DST-NRF Centre of Excellence for Invasion Biology

hosted by Stellenbosch University, South Africa

PROFILE

2013

C·I·B
DST-NRF Centre of Excellence for Invasion Biology

UNIVERSITEIT STELLENBOSCH UNIVERSITY

1. Overview

The C·I·B is an inter-institutional Centre of Excellence established within the DST-NRF Centres of Excellence Programme, and co-funded principally by the South African Department of Science and Technology, through the National Research Foundation, and Stellenbosch University. The C·I·B was established in 2004 with the mandate to conduct research and training in biodiversity science especially as it applies to understanding the rates, impacts and management of biological invasions.

> **Vision:** The raison d'être of the C·I·B is to provide the scientific understanding required to reduce the rate and impacts of biological invasions in a manner that will improve the quality of life of all South Africans during times of change.

The mission of the C·I·B is to:

- Undertake research and education in biodiversity and ecosystem functioning, including investigations of the changes in biological diversity that are a consequence of biological invasions, the consequences for ecosystem functioning and of these invasions and their remediation, and the longer-term effects of invasions on ecosystem services during global environmental change;
- Remain at the forefront of research regarding biological invasions, biodiversity and ecosystem functioning by pursuing research excellence, inter-disciplinarity, and by encouraging local, regional and international exchanges;
- Enhance its national and international societal relevance by means of: 1. a coordinated programme of innovative research, the products of which will be broadly disseminated in the international literature; 2. graduates who are sought after for their knowledge, their creative and critical thinking, and for their expertise; 3. a well-supported core and associated staff who are respected and trusted by their peers, clients, and community;
- Remain relevant to the needs of the community, focusing on South Africa in the context of trends shaping Africa and the globe.

2. Research Partners, Management and Location

The C·I·B's management team and administrative hub are based in Stellenbosch, while the core research team of twenty-four senior researchers and their associated postdoctoral researchers and graduate students is distributed between ten higher education and R&D institutions in South Africa. Biographic profiles and research specialities of core research personnel can be found at www.sun.ac.za/cib. These personnel are: Dave Richardson (Director) (Ph.D., based at Stellenbosch University); Christian Chimimba (Ph.D., University of Pretoria); Susana Clusella-Trullas (Ph.D., Stellenbosch University); Colleen Downs (Ph.D., University of KwaZulu-Natal); Karen Esler (Ph.D., Stellenbosch University); Stefan Foord (Ph.D., University of Venda); Llewellyn Foxcroft (Ph.D., South African National Parks); Mirijam Gaertner (Ph.D., City of Cape Town); Charles Griffiths (Ph.D., University of Cape Town); Cang Hui (Ph.D., Stellenbosch University); Bettine Jansen van Vuuren (Ph.D., University of Johannesburg);

Steven Johnson (Ph.D., University of KwaZulu-Natal); Jaco Le Roux (Ph.D., Stellenbosch University); Heidi Prozesky (D.Phil., Stellenbosch University); Mark Robertson (Ph.D., University of Pretoria); Tamara Robinson (Ph.D., Stellenbosch University); Mathieu Rouget (Ph.D., University of KwaZulu-Natal); Michael Somers (Ph.D., University of Pretoria); John Terblanche (Ph.D., Stellenbosch University); Brian van Wilgen (Ph.D., D.Sc., Council for Scientific and Industrial Research); Olaf Weyl (Ph.D., South African Institute for Aquatic Biodiversity); John Wilson (Ph.D., South African National Biodiversity Institute); Theresa Wossler (Ph.D., Stellenbosch University); Sarah Davies (Deputy Director: Operations) (M.Sc., Stellenbosch University).

The expertise of the core team covers a wide range of fields including bio-indication, biogeography, community ecology, conservation biology, environmental management and planning, evolutionary physiology, invasion ecology, landscape ecology, macroecology, marine ecology, fresh water ecology, molecular ecology, phylogeography, pollination biology, population biology, sociology, spatial ecology, restoration, resource economics, systematics, and vegetation dynamics.

Specific research and training topics covered by the C·I·B include long-term impacts of invasions, determinants of invasion success, impact and risk assessment, interactions between biological invasions and climate change, modelling of invasion success and spread and the efficacy of bio-control agents, the determinants of species abundance and distribution, the consequences for ecosystem functioning of invasions and the removal of invasive species, and the social consequences of invasions. C·I·B researchers have experience in environments ranging from sub-tropical to temperate and arid Africa, tropical to sub-Antarctic islands, central America, Australia, and the Antarctic, and from terrestrial to freshwater and marine biomes.

3. C·I·B Hub and Partner Facilities

Stellenbosch University is the host institution for the C·I·B hub and provides the following facilities:

Human resources – Direct: Besides the key academic and management personnel, the C·I·B is supported by several technical staff, a database manager, several personnel concerned with outreach, and three administrative staff. **Indirect:** The C·I·B draws in various ways on the human resources that are contained within a large, modern University. It is also supported by a Research Assistant based at the C·I·B's Northern Hub at the University of Pretoria.

Physical resources: Offices, a display area, seminar room, storage facility and large laboratory in the C·I·B hub complex; access to lecture rooms, ecophysiology and molecular laboratory facilities and post-graduate offices in the Department of Botany and Zoology to which the C·I·B is affiliated; central University information technology infrastructure (LAN).

Academic and administrative resources: Library resources in the form of books, journals and electronic media; central analytical facilities including DNA sequencing and mass spectrometry; a language centre providing tuition in scientific writing; academic marketing resources provided routinely by student recruitment services; research and

contract support via the Research Development division; student administration; international student liaison; financial and human resources administration.

Partner institutions: The Universities of Pretoria (Northern Hub), Cape Town, Johannesburg, KwaZulu-Natal, and Venda, as well as the Council for Scientific and Industrial Research (CSIR), City of Cape Town, South African National Biodiversity Institute (SANBI), South African Institute for Aquatic Biodiversity (SAIAB) and South African National Parks (SANParks) are hosts to one or more core team members of the C·I·B. The C·I·B also supports students at several other tertiary institutions across South Africa. The structure of these institutions and the support they provide to core team members is set out on the institutional home pages which can be accessed via www.sun.ac.za/cib.

4. Research and Training Experience

The C·I·B is a highly respected research organization, and its staff regularly publish their work in a wide variety of sources including internationally-acclaimed journals such as *Nature*, *Science*, *Proceedings of the National Academy of Sciences of the USA*, *Proceedings of the Royal Society B*, *Trends in Ecology & Evolution*, *American Naturalist*, *Biological Reviews* and *Ecology Letters*. The research standing of the C·I·B researchers is further reflected in their editorial positions with several leading international journals, and participation in international science organizations at an executive level. The C·I·B has played a major role in providing scientific expertise to policy-makers, including identifying the way forward for the development of invasive alien species (IAS) indicators for the Global 2010 biodiversity targets and contributing extensively to the development of regulations for Chapter 5 of the National Environmental Management: Biodiversity Act.

The C·I·B team draws on many years of collective experience in training at the post-doctoral, graduate and undergraduate levels, and on membership in or affiliation with accredited South African training institutions. In addition, several team members have been involved or are currently involved in regional training programmes. C·I·B staff members have also been involved with a variety of community-based outreach programmes spanning several levels of work from extension regarding particular problems in biodiversity conservation, to teacher in-service training and learner education at the secondary level (see 'Outreach' below).

5. Outreach

The C·I·B runs a highly-acclaimed science education outreach project that focuses on building capacity in biodiversity science and providing quality schooling for learners and educators in communities where school capacity is limited. The Iimbovane Outreach Project ('Iimbovane' means 'ants' in iSiXhosa) increases the understanding of biodiversity among educators and learners through training and by actively involving them in the monitoring of ants. The project is implemented directly in 18 secondary schools with an additional ten subscription schools using our materials, and reached approximately 8900 learners between 2006 and 2012. It exposes learners to hands-on science projects in order to inform, excite and motivate them to follow careers in biodiversity science.

6. C·I·B Partnerships

The C·I·B has a wide range of international collaborations and formal partnerships with R&D and training institutions. These span many countries and a range of organizations from government agencies to University Departments. Memoranda of Understanding have been signed with the Department of Environmental Affairs' Natural Resources Management Programme (formerly Working for Water), the Western Cape Nature Conservation Board (CapeNature), the City of Cape Town's Environmental Resource Management Department, University of Tennessee (USA), Institute of Botany of the Academy of Sciences of the Czech Republic, South African National Biodiversity Institute, the Canadian Aquatic Invasive Species Network (CAISN) at the Great Lakes Institute for Environmental Research (Canada), and the Institute for Ecology and Biodiversity (IEB) of the University of Concepción (Chile). A number of research associates located in South Africa and abroad work on collaborative projects that contribute to all key performance areas.

7. Additional Information

Further information on the C·I·B and its partners is available on the C·I·B home page, which can be found at: www.sun.ac.za/cib or by contacting the Centre at:

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GPS co-ordinates 33°55'56.34"S; 18°51'48.47"E (-33.932318°, 18.863464°); http://maps.google.com

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