Evaluating the Aichi targets:
assessing existing observation capabilities and identifying essential biodiversity variables

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20 targets for 2020 – 5 Strategic Goals

Target 1 - By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably. [T1-T4]

A *Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society*

Target 5 - By 2020, the rate of loss of all natural habitats, including forests, is at least halved (...), and degradation and fragmentation is significantly reduced. [T5-T10]

B *Reduce the direct pressures on biodiversity and promote sustainable use*

Target 11 - By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved (...) [T11-T13]

C *To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity*

Target 14 - By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded (...) [T14-T16]

D *Enhance the benefits to all from biodiversity and ecosystem services*

Target 17 - By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan. [T17-T20]

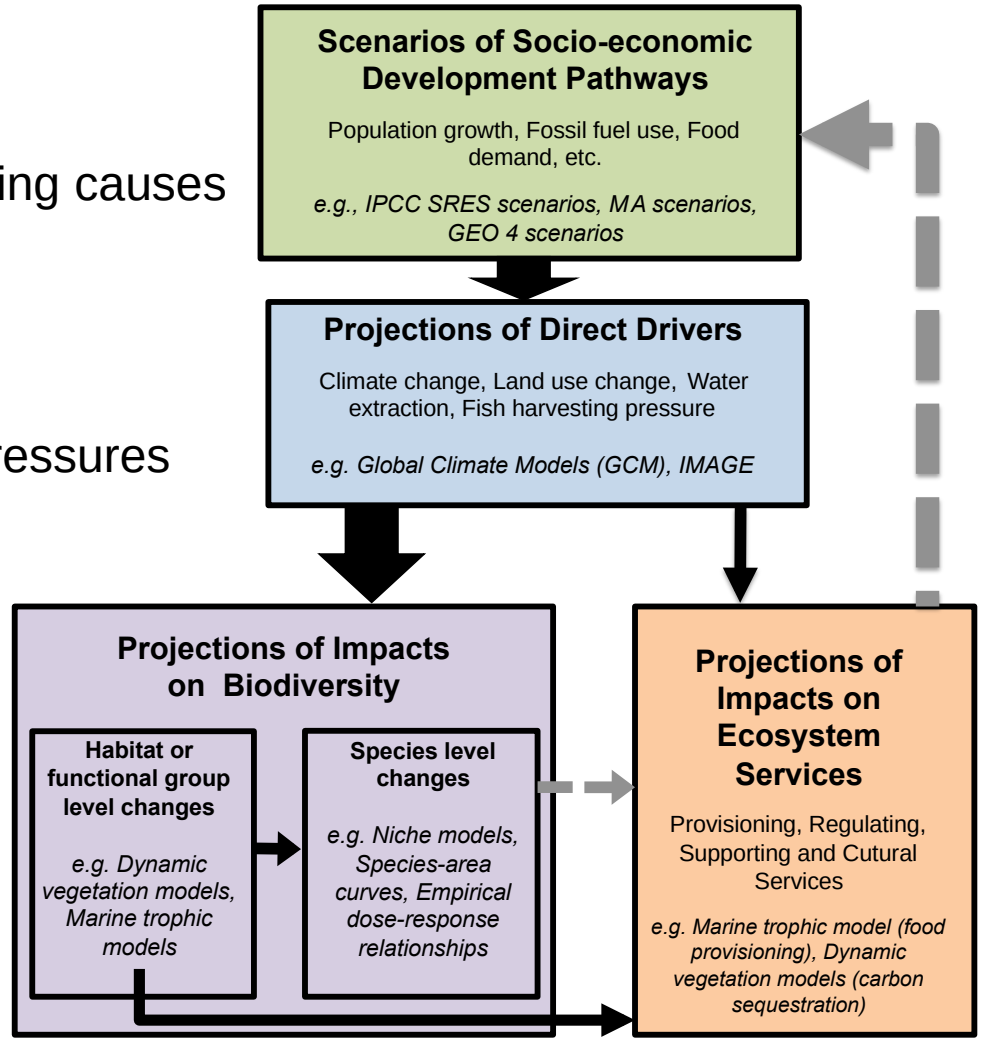
E *Enhance implementation through participatory planning, knowledge management and capacity building*

Observations for 2020: a scenarios perspective

Strategic Goal A:
Address the underlying causes

Strategic Goal B:
Reduce the direct pressures

Strategic Goal C:
Improve the status of biodiversity



Strategic Goal E:
Enhance implementation

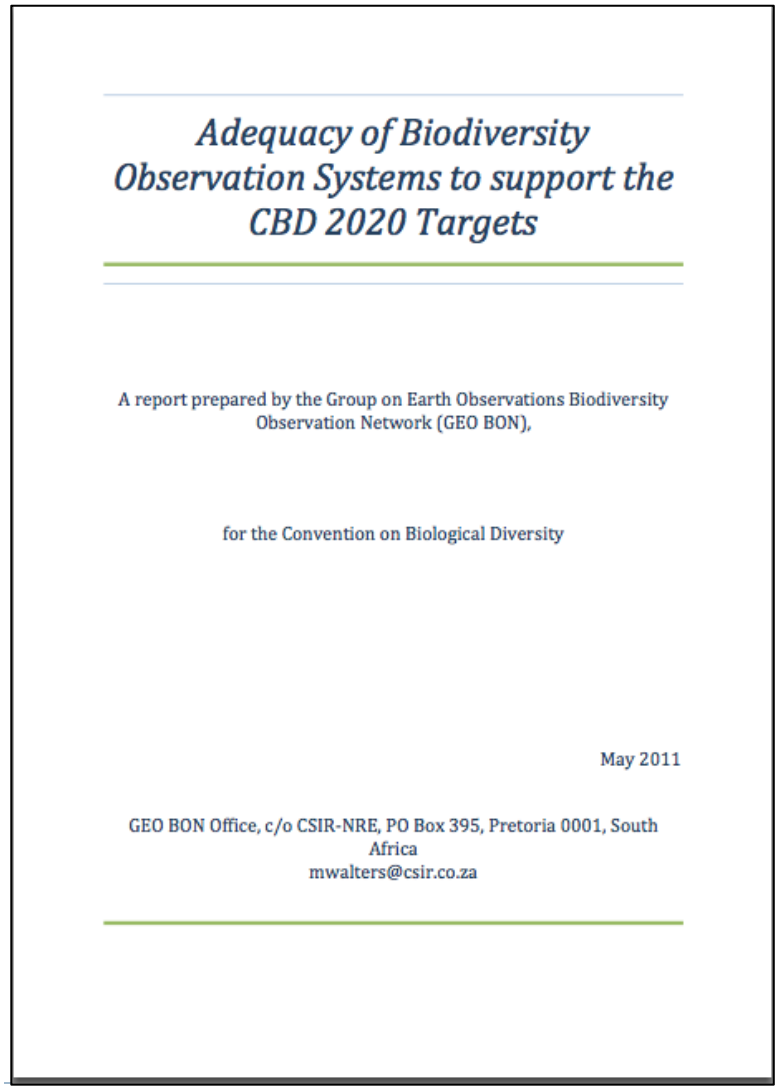
Strategic Goal D:
Enhance the benefits to all

Pereira, H.M. *et al.* (2010) *Science* 330:1496-1501.

Adequacy report

- Organized around the 5 Strategic Goals for 2020
  - For each target
    - Key concepts
    - Indicators (sources, organizations, spatial and temporal coverage)
    - Gaps and data limitations
    - Adequacy assessment
    - Estimated costs

http://www.earthobservations.org/documents/cop/bi_geobon/2011_cbd_adequacy_report.pdf



Adequacy of Biodiversity Observation Systems to support the CBD 2020 Targets

A report prepared by the Group on Earth Observations Biodiversity Observation Network (GEO BON),

for the Convention on Biological Diversity

May 2011

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Target 11 – Protected areas

- By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

Target 11 – Protected areas

Observation dataset	Sources and Organisational Holder/s	Start year [end year if interrupted]	Frequency of update	Geog Coverage	Spatial Resolution
Protected area coverage					
Coverage of PAs in terrestrial, marine and freshwater environments	World Database on Protected Areas (WDPA, through "Protected Planet") maintained by UNEP-WCMC and IUCN	1872	Annual	Global (including marine and international sites)	Site
Areas of importance for biodiversity and ecosystem services					
PA coverage of areas of particular importance for biodiversity	Key biodiversity areas, including Important Bird Areas (IBAs, BirdLife International), Important Plant Areas (IPAs, Plantlife International), Alliance for Zero Extinction sites (AZEs), and Ecologically and Biologically Significant Areas (EBSAs) (IUCN and others).	Various: IBAs (1980); IPAs (1990s); AZEs (2005); EBSAs (2009)	Annual	Global (IBAs, AZEs, Ramsar) and many countries (IPAs, Key Biodiversity Areas (KBAs))	Site
PA coverage of areas of particular importance for ecosystem services[26]	Natural Capital Project Key sites for biodiversity (as above), but including also Ramsar and natural World	Various (e.g., Ramsar, 1971; World Heritage 1972)	Annual	Global (Ramsar, World Heritage) and national	Site
Management effectiveness: outcome of management					
Biodiversity trends, including trends in species populations in PAs and extinction risk trends of species in PAs	Living Planet Index dataset (ZSL/WWF); Red List Index datasets (IUCN/BirdLife International)	For individual datasets, see Target 12	Varies (annual to 4-10 yearly)	Global	See Target 12

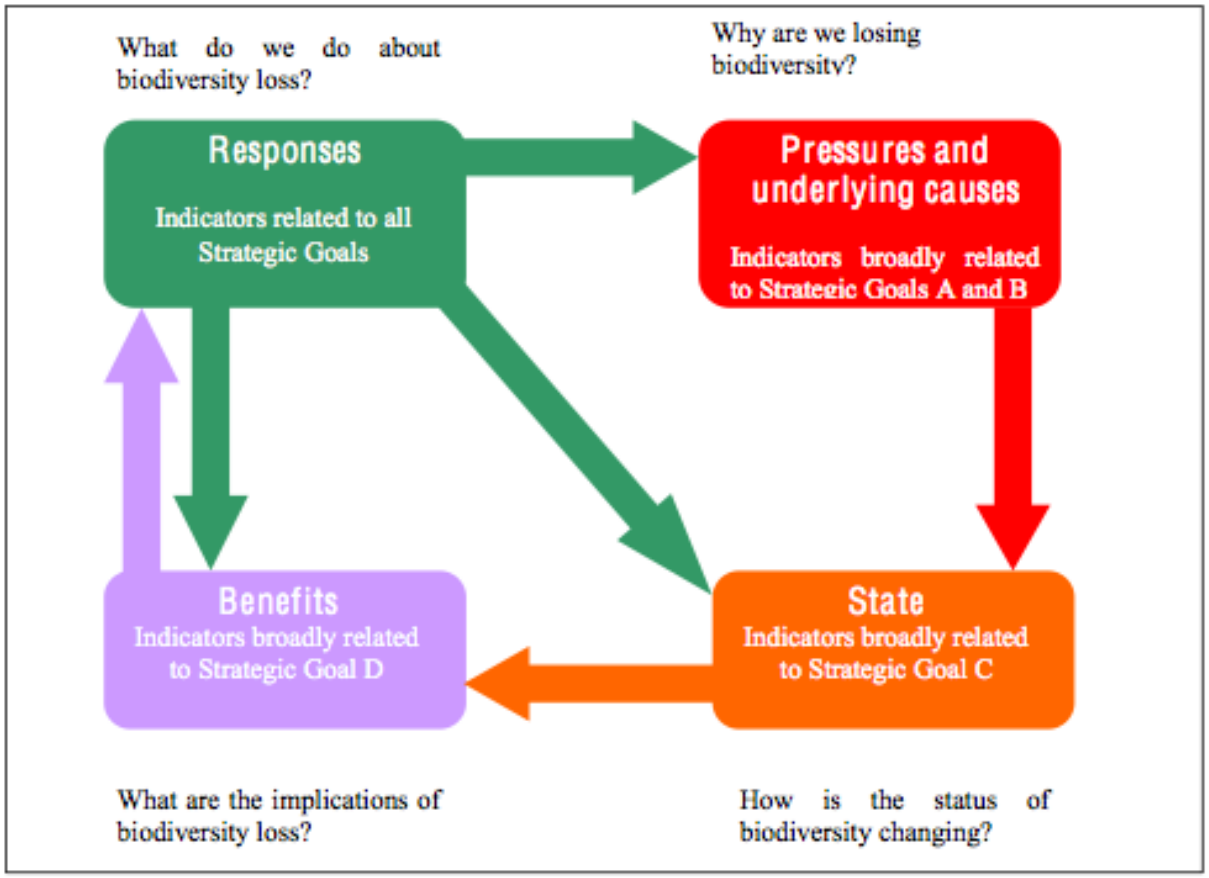
Target 12 – Prevented extinction of threatened species

By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Observation dataset	Sources and Organisational Holder/s	Start year [end year if interrupted]	Frequency of update	Geographical Coverage	Spatial Resolution
Changes in populations of threatened species (and other sensitive species, e.g., endemics)	Critically Endangered Bird Indicator (CEBI; BirdLife International)	Just getting started	Would be annual	~200 species worldwide	Global
	Status of AZE species and AZEs	2005	Twice to date	587 sites globally	Sites; see Target 11
	Indices of changes in abundance for threatened species in other taxonomic groups	LPI could provide useful time series data for some species, as could regional population indices (e.g. ASTI) but likely to be biased to recovering species. Global population monitoring may be possible for some plants (Kew through sampled Red Listing approach; GLORIA network; CAFF) and large mammals (IUCN Species Survival Commission (IUCN SSC); International Whaling Commission, International Council for the Exploration of the Sea; Pacific International Council for the Exploration of the Sea (PICES)); and regionally for numerous taxa including amphibians, butterflies, etc for Europe (e.g., see EEA) and North America (e.g., see NatureServe)			

Indicators framework and list of indicators - AHTEG

Conceptual model for communicating the different types of indicators for assessing progress towards the Strategic Plan for Biodiversity 2011-2020 (Based on the International Expert Workshop on the 2010 Biodiversity Indicators and Post-2010 Indicator Development held in Reading, United Kingdom, from 6-8 July 2009).



Indicators framework and list of indicators - AHTEG

AHTEG report for CBD, Aug2011

Policy Question7	Headline Indicator	Operational Indicators8 (A: Priority and ready for use globally, B: Priority to be developed at global level, C: For consideration at sub-global level)	Most relevant Aichi Target	Other relevant Aichi Targets
State – How is the state of biodiversity changing?	Trends in extent, condition and vulnerability of ecosystems, biomes and habitats	Extinction risk trends of habitat dependent species in each major habitat type (A)	12	5, 6, 7, 8, 10, 14
		Trends in extent of selected biomes, ecosystems and habitats (A) (decision VII/30 and VIII/15)	5	7, 14, 15
		Trends in proportion of degraded/threatened habitats (B)	5	7, 14, 15
		Trends in fragmentation of natural habitats (B) (decision VII/30 and VIII/15)	5	7, 14, 15
		Trends in condition and vulnerability of ecosystems (C)	5	6, 7, 8, 9, 10, 11, 14, 15
		Trends in the proportion of natural habitats converted (C)	5	7, 10, 11, 14, 15
	Trends in abundance, distribution and extinction risk of species	Trends in abundance of selected species (A) (decision VII/30 and VIII/15) (UNCCD indicator)	12	5, 6, 7, 10, 13, 14, 15
		Trends in extinction risk of species (A) (decision VII/30 and VIII/15) (MDG indicator 7.7) (also used by CMS)	12	5, 6, 7, 10, 13, 14, 15
		Trends in distribution of selected species (B) (decision VII/30 and VIII/15) (also used by UNCCD)	12	5, 6, 7, 11, 14, 15
	Trends in genetic diversity of species	Trends in genetic diversity of cultivated plants, and farmed and domesticated animals and their wild relatives (B) (decision VII/30 and VIII/15)	13	7, 12, 14, 16
		Trends in genetic diversity of selected species (C)	13	7, 12, 14, 16
Pressures and underlying causes - Why are we losing biodiversity?	Trends in pressures from unsustainable agriculture, forestry, fisheries and	Trends in Ecological Footprint and/or related concepts (A) (decision VII/30 and VIII/15)	4	5, 6, 7, 8, 10, 14
		Trends in population and extinction risk of utilized species, including species in trade (A) (also used by CITES)	4	5, 6, 7, 12, 14, 15
		Trends in extinction risk of target and bycatch aquatic species (A)	6	4, 12
		Trends in population of target and bycatch aquatic species (A)	6	4, 12

97 Operational Indicators

The state of national monitoring

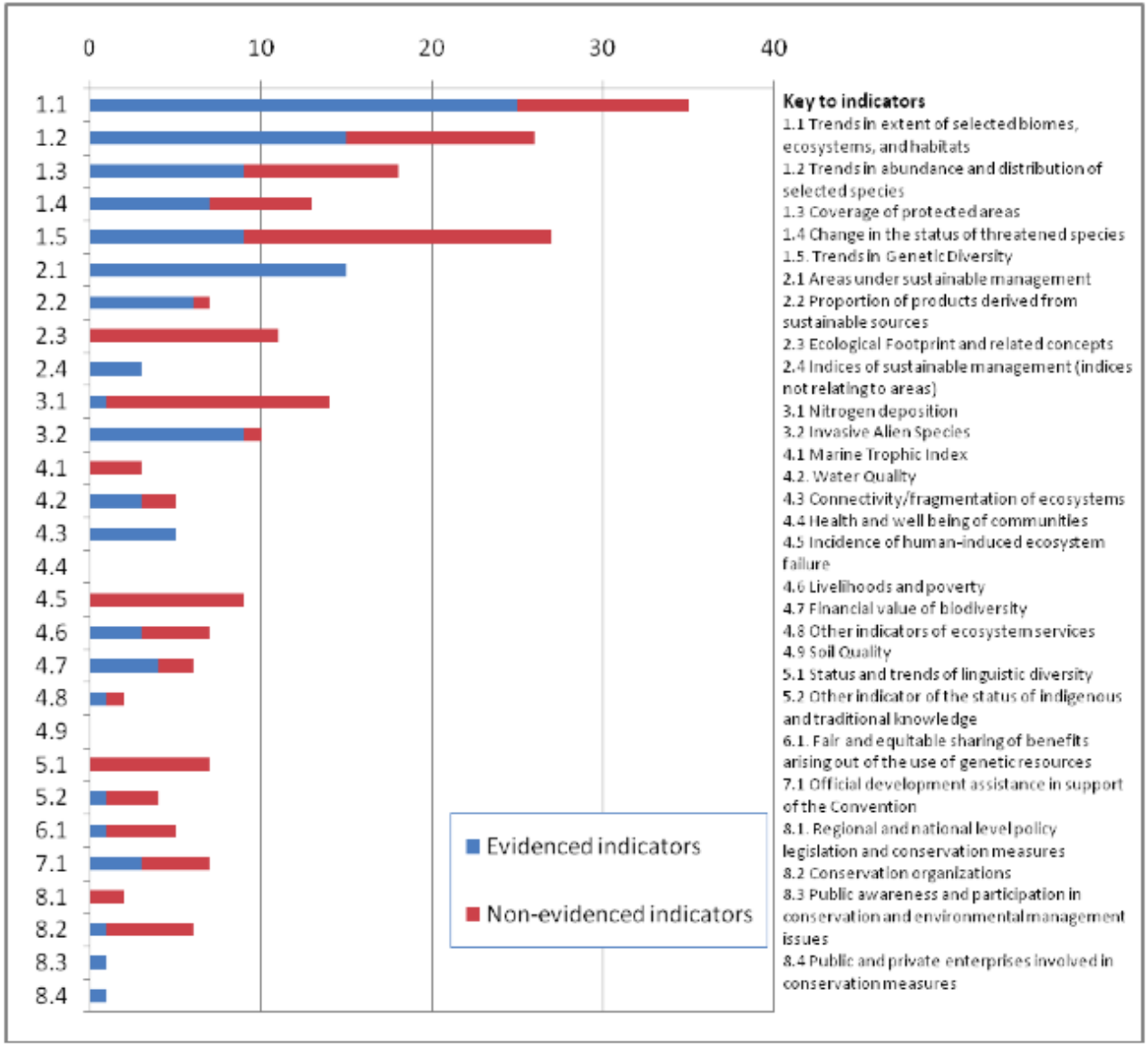
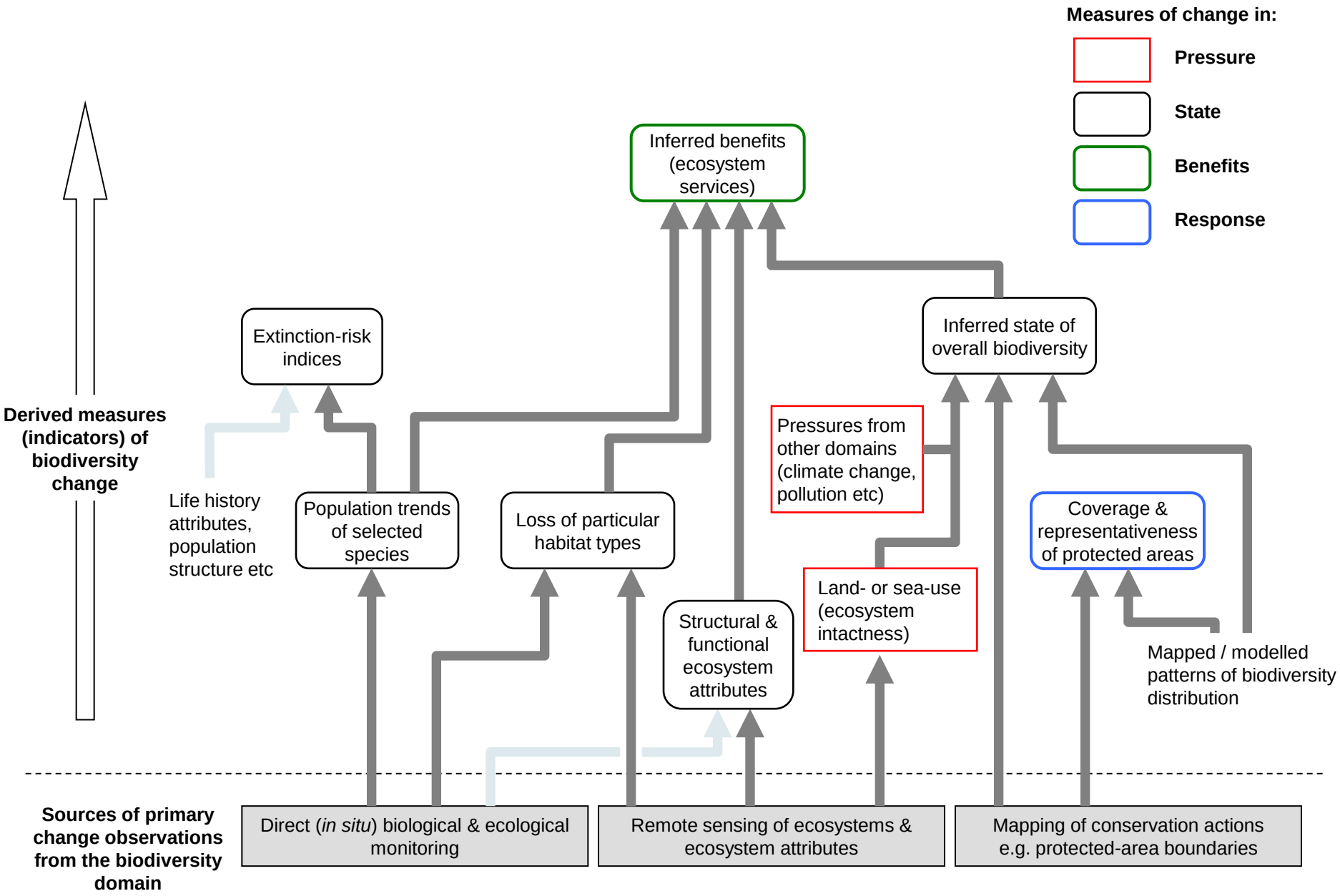


Figure 10: Number of CBD Parties reporting 'additional' indicators to CBD global indicators in 4th national reports, within CBD headline indicator categories

Essential Biodiversity Variables

- A relatively small number of essential variables (16-18) are necessary to derive the AHTEG operational indicators for the 2020 targets
- Each essential variable talks to multiple indicators and targets and many indicators and targets are informed by multiple essential variables
- Focus on primary change observations


Measures of change in:
Pressure
State
Benefits
Response
Inferred benefits (ecosystem services)
Extinction-risk indices
Inferred state of overall biodiversity
Derived measures (indicators) of biodiversity change
Pressures from other domains (climate change, pollution etc)
Life history attributes, population structure etc
Population trends of selected species
Loss of particular habitat types
Coverage & representativeness of protected areas
Land- or sea-use (ecosystem intactness)
Structural & functional ecosystem attributes
Mapped / modelled patterns of biodiversity distribution
Sources of primary change observations from the biodiversity domain
Direct (in situ) biological & ecological monitoring
Remote sensing of ecosystems & ecosystem attributes
Mapping of conservation actions e.g. protected-area boundaries

Essential biodiversity variables

- Emphasize *state* and *response*
  - Pressures are being monitored by other initiatives (e.g. climate change)
- Cover the different levels of biodiversity
  - Genetic diversity
  - Species populations, distributions, and extinction risk
    - Marine, freshwater and terrestrial
  - Functional types and ecosystems
  - Ecosystem services

Essential biodiversity variables: species level changes

Sub variable	Examples of datasets and/or relevant institution[40]	Gaps	Could be done by 2020 or already in development	Targets () denotes less relevance
Terrestrial species abundance	Birds (BirdLife International)	Africa, South / central America, Asia, Pacific Tropics	Critically endangered and common birds in gap regions	5, 6, 7 ,10 ,11 ,12 ,14 ,15
	Mammals (ZSL/WWF)		Large mammals (camera trapping – Wildlife Picture Index) and bats (iBats) could be done in gap regions	
	Butterflies	Africa, Americas, Asia	Iconic species monitoring in gap regions	
	Plants	No population trend data except for tree species and species targeted for demographic research - usually either highly threatened or invasive aliens	SRLI of threatened plant species in hotspots	
Marine species abundance	Fishes (International Council for Exploration of the Sea (ICES), Northwest Atlantic Fisheries Organization (NAFO), OBIS) SAHFOS plankton monitoring National and EU monitoring programmes	Non-commercial species	Reef Life Survey (RLS) – citizen science Extend SAHFOS monitoring transects Coordinate regional monitoring programmes	

Essential variable: Species abundance over time (state)

Implication for parties

- These variables may be consistently monitored and reported at the national scale by the parties, and contribute towards assessing national targets and global targets
- Some of essential measures have existing datasets and networks behind them, but others require establishment of new monitoring programs
- Even for measures for which have datasets, regional and other gaps exist (e.g. geospatial, taxonomic, temporal), that require countries to monitor and mobilize data

- Thank you for your attention!

- http://www.earthobservations.org/

Essential biodiversity variables: genetic level changes

Sub variable	Examples of datasets and/or relevant institution[40]	Gaps	Could be done by 2020 or already in development	Targets () denotes less relevance
Domestic animals and exploited species	DAD-IS (FAO)	Data gaps and infrequent data updates, particularly in developing region; fisheries and aquaculture not covered.		(4), 6, 7, 13, 14, (15)
Cultivated plants	*Ex situ* collections databases (FAO, CGIAR)	Lack of *in situ* data	Mapping diversity of a targeted set of cultivated plants and their wild relatives; Inventory of threatened cultivated plant varieties	(4), 6, 7, 13, 14
Threatened species	ISIS (animals) BGCI (plants)	Coverage (predominantly large mammals, captive populations) No genetic data		(5), (8), 12