



Centre for Invasion Biology

Hosted by Stellenbosch University, South Africa

PROFILE



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1. Overview

The Centre for Invasion Biology (C·I·B) is an academic and research entity of Stellenbosch University (SU) with a national, regional, and international scope and mandate to conduct research and training in biodiversity science especially as it applies to understanding the impacts of and managing and preventing biological invasions.

The C·I·B resides within the School for Climate Studies at Stellenbosch University and has affiliated researchers at a range of academic and non-academic institutes throughout South Africa. The C·I·B's activities are significantly interdisciplinary in nature, and it aims to enhance its activities and contribution within Africa, especially through scientific risk assessment in national and multi-lateral forums and global scientific and policy bodies, advancing technical guidance, and implementation of response actions.

2. Mission

The Centre for Invasion Biology (C·I·B) is a transdisciplinary, African-rooted hub that generates and applies knowledge on biological invasions to support biodiversity conservation, policy, and ecosystem management across Africa and the world.

The mission of the C·I·B is to:

- undertake research and education that investigate changes in biological diversity as a consequence of biological invasions, their effects on ecosystems and the remediation thereof, including the effects on ecosystem services under climate, land-use, and other relevant environmental changes;
- pioneer internationally leading research regarding biological invasions by pursuing research excellence, inter-disciplinarity, and local, regional, and international exchanges;
- coordinate innovative research that is disseminated in the international literature; graduates who are sought after for their knowledge, expertise, and creative and critical thinking; a well-supported staff who are respected and trusted;
- conduct policy- and management-relevant independent research that supports managers, policymakers, and those tasked with monitoring and reporting on biodiversity change;
- be relevant to the needs of the community, focusing on Africa and the global community;
- help build an Africa-wide research community of practice on biological invasion;
- foster linkages within broader themes such as One Health and One Biosecurity, and institutional partners.

3. Vision

The raison d'être of the CIB is to provide the scientific understanding required to manage the rate and impacts of biological invasions in a manner that will improve the quality of life of all Africans.

4. Core Features

- Context-sensitive (Ubuntu): Research and interventions grounded in African ecosystems, governance, and socio-economic realities from local communities to regional (and international) decision-makers.
- Ethical and inclusive: uphold integrity, equity and respect, ensuring diverse voices shape our research and impact.
- Impact-orientated: The scientific outputs and human-capacity produced demonstrably support

evidence-based policy and management.

- Collaborative: Strong active research networks linking African institutions with global partners that are strategically connected to end users of research.
- Agile and resilient: Adaptive operational models that can pivot and diversify funding.
- Focused on excellent science: The research conducted is globally recognised for its quality and integrity.

5. Strategic Goals

- Develop financial sustainability to support, nurture, and develop researchers.
- Attain globally recognition in the science of biological invasions and become a key research centre for the African continent.
- Strengthen African research networks.
- Translate research for policy.

6. 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. The expertise of the core team covers a wide range of fields including bio-indicators, community ecology, conservation biology, environmental management and planning, evolutionary physiology, global change, insect behavioural ecology, invasion ecology, landscape ecology, macroecology, marine ecology, freshwater ecology, molecular ecology, phylogeography, pollination biology, population biology, resource economics, restoration, risk analysis, spatial ecology and thermal ecology. 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.

7. 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** 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. The C-I-B also draws in various ways on the human resources that are contained within a modern, research-intensive University. It is supported by a Research Assistant based at the Northern Hub at 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.
- **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, Cape Town, Rhodes, Witwatersrand, KwaZulu-Natal, and Venda, as well as South African National Parks (SANParks), the South African National Biodiversity Institute (SANBI) and the South African Institute for Aquatic Biodiversity (SAIAB) 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.

8. 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*, *Trends in Ecology & Evolution*, *American Naturalist* and *Ecology Letters*. The research standing of C-I-B researchers is reflected in editorial positions with leading international journals, and participation in international science organizations at an executive level.

The C-I-B has a major role in providing scientific expertise to policy-makers, including co-producing the first National Status Report on Biological Invasions in South Africa with SANBI, identifying the way forward for the development of alien and invasive species 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 early career researchers, graduate and undergraduate students. Team members are members or affiliates of accredited South African training institutions. In addition, several team members and staff are currently involved in regional training programmes, community-based outreach programmes and teacher in-service training and learner education at the secondary level.

9. 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 limbovane Outreach Project ('limbovane' 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 reaches 2000 – 3000 Grade 10 learners per year. It exposes learners to hands-on science projects to inform, excite and motivate them to follow careers in biodiversity science.

10. C-I-B Partnerships

The C-I-B has a wide range of partnerships with R&D and training institutions. These span many countries and a range of organizations from government agencies to NGOs. Memoranda of Understanding have been signed with Department of Environmental Affairs' Natural Resources Management Programme (formerly Working for Water), Western Cape Education Department (through limbovane), Western Cape Nature Conservation Board (CapeNature), BirdLife South Africa, Statistics in

Ecology, Environment and Conservation (SEEC at UCT), The Nature Conservancy, Institute of Botany at the Academy of Sciences of the Czech Republic and Institute for Ecology and Biodiversity (IEB) of the University of Concepción (Chile). The C-I-B is also founder and co-host of the Soil Ecosystem Research Group in South Africa and a signatory to the Honolulu Challenge.

