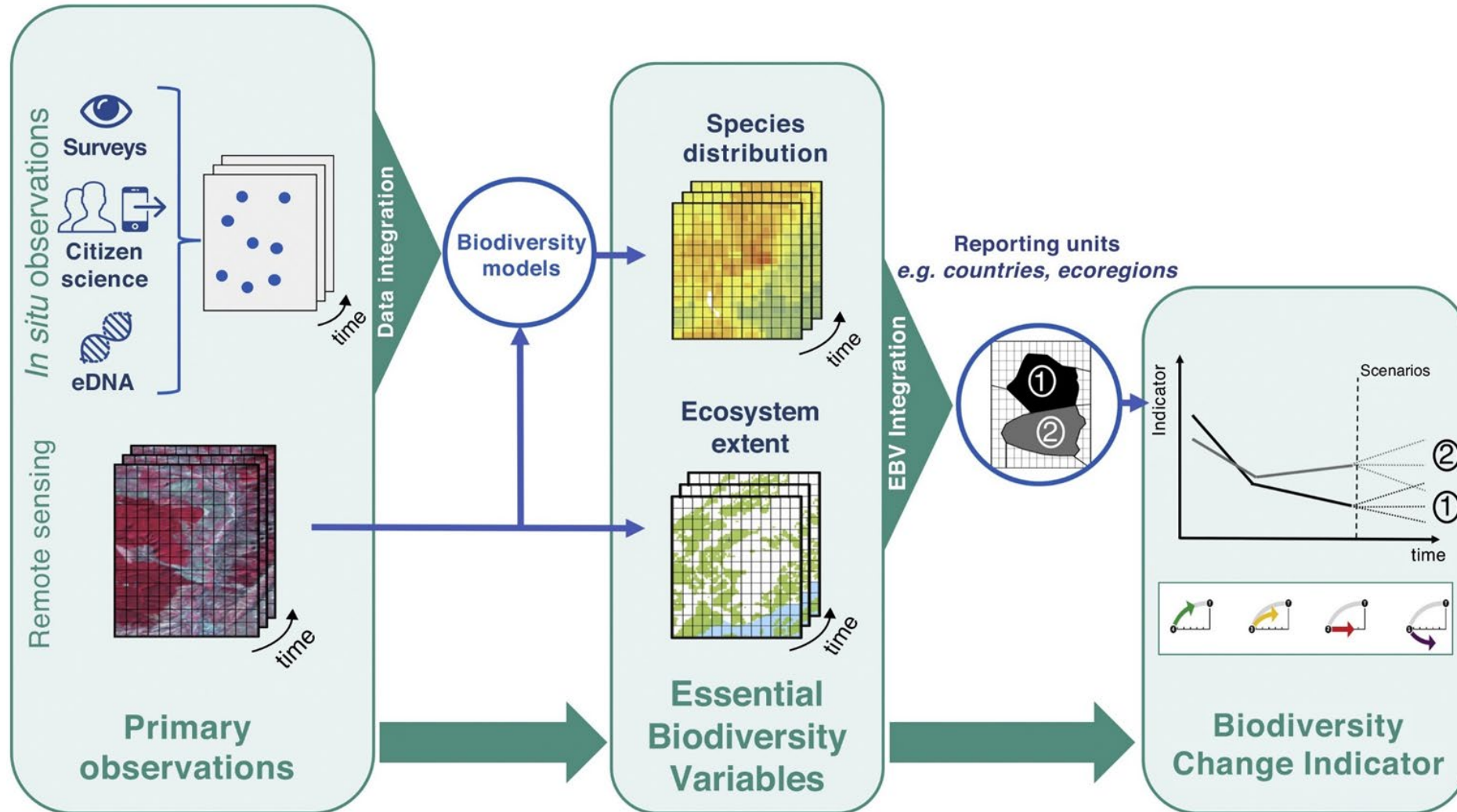# Proposed Headline Indicators for the Post-2020 Global Biodiversity Framework

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Dr. Walter Jetz (GEO BON, Yale University)

WCMC|CBD – Headline Indicator webinars – 4 March 2022

Essential Biodiversity Variables (EBVs)

Pereira et al. (2013) *Science*
Navarro et al. (2017) *Curr. Opin. Environ. Sustain.*

A.0.2 Species Habitat Index (SHI)

Goal / Target

Goal A. Ecosystems **integrity** and **connectivity**, healthy and resilient **species populations**, and safeguarded **genetic diversity.**

Rationale

- The **integrity of ecosystems** requires the s**ustained ecological processes** of their species. The SHI measures changes in component **species and associated ecological processes and functions**.

- The index captures alterations to the **quality and connectivity of habitats** at the level of single species and assemblages. When aggregated over a larger units, SHI is a **compound** measure of an area's **ecological integrity and connectivity**.

- When evaluated over species' geographic ranges, the SHI also informs about trends in the **health of species populations** and potential changes in their **genetic diversity**.
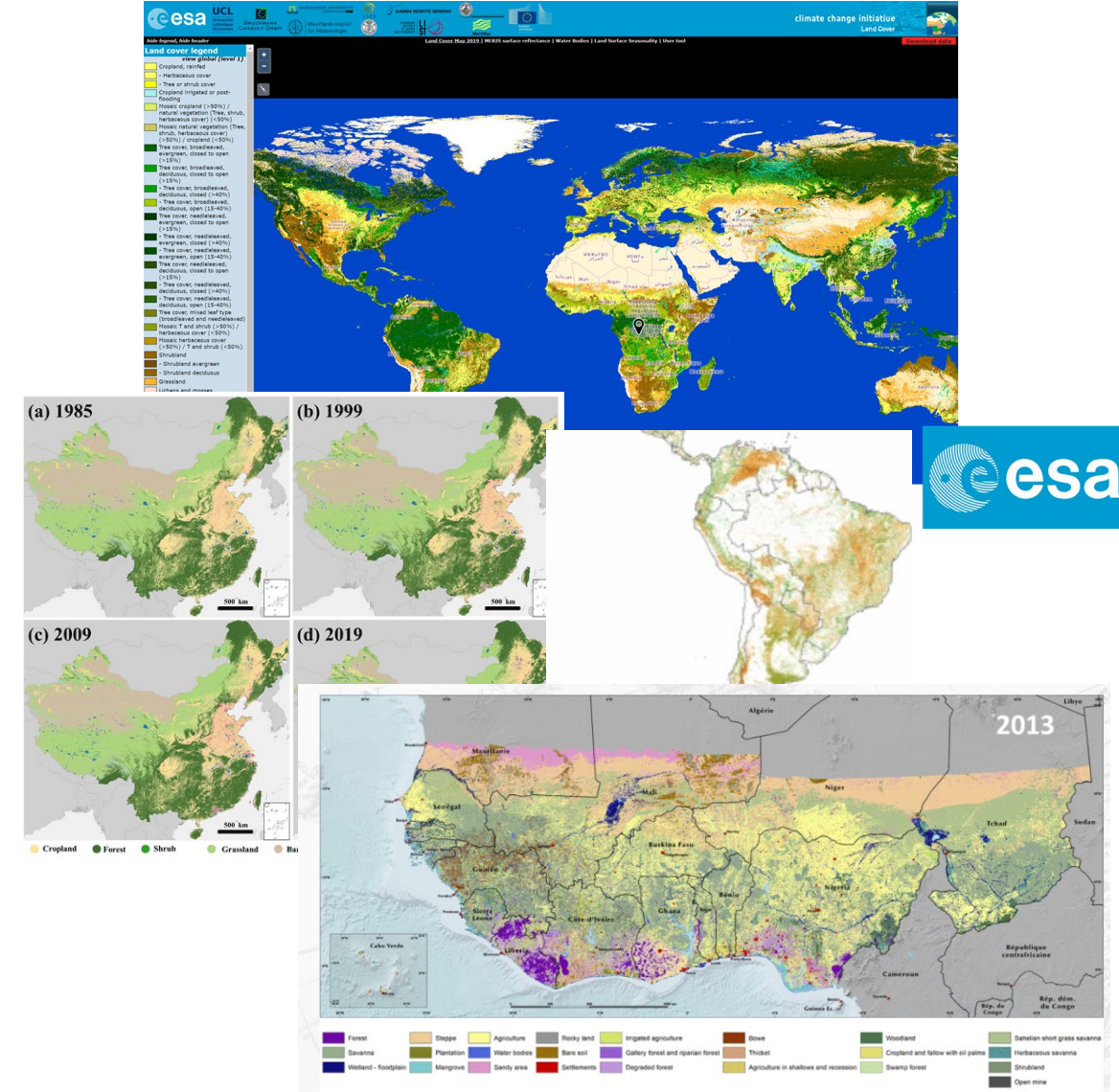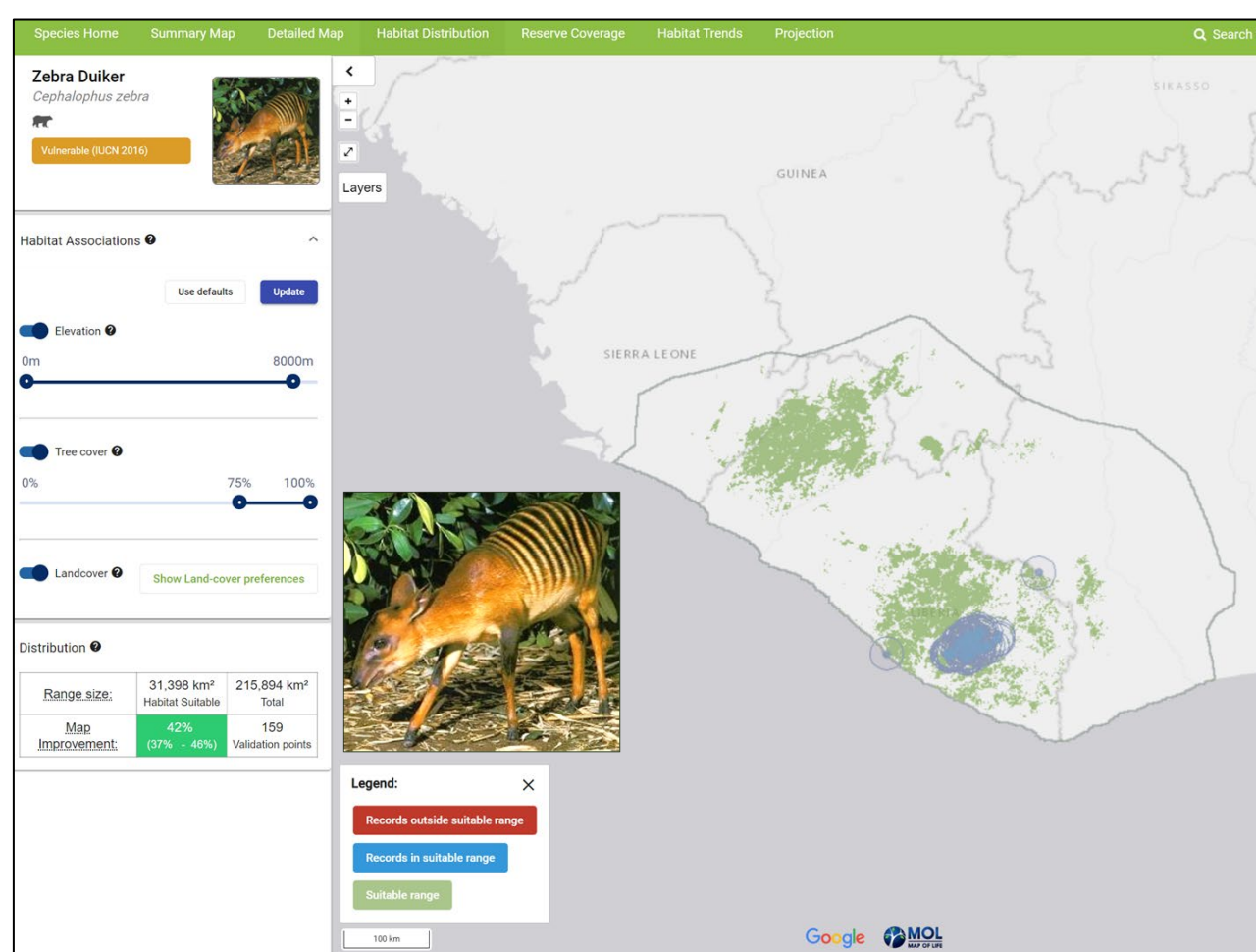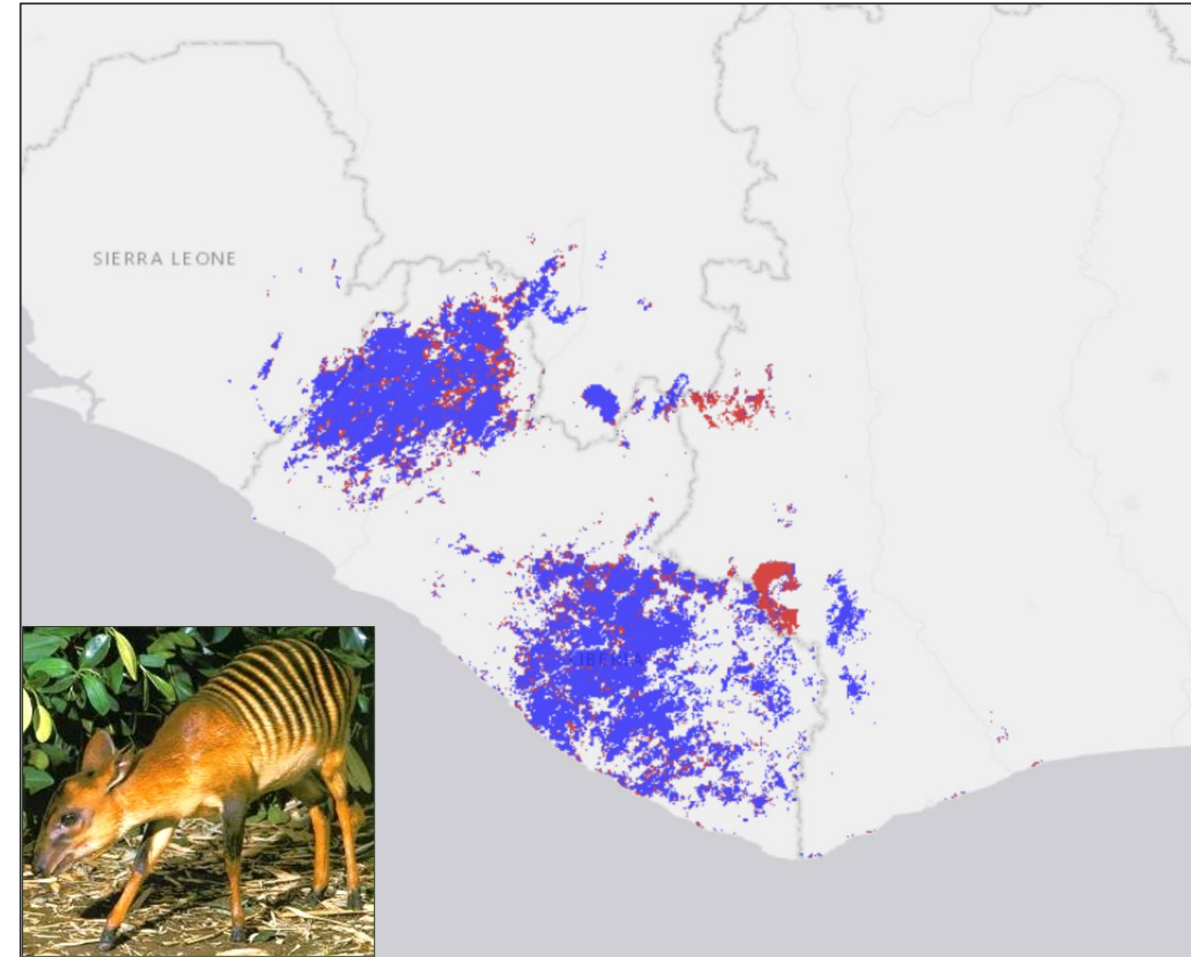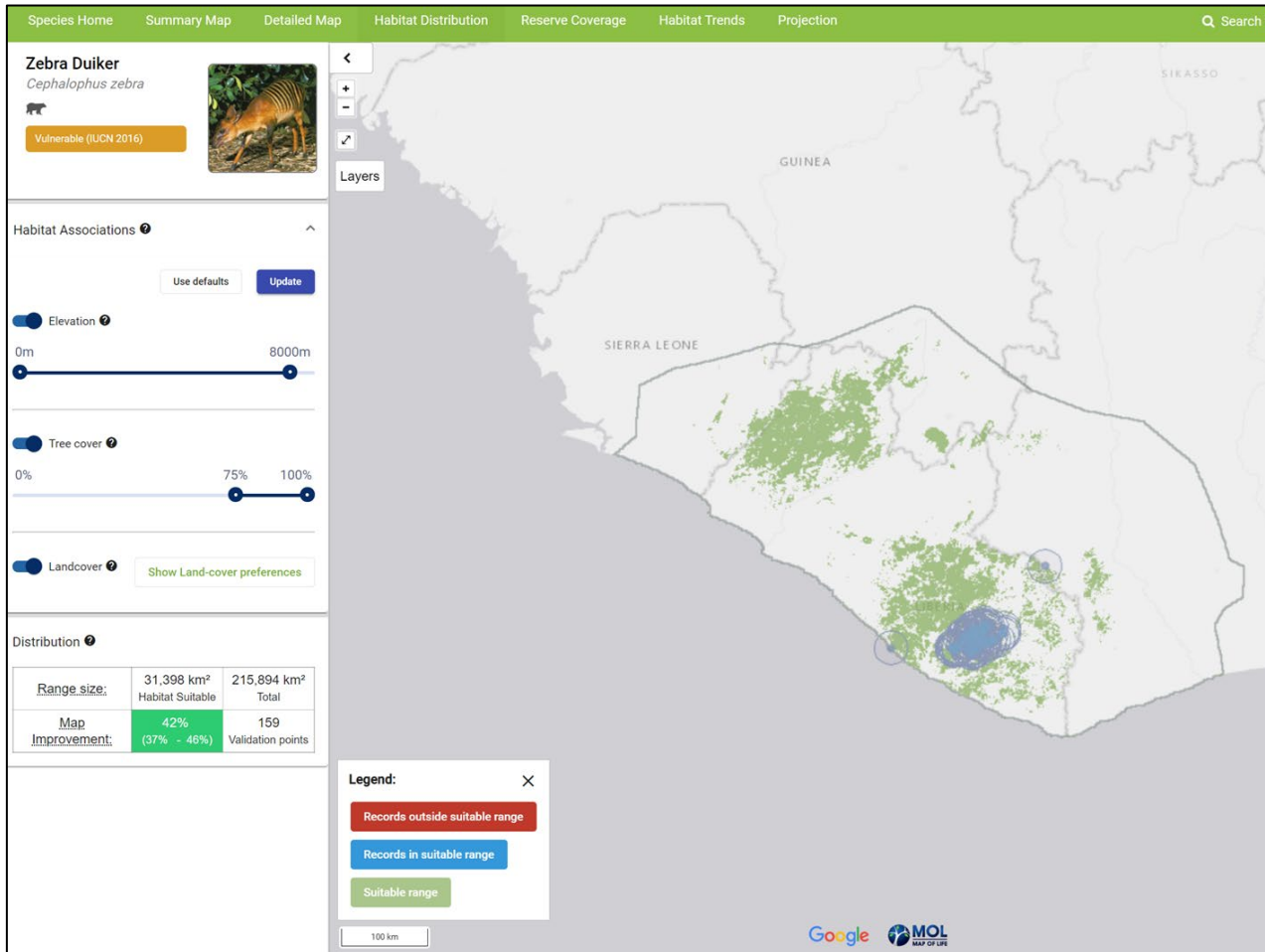
A.0.2 Species Habitat Index (SHI)
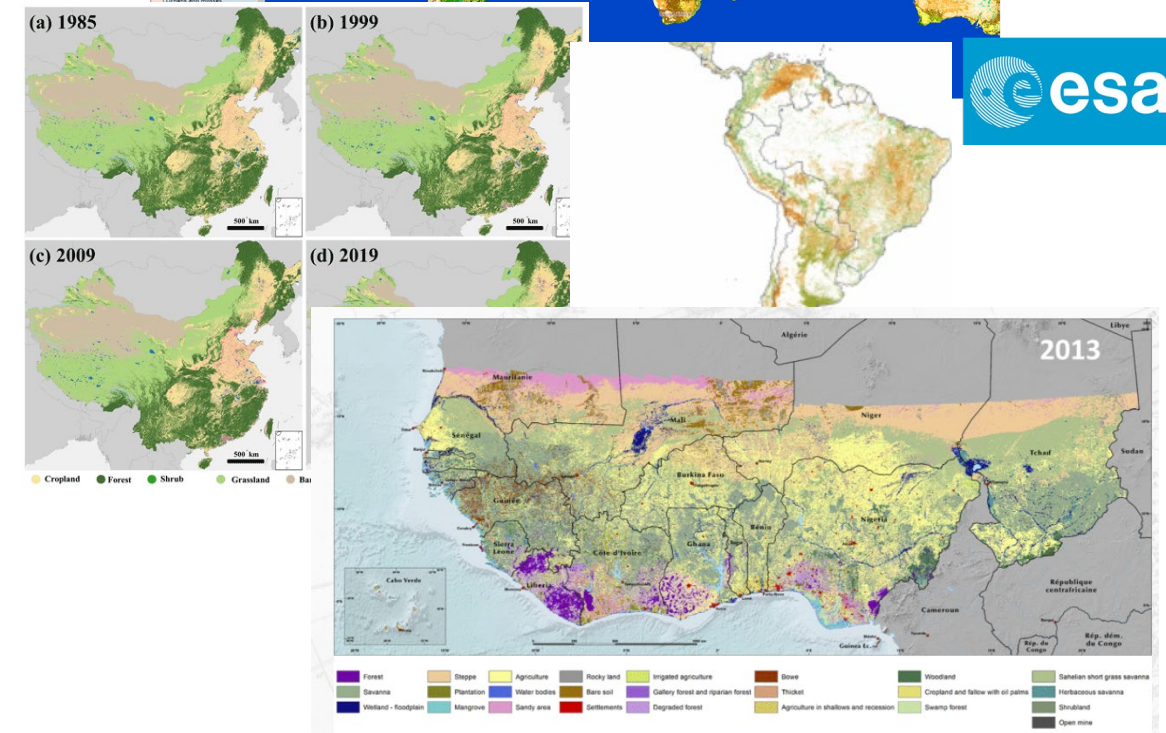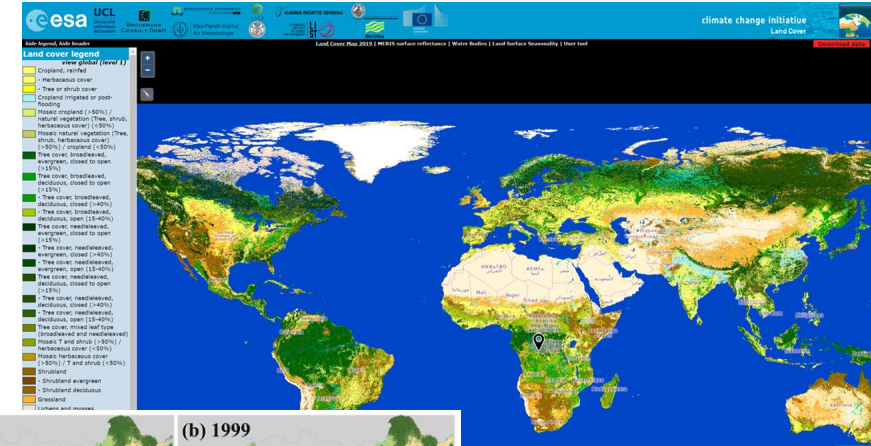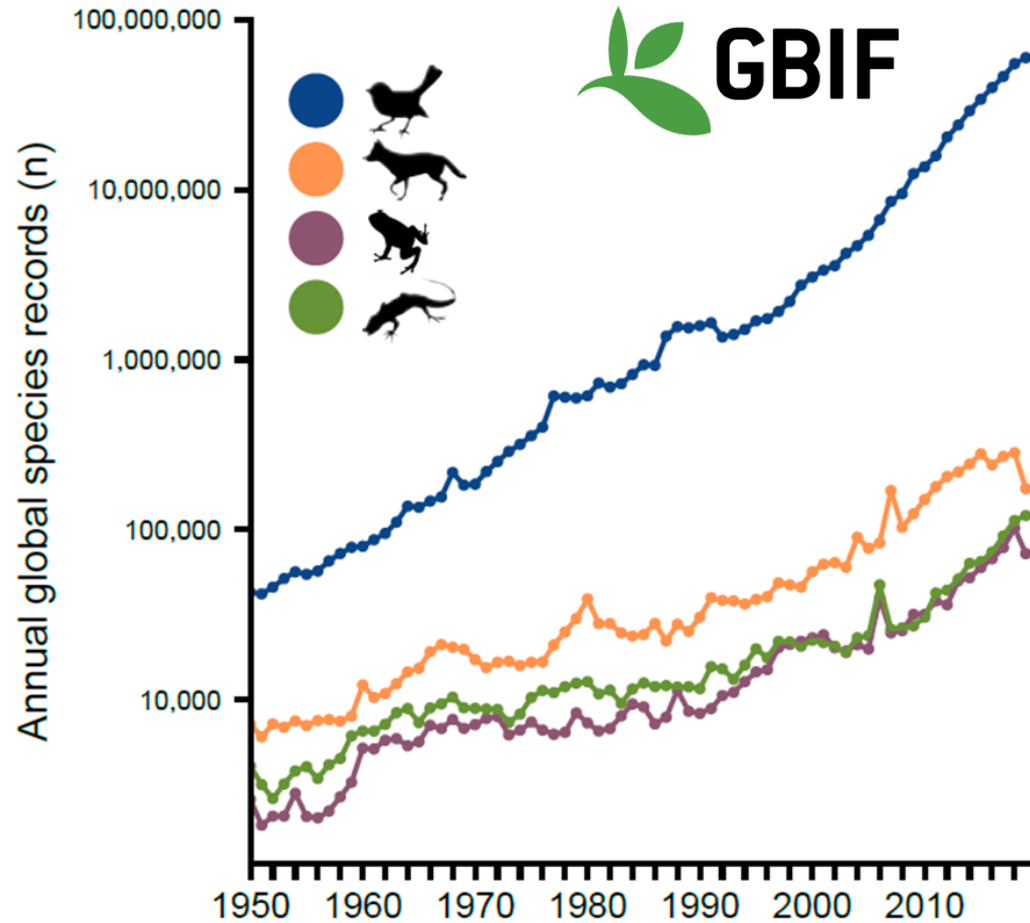
A.0.2 Species Habitat Index (SHI)

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Species Habitat Index

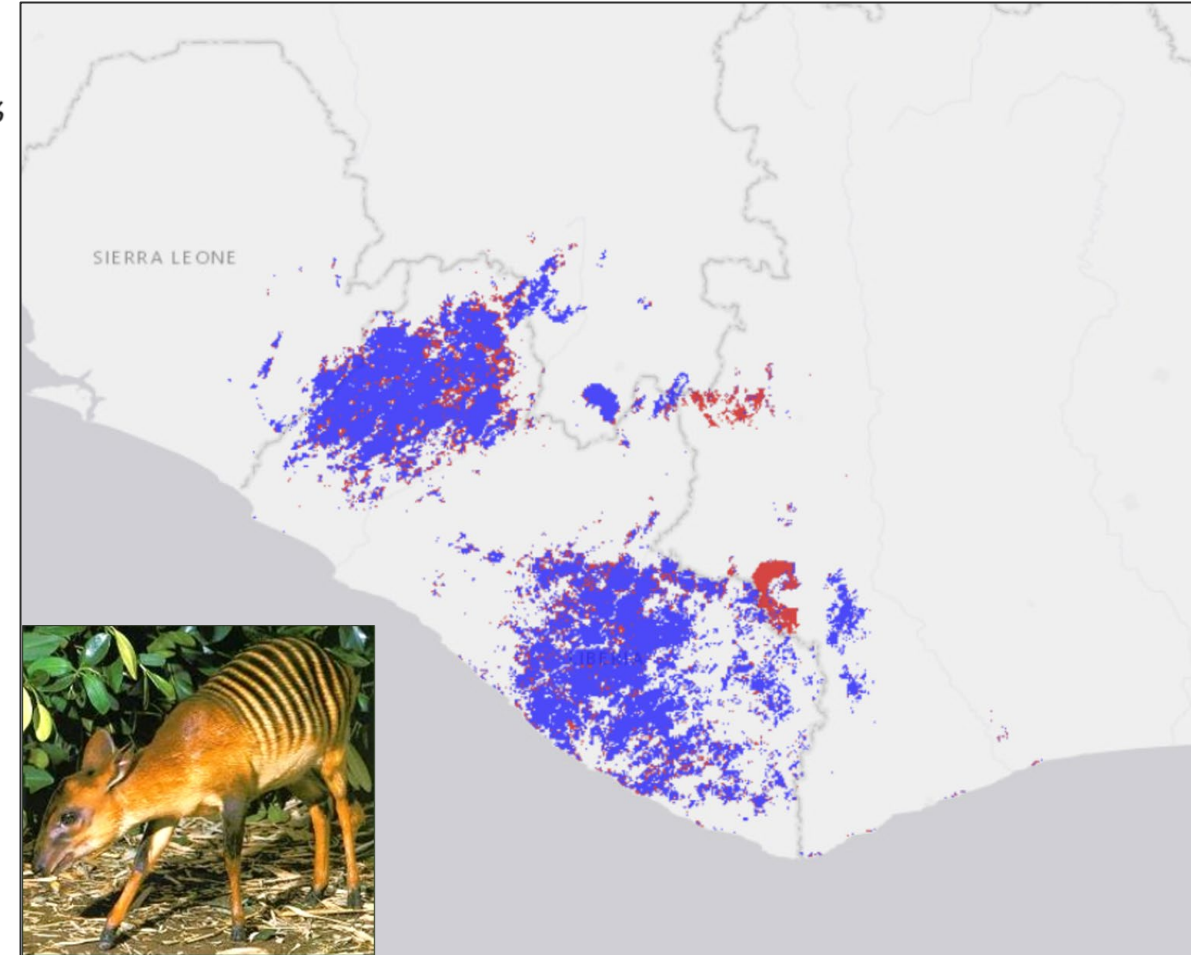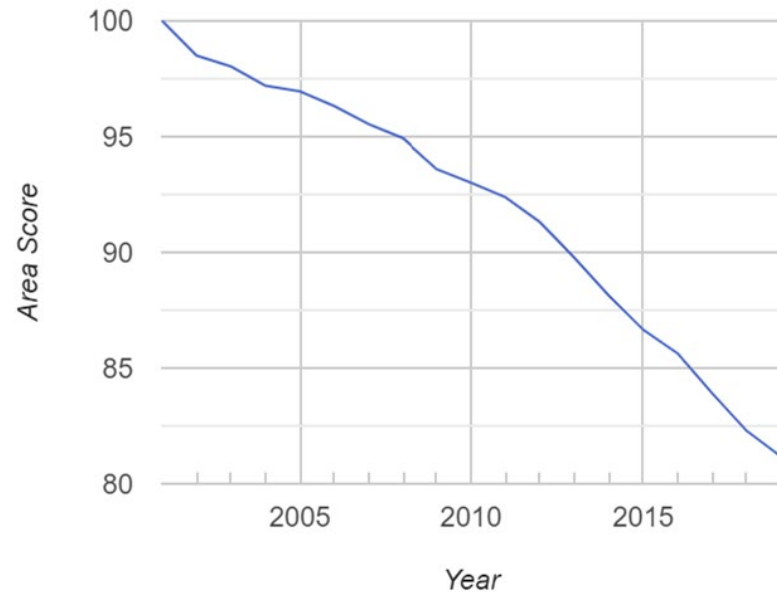Country

Liberia

Stewardship ❓ *86%*

Species Habitat Score – Area ❓

Reference (2001): ca. 31,000 km²
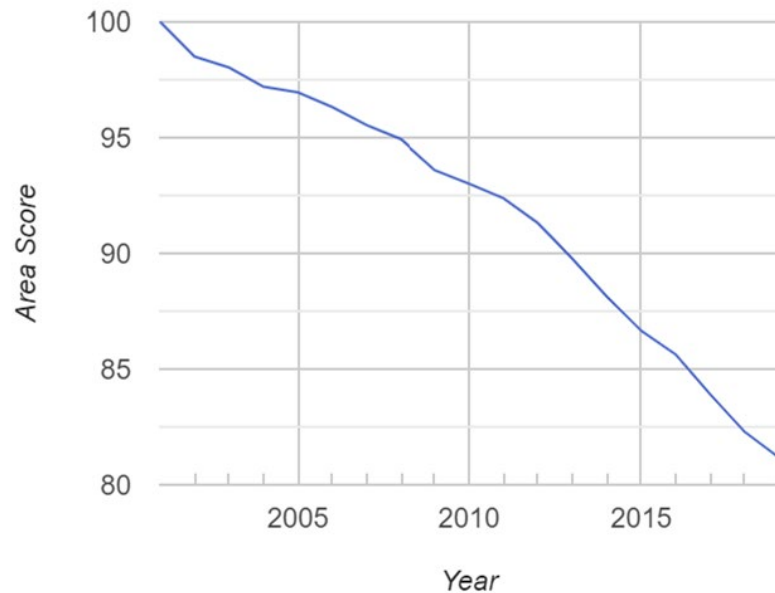
A.0.2 Species Habitat Index (SHI)
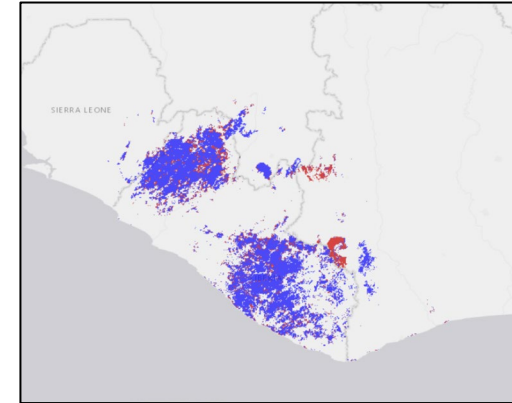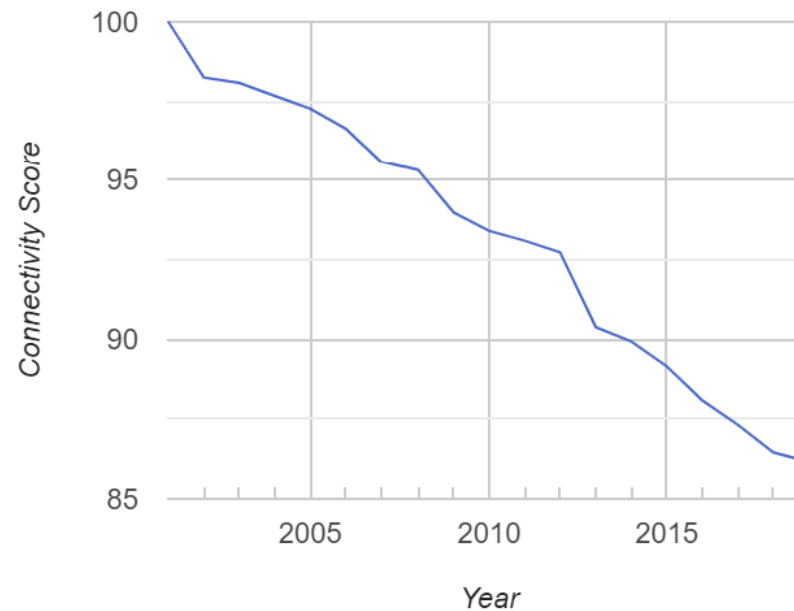
Visualization and download:
https://mol.org/species/habitat-trend/Cephalophus_zebra

Available for ~15,000 other species, growing

A.0.2 Species Habitat Index (SHI)

Species Habitat Score – Area ❓
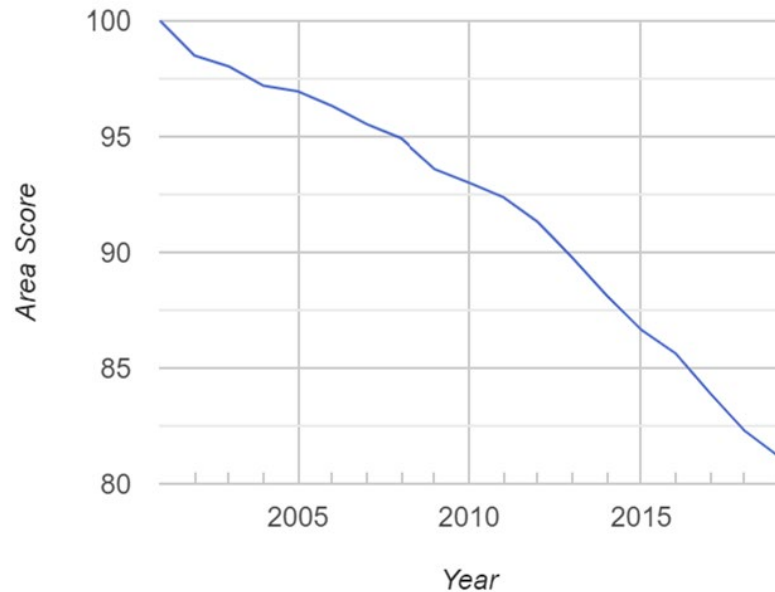
Reference (2001): ca. 31,000 km^2

Country 1

Species	Steward	Area	Connectivity
A	0.86	81	87
B	1.00	102	101
C	0.30	60	76
National SHI		**81**	**88**

Country 2

Species	Steward	Area	Connectivity
C	0.70	80	86
D	1.00	130	120
National SHI		**105**	**103**

Methodology

Straightforward independent calculation with national distribution and landcover/ecosystem classifications

Step 1: Determine baseline species distributions

Step 2: Calculate species metrics and SHI for the baseline period.

Step 3: Calculate change in core metrics and SHI.

Country 1

Species	Steward	Area	Connectivity
A	0.86	81	87
B	1.00	102	101
C	0.30	60	76
National SHI		**81**	**88**

Country 2

Species	Steward	Area	Connectivity
C	0.70	80	86
D	1.00	130	120
National SHI		**105**	**103**

A.0.2 Species Habitat Index (SHI)

Scale:
- Available for >180 countries, 2001-2020

Disaggregations:
- By species, species group (taxonomic, functional) and ecosystem type
- To any sub-national regional area down to 1 km^2 size

Gaps:
- Marine ecosystems in development (13,000 fish species). Habitat change inputs address coral reefs, mangroves, seagrass, and human impacts.
- Methodology readily applied to freshwater, with data on dams and barriers, defining edge pixels for species with impacted movement.

A.0.2 Species Habitat Index (SHI)

Goal Milestones, Components		SHI	SHI Relevance
A1: Ecosystems	Area	Captures changes in the area available for species to ecosystem processes.	Secondary
	Connectivity	Measures changes in the connectivity of the ecological processes supporting ecosystems.	Primary
	Integrity	Provides a composite measure of change in the ecological intactness of assemblages	Primary
A2: Species Populations	Extinction rate	The count of species with SHI equal to 0 over time provides an estimate of extinction rate	Primary / Secondary
	Extinction risk, Threat status	Extinction risk and threat status are a direct function of decreasing SHI	Secondary
	Population abundance (size)	Population sizes are directly related to the area and connectivity of their habitats.	Primary
	Population Distribution	The area component of SHI directly measures changes in population distribution	Primary
A3: Species Genetics	Genetic diversity	SHI is directly related to genetic diversity change and represents the genetic diversity indicator "Proportion of populations, or geographic range, maintained within species"	Primary / Secondary

A.0.2 Species Habitat Index (SHI)

Use:

Powers & Jetz (Nature Climate Change, 2019)
Jetz et al. (Nature Ecology & Evolution, 2019)
Hansen et al. (Conservation Letters, 2021)
Jetz et al. (Nature Ecology & Evolution, 2021)
Rohan et al. (PNAS, in press)

IPBES, Global Assessment
IPBES, Core Indicator
BIP Indicator Partner
Living Planet Report 2020

Access:

https://mol.org/indicators/habitat

https://geobon.org/ebvs/indicators/

Soon:
UN Biodiversity Lab
CBD / WCMC Target Tracker

Info: CBD/WG2020/3/INF/6

mol.org/indicators/habitat