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Regional assessment on biodiversity and ecosystem services for Europe and Central Asia

Bern 6 June

The co-chairs of the Europe and Central Asia assessment expert group



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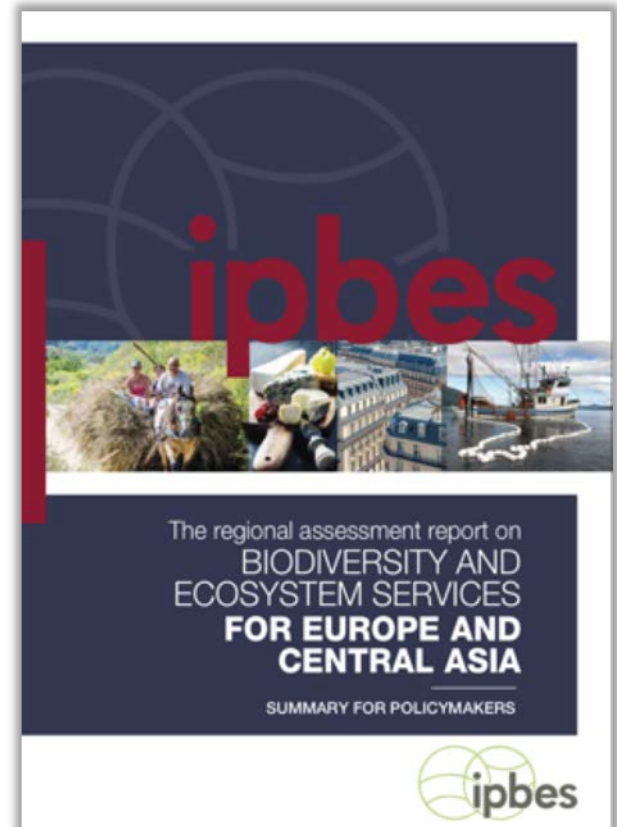


Food and Agriculture
Organization of the
United Nations



Assessment Report on Biodiversity and Ecosystem Services in Europe and Central Asia

- **>120 leading international experts** from 36 countries over three years
- More than **4,000 publications** (scientific papers, Government reports, indigenous and local knowledge and other sources)
- Refined by over **7,700 comments** from external reviewers and Governments



Regional assessment for Europe and Central Asia



Units of analysis

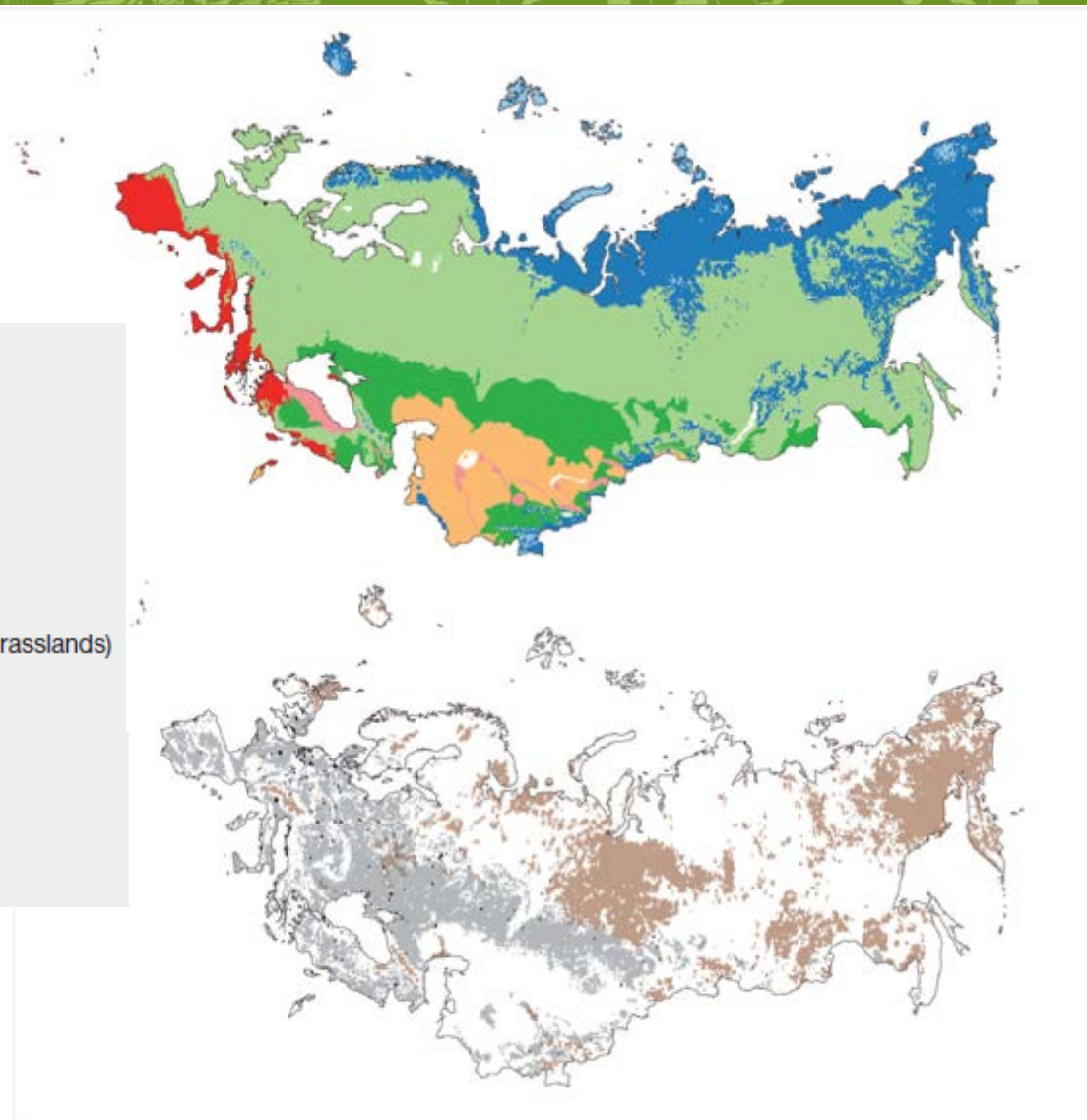


Figure: ECA units of analysis

Nature's contributions to people

Consideration of ecosystem services through the lens of nature's contributions to people which embodies:

- The scientific concept of ecosystems goods and services
- The notion of nature's gifts from indigenous and local knowledge systems

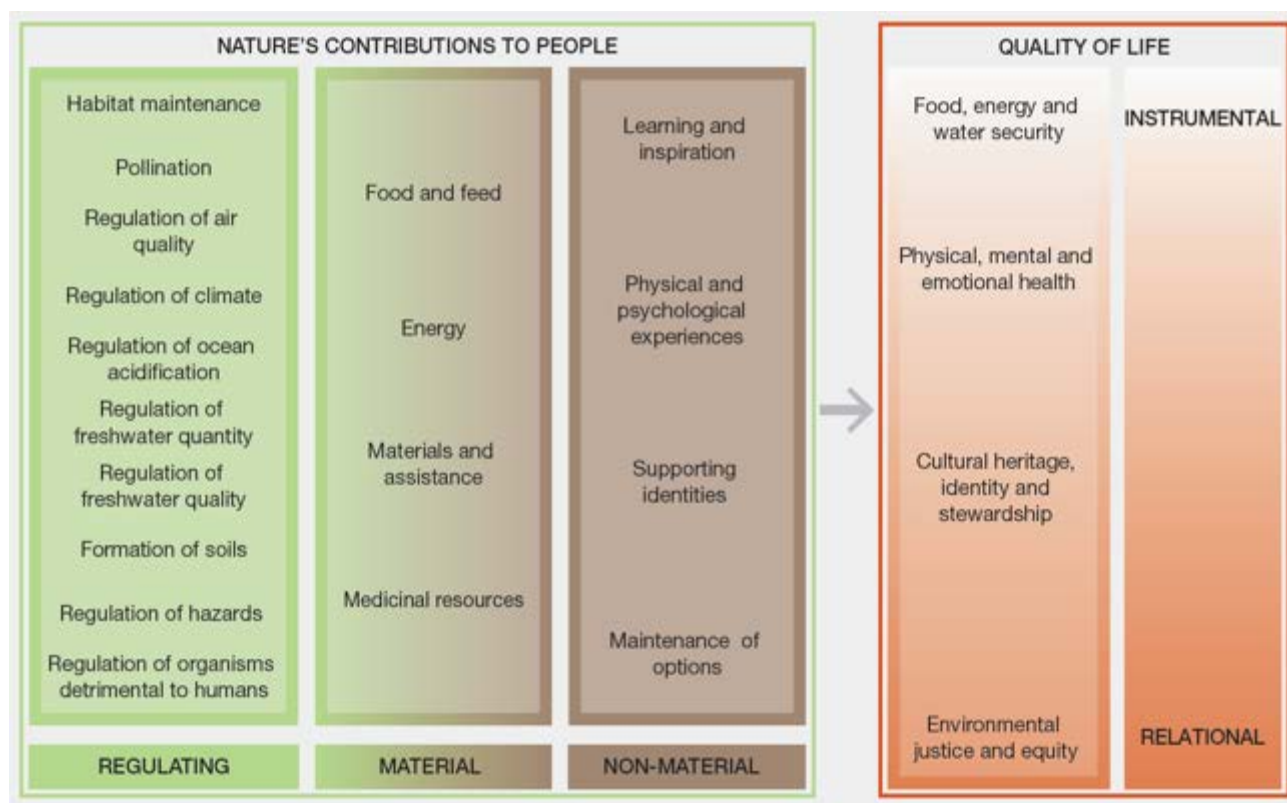


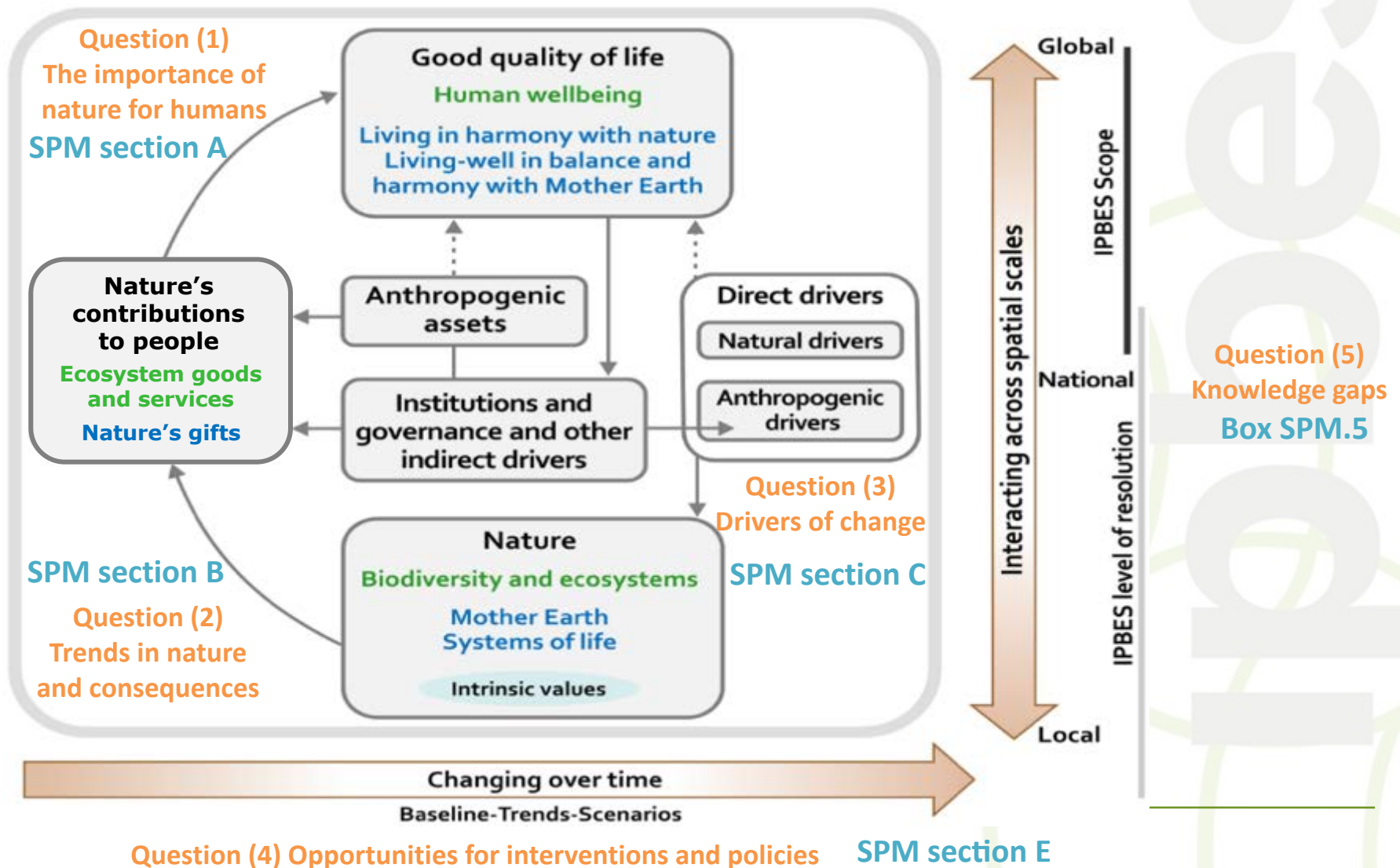
Figure: Nature's contributions to people and quality of life (instrumental and relational values)



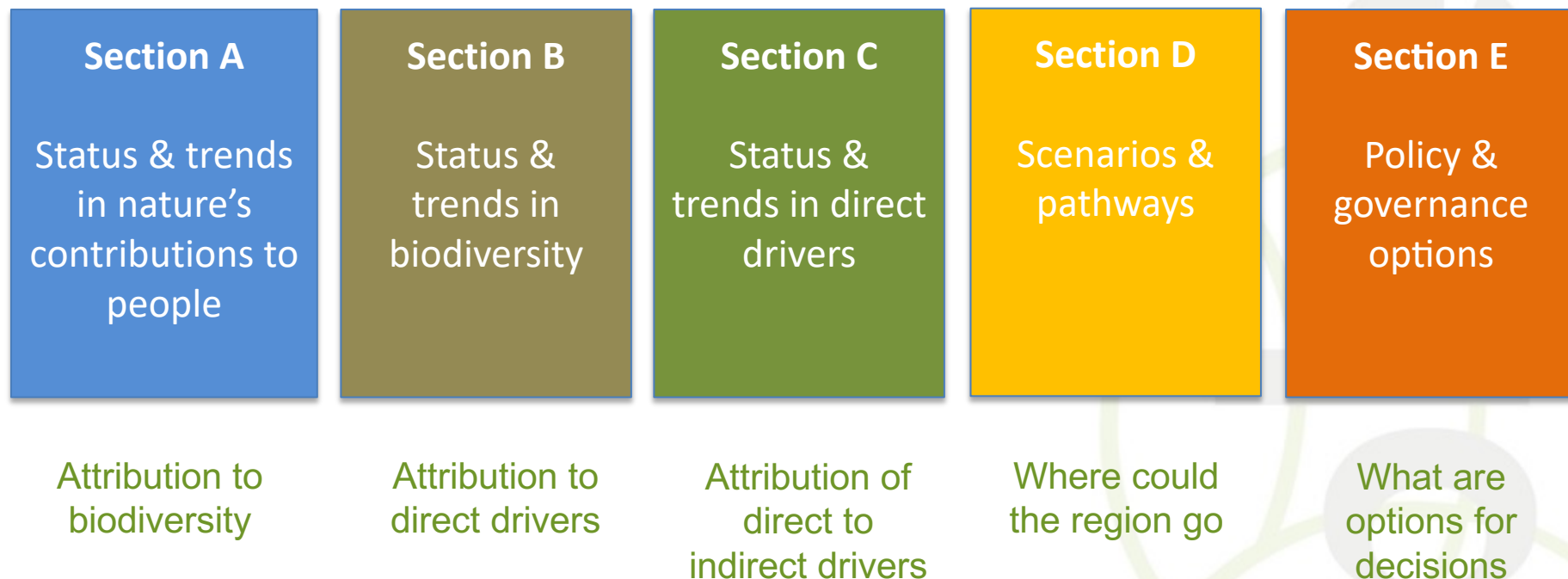
Policy-relevant questions

- 
1. How do biodiversity and ecosystem services contribute to the economy, livelihoods, food security, well-being and good quality of life?
 2. What are status, trends and potential future dynamics?
 3. What are the pressures driving change?
 4. What are actual & potential impacts of various policies & interventions?
 5. What gaps are there in relevant knowledge?

How questions and SPM sections map on the conceptual framework



Structure of the SPM



16 key messages, 20 background messages, 11 figures, 4 tables, 5 boxes, 2 appendices



Nature is precious, but declining, in Europe and Central Asia

- Nature's contributions to people are precious, and **essential** for human life
- Nature's contributions to people can be worth **thousands of dollars/hectare/year**
- Non-material (e.g. tourism and recreation) and regulating (e.g. air and water quality) contributions are **at least as valuable** as material contributions (e.g. food and timber)
- Material contributions have been consumed **at the expense** of regulating and non-material contributions

Nature is precious, but declining, in Europe and Central Asia

- Nature's contributions are of great value in monetary and non-monetary terms, e.g.:

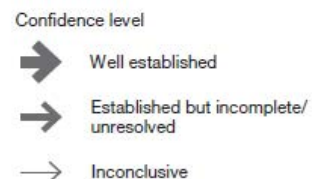
- \$464 /ha/yr: estimated value of nature's **regulation of climate**
- \$765 /ha/yr: estimated value of **habitat creation and maintenance**
- \$1,965 /ha/yr : median value of **regulation of freshwater and coastal water quality**

- >50% of **nature's regulating contributions to people** declined from 1960 to 2016



		WE	CE	EE	CA	ECA
REGULATING NATURE'S CONTRIBUTIONS TO PEOPLE	Habitat maintenance	↘	↘	↘		↘
	Pollination	↘	↘	↘		↘
	Regulation of air quality	↕	↗	↗	↕	↗
	Regulation of climate	↗	↕	↗	↕	↕
	Regulation of ocean acidification					↕
	Regulation of freshwater quantity	↘	↕	↘	↘	↘
	Regulation of freshwater quality	↘	↘	↘		↘
	Formation and protection of soils	↘	↘	↘	↘	↘
	Regulation of coastal and fluvial floods	↕	↘	↘	↕	↘
	Regulation of organisms (removal of carcasses)	↗	↕	↗	↗	↗
MATERIAL NATURE'S CONTRIBUTIONS TO PEOPLE	Food	↗	↗	↗	↗	↗
	Biomass-based fuels	↗	→	→		↗
	Materials (wood and cotton)	→	→	→	→	→
NON-MATERIAL NATURE'S CONTRIBUTIONS TO PEOPLE	Learning derived from indigenous and local knowledge	↘	↘	↘	↘	↘
	Physical and psychological experiences	↕	↘	↘		↕
	Supporting identities					↕

Figure: Trends in nature's contributions to people



Nature is precious, but declining, in Europe and Central Asia

- Declines in nature's contributions are caused by declines in biodiversity.

Ecosystems:

- Extent of **wetlands** in Western, Central and Eastern Europe has declined by **50%** since 1970
- Extent and biodiversity status of **14 out of 15 terrestrial habitat types** across the region declining since the 1950s
- Among EU assessments of species and habitat types of conservation interest, only **9% of marine habitat types** show a “favourable conservation status”



Nature is precious, but declining, in Europe and Central Asia

- Declines in nature's contributions are caused by declines in biodiversity.

Species:

Over the past decade:

- 26% of known **marine fish** populations in decline. Less than 2% increasing
- 42% of known **terrestrial animal and plant species** declined
- 71 per cent of **freshwater fish** and 60 per cent of **amphibians** with known population trends have been declining



Trends in biodiversity

		PAST					PRESENT				
		WE	CE	EE	CA	ECA	WE	CE	EE	CA	ECA
TERRESTRIAL	Agroecosystems	↘	↘	↘	↘	↘	↘	↘	↕	↕	↘
	Alpine and subalpine systems	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
	Boreal peatlands	↘	•	↘	•	↘	↘	•	↘	•	↘
	Deserts	↘	•	↘	↘	↘	↘	•	↘	↘	↘
	Forest-steppe, steppe and other southern peatlands	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
	Mediterranean forests and scrubs	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
	Permafrost peatlands	→	•	→	•	→	↘	•	↘	•	↘
	Snow and ice-dominated systems	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
	Subterranean habitats	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
	Temperate and boreal forests and woodlands	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
	Temperate grasslands	↘	↘	↘	↘	↘	↘	↘	↕	↕	↕
	Temperate peatlands	↘	↘	↘	•	↘	→	→	→	•	→
	Tropical and subtropical dry and humid forests	↘	↘	↘	↘	↘	↕	↕	↕	↕	↕
	Tundra	↘	•	↘	•	↘	↘	•	↘	•	↘
	Urban ecosystems	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
INLAND SURFACE WATER	Aral Sea	•	•	•	↘	↘	•	•	•	↘	↘
	Caspian Sea	•	•	↘	↘	↘	•	•	↘	↘	↘
	Inland surface water	↘	↘	↘	↘	↘	↘	↕	↘	↘	↘
	Saline lakes	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
MARINE	Northeast Atlantic	Baltic Sea	Mediterranean Sea	Black and Azov Seas	Arctic Ocean	Northwest Pacific Ocean	ECA deep-sea				
PAST	↘	↘	↘	↘	↕	↘	↕				
PRESENT	↘	↘	↘	↘	↘	↘	↘				

↗

Strong and consistent increase in indicator

↘

Strong and consistent decrease in indicator

→

Stable indicator

•

Not applicable

↕

Variable trend in indicator

↗

Moderate and consistent increase in indicator

↘

Moderate and consistent decrease in indicator

↕

Confidence level

↗

Well established

↘

Established but incomplete/unresolved

↑	Strong and consistent increase in indicator	↓	Strong and consistent decrease in indicator	→	Stable indicator	•	Not applicable	↕	Well established
↗	Moderate and consistent increase in indicator	↘	Moderate and consistent decrease in indicator	↕	Variable trend in indicator	→	Established but incomplete/unresolved	→	Inconclusive

Underlying causes of change in Europe and Central Asia

- **Human activities** cause biodiversity decline
 - Land-use change and intensification
 - Climate change
 - Natural resource extraction
 - Pollution
 - Invasive alien species



Underlying causes of change in Europe and Central Asia

- These activities reflect **societal choices, government policy, economic growth, population growth and technological development**
- **Loss of indigenous and local knowledge** and associated biodiversity-friendly practices
- Europe and Central Asia consumes more than it produces, leaving a large ecological footprint, also on the rest of the world



	Land use change				Climate change				Invasive alien				Pollution				Extraction			
	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA
Temperate and boreal forests	↕	↕	↕	↕	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↘	→	→	↗
Mediterranean forests	↗	↗	•	•	↗	↗	•	•	↗	↗	•	•	↗	↗	•	•	↗	↗	•	•
Cold grasslands	↘	↘	↘	→	↗	↗	↗	↗	↗	→	→	→	↗	↗	↗	↗	↗	↗	↗	↗
Temperate and boreal grasslands	↕	↕	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
Mediterranean grasslands and scrubs	↕	↕	•	•	↗	↗	•	•	↗	↗	•	•	↗	↗	•	•	↕	↕	•	•
Drylands and deserts	↗	•	↕	↕	↗	•	↗	↗	↗	•	↗	↗	↗	•	↗	↗	↗	•	↕	↗
Wetlands, peatlands, mires and bogs	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	→	↗	↗	↗	↗	↗	↗	↗	↗
Urban and semi-urban systems	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
Cultivated areas	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	•	•	•	•
Inland freshwaters	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
Deep marine waters	→	→	→	•	↗	↗	↗	•	↗	↗	↗	•	↗	↗	↗	•	↗	↗	↗	•
Coastal marine waters	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗

↗ Strong increase

↗ Increase

↘ Strong decrease

↘ Decrease

→ Stable

↕ Variable

• Not applicable

Confidence level

→ Well established

→ Established but incomplete/unresolved

→ Inconclusive

Figure: Trends in direct drivers

	LAND USE CHANGE															
	Agricultural land use				Forestry				Traditional land use				Protected area development			
	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA
INSTITUTIONAL	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	~	~	✓	✓	~	~
ECONOMIC	~	~	~	~	✗	~	✗	~	✓	✓	✗	✗			✗	✗
DEMOGRAPHIC			~	~					✗	✗	✗	✗				
CULTURAL	✓	~	✗	✗	✓	✓	✓	✗	~	~	~	~	✓	✓	✗	✗
TECHNOLOGICAL	~	~	~	~												
	Climate change				Pollution				Natural resource extraction				Invasive alien species			
	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA
	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA
INSTITUTIONAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✗	✓	✓	~	~
ECONOMIC	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗		✗	✗	✗	✗	✗
DEMOGRAPHIC					✗	✗	✗	✗	✗	✗	✗	✗				
CULTURAL					~	~	~	~	~	~	~	~	✗	✗	✗	✗
TECHNOLOGICAL	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗				
<p>The colour shows the impact of an indirect driver on a direct driver's effect on biodiversity and nature's contributions to people along a gradient from negative to positive effects. WE = Western Europe, CE = Central Europe, EE = Eastern Europe, CA = Central Asia</p> <p>  Negative  Both ways  Positive  Lack of evidence </p>																

Table: Direct and indirect drivers

ECA's impact at home and on the rest of the world

- De-intensification of food production would reduce impacts on biodiversity
- But this would require increased imports from elsewhere
- ECA already has a large ecological footprint
- To reduce it, consumption of NCP from within and outside ECA would need to be reduced

Subregion	Ecological Footprint	Biocapacity
Western Europe	5.1 ha	2.2 ha
Central Europe	3.6 ha	2.1 ha
Eastern Europe	4.8 ha	5.3 ha
Central Asia	3.4 ha	1.7 ha





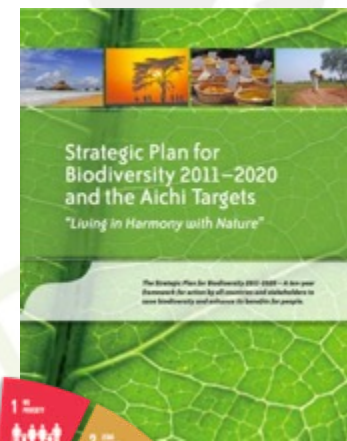
Box: Progress towards the Aichi Biodiversity Targets

Aichi Biodiversity Targets and Strategic Goals (A to E):

- Goal A, some progress in addressing the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society; subsidies with negative impacts not yet reformed.
- Goal B, pressure from direct drivers on biodiversity unlikely to be reduced and the use of biodiversity not yet sustainable.
- Goal C, progress made in safeguarding ecosystems, species and genetic diversity through protected areas.
- Goal D, not advanced the benefits to all people from biodiversity and ecosystem services because of the deterioration of nature's capacity to provide certain contributions to people and the unequal distribution of nature's contributions.
- Goal E, implementation through participatory planning, knowledge management and capacity-building has been positive where the Aichi Biodiversity Targets have informed the development of national-level targets, except for ILK.

Future options for Europe and Central Asia

- **Business-as-usual** will further deteriorate biodiversity and nature's contributions to people
- A future based on the **balanced use** of nature's contributions, reflecting diverse societal values, is more likely to be sustainable
- **Decoupling** of economic growth from the degradation of nature
- Measuring **national welfare** beyond current economic indicators



Direct and indirect drivers (for scenarios)

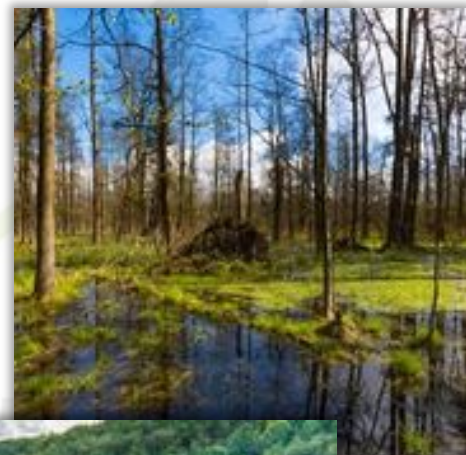
Scenario archetype	INDIRECT DRIVERS					DIRECT DRIVERS				
	INSTITUTIONAL (Environmental proactivity)	ECONOMIC (Gross domestic product)	DEMOGRAPHIC (Population)	CULTURAL (Sustainable consumption)	TECHNOLOGY	CLIMATE CHANGE (Temperature)	LAND USE CHANGE (Landscape homogeneity)	NATURAL RESOURCE EXTRACTION	POLLUTION	INVASIVE ALIEN SPECIES
Business-as-usual	↗↘	↗	↗	↘	↗↗	↗	↗	↗	↗	↗
Economic optimism	↘	↗	↗	↘	↗↗	↗	↗	↗	↗	↗
Regional competition	↘	→	→	→	↘	↗	↗	↗	↗	↗
Regional sustainability	↗	↗	↗	↗	→	↗	↘	↘	→	↘
Global sustainable development	↗	↗	→	↗	↗	↗	↗	↘	↘	↘
Inequality	↘	↗	↘	→	→	↗		↗		

Strong increase
 Increase
 Stable
 Decrease
 Strong decrease

Positive
 Neutral
 Negative
 Not interpreted in terms of impacts
 Lack of evidence

Future options for Europe and Central Asia

- Policy and governance options:
 - **Mainstreaming** biodiversity concerns (raising awareness, policy objectives, instrument design and policy mixes)
 - **Integration** across policy sectors (e.g., agriculture, fisheries, manufacturing)
 - **Participation** to integrate various values and forms of knowledge including indigenous and local knowledge
- Conservation efforts such as well-managed **protected areas**
- **Societal transformation**: education, consumption, shared responsibility



		Sectors	CONSERVATION				ENVIRONMENT ¹				AGRICULTURE				FORESTRY				FISHERIES				EXTRACTIVE & MANUFACTURING ²				SERVICES ³			
STEPS	OPTIONS AND OPPORTUNITIES	Sub-regions	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA	WE	CE	EE	CA
STEP 1: Raising awareness	Encourage education, joint learning and common understanding																													
	Promote information sharing, transparency, knowledge management and training																													
	Make trade-offs and tipping points visible at the relevant spatial scales																													
	Encourage participation and dialogue among different actors																													
	Make diverse values visible through national and business accounting																													
	Mainstream recognition of need for profound societal transformation towards sustainability																													
STEP 2: Defining policy objectives	Adopt and translate international and regional targets and standards into national and local strategies and action plans																													
	Improve integration and coherence of legislation, sectoral policies and planning processes, to account for trade-offs and synergies																													
	Develop context appropriate targets and objectives to stimulate positive change																													
	Increase transparency and participation of a wide range of actors including indigenous peoples and local communities in decision making																													
STEP 3: Designing instruments and policy mixes	Legal and regulatory instruments																													
	Define and ensure property and access rights and responsibility																													
	Set up, adjust and enforce legal and regulatory standards to sustain biodiversity and NCP																													
	Set up areas to protect biodiversity and NCP																													
	Economic and financial instruments																													
	Phase out harmful subsidies		NA	NA	NA	NA																								
	Tax and charge negative environmental impacts		NA	NA	NA	NA																								
	Redistribute public revenues considering ecological objectives																													
	Reward socio-economic activities delivering public goods																													
	Secure conservation financing						NA	NA	NA	NA																				
	Foster sustainable technological and social innovation																													
	Social and information-based instruments																													
	Promote eco-labelling and certification schemes and improve their transparency and accountability																													
	Promote voluntary agreements and partnerships for responsible management, which include self-enforcement mechanisms																													
	Promote sense of agency and efficacy through the enhancement of public participation																													
	Support social norms that promote sustainable lifestyles and practices																													
	Rights-based approaches and customary norms																													
	Strengthen the use of indigenous and local knowledge and practices																													
	Strengthen the consideration of cultural properties and heritage in protecting sites and landscapes						NA	NA	NA	NA																				
	Strengthen the use of Social License to Operate or similar approaches to recognise the needs of indigenous peoples and local communities																													

1. Include the following policy areas: Marine and freshwater quality and quantity, flood management, air and wider environmental pollution (including eutrophication and acidification), waste management, mitigation of or adaptation to climate change, soil management and land degradation. Options and opportunities in rows left blank have been covered by the other sectors, also in relation to their environmental outcomes.

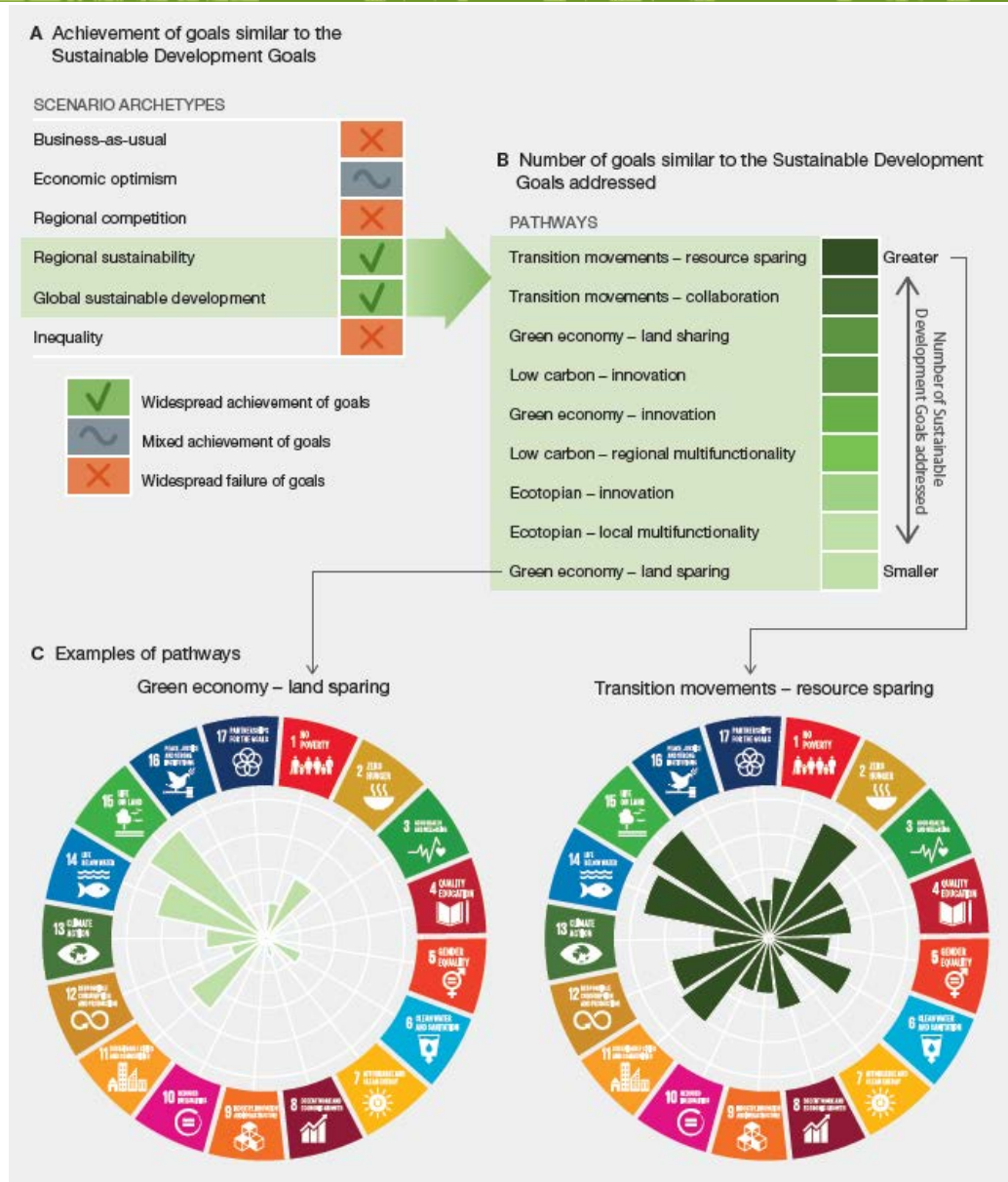
WE = WESTERN EUROPE CE = CENTRAL EUROPE EE = EASTERN EUROPE CA = CENTRAL ASIA
 ■ EFFECTIVELY IMPLEMENTED ■ UNDER DEVELOPMENT OR STARTED ■ NOT ASSESSED
 ■ IMPLEMENTED WITH SCOPE FOR IMPROVEMENT ■ NOT YET INITIATED ■ NA = NOT APPLICABLE

Table: Policy options and opportunities for mainstreaming biodiversity

Beyond 2030 – scenarios and pathways

The most effective pathways stress long-term societal transformation

Figure: Summary of the extent to which targets and goals such as the Aichi Biodiversity Targets and Sustainable Development Goals are expected to be achieved under the six scenario types for Europe and Central Asia





Conclusions

- Biodiversity and ecosystem services extremely valuable for human wellbeing
- Biodiversity and most ecosystem services in decline, despite some positive examples
- Many opportunities for decision makers (mainstreaming, integration, mixing of policy instruments, multi-actor opportunities)



Thank you!



Box: Scenario archetypes

- *Business-as-usual* assumes the continuation of past and current trends in indirect and direct drivers.
- *Economic optimism* assumes global developments steered by economic growth, resulting in a strong dominance of international markets with a small degree of regulation.
- *Regional competition* assumes an increasingly fragmented world with a growing gap between rich and poor; increasing problems with crime, violence and terrorism; and strong trade barriers.
- *Regional sustainability* assumes a shift towards local and regional decision-making that is strongly influenced by environmentally aware citizens. A proactive attitude to environmental management prevails, but poor international collaboration obstructs coordination to solve global environmental issues.
- *Global sustainable development* assumes a globalised world with an increasingly proactive attitude of policy-makers and the public towards environmental issues, and strong regulation.
- *Inequality* assumes increasing economic, political and social inequalities with power concentrated in a relatively small political and business elite who invest in green technology.



Box: Key knowledge gaps

Geographical variation in knowledge on nature and its contributions to people in Europe and Central Asia.

Gaps in our understanding of:

- nature's contributions to people
- the contribution of indigenous and local knowledge
- the status and trends of nature
- the drivers of biodiversity change

Lack of integrated scenario and modelling studies

Gaps in the quantification and timing of pathways towards desired futures

Inadequate understanding of how to mainstream policy objectives across different sectors and scales



Scoping document: General policy questions

- How do biodiversity and ecosystem functions and services contribute to the economy, livelihoods, food security, and good quality of life in the regions, and what are the interdependences among them?
- What are the status, trends and potential future dynamics of biodiversity, ecosystem functions and ecosystem services that affect their contribution to the economy, livelihoods and well-being in the regions?
- What are the pressures driving the change in the status and trends of biodiversity, ecosystem functions, ecosystem services and good quality of life in the regions?
- What are the actual and potential impacts of various policies and interventions on the contribution of biodiversity, ecosystem functions and ecosystem services to the sustainability of the economy, livelihoods, food security and good quality of life in the regions?
- What gaps in knowledge need to be addressed in order to better understand and assess drivers, impacts and responses of biodiversity, ecosystem functions and services at the regional level?



Scoping document: ECA specific policy questions

- ECA (a) How can ecosystems that provide ecosystem services, such as those underpinning ecosystem-based adaptation to climate change and nature-based solutions to sustainable development, be protected through investments, regulations and management regimes for terrestrial, freshwater, coastal and marine systems?
- ECA (b) What are the effects of production, consumption and economic development on biodiversity and ecosystem services and their contribution to human well-being? Major links with other regions will be assessed;
- ECA (c) How can sectoral policies and new policy instruments encourage opportunities arising from the contribution of biodiversity and ecosystem services to human well-being?