SANBI
Biodiversity for Life
South African National Biodiversity Institute

Biodiversity assessment and planning – practice and policy

Andrew Skowno
National Biodiversity Assessment Scientific Lead - SANBI
Hon Associate Prof - UCT Biological Sciences

Guest Lecture: 22 August 2025

Space and Conservation – 3rd year Biological Sciences

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

https://www.sanbi.org/about/

forestry, fisheries & the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Spatial biodiversity assessment and planning in SA

Spatial assessment

- National Biodiversity Assessment

Conservation Biology

Conservation Practice and Policy

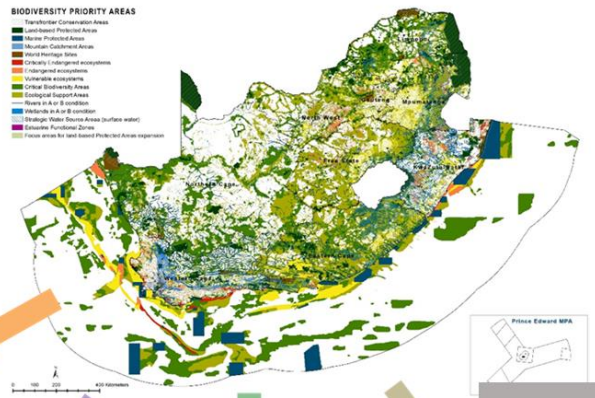
Practical actions for applied systematic conservation planning *Conservation Biology*, Volume 33, No. 6, 1235–1246

DOI: 10.1111/cobi.13321

Spatial prioritisation (planning)

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

4-way action plan

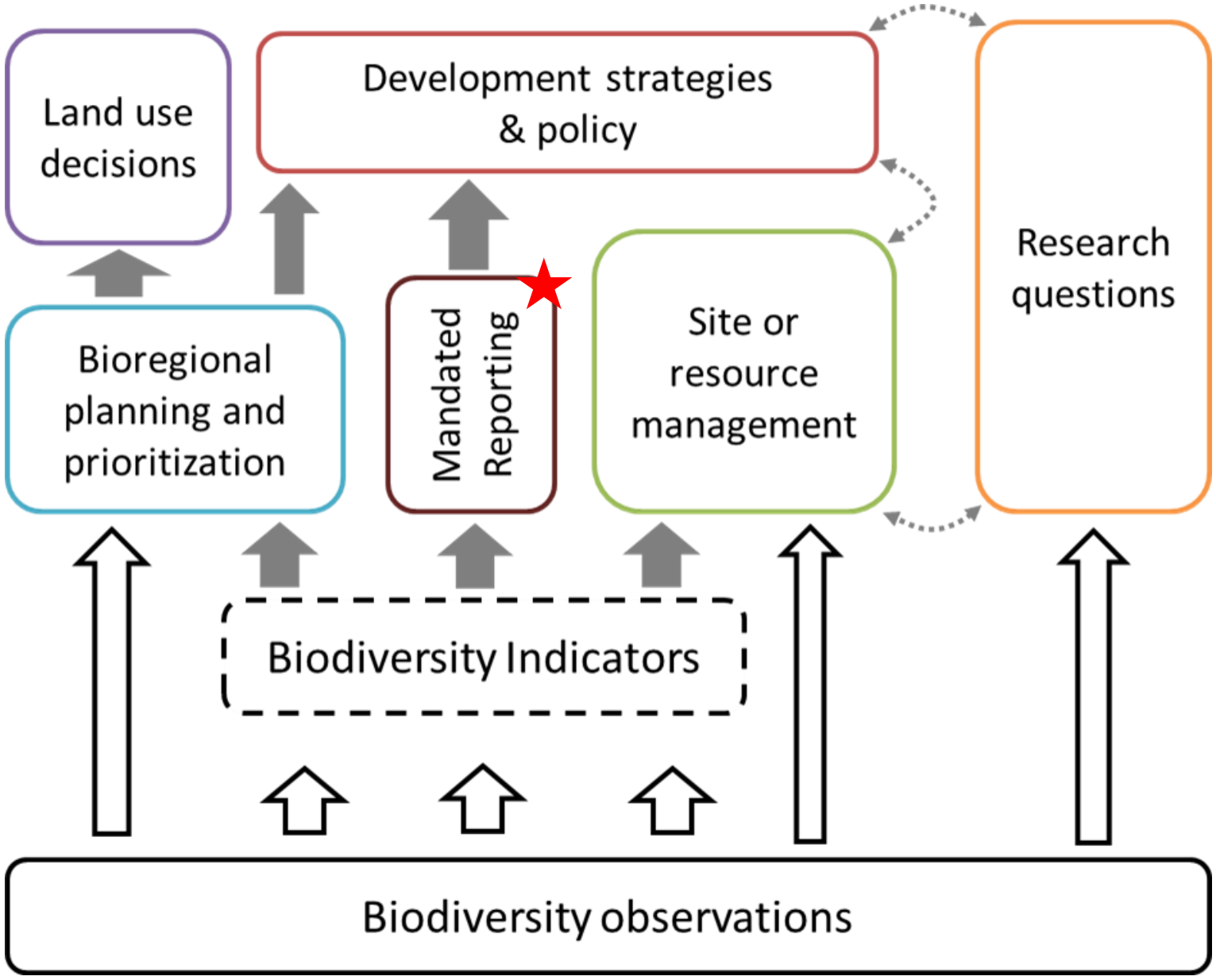


Avoid and reduce loss
- Land-use planning
- Environmental assessment
- Regulatory permits

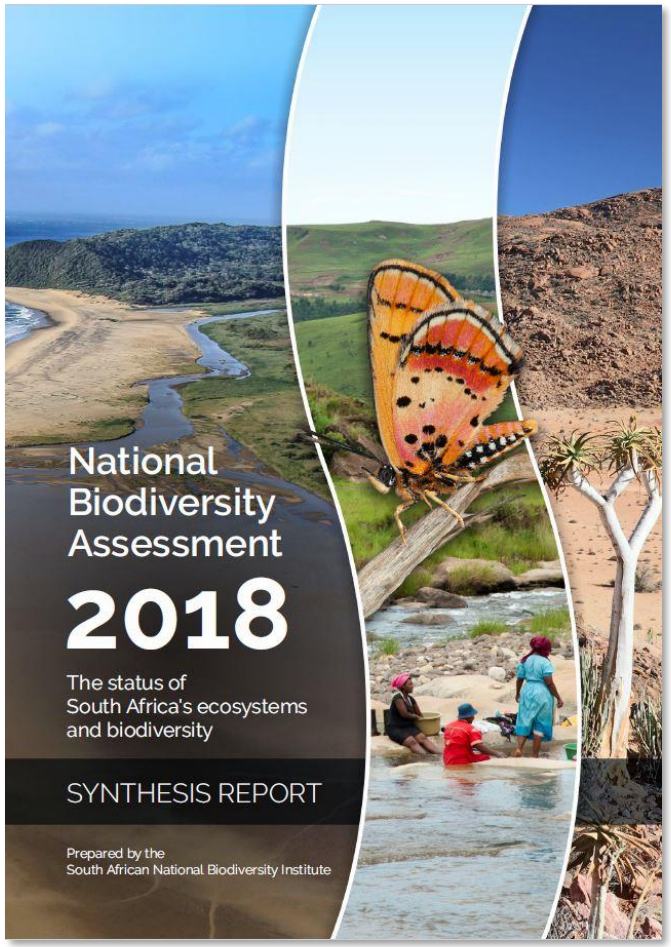
Protect
- Protected area expansion
- Biodiversity stewardship
- Management effectiveness

Restore
- 'working for…'
- Natural resource management
- Ecological infrastructure

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

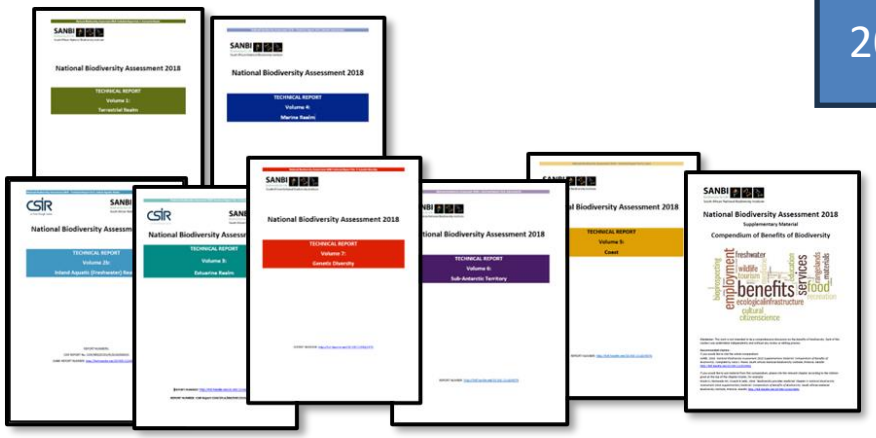

Land use decisions
Development strategies & policy
Research questions
Bioregional planning and prioritization
Mandated Reporting
Site or resource management
Biodiversity Indicators
Biodiversity observations

Background of the NBA



Synthesis Report (2004-2018)

- Part of SANBIs 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



Technical Reports 2004-2018

2025

booklet

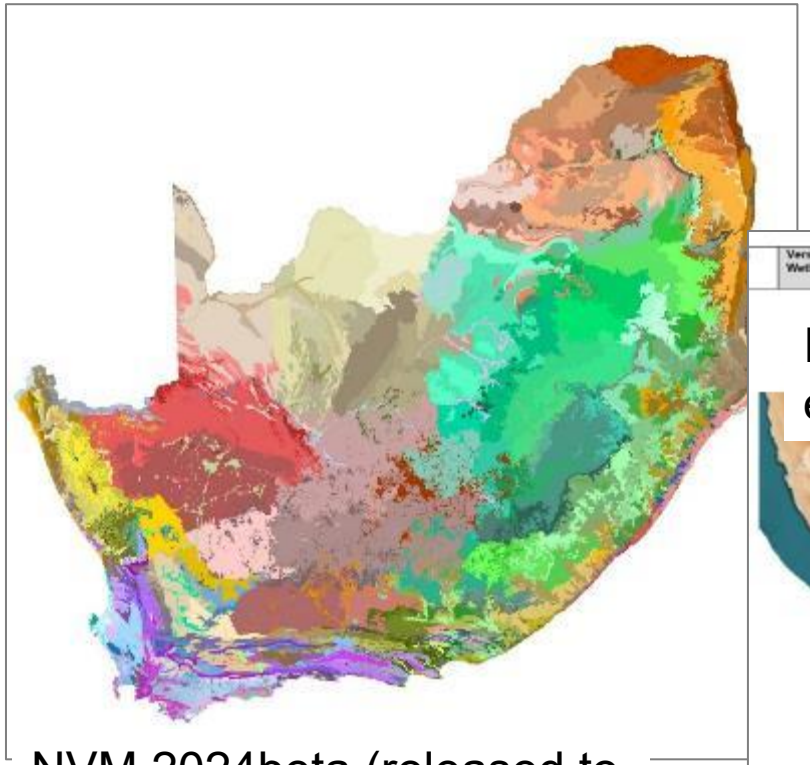
http://nba.sanbi.org.za/

https://github.com/SANBI-NBA

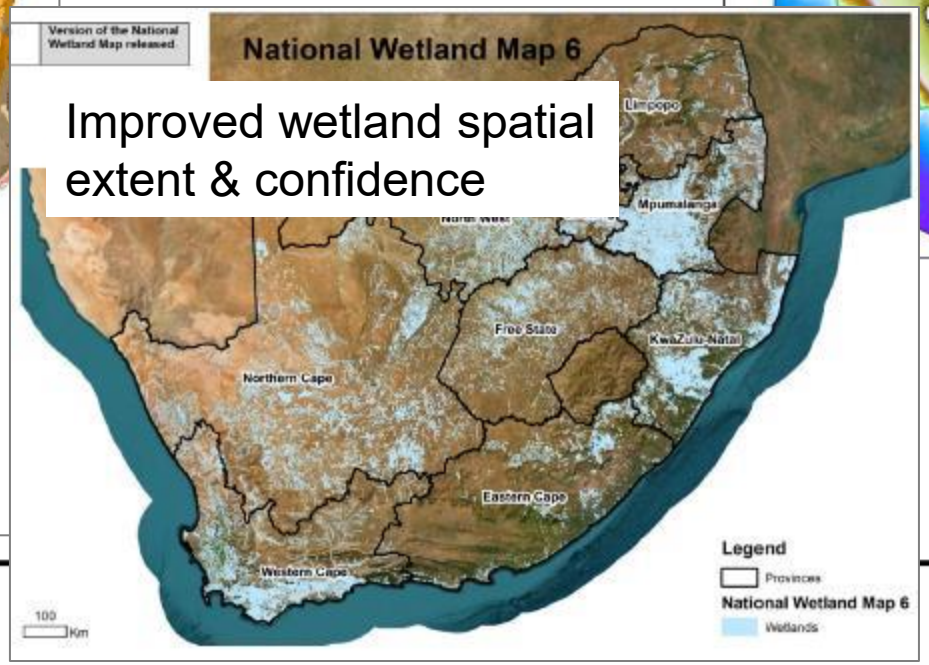
NBA 2025 - ecosystems

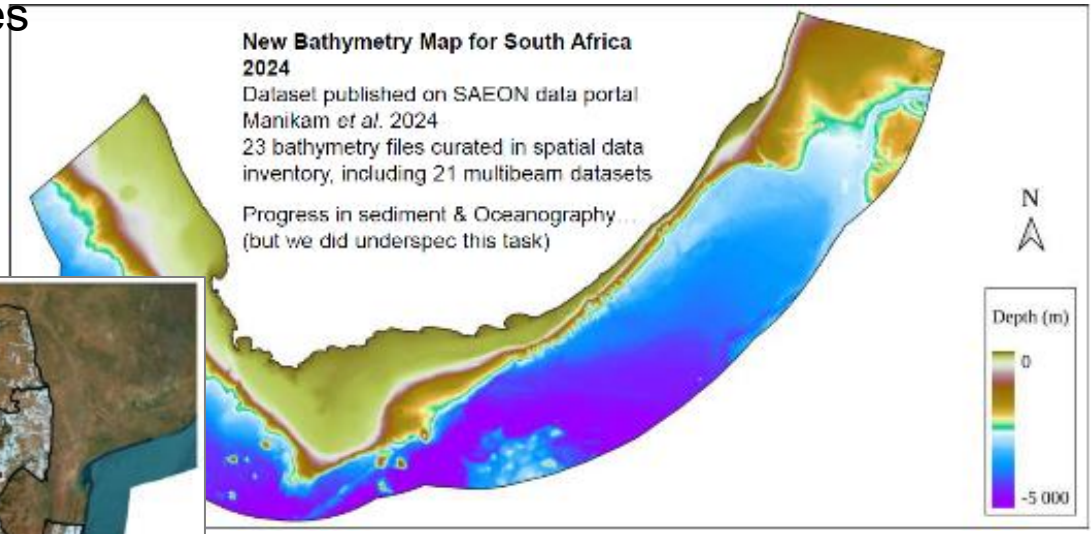
Various updates to maps of ecosystem types:

- 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

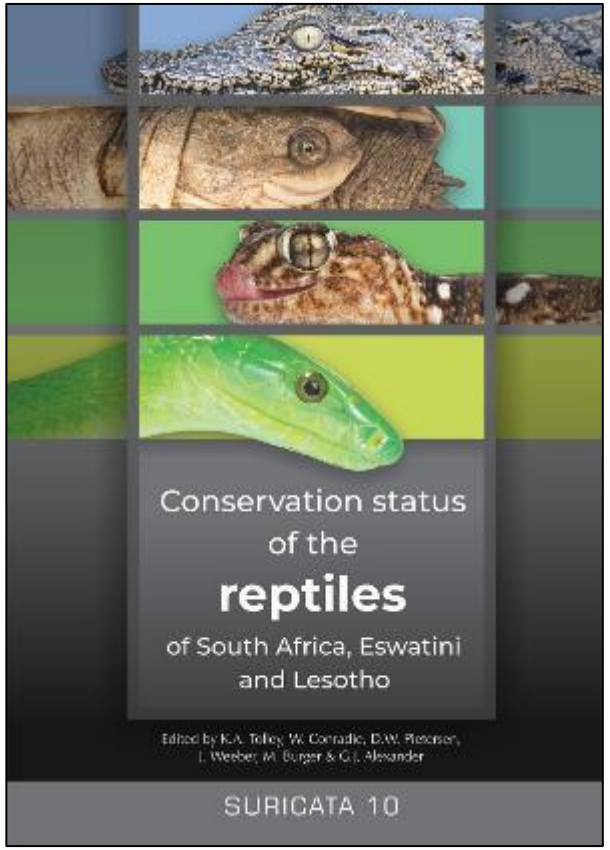




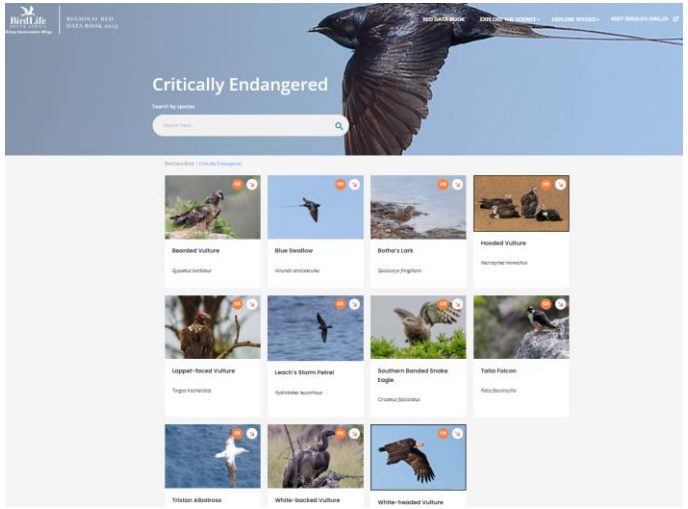
We are a pilot for the

GLOBAL ECOSYSTEMS ATLAS

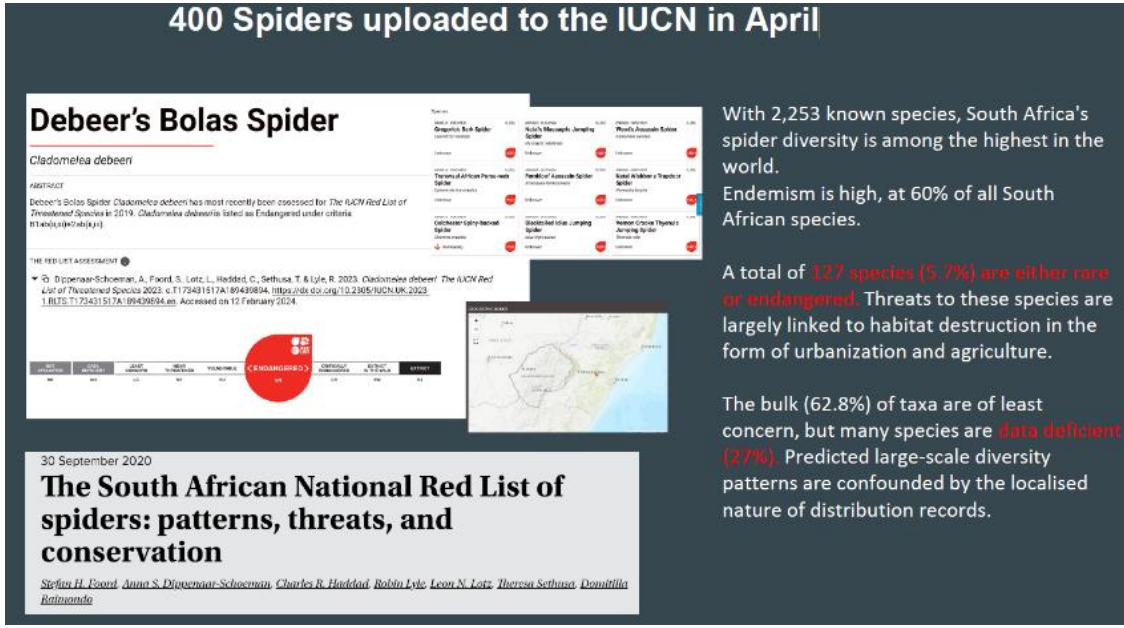
NBA 2025 - species



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/



NBA 2025 – Genetic diversity

Pilot study

National Genetic Indicators

95%

Populations Maintained (PM)[1]

of 112 species assessed

GBF complementary indicator

42%

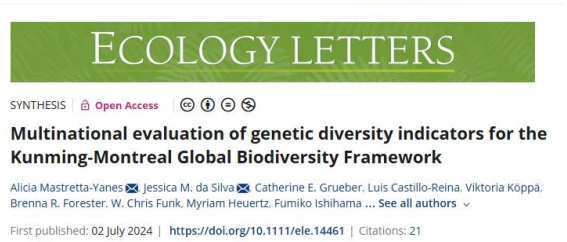
Populations with Ne > 500[2]

of 112 species assessed

GBF headline indicator

5

species being Monitored Genetically



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

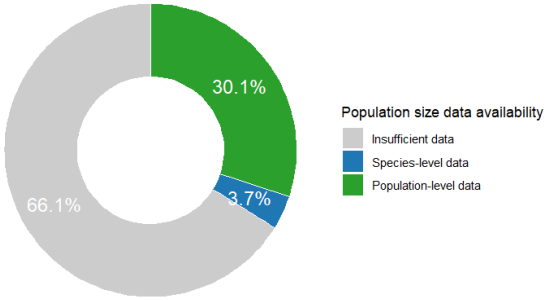
Updates
...in progress

Mammal Genetic Indicators

98.5%

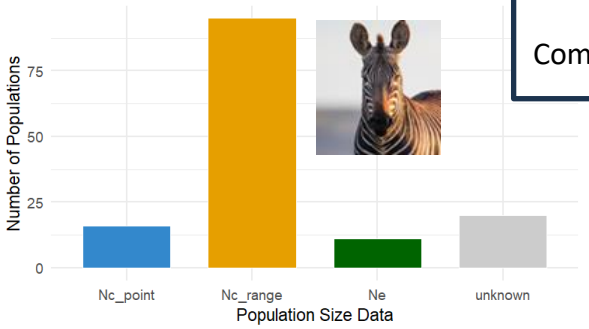
Populations Maintained (PM)[1]

of 322 mammals assessed



~ 1/3 of mammals have data on population size

Coming in 2026



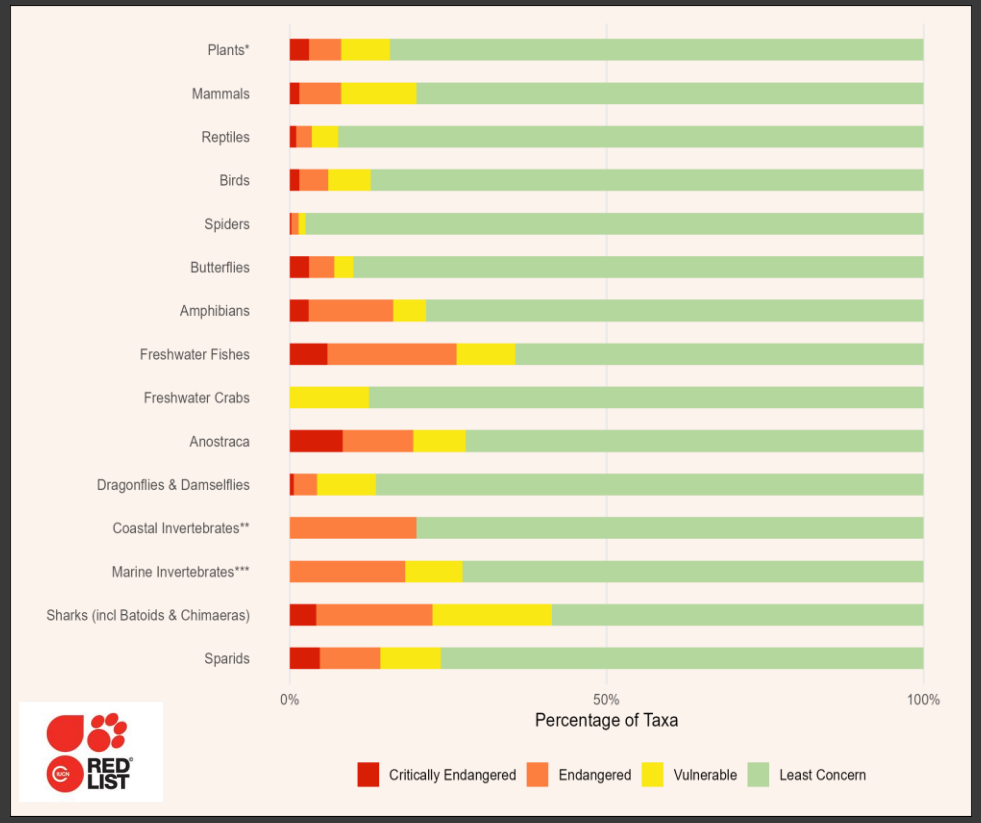
What data does exist is mainly based on broad census size

e.g., > 5,000, >10,000, <1,000

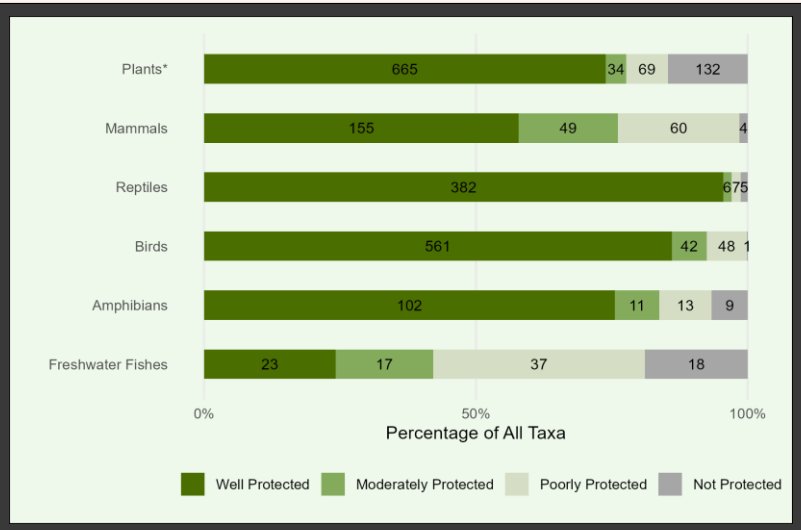
Headline Indicators of the NBA

Species

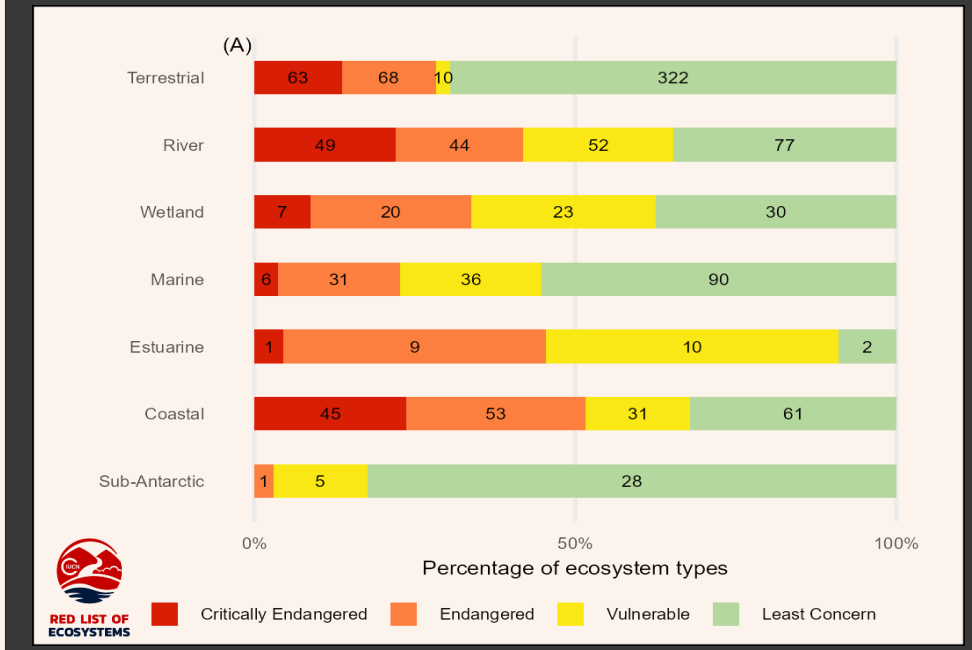
Threat Status

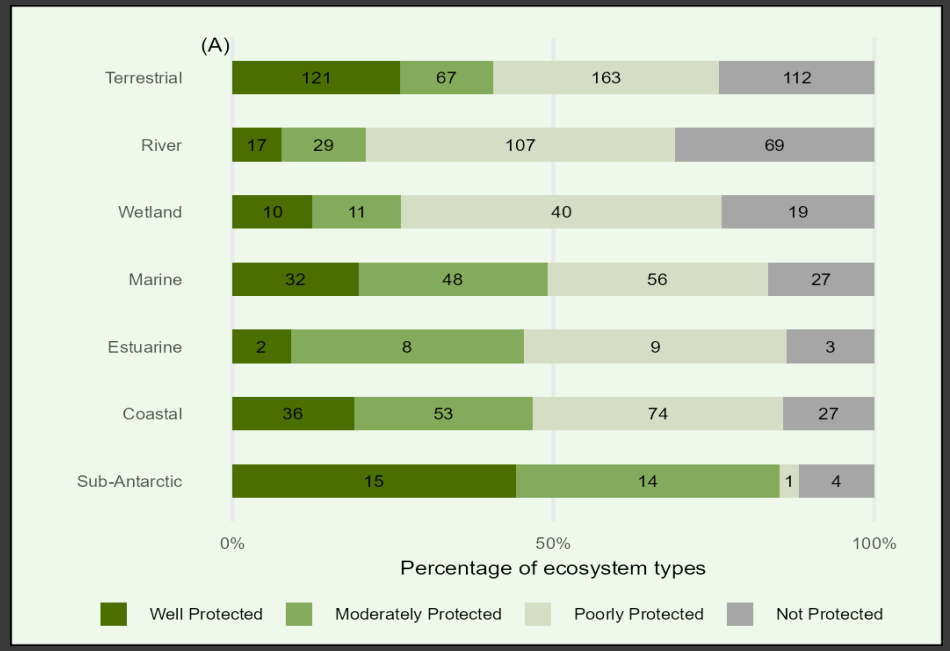


Protection Level



Ecosystems





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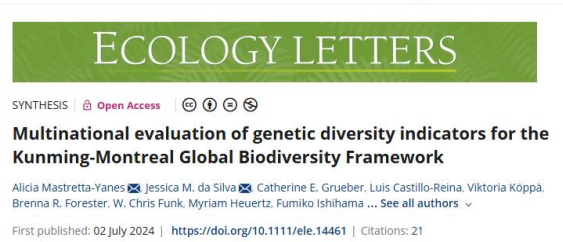

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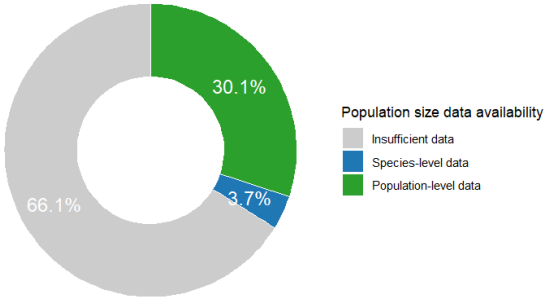

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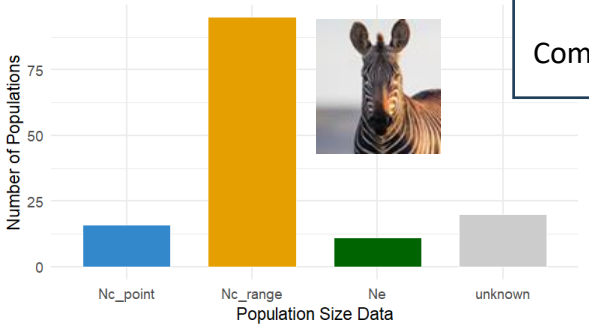

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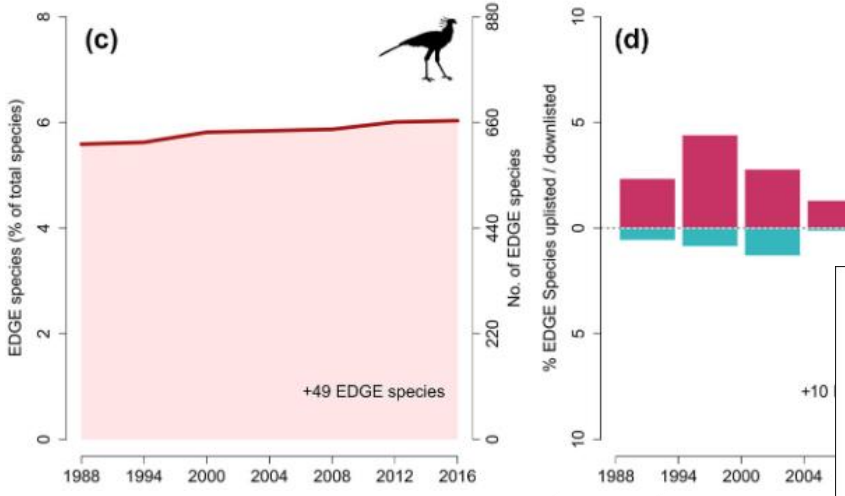
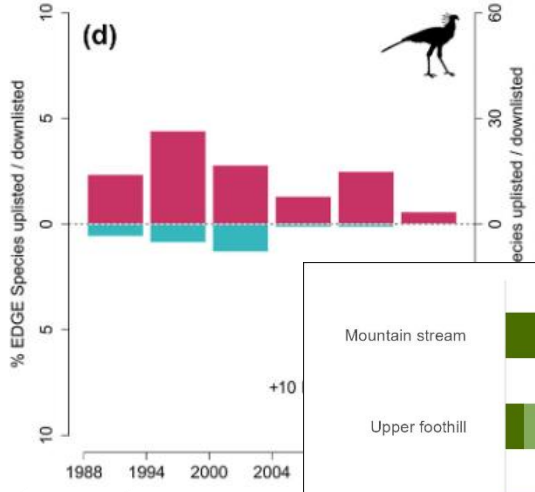
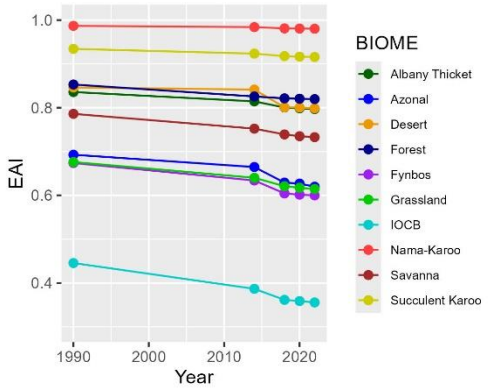
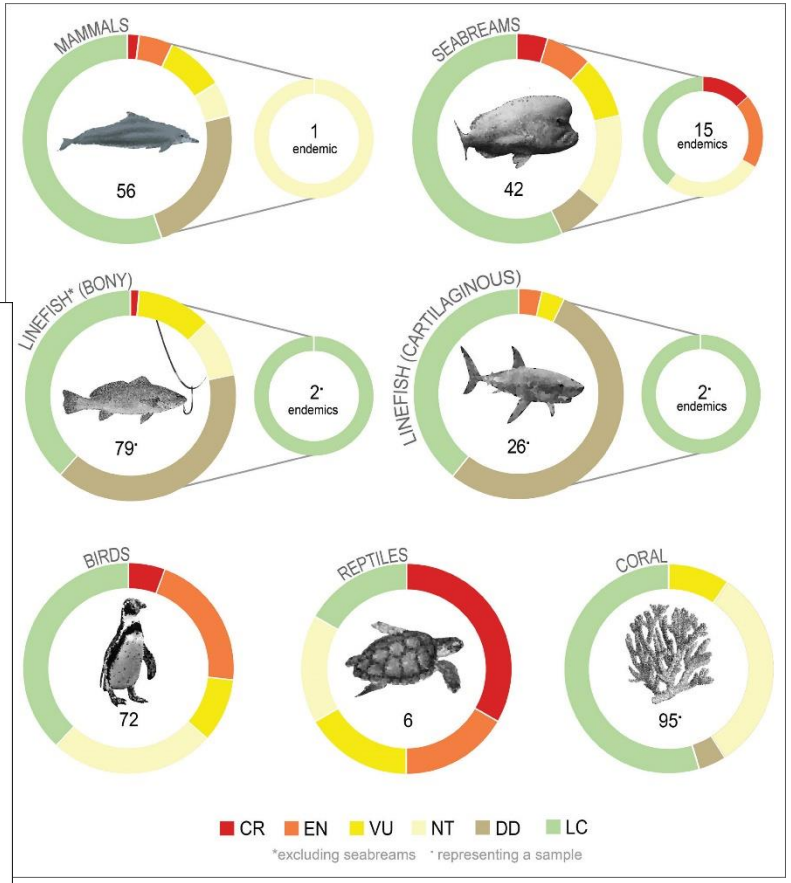
Content NBA 2025

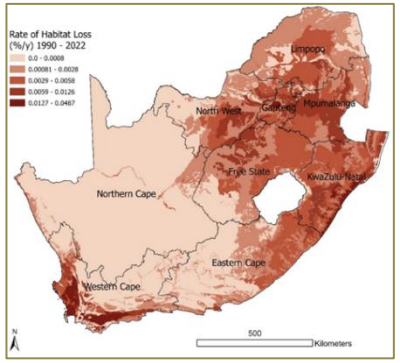
The NBA reports on the state of all of South Africa's species and ecosystems, across land and sea, and now includes aspects of genetic diversity. A range of indicators track the risks to biodiversity and the degree to which biodiversity is protected.

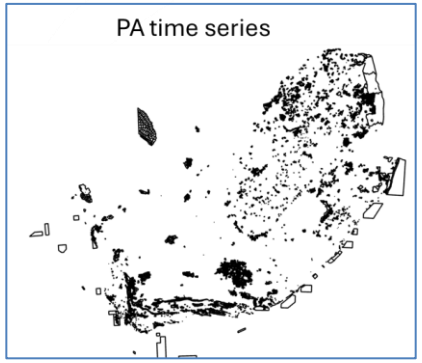


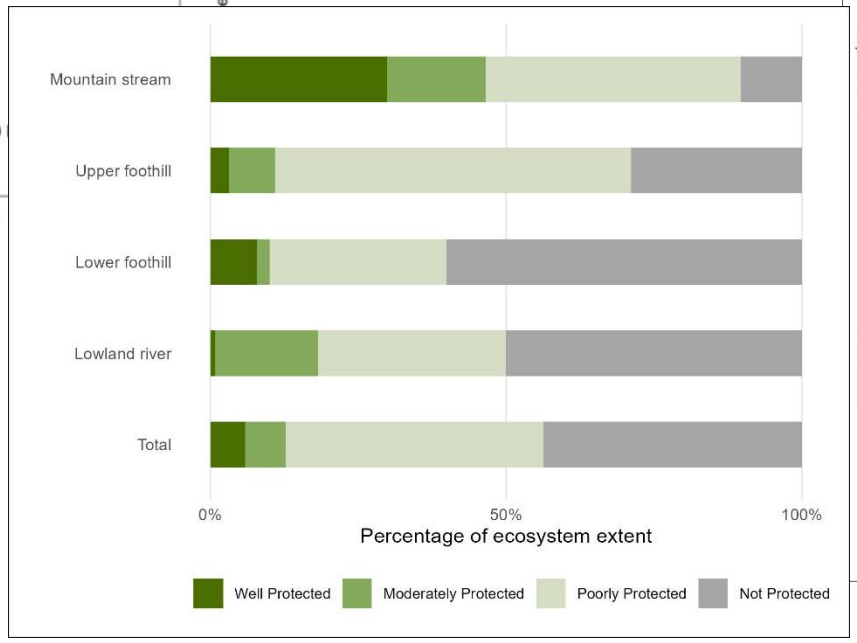




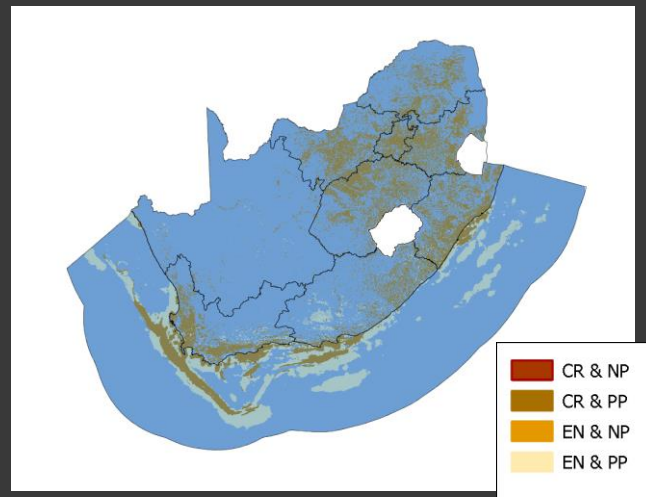


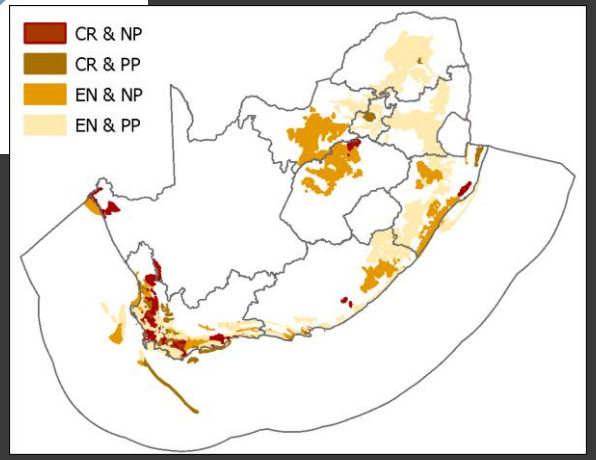


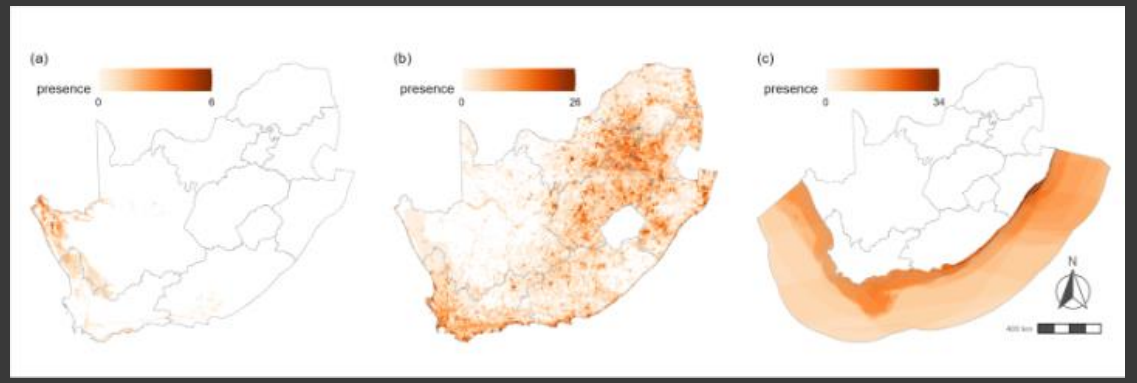


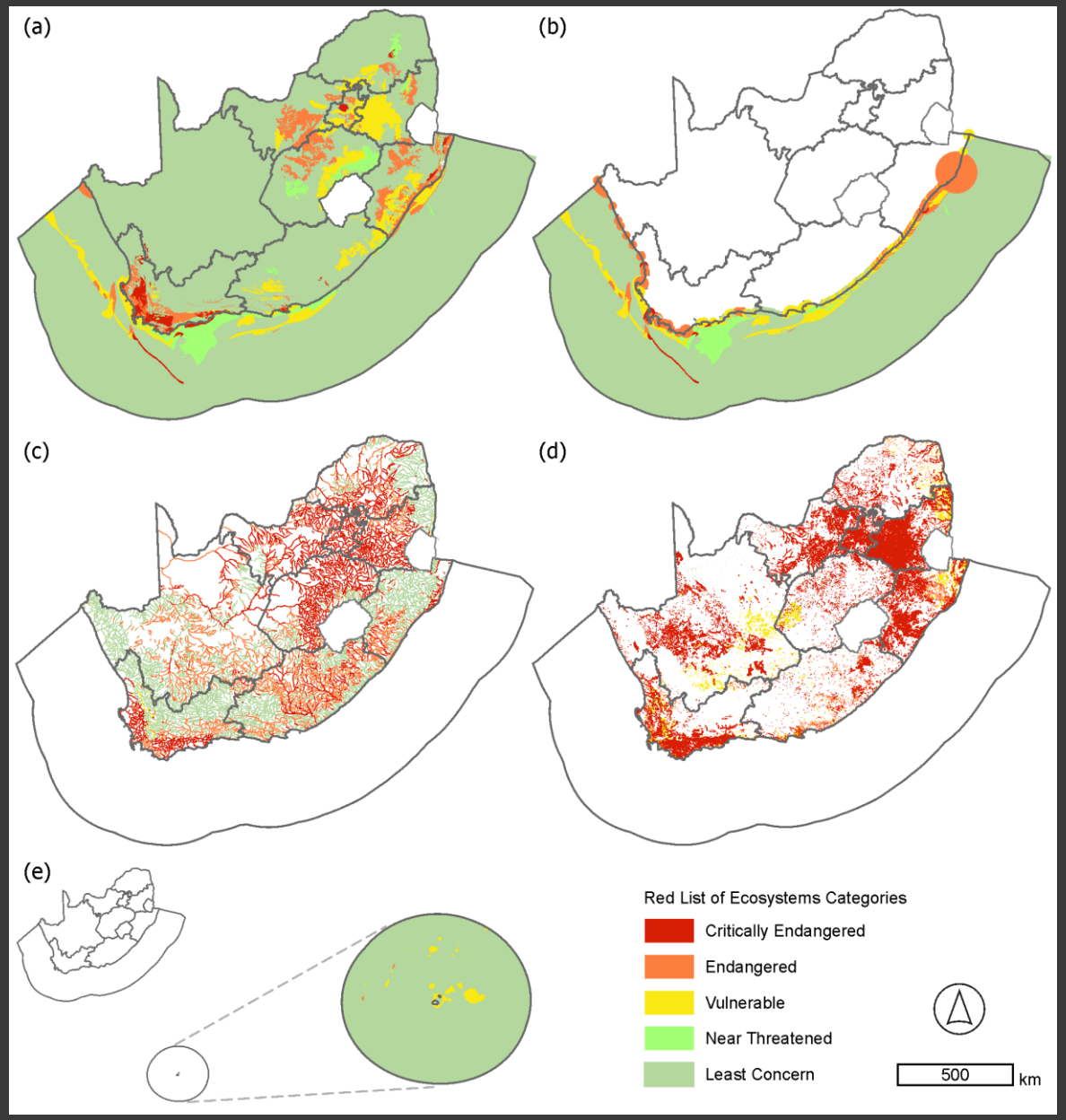


Indicators as maps









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

RED LIST OF ECOSYSTEMS

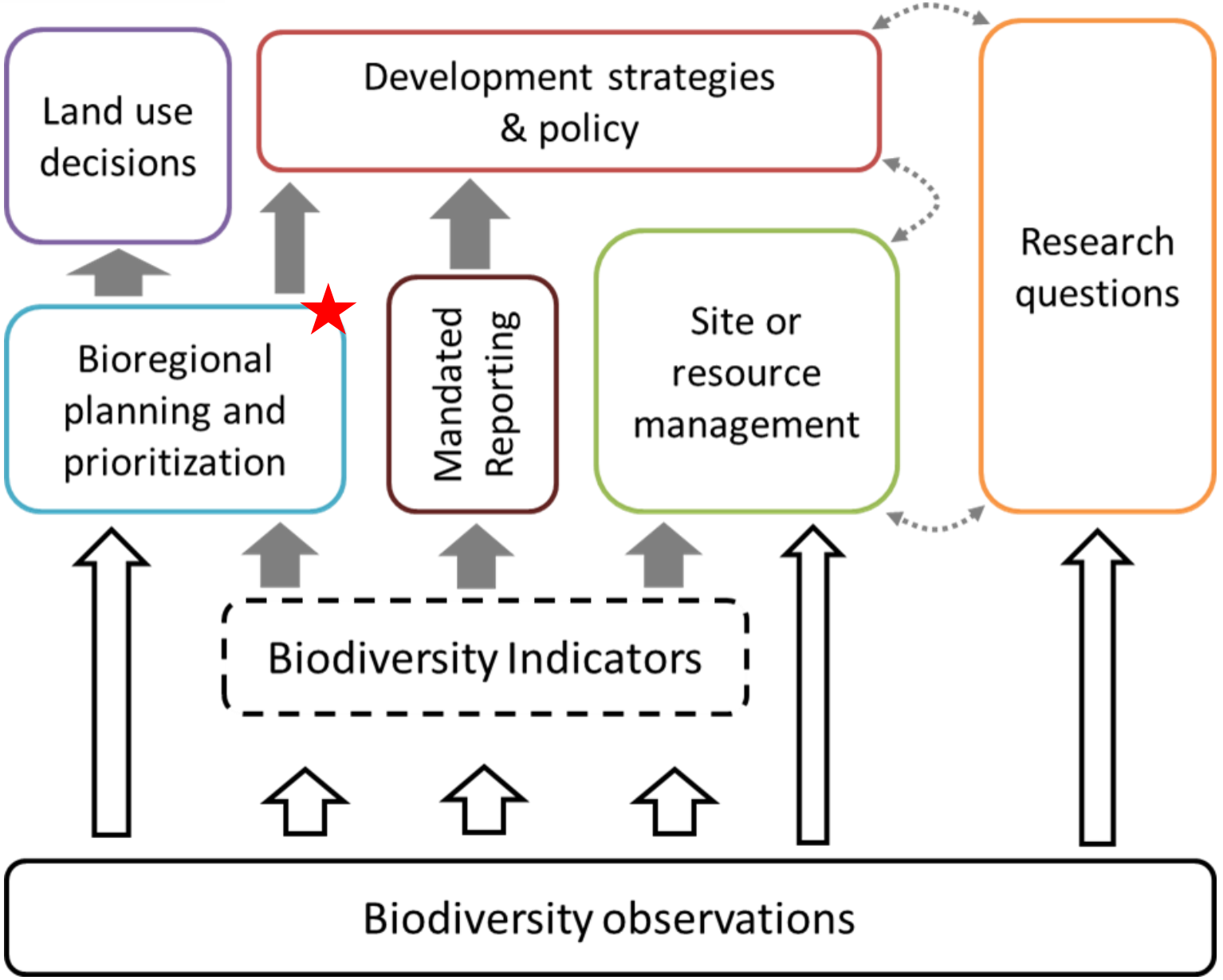
RED LIST

EDGE

KBA
KEY BIODIVERSITY AREAS

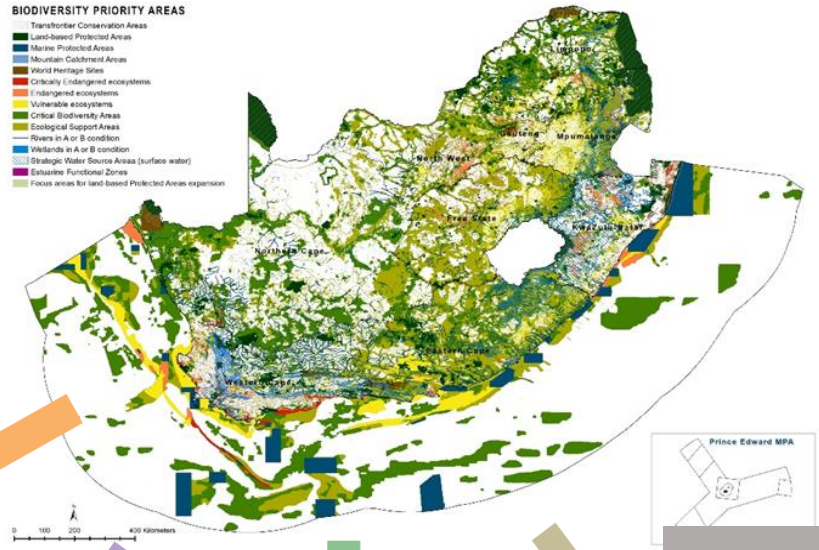
Kunming - Montreal
GLOBAL BIODIVERSITY FRAMEWORK

SANBI
Biodiversity for Life
South African National Biodiversity Institute



Tools for conserving biodiversity

4-way action plan



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

Avoid and reduce loss
- Land-use planning
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Protect
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Restore
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Reduce pressures
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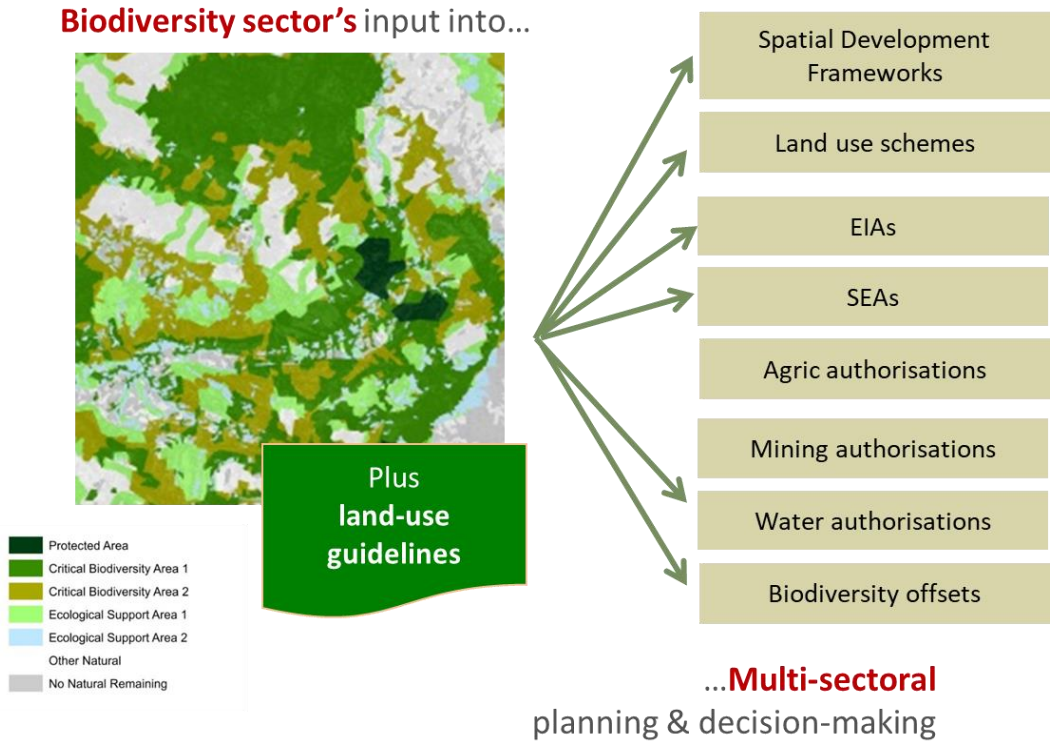
Tools for conserving biodiversity

- 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.

ISBN: 978-1-928224-72-3

THE BIODIVERSITY PLAN
For Life on Earth

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?

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.

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

1 Spatial datasets

Baseline map of ecosystem types

Map of current extent and condition — T2

Map of protected and conserved areas

Maps of species occurrence

2 Assessment

Risk status — Goal A

Ecosystems: CR, EN — T1

Species: VU, LC — T4, T5

RED LIST OF ECOSYSTEMS

RED LIST

Protection levels — T3

Ecosystems: Well protected; Moderately protected

Species: Poorly protected; Not protected — T4, T5

3 Prioritisation and planning

Basic prioritisation: Combines results of the assessment to identify areas that are threatened and under-protected.

Multi-criteria approach: Uses criteria to identify important sites for biodiversity, drawing from the foundational datasets and results of the assessment.

KBA KEY BIODIVERSITY AREAS — T1, T2, T3

Systematic conservation planning: Identifies a portfolio of biodiversity priority areas based on biodiversity targets. Can include a range of additional data on ecological processes, ecosystem services, constraints and opportunities.

28% 22% 30% — T1

Priority areas

Products

Maps of threatened or under-protected ecosystems and species, and priority areas for conservation action. — T1, T3, T21

Accompanying guidelines that interpret the outputs to make them useful to end-users.

Mainstreaming biodiversity

The products have relevance for policy, planning, decisions and action. — T14, T15

Mainstreaming Biodiversity Priorities gives advice on how to go about using the spatial products

INFORMATION → ACTION

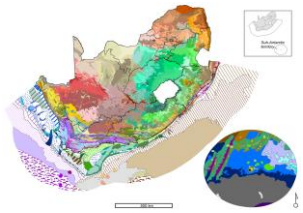
Convention on Biological Diversity

IEM

Genetic Diversity data

Species Data Collection & Taxonomy

Ecosystem Classification & Mapping



Species Assessments

Ecosystem Assessments

Ecosystem Condition Assessment

National Biodiversity Assessment

Biodiversity Targets

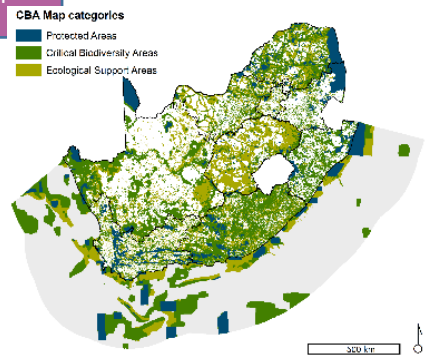
Key Biodiversity Areas

Natural Capital Accounts

Mainstreaming Biodiversity

Decisions & Strategies & Policies

Biodiversity Planning & Prioritisation



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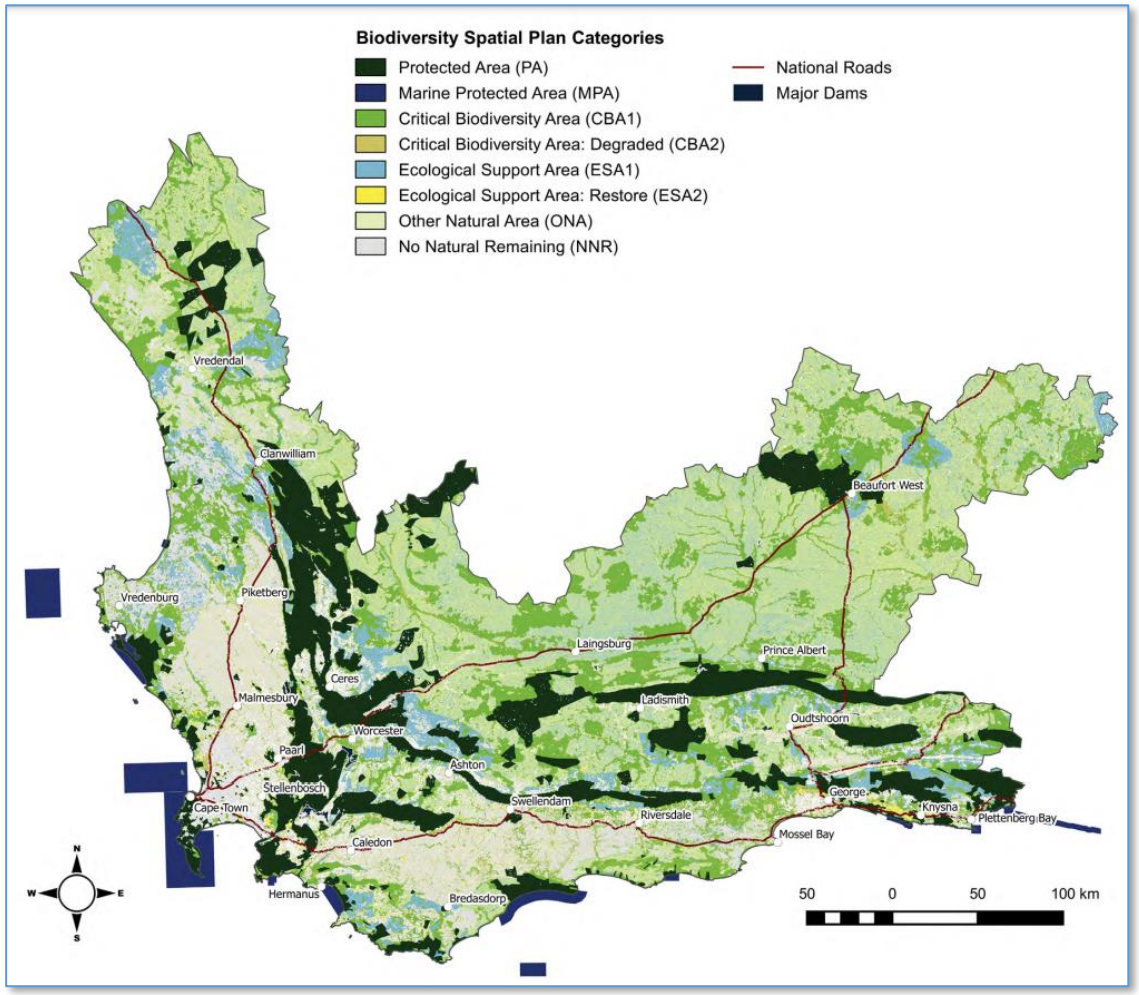

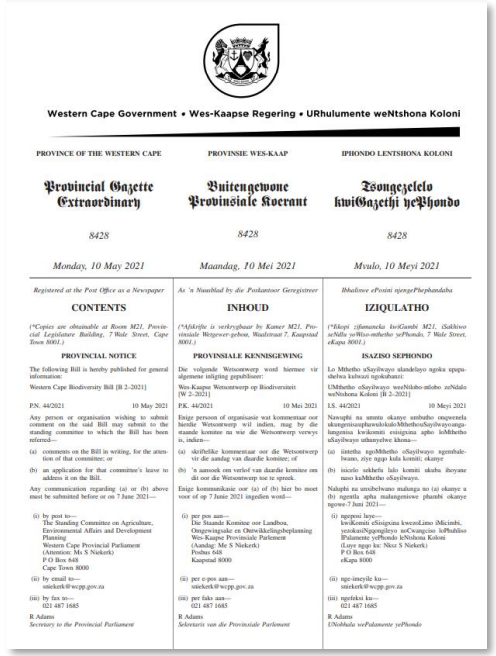

Western Cape Government • Wes-Kaapse Regering • URhulumente weNtshona Koloni

PROVINCE OF THE WESTERN CAPE — PROVINSIE WES-KAAP — IPHONDO LENTSHONA KOLONI

Provincial Gazette Extraordinary — Buitengewone Provinsiale Koerant — Tsongezelelo kwiGazethi yePhondo

8428 — 8428 — 8428

Monday, 10 May 2021 — Maandag, 10 Mei 2021 — Mvulo, 10 Meyi 2021

CONTENTS — INHOUD — IZIQULATHO

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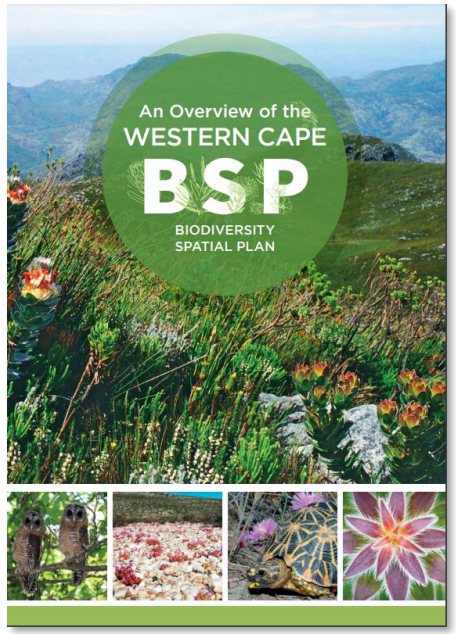
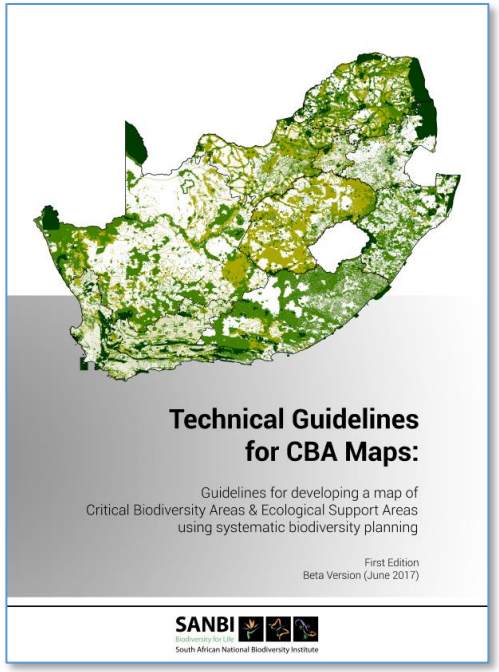


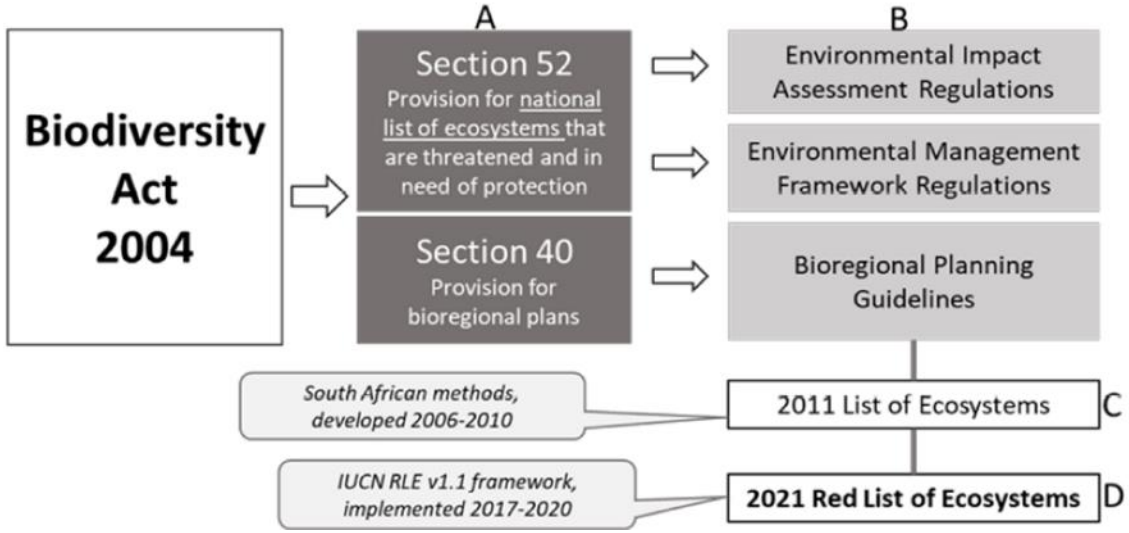


South African NATIONAL PARKS

Western Cape Government
Environmental Affairs & Development Planning

CapeNature

Tools for conserving biodiversity

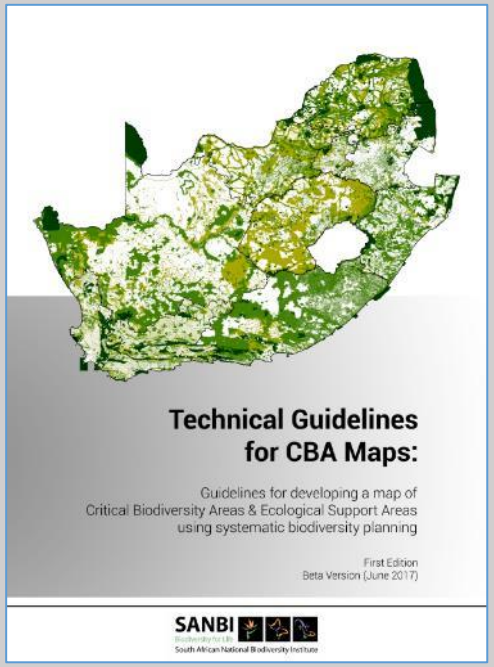


Mandatory EIA Screening

Listing Notice 3 Triggers for EIA Environmental Authorisations

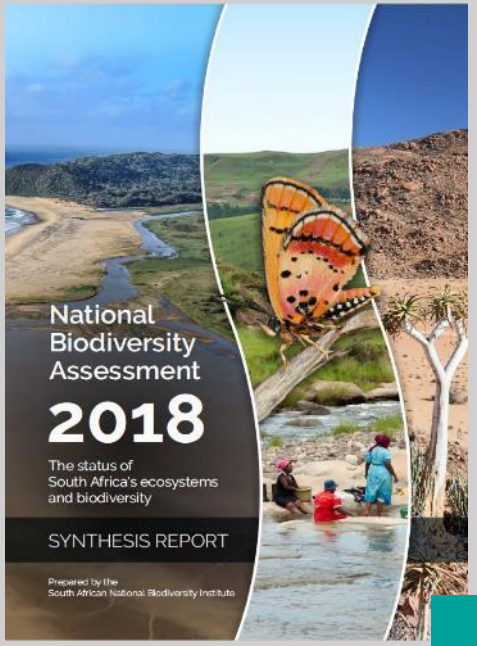
http://ecosystemstatus.sanbi.org.za

https://screening.environment.gov.za



Conservation Plans

http://biodiversityadvisor.sanbi.org



Reporting

http://nba.sanbi.org.za

TNFD Taskforce on Nature-related Financial Disclosures

Convention on Biological Diversity

KUNMING MONTREAL GLOBAL BIODIVERSITY FRAMEWORK