Global Biodiversity Framework Indicators

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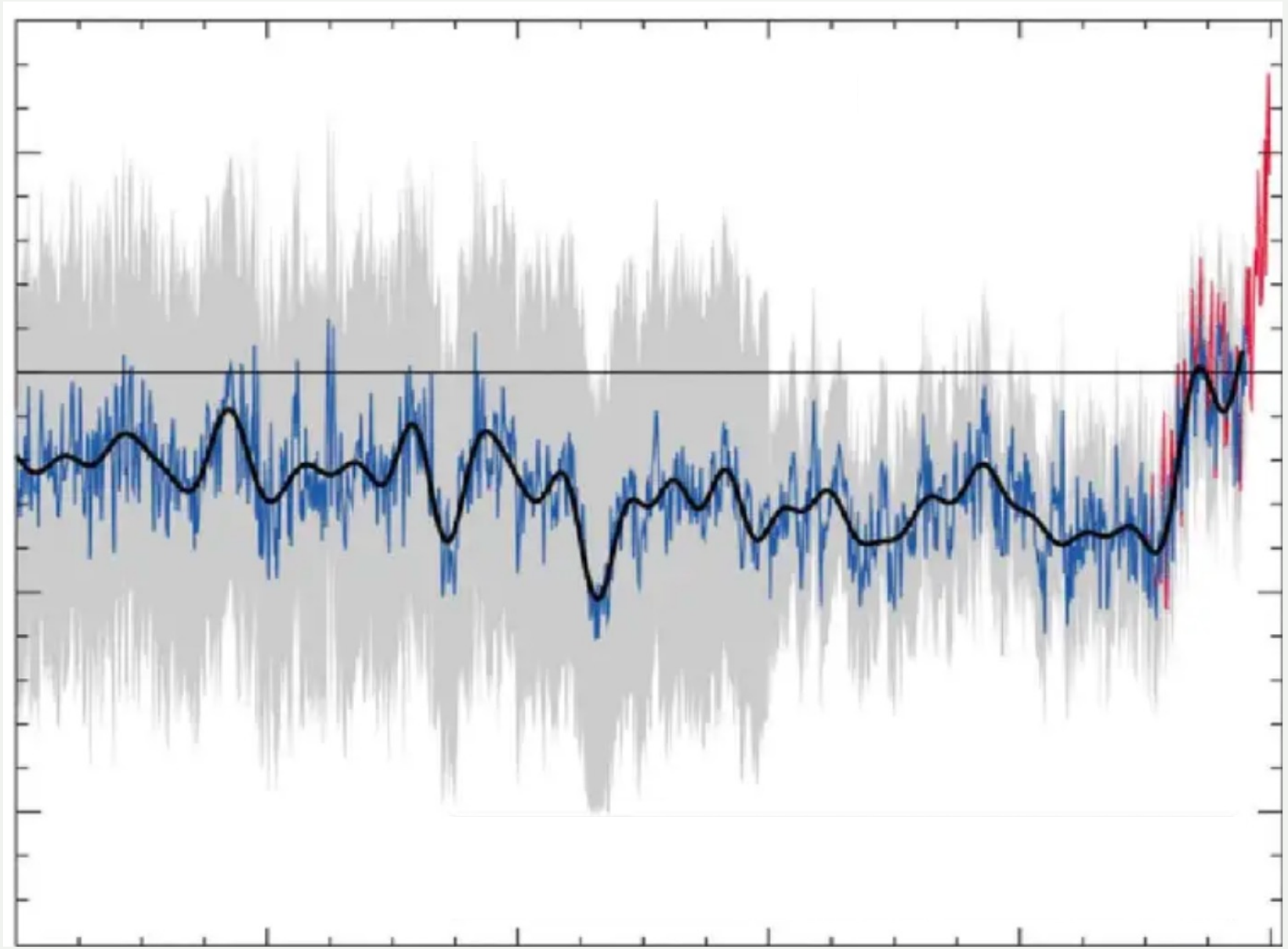
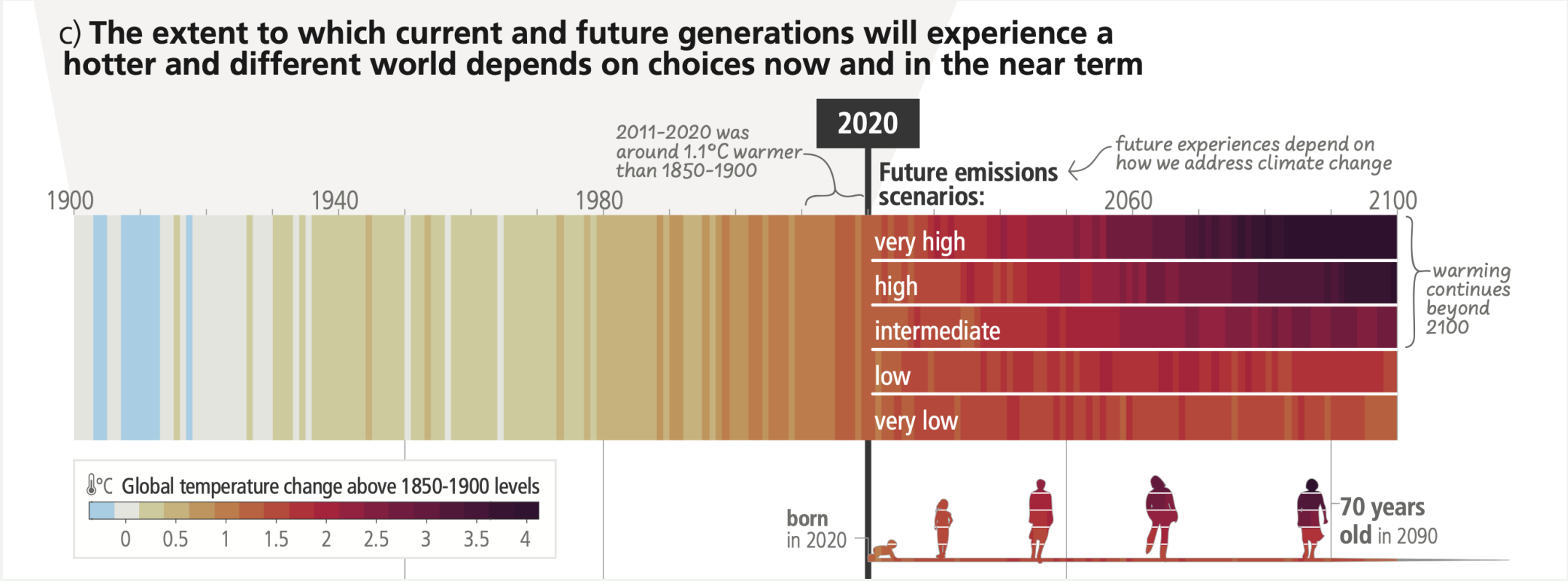
Bios2 Summer school Indicators

May 2024





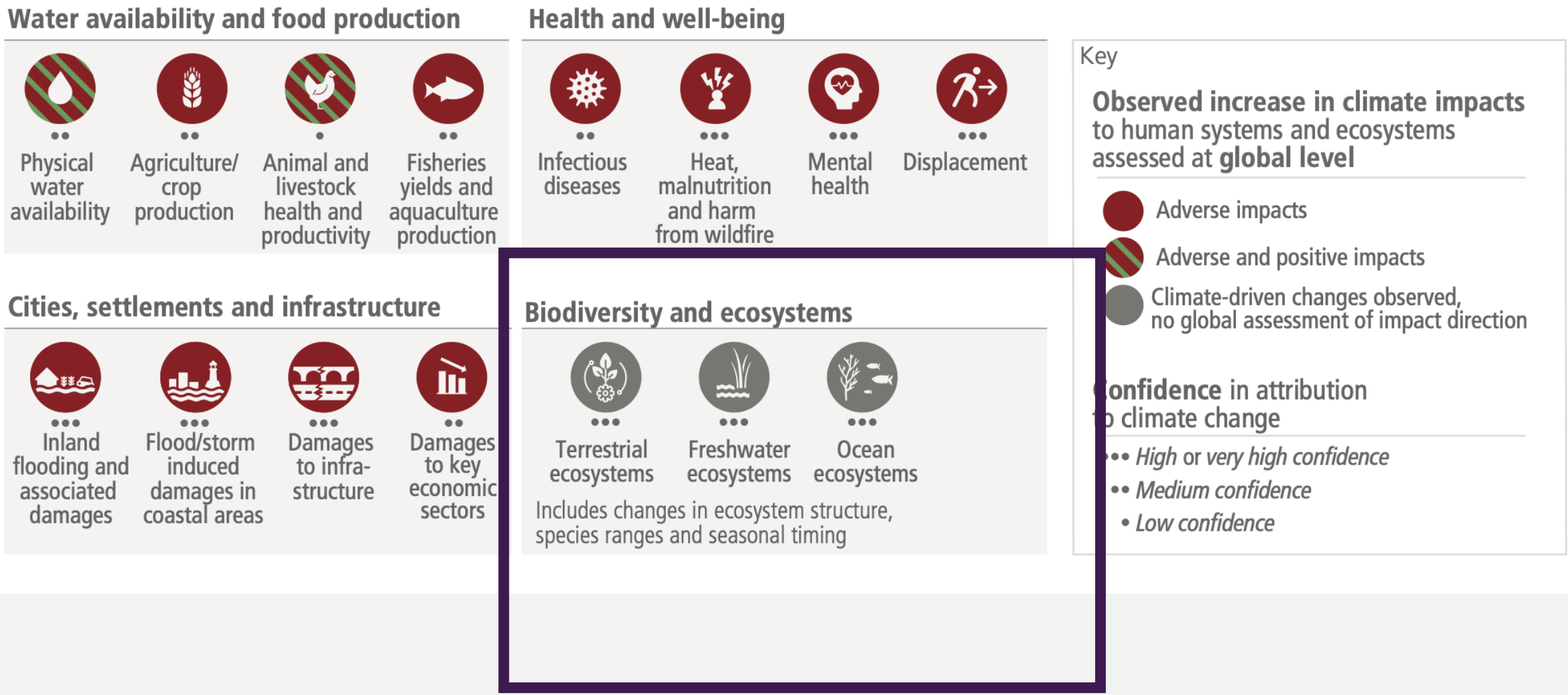
Observed Warming and its Causes

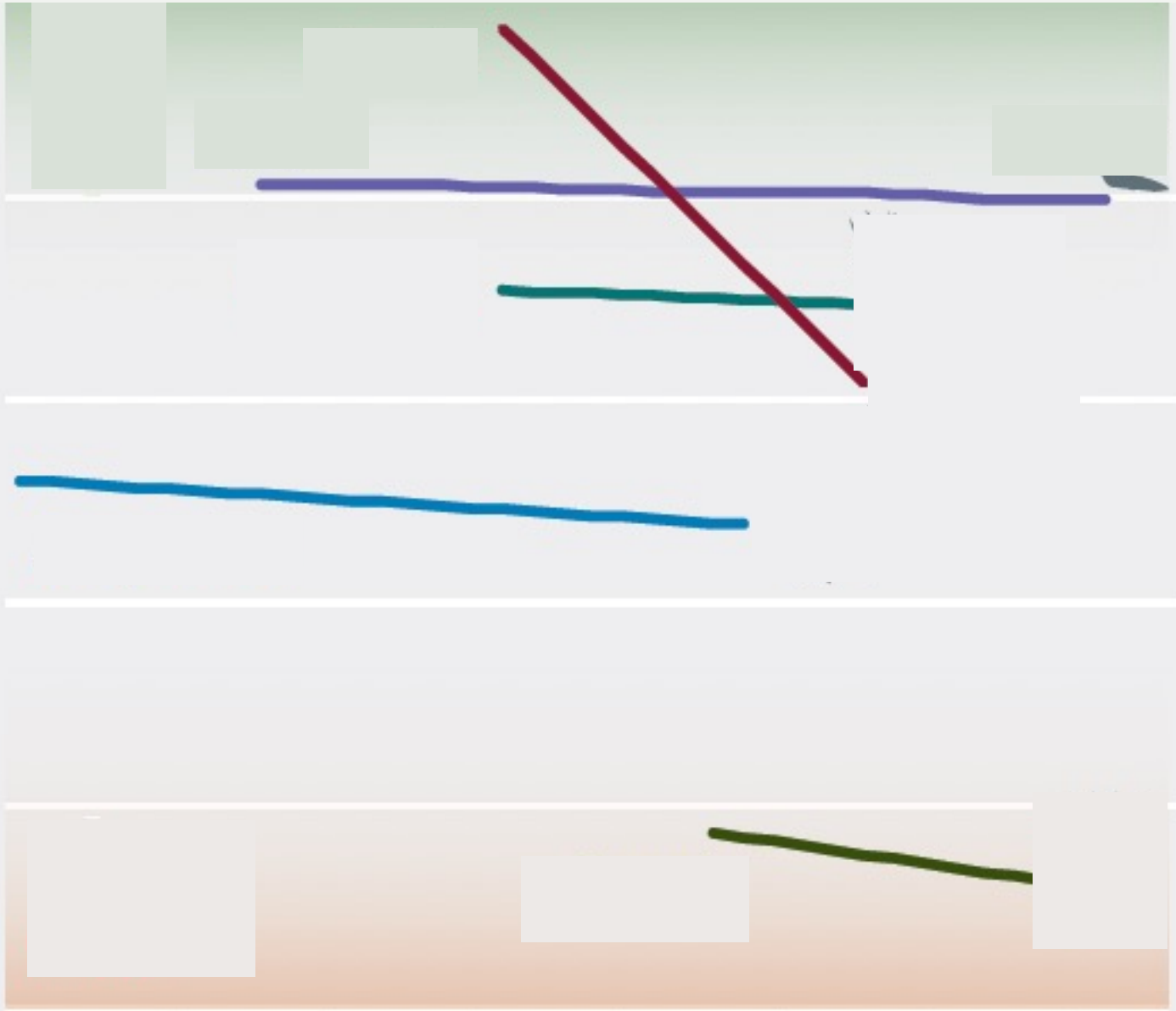
A.1 **Human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming, with global surface temperature reaching 1.1°C above 1850-1900 in 2011-2020. Global greenhouse gas emissions have continued to increase, with unequal historical and ongoing contributions arising from unsustainable energy use, land use and land-use change, lifestyles and patterns of consumption and production across regions, between and within countries, and among individuals (*high confidence*). {*2.1, Figure 2.1, Figure 2.2*}**

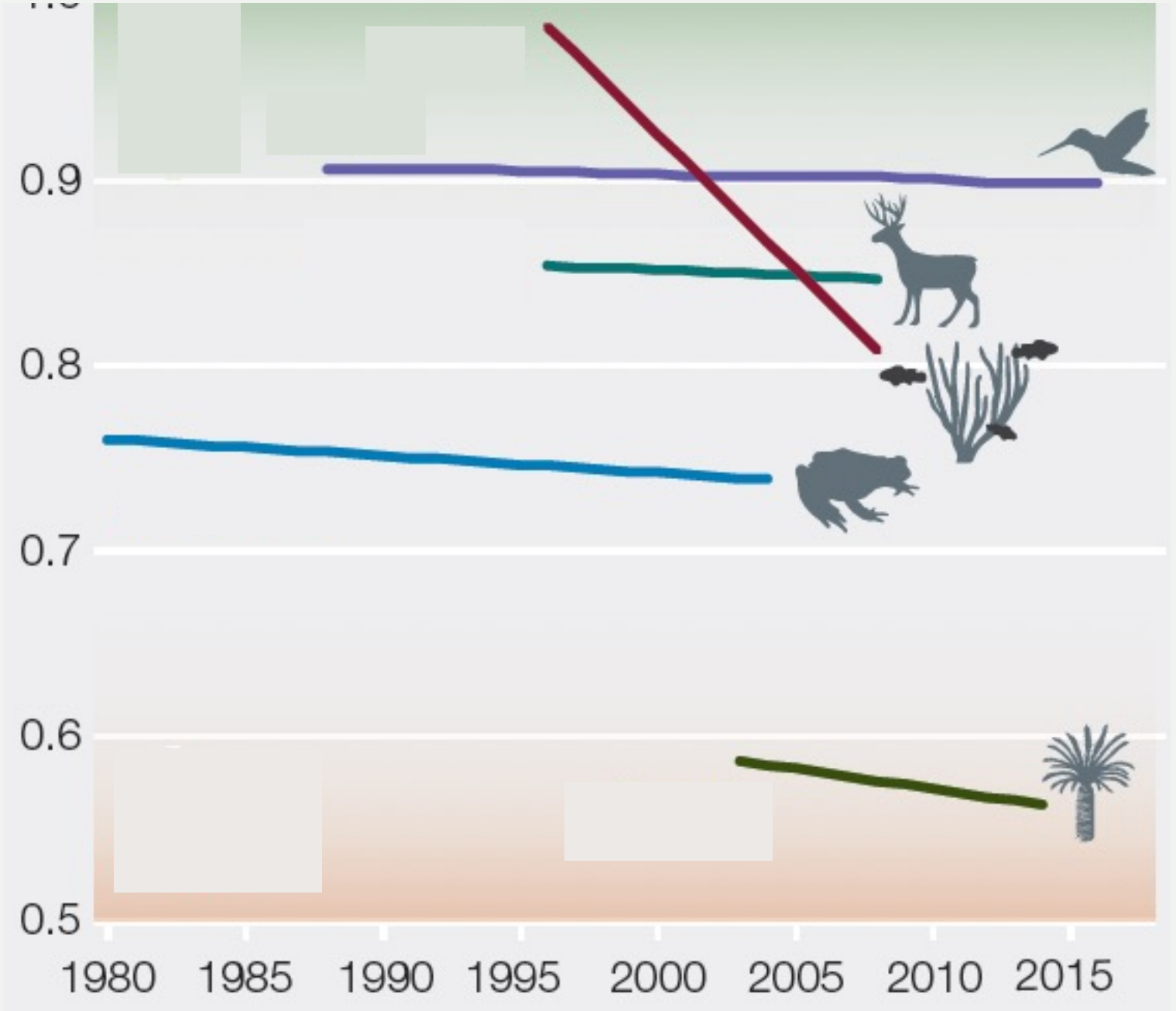
. Synthesis Report.
6th Assessment AR6

ipcc
INTERGOVERNMENTAL PANEL ON climate change

a) **Observed widespread and substantial impacts and related losses and damages attributed to climate change**






0.9
0.8
0.7
0.6
0.5
1980
1985
1990
1995
2000
2005
2010
2015

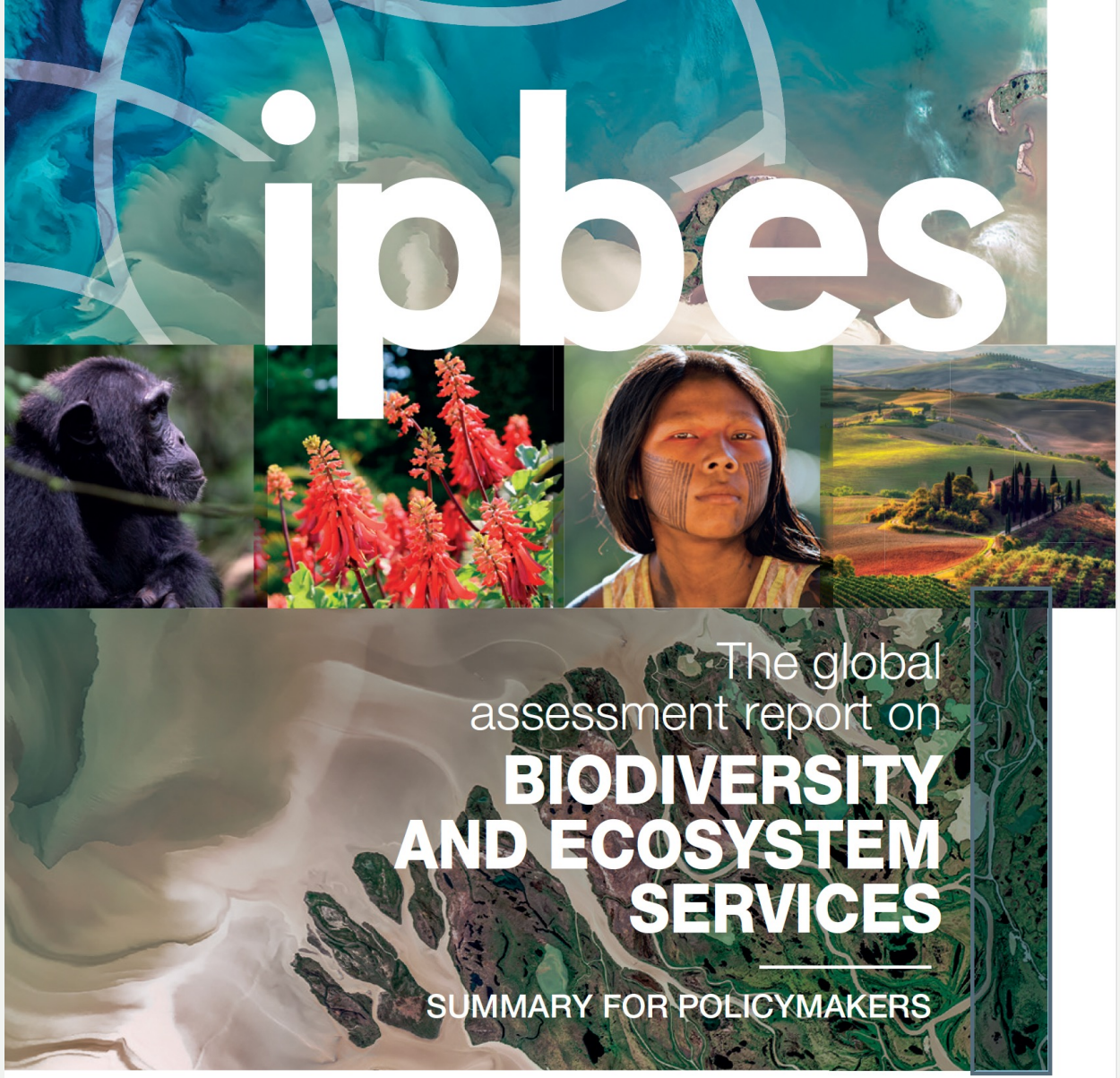


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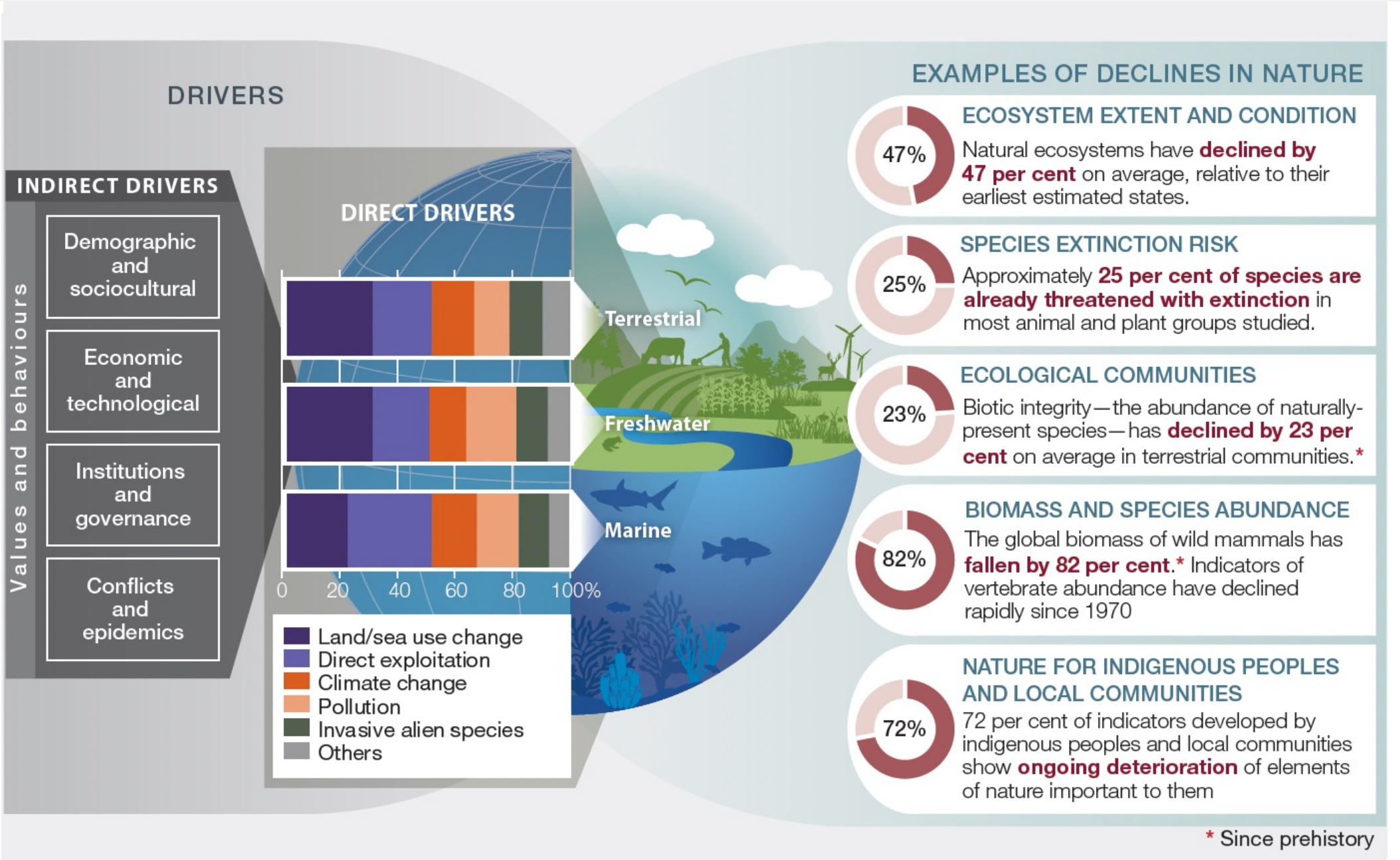
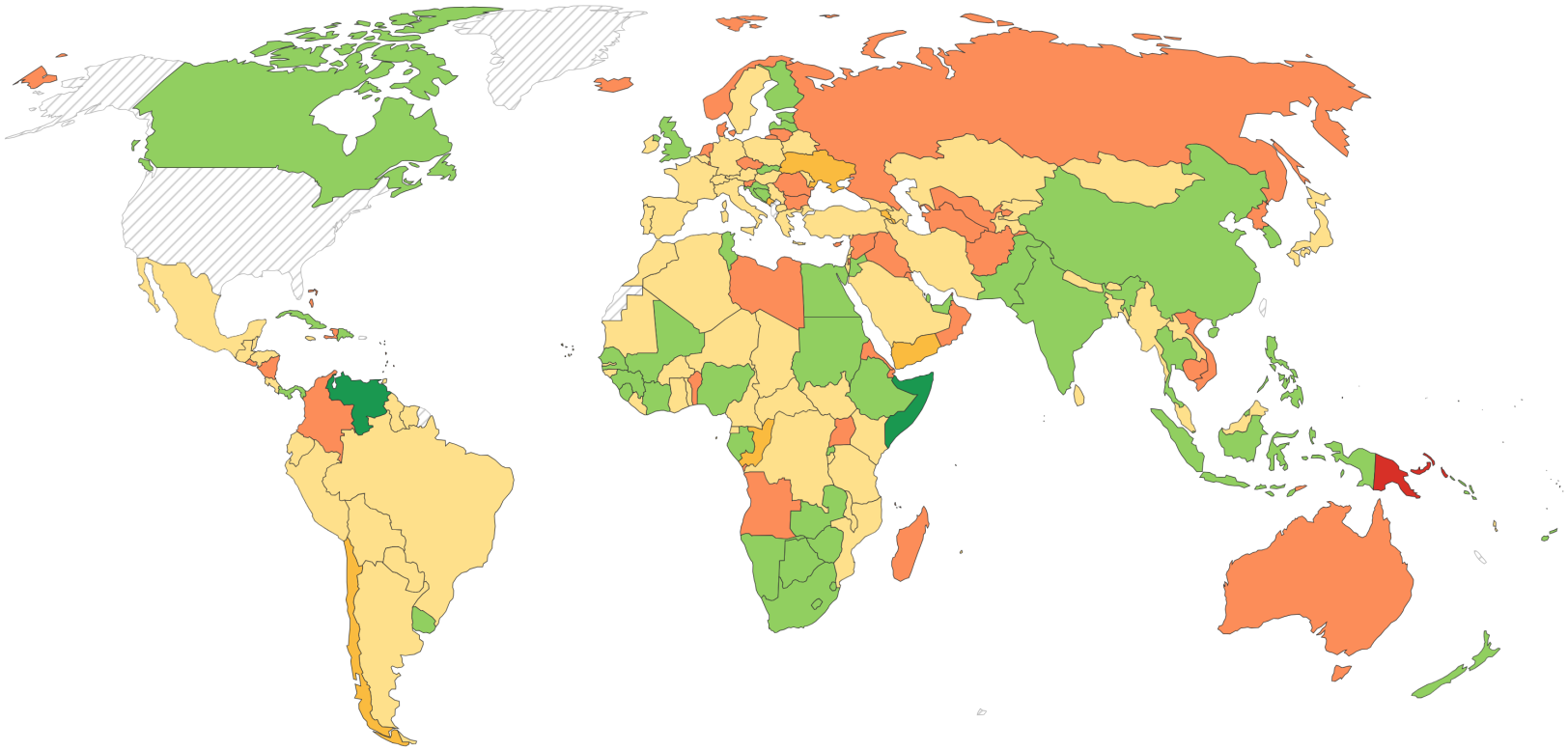
Figure SPM 1 **Global trends in the capacity of nature to sustain contributions to good quality of life from 1970 to the present, which show a decline for 14 of the 18 categories of nature's contributions to people analysed.**


DRIVERS
INDIRECT DRIVERS
Values and behaviours
Demographic and sociocultural
Economic and technological
Institutions and governance
Conflicts and epidemics
DIRECT DRIVERS
0
20
40
60
80
100%
Land/sea use change
Direct exploitation
Climate change
Pollution
Invasive alien species
Others
Terrestrial
Freshwater
Marine
EXAMPLES OF DECLINES IN NATURE
47%
ECOSYSTEM EXTENT AND CONDITION
Natural ecosystems have declined by 47 per cent on average, relative to their earliest estimated states.
25%
SPECIES EXTINCTION RISK
Approximately 25 per cent of species are already threatened with extinction in most animal and plant groups studied.
23%
ECOLOGICAL COMMUNITIES
Biotic integrity—the abundance of naturally-present species—has declined by 23 per cent on average in terrestrial communities.*
82%
BIOMASS AND SPECIES ABUNDANCE
The global biomass of wild mammals has fallen by 82 per cent.* Indicators of vertebrate abundance have declined rapidly since 1970
72%
NATURE FOR INDIGENOUS PEOPLES AND LOCAL COMMUNITIES
72 per cent of indicators developed by indigenous peoples and local communities show ongoing deterioration of elements of nature important to them
* Since prehistory

National progress towards Aichi Biodiversity Target 2, 2022

Our World in Data

Aichi Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting and reporting systems.



Data source: Data from multiple sources compiled by the UN

Aichi targets:
Why didn’t we succeed?

- Ambitious goals, but they weren’t always **measurable**.
    - Most national success: Progress made towards the goal of “conserving 17% of land areas globally”.
- **Monitoring and reporting progress** was not prioritized.
- **Finance gaps** reinforced existing imbalances.

The Kunming-Montréal Global Biodiversity Framework

Four goals for 2030:

- 23 action-oriented global targets

General objectives:

- Halt biodiversity loss
- Restore ecosystems
- Use and manage biodiversity sustainably
- Protect indigenous rights

Targets: The GBF's long-term goals for 2050

GOAL A

Ecosystem health & extent

Halting human-induced **extinctions**

Maintaining **genetic diversity**

GOAL B

Sustainable use
and management of biodiversity

Nature's contributions to people

GOAL C

Sharing **benefits** from the use of genetic resources

Protecting **traditional knowledge**

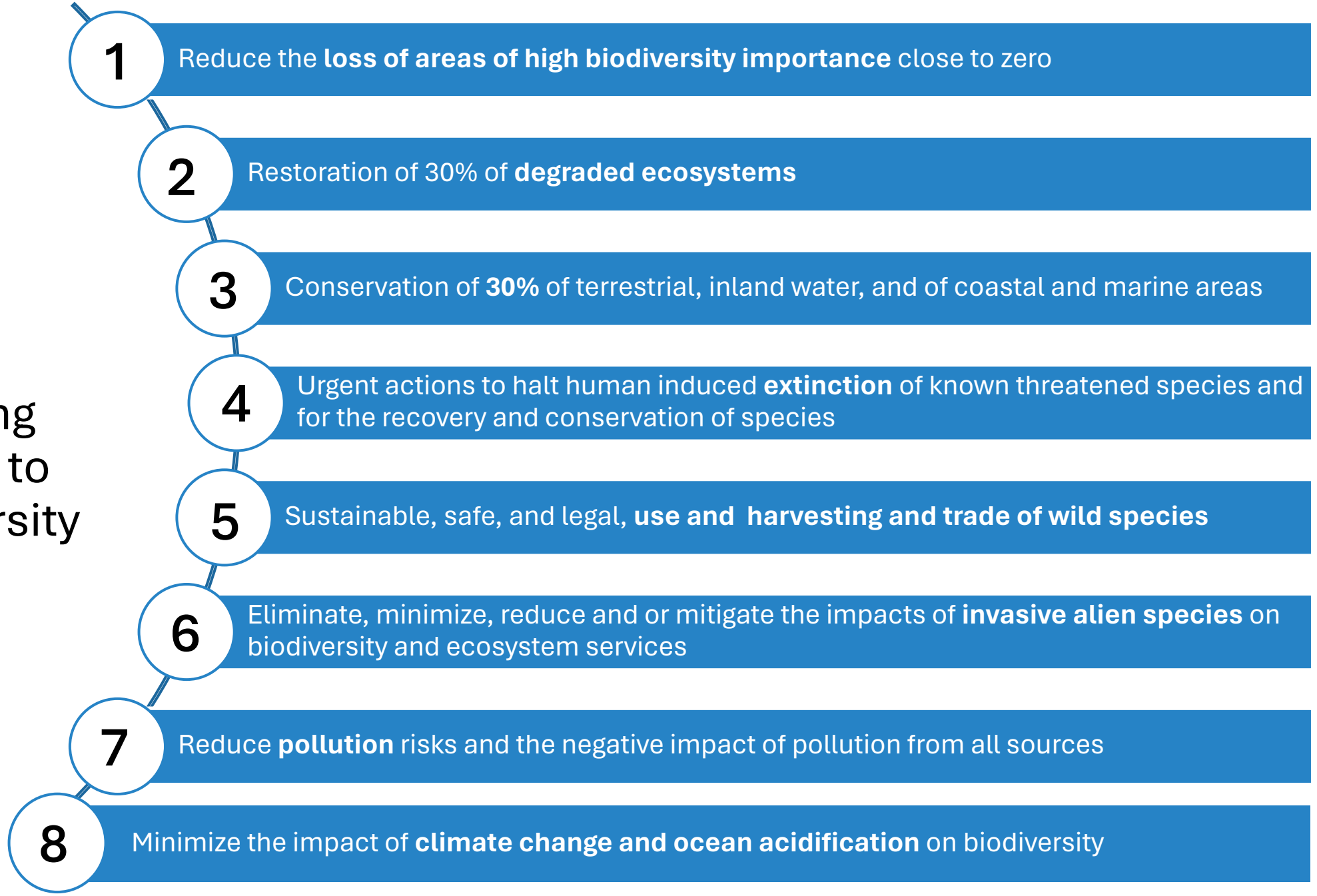
GOAL D

Secure and equitable **access to means** of implementing the GBF

Closing the **biodiversity finance gap**

Targets

1. Reducing **threats** to biodiversity



Targets

2. Meeting people's needs through **sustainable use and benefit-sharing**

9 Ensure that the management and use of wild species are sustainable, thereby providing **social, economic and environmental benefits for people**

10 Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed **sustainably**

11 Restore, maintain and enhance **nature's contributions to people**

12 Ensure quality and connectivity of, access to, and benefits from **green and blue spaces** in urban and densely populated areas

13 Ensure fair and equitable **sharing of benefits** that arise from the utilization of genetic resources

Targets

3. **Tools and solutions** for implementation and mainstreaming

Global Biodiversity Framework: What's different this time?

GBF Indicators

- **Headline indicators**: These capture the global scope of the objectives (A to D) and targets used for planning and monitoring progress. They are relevant indicators at national, regional and global levels, validated by the parties.

- **Component indicators**: optional indicators which, together with the headline indicators, cover elements of the objectives and targets.

- **Complementary indicators**: optional indicators for thematic or in-depth analysis of each goal and target, which can be applied at global, regional, national and sub-national levels.

- Reference period: 2011-2020, for reporting and monitoring progress.

- Indicators must be capable of detecting relevant trends

- Baseline: the conditions used to define the desirable states or ambition levels of goals and targets should, where appropriate, take account of historical trends, the current situation and future scenarios.

GBF - Essential Criteria

Indicators should meet, or be able to meet by 2025, the following criteria:

1) Data and metadata related to the indicator are publicly available;

2) The method underlying the indicator is published in a peer-reviewed academic journal, or has undergone a scientific peer review process;

3) Data sources and indicators are compiled and regularly updated at least every at least every 5 years, if possible;

4) A mechanism is in place to monitor indicator methodology and/or data production

Headline Indicators – Goal A

Proposed goal or target	*Proposed indicators*[6]	*Proposed disaggregation*	*Existing national reporting/ validation process*	*Methodological basis*	*Global data set for national disaggregation*[7]
Goal A. The integrity of all ecosystems is enhanced, with an increase of at least 15% in the area, connectivity and integrity of natural ecosystems, supporting healthy and resilient populations of all species, the rate of extinctions has been reduced at least tenfold, and the risk of species extinctions across all taxonomic and functional groups, is halved, and genetic diversity of wild and domesticated species is safeguarded, with at least 90% of genetic diversity within all species maintained.	A.0.1 Extent of selected natural and modified ecosystems (i.e. forest, savannahs and grasslands, wetlands, mangroves, saltmarshes, coral reef, seagrass, macroalgae and intertidal habitats)	By terrestrial and marine ecosystem types By mountains		UN System of Environmental-Economic Accounting (SEEA): https://seea.un.org/ecosystem-accounting Ecosystem types based on IUCN categories	Near ready**
	A.0.2 Species Habitat Index	By species group		GEOBON: https://geobon.org/ebvs/indicators/ (Measures connectivity and integrity of habitats)	Existing, 2001 to present**
	A.0.3 Red list index	By species group	SDG (15.5.1)	SDG: IUCN: https://www.iucnredlist.org/	Existing, data from 1996 to present
	A.0.4 The proportion of populations within species with a genetically effective population size > 500	By species group		GEOBON, see: https://www.sciencedirect.com/science/article/pii/S0006320720307126	Near ready**

Data-driven vs. modelled

SHI Species Habitat Index

The Species Habitat Index (SHI) measures changes in the estimated size and quality of ecologically intact areas supporting species populations. Ecosystems are made up of species, and as multi-species aggregate, the SHI provide a compound estimate of the ecological quality of natural ecosystems and the health and resilience of species populations.

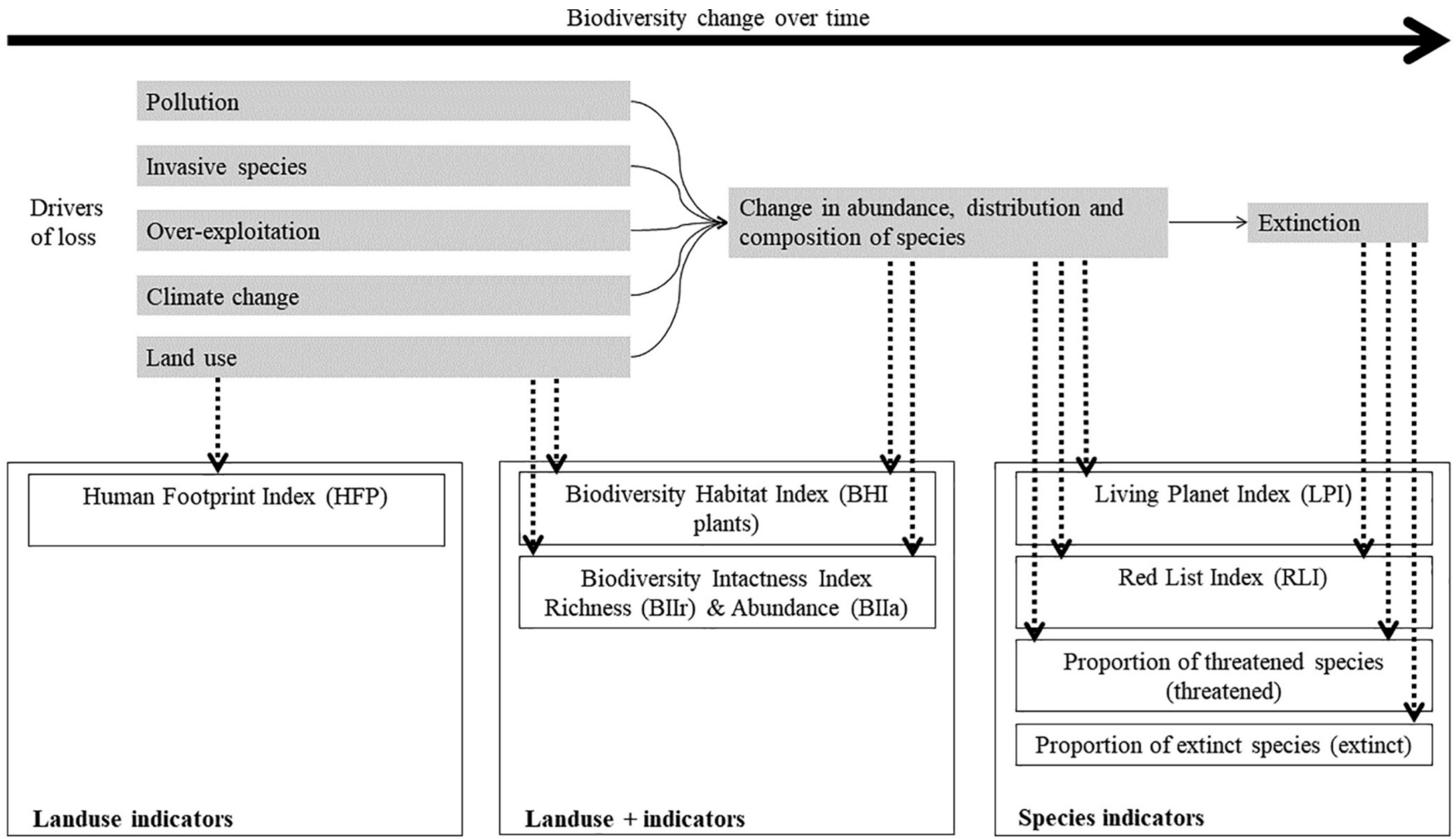
An interactive SHI map is hosted on Map of Life.

EBV class Species Populations
Species distribution

EBV class Ecosystem Structure
Ecosystem extent and fragmentation

1) Size of suitable habitat (modelled)
2) Connectivity of suitable habitat
3) Take an ‘average’ of the 2, compare to baseline (SHI=100)
4) SHI 95 means an average loss of 5% area and connectivity

Do we really need 274 indicators?



Stevenson et al. 2024 Biol Conservation

Simplicity versus complexity

Data needs

Data-driven - abundances/time series

Can we model all or part of the species

Is the justification simple?

(not necessarily the methodology..)

Calculate at different scales (“disaggregate”)

Taxonomic / Geographic Bias

Sub-national versus national versus Global responsibilities

25%

of Earth's remaining "*intact*" wilderness

Watson *et al.*, 2018 *Nature*