Supporting Implementation of the Post-2020 Global Biodiversity Framework (GBF): Indicators

Information on the proposed GEOBON Headline Indicators addressing draft GBF Goal A and Target 2|3 - Species populations and area-based conservation

GEO BON

Group on Earth Observations
Biodiversity Observation Network

SHI Species Habitat Index

SPI Species Protection Index

Supporting Implementation of the Post-2020 Global Biodiversity Framework (GBF): Indicators

Information on the proposed GEOBON Headline Indicators addressing draft GBF Goal A and Target 2|3 - Species populations and area-based conservation

I. Jillian Campbell (CBD): Introduction
II. Melodie McGeoch (La Trobe): Species Population Essential Biodiversity Variables
Walter Jetz (Yale): Indicator policy relevance, calculation, adaptation, and use
Q&A
III. María Cecilia Londoño Murcia (Humboldt): Indicator national use and adaptation in Colombia
Q&A
IV. Davnah Urbach (GMBA): Species populations and area-based conservation in mountains
Eva Spehn (SCNAT): A national perspective on indicators from Switzerland
Q&A
V. Jillian Campbell (CBD): Closing

SHI Species Habitat Index

SPI Species Protection Index

Melodie McGeoch (La Trobe University)

Species Population Essential Biodiversity Variables

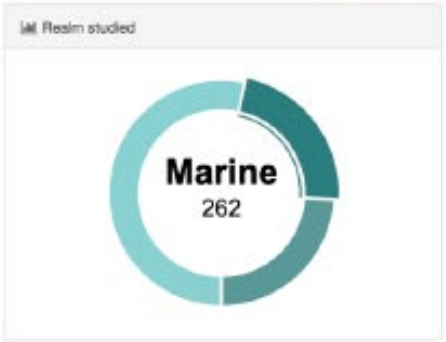
Walter Jetz (Yale University)

Indicator policy relevance, calculation, adaptation, and use

GEO BON in a nutshell

A global Partnership:
1792 registered members from 123 countries and 1116 institutions







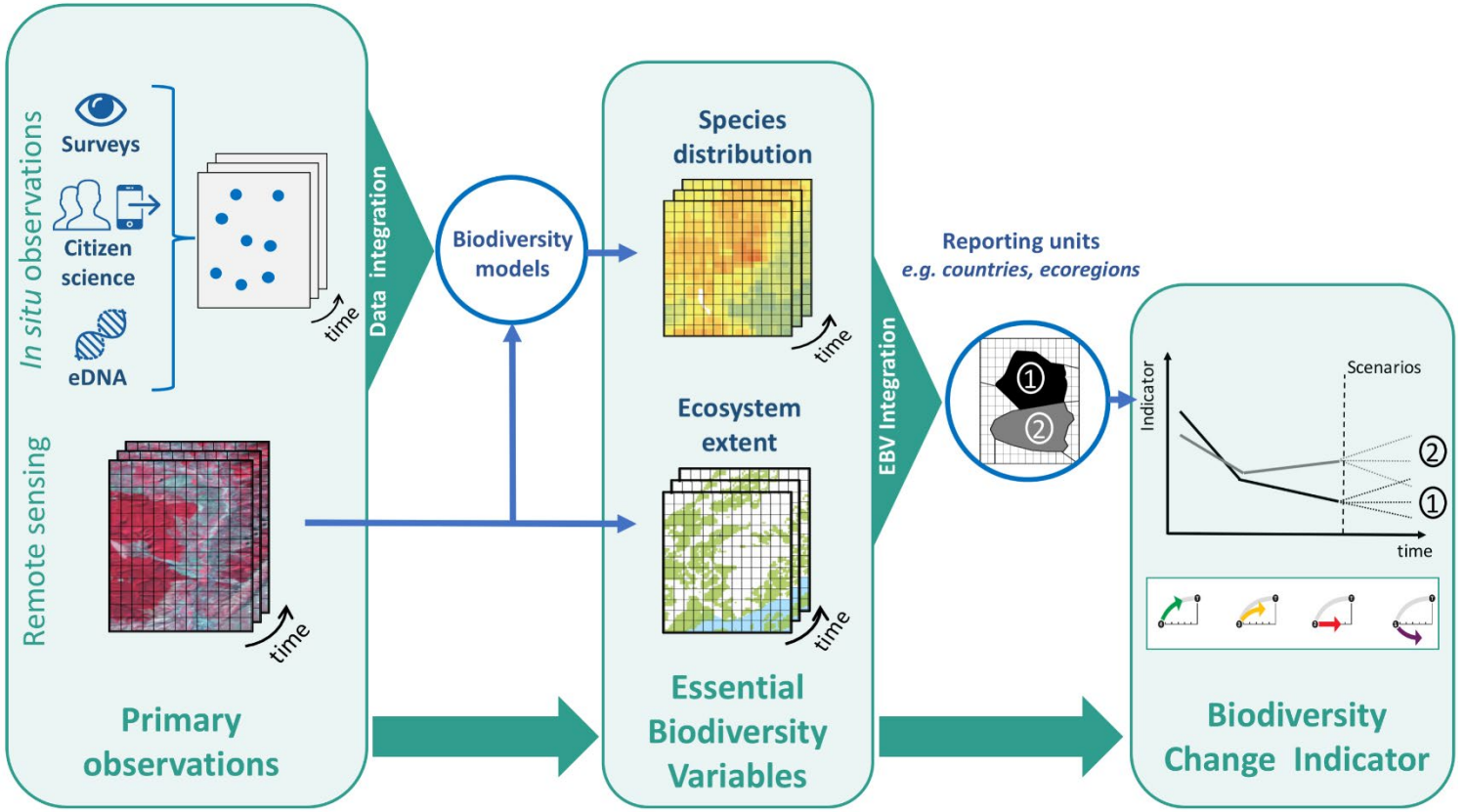




https://members.geobon.org/pages/index.php

The Essential Biodiversity Variables

EBVs: Minimum set of measurements, **complementary** to one another, that can capture major dimensions of biodiversity **change**.



Users

National Governments

CBD

ipbes Science and Policy for People and Nature

SUSTAINABLE DEVELOPMENT GOALS

Navarro et al., (2017) COSUST

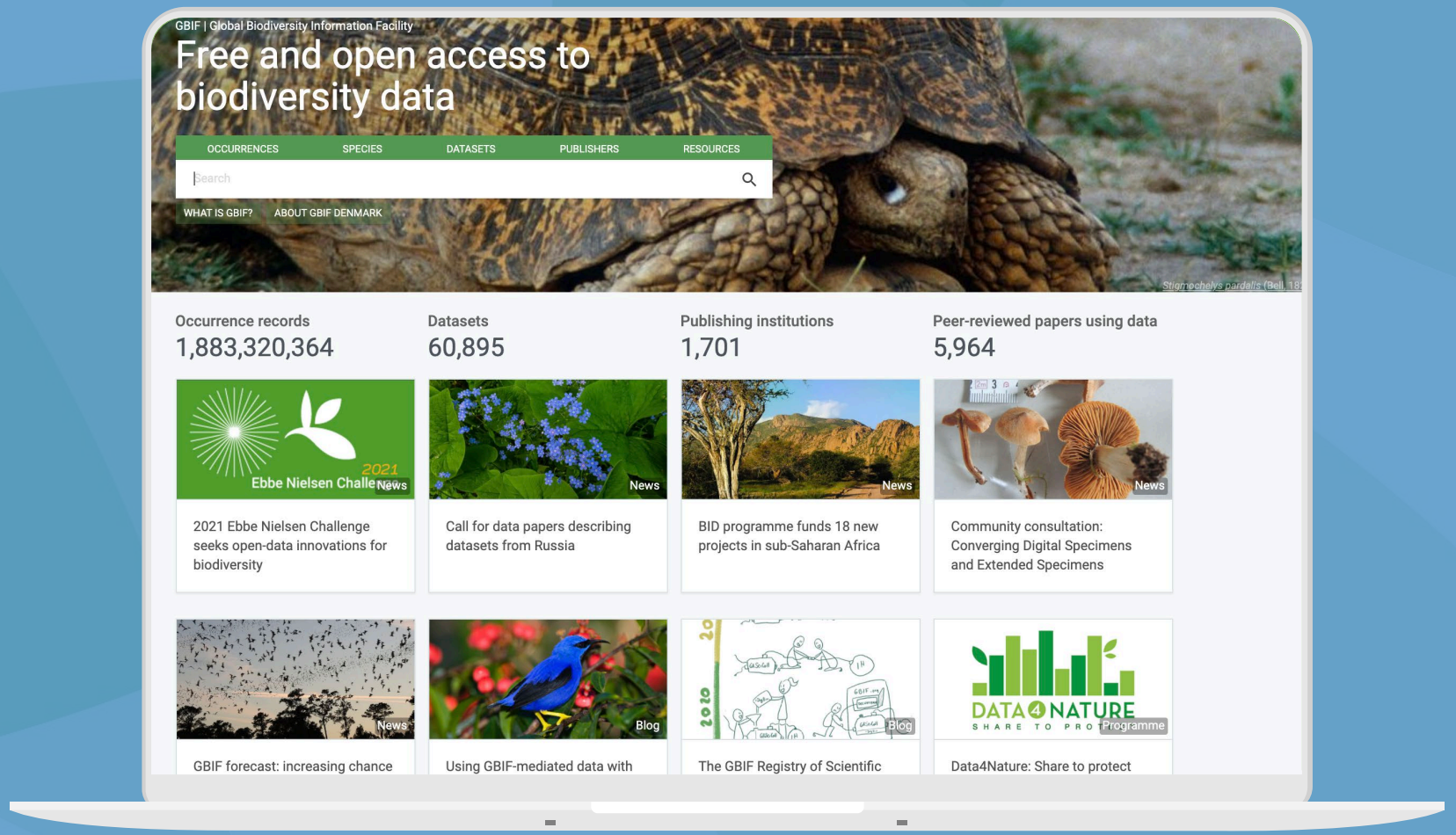
What is gbif?

Intergovernmental network and data infrastructure

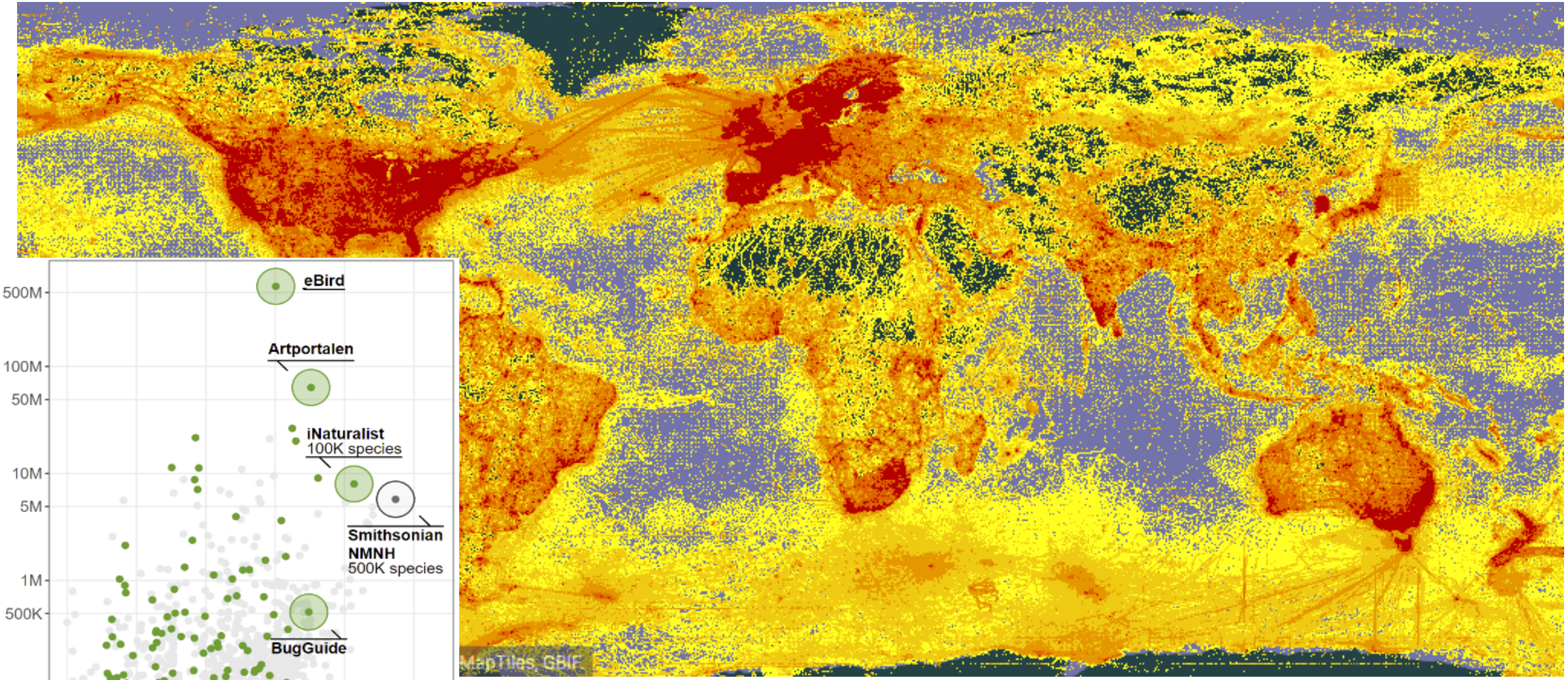
Provides anyone, anywhere, free and open access to data about all types of life on Earth

Voluntary collaboration through Memorandum of Understanding

Participant nodes, Secretariat in Copenhagen, DK

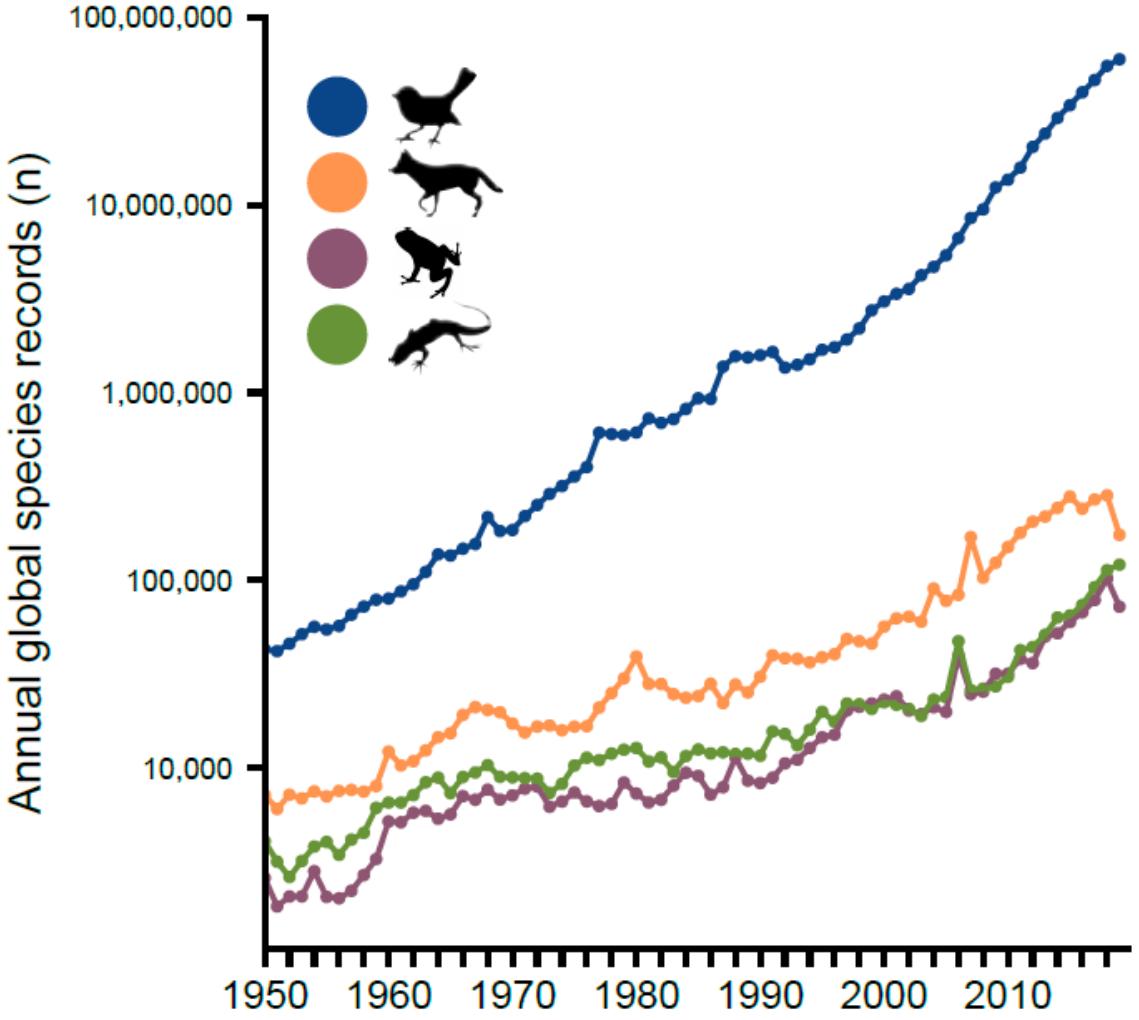


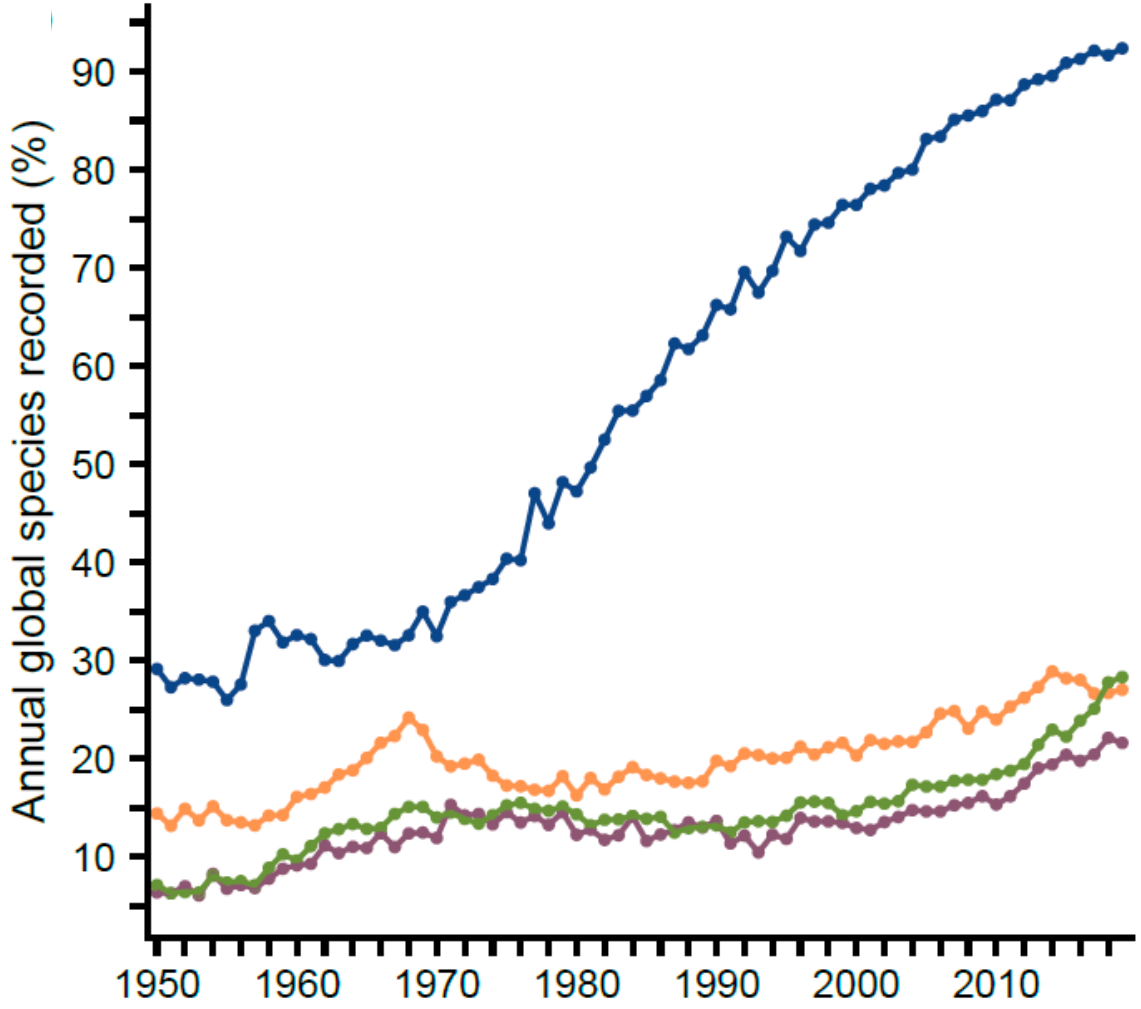
https://www.gbif.org/



https://www.gbif.org/occurrence/search

Dramatic growth in annual species records





https://www.gbif.org/analytics/global

Oliver et al., PLOS Biology (in press)

Supporting implementation of invasive alien species indicators

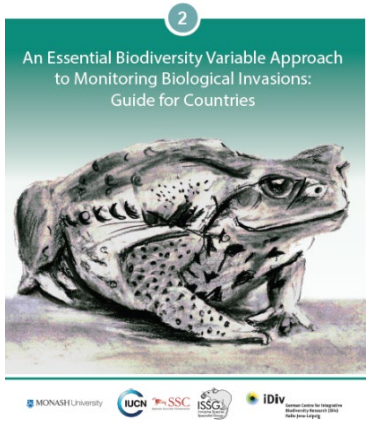
1. Where the data come from

Country checklists (GRIIS)

Countries track IAS distributions

GBIF occurrence records

Global Register of Introduced and Invasive Species



ISSG Invasive Species Specialist Group

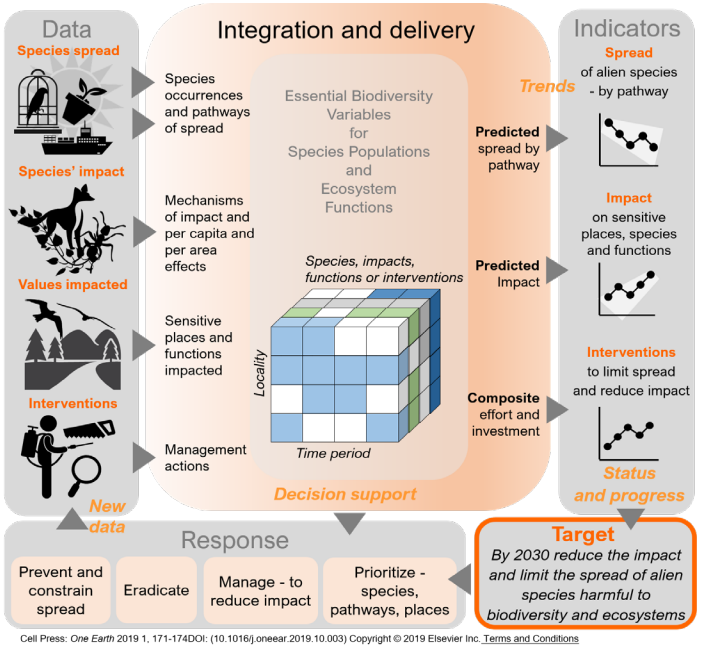
IUCN SSC Species Survival Commission

GBIF

http://invasionevs.com

2. Calculation from Species Populations EBV

Modelled status and trends
to estimate change and uncertainty



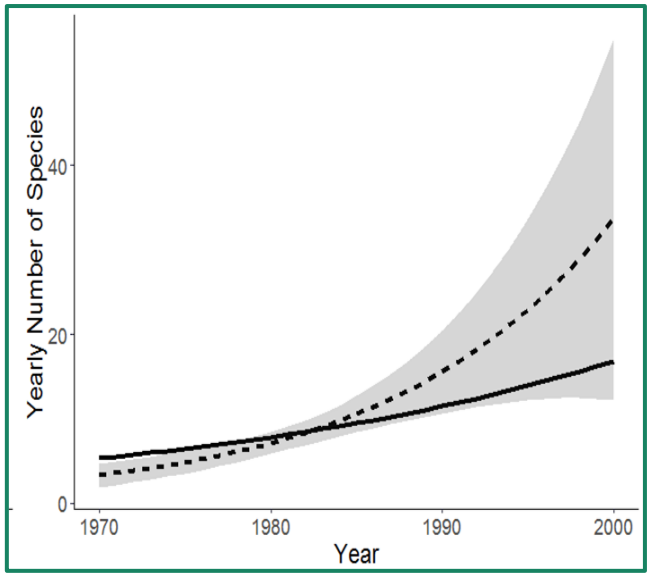
Cell Press: *One Earth* 2019 1, 171-174DOI: (10.1016/j.oneear.2019.10.003) Copyright © 2019 Elsevier Inc. Terms and Conditions

EBV framework for IAS
https://bit.ly/2CsCq8H

MOL MAP OF LIFE

3. Headline Indicator e.g. GBF Target 5

Rate of invasive alien species spread
For countries, pathways
and IAS species groups

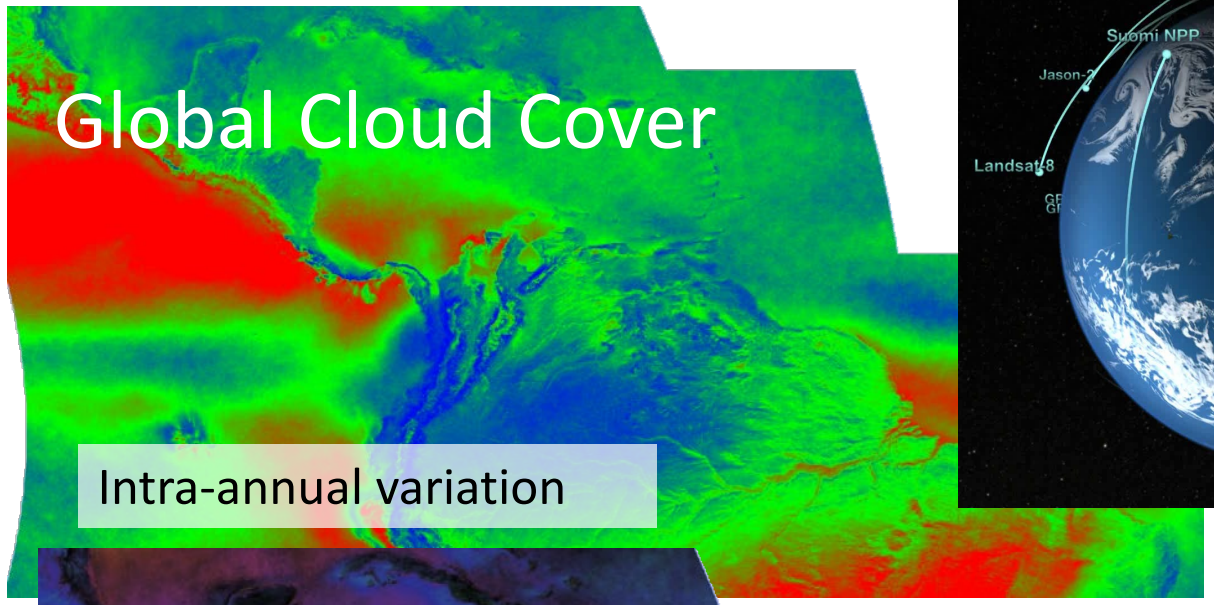


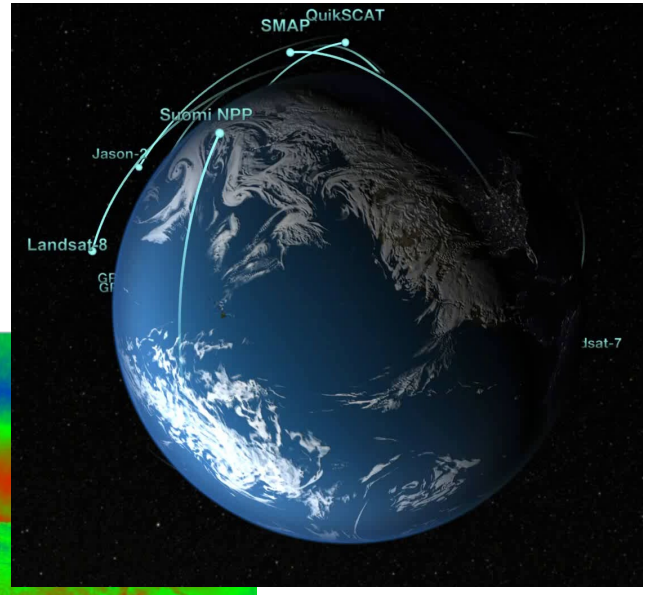
Resources and further information:

Country guidelines- https://bit.ly/383m2tL
Country checklists- https://bit.ly/31ZrQCM
Invasion indicators - https://bit.ly/3hUTloJ
GRIIS methods-: https://go.nature.com/2yYfcFh
Data workflow- https://bit.ly/3k3HDLl
The researchers- https://bit.ly/36tehxU

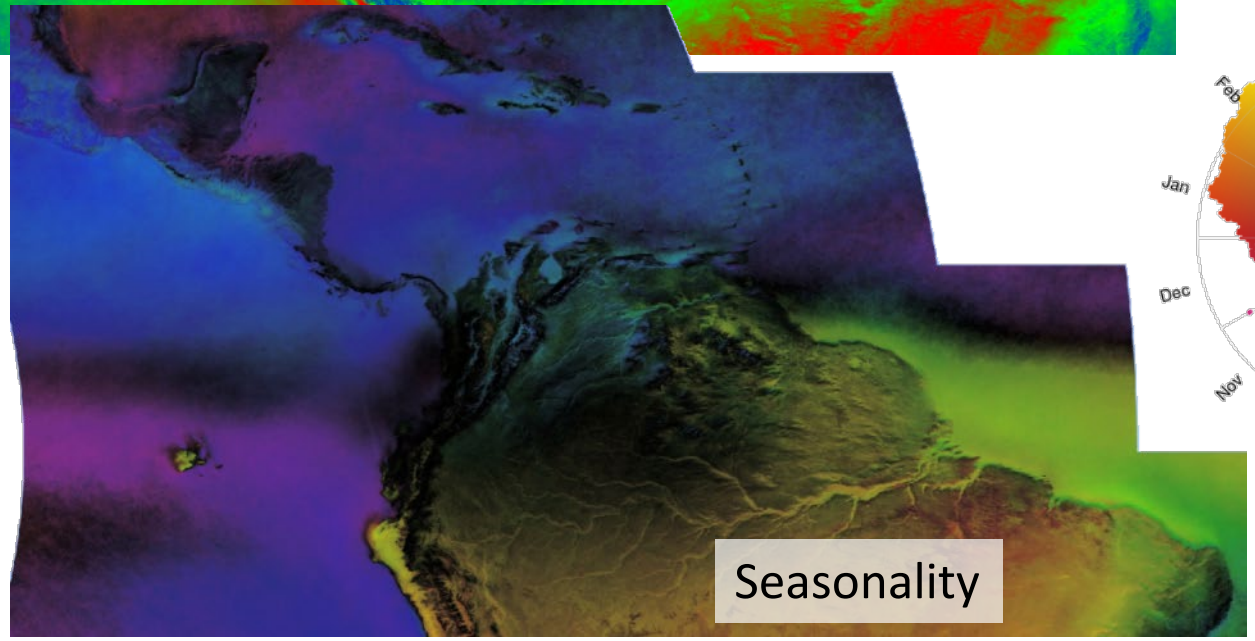
Global Remote Sensing

20 years of
MODIS satellite

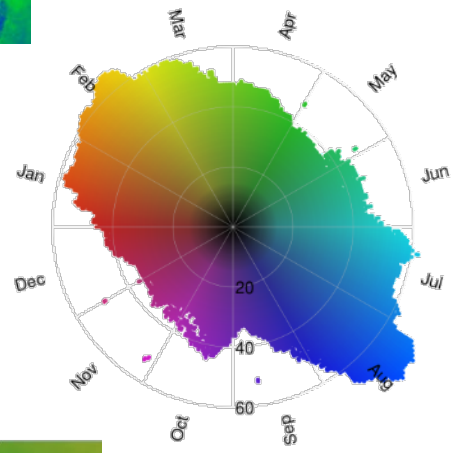




Intra-annual variation



Seasonality

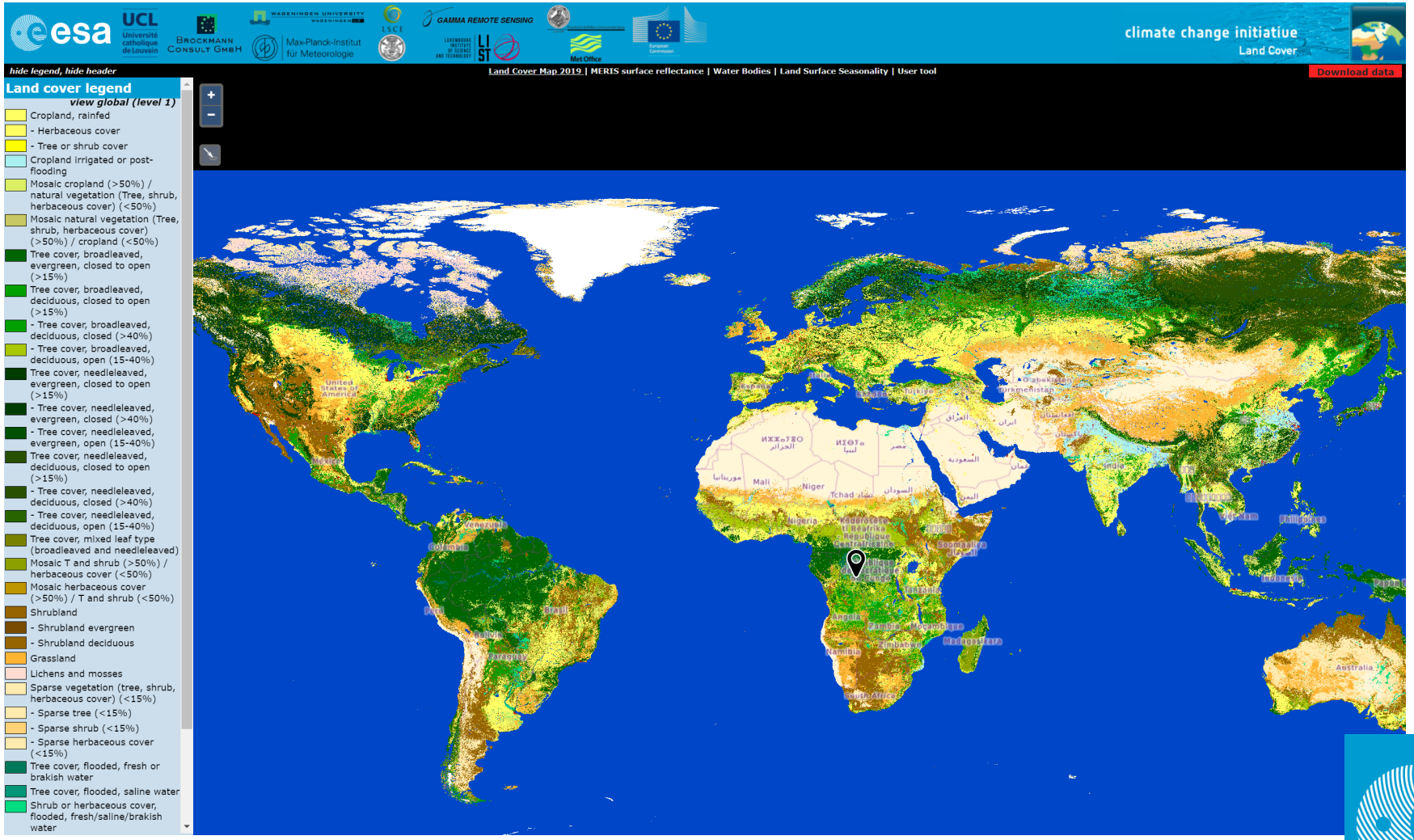


EarthEnv

NASA

Global Remote Sensing

Annual land cover, 300m resolution. Coming: 30m, 10m



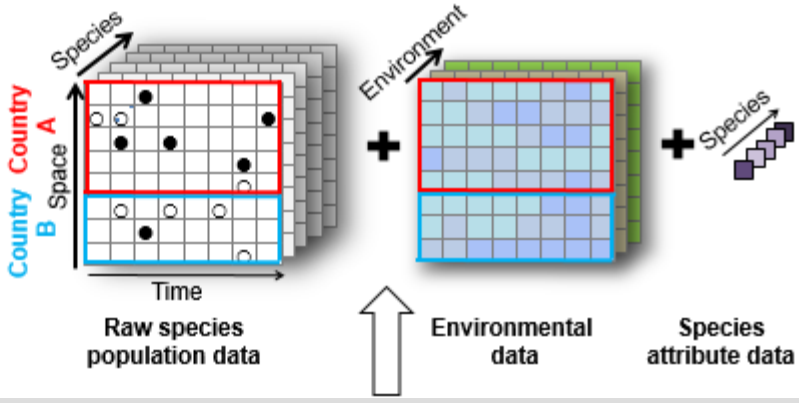
esa

Species Populations Working Group

Walter Jetz[1], Melodie A. McGeoch[2], Robert Guralnick[3], Simon Ferrier[4], Jan Beck[5], Mark J. Costello[6], Miguel Fernandez[7,8], Gary N. Geller[9], Petr Keil[10], Cory Merow[1], Carsten Meyer[10,11], Frank E. Muller-Karger[12], Henrique M. Pereira[10,13,14], Eugenie C. Regan[15], Dirk S. Schmeller[16,17], Eren Turak[18,19]

Nature Ecology & Evolution 2019





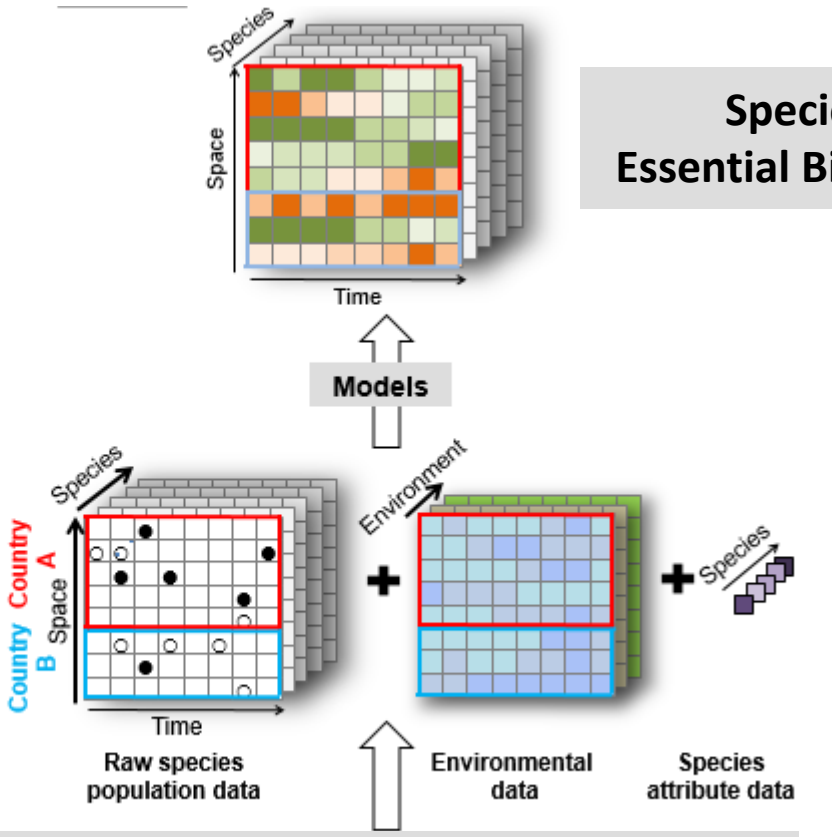
Data

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Nature Ecology & Evolution 2019





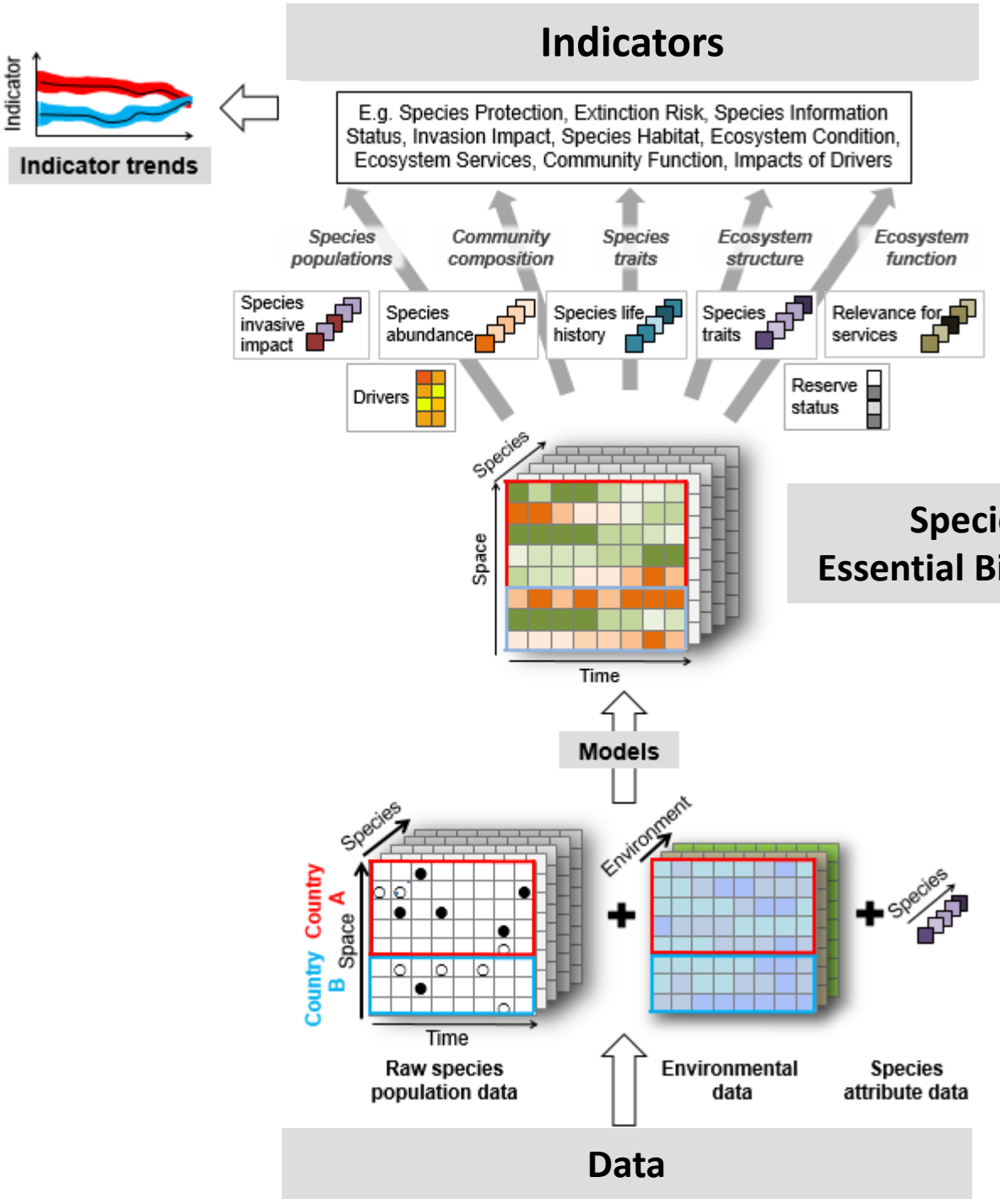
Species Population Essential Biodiversity Variable

Species Populations Working Group

Walter Jetz[1], Melodie A. McGeoch[2], Robert Guralnick[3], Simon Ferrier[4], Jan Beck[5], Mark J. Costello[6], Miguel Fernandez[7,8], Gary N. Geller[9], Petr Keil[10], Cory Merow[1], Carsten Meyer[10,11], Frank E. Muller-Karger[12], Henrique M. Pereira[10,13,14], Eugenie C. Regan[15], Dirk S. Schmeller[16,17], Eren Turak[18,19]

Nature Ecology & Evolution 2019



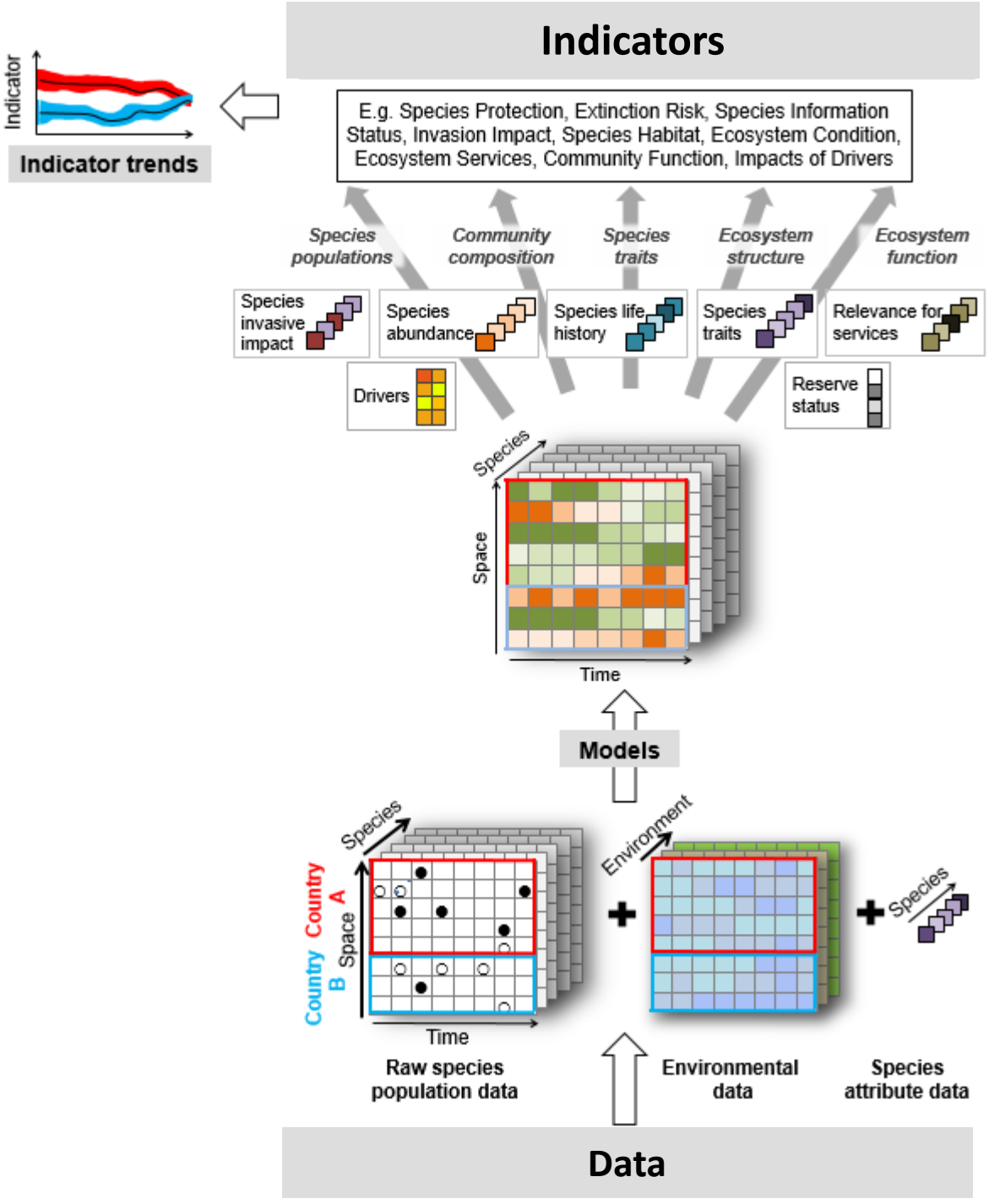


Species Populations Working Group

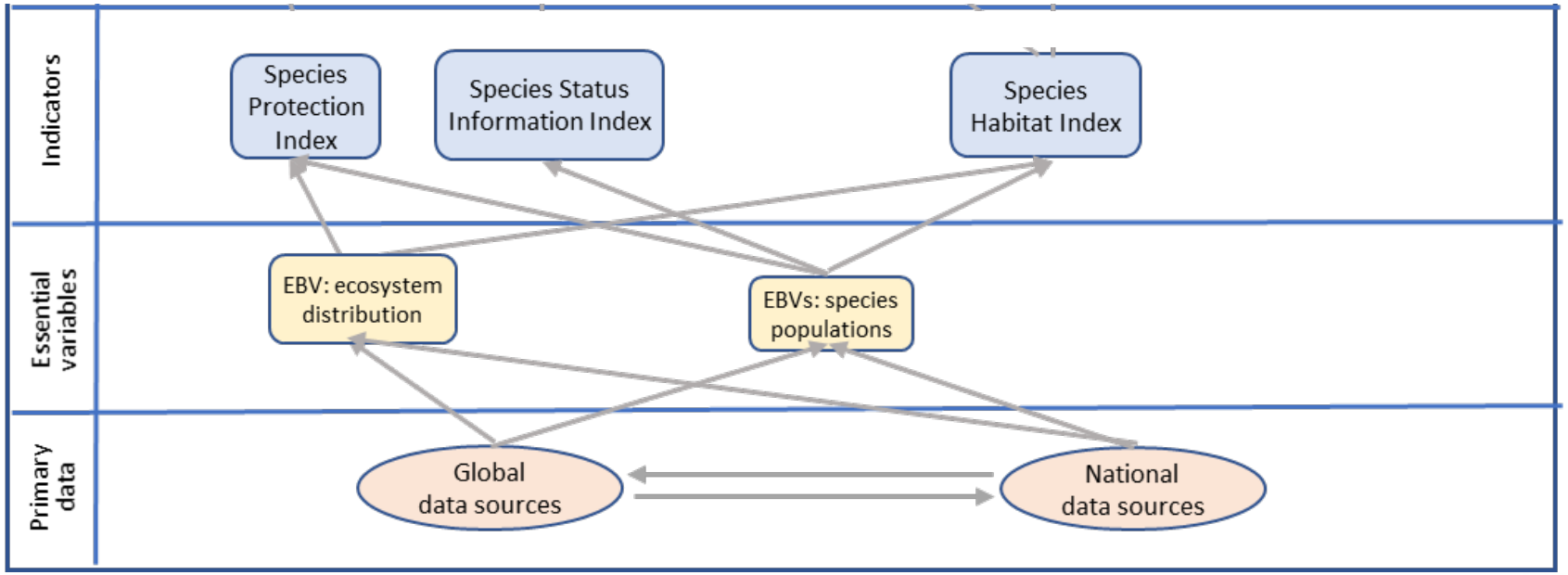
Walter Jetz[1], Melodie A. McGeoch[2], Robert Guralnick[3], Simon Ferrier[4], Jan Beck[5], Mark J. Costello[6], Miguel Fernandez[7,8], Gary N. Geller[9], Petr Keil[10], Cory Merow[1], Carsten Meyer[10,11], Frank E. Muller-Karger[12], Henrique M. Pereira[10,13,14], Eugenie C. Regan[15], Dirk S. Schmeller[16,17], Eren Turak[18,19]

Nature Ecology & Evolution 2019



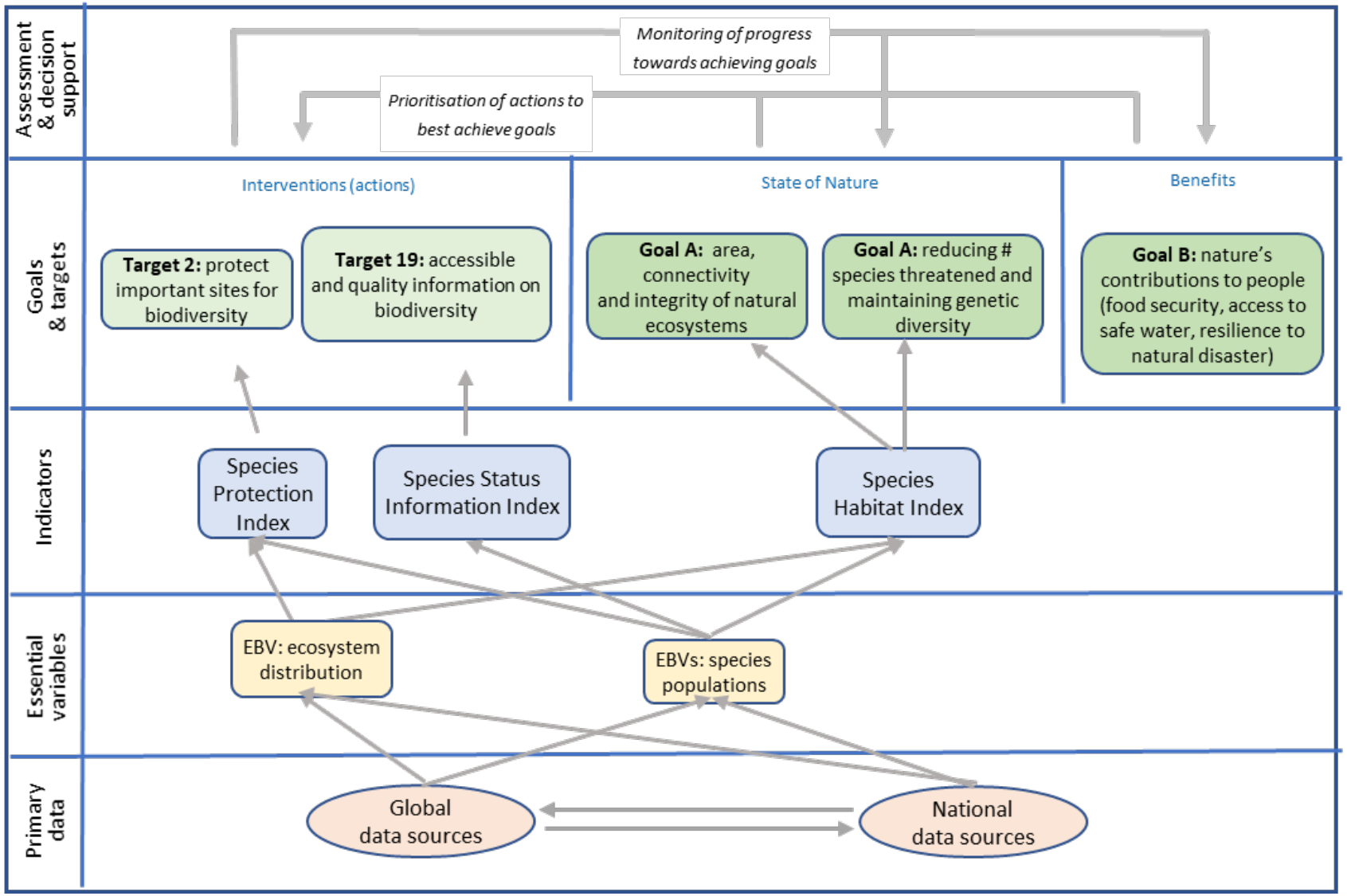


Added-value of EBV-based indicators for Post-2020 Global Biodiversity Framework



Source: Kim et al. *In prep.* Essential Biodiversity Variables and Essential Ecosystem Services Variables for Post-2020 Policy Development and Implementation.

Added-value of EBV-based indicators for Post-2020 Global Biodiversity Framework



Source: Kim et al. *In prep.* Essential Biodiversity Variables and Essential Ecosystem Services Variables for Post-2020 Policy Development and Implementation.

Species Habitat Index

Species Protection Index

IUCN World Parks Congress Sydney 2014

Parks, people, planet: inspiring solutions



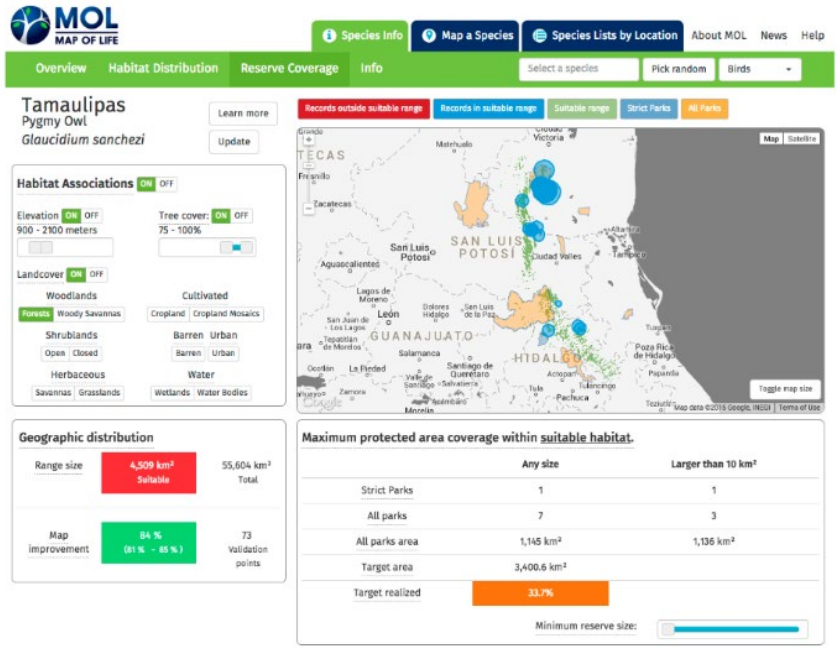
Map of Life: A preview of how to evaluate species conservation with Google Earth Engine

Thursday, January 8, 2015

Posted by Walter Jetz, Dept. of Ecology and Evolutionary Biology, Yale University, and Dave Thau Developer Advocate, Google Earth Engine, with support from Robert Guralnick, Dept. of Natural H University of Florida

Google AI Blog

The latest news from Google AI



Karger, D. N., M. Kessler, M. Lehnert, and W. Jetz. 2021. Limited protection and ongoing loss of tropical cloud forest biodiversity and ecosystems worldwide. Nature Ecology & Evolution. https://doi.org/10.1038/s41559-021-01450-yc

Almond, R., M. Grooten, and T. Peterson. 2020. Living Planet Report 2020-Bending the curve of biodiversity loss. World Wildlife Fund.

Hansen, A. J., B. P. Noble, J. Veneros, A. East, S. J. Goetz, C. Supples, J. E. Watson, P. A. Jantz, R. Pillay, and W. Jetz. Towards monitoring ecosystem integrity within the Post-2020 Global Biodiversity Framework. https://ecoevorxiv.org/eyqw5/

"Environmental performance index." Yale University and Columbia University: New Haven, CT, USA (2020). https://epi.yale.edu

Jetz, W., M. A. McGeoch, R. Guralnick, S. Ferrier, J. Beck, M. J. Costello, M. Fernandez, G. N. Geller, P. Keil, C. Merow, C. Meyer, F. E. Muller-Karger, H. M. Pereira, E. C. Regan, D. S. Schmeller, and E. Turak. 2019. Essential biodiversity variables for mapping and monitoring species populations. Nature Ecology & Evolution **3**:539-551.

Rinnan, D. S., and W. Jetz. 2020. Terrestrial conservation opportunities and inequities revealed by global multi-scale prioritization. bioRxiv:2020.2002.2005.936047.

Rinnan, D. S., G. Reygondeau, J. McGowan, V. Lam, R. Sumaila, A. Ranipeta, K. Kaschner, C. Garilao, W. L. Cheung, and W. Jetz. 2021. Targeted, collaborative biodiversity conservation in the global ocean can benefit fisheries economies. bioRxiv:2021.2004.2023.441004.

Powers, R. P., and W. Jetz. 2019. Global habitat loss and extinction risk of terrestrial vertebrates under future land-use-change scenarios. Nature Climate Change 9:323-329. https://doi.org/10.1038/s41558-019-0406-z

Jetz, W., M. A. McGeoch, R. Guralnick, S. Ferrier, J. Beck, M. J. Costello, M. Fernandez, G. N. Geller, P. Keil, C. Merow, C. Meyer, F. E. Muller-Karger, H. M. Pereira, E. C. Regan, D. S. Schmeller, and E. Turak. 2019. Essential biodiversity variables for mapping and monitoring species populations. Nature Ecology & Evolution 3:539-551. https://doi.org/10.1038/s41559-019-0826-1

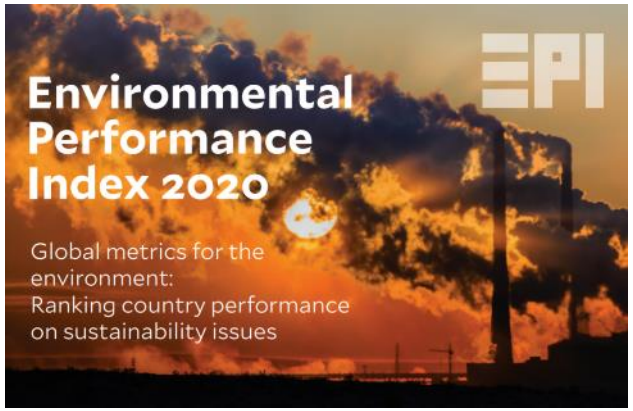
Jetz, W., and D. Thau. 2015. Map of Life: A preview of how to evaluate species conservation with Google Earth Engine. Google AI. https://ai.googleblog.com/2015/01/map-of-life-preview-of-how-to-evaluate.html

Species Habitat Index

Species Protection Index

Indicator use



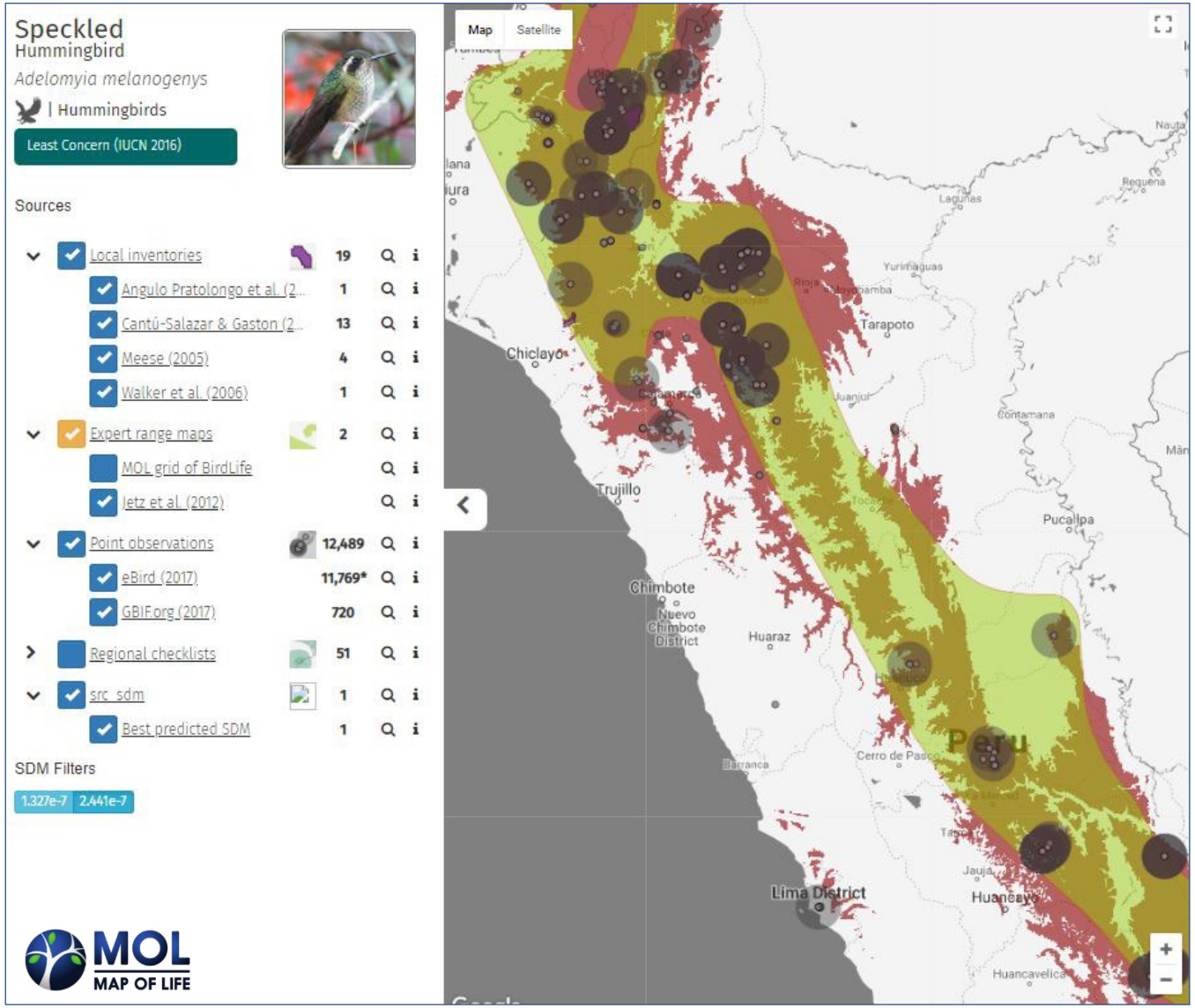


IPBES Core Indicators

NATIONAL GEOGRAPHIC



Putting species on the map





https://mol.org/species/map/Adelomyia_melanogenys

Species Home | Summary Map | Detailed Map | Habitat Distribution | Reserve Coverage | Habitat Trends | Projection | Search fo

Zebra Duiker

Cephalophus zebra



Vulnerable (IUCN 2016)

Habitat Associations

Use defaults | Update

Elevation

0m — 8000m

Tree cover

0% — 75% — 100%

Landcover | Show Land-cover preferences

Distribution

Range size:	31,398 km² Habitat Suitable	215,894 km² Total
Map Improvement:	42% (37% - 46%)	159 Validation points

Layers



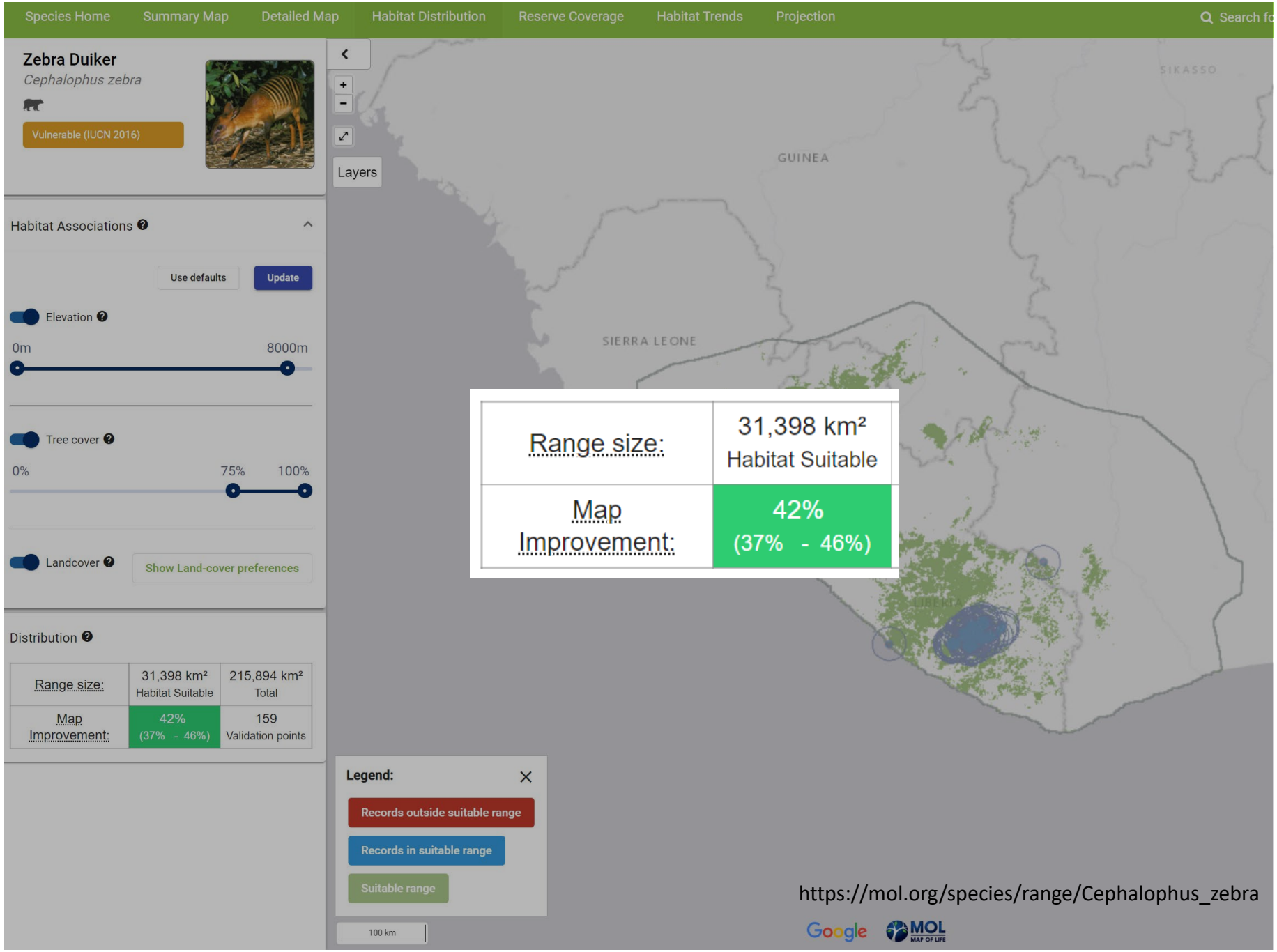
Legend:

- Records outside suitable range
- Records in suitable range
- Suitable range

100 km

https://mol.org/species/range/Cephalophus_zebra

Google | MOL MAP OF LIFE


Species Home
Summary Map
Detailed Map
Habitat Distribution
Reserve Coverage
Habitat Trends
Projection
Search fo
Zebra Duiker
Cephalophus zebra
Vulnerable (IUCN 2016)
Habitat Associations
Use defaults
Update
Elevation
0m
8000m
Tree cover
0%
75%
100%
Landcover
Show Land-cover preferences
Distribution
Range size:
31,398 km²
Habitat Suitable
215,894 km²
Total
Map Improvement:
42%
(37% - 46%)
159
Validation points
Layers
GUINEA
SIERRA LEONE
LIBERIA
SIKASSO
Range size:
31,398 km²
Habitat Suitable
Map Improvement:
42%
(37% - 46%)
Legend:
Records outside suitable range
Records in suitable range
Suitable range
100 km
https://mol.org/species/range/Cephalophus_zebra
Google
MOL
MAP OF LIFE

Species Home | Summary Map | Detailed Map | Habitat Distribution | Reserve Coverage | Habitat Trends | Projection

Zebra Duiker

Cephalophus zebra



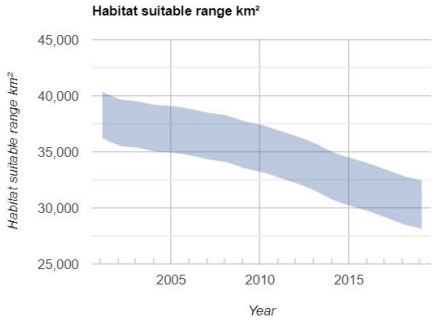
Vulnerable (IUCN 2016)

Map overlay:

1km ESA land cover, tree cover and elevation

Legend:

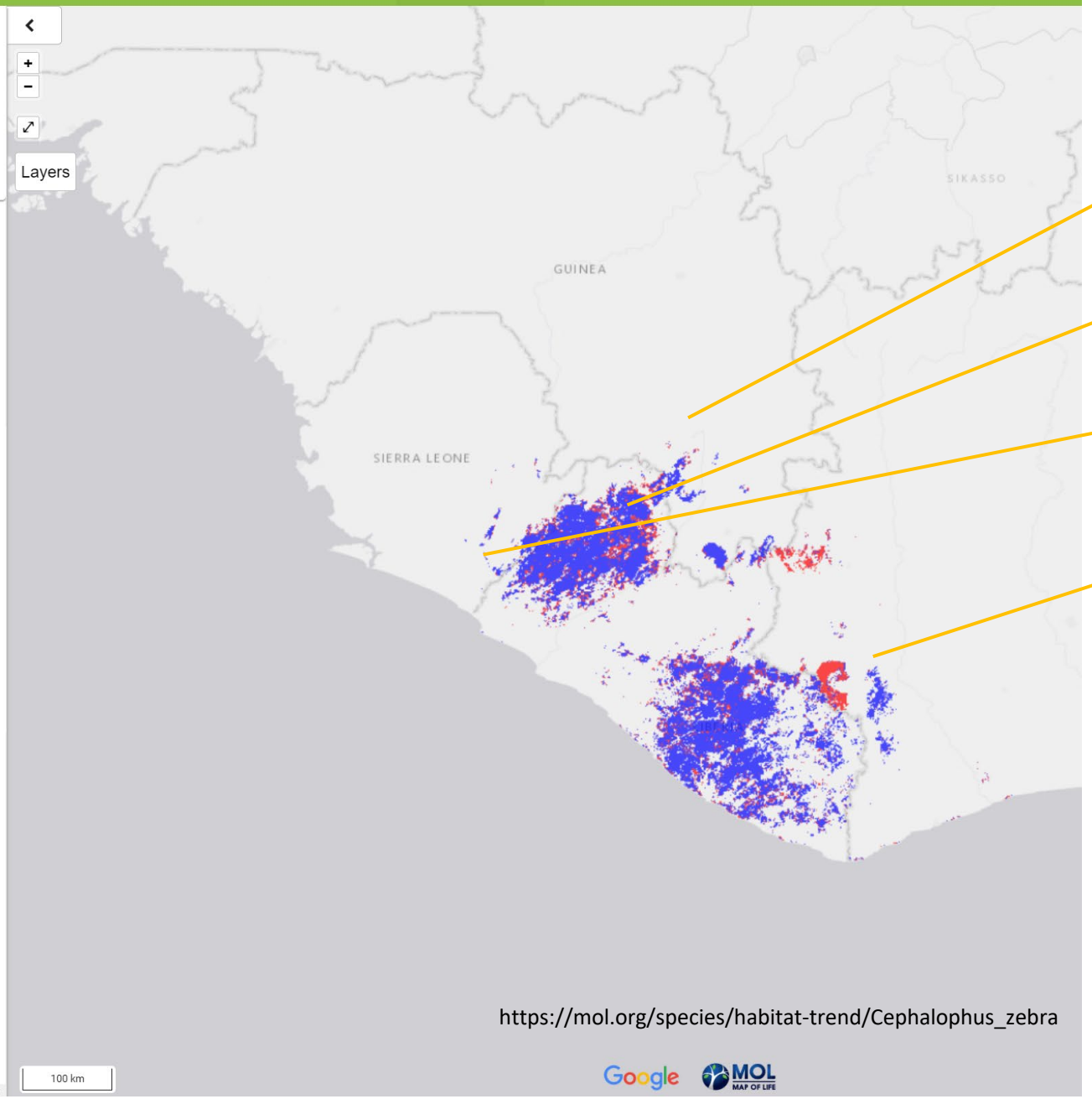




View larger chart

Suitable elevation: 0 to 8000 meters
Suitable tree cover: 75 to 100%

Toggle land cover suitability



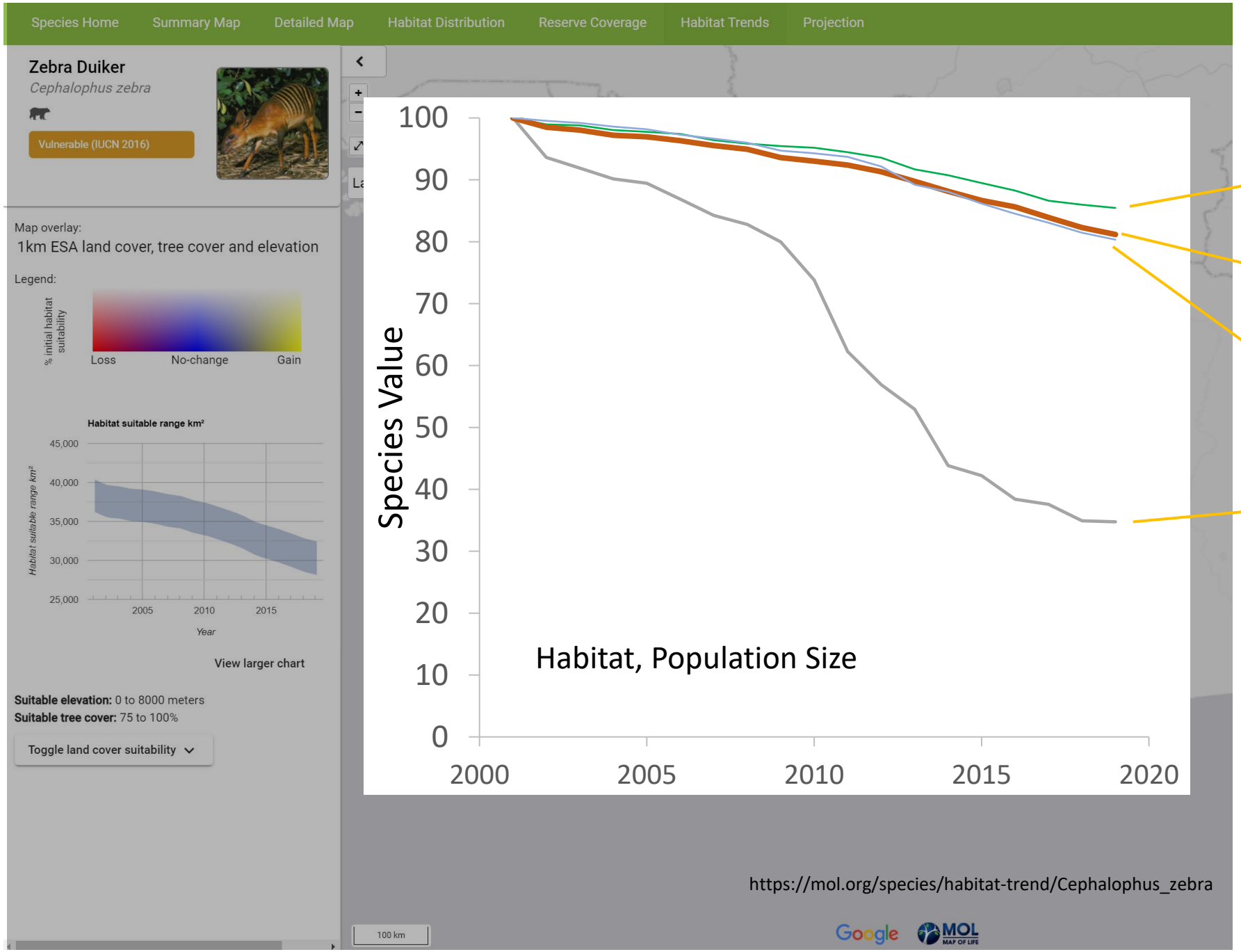
https://mol.org/species/habitat-trend/Cephalophus_zebra

Guinea
4% steward

Liberia
86% steward

Sierra Leone
3% steward

Cote d'Ivoire
7 % steward



Guinea
4% steward

Liberia
86% steward

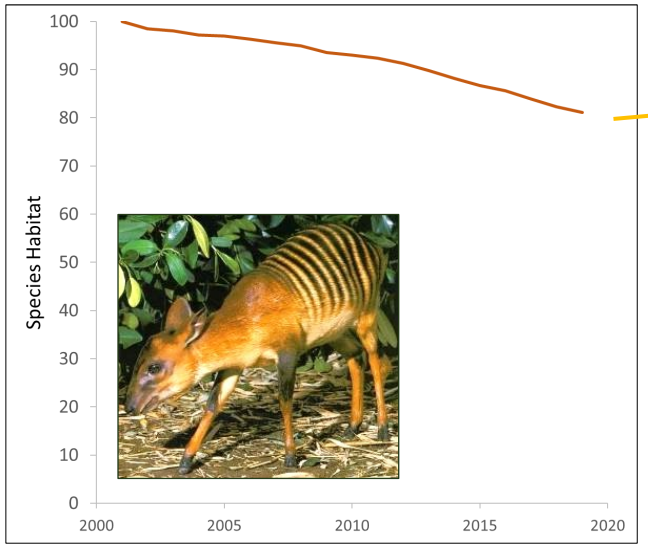
Sierra Leone
3% steward

Cote d'Ivoire
7 % steward

https://mol.org/species/habitat-trend/Cephalophus_zebra

Species Habitat Index

Example for Year 2019 against a 2001 baseline



Species	Value	Steward
A	81	0.86

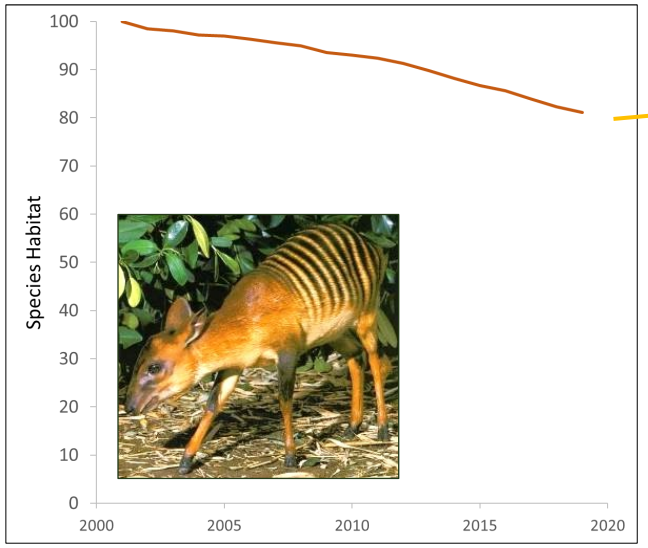
Average* change in the estimated size of ecologically intact areas supporting species populations in country

*weighted by country stewardship

Species Habitat Index

Change in the estimated size of ecologically intact areas supporting species populations

Example for Year 2019 against a 2001 baseline



Species	Value	Steward
A	81	0.86
B	102	1.00
C	60	0.30
SHI	**88**	

Average* change in the estimated size of ecologically intact areas supporting species populations in country

*weighted by country stewardship

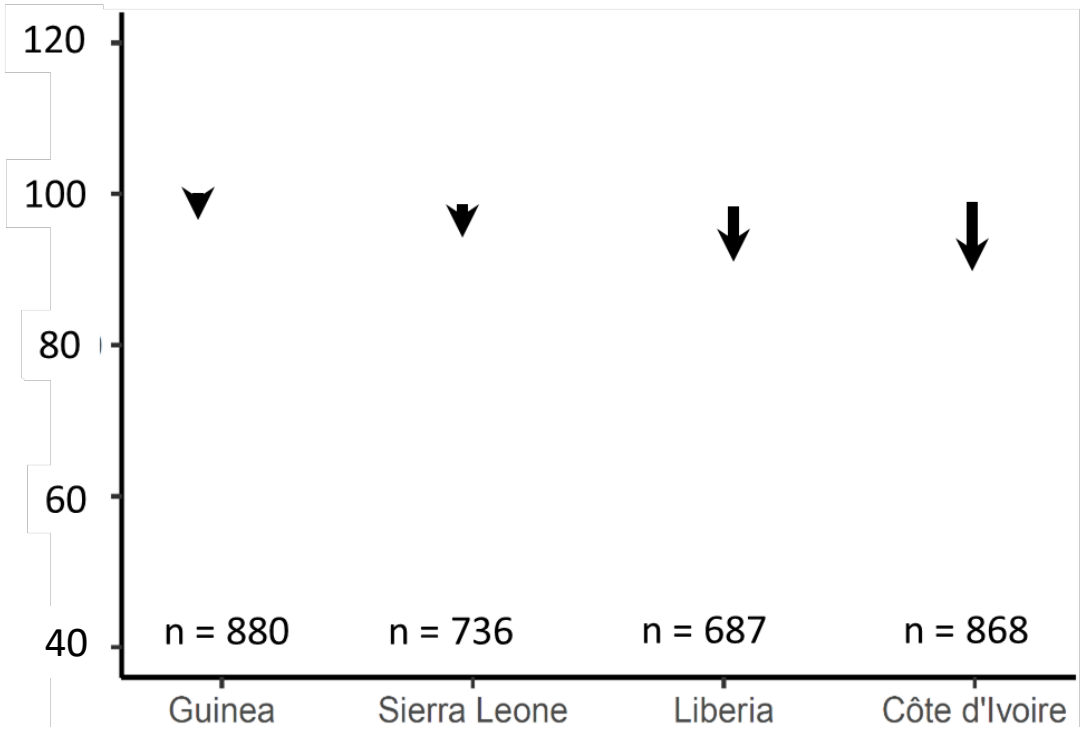
Species Habitat Index

Change in the estimated size of ecologically intact areas supporting species populations

Example for Year 2019 against a 2001 baseline

SHI

2001 - 2019





Goal A

The area, connectivity and integrity of natural ecosystems increased by at least [X%] supporting healthy and resilient populations of all species while reducing the number of species that are threatened by [X%] and maintaining genetic diversity.

- Ecosystem integrity and connectivity
- Prevent extinction, improve the conservation status of species
- Increase the population and health of species
- Maintain genetic diversity
- Protection of critical ecosystems

Goal A

Species Habitat Index

Change in the estimated size of ecologically intact areas supporting species populations

Calculated for thousands of species globally that in their aggregate define ecosystems, SHI addresses these components:

- Ecosystem integrity and connectivity	strongly
- Prevent extinction, improve the conservation status of species	strongly
- Increase the population and health of species	strongly
- Maintain genetic diversity	indirectly
- Protection of critical ecosystems	indirectly

Species Habitat Index

Conservation Letters
Open Access
A journal of the Society for Conservation Biology

In press

Andrew Hansen; Montana State University, Ecology Department
Noble, Benjamin; Montana State University, Ecology Department
Veneros, Jaris; Montana State University, Ecology Department
East, Alyson; Montana State University, Ecology Department
Goetz, Scott; Northern Arizona University, School of Informatics, Computing and Cyber Systems,
Supples, Christina; United Nations Development Programme
Watson, James; 4School of Geography, Planning and Environmental Management, University of Queensland; Wildlife Conservation Society
Jantz, Partick; Northern Arizona University, School of Informatics, Computing and Cyber Systems,
Pillay, Rajeev; University of Northern British Columbia, Natural Resources and Environmental Studies Institute
Jetz, Walter; Yale University, EEB Department
Ferrier, Simon; CSIRO, Land & Water; CSIRO
Grantham, Hedley; Conservation International, Science + Knowledge
Evans, Thomas; Wildlife Conservation Society
Ervin, Jamison; United Nations Development Programme
Venter, Oscar; University of Northern British Columbia, Natural Resources and Environmental Studies Institute
Virnig, Anne; United Nations Development Programme

Table 2. Evaluation of potential indicators of ecosystem integrity. Metrics that meet the criteria are denoted by 'Yes' and those that do not by 'No'. Color codes are: green – meets all criteria; yellow – meets all except 6. Reference State; red – does not meet criteria.

Ecosystem Component (Level I / Level II) Potential Indicator (source)	1. Ecosystem structure, function, or composition	2. Extent and Spatial Resolution	3. Temporal Resolution	4. Aggrega-tion	5. Credibility \ Availability	6. Refer-ence State
Ecosystem Composition						
Species Habitat Index by group	Yes	Yes	Yes	Yes	Yes	Yes

https://ecoevorxiv.org/eyqw5

Species Home | Summary Map | Detailed Map | Habitat Distribution | Reserve Coverage | Habitat Trends | Projection

Zebra Duiker

Cephalophus zebra



Vulnerable (IUCN 2016)

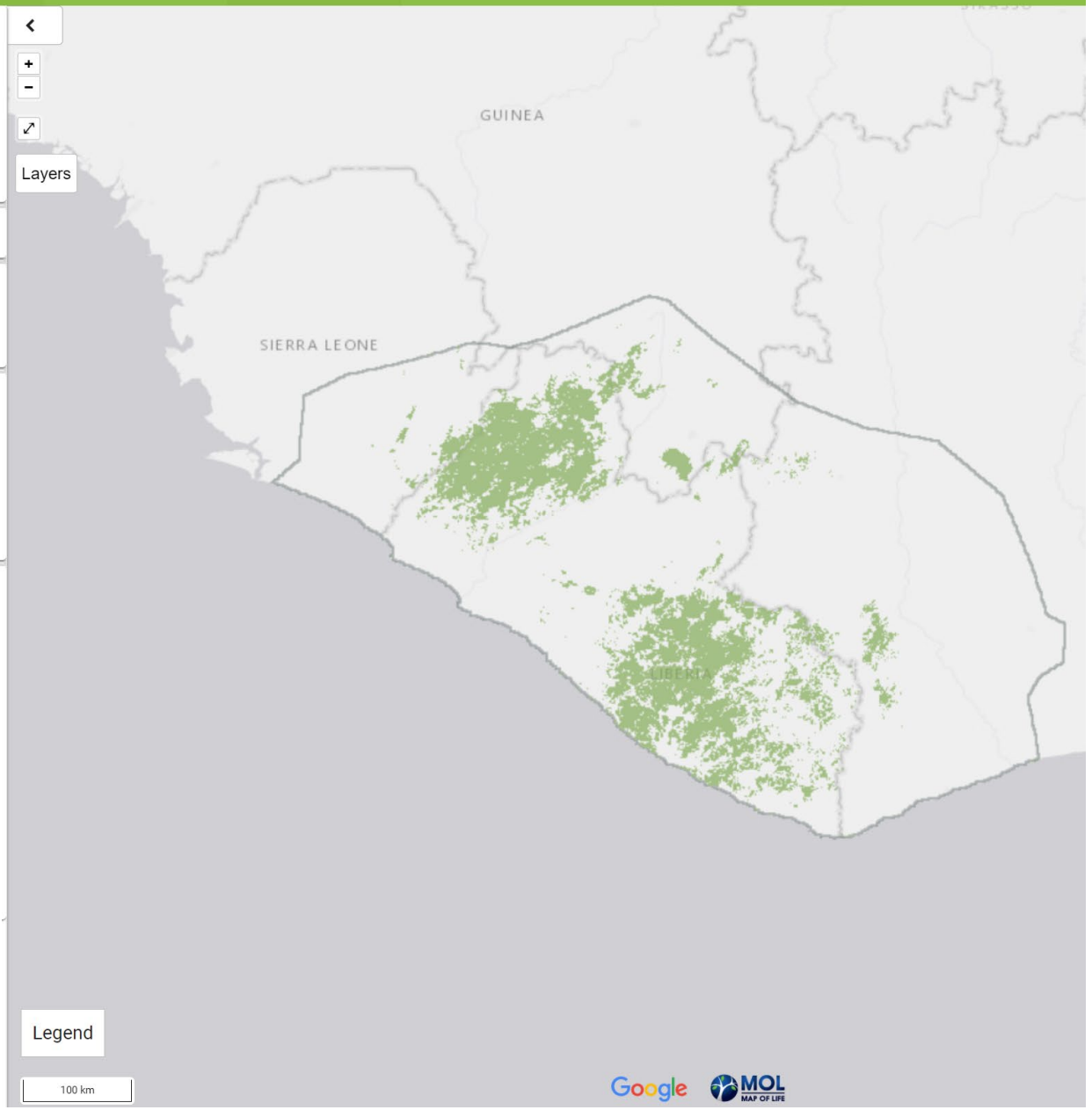
Habitat Associations

Map Options

Show Points Show Reserves

Distribution

Range size:	31,398 km² Habitat Suitable	215,894 km² Total
Map Improvement:	42% (37% - 46%)	159 Validation points



Species Home | Summary Map | Detailed Map | Habitat Distribution | Reserve Coverage | Habitat Trends | Projection

Zebra Duiker

Cephalophus zebra

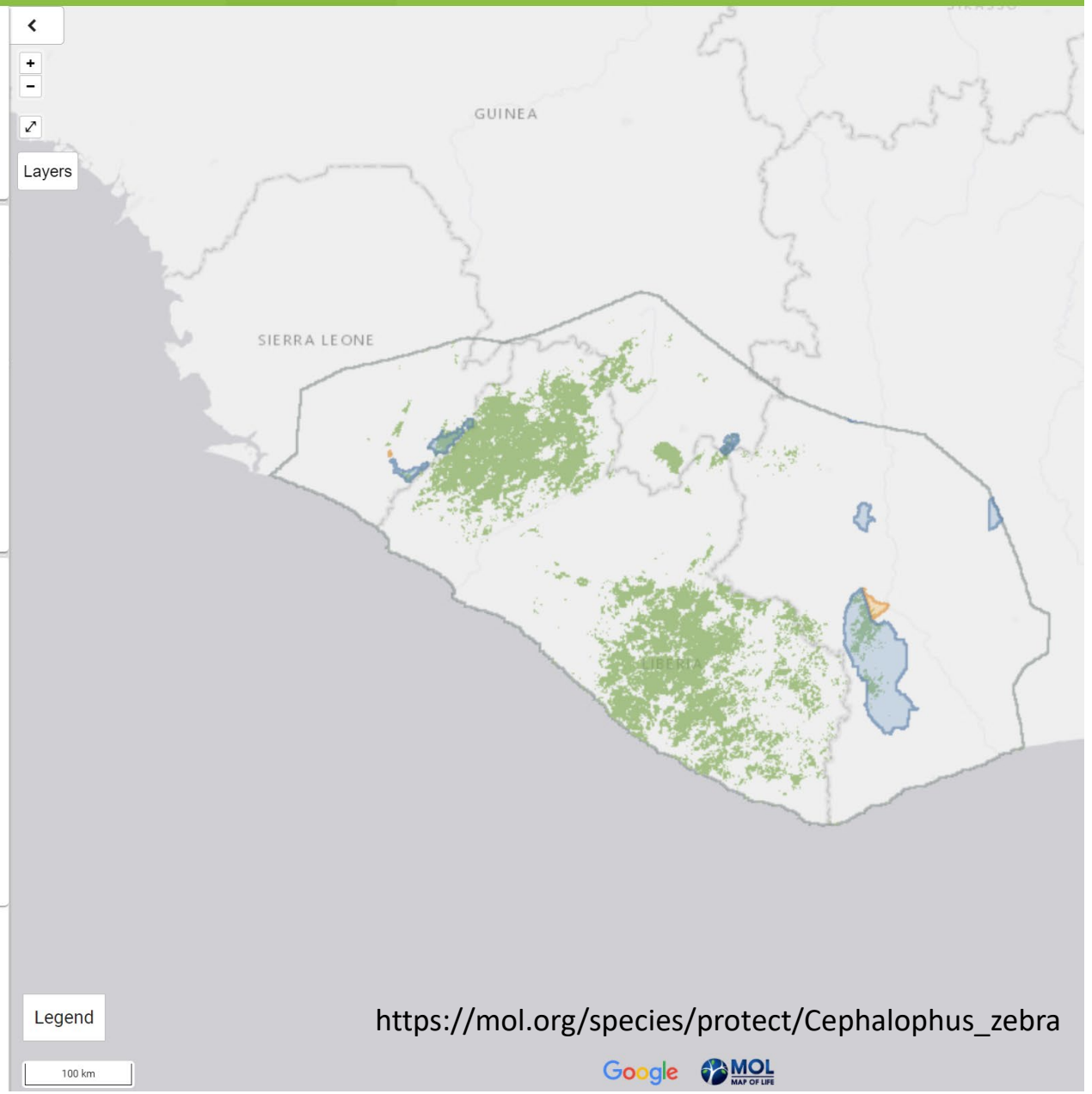


Vulnerable (IUCN 2016)

Protection

	Any Size	Larger than 10 km²
Strict Parks	4	4
All parks	26	18
Range protected	4,914.8 km²	4,894.7 km²
Target protected	13,745.2 km²	13,745.2 km²
Target realized*	35.756 %	35.61 %

Minimum reserve size:



https://mol.org/species/protect/Cephalophus_zebra

Species Home | Summary Map | Detailed Map | Habitat Distribution | Reserve Coverage | Habitat Trends | Projection

Zebra Duiker

Cephalophus zebra



Vulnerable (IUCN 2016)

Layers

GUINEA

Range size:	31,398 km² Habitat Suitable

Strict Parks	4
All parks	26
Range protected	4,914.8 km²
Target protected	13,745.2 km²
Target realized*	35.756 %

Protection

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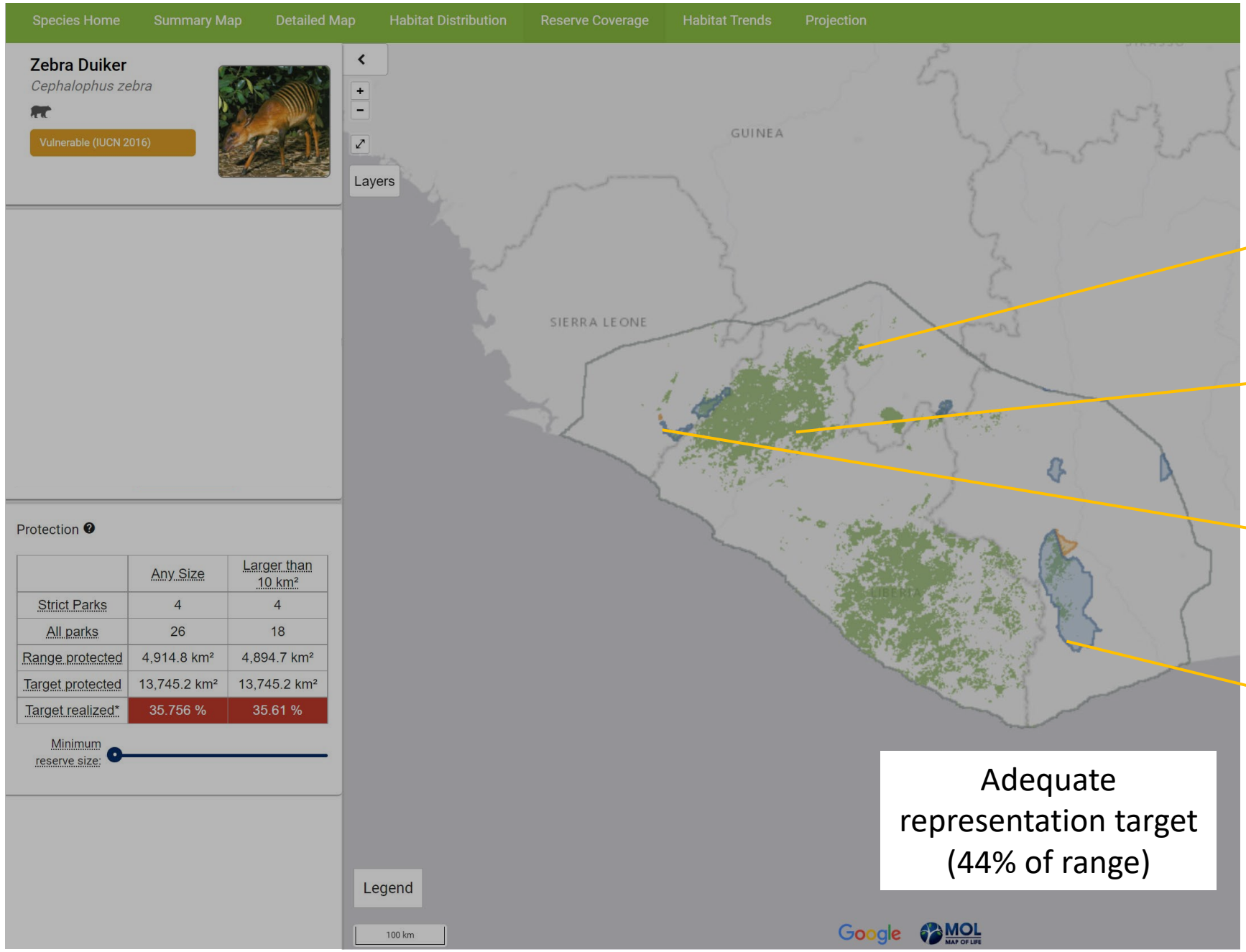
Minimum reserve size:

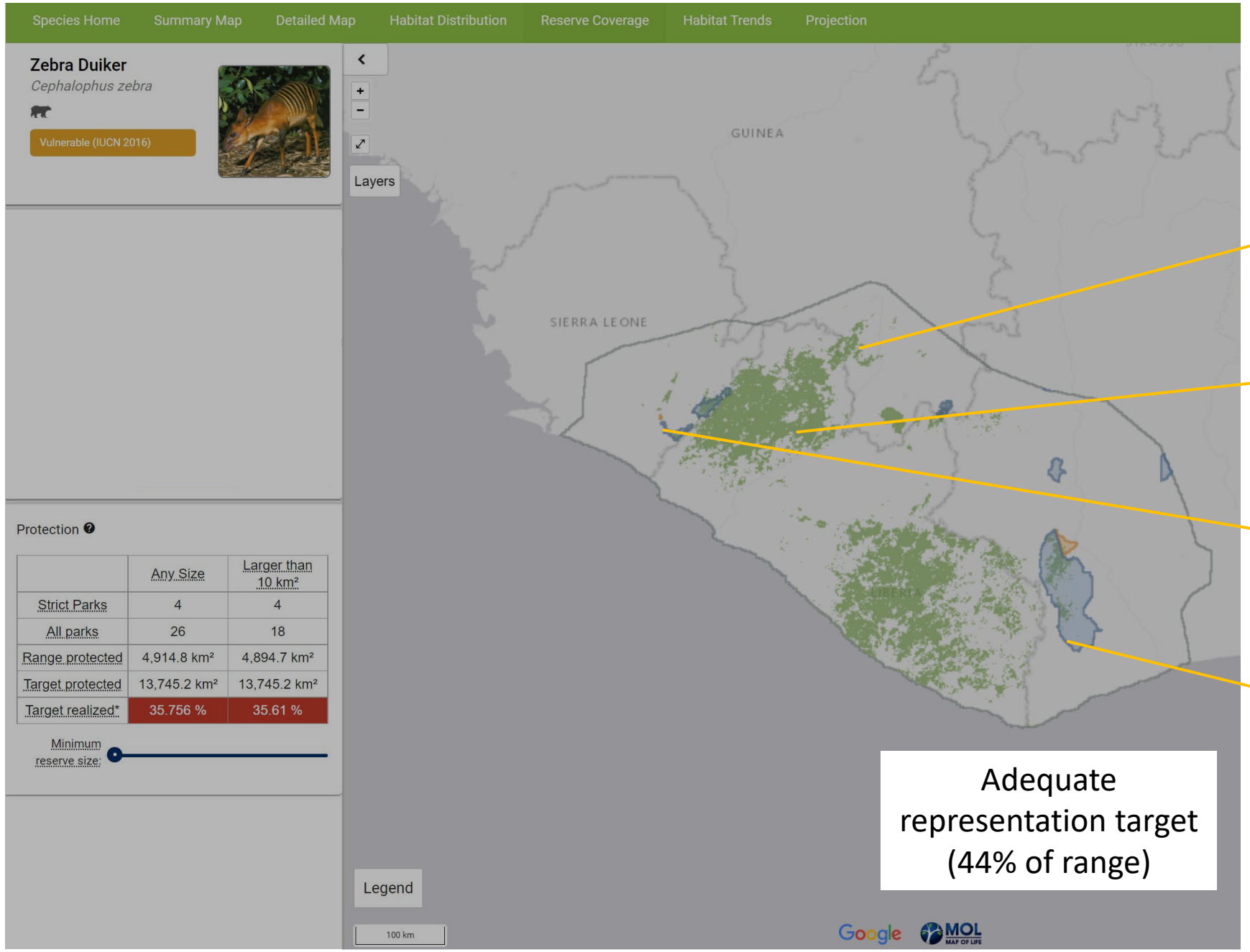
Adequate representation target (44% of range)

Legend

100 km

Google MOL MAP OF LIFE


Species Home
Summary Map
Detailed Map
Habitat Distribution
Reserve Coverage
Habitat Trends
Projection
Zebra Duiker
Cephalophus zebra
Vulnerable (IUCN 2016)
Layers
GUINEA
SIERRA LEONE
Protection
Any Size
Larger than 10 km²
Strict Parks 4 4
All parks 26 18
Range protected 4,914.8 km² 4,894.7 km²
Target protected 13,745.2 km² 13,745.2 km²
Target realized* 35.756 % 35.61 %
Minimum reserve size:
Legend
100 km
Google
MOL MAP OF LIFE
Adequate representation target (44% of range)
Guinea
4% steward
Liberia
86% steward
Sierra Leone
3% steward
Cote d'Ivoire
8 % of range



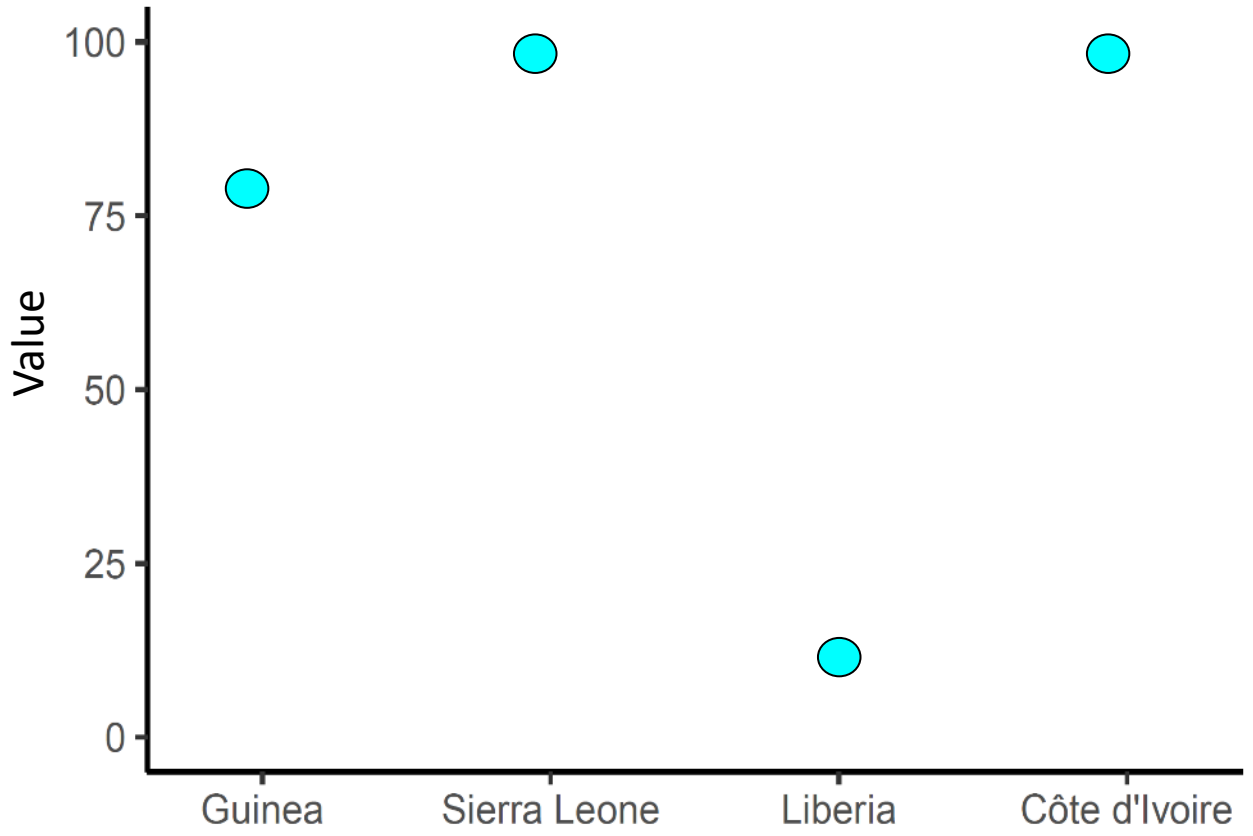
Guinea
38% of range
80% of target

Liberia
5% of range
10 % of target

Sierra Leone
50% of range
100% of target

Cote d'Ivoire
60% of range
100% of target

Species Protection Index



Guinea

80% of target

Liberia

10 % of target

Sierra Leone

100% of target

Cote d’Ivoire

100% of target

Species Protection Index



Species Protection Index

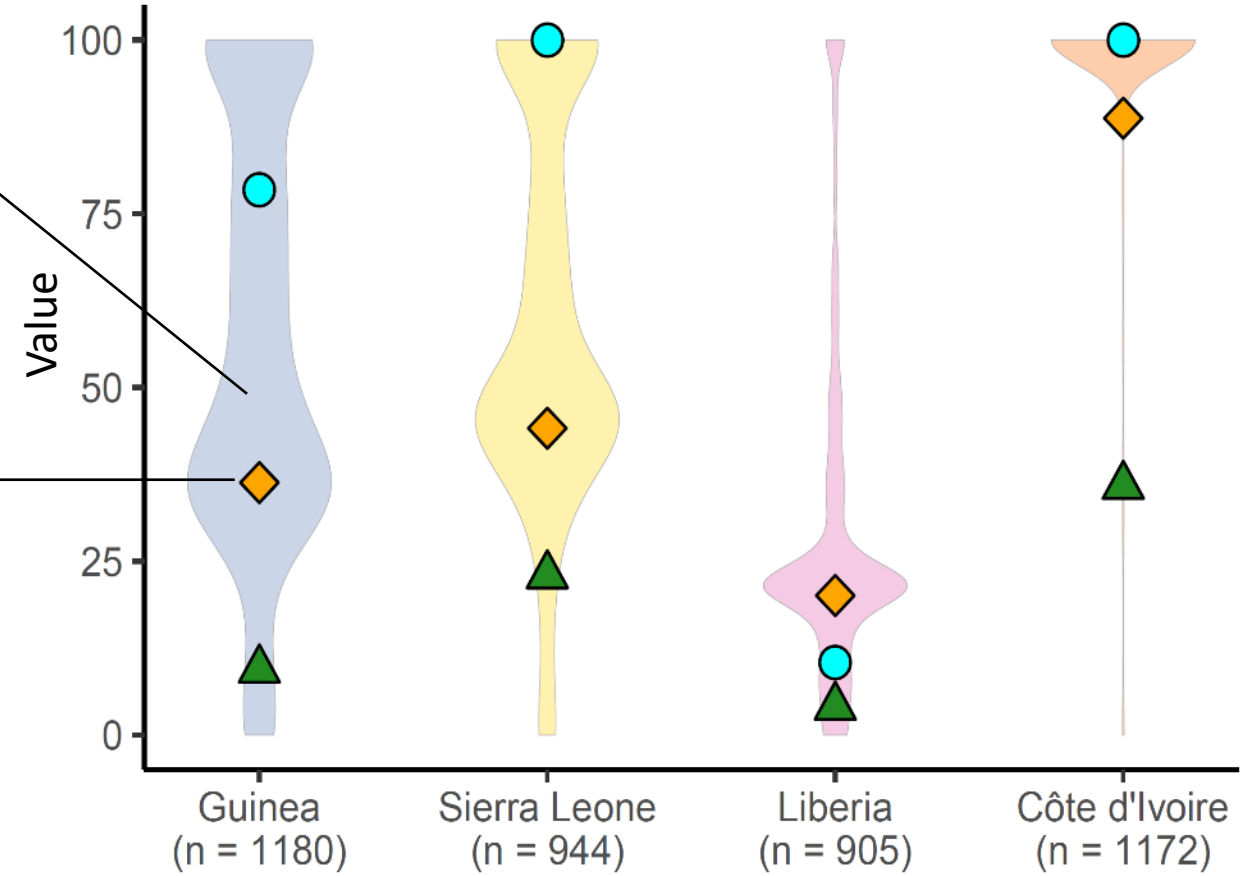
% Duiker Target Realized

% Country Protected Area

% Target realized for the 1,180 terrestrial vertebrate species occurring in Guinea

SPI

Average* of those 1,180 species values

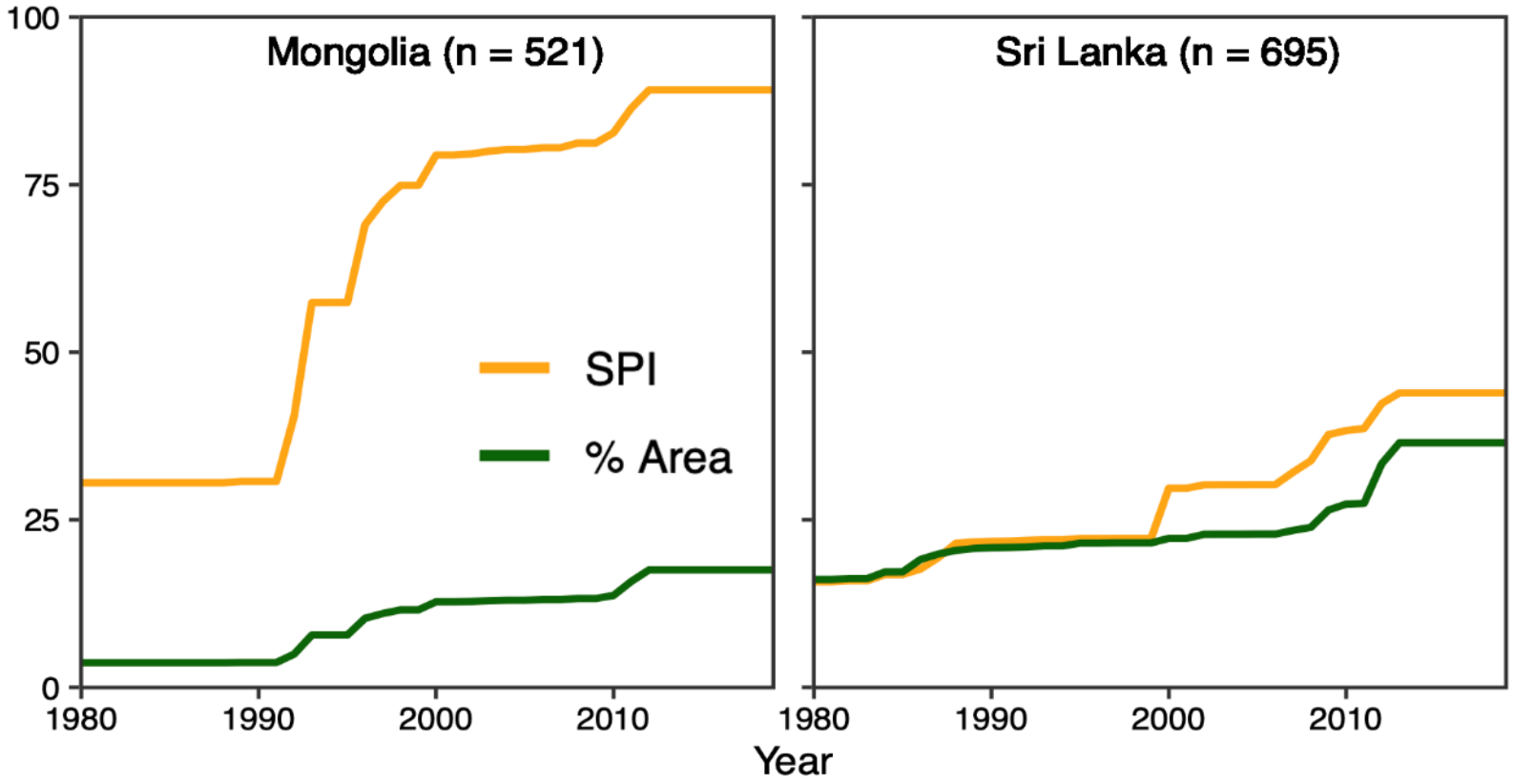




*weighted by country stewardship

Species Protection Index

Change in the adequate representation of species through area-based conservation



Target 2|3

By 2030, protect and conserve through well connected and effective system of protected areas and other effective area-based conservation measures at least 30 per cent of the planet with the focus on areas particularly important for biodiversity.

- Areas of particular importance for biodiversity are protected and conserved as priority
- Representative system of protected areas and other effective area-based conservation measures
- Connectivity within the system of protected areas and other effective area-based conservation measures
- Increased protection and conservation effectiveness

Target 2|3

Species Protection Index

Change in the adequate representation of species through area-based conservation

SPI – addresses these Target components:

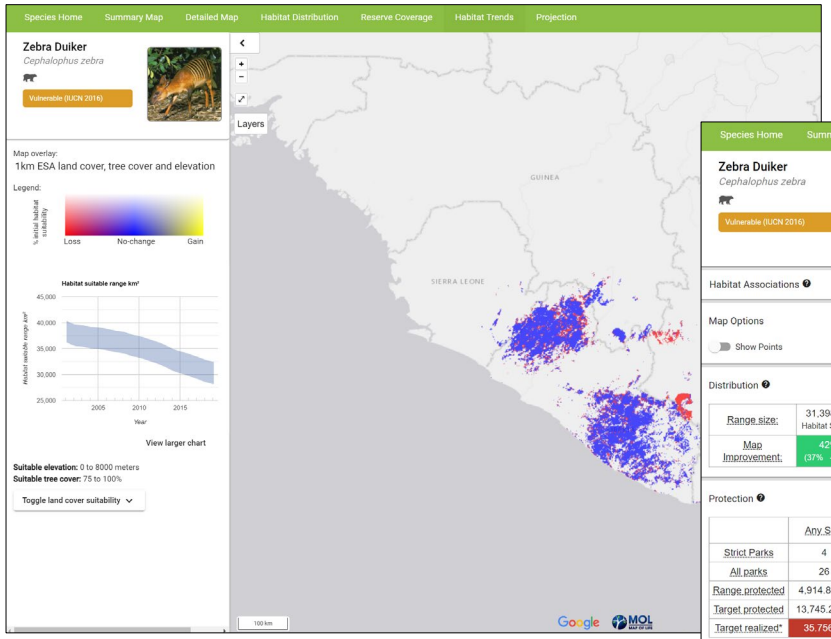
- Areas of particular importance for biodiversity are protected and conserved as priority	strongly
- Representative system of protected areas and other effective area-based conservation measures	strongly
- Connectivity within the system of protected areas and other effective area-based conservation measures	future extension
- Increased protection and conservation effectiveness	by weighting area protection contribution with effectiveness estimates

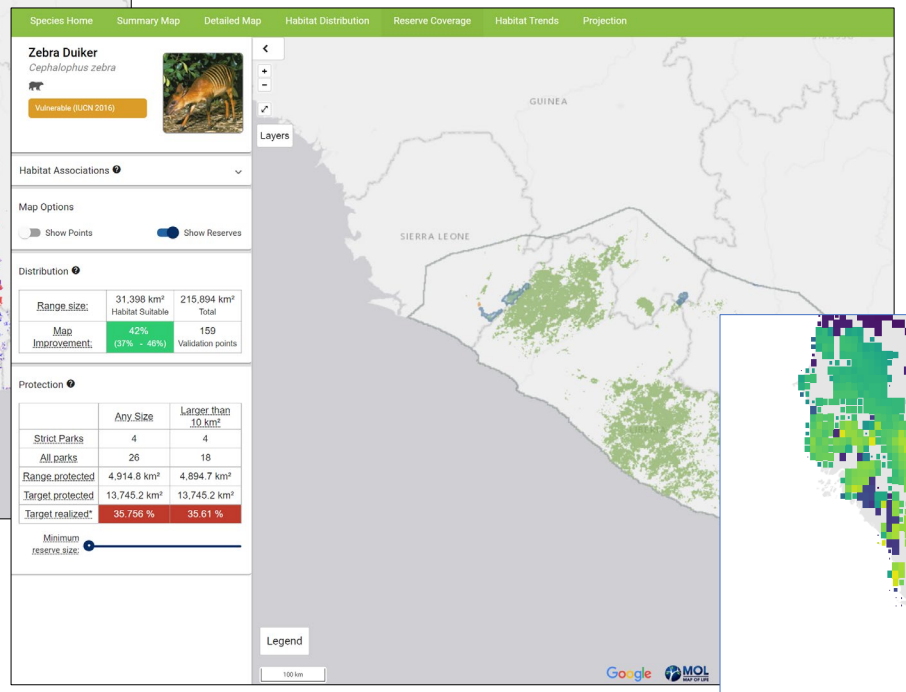
Species Habitat Index

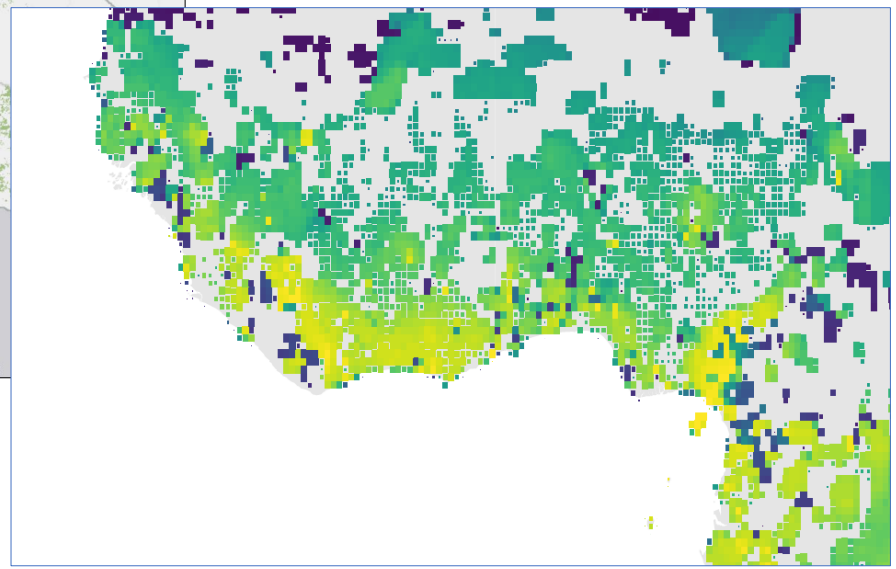
GEO BON

Species Protection Index

Decision-Support





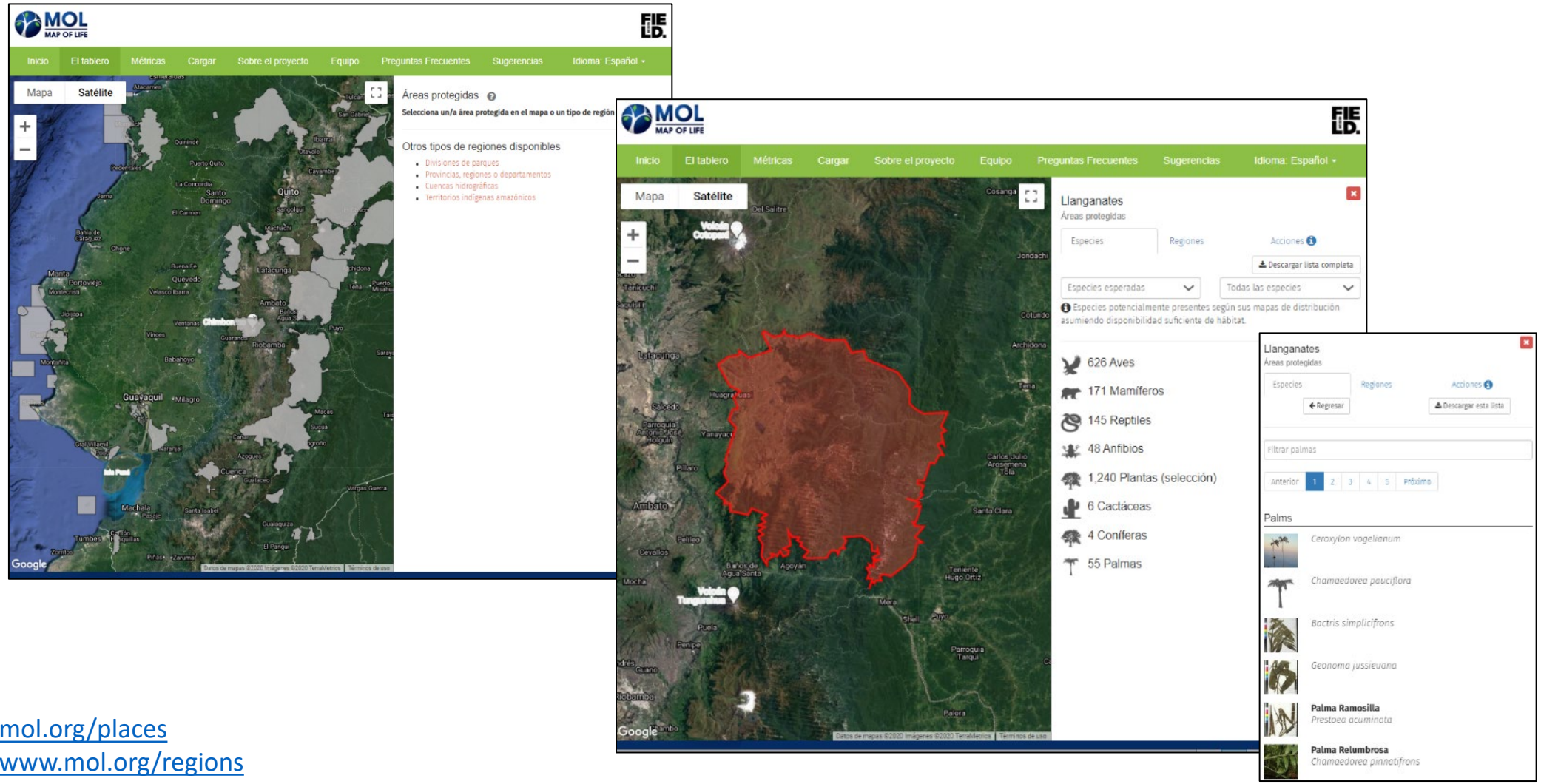


Species Habitat Index

GEO BON

Species Protection Index

Decision-Support

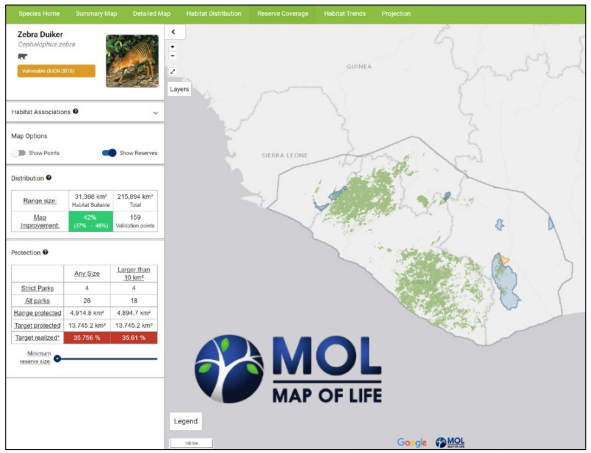


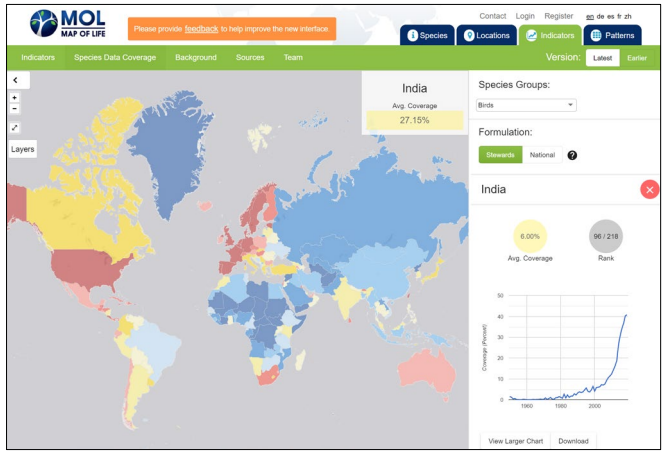
https://mol.org/places
https://www.mol.org/regions

Where to get indicator and base data

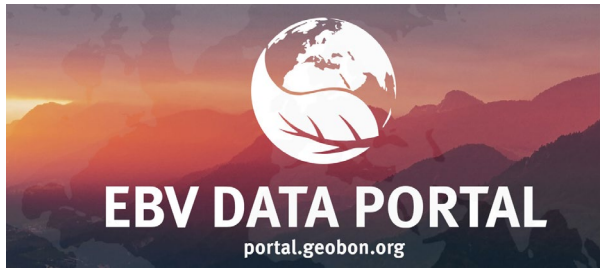
Species and annual country-level data and indicator values for reporting:

Map of Life





GEO BON Portal



Where to get indicator and base data

Annual country-level indicator values for reporting:

Indicators Dashboard



UN Biodiversity Lab



How to perform annual national reporting

Option 1: Go with provided

Use pre-calculated indicator values from any of above sources, based on a large and growing global dataset that supports comparability.

Option 2: Calculate independently

Use national data to develop species metrics, e.g. with focus on focal endemic species or species with sufficient data. Calculate SPI and SHI as average value of these species

Option 3: Mix & Match

Remove or replace provided species values with national calculations where preferred



Thank you!

María Cecilia Londoño Murcia

Indicator national use and adaptation in Colombia

EBV WORKFLOW IN COLOMBIA

SPECIES POPULATIONS
Species distribution








02 DATA AGGREGATION & QUALITY ASSESSMENT — BM

03 COLLABORATIVE DATA CLEANING

04 DISTRIBUTION MODELING — BM

05 EXPERT FEEDBACK PROCESSING — BM

06 MODEL VALIDATION & PUBLICATION — BM

PLANNING

COLLABORATIVE DEVELOPMENT OF SPECIES DISTRIBUTION MODELS

Species distribution maps and indicators or each species: representation in protected areas and habitat loss, are available at **BioModelos** platform: biomodelos.humboldt.org.co for each species.

COLLABORATIVE DEVELOPMENT OF EXPERT MAPS

PUBLICATION BY THIRD PARTIES

BM — Core Team

Expert





Anolis biporcatus
ANOLIS VERDE NEOTROPICAL

El ambiente es de todos — Minambiente
Fondo Adaptación

BIOMODELOS IMPACT

4617

VALIDATED MODELS

155

PUBLISHED MODELS

2371

2091

MODELS IN DEVELOPMENT

EXPERTS

523

1488

USERS

22

ACTIVE GROUPS

DOWNLOADS 930

BETTER MODELS WITH EXPERT SUPPORT

SPECIES PROTECTION INDEX

COLOMBIAN VERSION

a Representation Goal:
the area of each species distribution that should be represented in PAs

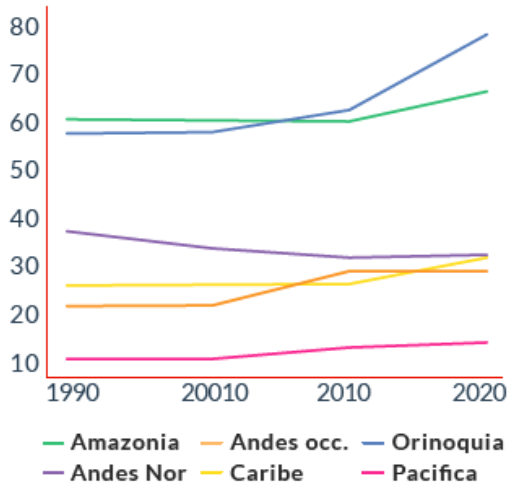
¿Are we meeting the representation goal?

b < a No

b >= a Yes

b Representation:
the area of each species distribution that is present in PAs

REPRESENTATIVENESS OF SPECIES

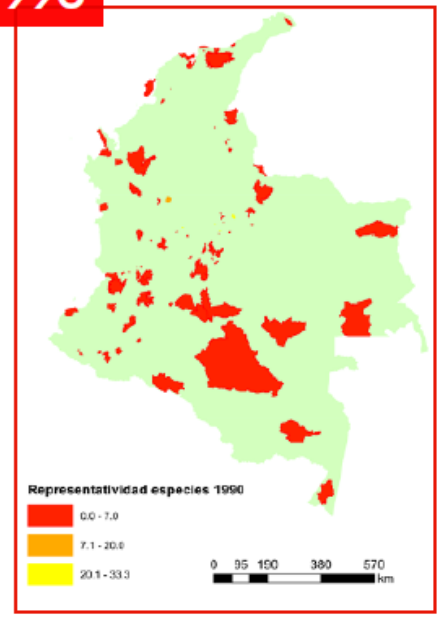


s = Species present in the unit of analysis

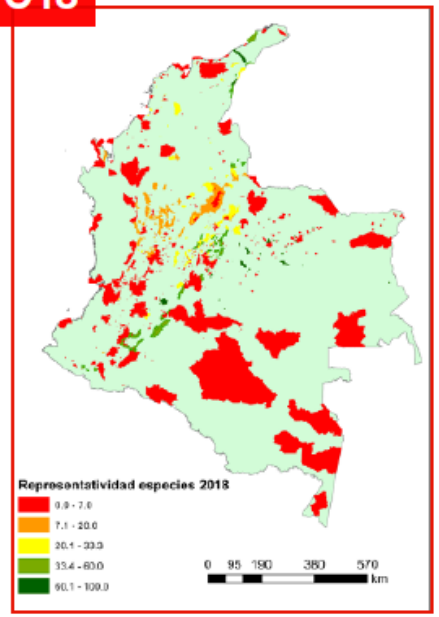
pr = Number of species in each unit of analysis that met the representation goal.

rep = Percentage of species in each unit of analysis that met the representation goal.

1990



2018



UAE	s	pr 1990	rep 1990
1010001	36	6	16.7
1010002	72	48	66.7
1010003	120	12	10.0
1010004	72	54	75.0
1010005	42	12	28.6
1010006	66	30	45.5
1010007	18	6	33.3
1010008	42	12	28.6
1010009	48	30	62.5
1010010	138	6	4.3
1010011	84	54	64.3

UAE	s	pr 2018	rep 2018
1010001	36	12	33.3
1010002	72	54	75.0
1010003	120	12	10.0
1010004	72	54	75.0
1010005	42	18	42.9
1010006	66	30	45.5
1010007	18	12	66.7
1010008	42	12	28.6
1010009	48	30	62.5
1010010	138	12	8.7
1010011	84	54	64.3

SPECIES HABITAT INDEX



CR · En peligro crítico

Plecturocebus caquetensis

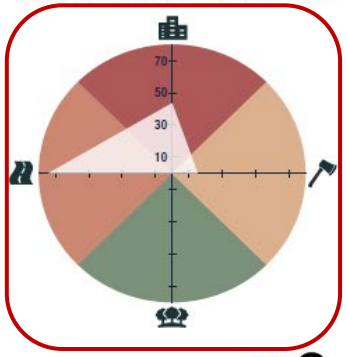
MICO BONITO DE CAQUETÁ

AUTORES
J. García-Villalba y T. Defler

BIOMODELOS

CATÁLOGO DE LA BIODIVERSIDAD

AMENAZA POR HUELLA HUMANA



0 %

ESTADÍSTICAS

RANGO DE DISTRIBUCIÓN

1645 km² Potencial	133 km² Remanente
2830 km² PMC sobre modelo	2309 km² PMC sobre modelo

EOO
314 km²

AOO
80 km²

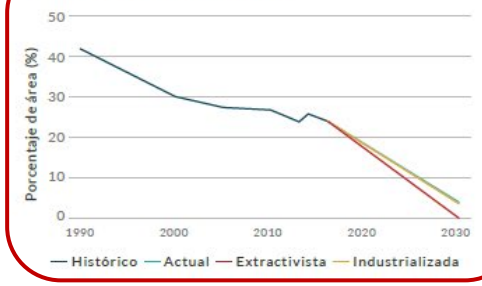
COBERTURAS

Bosque denso
Bosque fragmentado
Bosque de galería y ripario
Vegetación secundaria o en transición

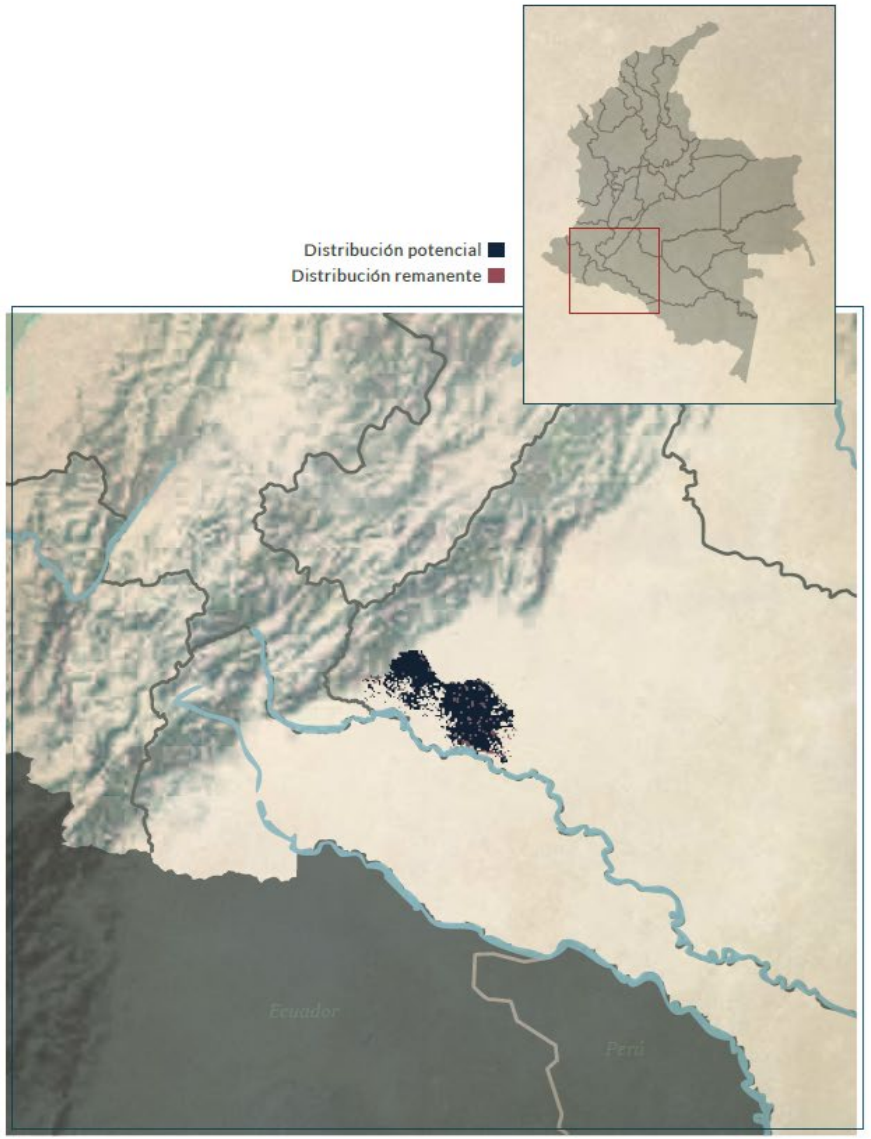
REPRESENTATIVIDAD ÁREAS PROTEGIDAS

0 % Todas las áreas	0 % PNN	0 % RSC	0 % Otras figuras

TENDENCIA DE DISTRIBUCIÓN



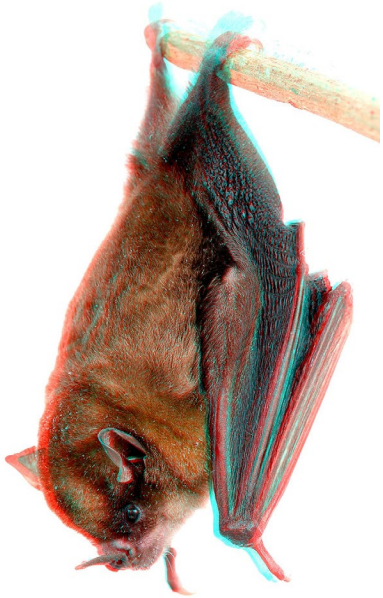
Javier García-Villalba













¡Gracias!

biomodelos.humboldt.org.co

Mejores modelos con el apoyo de expertos

Davnah Urbach (GMBA)

Species populations and area-based conservation in mountains

Eva Spehn (SCNAT)

A national perspective on indicators from Switzerland

UNIVERSITÄT BERN

GLOBAL MOUNTAIN BIODIVERSITY ASSESSMENT

Species populations and area-based conservation in mountains

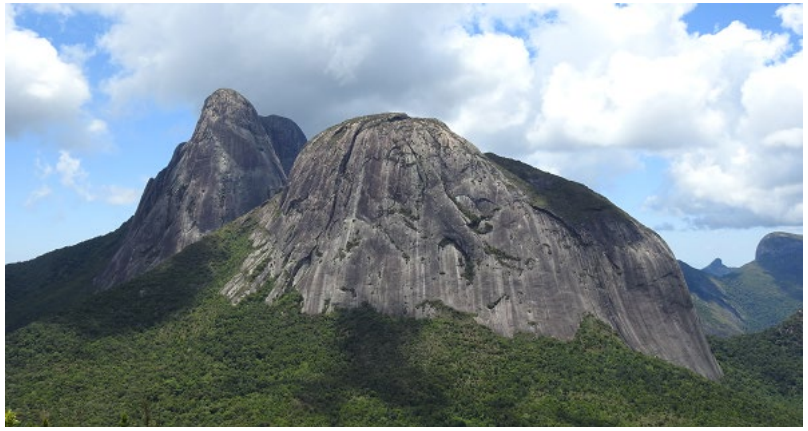
Davnah Urbach (GMBA Executive director) and Eva Spehn (Swiss Biodiversity Forum, SCNAT)

13.07.2021

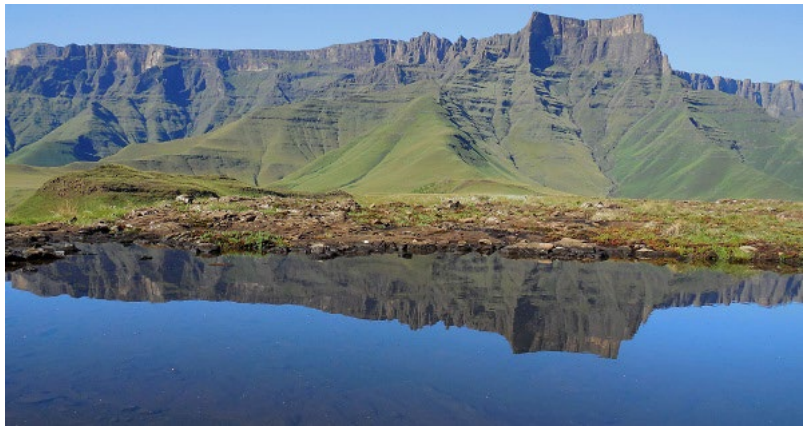


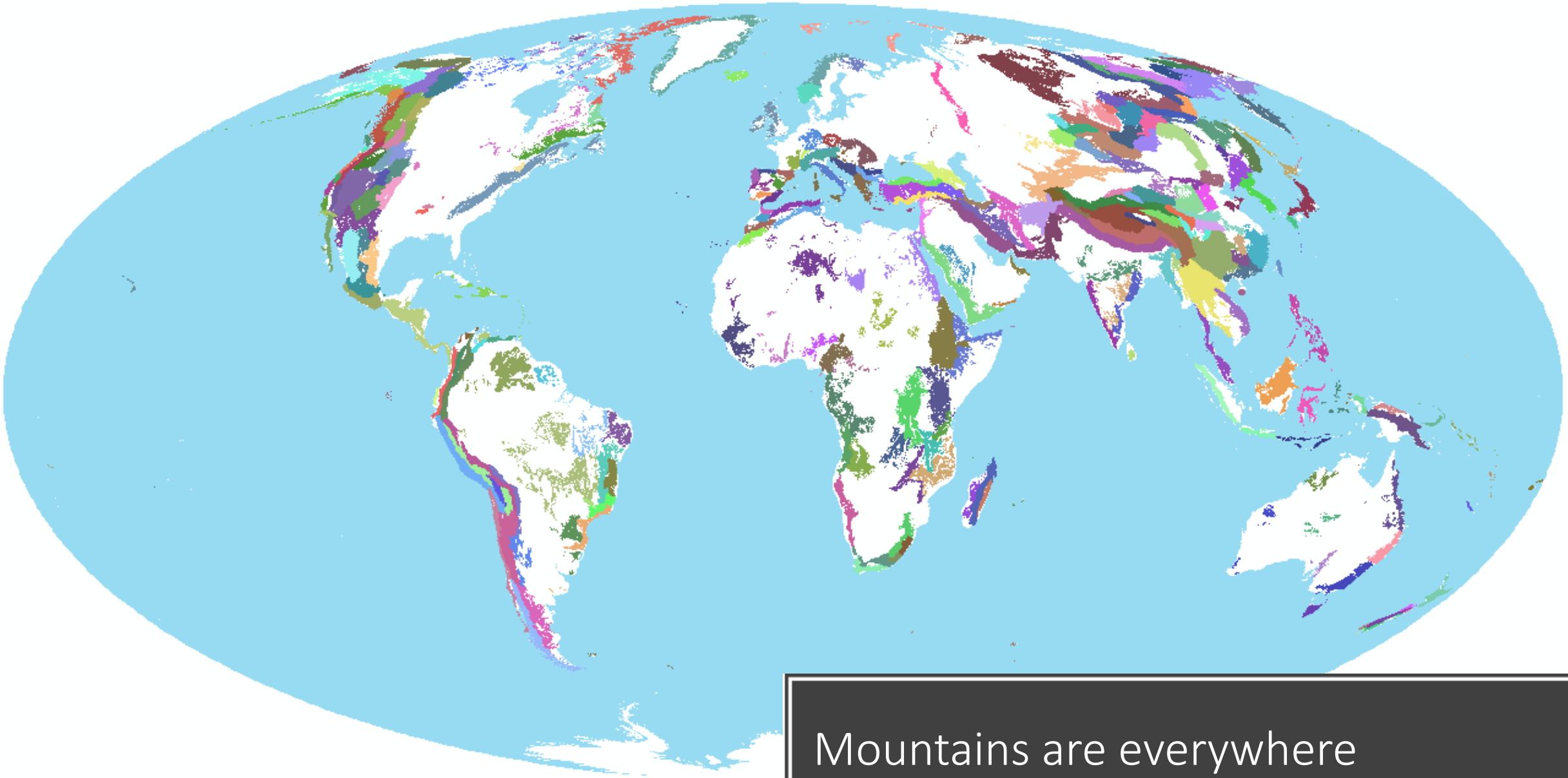












Mountains are everywhere

Körner et al. (2017), Snethlage et al. (in preparation),
https://www.gmba.unibe.ch/ services/tools/mountain_inventory
https://www.gmba.unibe.ch/services/tools/ mountain_definition







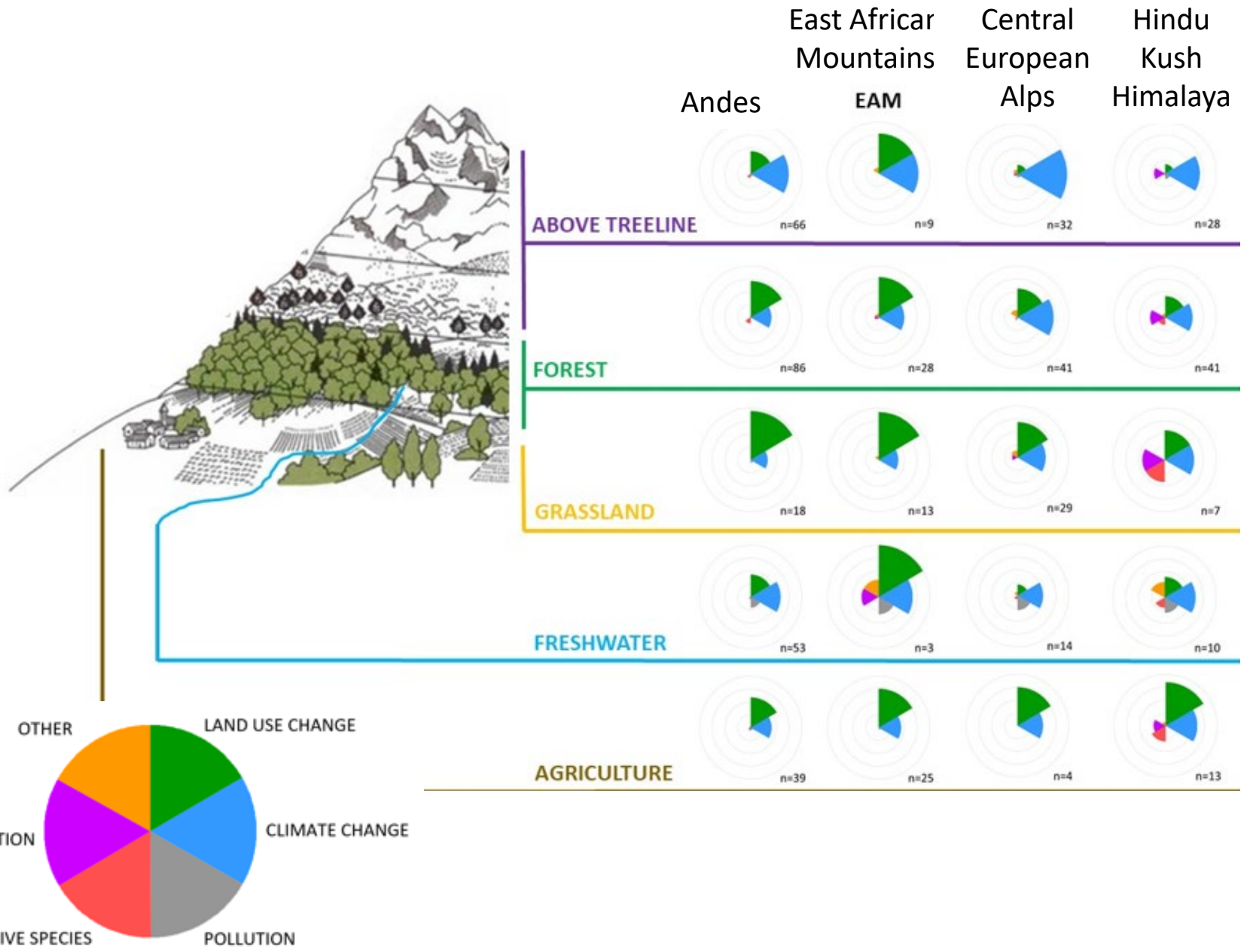






- Enormous diversity of species
- High levels of endemism
- Numerous world biodiversity hotspots

Biodiversity is at risk



Payne et al. 2020













Mountain biodiversity & SDGs



GLOBAL MOUNTAIN BIODIVERSITY ASSESSMENT

Support and foster inter- & transdisciplinary science on the conservation, management, and sustainable use of mountain biodiversity with

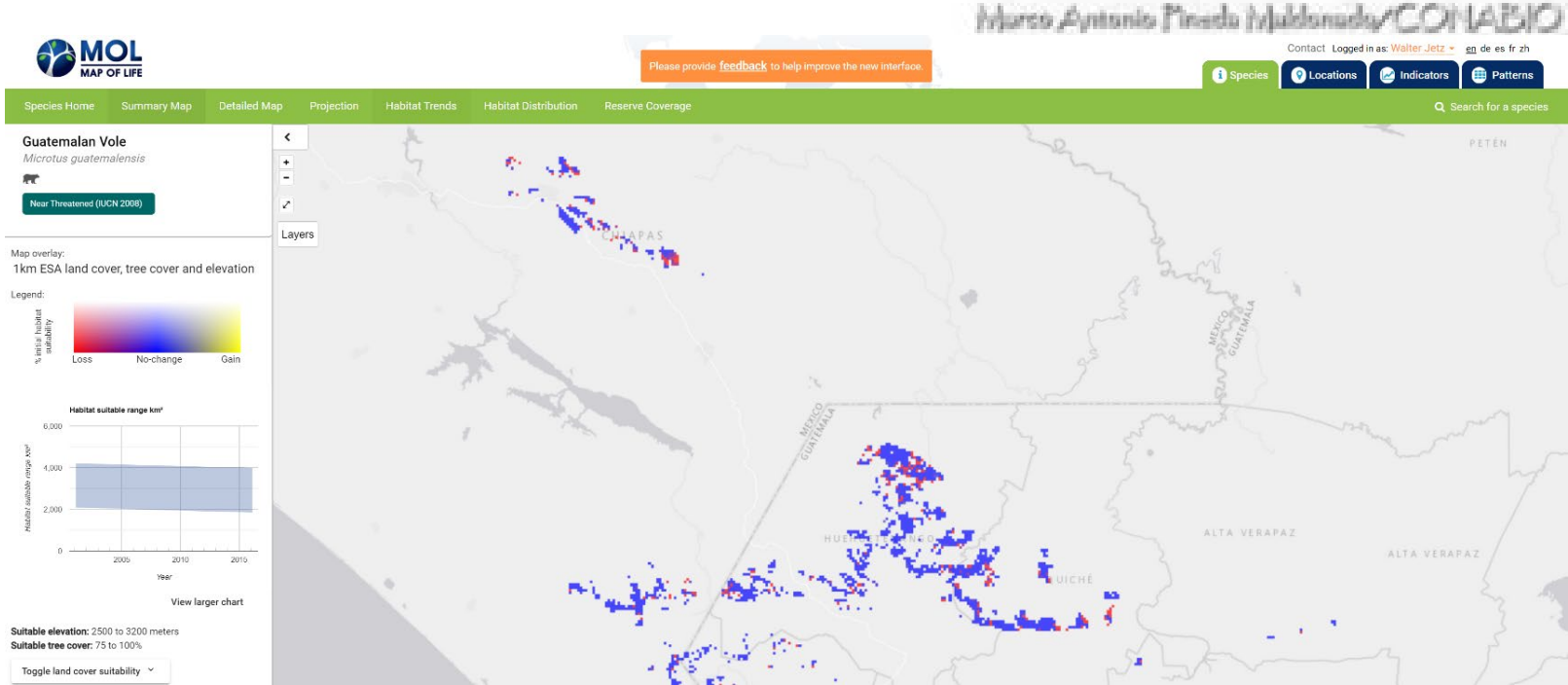
network, tools, working groups, projects, science-policy interface, events, communication

futureearth
research for global sustainability

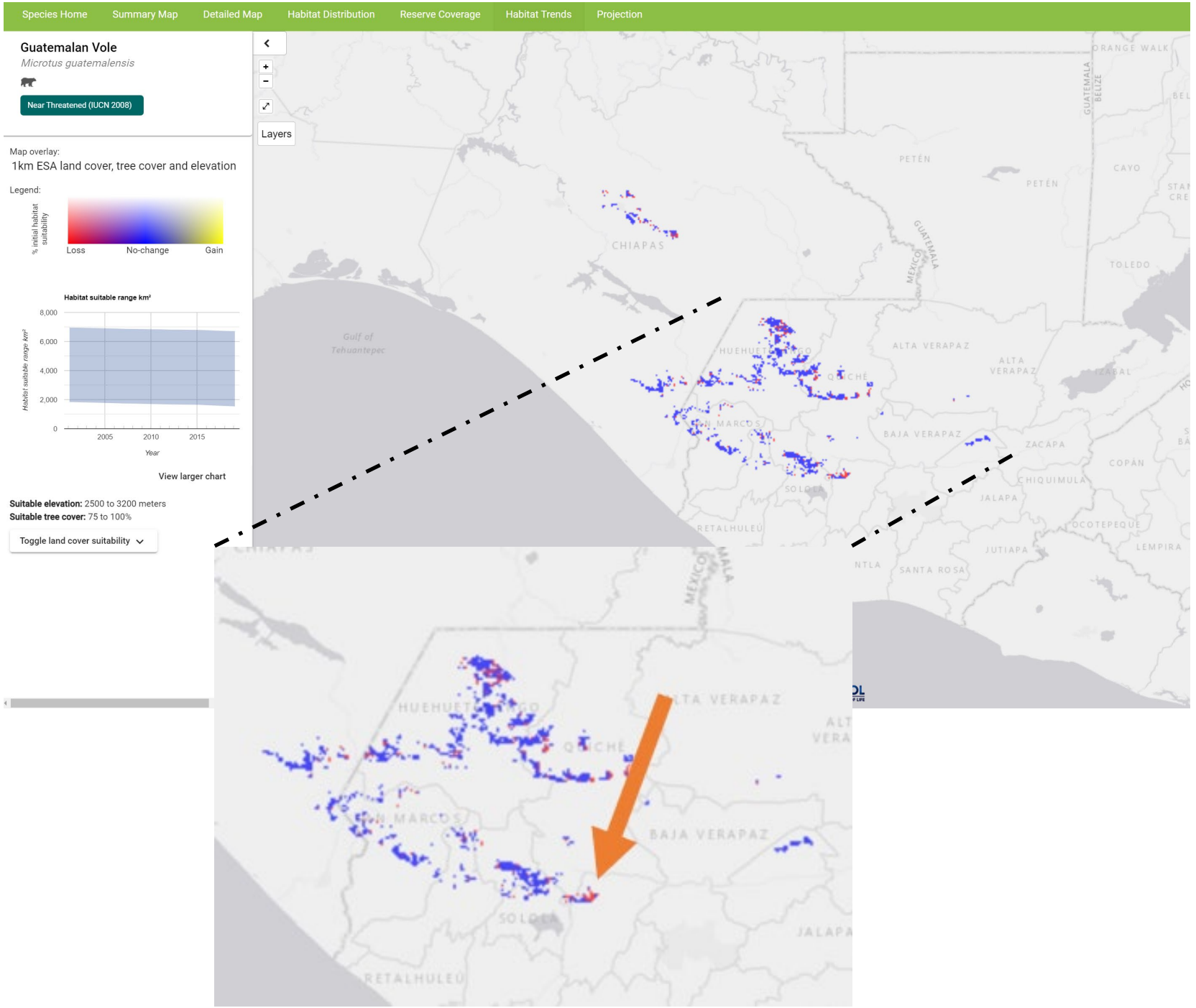
Species Habitat Index (SHI) & Species Protection Index (SPI) for mountain species – the Guatemalan vole



https://mol.org/species/habitat-trend/Microtus_guatemalensis



Species Habitat Index



Species Home | Summary Map | Detailed Map | Ha

Guatemalan Vole

Microtus guatemalensis

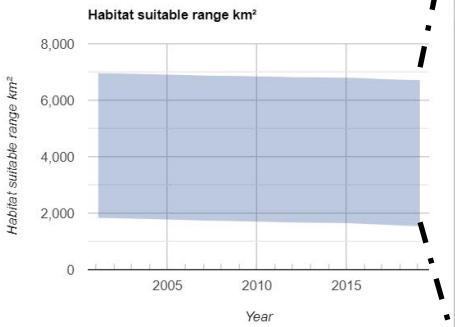
Near Threatened (IUCN 2008)

Map overlay:

1km ESA land cover, tree cover and elevation

Legend:





View larger chart

Suitable elevation: 2500 to 3200 meters

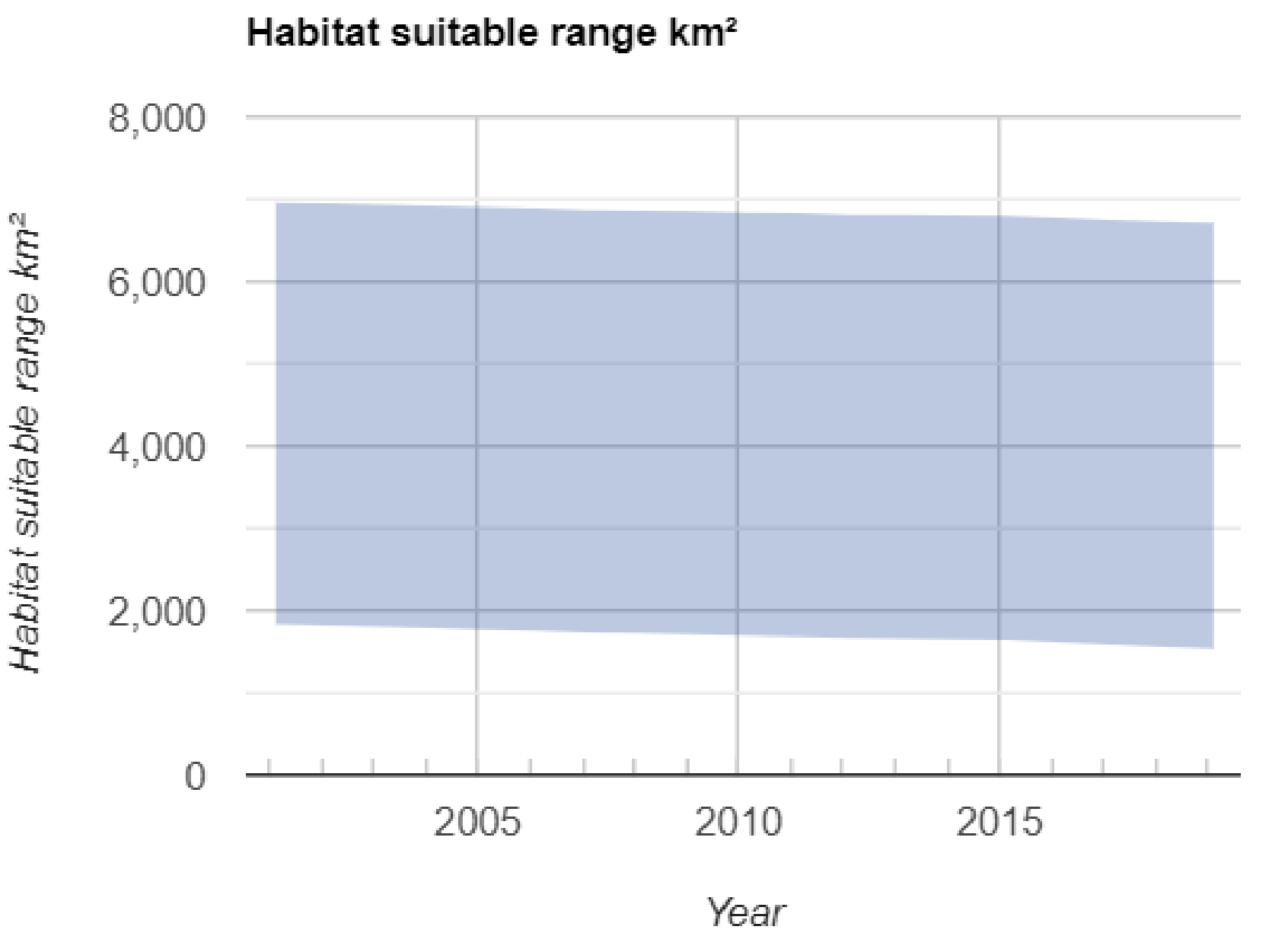
Suitable tree cover: 75 to 100%

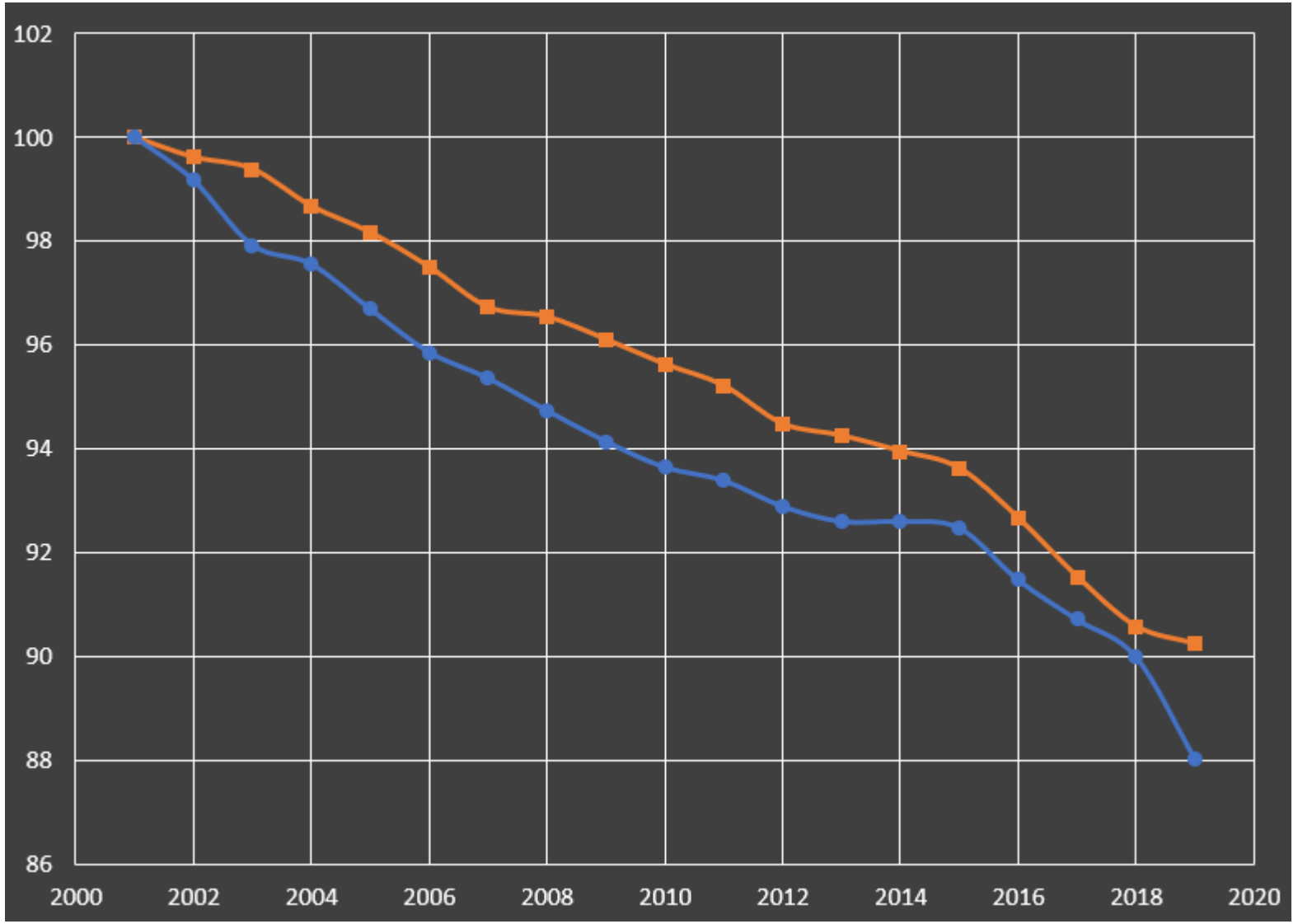
Toggle land cover suitability

Layers

50 km

Google MOL MAP OF LIFE

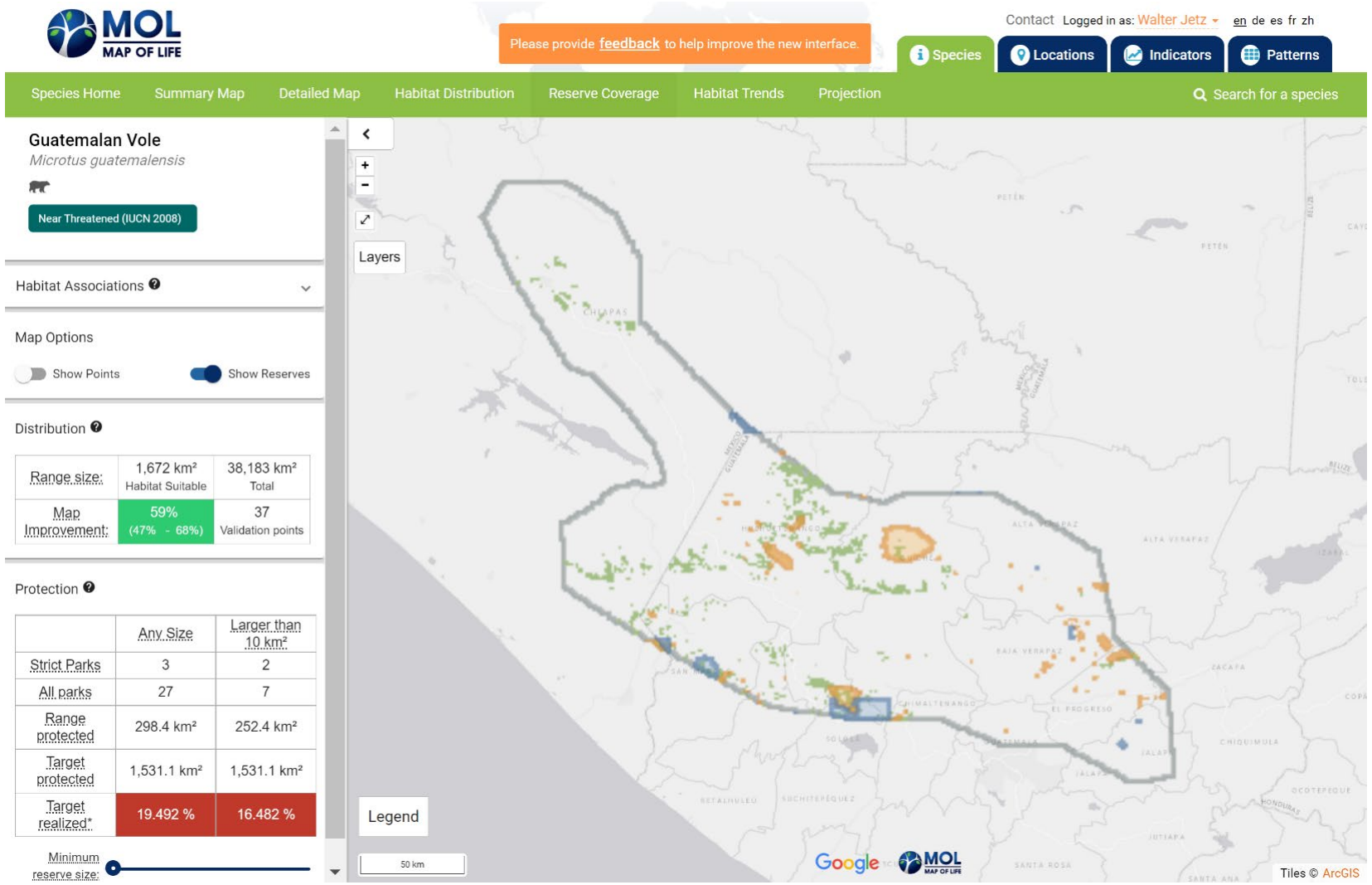


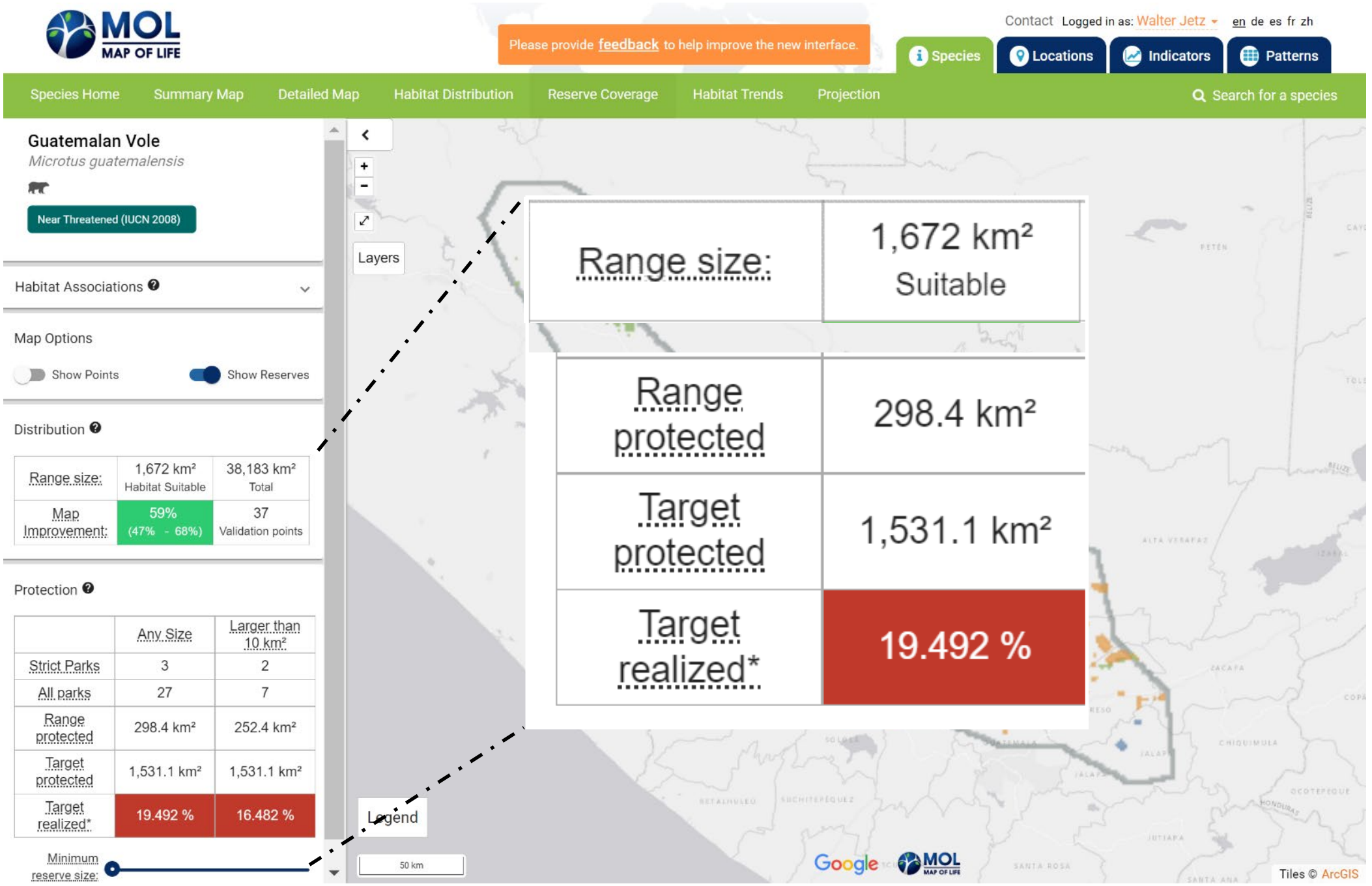


Mexico: 2019 Range 88% of 2001 baseline (species value: 88)

Guatemala: 2019 Range 90% of 2001 baseline (species value: 90)

Species Protection Index




MOL
MAP OF LIFE
Please provide feedback to help improve the new interface.
Contact Logged in as: Walter Jetz en de es fr zh
Species
Locations
Indicators
Patterns
Species Home
Summary Map
Detailed Map
Habitat Distribution
Reserve Coverage
Habitat Trends
Projection
Search for a species
Guatemalan Vole
Microtus guatemalensis
Near Threatened (IUCN 2008)
Habitat Associations
Map Options
Show Points
Show Reserves
Distribution
Range size: 1,672 km² Habitat Suitable 38,183 km² Total
Map Improvement: 59% (47% - 68%) 37 Validation points
Protection
Any Size
Larger than 10 km²
Strict Parks 3 2
All parks 27 7
Range protected 298.4 km² 252.4 km²
Target protected 1,531.1 km² 1,531.1 km²
Target realized* 19.492 % 16.482 %
Minimum reserve size:
Layers
Legend
50 km
Range size: 1,672 km² Suitable
Range protected 298.4 km²
Target protected 1,531.1 km²
Target realized* 19.492 %
Google
MOL MAP OF LIFE
Tiles © ArcGIS

Thank you!


UN
environment
programme


GLOBAL
MOUNTAIN
BIODIVERSITY
ASSESSMENT


MOUNTAIN
RESEARCH
INITIATIVE


G·R·I·D
ARENDAL
A UNEP Partner


MOL
MAP OF LIFE

A mountain nation perspective from Switzerland

Eva Spehn (Swiss Forum Biodiversity, SCNAT)

scnat
akademie der naturwissenschaften



Policy recommendation

Acknowledge the importance of mountain biodiversity and ecosystems in global policy frameworks and specifically in the post-2020 framework

UNEP, Grid-Arendal, GMBA, MRI (2020)

Indicators for Elevating Mountains in the Convention on Biological Diversity's Post-2020 Global Biodiversity Framework

Effective indicators of mountain biodiversity and ecosystems status and trends are crucial for supporting the goals and targets of the Convention on Biological Diversity's (CBD) Post-2020 Global Biodiversity Framework (GBF). Given the uniqueness of biodiversity in mountains, and the relevance of the ecosystem services they deliver for the well-being of people worldwide, the need to elevate mountains in the GBF was addressed by previous policy briefs presented at the first[1] and second[2] meetings of the Open-Ended Working Group (OEWG). This document complements earlier contributions and supports decision-makers in ongoing Post-2020 GBF discussions by:

- identifying indicators in CBD/SBSTTA/24/3Add.1[3] considered important for safeguarding mountain biodiversity and ecosystem integrity
- providing the rationale for the adoption of such indicators at multiple levels
- suggesting indicators for further consideration and development.

Adopting indicators that promote mountain biodiversity conservation will contribute to realizing the CBD's vision of "Living in Harmony with Nature" by 2050 and strengthen the coherence among international frameworks and science- and evidence-based policy-making.

Indicators suggested in CBD/SBSTTA/24/3Add.1 fall into three groups: headline, component, and complementary. A minimum set of high-level headline indicators tracks national, regional, and global progress on GBF goals and targets. Component indicators measure progress toward th goals' and targets' components more specifically.

Indicator criteria

- (Meta)data publicly available ☑
- Methodology for data product published or peer reviewed ☑
- Evidence for regular update of the indicator ☑
- Mechanism for maintenance of the indicator ☑
- Can be disaggregated for mountains ☑

Linking policy brief recommendations with CBD/SBSTTA/24/3Add.1 indicators

	Code	Indicators	Policy brief recommendations							
			1	2	3	4	5	6	7	8
Headline	A.0.1	Extent of selected natural ecosystems*	✓	✓	✓	✓		✓		
Headline	A.0.4	Species Habitat Index	✓	✓		✓	✓			
Headline	2.0.1	Protected areas coverage of important biodiversity areas	✓	✓	✓	✓	✓			
Headline	2.0.2	Species Protection Index	✓	✓		✓	✓			
Headline	10.0.2	Ecosystems providing reduced coastal erosion, flood protection and other services	✓	✓	✓	✓		✓		
Component	A.1.1.	Extent of natural ecosystem (A.0.1) by type	✓	✓	✓					
Component	2.1.1	Protected area coverage by type**	✓	✓	✓	✓				
Component	2.1.2	Protected area coverage of important biodiversity areas by type**	✓	✓	✓	✓				
Component	19.1.4	Growth in Species Occurrence Records Accessible Through GBIF		✓						

*forest, savannahs and grasslands, wetlands, mangroves, saltmarshes, coral reef, seagrass, macroalgae and intertidal habitats

**marine, freshwater, mountain and terrestrial

Acknowledge the importance of mountain biodiversity & ecosy
Collect soun
Acknowledge ecosystem-specif
Reduce pressures & fac
Support protected area coverage & effective area-based conservation measures for impo
Address the effects of global change & support the adoption of ecosyste
Recognize mountains as reservoirs of genetic resources & local bre
Strengthen reg

Indicators for the promotion of mountain biodiversity conservation

UNEP, Grid-Arendal, GMBA, MRI (2021)

Criteria for Post-2020 GBF Indicators in Switzerland:

- Use only "BIP-approved" indicators
- Unambiguous indicators
- Synergies with other reporting processes
- Choosing "institutionalized" indicators
- Global and national scale
- One indicator for each monitoring element
- A simple way to assess progress towards goals/targets

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Indicators for national reporting

Assessment of Post-2020 GBF Indicators in CBD/SBSTTA/24/INF/16 (UNEP-WCMC, BIP) :

A.0.4 Species Habitat Index (SHI)

GA.2. ***Ecosystem integrity and connectivity (terrestrial,freshwater and marine ecosystems)****

GA.4. *Increase the population and health of species*

GB.1. Nature's regulating contributions including climate regulation, disaster prevention and others

T1.2. Prevention of reduction and fragmentation of natural habitats due to land/sea use change*

8.2. Sustainable management of terrestrial wild species of fauna and flora

2.0.2 Species Protection Index (SPI)

GA.3. *Prevent extinction and improve the conservation status of species*

GA.6. ***Protection of critical ecosystems****

T2.2. Areas of particular importance for biodiversity are protected and conserved as priority*

T2.3. Representative system of protected areas and other effective area-based conservation measures*

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Indicators for national reporting

- Scientifically sound, same method → comparison across countries and over time
- Scalable (global to national and vice-versa)
- Available (trusted organisation, measured regularly across all countries, remotely sensed and in-situ data combined
- Customizable (mix & match): global data downscaled to countries, use these and/or add additional observation data from your country

→ *contribute to national reporting and implementation of the post-2020 GBF*

→ *contribute to models that support improved policy assessments and scenarios at multiple scales*

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