

SANBI

Biodiversity for Life

South African National Biodiversity Institute



National Biodiversity Monitoring

Indicators for Species and Ecosystems

2017 Joint Forum: BIM and FBIP, Salt Rock, KZN

Andrew Skowno, Stephen Holness, Jeffrey Manuel

Celebrating biodiversity for the benefit and enjoyment of all South Africans

www.sanbi.org

What is biodiversity monitoring?

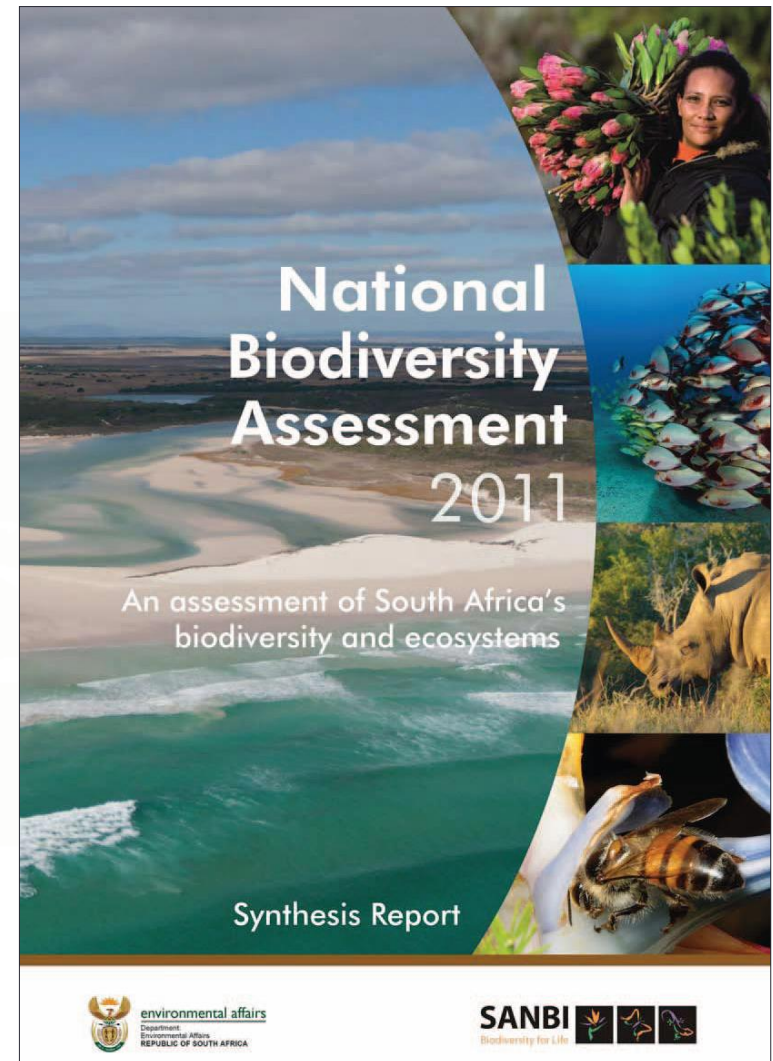
Systematic focused **observation** and measurement of changes of **biodiversity** in its various forms (genes, taxa, structure, function & ecosystems), usually within a **defined context** (e.g. a research question, management goal or policy focused reporting)

Benefits of Monitoring

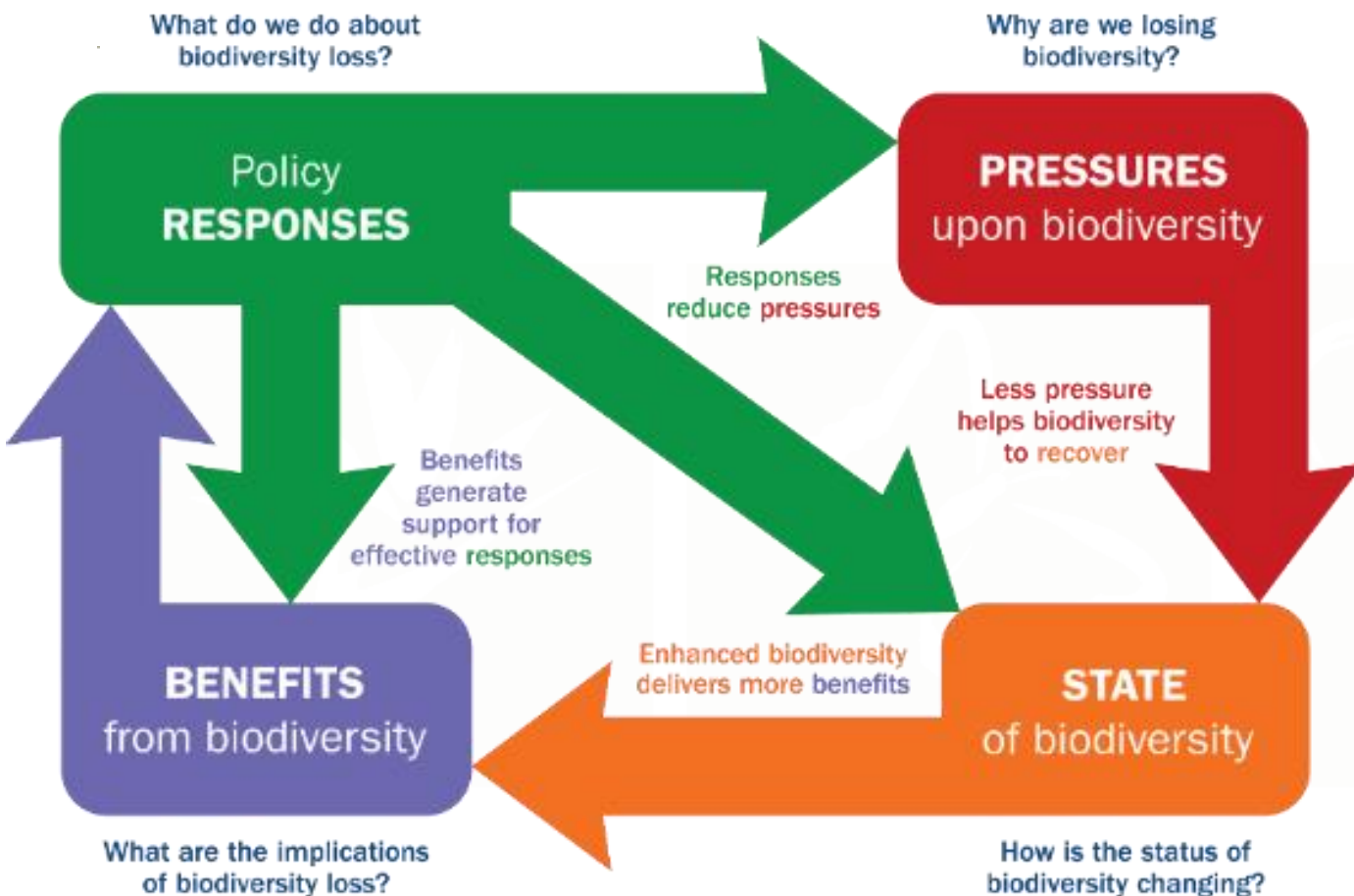
- **Learn about the system:** How ecological systems function & respond to environmental cycles and management interventions.
- **Discovery:** Uncovering unexpected events, such as threats to biodiversity, serendipitously.
- **Guide Policy:** Providing decision makers with synthesised information on ecological changes on which to base env policies.
- **Adaptive management:** Choosing management actions that are relevant to changes in the state of the system being monitored.
- **Communicating science:** Engaging stakeholders on ecological issues to increase effort and support for monitoring and management.

SANBI's monitoring mandate

- *‘to monitor and report on the status of biodiversity in South Africa’.*
- *‘...to provide science-based policy advice’.*
- Part of this mandate is met through the **NBA**.
- The NBA focusses specifically on **high-level indicators** for species and ecosystems.
- Revised every 7 years.



Monitoring and Indicators



- Indicators are purpose-dependent. Framing depends on issue/concern.
- In the NBA, we primarily focus on **State** and **Pressure** indicators, to address biodiversity loss and protection.

www.bipindicators.net



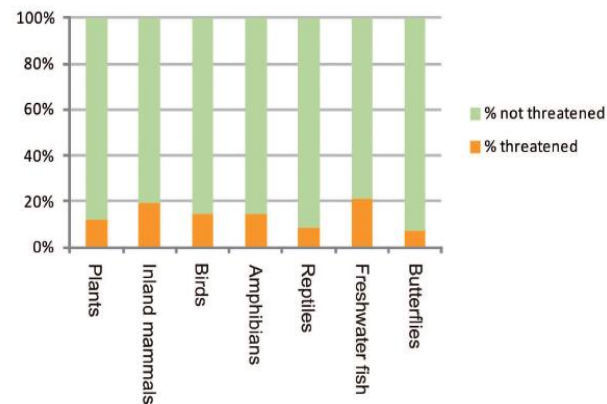
NBA Headline Indicators

NBA Indicator

Threat Status

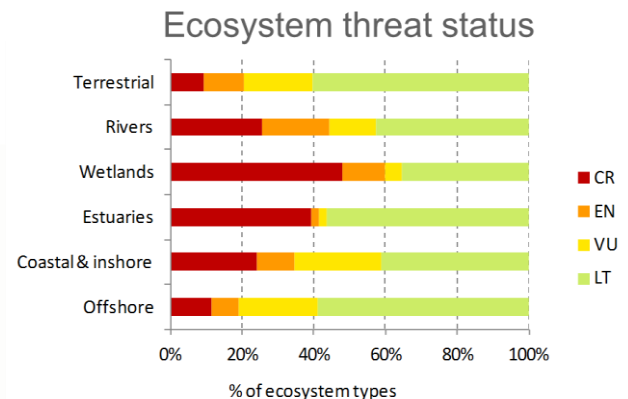
Species

(IUCN Red List)



Ecosystems

(SA & IUCN Red Lists)

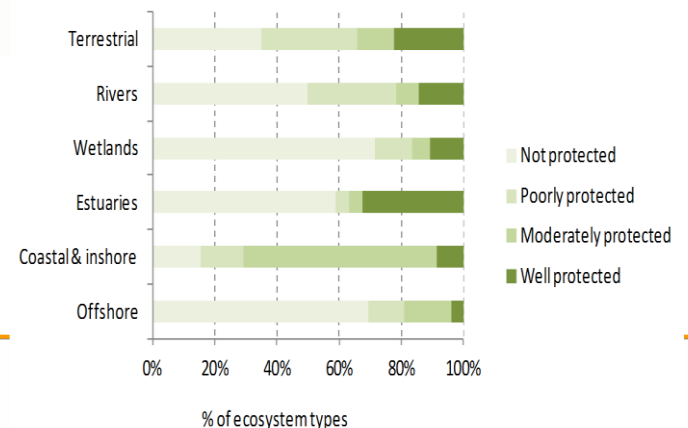


Protection Level

South African Species Protection Level

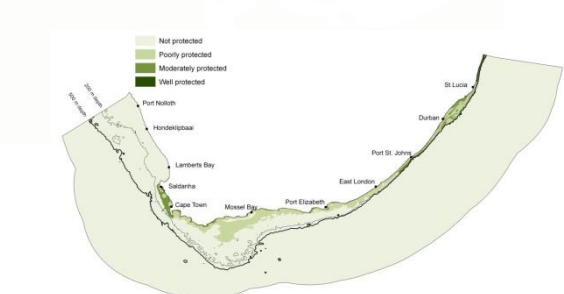
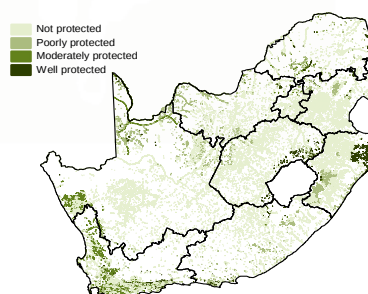
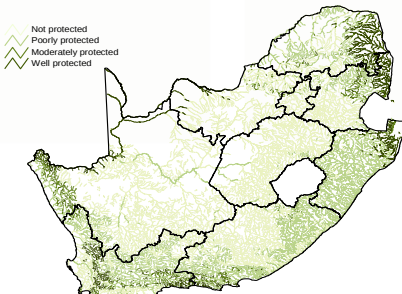
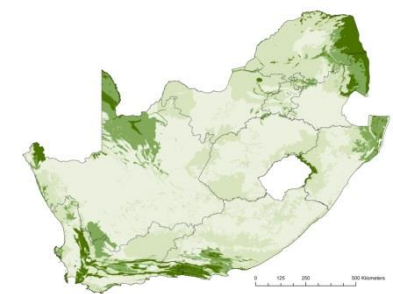
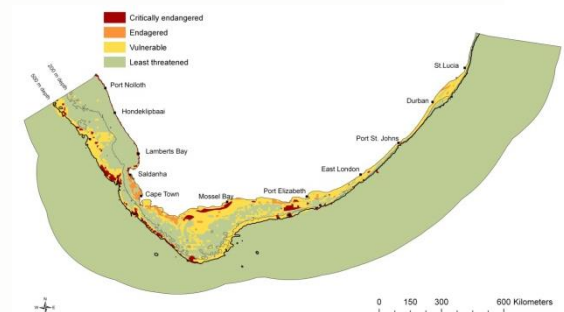
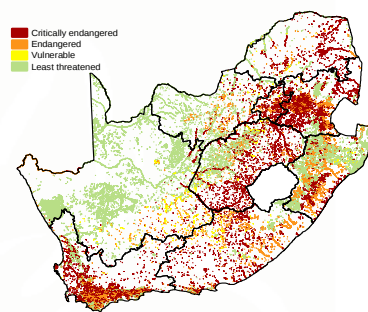
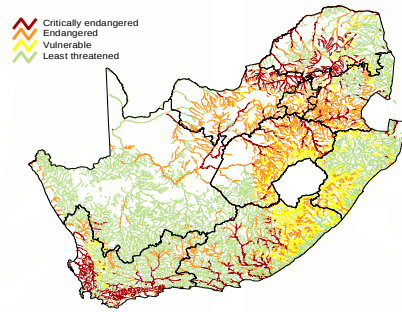
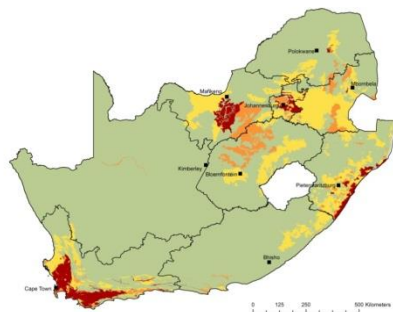
(under development)

South African Ecosystems Protection Level

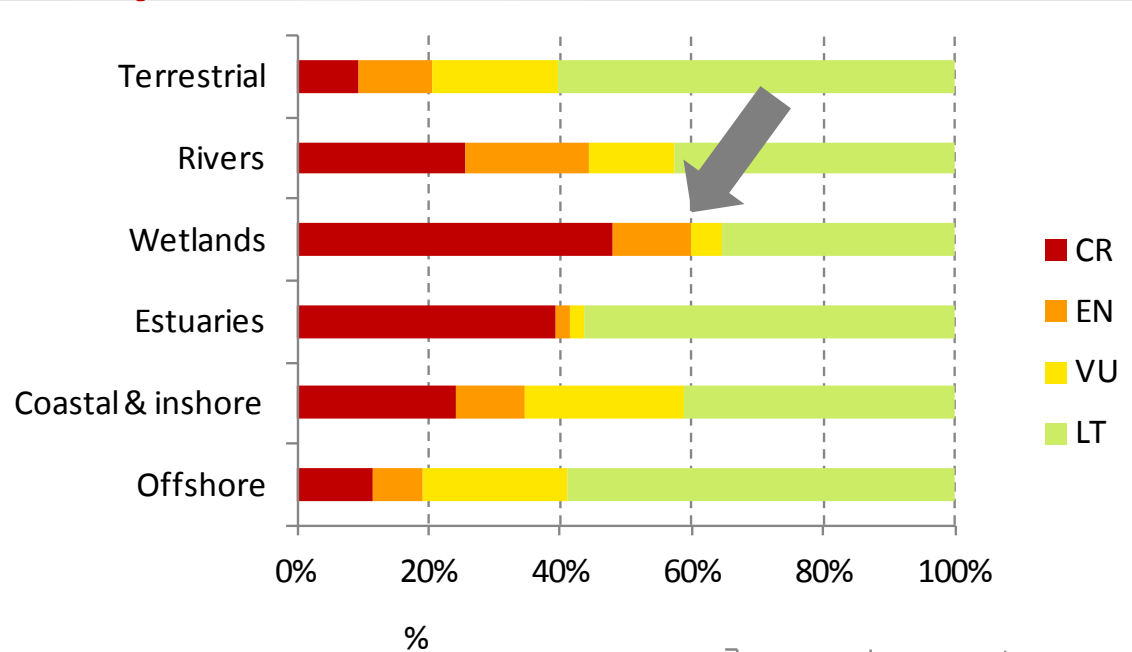


National Ecosystem Headline Indicators

- How threatened are our ecosystems?
- How well protected are our ecosystems?

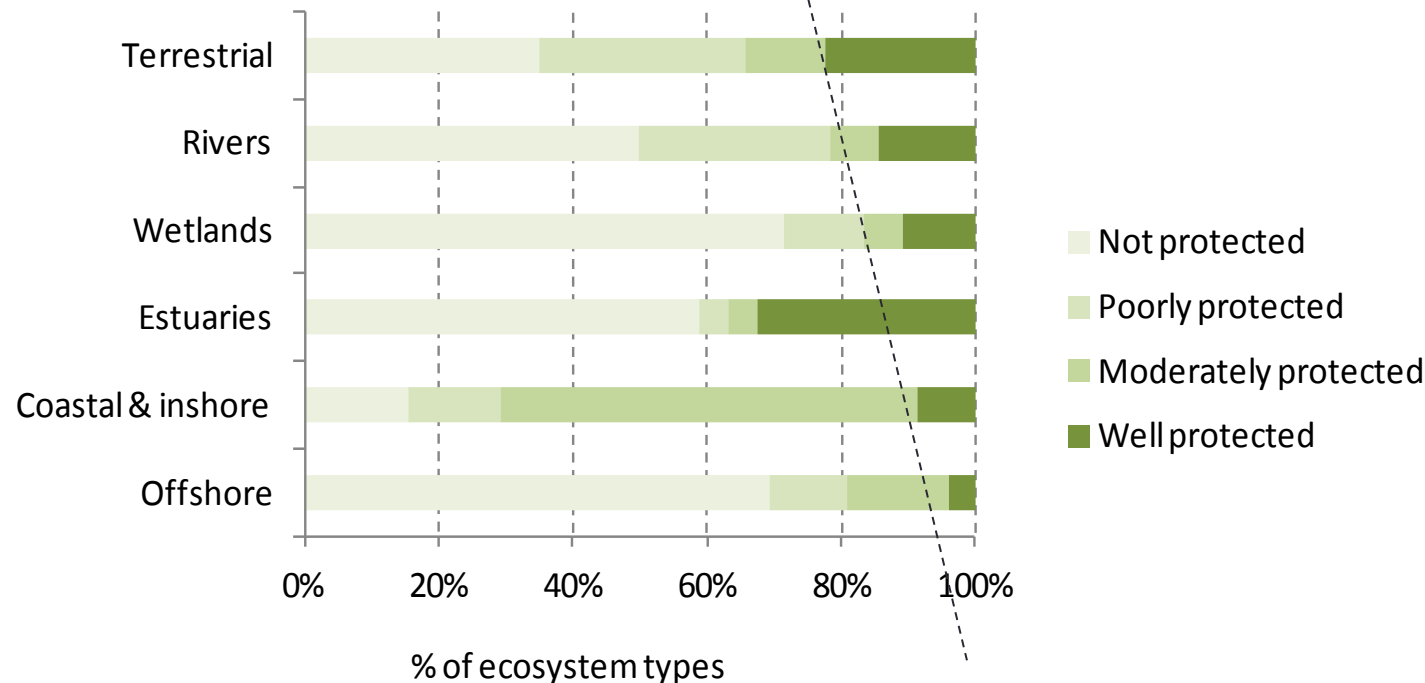


Ecosystem threat status



Powerful indicators that can be simply displayed

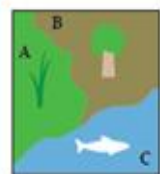
Ecosystem protection level



Developing Ecosystem Indicators

Four key datasets

1



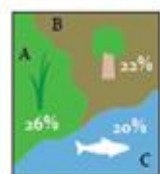
Map of ecosystem types



Map of ecological condition



Map of protected areas



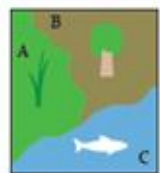
Biodiversity targets for ecosystem types

Assessment

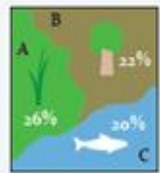
2

Biodiversity assessment provides two useful high-level indicators of biodiversity status:

Ecosystem threat status



Step 1: Map and classify ecosystem types.



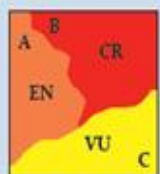
Step 2: Set biodiversity targets for ecosystem types.



Step 3: Map ecological condition.

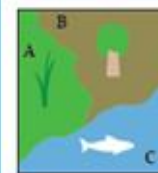


Step 4: Determine the proportion of each ecosystem type that is still in good ecological condition.

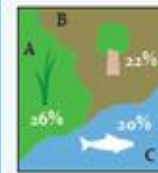


Step 5: Evaluate this proportion against the biodiversity target and other thresholds to assign ecosystem threat status category.

Ecosystem protection level



Step 1: Map and classify ecosystem types.



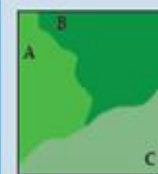
Step 2: Set biodiversity targets for ecosystem types.



Step 3: Map existing protected areas.



Step 4: Determine the proportion of each ecosystem type that is included in the existing protected area network.



Step 5: Evaluate this proportion against the biodiversity target to assign ecosystem protection level category.

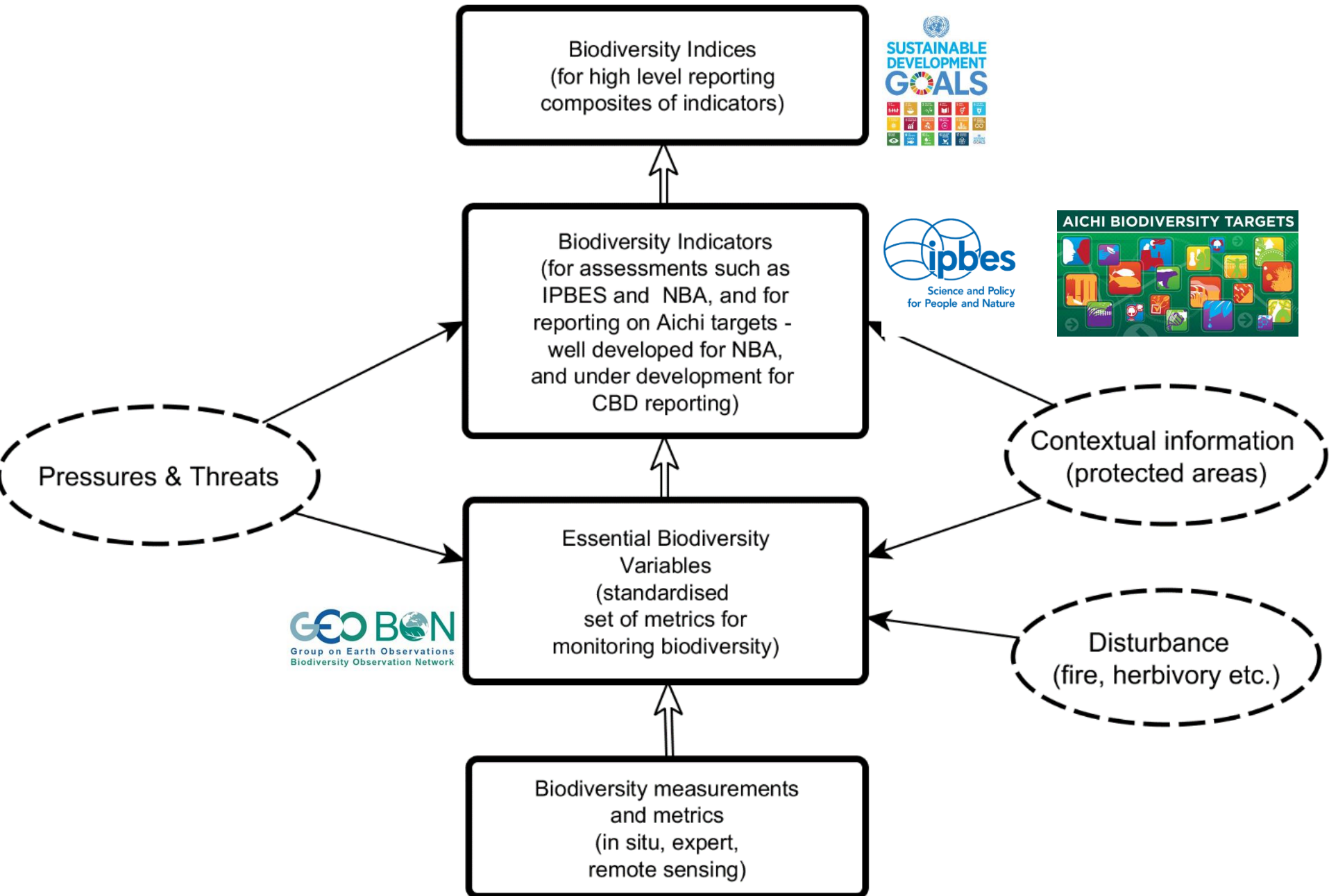
Ecosystem Red Lists and Protection Level GAPS

- Refined Ecosystem Classification Systems and maps
 - Terrestrial is stable.
 - Freshwater and Estuarine realms stabilized by 2018.
 - Marine ecosystem typologies and maps are limited by basic data availability.
- Standardised Ecological Condition Classification and assessments.
- Conceptual models of ecosystem collapse

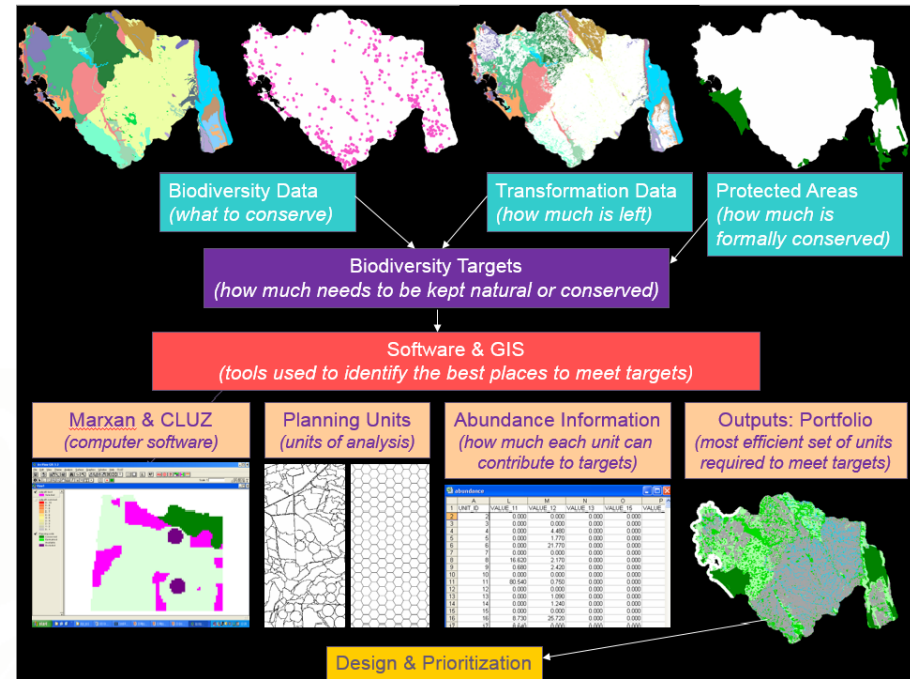
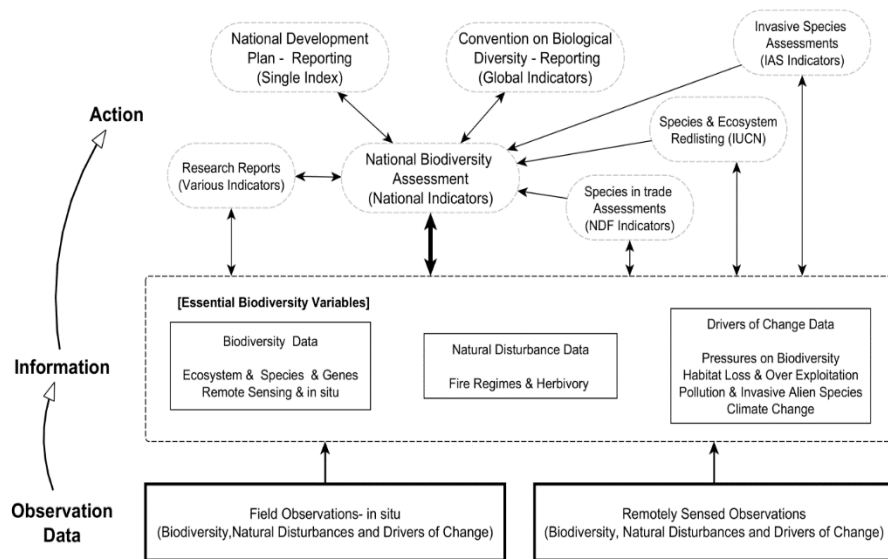
Species Red Lists and Protection Levels GAPS

- Taxonomic coverage
- Species distribution
- Repeat assessments
- Understanding efficacy of PAs for different taxa

Moving towards standardised indicators

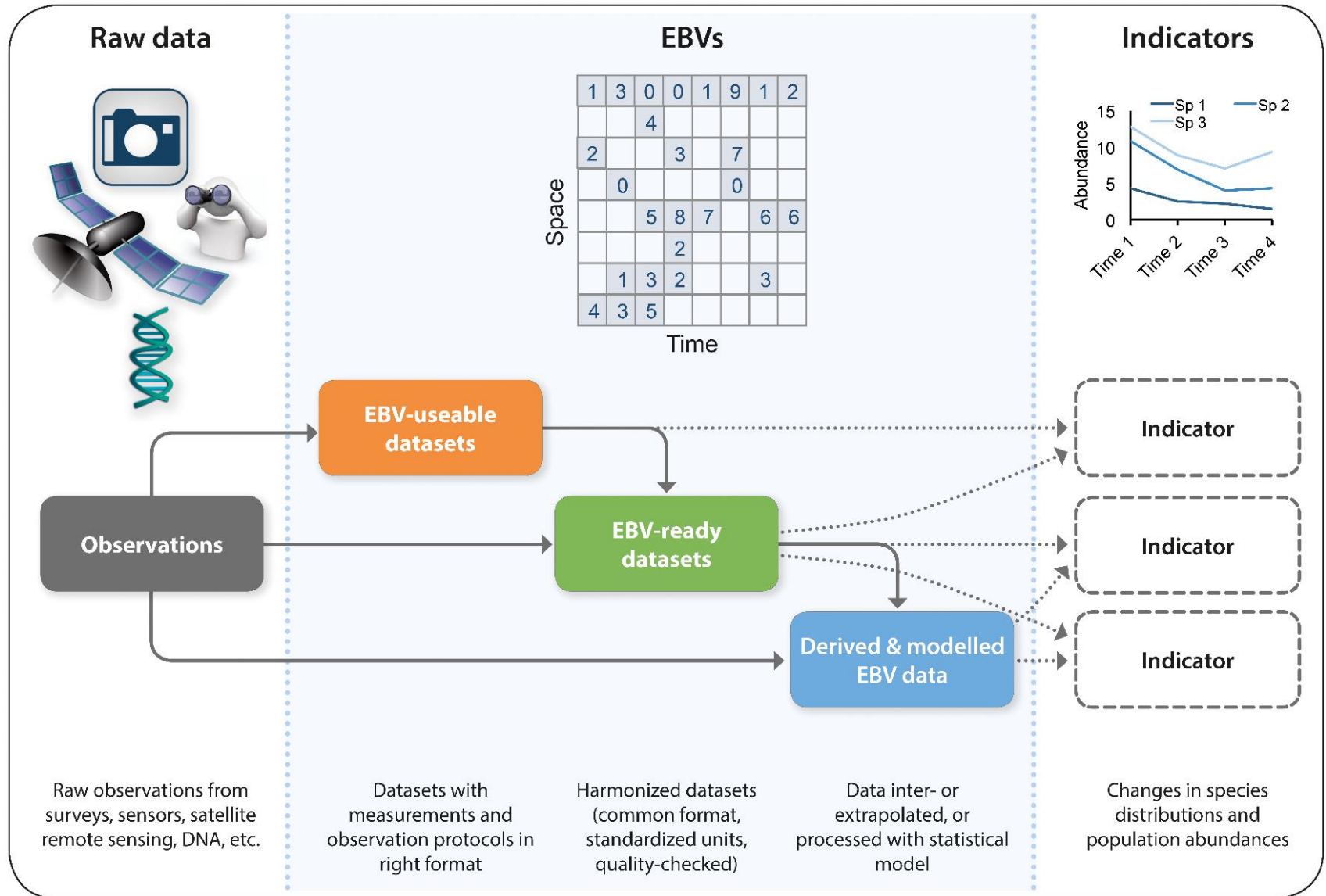


The need for a National Biodiversity Information System



- **The same input data** is used in populating indicators and in biodiversity prioritization processes.
- For both monitoring and prioritization a **national biodiversity information system** is an essential foundational element.
- Without a NBIS, processes will continue to be developed independently and inefficiently.

Constructing new (standardised) indicators



Informatics PRIORITIES, ranked

- Quality control and integrity of data
- Taxonomic matching and reconciliation
- Standardised workflow approach
- Balancing automation and expert input
- Repeatability of workflows
- Implementing a data cube approach (Taxonomy, Space, Time)
- Data products, storage and publishing
- Standardization
- ICT scenarios and linking across infrastructures



Thank you

