

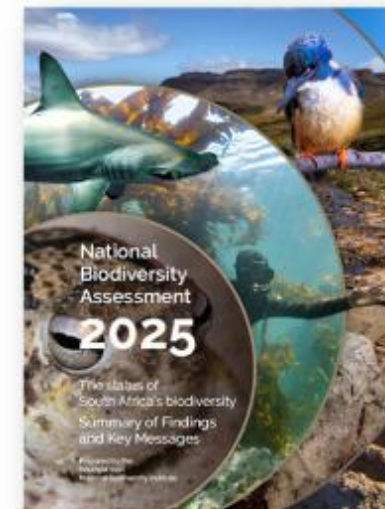
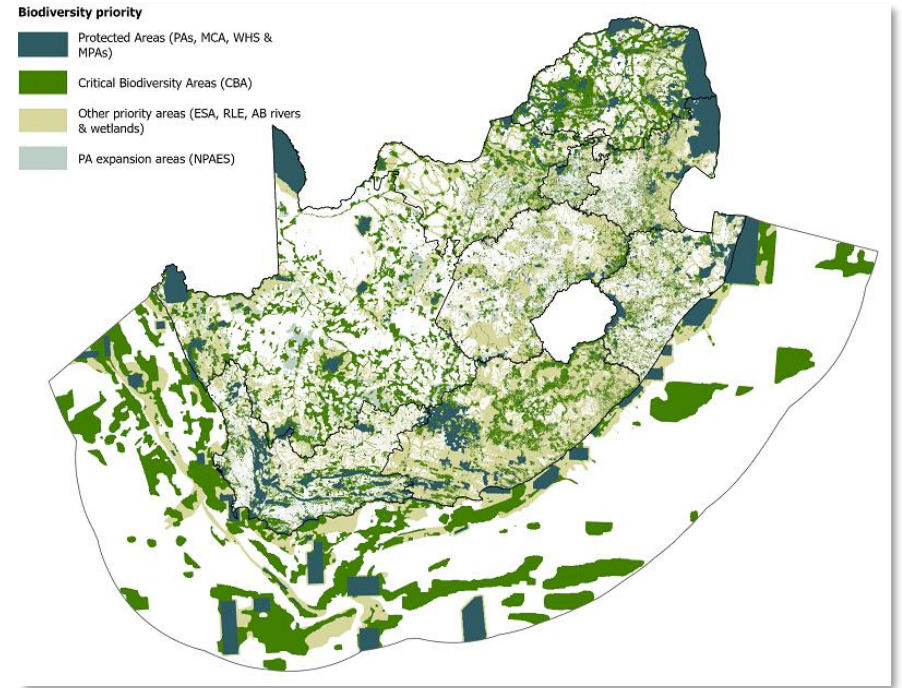
Biodiversity assessment and planning – practice and policy

Andrew Skowno

Group on Earth Observations – Global Ecosystem Atlas
& Hon Associate Prof - UCT Biological Sciences

Guest Lecture: 28 August 2026

Space and Conservation – 3rd year Biological Sciences



Spatial biodiversity assessment and planning in SA

Spatial assessment

- National Biodiversity Assessment



Spatial prioritisation (planning)

- Maps of Critical Biodiversity Areas (CBA Maps)
- Protected Area Expansion Strategies (PAES)

4-way action plan

Avoid and reduce loss

- Land-use planning
- Environmental assessment
- Regulatory permits

Protect

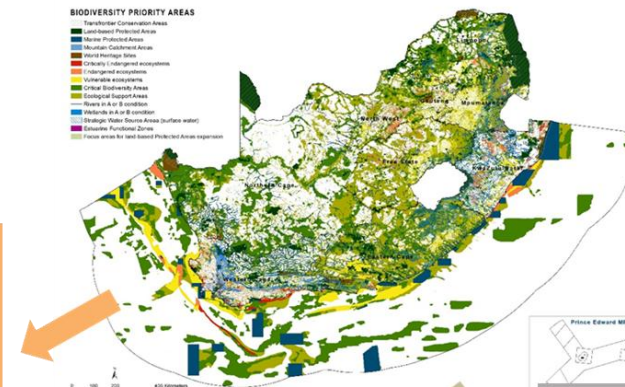
- Protected area expansion
- Biodiversity stewardship
- Management effectiveness

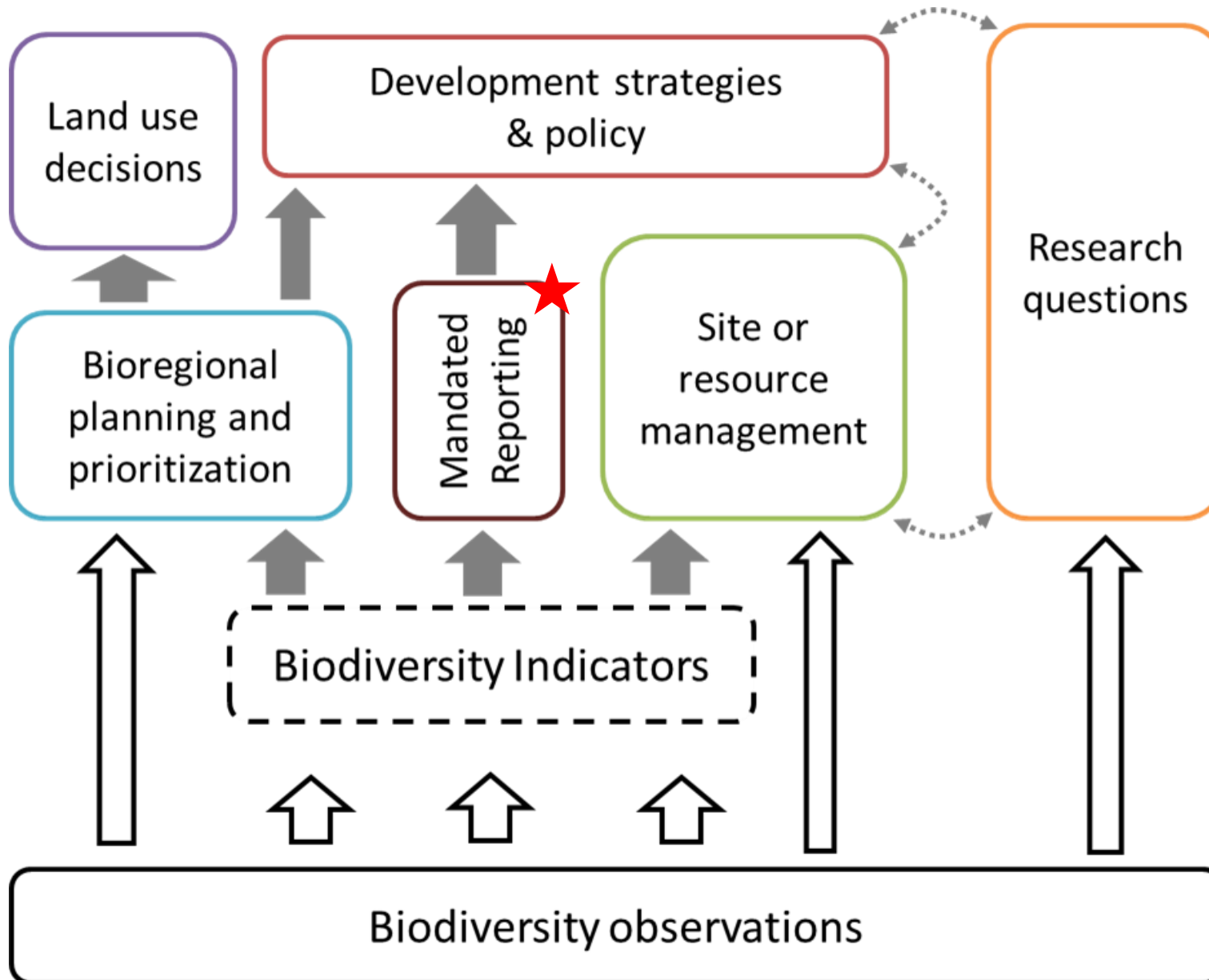
Restore

- 'working for...'
- Natural resource management
- Ecological infrastructure

Reduce pressures

- Sustainable wildlife ranching
- Regenerative agriculture
- Sterile plantations
- Biodiversity-friendly cultivation





SANBI

Biodiversity for Life



South African National Biodiversity Institute



Mandate...

(1) The Institute

(a) must monitor and report regularly to the Minister on

(i) the status of the Republic's biodiversity

(ii) the conservation status of all listed threatened or protected species and listed ecosystems; and

(iii) the status of all listed invasive species;

(b) must monitor and report regularly to the Minister on the impact of any genetically modified organism that has been released into the environment including the impact on non-target organisms and ecological processes, indigenous biological resources and the biological diversity of species used for agriculture;

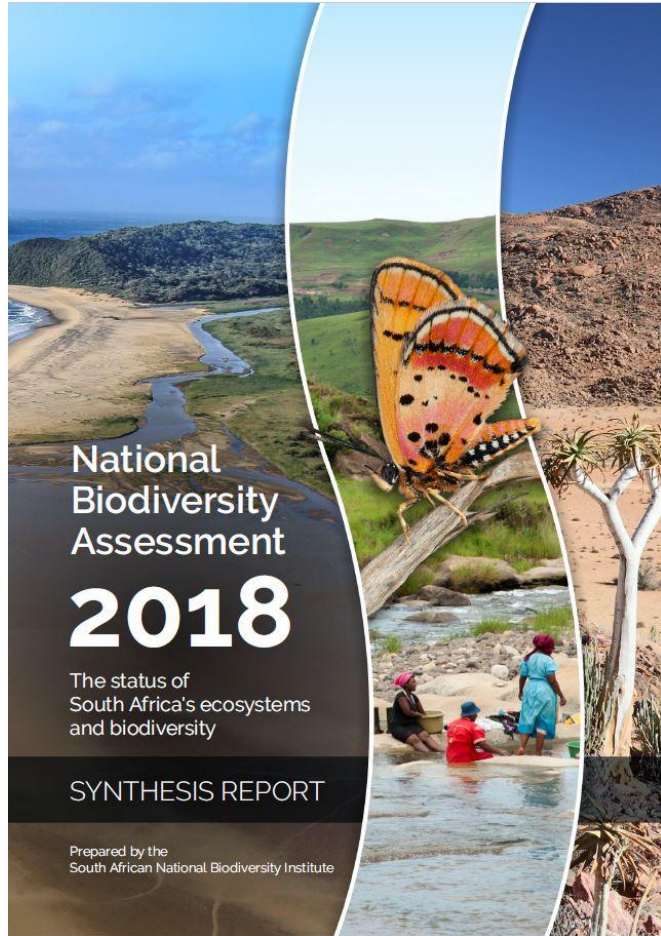
(c) must act as an advisory and consultative body on matters relating to biodiversity to organs of state and other biodiversity stakeholders;

(d) must co-ordinate and promote the taxonomy of South Africa's biodiversity;

And much more

Background of the NBA

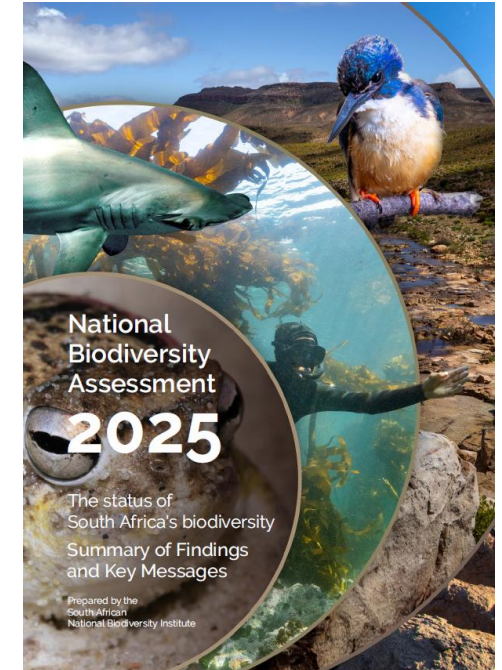
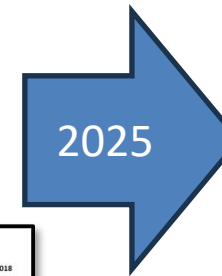
- Part of SANBI's mandate – to report regularly on state of biodiversity
- Multi-author and institution collaboration (400+ contributors)
- Source of indicators and metrics for MEAs and SoER
- Provides high level messages for policy makers
- Three releases so far (2005, 2012, 2019) with next one this year 2025



Synthesis Report (2004-2018)



Technical Reports 2004-2018



<http://nba.sanbi.org.za>

<https://github.com/SANBI-NBA>

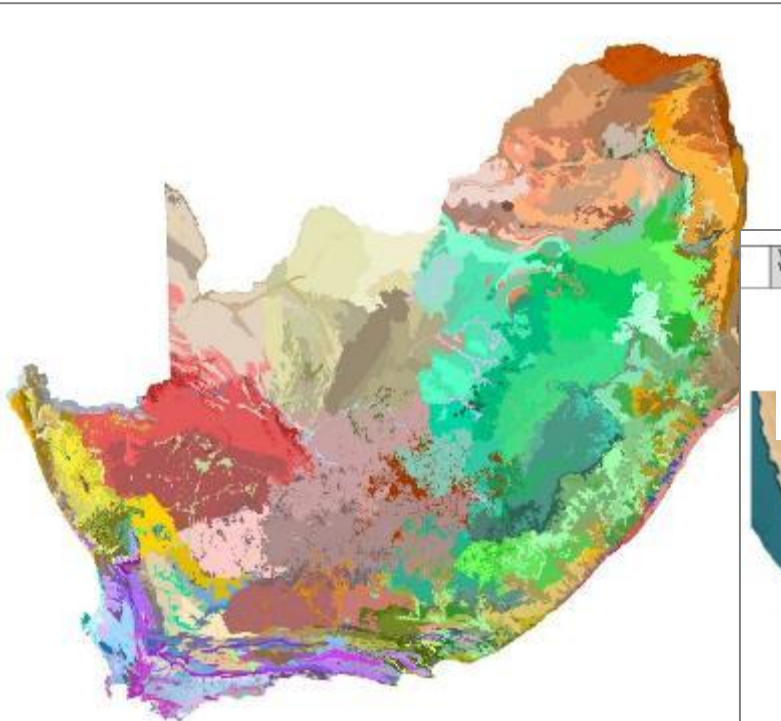
<https://doi.org/10.1007/s13280-025-02285-8>

NBA 2025 - ecosystems

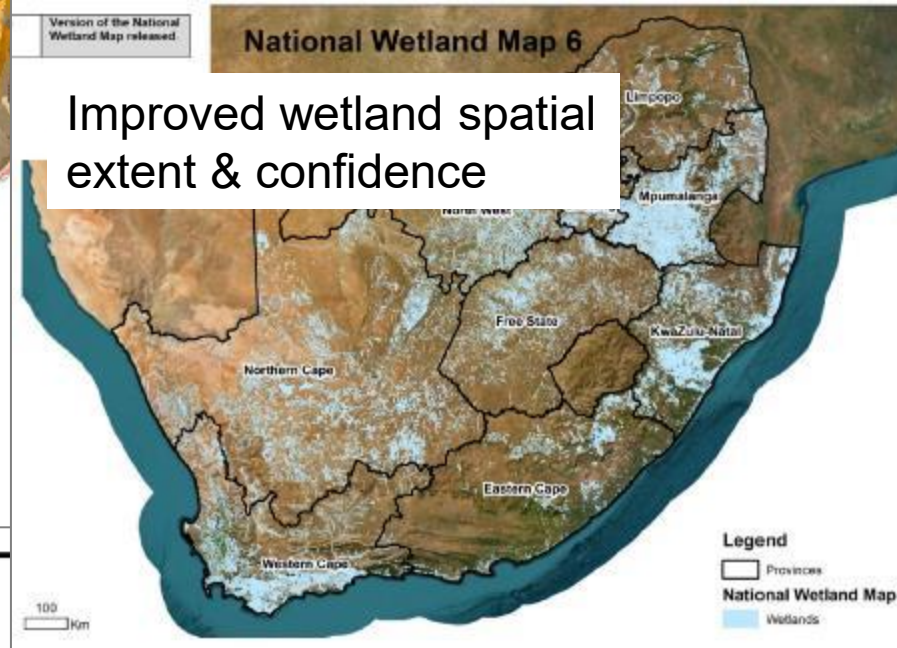


Various updates to maps of ecosystem types:

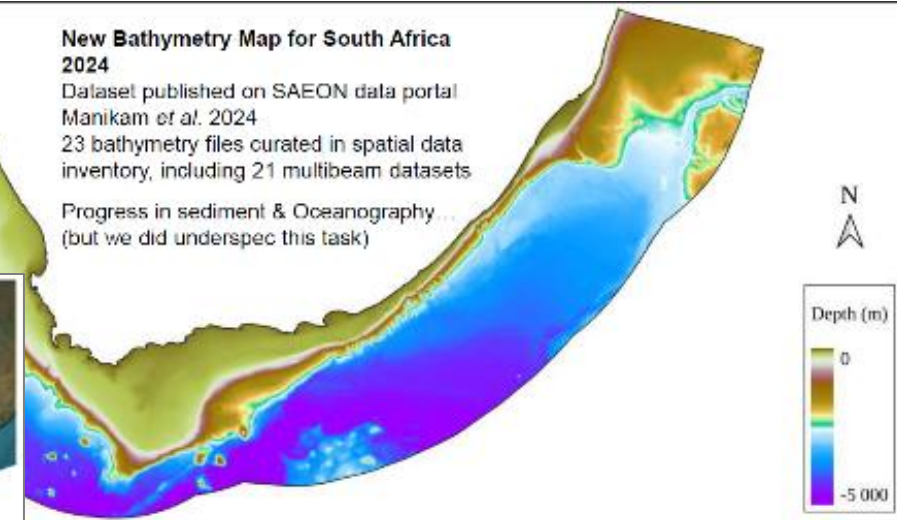
- New version of the terrestrial map of ecosystem types
- New version of the wetland classification systems and map
- Ongoing work updating the map of marine ecosystem types



NVM 2024beta (released to the public on 5 July 2024)
466 vegetation types



Improved wetland spatial extent & confidence



New Bathymetry Map for South Africa 2024

Dataset published on SAEON data portal
Manikam et al. 2024
23 bathymetry files curated in spatial data inventory, including 21 multibeam datasets

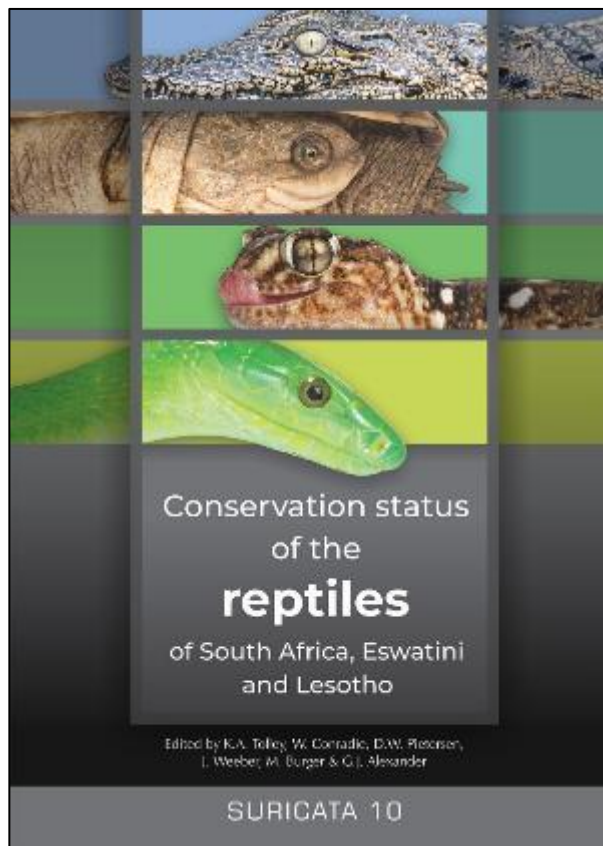
Progress in sediment & Oceanography...
(but we did underspec this task)

We are a pilot for the

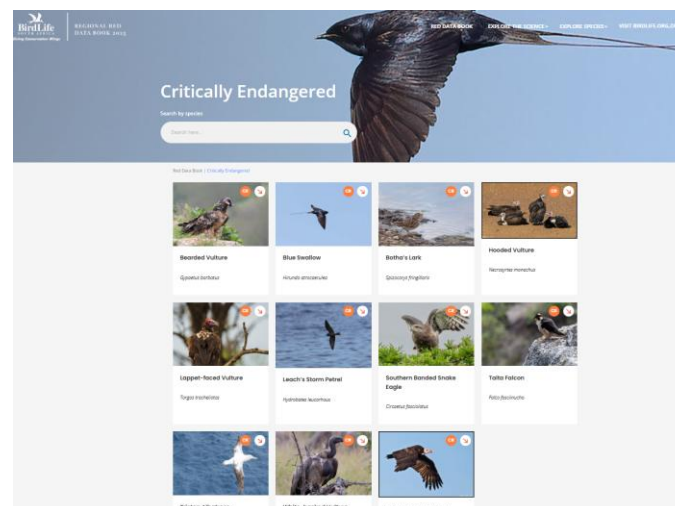


**GLOBAL
ECOSYSTEMS
ATLAS**

NBA 2025 - species



New assessments : Crabs and Spiders, Anostraca (fairy shrimps) and sample of Bees.
Reassessed – Reptiles, Bird, Mammals and Amphibians
In progress for 2027: Freshwater Fish, Butterflies and Odonata



<https://www.birdlife.org.za/red-data-book/>

400 Spiders uploaded to the IUCN in April

Debeer's Bolus Spider

Cladomela debeeri

ABSTRACT

Debeer's Bolus Spider *Cladomela debeeri* has most recently been assessed for The IUCN Red List of Threatened Species in 2019. *Cladomela debeeri* listed as Endangered under criteria B1ab(iii)(c)(v)(vi).

THE RED LIST ASSESSMENT

▼ D. Diersma-Schoeman, A. Faard, S. Letz, L. Haddad, C. Sethusa, T. & Lyle, R. 2023. *Cladomela debeeri*. The IUCN Red List of Threatened Species 2023. <1775431517A19439384>. <https://doi.org/10.2305/IUCN.RK.2023.1.BUTS.1775431517A19439384.en>. Accessed on 12 February 2024.



With 2,253 known species, South Africa's spider diversity is among the highest in the world. Endemism is high, at 60% of all South African species.

A total of **127 species (5.7%)** are either **rare or endangered**. Threats to these species are largely linked to habitat destruction in the form of urbanization and agriculture.

The bulk (62.8%) of taxa are of least concern, but many species are **data deficient (27%)**. Predicted large-scale diversity patterns are confounded by the localised nature of distribution records.

30 September 2020

The South African National Red List of spiders: patterns, threats, and conservation

Stefan H. Faard, Anna S. Diersma-Schoeman, Charles R. Haddad, Robin Lyle, Leon N. Letz, Theresa Sethusa, Donatilla Ratinondo

NBA 2025 – Genetic diversity



Pilot study

National Genetic Indicators

95%

Populations Maintained
(PM)¹

of 112 species assessed

GBF complementary indicator

42%

Populations with
 $N_e > 500$ ²

of 112 species assessed

GBF headline indicator

5

species being
Monitored Genetically

ECOLOGY LETTERS

SYNTHESIS | Open Access | CC BY-NC-ND

Multinational evaluation of genetic diversity indicators for the Kunming-Montreal Global Biodiversity Framework

Alicia Mastretta-Yanes ✉, Jessica M. da Silva ✉, Catherine E. Grueber, Luis Castillo-Reina, Viktoria Köppä, Brenna R. Forester, W. Chris Funk, Myriam Heuertz, Fumiko Ishihama ... See all authors

First published: 02 July 2024 | <https://doi.org/10.1111/ele.14461> | Citations: 21

In addition, there are efforts to report on EDGE and PD indicators

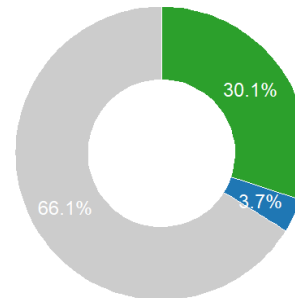
Updates
...in progress

Mammal Genetic Indicators

98.5%

Populations Maintained
(PM)¹

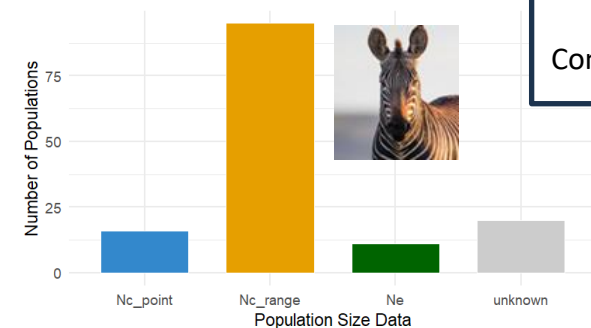
of 322 mammals assessed



Population size data availability

- Insufficient data
- Species-level data
- Population-level data

~ 1/3 of mammals have data on population size



What data does exist is mainly based on broad census size
e.g., > 5,000, >10,000, <1,000

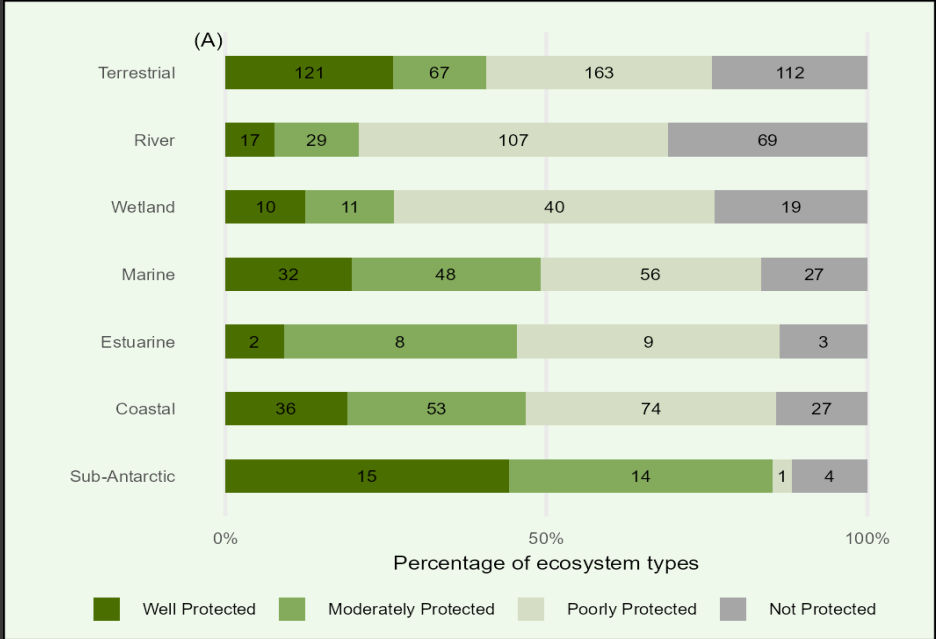
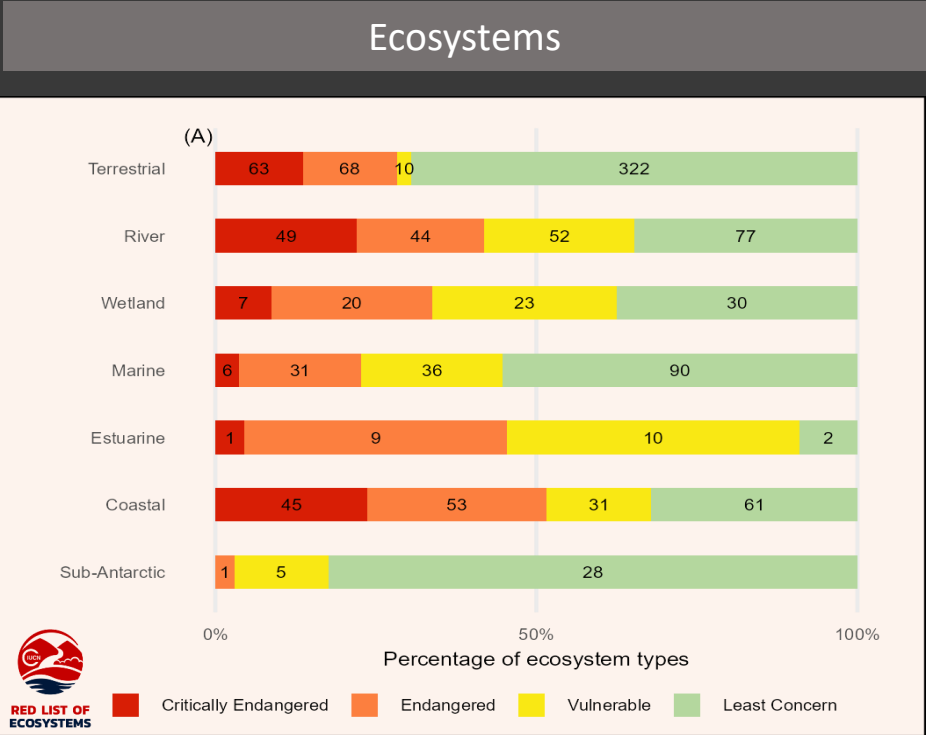
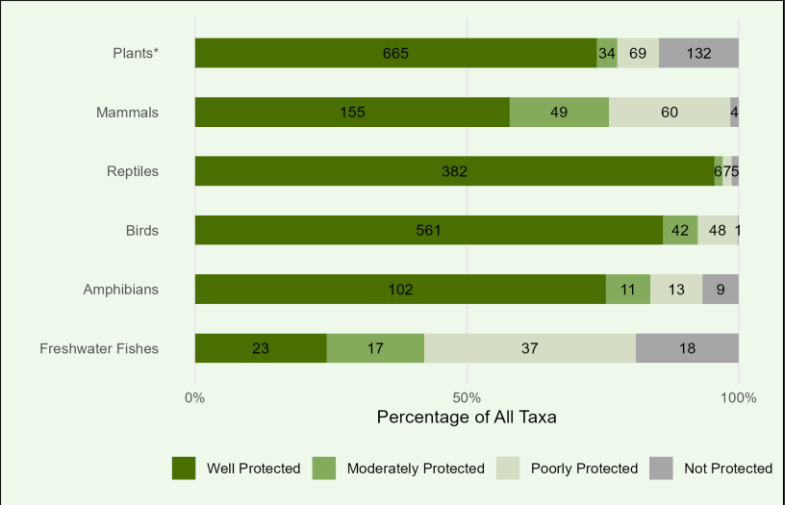
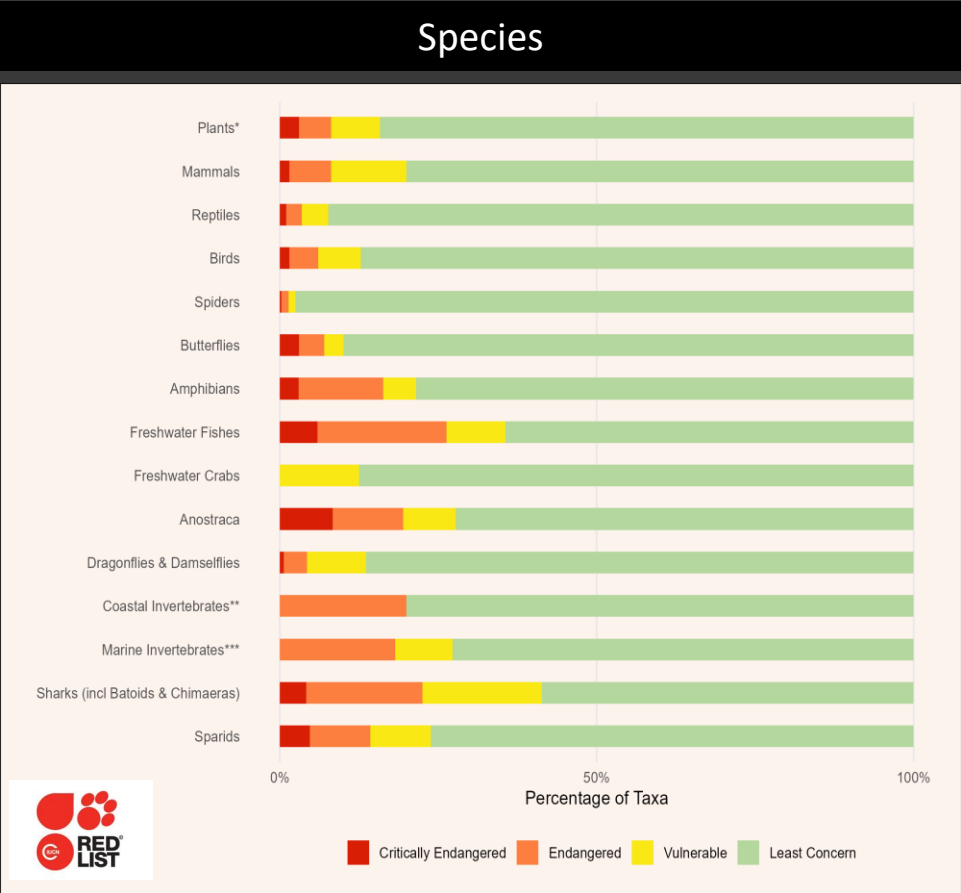


Coming in 2026

Headline Indicators of the NBA

Threat Status

Protection Level



NBA 2025 – Genetic diversity



Pilot study

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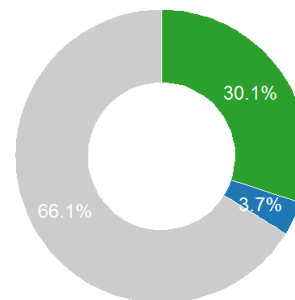
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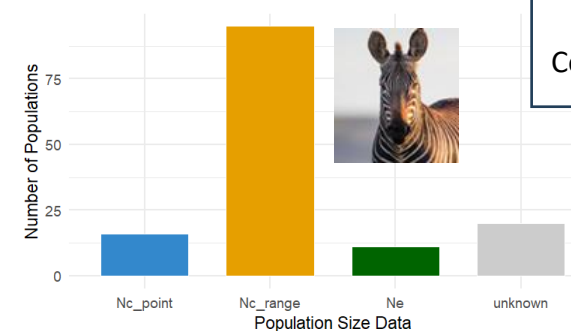
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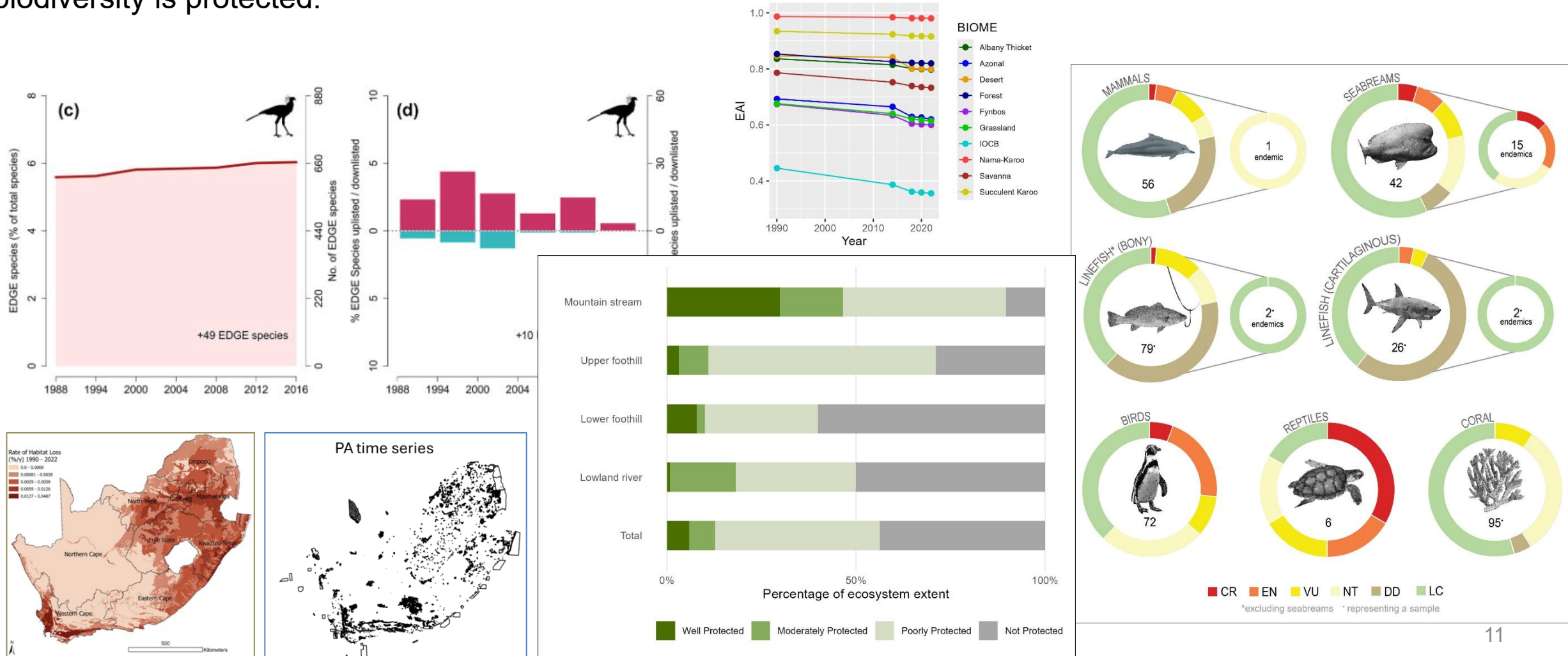
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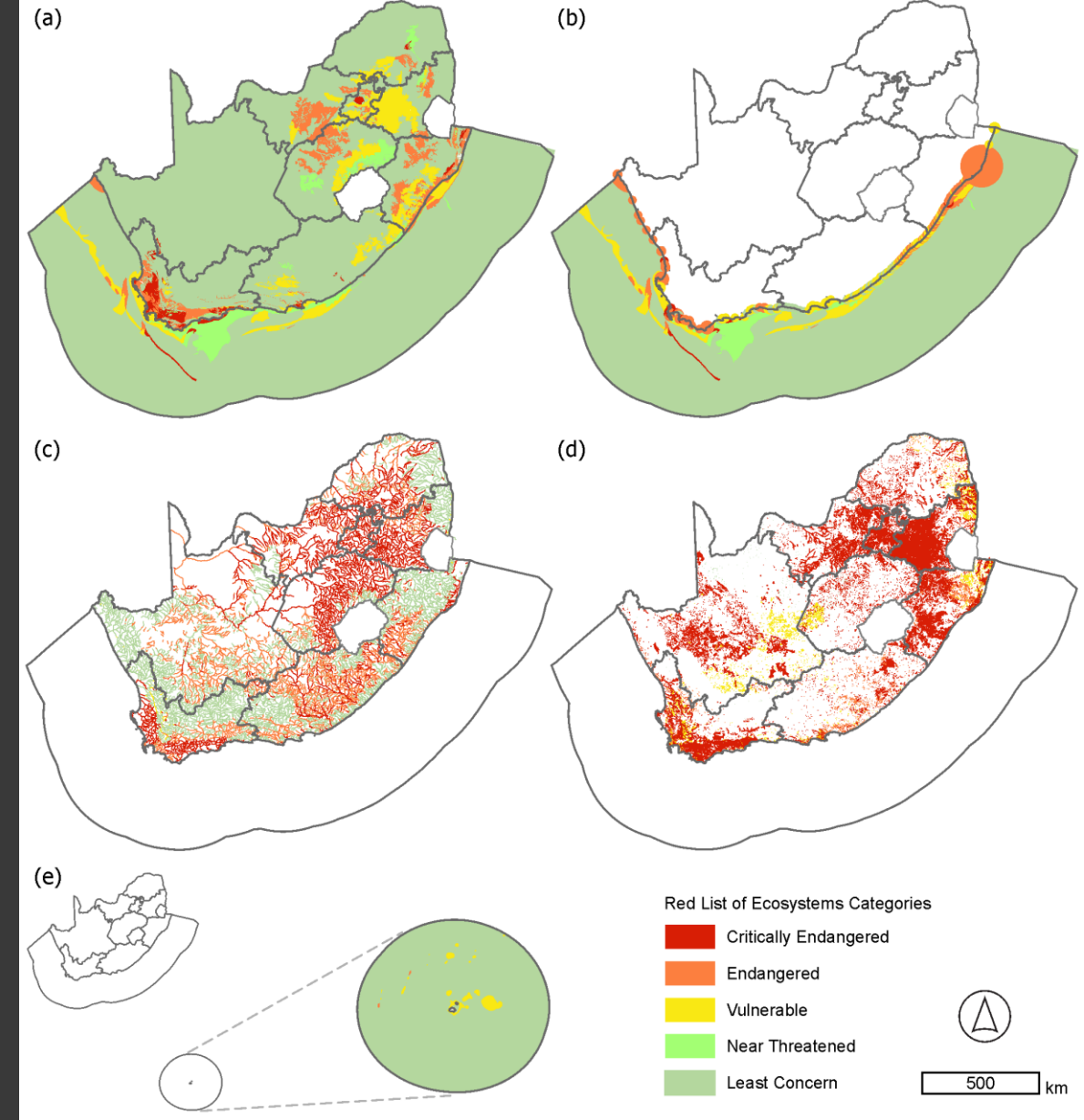
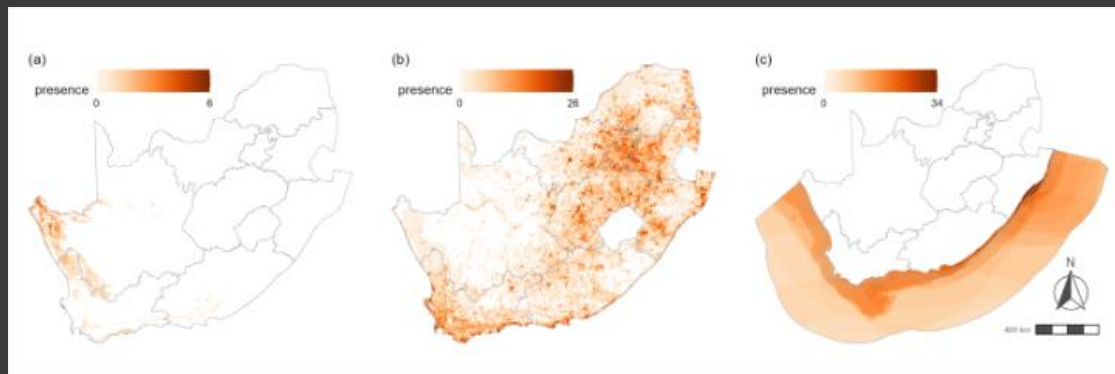
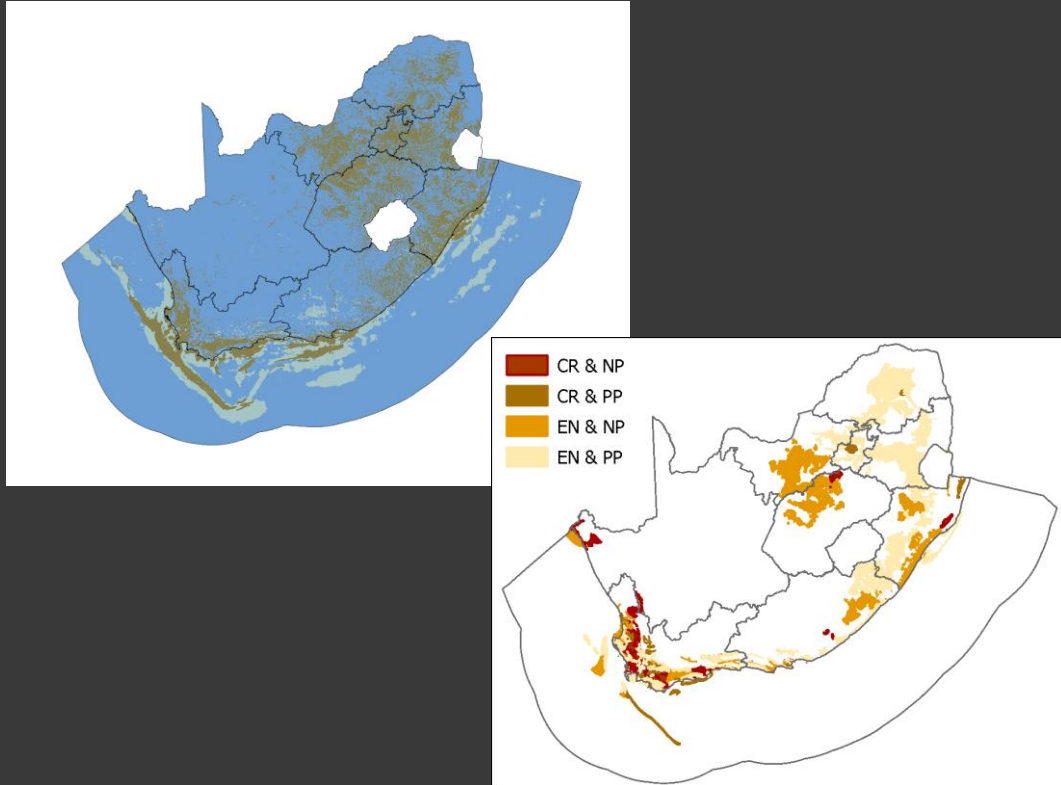
Coming in 2026

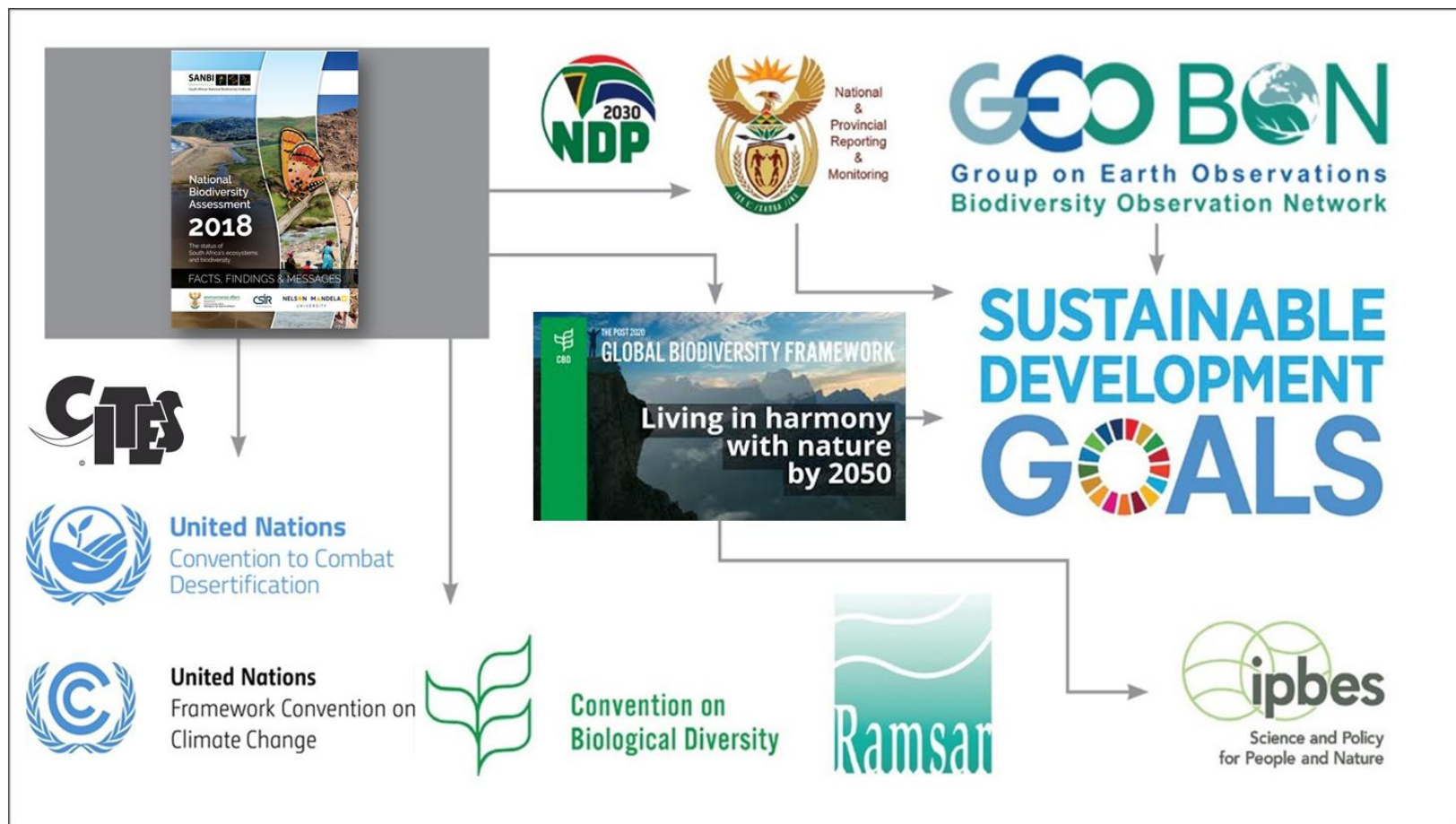
Content NBA 2025

The NBA reports on the state of all of South Africa's species and ecosystems, across land and sea, and now includes aspects of genetic diversity. A range of indicators track the risks to biodiversity and the degree to which biodiversity is protected.



Indicators as maps

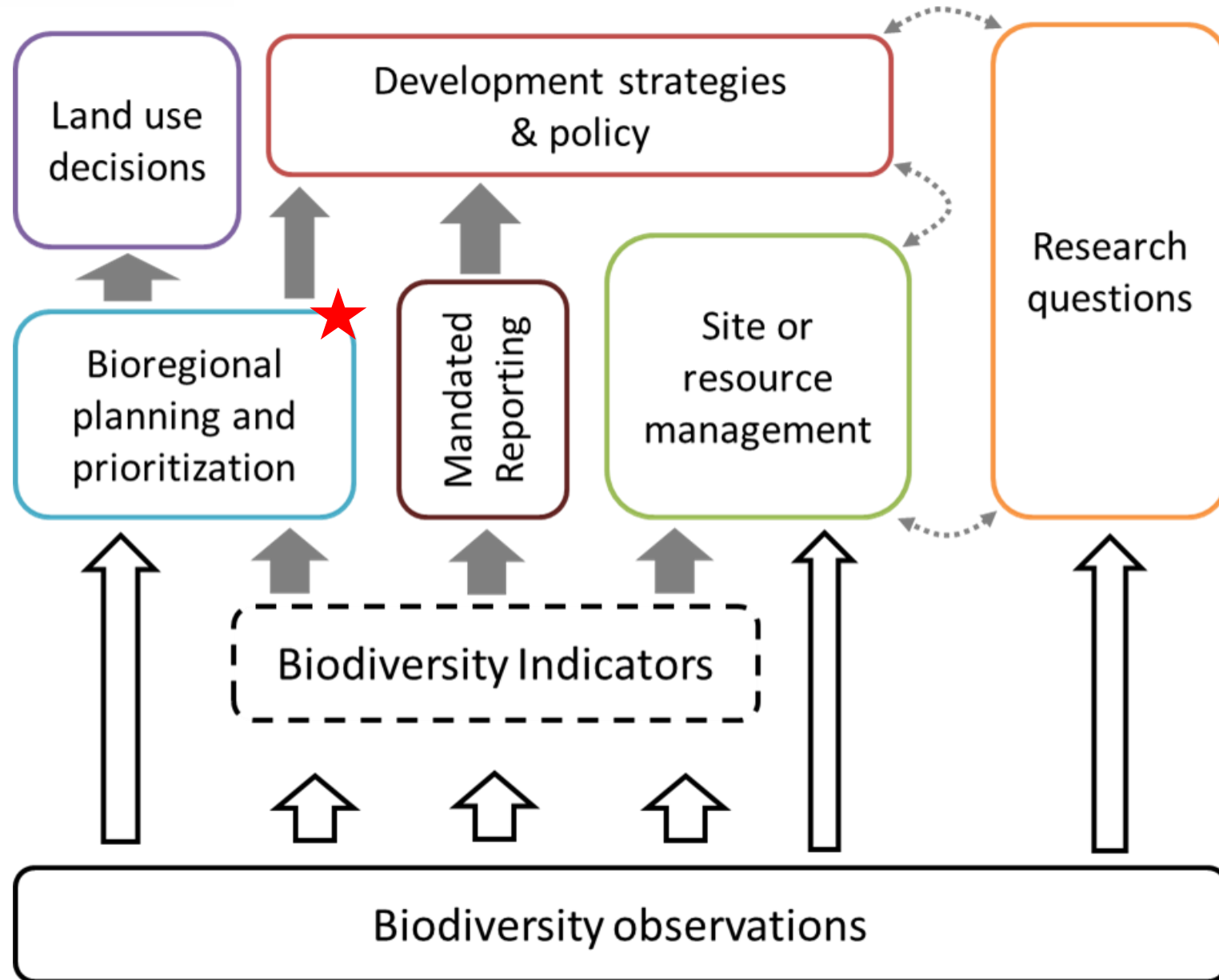




The NBA as a key informant of “state of biodiversity” reporting for or national and global processes



Kunming - Montreal
GLOBAL BIODIVERSITY FRAMEWORK



Tools for conserving biodiversity

4-way action plan

Avoid and reduce loss

- Land-use planning
- Environmental assessment
- Regulatory permits

Protect

- Protected area expansion
- Biodiversity stewardship
- Management effectiveness

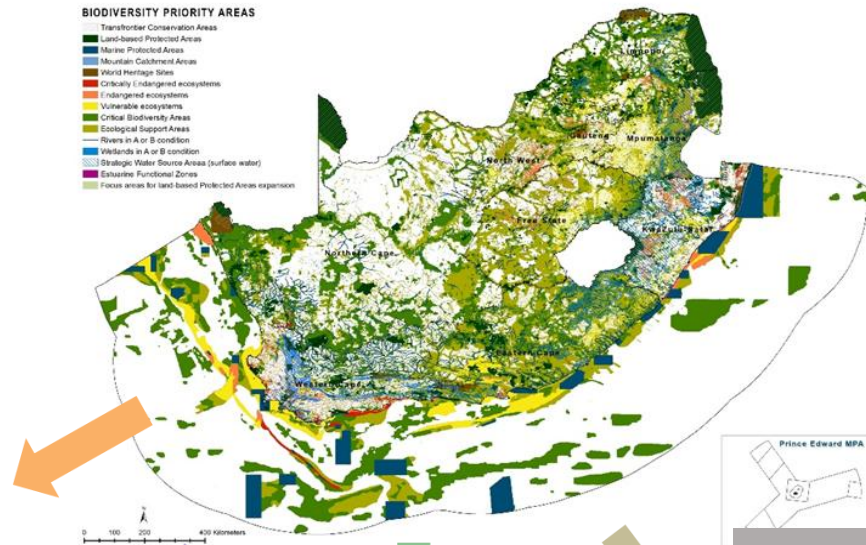
Restore

- 'working for...'
- Natural resource management
- Ecological infrastructure

Reduce pressures

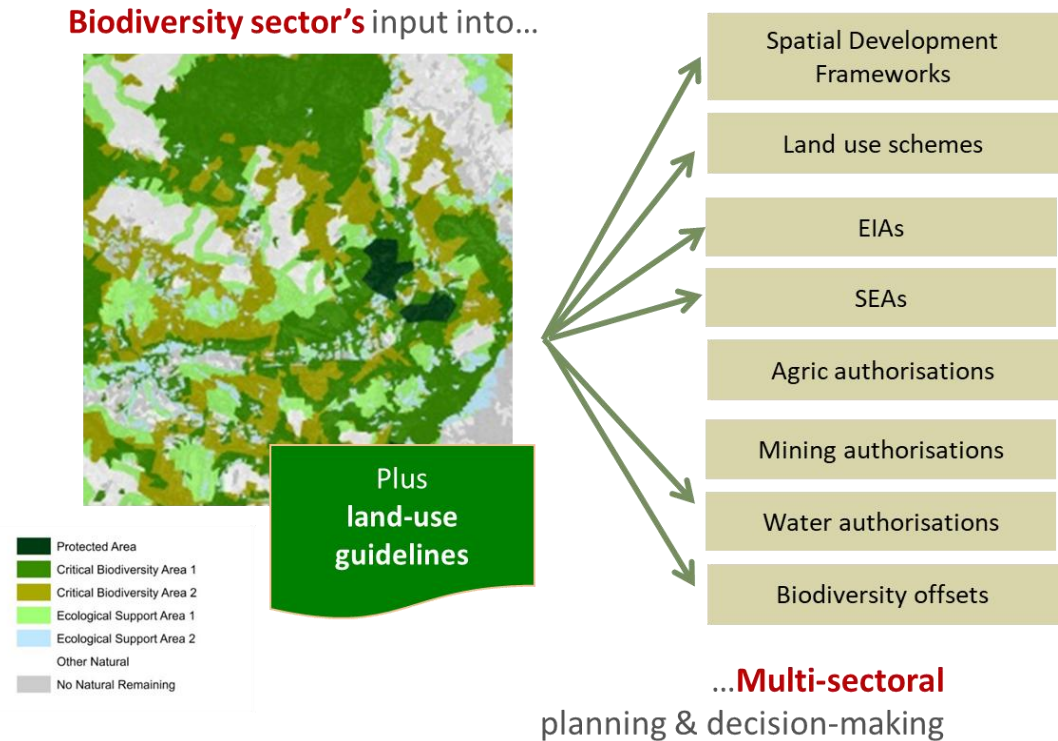
- Sustainable wildlife ranching
- Regenerative agriculture
- Sterile plantations
- Biodiversity-friendly cultivation

Can't act everywhere, so need to identify priority areas



Tools for conserving biodiversity

- Because we can't act everywhere, we need to identify priority areas
- Spatial biodiversity planning provides a defensible and **spatially explicit approach**, based on **best available science** to identify priority areas
- Underpins many of the evidence-based tools and knowledge products on which SANBI's policy advice is based



Mapping biodiversity priorities: a quick overview

A practical approach to spatial biodiversity assessment and prioritisation to inform national policy, planning, decisions and action.

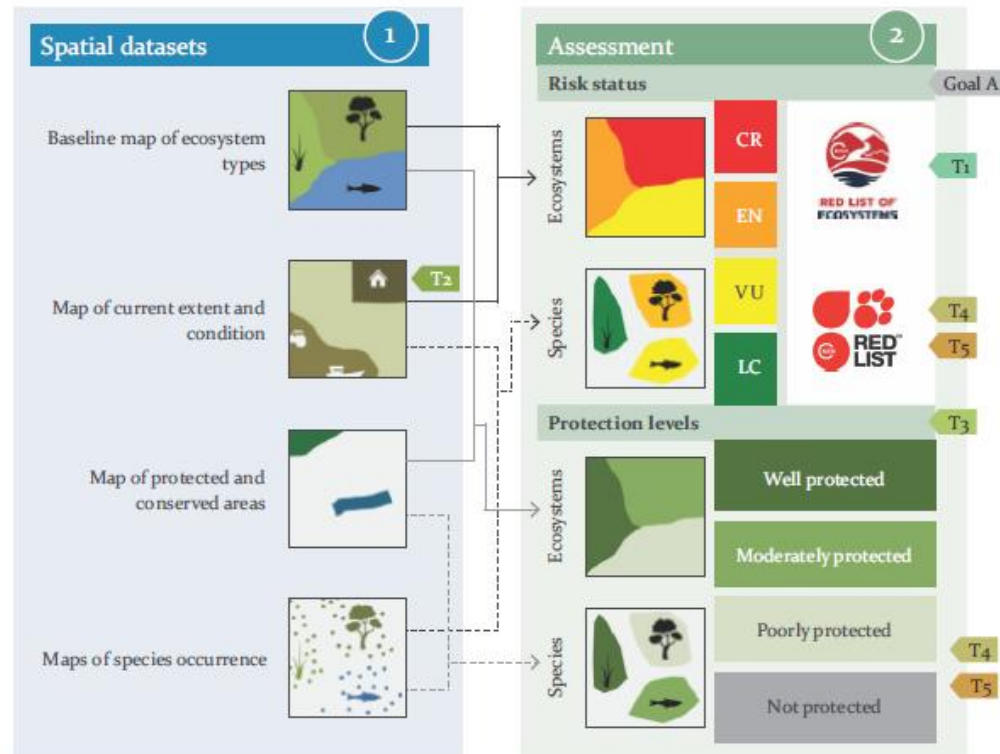
Purpose

Spatial data and mapping can provide multiple benefits for biodiversity policy, planning, decisions and action at a national level. This document sets out a practical approach to spatial biodiversity assessment and prioritisation. It shows how it is possible to use a few foundational datasets to produce useful indicators of the state of biodiversity and maps that identify biodiversity priority areas. The products can be useful in a wide range of applications, from mainstreaming biodiversity to global reporting.

Key questions

Answering three key questions about biodiversity can be useful for a range of policy, planning, decisions and action:

- 1 What biodiversity does a country have and where is it?
- 2 What is the state of biodiversity across the landscape and seascape?
- 3 Where and how should a country act first to manage and conserve biodiversity?



ISBN: 978-1-928224-72-3



THE BIODIVERSITY PLAN For Life on Earth

Spatial biodiversity data and information can contribute to implementing and monitoring the goals and targets of the Global Biodiversity Framework, including:

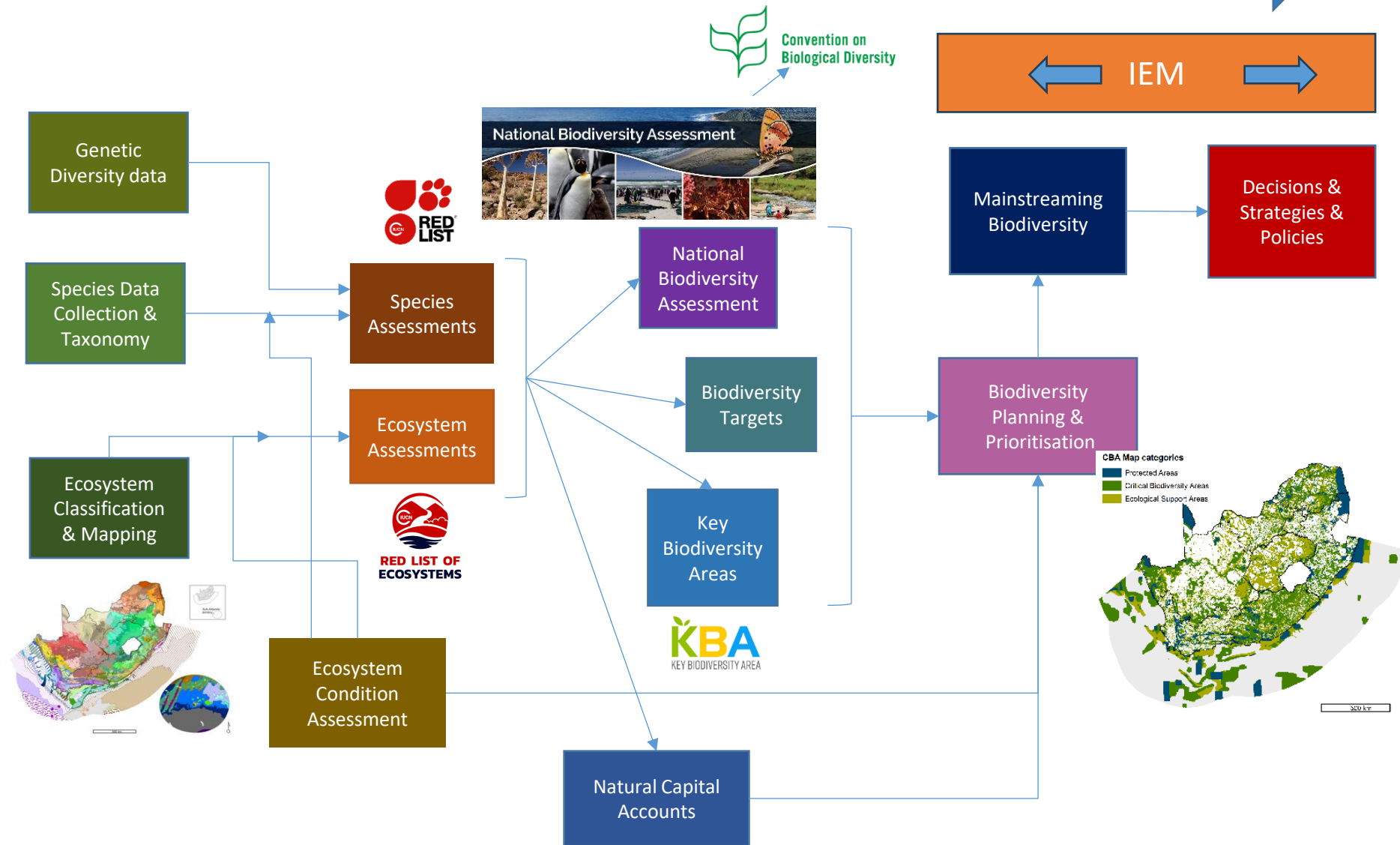
Goal A	
Target 1	Target 5
Target 2	Target 14
Target 3	Target 15
Target 4	Target 21

Guiding principles

The approach is based on the principles of systematic conservation planning and augmented by several operating principles:

- 1 Aim to conserve a viable representative sample of every different type of biodiversity.
- 2 Aim to conserve key processes that allow biodiversity to persist over the long-term.
- 3 Set quantitative biodiversity targets to achieve representation and persistence.
- 4 Use the best available information to enable robust, defensible and credible results.
- 5 Use an adaptive approach: start simply and plan for iterative improvements.
- 6 Aim for consistency across terrestrial, freshwater and marine realms.
- 7 Keep the process simple, with clear and understandable outputs.
- 8 Make a clear link to implementation by remaining aware of the context.
- 9 Be inclusive and engage stakeholders at relevant stages.
- 10 Make the products freely and easily accessible for wide use.







Technical Guidelines for CBA Maps:

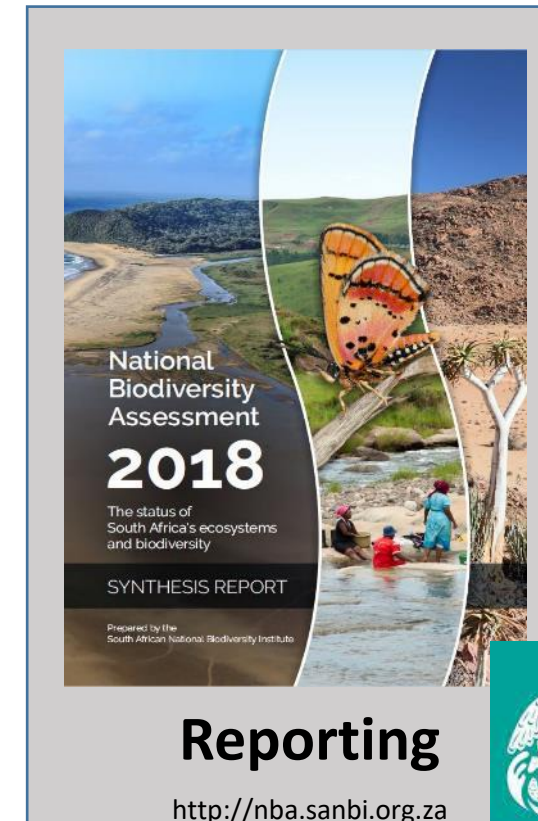
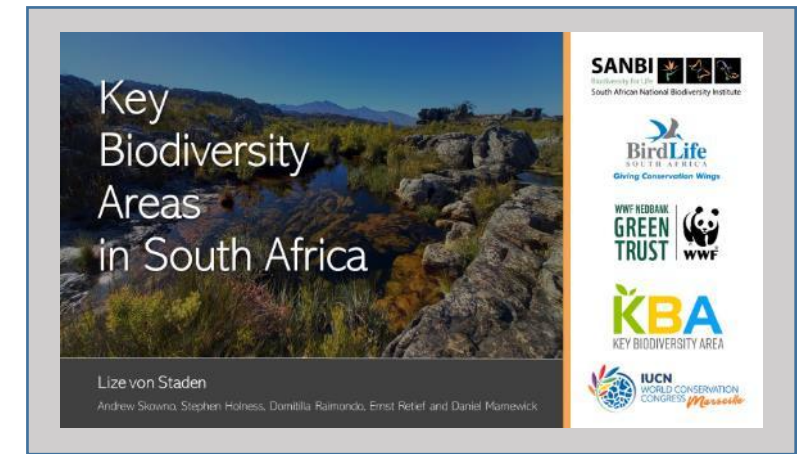
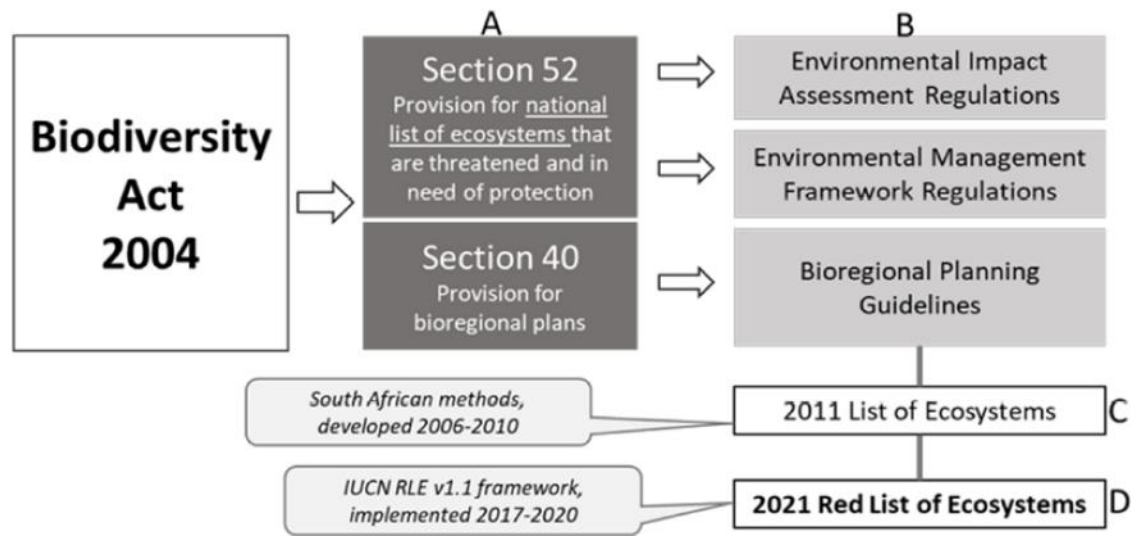
Guidelines for developing a map of
Critical Biodiversity Areas & Ecological Support Areas
using systematic biodiversity planning

First Edition
Beta Version (June 2017)

SANBI
SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE

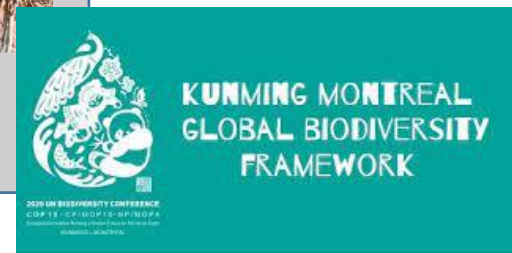






TNFD Taskforce on Nature-related Financial Disclosures

Convention on Biological Diversity



Reporting

<http://nba.sanbi.org.za>



Mandatory EIA Screening Listing Notice 3 Triggers for EIA Environmental Authorisations

<http://ecosystemstatus.sanbi.org.za>

<https://screening.environment.gov.za>



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SANBI
South African National Biodiversity Institute

Conservation Plans

<http://biodiversityadvisor.sanbi.org>