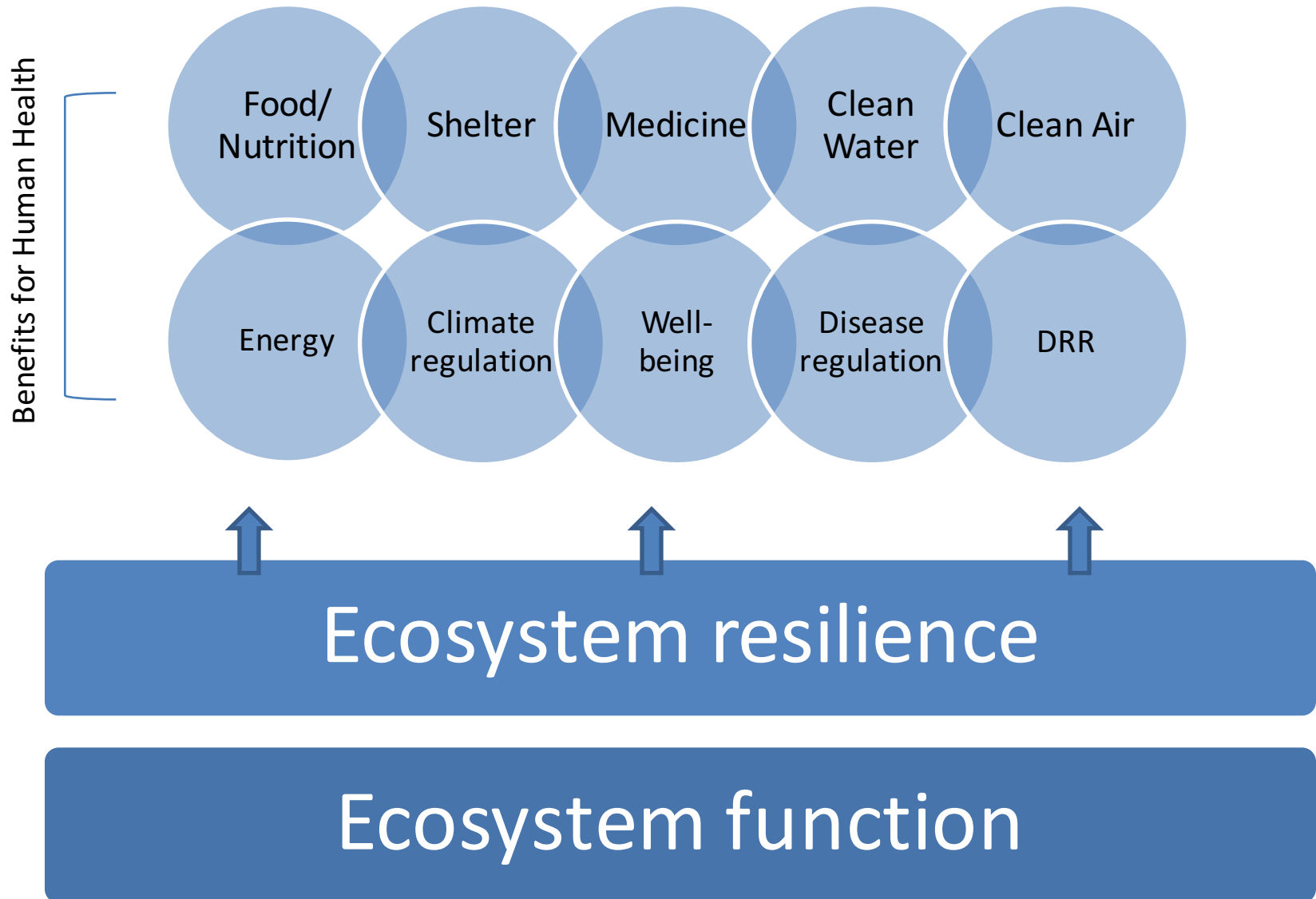# IUCN RED LIST OF ECOSYSTEMS & IMPLICATIONS FOR HUMAN HEALTH
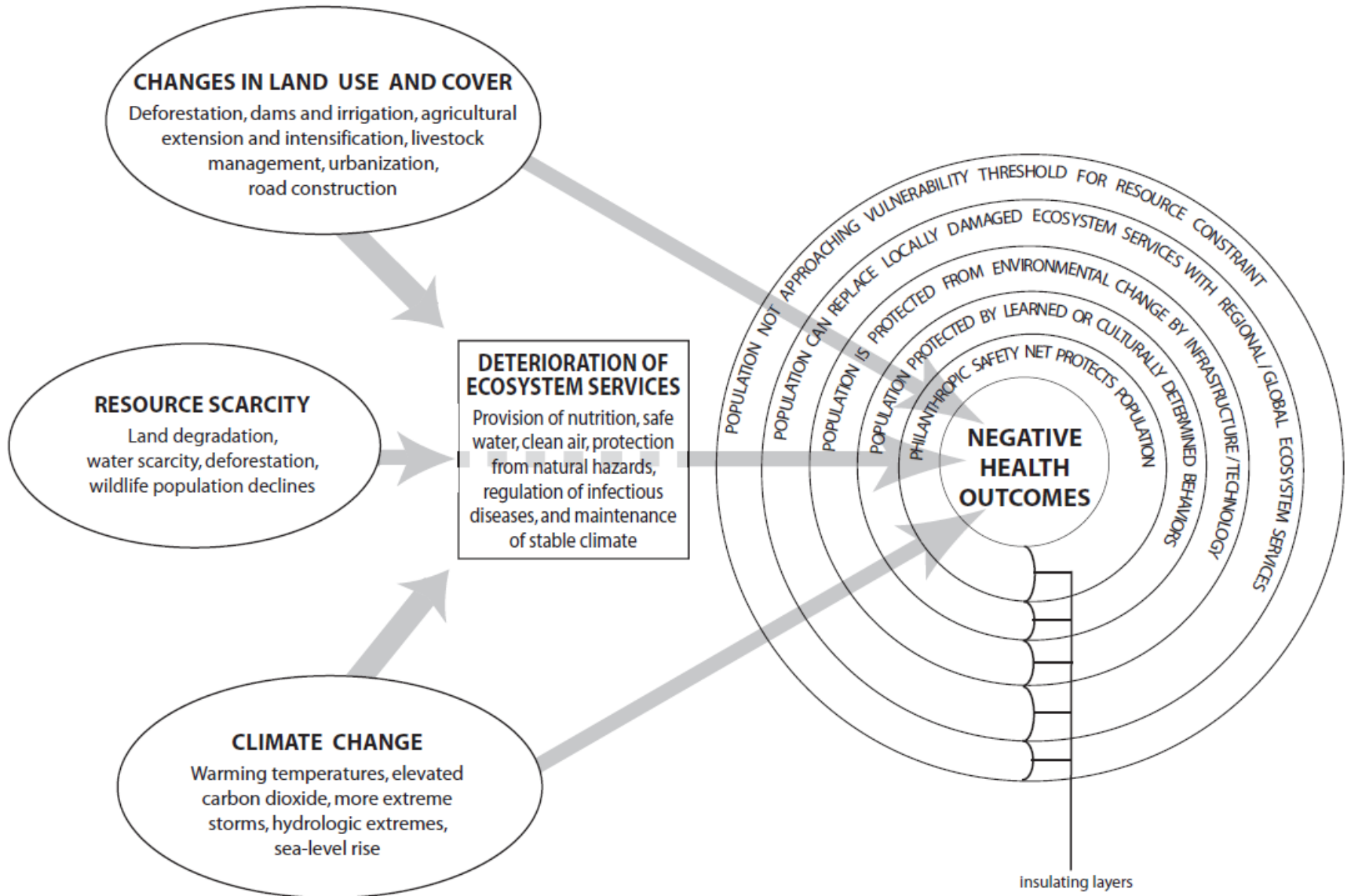
Rebecca Miller

CBD Regional Workshop on the Linkages Between Biodiversity and Health in the European Region

Helsinki, Finland, 23 October 2017

BIODIVERSITY-HEALTH LINKAGES

Benefits for Human Health

Food/ Nutrition · Shelter · Medicine · Clean Water · Clean Air

Energy · Climate regulation · Well-being · Disease regulation · DRR

Ecosystem resilience

Ecosystem function

IUCN CEM

CHANGES IN LAND USE AND COVER
Deforestation, dams and irrigation, agricultural extension and intensification, livestock management, urbanization, road construction

RESOURCE SCARCITY
Land degradation, water scarcity, deforestation, wildlife population declines

DETERIORATION OF ECOSYSTEM SERVICES
Provision of nutrition, safe water, clean air, protection from natural hazards, regulation of infectious diseases, and maintenance of stable climate

CLIMATE CHANGE
Warming temperatures, elevated carbon dioxide, more extreme storms, hydrologic extremes, sea-level rise

POPULATION NOT APPROACHING VULNERABILITY THRESHOLD FOR RESOURCE CONSTRAINT
POPULATION CAN REPLACE LOCALLY DAMAGED ECOSYSTEM SERVICES WITH REGIONAL/GLOBAL ECOSYSTEM SERVICES
POPULATION IS PROTECTED FROM ENVIRONMENTAL CHANGE BY INFRASTRUCTURE/TECHNOLOGY
POPULATION PROTECTED BY LEARNED OR CULTURALLY DETERMINED BEHAVIORS
PHILANTHROPIC SAFETY NET PROTECTS POPULATION

NEGATIVE HEALTH OUTCOMES

insulating layers

Meyers et al. 2013 *PNAS*

- Which ecosystems are most at risk of large changes that involve loss of diversity?

- How great are the risks?

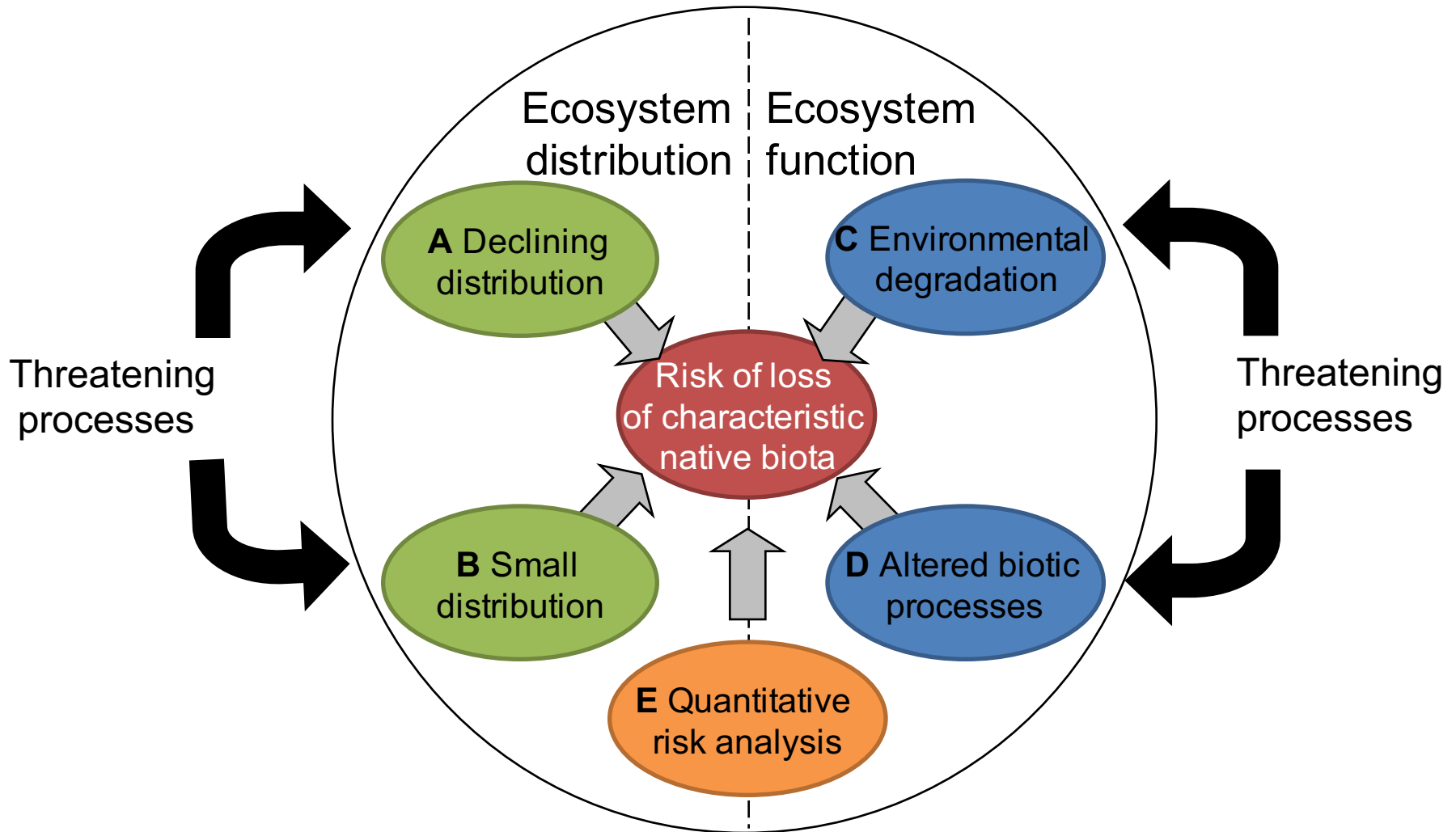- How soon are the changes likely to occur?

1. A **standard method** for assessing and comparing risks of ecosystem collapse.
2. **Easily understood** by policy makers and the public.
3. **Transparent**, **objective** and **scientifically rigorous**.
4. Applicable to **terrestrial**, **marine**, **freshwater** and **subterranean** ecosystems.
5. Allows risk assessment of **local to global areas**.
6. **Flexible** to use data of varying quality and coverage.
7. Focus on **ecological processes** not just patterns.
8. Ecosystems & ecosystem services as essential components of **planning & policy**.

Goal:

Support conservation in resource use and management decisions by identifying ecosystems most at risk of biodiversity loss

ASSESSING ECOSYSTEM CHANGE

Ecosystem distribution | Ecosystem function

A Declining distribution

C Environmental degradation

Risk of loss of characteristic native biota

B Small distribution

D Altered biotic processes

E Quantitative risk analysis

Threatening processes

Threatening processes

Each criterion has sub-criteria that represent different measures of risk, e.g., different timeframes or distribution metrics

CRITERIA
(decision rules)

CATEGORIES

A. Declining distribution

B. Restricted distribution

C. Degradation of abiotic environment

D. Altered biotic processes & interactions

E. Quantitative risk analysis

Thresholds

CO Collapsed

CR Critically Endangered

Threatened

Ecosystems

EN Endangered

VU Vulnerable

NT Near Threatened

LC Least Concern

DD Data Deficient

NE Not Evaluated
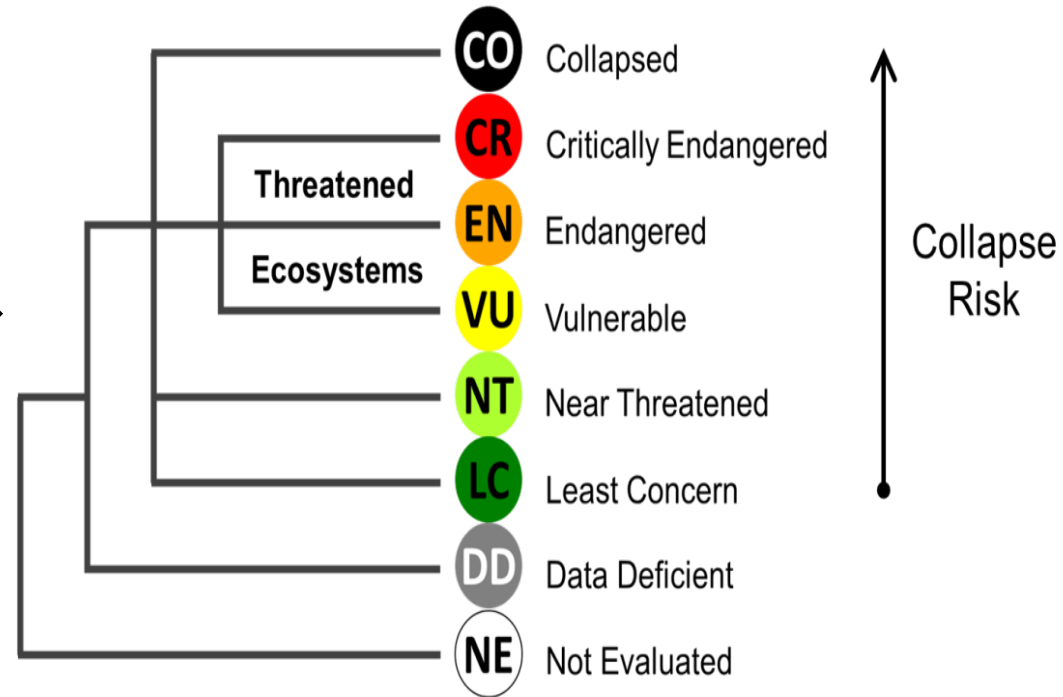
Collapse Risk

Assesses risk of ecosystem collapse, as measured by losses in area, biotic/abiotic degradation, and modelling

Keith *et al*. 2013 PLoS ONE http://dx.plos.org/10.1371/journal.pone.0062111
Bland et al. 2017 https://portals.iucn.org/library/node/45794

Draft RLE for Senegal

Categori:
- CR
- EN
- VU
- NT
- LC
- NE
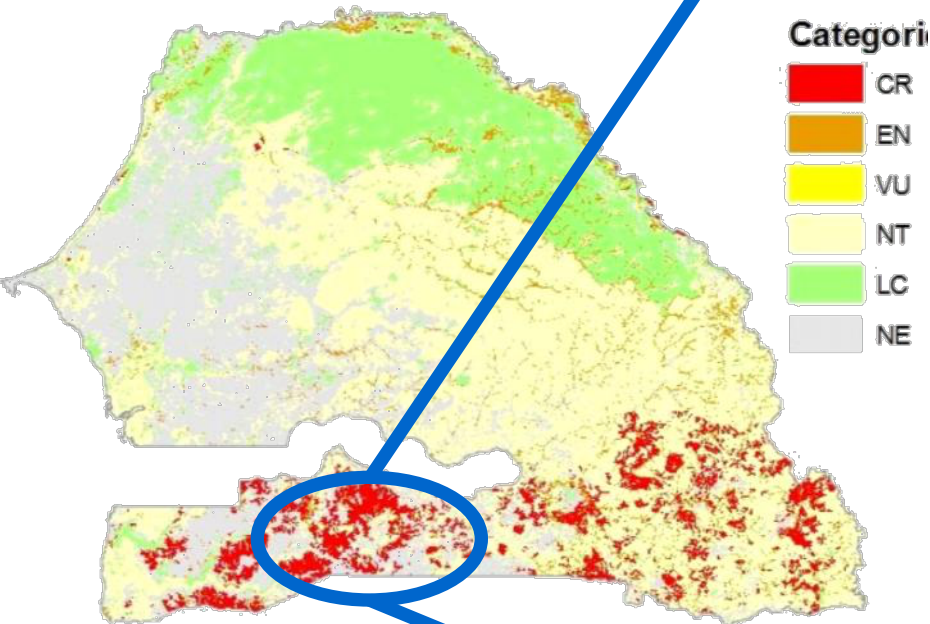
High risk of collapse

- Why?(risk) Forest clearance, climate change agriculture, poor governance (tenure, rights)

- What action? (choice) Restoration, agro-forestry, protected areas, assess species at risk (RLS)

- Who? People/villages, governments...

- So what? Revisit RLE after X time – changes??

RISK ASSESSMENT OUTPUTS

Descriptions of **defining biotic components**, **abiotic environments & ecological processes** that define the ecosystem type

Diagnosis of **threats & salient mechanisms** that drive loss of biodiversity from the system

Identification of **ecological variables** thought to provide the most **sensitive and direct measures** of ecosystem status

Collation and synthesis of **spatial data** and **time series data** relevant to tracking the status of the ecosystem type

Identification of the major factors that **management strategies** must address to conserve the ecosystem type

Contextual information, such as contributions to ecosystem services

RISK ASSESSMENT OUTCOMES
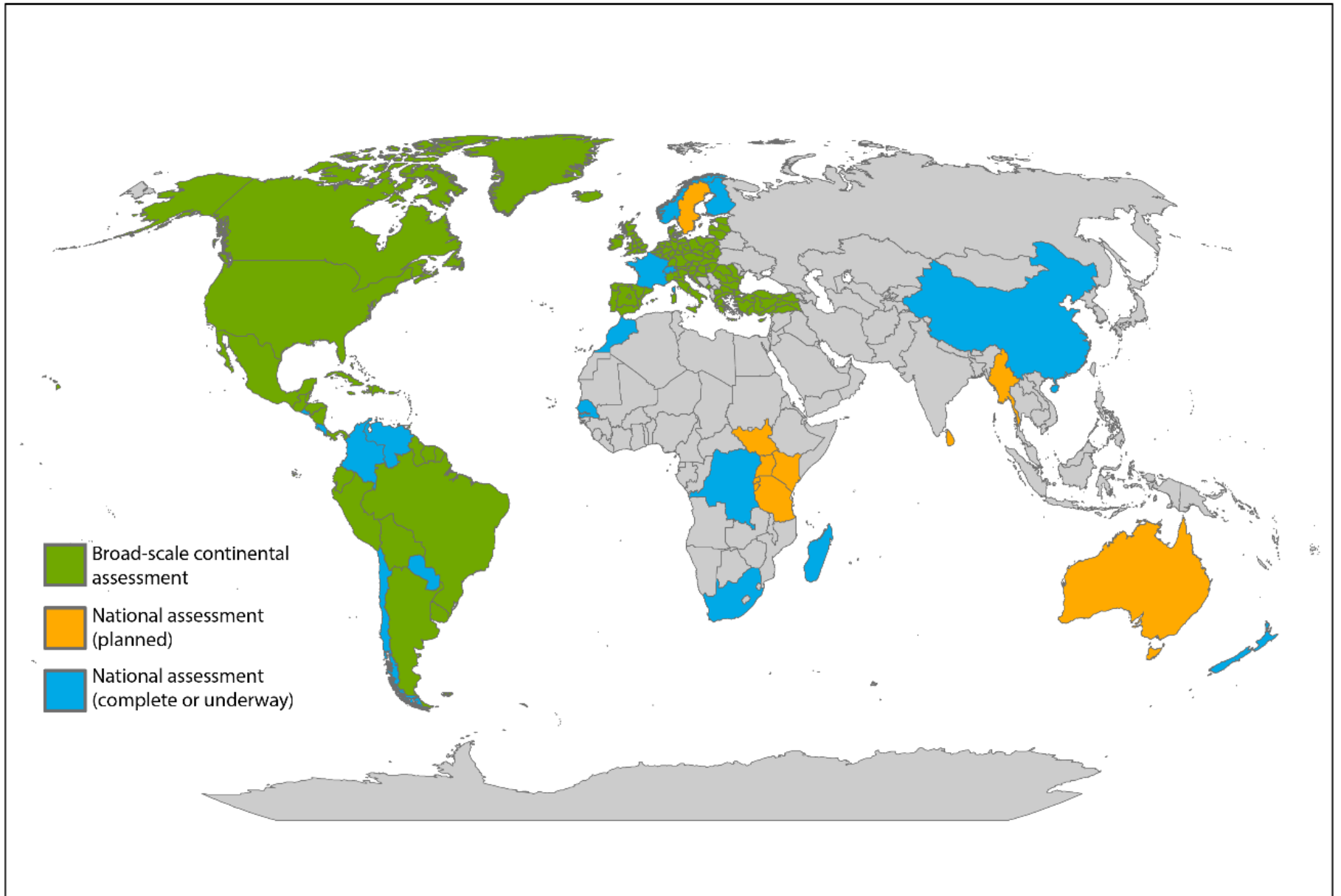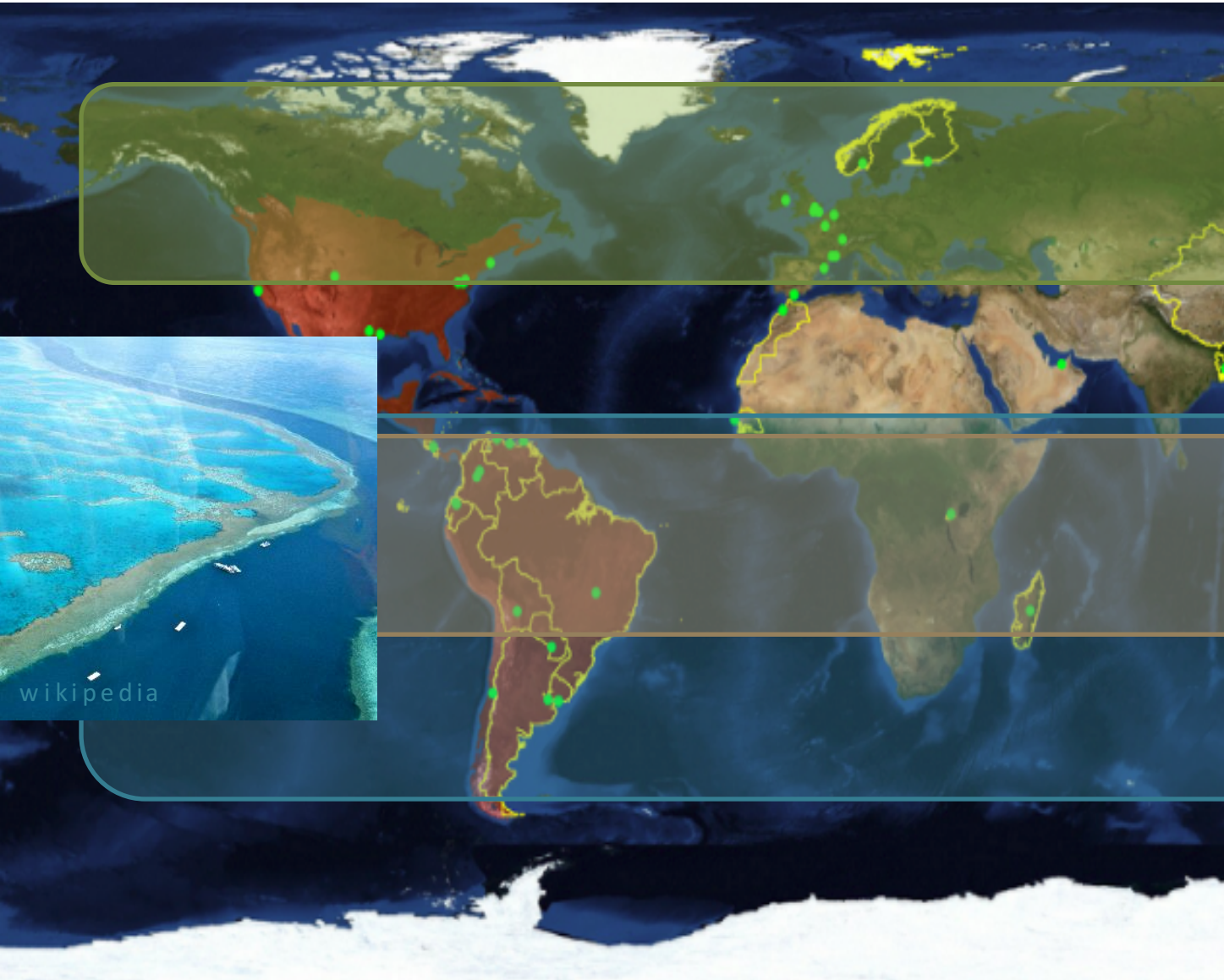
The national Red List of Ecosystems in France

Results for non riparian mediterranean forest ecosystems

	A1	A2a	A2b	A3	B1	B2	B3	C1	C2a	C2b	C3	D1	D2a	D2b	D3	E	Total
Mediterranean *Quercus pubesens* forests	LC	DD	LC	LC	LC	LC	LC	LC	DD	NT	DD	LC	DD	NT	LC	DD	NT
Mediterranean *Quercus ilex* forests	LC	DD	LC	LC	LC	LC	LC	LC	DD	LC	LC	LC	DD	DD	LC	DD	LC
Pine forests with *Pinus halepensis*	LC	LC	LC	LC	LC	LC	LC	LC	DD	LC	LC	LC	DD	DD	LC	LC	LC
Pine forests of Corsica with *Pinus nigra* subsp *laricio*	LC	LC	LC	LC	NT	NT	LC	LC	DD	LC	LC	NT	DD	NT	LC	DD	NT
Pine forests with *Pinus halepensis*	LC	DD	LC	LC	VU	EN	LC	LC	DD	LC	DD	VU	EN	EN	VU	DD	EN
Pine forests with *pinus pinaster* subsp *pinaster*	LC/DD	DD	DD	LC	LC	LC	LC	LC	LC	LC	LC	NT	DD	NT/VU	LC	DD	NT/VU
Pine forests with *Pinus pinea*	DD	DD	DD	DD	NT	NT	LC	LC	DD	LC	LC	DD	DD	DD	DD	DD	NT
Mediterranean *Quercus suber* forests	LC	DD	NT	NT	LC	LC	LC	VU	DD	DD	DD	VU	DD	DD	DD	DD	VU
Mediterranean *Castanea sativa* woods	NT	DD	DD	NT	LC	LC	LC	LC	DD	LC	LC	NT	DD	VU	DD	DD	VU
Juniperus spp Forests and matorrals	LC	LC	LC	LC	LC	NT	LC	LC	DD	LC	LC	NT	DD	DD	NT	DD	NT
Olea and Ceratonia forests	DD	DD	DD	DD	LC	NT	LC	LC	DD	LC	LC	DD	DD	DD	DD	DD	NT
Mediterranean *Taxus baccata* forests	DD	DD	DD	DD	DD	DD	LC	LC	DD	LC	DD	DD	DD	DD	DD	DD	DD
Non riparian mediterranean *Ostya carpinifolia* forests	LC	DD	LC	DD	LC	LC	LC	LC	DD	LC	DD	DD	DD	DD	DD	DD	LC

Broad-scale continental assessment

National assessment (planned)

National assessment (complete or underway)
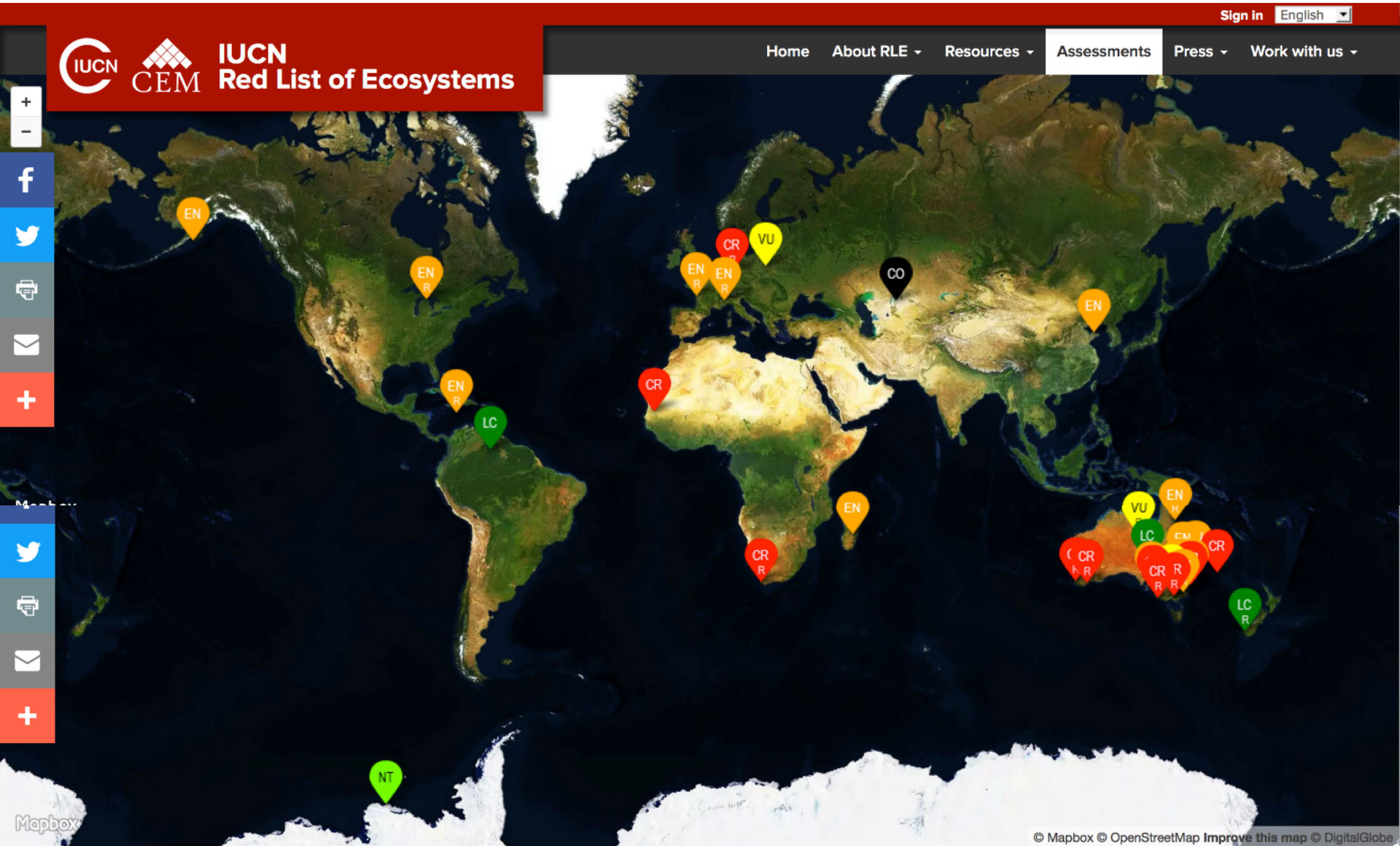
Seppo Tuominen

wikipedia

www.mangrove.at

Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria

Edited by Lucie M. Bland, David A. Keith, Rebecca M. Miller, Nicholas J. Murray and Jon Paul Rodríguez

Version 1.1
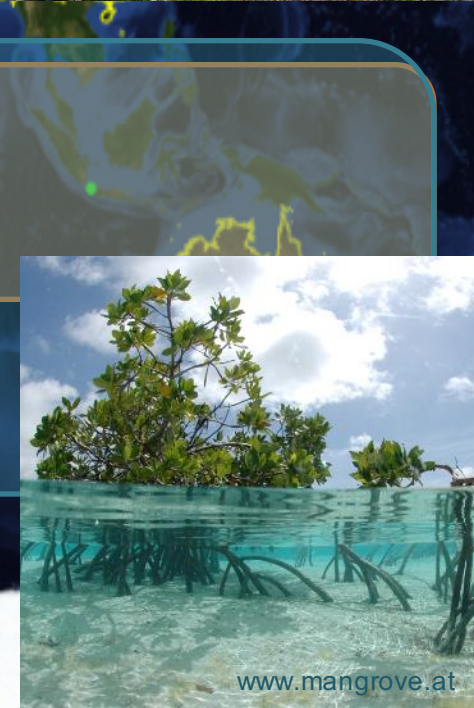
<u>Valuable tool for:</u>

- **Monitoring and reporting** status of biodiversity (local, national, regional, global)
- Standardize **data and metrics** (across countries, regions & sectors)
- Integration of biodiversity-health links in **NBSAPs**
- **Integrated risk assessment** in policies, plans and actions
- Identify **priority areas** to/for:
    - **Safeguard ecosystem services** essential to health & well-being
    - **Ecosystem restoration**
    - Strengthen monitoring of areas **potentially vulnerable to EID outbreaks, food & nutrition insecurity, mental health, etc.**
- Create **synergies** between the RLE and other assessment tools
    - More **integrated assessment of trade-offs**, where inevitable
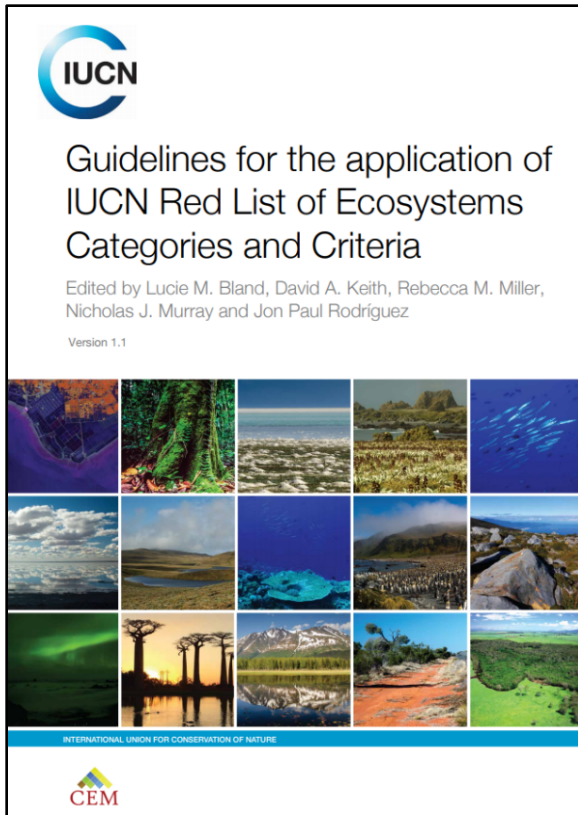
Thank you for your attention

IUCN Red List of Ecosystems

@redlisteco

www.iucnrle.org

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