodia and New Caledonia.

The so-called Pl@nt-Inv Kruger collaboration is a further refinement and validation of this technology. Ultimately, the simple platform produced will guide users towards identifying an unknown alien plant through a series of step-wise choices and simple schematics concerning morphological, habit and habitat characteristics. Final identification is based on the similarity (expressed as a ranked percentage probability) of the unknown specimen to so-called 'type' specimen information database during Phase 1 of the project. Pictures and text can then be accessed to confirm the identity of the plant.

OPEN SOURCE AND USER FRIENDLY

In keeping with the mandates of SAEON, the Kruger National Park and CIRAD, the interactive identification tool-associated software and 'raw' database will be open source and freely available online



All photographs by Rob Taylor



Above: SAEON Technician Thembi Marshall examines an *Argemone mexicana* (Yellow-flowered Mexican poppy) flowering on the banks of the Letaba River. Several plant characteristics as well as the abundance and location are recorded for each species.

Below: A cleanly pressed *Senna pendula* (Easter cassia) specimen and herbarium information sheet. The project's specimen collection will be housed at Skukuza herbarium in the Kruger National Park.



All photographs credit: Rob Taylor

to all interested parties and potential users. It is also planned for the application to be compatible with a range of mobile electronic storage devices, such as smart phones, PDAs and tablets, thus allowing for easy and convenient use under field conditions.

Furthermore, it will be linked to a Web-based collaborative platform where people can share information, knowledge and questions on invasive plants. This 'one-stop' product will assist managers, conservationists, and technical crews in Kruger and beyond, to identify alien plants and will suggest appropriate methods for eradication *in situ*.

ALIEN CONTROL IN OTHER VULNERABLE SYSTEMS

The Pl@nt-Inv Kruger project has the capacity to educate people on the ground regarding the full range of alien plants found in the savannas of north-eastern South Africa as well as stressing the very severe threat posed by these invaders. As a validation of a valuable technology, this collaboration will

Below: An infestation of *Datura innoxia* (Downy thornapple) hand-pulled on the southern bank of the Limpopo River in northern Kruger National Park. An identification tool for this species and advice on its recommended method of eradication will be supported by the Pl@nt-Inv Kruger project.



pave the way for similar alien awareness and control initiatives in other vulnerable systems (many of which are of interest to SAEON, such as grasslands and fynbos) and also in a range of sectors outside of conservation. The reference specimens of all the alien plant species included in the project database will be located in the Skukuza Biological Collection in the Kruger National Park.

Currently Phase 1 of the Pl@nt-Inv Kruger project, which is scheduled to last for 18 months, is underway at the SAEON Ndlovu Node. Two dedicated project technicians, Rob Taylor and Thembi Marshall, are being kept busy collecting reference specimens and photographs during field trips into the Kruger, and populating a database with the relevant supporting information sourced from printed and electronic sources.

In addition, these collecting trips – which include time spent in heavily impacted tourist camps and staff villages, along major rivers, and also in some wilderness areas – have extended the known distribution of specific alien plant species within the Kruger National Park and, in several cases, have turned up alien species previously not recorded in the park.

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