Poster presentation

PL@NTINVASIVE-KRUGER: COMPUTER-BASED IDENTIFICATION AND INFORMATION TOOLS TO MANAGE ALIEN INVASIVE SPECIES IN THE KRUGER NATIONAL PARK, SOUTH AFRICA

Thomas Le Bourgeois[1], Llewellyn C. Foxcroft[2,3], Dave I. Thompson[4,5], Anne Guezou[1], Pierre Grard[6], Robert W. Taylor[4], Thembisile Marshall[4], Alain Carrara[1]

[1]Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), TA A/51 PS2, Bv de la Lironde, 34398 Montpellier cedex 5 France;
[2]Conservation Services, South African National Parks, Private Bag X402, Skukuza 1350, South Africa;
[3]Centre for Invasion Biology, Department of Botany and Zoology, Stellenbosch University, Matieland 7602, South Africa;
[4]South African Environmental Observation Network, Ndlovu Node, Private Bag X1021, Phalaborwa 1390, South Africa;
[5]School of Life Sciences, University of KwaZulu-Natal Pietermaritzburg, Private Bag X01, Scottsville 3209, South Africa;
[6] French Institute of Pondicherry, 11, St.Louis Street, PO Box 33, Pondicherry 605001, India

Introduction

Invasive plant species are a major threat to the biodiversity of protected areas and South Africa's Kruger National Park (KNP), which covers some 20 000 km^2, is no exception. Landscape and habitat diversity and a river network that drains highly invaded catchments outside the park make KNP highly susceptible to alien plant invasions. Efficient control of the threat requires early detection of introduced species, effective methods of eradication, and dissemination of current data to increase awareness. A collaborative project was initiated to provide a platform and a range of tools to support these actions.

Methods

Pl@ntInvasive-Kruger aimed to develop a suite of science-based, computer-driven tools for use by KNP managers, researchers and teams involved in alien plant control. Three applications were developed, each of which is supported by a global, multi-user database:

i. The *PUBLISH* tool returns synthesised species information;
ii. *IDAO*, which utilises computer-aided plant identification ; and
iii. *IDENTIFY*, an image recognition system.

Results & Discussion

The online *DataManager* database allows data management by members for field surveys and facilitates collections management and the automated synthesis of species information. These syntheses are available as HTML pages through the *PUBLISH* tool, which detail descriptions and imagery of both invasive and contained alien plants, and includes information on ecology, biology and management. These data support the two identification tools.

PlantInvKruger-IDAO constructs unknown species in a step-wise manner from prominent characteristics selected by the user from schematic multiple-choice menus. The *IDAO* application is compatible with a range of mobile electronic devices. *PlantInvKruger-IDENTIFY* assists, through image recognition algorithms, with the specific identification of images of plants and plant parts submitted to the database through a web interface. In both cases the suggested identification is expressed as the similarity of the unknown specimen to the type specimen information housed in the database and can be confirmed by accessing the species HTML pages.

All tools are used from a collaborative web platform (*Pl@ntNet*) where members can also share information and documents and manage discussions (http://community.plantnet-project.org/pg/groups/561/plntinvasivekruger/).

Conclusions

Correct identification is an essential aspect of alien plant control programs, but is difficult and time consuming where large numbers of alien and indigenous species occur. The *Pl@ntInvasive-Kruger* database currently contains information on almost 400 alien plant species, with the identification tools focussing on the 113 most important species. By assisting with the identification of invasive plant species and facilitating the sharing of information between interested parties, *Pl@ntInvasive-Kruger* will promote biodiversity conservation in KNP. This project is a case study of the Pl@ntNet project funded by Agropolis Fondation. It is currently in the final testing and refinement stage, with evaluations being conducted with end users.

Keywords

Protected area, biodiversity conservation, global database, information synthesis, IDAO, image recognition, data sharing, HTML

Reference

Thomas Le Bourgeois, Pierre Grard, Llewellyn C. Foxcroft, Dave I. Thompson, Alain Carrara, Anne Guezou, Robert W. Taylor, Thembisile Marshall. 2013. Pl@ntInvasive-Kruger V.1.0: Alien plants of the Kruger National Park, South Africa. Cirad-SANParks-SAEON ed., CD-ROM, Montpellier, France, Skukuza, South Africa.