Prof. Dr. Johan Rockström

Why Biodiversity Matters
For Humanity’s Future on Earth

Trondheim Conferences on Biodiversity,
Trondheim, 02 July 2019
Biodiversity in Peril: 60% Decline in Population Sizes Across Globe

The Global Living Planet Index: Average abundance of 16,704 populations representing 4,005 species monitored across the globe declined by 60% from 1970 to 2014.
Impacts and risks for selected natural, managed and human systems

IPCC Special Report, 2018
The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?
3 Potential States of the Earth System

Natural limit cycle in Pleistocene

Earth Resilience

Living Biosphere – Feedbacks and Dynamics

Stabilized Earth

Hothouse

Iceage
We have never exceeded 2 °C in the last Three Million Years

Results of model simulations: Observations shown in black, model results in colour.
Transgressing
The Planetary
Biosphere Integrity
Boundary
More species threatened than ever before in human history

Source: IPBES Global Assessment Report, 2019
A living biosphere on a Sustainable Planet
Basis for human wellbeing
Biosphere Feedbacks on Earth Stability
A Global Map of Potential Tipping Cascades
A Roadmap for Rapid Decarbonization

Rockström, Gaffney, Rogelj, Meinshausen, Nakicenovic, Schellnhuber. Science 24 March 2017
Steffen, Rockström, Cornell et al 2015 *Science*

Image: Globaia
Aiming higher to bend the curve of biodiversity loss

The development of the post-2020 strategic plan for the Convention on Biological Diversity provides an opportunity to set out an ambitious plan of action to restore global biodiversity. The components, including its goal, targets and some metrics, already exist and provide a roadmap to 2050.

Georgina M. Mace, Mike Barrett, Neil D. Burgess, Sarah E. Cornell, Robin Freeman, Moni Andy Purvis

Key Elements and Innovations for the CBD’s Post-2020 Biodiversity Framework:
A Collaborative Discussion Piece
October 2018

Recommendations for the Post-2020 Framework

- Create a simple overarching “apex goal” that conveys the fundamental importance of nature in achieving climate resilience, sustainable development, and human well-being.
- Outline a clear logic structure for biodiversity priorities that clarifies relationships between specific targets and drives implementation of the actions needed at all levels to achieve larger objectives for the state of biodiversity.
- Ensure the targets on all levels are clear, concise and quantifiable, to clarify the actions needed and enable progress to be measured.

IUCN’s position on review of progress and the post-2020 biodiversity framework

Convention on Biological Diversity
Fourteenth Meeting of the Conference of the Parties (COP14)
Sharm El-Sheikh, Egypt, 17-29 November, 2018

Bold nature retention targets are essential for the global environment agenda

Ambitious targets for the retention — not just formal protection — of nature are urgently needed to conserve biodiversity and to maintain crucial ecosystem services for humanity.

Martine Maron, Jeremy S. Simmonds and James E. M. Watson
Biodiversity goal

Biodiversity challenge

Policy gaps

Climate goal

Climate challenge

Stable and Resilient Biosphere
<table>
<thead>
<tr>
<th>Year</th>
<th>Climate Change</th>
<th>Biodiversity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>Stay within global carbon budget &lt; 800 GtCO₂</td>
<td>“Tackling the Extinction of Threatened Species” (CBD)</td>
</tr>
<tr>
<td>Apex Target?</td>
<td>Bend the Global Curve of Emissions</td>
<td>Bend the Global Curve of Biodiversity Loss</td>
</tr>
<tr>
<td>Apex Target?</td>
<td>50% Reductions by 2030 (40% / 1990)</td>
<td>Zero (Halt and Conserve)</td>
</tr>
<tr>
<td>2050</td>
<td>Zero emissions by 2050 (± 5 GtCO₂)</td>
<td>Set of Science Based Targets as part of global biodiversity framework “Landing Lights”</td>
</tr>
<tr>
<td>Apex Target?</td>
<td>Zero</td>
<td>Zero (Restoring &amp; Recovery)</td>
</tr>
</tbody>
</table>
Exponential road map for natural climate solutions

How do we realise the 37% biosphere potential by 2030?

Natural climate solutions

GLOBAL COMMONS SYSTEMS
THE CONNECTED, SHARED RESOURCES THAT ENSURE A HABITABLE PLANET

EARTH COMMISSION
IDENTIFY METRICS & ASSESS RISKS

SCIENCE-BASED TARGETS NETWORK
TRANSFORM, DEVELOP METHODS, CREATE DATA ARCHITECTURE, PROMOTE, ENGAGE, & MOBILIZE

SYSTEMS ACTORS
SET & ADOPT TARGETS, REDESIGN STRATEGY, CHANGE OPERATIONS & ACTIVITIES

POLICY
BUSINESSES
CITIES
PEOPLE
Earth system STABILITY
BIODIVERSITY
ECOSYSTEM FUNCTIONS
GLOBAL COMMONS SYSTEMS
ECOSYSTEM SERVICES
HUMAN WELLBEING & EQUITY
Introducing a new definition of Sustainable Development

Prosperity and Equity within Stable and Resilient Earth System
Thank You!