

# Red List of Ecosystems



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**EcoHealth  
Alliance**

Research into the critical connections between human, wildlife health and ecosystems.

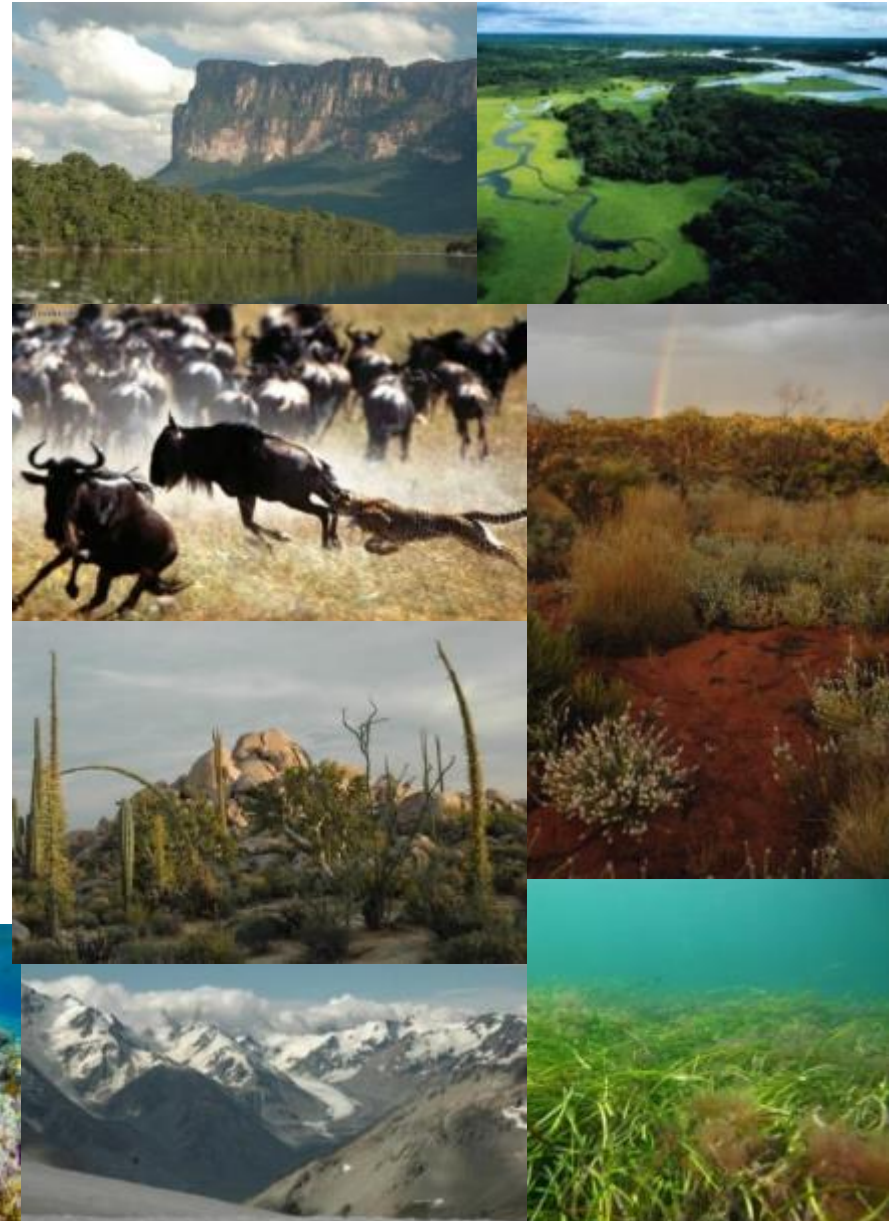
- How human activities (land use change) could **lead to disease emergence** (Ebola, Zika, ...)
- **Disease regulation** as an ecosystem service: Estimate the economic impact of infectious diseases due to land use change

**Red List of Ecosystems:** a quantitative framework to evaluate ecosystem condition

# Red List of Ecosystems

**Goal:** develop a consistent global framework for monitoring the status of ecosystems and identifying those most at risk of biodiversity loss.

- How great are the risks?
- How soon are the changes likely to occur?



# Assessing risks to ecosystems

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1989

2008

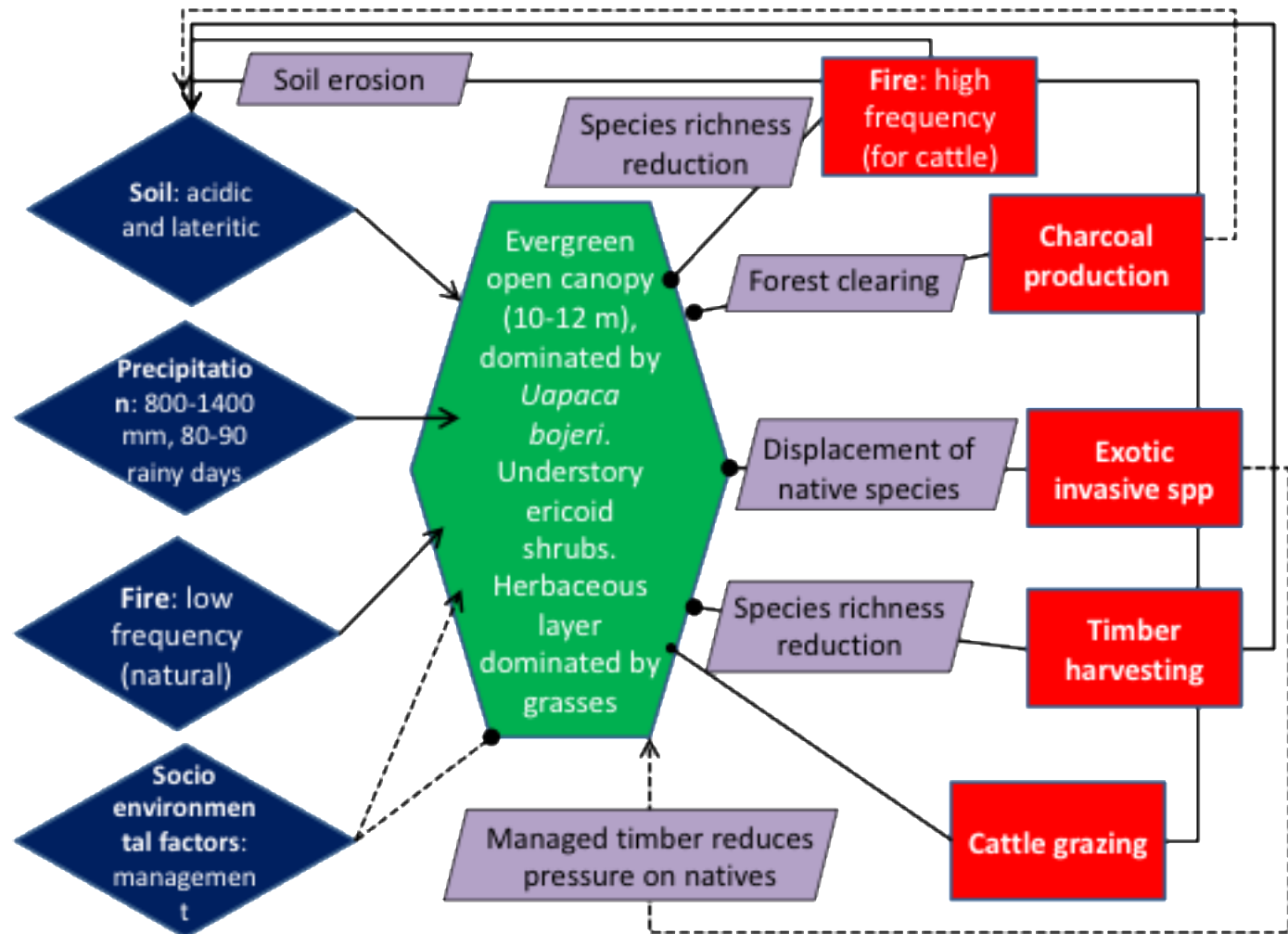
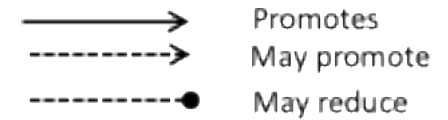


Aral sea: collapsed ecosystem

Freshwater aquatic →  
ephemeral steppe + hypersaline  
lakes

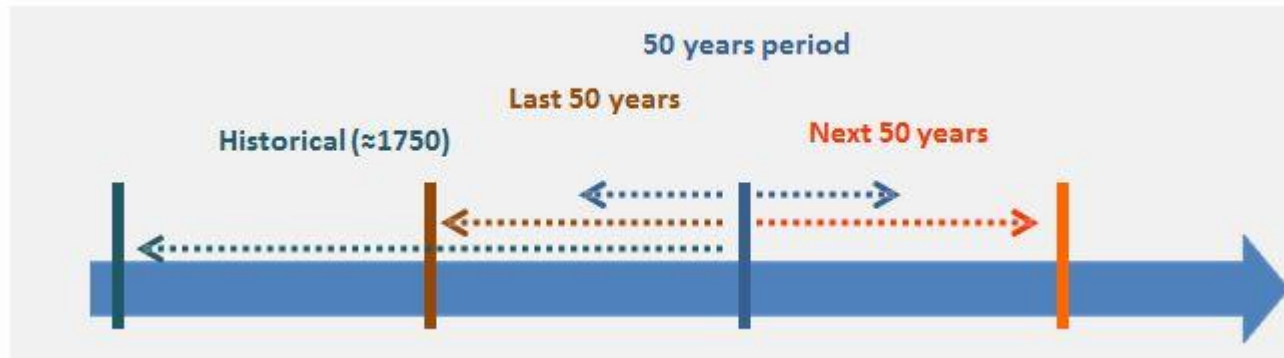
- Unlike species, ecosystems do not go extinct!
  - Cannot sustain its *defining features*:  
**Characteristic native biota** and  
**Ecological processes** that structure & sustain the system
- Ecosystem collapse ~ species extinction - Analogous concepts
- Ecosystem collapse affects capacity to **deliver ecosystem services**

# Conceptual models

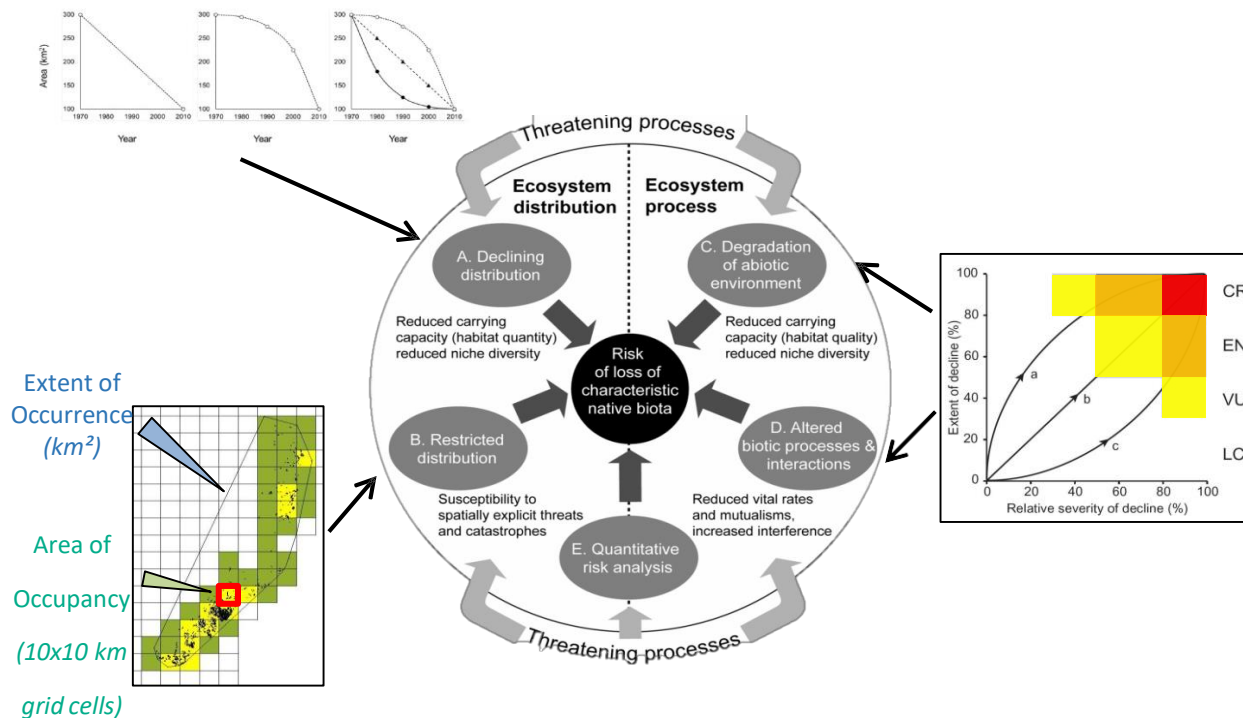




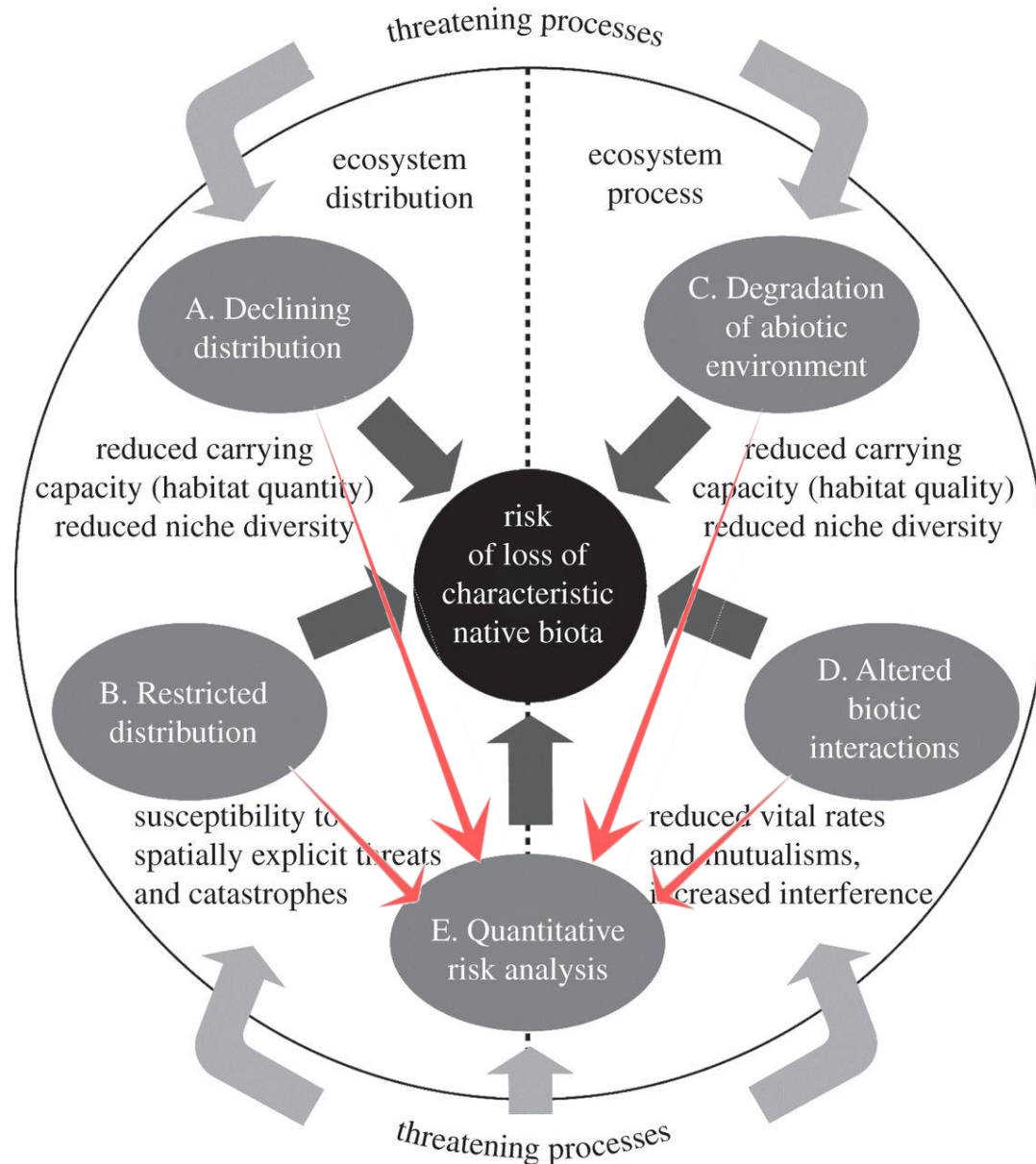
# RLE Methodology



5 Criteria  
4 Time periods



# RLE Methodology



# RLE Methodology

## Listing Criteria (decision rules)

**A**

Distribution  
reduction

**B**

Restricted  
distribution & decline

**C**

Degradation of  
abiotic environment

**D**

Disruption to biotic  
processes

**E**

Quantitative estimate  
of risk of collapse

**Quantitative  
thresholds**

Each ecosystem type  
assigned to an ordinal  
category of risk

**Collapsed**

**Critically  
endangered**

**Endangered**

**Vulnerable**

**Near-threatened**

**Least concern**

**Data deficient**

**Not Evaluated**

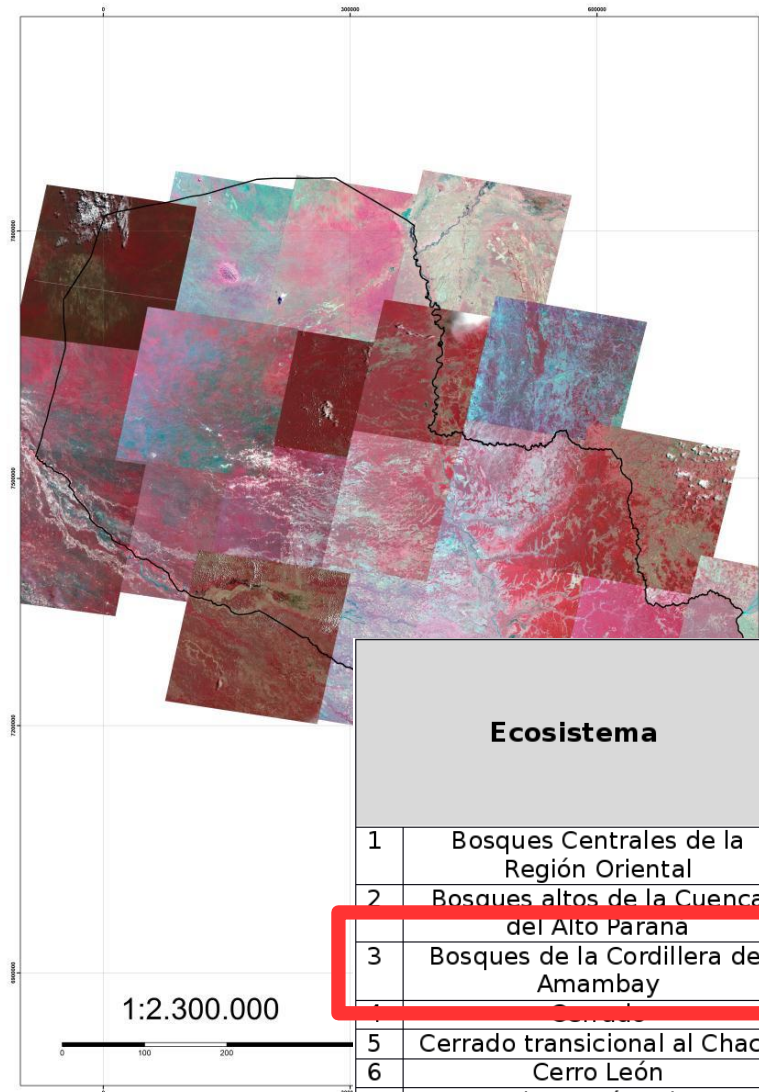
*RLE outcomes: more than a threat category*



# RLE Criterion A: Declining distribution

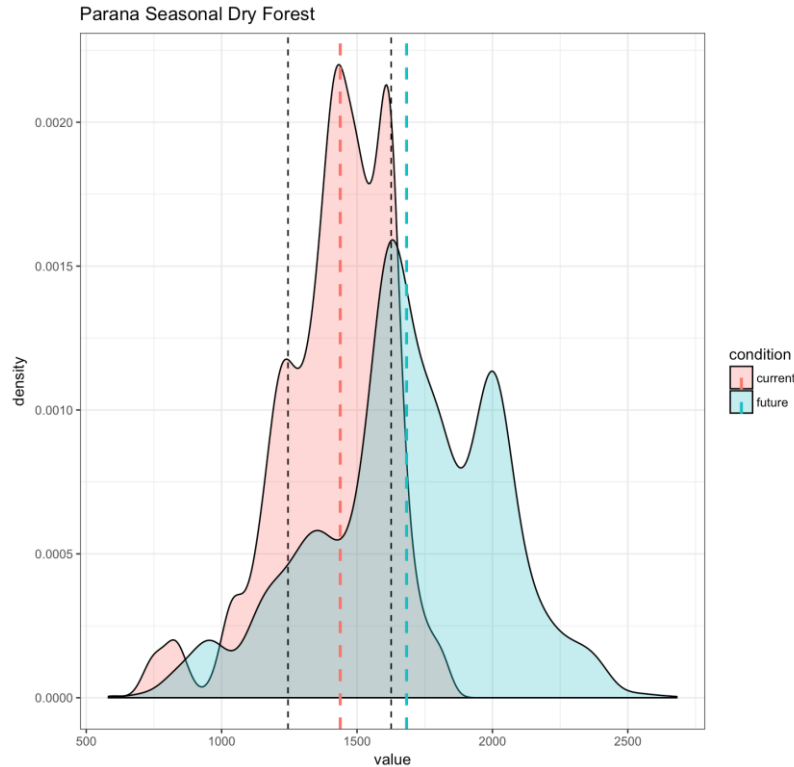
Example from Paraguay:  
Decline in distribution in the past  
50 years > 50%:

Endangered



Ecosistema		Superficie original (Ha)	Porcentaje actual (2015)	Porcentaje de pérdida histórica (50 años)	Categoría de Amenaza según criterio A1			
					CR ≥80	EN ≥50	VU ≥30	No Amenazado bajo este criterio
1	Bosques Centrales de la Región Oriental	4.960.142	21	79		X		
2	Bosques altos de la Cuenca del Alto Paraná	2.333.235	17	83	X			
3	Bosques de la Cordillera del Amambay	1.079.048	34	66		X		
4	Cerrado	2.543.775	13	87		X		
5	Cerrado transicional al Chaco	575.146	92	8				X
6	Cerro León	54.531	100	0				X

# RLE Criterion C: Degradation abiotic environment



Example Parana Seasonal Dry Forest

Precipitation will increase in more than 40% of the area in the next 50 years

Critically Endangered

C. Environmental degradation over ANY of the following time periods:					
			Relative severity (%)		
		Extent (%)	≥ 80	≥ 50	≥ 30
C1	The past 50 years based on change in an abiotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:	≥ 80	CR	EN	VU
		≥ 50	EN	VU	
		≥ 30	VU		
C2	The next 50 years, or any 50-year period including the present and future, based on change in an abiotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:	Extent (%)	≥ 80	≥ 50	≥ 30
		≥ 80	CR	EN	VU
		≥ 50	EN	VU	
		≥ 30	VU		
C3	Since 1750 based on change in an abiotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:	Extent (%)	≥ 90	≥ 70	≥ 50
		≥ 90	CR	EN	VU
		≥ 70	EN	VU	
		≥ 50	VU		

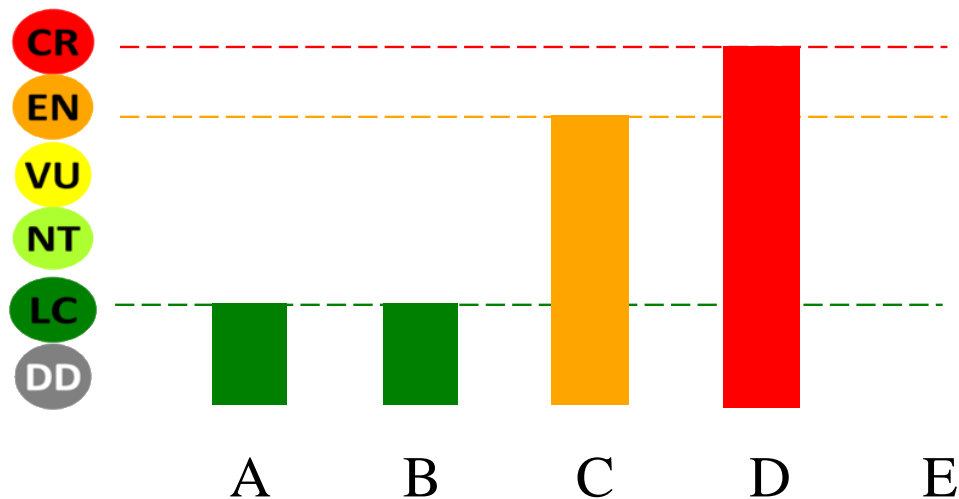
# RLE Methodology

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CRITERIA HAVE ENSEMBLE PROPERTIES

Two principles:

- Assess as many criteria for which data are available
- Overall status: highest returned by any one criterion

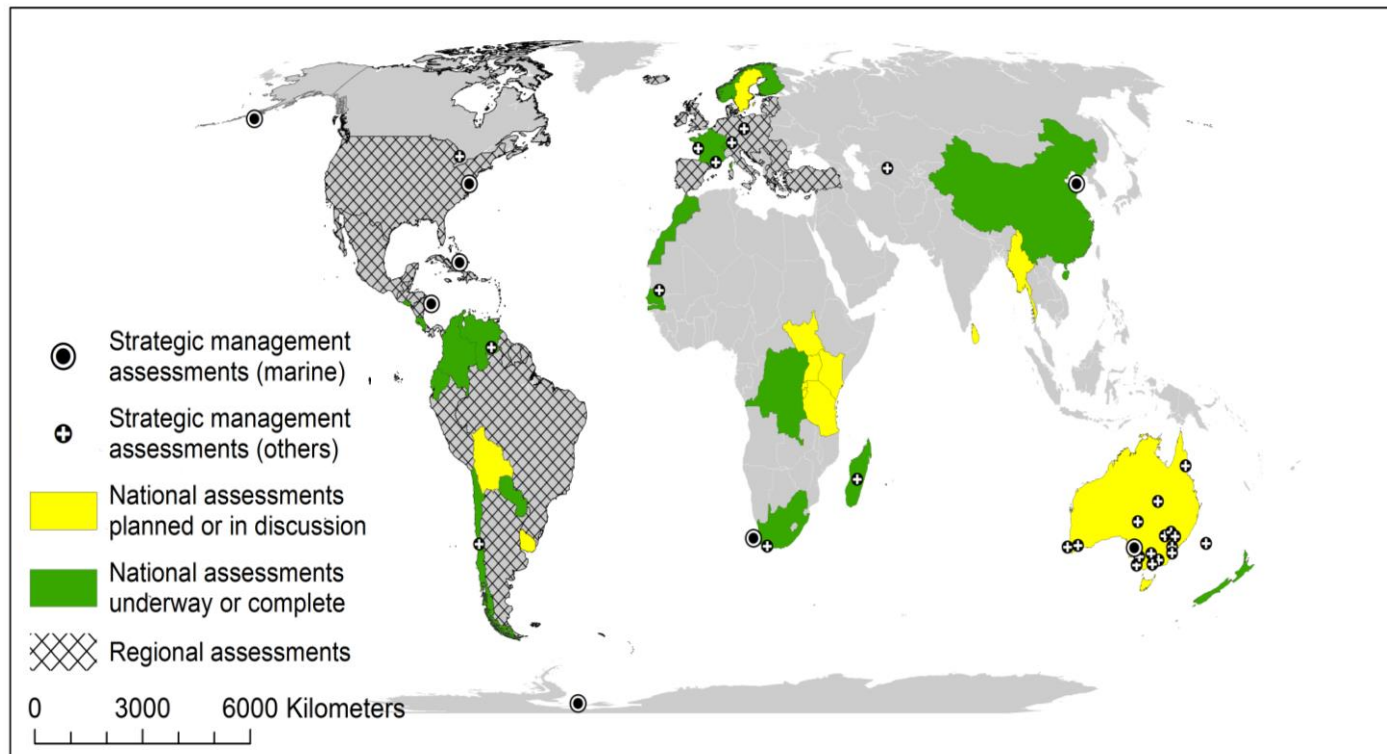


Overall status: Critically Endangered

# Global policy impact of RLE

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- National RLE assessments underway/completed in >20 countries on 6 continents
  - 3 countries already updating first assessments
- 5 countries already integrate RLE into regulatory policy

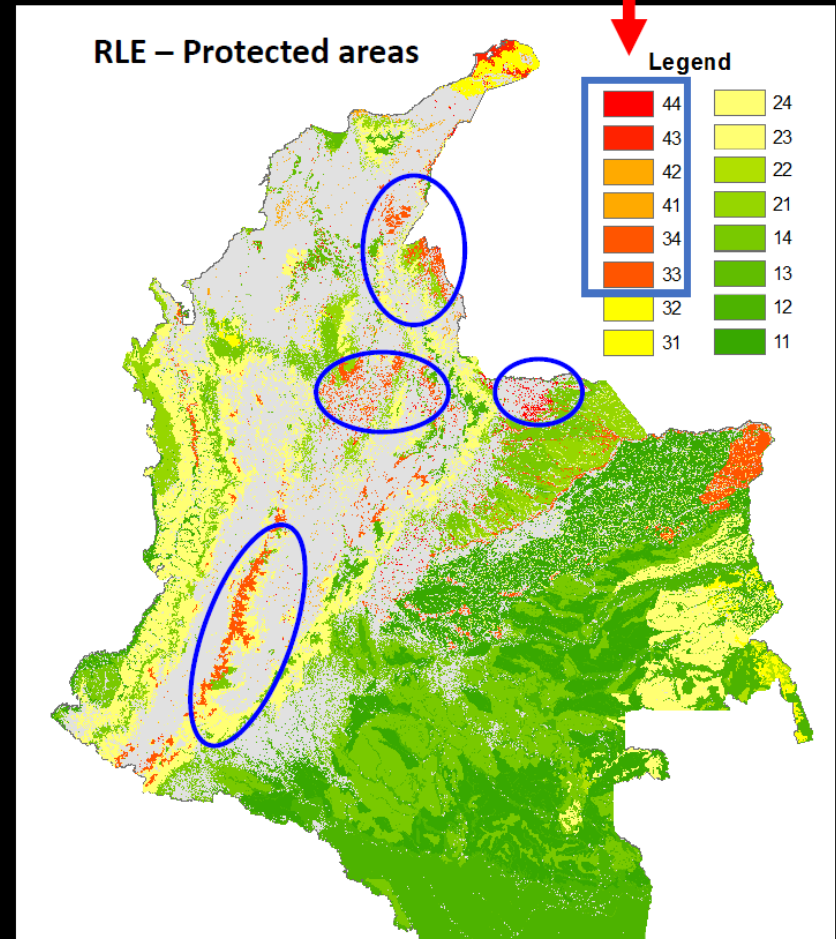


# Applications of the RLE

## APPLICATIONS - conservation options

- **CR + EN** *Conservation in low represented ecosystems*

<i>RLE</i>	<i>% Area in NPAs</i>	<i>% Area in Indigenous Terr.</i>
CR	4%	33%
EN	12%	18%
VU	16%	47%
LC	20%	49%

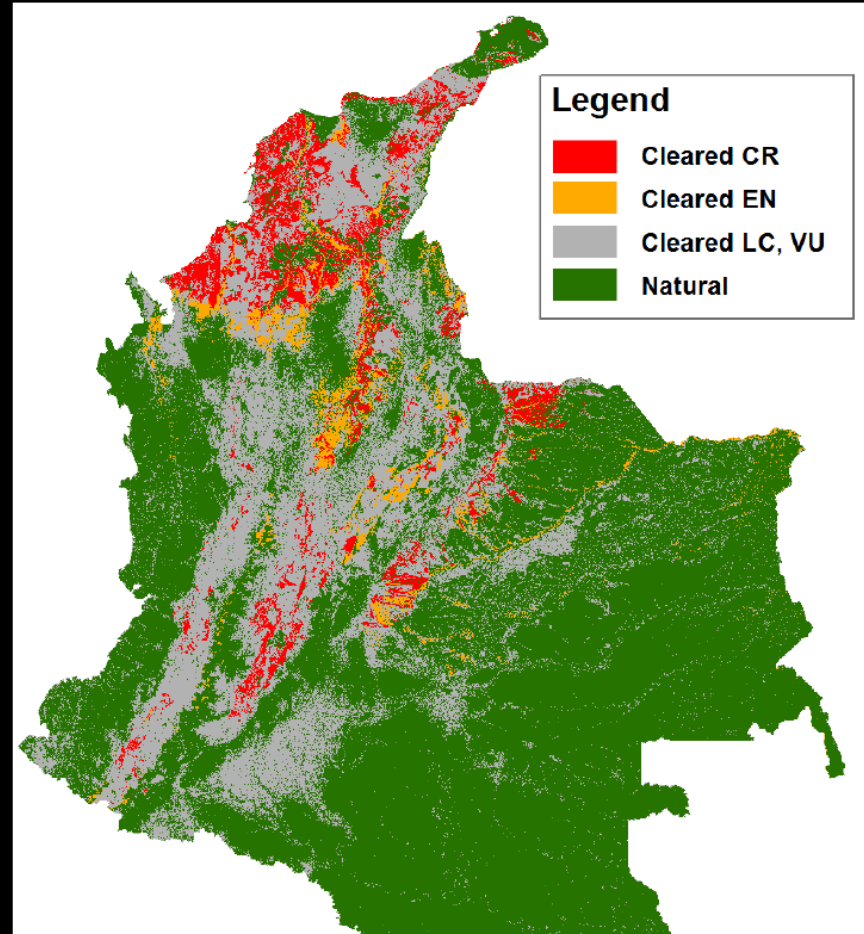




# Applications of the RLE

## APPLICATIONS - restoration options

- **CR + EN** *Conservation* in low represented ecosystems
- **CR + EN** *Restoration* in remote areas with unproductive cattle



Colombia, Andres Etter

# Applications of the RLE



Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

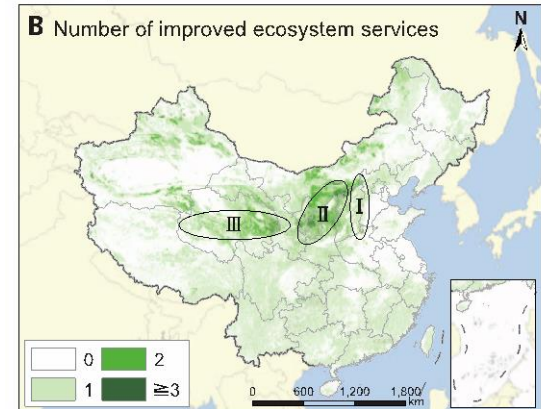
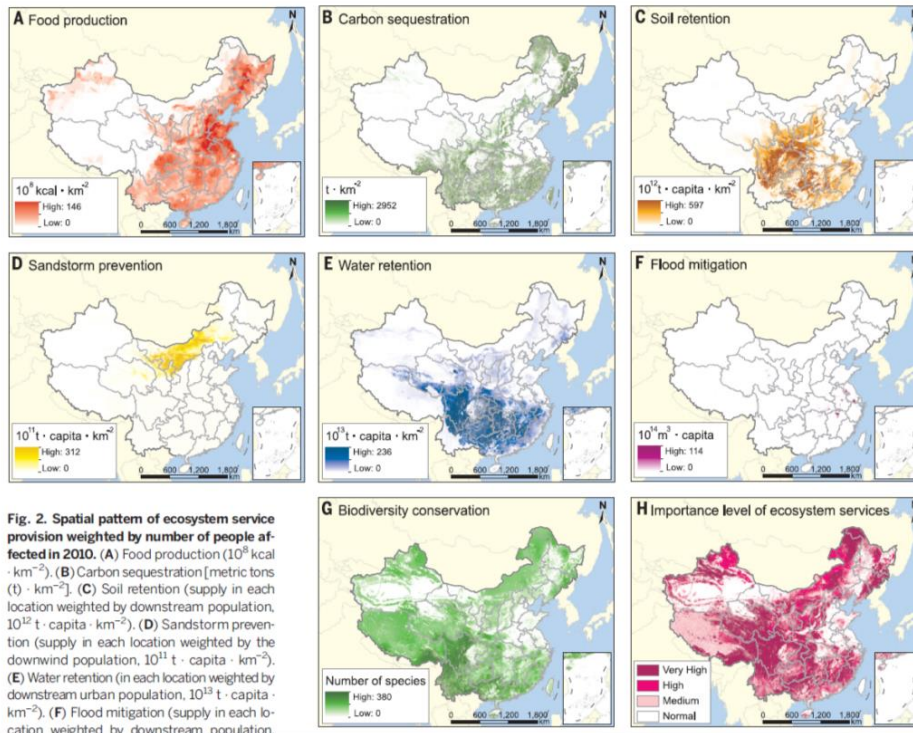
Biological Conservation

journal homepage: [www.elsevier.com/locate/biocon](http://www.elsevier.com/locate/biocon)



## Preliminary assessment of ecosystem risk based on IUCN criteria in a hierarchy of spatial domains: A case study in Southwestern China

Jianbo Tan<sup>a,b</sup>, Ainong Li<sup>a,\*</sup>, Guangbin Lei<sup>a</sup>, Jinhu Bian<sup>a</sup>, Guoke Chen<sup>c</sup>, Keping Ma<sup>c</sup>



Mapping ecosystem services in China

# Applications of the RLE

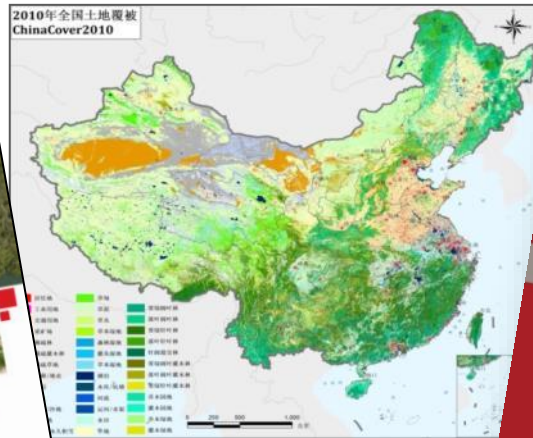
## Reporting on ecosystem status

Convention on Biological Diversity

Reporting against Aichi targets



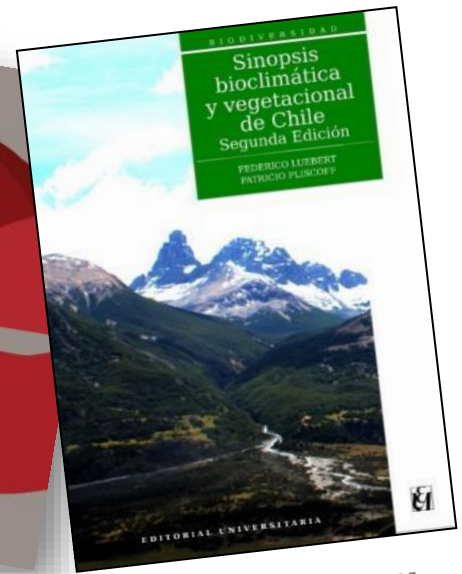
France



China



Norway



Chile



# Applications of the RLE

## Support for assessors



### Introduction to the IUCN Red List of Ecosystems Categories and Criteria

Course Manual



### Guidelines for the Application of IUCN Red List of Ecosystems Categories and Criteria

Edited by L.M. Bland, D.A. Keith, N.J. Murray and J.P. Rodriguez

Version 1.0



OR CONSERVATION OF NATURE