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Ongoing developments with relevance for the work of the Joint Task Force

Conference of European Statisticians

Draft assessment of coastal waters, marine ecosystems and seas, and biodiversity and ecosystems in the pan-European region*

Note by the secretariat

Summary

At its twenty-fifth session (Geneva, 13–15 November 2019), the Committee on Environmental Policy requested the secretariat and the United Nations Environment Programme, working in close cooperation with the European Environment Agency, to prepare a limited indicator-based and thematic pan-European environmental assessment.

This document sets out the draft content of two sections of the assessment, covering (a) coastal waters, marine ecosystems and seas, and (b) biodiversity and ecosystems.

The Joint Task Force is invited to review and comment upon these sections.

> * An agreement was reached to publish the present document after the standard publication date so as to include the most recent information. This document has not been formally edited due to resource constraints.

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I. Introduction

1.   At its twenty-fifth session (Geneva, 13–15 November 2019), the Committee on Environmental Policy requested the secretariat and the United Nations Environment Programme (UNEP), working in close cooperation with the European Environment Agency, to prepare a limited indicator-based and thematic pan-European environmental assessment.[1] The Committee also welcomed document ECE/CEP/AC.10/2019/6, which identified the environmental topics to be addressed by the assessment, together with the two themes of the Ninth Environment for Europe Ministerial Conference (Nicosia, 5–7 October 2022).

2.   This document sets out the draft content of two sections of the assessment, covering coastal waters, marine ecosystems and seas, and biodiversity and ecosystems.

II. Draft assessment of coastal waters, marine ecosystems and seas, and chemicals and waste in the pan-European region

A. Coastal waters, marine ecosystems and seas

1. Key messages and recommendations

Key messages

3.   Marine pollution, both from land-based (for example, nutrients, plastic, chemicals) and sea-based (for example, plastic, oil) sources, continues to be an urgent problem in most sea regions. Beach and marine litter, dominated by plastic, is recognized as a major global threat to coastal and marine ecosystems in most areas, including remote and less populated areas, for example, the Barents Sea.

4.   Amongst the climate-induced changes in coastal and marine ecosystems are increasing sea surface temperatures by about 0.2 °C per decade in the North Atlantic and 0.5 °C per decade in the Black Sea (since 1981) and observed reductions in surface water pH (i.e., acidification), at a rate of approximately 0.02 pH units per decade, in the sea regions surrounding the European Union (and across the global ocean), except for variations near coasts, with as yet unknown impact.

5.   Marine Key Biodiversity Areas (KBAs) coverage by protected areas in most littoral ECE countries increased during the period 2000–2019. However, the coverage of marine protected areas (MPAs) in 20 out of 37 littoral countries in the region of the United Nations Economic Commission for Europe (ECE) lags the Convention on Biodiversity Diversity Aichi target 11 (conserving at least 10 per cent of coastal and marine areas) and is 6.7 per cent for the overall pan-European area.

6.   Geographically, there are significant variations in the proportion of sustainable fish stocks. The Mediterranean Sea and Black Sea remain highly overfished, whereas signs of recovery of fish stocks can be observed in the North-East Atlantic Ocean and the Baltic Sea as a result of improved management decisions.

7.   A holistic and ecosystem-based approach to the management of coastal waters and marine ecosystems that addresses the combined effects of multiple pressures is progressively integrating social, economic and governance aspects. Such an approach applies equally to the use of nature-based solutions in sustainable infrastructure for enhancing coastal resilience and its climate-proof functionalities, and to the transition to "blue" sustainable tourism as part of the post-COVID-19 recovery.

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[1] ECE/CEP/2019/15, para. 37 (k) (ii).

Recommendations

8.   Governments at all levels (local, national and regional) should take urgent action to reduce key pressures to halt the degradation of coastal waters, marine ecosystems and seas. Climate change, biodiversity loss and pollution threats are intricately connected and constitute the triple planetary crisis.

9.   Further efforts are needed, in particular in Eastern and South-Eastern Europe, to achieve the target of conservation of 10 per cent of coastal and marine areas in the pan-European area. The target has already been achieved in most of the European Union.

10.   The theme "Coastal waters, marine ecosystems and seas", associated indicators and dataflows should be included as a theme within the United Nations Economic Commission for Europe (ECE) set of environmental indicators. Promising new developments related to data (for example, earth observation, artificial intelligence, citizen monitoring, models and novel in-situ measurements) should be considered to improve the spatial and temporal coverage, including the need for long-term time-series data to understand climate-change impacts.

11.   Policymakers should increase efforts to complement inventories of the number of items of beach and marine litter with information on composition and sources of litter to be able to design more effective measures. In particular, joint efforts should be taken where subregional measures are deemed necessary, as in the Caspian Sea where there is no reliable information on the presence or amount of litter discharged into the coastal or marine environment

2.   Context

12.   Oceans play a critical role as a climate regulator and buffer to climate change effects, which comes at the expense of their productivity and the health of marine ecosystems. The ubiquitous degradation of coastal waters, marine ecosystems and oceans is a clear manifest of the triple planetary crisis and the intricately connected threats of climate change, biodiversity loss and pollution.[2] At the global level, two-thirds of the oceans are significantly impacted by human activities that generate multiple pressures ranging from excessive inputs of nutrients and hazardous substances, including plastics, microplastics and nano-plastics; unsustainable fishing, including illegal, unreported and unregulated (IUU) fishing; and habitat destruction due to coastal development – including for tourism – and extraction of natural resources. Other detrimental environmental changes associated with climate change include ocean warming, acidification and deoxygenation impacting the diversity and abundance of marine species.

13.   "Blue economy", which is steadily growing and poses sustainability challenges, involves income generating activities in the ocean such as harvesting of food, shipping, seabed mining, offshore hydrocarbon exploration and exploitation, tourism and recreation. Interest in seabed mining is on the rise, in part fuelled by the increased demand for minerals and rare earths, such as cobalt needed in batteries for electric vehicles as a climate change mitigation measure.

14.   The systematic nature of these challenges calls for the use of integrated and ecosystem-based management approaches, supported by spatially-based assessments and the analysis of multiple pressures and cumulative impacts.[3]

15.   Despite having specific ecological, socioeconomic characteristics and governance structures, a number of similarities related to the key trends and challenges exist among the pan-European sea regions. The assessment follows a combined approach, by integrating existing knowledge available at the sea region level and national data reported under the

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[2] UNEP, *Making Peace with Nature: A Scientific Blueprint to Tackle the Climate, Biodiversity and Pollution Emergencies* (Nairobi, UNEP, 2021), available at www.unep.org/resources/making-peace-nature.

[3] European Environment Agency European Topic Centre on Inland, Coastal and Marine Waters (2019), briefing on "Multiple Pressures and Their Combined Effects in Europe's Seas", available at www.eea.europa.eu/themes/water/europes-seas-and-coasts/multiple-pressures-and-their-combined.

Sustainable Development Goal 14 "Conserve and sustainably use the oceans, seas and marine resources for sustainable development".

16.   The pan-European area includes 37 littoral ECE countries[4] and the following sea regions: Baltic Sea, Black Sea, Caspian Sea, Mediterranean Sea and North-east Atlantic Ocean.[5] For the latter four, extensive knowledge and information are available in publications and indicators maintained by the European Environment Agency and the Regional Seas Conventions.[6] Other sea (sub)regions included in the assessment area, such as the Aral Sea, Barents Sea, East Siberian Sea, North Sea and Norwegian Sea are not systematically discussed.

17.   Information on the Caspian Sea is mainly available in the Caspian Sea State of the Environment (2019) report by the Tehran Convention.[7] Twenty-two of the thirty-seven littoral ECE countries are member States of the European Union. The new European Union Biodiversity Strategy 2030 is instrumental for measuring ecosystem health and halting biodiversity loss across ecosystems including marine ecosystems. In parallel, the Marine Strategy Framework Directive (Directive 2008/56/EC; Commission Decision 2017/848) aims at achieving or maintaining Good Environmental Status in the four European Union regional seas by protecting and restoring the marine environment and phasing out pollution. The Maritime Spatial Planning Directive (Directive 2014/89/EU) makes a key contribution to the Marine Strategy Framework Directive on aspects related to use and management of ocean space.

Links to conference themes

18.   A direct link between the theme of coastal waters, marine ecosystems and seas and the two conference themes exists. For example, the use of nature-based solutions in sustainable infrastructure enhances coastal resilience and its climate-proof functionalities. At the same time, this approach addresses multiple issues, such as rising sea levels, flood protection, coastal erosion that causes loss of land, assets and livelihoods, while harmonizing coastal development with habitat and ecological protection.

19.   With more than half of the European Union's tourist accommodation establishments located in coastal areas, maritime and coastal tourism is a pillar of the blue economy, in particular in the Mediterranean region, which hosts about one third of world tourism.[8] The prospects of maritime and coastal tourism have been severely impacted by the coronavirus (COVID-19) pandemic, together with many other closely connected sectors. The post-COVID recovery is expected to boost ambitions and trends towards more sustainable tourism.

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[4] The 37 littoral ECE countries are (in alphabetical order, with the 22 European Union Member States marked in **bold**): Albania, Azerbaijan, **Belgium**, Bosnia & Herzegovina, **Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, France**, Georgia, **Germany, Greece**, Iceland, **Ireland**, Israel, **Italy**, Kazakhstan, **Latvia, Lithuania, Malta**, Monaco, Montenegro, **the Netherlands,** Norway, **Poland, Portugal, Romania**, the Russian Federation, **Slovenia, Spain, Sweden**, Turkey, Turkmenistan, Ukraine and the United Kingdom of Great Britain and Northern Ireland.

[5] The sea (sub)regions covered by the North-east Atlantic Ocean are the Barents Sea, Bay of Biscay, Celtic Sea, Greenland Sea, Iceland Sea, North Sea and Norwegian Sea

[6] Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM Convention); Bucharest Convention for the Black Sea; Barcelona Convention for the Mediterranean Sea; and Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention).

[7] Interim Secretariat of the Framework Convention for the Protection of the Marine Environment of the Caspian Sea (Tehran Convention), *Caspian Sea: State of the Environment* (Geneva and Arendal, Tehran Convention Secretariat and GRID-Arendal, 2019), available at www.grida.no/publications/476.

[8] UNEP Mediterranean Action Plan and Plan Bleu, *State of Environment and Development in Mediterranean* (Nairobi, UNEP, 2020), available at https://planbleu.org/en/soed-2020-state-of-environment-and-development-in-mediterranean/.

3.   State, main trends and recent developments

20.   Marine pollution originating from land-based sources includes discharges from municipal waste, mainly in the form of plastic litter, wastewater and industrial activities. Huge investments on large-scale projects, constructing new or modernizing wastewater treatment plants has led to a general decrease in the discharge of untreated wastewater into the sea, in particular in certain areas of the Black Sea,[9] Caspian Sea[10] and the Mediterranean Sea.[11] The semi-enclosed Baltic and Black Seas are historically known for their high sensitivity to eutrophication, the enrichment of water by nutrients nitrogen and phosphorus, as a result of limited exchange of water with outside seas.

21.   Marine litter pollution includes beach, floating and seafloor litter, litter in biota and micro-litter – pieces of plastic less than 5 mm in diameter known as microplastics. Microplastics are of growing concern because they accumulate in the food web, posing a risk to marine biota and human health. Marine litter has been observed throughout the pan-European area, including the less populated Barents Sea area.[12] Most of the litter comes from land-based sources, except in the North-East Atlantic where sea-based litter is equally important.[13] No reliable information on the volumes of litter discharged into the coastal or marine environment of the Caspian Sea is available, although this is considered a pressing issue.[14]

22.   Fishing is one of the main pressures affecting the sustainability, health, productivity and resilience of marine ecosystems. Overexploitation of commercial fish and shellfish stocks continues across the sea regions in the pan-European area. The state of fisheries has improved significantly in the North-East Atlantic Ocean and the Baltic Sea, with clear signs of recovery of commercial fish and shellfish stocks since the early 2000s. On the other hand, the situation remains critical in the Mediterranean Sea and the Black Sea with no signs of improvement. This is due to elevated fishing pressures, significant knowledge gaps on the status of fish and shellfish stocks and the difficulties in the Mediterranean Sea in adopting management measures for a single stock.[15] The Caspian Sea has also seen declining fish stocks,[16] as a result of overfishing and unregulated fishing. IUU fishing is one of the factors that negatively impacts the local economies and coastal livelihoods, as well as being a threat to marine ecosystems.

23.   A drastic decline in marine biodiversity is observed, at a faster rate than for land species. The Red List assessments for the European Union sea regions show that of the 1,196 marine species assessed, 9 per cent are threatened, while 3 per cent are near-threatened. Birds, mammals and turtles are particularly at risk, with over 20 per cent of species being threatened.[17] Eighteen species of sturgeon from all over Europe and Asia assessed in the Red List were all found to be threatened. The Beluga sturgeon in the Caspian Sea is listed as

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[9]   J. Slobodnik and others (2021), "Summary of EMBLAS Project Finding, Gaps and Recommendations." EU/UNDP Project: Improving Environmental Monitoring in the Black Sea–Selected Measures (EMBLAS-Plus) – Agreement ENI/2017/389-859.

[10] Tehran Convention, *Caspian Sea: State of the Environment*.

[11] European Environment Agency and UNEP Mediterranean Action Plan, *Technical Assessment of Progress towards a Cleaner Mediterranean — Monitoring and Reporting Results for Horizon 2020 Regional Initiative* (Luxembourg, Publications Office of the European Union, 2021), available at www.eea.europa.eu/publications/technical-assessment-of-progress-towards.

[12] For example, Bjørn E. Grøsvik and others, "Assessment of Marine Litter in the Barents Sea, a Part of the Joint Norwegian–Russian Ecosystem Survey." *Frontiers in Marine Science* 5 (2018). https://doi.org/10.3389/fmars.2018.00072.

[13] European Environment Agency, *State of Europe's Seas* (Luxembourg, Publications Office of the European Union, 2017), available at www.eea.europa.eu/publications/state-of-europes-seas.

[14] Tehran Convention, *Caspian Sea: State of the Environment*.

[15] WISE-Marine – Marine Information System for Europe, available at https://water.europa.eu/marine, and European Environment Agency, *Marine Messages II – Navigating the Course towards Clean, Healthy and Productive Seas through Implementation of an Ecosystem-based Approach* (Luxembourg, Publications Office of the European Union, 2019, available at www.eea.europa.eu/publications/marine-messages-2/.

[16] Tehran Convention, *Caspian Sea: State of the Environment*.

[17] European Environment Agency, *Marine Messages II*.

critically endangered along with all of the other commercially important Caspian Sea species, which are the main producers of wild caviar[18].

24. The resilience of marine ecosystems is further reduced due to changes in ocean temperature and oxygen content, and ocean acidification as a result of anthropogenic climate change. Such changes in environmental conditions indicate that significant systemic changes are taking place in the European Union sea regions.[19] Increases in sea surface temperature lead to changes in species' distribution ranges (see European Environment Agency indicator on Changes in fish distribution in European seas[20]), abundance and seasonality, affecting marine food webs.

25. Political awareness of the role of oceans in achieving climate targets is on the rise, with more governments committing to more ambitious ocean agendas. The European Union Biodiversity Strategy for 2030 highlights the need for expanding protection of the European Union's sea regions to 30 per cent, creating ecological corridors to help reverse biodiversity loss, contribute to climate change mitigation and resilience.[21] A proposal for legally binding instruments on restoration is also included as part of the European Union Restoration Plan. At the global level, 51 countries have pledged to protect at least 30 per cent of marine areas by 2030, known as the Global Ocean Alliance 30by30,[22] of which 17 are ECE countries.[23] Following an extensive participatory process (3rd International Ocean Governance Forum, April 2021), the European Union is revising its International Ocean Governance Agenda – an integral part of the European Green Deal and the European Union's response to Sustainable Development Goal 14 (life below water). Other initiatives at the regional or global level address awareness of marine litter pollution, sustainable blue economy and conservation efforts. The understanding of the seas continues to improve through the deployment of innovative sensors and autonomous observation platforms, enabling the expansion of observation programmes through better coordination and integration.

4. Indicators

26. Sustainable Development Goal 14 provides an appropriate indicator framework for the purpose of the pan-European assessment of coastal waters, marine ecosystems and ocean.[24]

Marine Pollution: Beach litter density

27. This indicator provides the number of litter items on a 100 m beach stretch of European Union sea regions (table 1 and figure I overleaf). No data is available for the Caspian Sea.

28. The data is derived from the citizen-science-based European Environment Agency Marine Litter Watch database (2014–2019). The values are consistent with beach litter densities provided in regional assessments, in particular for the Baltic and Black Seas. Plastic is the most abundant type, comprising around 70-83 per cent of marine litter, exceeding 90 per cent in some areas.

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[18] International Union for the Conservation of Nature, "Sturgeon more critically endangered than any other group of species", news article, 18 March 2010, available at www.iucn.org/content/sturgeon-more-critically-endangered-any-other-group-species.

[19] WISE-Marine – Marine Information System for Europe, available at https://water.europa.eu/marine.

[20] See www.eea.europa.eu/data-and-maps/indicators/fish-distribution-shifts/assessment-1.

[21] European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, On a New Approach for a Sustainable Blue Economy in the EU Transforming the EU's Blue Economy for a Sustainable Future, COM(2021) 240 final.

[22] See www.gov.uk/government/topical-events/global-ocean-alliance-30by30-initiative/about.

[23] As at 21 July 2021, these are: Armenia, Belgium, Croatia, Cyprus, Denmark, Finland, France, Germany, Italy, Luxembourg, Monaco, Montenegro, Norway, Portugal, Spain, Sweden and the United Kingdom of Great Britain and Northern Ireland.

[24] The context for the selection of the following indicators is provided above and supplemented with more information in an appendix to be made available online.

29.   Most assessments are not able to draw conclusions on time trends in marine litter. This is due to the survey limitations and methodological challenges with interpreting marine litter data. The abundance of beach litter is highly influenced by water currents, prevailing winds and the exposure of the beach.[25]

Table 1
Overview of the number of beach litter items and plastic composition

Sea region	*Number of items on beach per 100 m of shoreline, median for the period 2014 –2019* [a]	*Plastic composition*
Baltic Sea	78	70 per cent of beach litter
Black Sea	652	83 per cent of beach litter
Mediterranean Sea	428	95–100 per cent of the total floating marine litter; 50 per cent of the seabed marine litter
North-East Atlantic	105	Over 90 per cent of beach litter in some areas

Source: Kideys and Aydın, 2020.[26]
Note: [a] Only European Environment Agency monitoring data from sea beaches under Marine Litter Watch.

Figure I
Evolution in median beach litter numbers for the four sea regions surrounding the European Union combined, number per 100 m of beach (2014–2019)
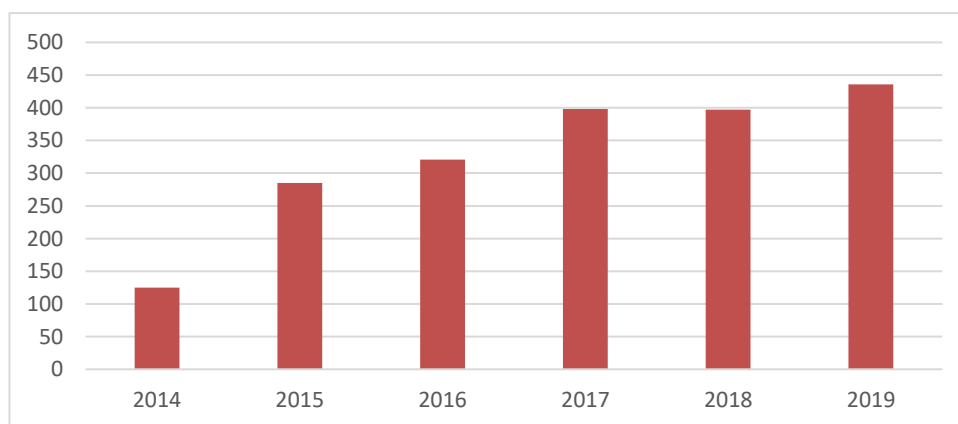
Source: Kideys and Aydın, 2020.
Note: Monitoring data only. No data for the Caspian Sea.

Fisheries: Proportion of fish stocks within biologically sustainable levels

30.   This indicator is based on data held by the Food and Agriculture Organization of the United Nations (FAO) for Sustainable Development Goal indicator 14.4.1 (Proportion of fish stocks within biologically sustainable levels), which measures the sustainability of the marine

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[25] European Commission, *Guidance on Monitoring of Marine Litter in European Seas. A guidance document within the Common Implementation Strategy for the Marine Strategy Framework Directive* (Brussels, 2013), MSFD Technical Subgroup on Marine Litter.

[26] Kideys, A.E. and M. Aydın, *Marine Litter Watch (MLW) European Beach Litter Assessment 2013– 2019* (European Topic Centre on Inland, Coastal and Marine waters, 2020), available at www.eionet.europa.eu/etcs/etc-icm/products/marine-litter-watch-mlw-european-beach-litter-assessment-2013-2019.

capture fisheries by their abundance.[27] Table Table 2 below shows the proportion of marine fish stocks within biologically sustainable levels, supplemented with data for the four European Union sea regions on the proportion of assessed stocks meeting the Marine Strategy Framework Directive's Good Environmental Status primary criteria.

Table 2
Proportion of marine fish stocks within biologically sustainable levels

			Proportion of assessed stocks meeting specified criteria (per cent)			
FAO Major Fishing Area [a]	*Proportion of stocks within biologically sustainable levels, 2017 (per cent)*	*Sea region [b]*	*both GES criteria*	*either of the two GES criteria*	*at least one of the two GES criteria*	*neither of the two GES criteria*
Mediterranean and Black Seas	37.50	Mediterranean Sea	0	6.1	6.1	93.9
		Black Sea	0	14.3	14.3	85.7
North-East Atlantic, including Baltic Sea	79.31	Baltic Sea	12.5	50.0	62.5	37.5
		North-East Atlantic	44.1	38.2	82.3	17.7

Sources: [a] FAO, *The State of World Fisheries and Aquaculture 2018 – Meeting the Sustainable Development Goals* (Rome, FAO, 2018), available at www.fao.org/3/I9540EN/i9540en.pdf.; and [b] European Environment Agency, *Marine Messages II*.

Notes: GES = Good Environmental Status. GES primary criteria: achieving (a) a fishing mortality and (b) a reproductive capacity compatible with having population biomass levels above those capable of producing the maximum sustainable yield.

31.   Both sources confirm that there are significant differences between regions. The Mediterranean Sea and Black Sea remain highly overfished, whereas signs of recovery of fish stocks can be observed in the North-East Atlantic and the Baltic Sea as a result of improved management decisions.

Climate change impacts: Average marine acidity (pH) measured at agreed suite of sampling stations

32.   This indicator combines data reported by ECE littoral countries under Sustainable Development Goal target 14.3.1 (Average marine acidity (pH) measured at agreed suite of representative sampling), superimposed on the global annual average of surface ocean pH for the period 1985–2018. The purpose of this indicator is to monitor the carbon system by measuring four parameters: pH, total dissolved inorganic carbon, carbon dioxide partial pressure and total alkalinity. Each country's government decides which sites to select, as long as the same sites are measured regularly to capture the changes in the parameters' values. When at least half of coastal nations report values, regional values can be aggregated.

33.   Observations of ocean acidification over the past 35 years have shown an increase in acidity by 0.052 pH units (figure II overleaf). At the national scale, the trend is more complex with significant variations near the coast. Long-term observational records, especially in the coastal zones, are required to identify the ocean acidification signals.

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[27] A fish stock whose abundance is at or greater than the level that can produce the maximum sustainable yield is classified as biologically sustainable. In contrast, when abundance falls below the maximum sustainable yield level, the stock is considered biologically unsustainable.

Figure II

Global annual average of surface ocean pH taken from the Copernicus Marine Service and based on a reconstruction method using in situ data and remote sensing data, as well as empirical relationships, pH units (1985–2019)
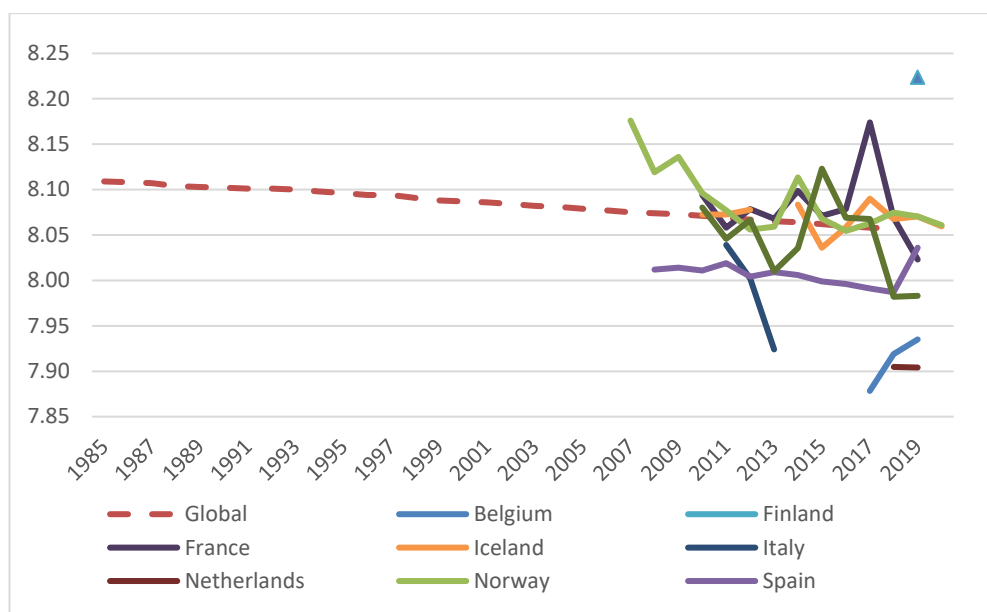
Sources: European Environment Agency, "Yearly mean surface seawater pH reported on a global scale" (2020), available at www.eea.europa.eu/data-and-maps/daviz/yearly-mean-surface-sea-water-1#tab-chart_3); and Sustainable Development Goal target 14.3 national data (United Nations Global Sustainable Development Goal Indicators Database, available at https://unstats.un.org/sdgs/indicators/database/, retrieved on 29 April 2021), with the exception of data from Belgium: Research Institute Nature and Forest, Flanders Region (2020), available at https://www.vlaanderen.be/inbo/backgroundindicatoren/noordzee-oceaanverzuring).

Climate change impacts: Average sea surface temperature anomaly

34. This indicator shows the annual average sea surface temperature (in °C), referenced to the average temperature between 1993 and 2012 in the global ocean and four pan-European seas.

35. All sea regions have warmed considerably since 1870 (see figure III overleaf). The warming has been evident since the late 1970s and particularly rapid since 1998. Since 1981, marking the satellite era for which more comprehensive data is available, the trend in sea surface temperature rise has been between around 0.2 °C per decade in the North Atlantic and 0.5 °C per decade in the Black Sea. According to the Intergovernmental Panel on Climate Change,[28] the average sea surface temperature has increased by 0.6 °C since 1850. Depending on the emissions scenario, sea surface temperature is projected to continue to increase, albeit more slowly than air temperature over land.

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[28] Intergovernmental Panel on Climate Change, *Special Report on the Ocean and Cryosphere in a Changing Climate* (2019), available at www.ipcc.ch/srocc/.

Figure III
Time series of annual average sea surface temperature (°C), referenced to the average temperature between 1993 and 2012
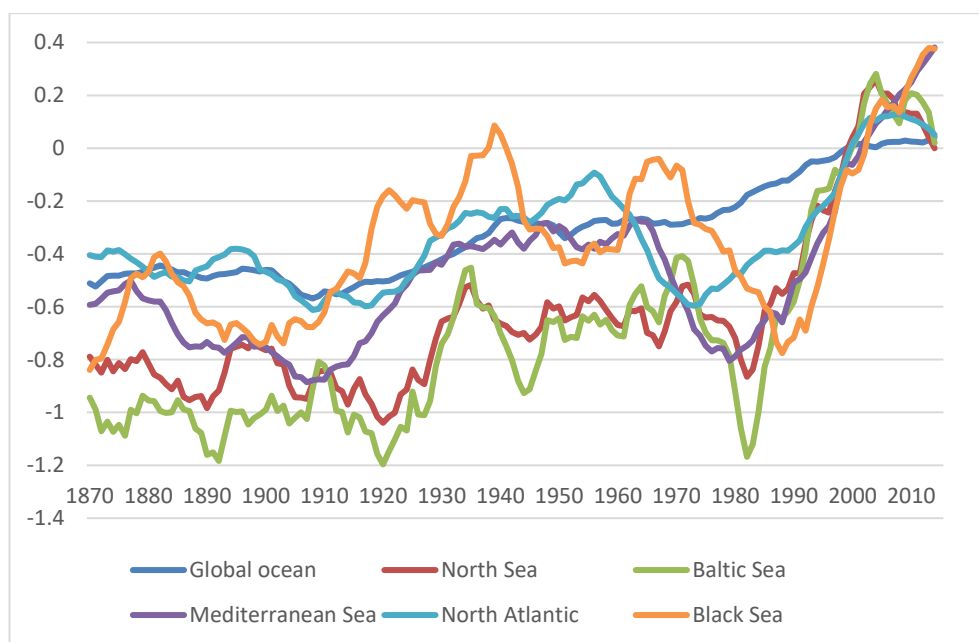
Source: WISE-Marine[29]

Responses: Coverage of protected areas in relation to marine areas

36.   This indicator shows the coverage of marine protected areas (MPAs) in relation to the area of the Exclusive Economic Zone (see table 3).

Table 3
Percentage MPA coverage per subregion in 2018

Subregion	Littoral ECE countries	MPA coverage, per cent
European Union	Belgium, Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden	10.8
Western Europe	Iceland, Israel, Monaco, Norway, United Kingdom of Great Britain and Northern Ireland	8.5
Central Asia	Kazakhstan, Turkmenistan	29.7
Eastern Europe	Azerbaijan, Georgia, Russian Federation, Ukraine	3.1
South-Eastern Europe	Albania, Bosnia and Herzegovina, Montenegro, Turkey	0.2
Total for pan-European Region		**6.7**

Source: United Nations Global Sustainable Development Goal Indicators Database, available at https://unstats.un.org/sdgs/indicators/database/, retrieved on 29 April 2021.
Note: No data for Bosnia and Herzegovina.

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[29] WISE-Marine – Marine Information System for Europe, available at https://water.europa.eu/marine.

37.   A total of 10.8 per cent of the surface of European Union seas was designated as MPA by the end of 2016, implying that the bloc has reached the global Aichi Biodiversity Target 11.[30] However, that MPA coverage is more than six times higher in coastal waters than in offshore waters, meaning that not all biodiversity features are adequately represented in the MPA network.[31] The greatest growth in protected areas and other effective area-based conservation measures over the last 10-year period has been in marine and coastal areas as compared to terrestrial areas. [32] However, , the current MPA coverage stands at 7.74 per cent at the global level, and only 6.7 per cent in 2018 in the pan-European level, falling short of the 10 per cent coverage target.

5.   Case studies

"The Black Sea is recovering but chemical and marine litter pollution are still a major issue" [33]

38.   For decades, the Black Sea has been the European Union's most polluted sea region. In the 1990s, the Black Sea experienced unprecedented degradation when widespread nutrient loading caused a large dead zone. The main sources of nutrients were runoff from the agricultural sector (fertilizers and livestock waste), domestic and industrial wastes. Three rivers – Dniester, Dnipro and Danube – are the main source of nutrient, chemical and litter pollution into the Black Sea. The contaminants monitoring programme conducted under the EMBLAS series of projects revealed extremely high concentrations of chemicals in offshore waters, biota, fish and mussels. Water samples showed traces of caffeine, medicine and illicit drugs, with pharmaceuticals, especially antibiotics, posing the biggest threat. The number of floating items per km^2 (90.5 items/km^2) is the highest among European Union seas and almost twice that in the Mediterranean Sea. Sediment samples taken from the seafloor were found to contain microplastics.

39.   Over the past 20 years, the Danube has been the subject of a massive clean-up operation financed by the European Union. The construction of wastewater treatment plants along the river has prevented the discharge of raw wastewater in the river, leading to an improvement in water quality over the last 15 years. Other improvements included reductions in industrial and agricultural discharges. The ecosystem in the North-western shelf of the Black Sea is recovering, as witnessed by the return of once-abundant red seaweed *Phyllaphora.* This is a clear example of a "source-to-sea" approach to coastal and marine management.

"A green and blue recovery for coastal and maritime tourism in the Mediterranean"[34]

40.   In 2019, the Mediterranean basin welcomed more than 400 million international tourists, and the tourism sector accounted for up to 15 per cent of regional GDP. Tourists are attracted by landscapes and rich biodiversity, cultural heritage and traditional lifestyles,

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[30] 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 areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

[31] See https://www.eea.europa.eu/themes/water/europes-seas-and-coasts/assessments/marine-protected-areas.

[32] *Protected Planet Report* (UNEP and International Union for the Conservation of Nature), available at https://livereport.protectedplanet.net/.

[33] Sources: EMBLAS-Plus project (http://emblasproject.org/) and BBC News, "The Black Sea: Can Europe's most polluted sea be saved?", 2 December 2019, available at www.bbc.com/reel/video/p07w83tq/can-europe-s-most-polluted-sea-be-saved-.

[34] Sources: Fosse, J., I. Kosmas, and A. Gonzalez, *The Future of Mediterranean Tourism in a (Post) Covid World* (Eco-union, 2021), available at https://www.ecounion.eu/wp-content/uploads/2021/04/Nota_Thefuture_mediterranean_tourism_03.pdf; European Environment Agency and UNEP Mediterranean Action Plan, *Technical Assessment of Progress towards a Cleaner Mediterranean*; UNEP Mediterranean Action Plan, *Mediterranean Strategy for Sustainable Development 2016-2025* (2016), Valbonne. Plan Bleu, Regional Activity Centre; and Plan Bleu, *MED Sustainable Tourism*, available at https://planbleu.org/en/projects/med-sustainable-tourism-community/.

coupled with favourable environmental conditions, such as a mild climate, beaches and clear seawater.

41. While being one of the global biodiversity hotspots,[35] the region is also subject to critical levels of habitat loss from unsustainable exploitation of resources, pollution, climate change and invasive marine species. The negative environmental impacts of tourism on the coastal and maritime areas originate mainly from the construction and operations of built infrastructures (resorts, residencies, ports and marinas, facilities, etc.) and from maritime or coastal recreational activities (nautical tourism, golf courses, water sports, etc.). The high spatial and temporal variations of tourism, which is predominantly concentrated along the coastal strip and peaks during the summer season, boosts the amount of potentially mismanaged waste, as well as in discharges of inadequately treated urban wastewater. More than 75 per cent of the annual waste production is generated during the summer.

42. A key challenge is to promote "blue" sustainable tourism practices in coastal and marine areas, promoting positive externalities for the environment, workers and local communities. The Mediterranean tourism sector has been hard hit in 2020 by travel restrictions due to the COVID-19 pandemic. It is now at a crossroads: back to previous overgrowing trends and mass tourism or leapfrog towards more sustainable tourism patterns? The massive investments provided by the ambitious, green and inclusive recovery plans offer a unique opportunity to recover better, by transforming the tourism sector and contributing to a more prosperous region. These measures should be multi-fold, involving various actors and benefitting the environmental, social and economic dimensions.

B. Biodiversity and ecosystems

1. Key messages and recommendations

Key messages

43. Overall forest area in the ECE region has increased by 33.5 million ha[36] over the past 30 years. The relative share of the particularly biodiversity-rich primary forests has declined significantly over the same period.[37] Forest fragmentation remains an important pressure.

44. Beyond forests, the status of ecosystems remains a cause for concern, with no evidence of a clear positive trend. Only a minority of the habitats assessed at the European Union level have a good conservation status, and the overall picture is likely to be similar beyond the European Union.

45. The protected area (PA) estate in the pan-European region has almost tripled over the past 30 years, and key policy targets related to PAs have been met in the region.

46. Land continues to be taken for infrastructure development in the pan-European region, but land take has decreased in most European Environment Agency member countries.

Recommendations

47. Governments should ensure that trends in forest area remain positive. They should take additional measures to safeguard the remaining primary forests and their ecological functionality, for example, by promoting management standards aimed at preserving high-conservation value forest and by enhancing forest connectivity.

48. Governments should make efforts to consolidate and improve the extended PA network within the ECE region through investment in management effectiveness, ecological

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[35] A biodiversity hotspot is an area characterized as of exceptional biodiversity value and a large number of endemic species

[36] ECE, "Forest area in UNECE region continues to increase, says FAO report, but greater efforts needed to protect these fragile ecosystems", press release, 23 July 2020, available at https://unece.org/forestry/press/forest-area-unece-region-continues-increase-says-fao-report-greater-efforts-needed.

[37] This trend mostly occurs in Russian Federation, which is also one of the top three countries in the world in terms of area of primary forest.

representativeness and connectivity. The whole range of governance types should be used, and other effective area-based conservation measures should be integrated;

49.   Governments should take measures to reduce land take further and consistently. Measures should also address the conversion of natural to agricultural ecosystems and the degradation of habitat quality due to biodiversity-unfriendly agricultural practices through, for example, more targeted use of subsidies and other incentives.

50.   Governments should mainstream biodiversity conservation across sectors and policies, to eliminate or reform harmful subsidies and incentives, and to develop effective positive incentives for biodiversity conservation and sustainable use.

2.   Context

Issues at stake

51.   Biodiversity, which encompasses diversity within species, between species and of ecosystems, plays an essential role in maintaining Earth's life-support systems, enabling nature-based solutions to societal challenges and maintaining quality of life. Ecosystem services are recognized as a basis for sustainable socioeconomic development.

52.   The pan-European region is characterized by its strong overlap with the Palearctic region and its extensive biomes of boreal coniferous and temperate deciduous forests, temperate grasslands and deserts, Mediterranean forest and Arctic tundra, as well as important marine ecosystems. It comprises the largest continuous forest, grassland and peatland ecosystems globally. These act as critical carbon sinks, provide ecosystem services and underpin the region's economies.

Policy objectives and challenges

53.   The global policy framework for biodiversity in a broad sustainable development context is defined by the relevant Sustainable Development Goals, particularly Goals 15 and 14.

54.   The countries of the pan-European region cooperate under various multilateral environmental agreements. The main multilateral environmental agreement on biodiversity is the 1992 Convention on Biological Diversity. Its last Strategic Plan for Biodiversity ran from 2011 to 2020 and was built around the Aichi Biodiversity Targets.[38] Other relevant multilateral environmental agreements are the 1979 Convention on the Conservation of Migratory Species of Wild Animals, the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora, the 1971 Convention on Wetlands of International Importance especially as Waterfowl Habitat and the 1979 Convention on the Conservation of European Wildlife and Natural Habitats.

55.   The main policy challenge related to biodiversity is to ensure its effective conservation and sustainable use. This implies addressing the drivers and root causes of pressures on species and terrestrial, marine and other aquatic ecosystems, including oceans, and increasingly requires restoration. Strategies include putting in place ambitious policy mixes (regulatory approaches, economic instruments and voluntary approaches), mainstreaming biodiversity across economic and sectoral policies, eliminating illegal exploitation and trade of biodiversity and eliminating illegal, unreported and unregulated fishing. Enforcement of existing legislation and regulation to end illegal activities is critical in this regard. Biodiversity conservation and restoration also requires reforming and removing environmentally harmful subsidies and strengthening the role of biodiversity-relevant taxes, fees and charges.

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[38]   To be revised in 2022, depending on the outcome of negotiations on a post-2020 global biodiversity framework.

3. State, main trends and recent developments

Strategic Plan of the Convention on Biological Diversity has only been partly fulfilled and biodiversity loss continues

56.   At the global level, only 6 of the 20 Aichi Biodiversity Targets – as the main concretization of Sustainable Development Goals 14 and 15 – have been partly achieved, and none has been fully achieved, according to *Global Biodiversity Outlook 5*.[39]

57.   For the pan-European region, ECE environmental indicator D-3 on forests and other wooded land shows that efforts to curb deforestation and forest degradation have met with success. This has been accompanied by a relative reduction in primary forest and a relative increase in planted forest.

58.   Large, undisturbed ecosystems – both forest and other types, including wetlands – continue to decline globally. Trends in ecosystems and habitats within the pan-European region may be similar: within the European Union, only 15 per cent of habitat assessments have a good conservation status, with 81 per cent having poor or bad conservation status.

59.   The conversion of land from natural to non-natural land cover types is one of the pressures contributing to ecosystem loss and degradation. The intensity of this land take has declined in most but not all countries of the pan-European region over the past 20 years, as is also shown by ECE indicator E-1 on land uptake.

60.   Species extinction risk is still increasing, although conservation efforts likely prevented an even steeper increase. Twenty-four per cent of species in well-understood taxonomic groups will continue to edge towards extinction unless the drivers of their decline are dramatically reduced. Climate change is emerging as an additional pressure on biodiversity, interacting with pre-existing pressures. Species richness continues to decline in agricultural landscapes and production forests; agricultural practices are among the main drivers of biodiversity loss at the global and pan-European levels. Although over the period 2005–2015 European production forests have become more diverse in tree species composition, recent research alerts that overall tree species richness is increasingly at risk in Europe, prominently through invasive species.[40]

61.   The same trends may be true for the pan-European region; the report *State of nature in the EU*[41] noted a deterioration of the average conservation status of bird populations. Species associated with agricultural areas display a particularly negative trend.

Area coverage of protected areas has increased, but their effectiveness in contributing to conservation goals needs to be further enhanced

62.   Protected areas remain a key instrument for reducing biodiversity loss. The area of terrestrial and marine PAs has grown significantly in the pan-European region. The latter is also supported by ECE indicator D-1 on terrestrial PAs. Meanwhile, there remains considerable room for improvement of the representativeness, connectivity and management effectiveness of PAs, and for enhanced enforcement of existing PA legislation.

There is a need for a broader policy response to biodiversity loss, reflecting its repercussions for human well-being and sustainable development

63.   Biodiversity mainstreaming into policies, poverty reduction and development planning has largely been an insular rather than a systematic effort in most countries over the past 10 years. One positive example has been the rise of environmental-economic accounting in some countries. Overall, little progress has been made over the past decade in eliminating,

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[39] Secretariat of the Convention on Biological Diversity, *Global Biodiversity Outlook 5* (Montreal, 2020).

[40] Forest Europe, *State of Europe's Forests 2020* (Zvolen, Slovakia, Forest Europe, 2020) available at https://foresteurope.org/wp-content/uploads/2016/08/SoEF_2020.pdf.

[41] European Environment Agency, *State of nature in the EU: Results from reporting under the nature directives 2013–2018*, Report No. 10/2020 (Luxembourg, Publications Office of the European Union, 2020), available at https://www.eea.europa.eu/publications/state-of-nature-in-the-eu-2020.

phasing out or reforming subsidies and other incentives potentially harmful to biodiversity, and in developing positive incentives for biodiversity conservation and sustainable use. This also broadly applies to the pan-European region.

64. Resource mobilization for biodiversity improved in some but, by far, not in all countries between 2010 and 2020. The mobilized resources are still not sufficient to meet financial needs and are still outweighed by financial support for activities harmful to biodiversity. This is also true in the forestry context, including regarding reforestation. In contrast, understanding of funding needs and gaps has improved, at least in some countries.

65. The status and trends of biodiversity and ecosystem services are of fundamental importance for human well-being and sustainable development. Encroachment of human settlements onto natural systems and wildlife trafficking disrupt the self-regulatory capacity of these ecosystems, increase the frequency of human-wildlife contacts and can lead to the spread of infectious diseases. For instance, it is possible that illegal exploitation of pangolins led to the transmission of coronavirus disease (COVID-19) to humans.

Links to conference themes

66. The conference theme "Greening the economy in the pan-European region: working towards sustainable infrastructure" responds to the need to mainstream the environment including biodiversity and ecosystems across sectors. This conference theme is directly related to indicator E-1 (land take) as increasing the environmental sustainability of infrastructure development relies partly on reducing its spatial footprint.

67. Tourism is both dependent on and affects the state of biodiversity in the areas where it occurs. By "Applying principles of circular economy to sustainable tourism", the ecological footprint of touristic activities in biodiversity-rich touristic areas – including pressures related to waste production, eutrophication and resource overexploitation – is reduced. In turn, this enables the provision of cultural ecosystem services and thereby enhances the human well-being benefits and broader development opportunities of these areas.

4. Indicators

Terrestrial protected areas (ECE indicator): overall moderate-to-good status

68. This indicator shows the overall area of nationally designated terrestrial PAs in absolute terms and as a share of the countries' total areas.[42] Figure IV overleaf gives this information for all ECE countries combined, for the period 1990–2019. Data availability for this indicator is very good for European Environment Agency member countries and cooperating countries, and fair-to-good for most other countries.

69. The area extent of PAs in the pan-European region has risen strongly over the past 30 years and increased by 60 per cent over the past 10 years. The share of PA in the pan-European area for which data are available stood at over 22 per cent in 2019, significantly above the Aichi Target 11 of 17 per cent. The degree or effectiveness of protection of biodiversity within PA, or about their overall contribution to reducing global biodiversity loss, depend of the PA management effectiveness.

Forests and other wooded land (ECE indicator): overall moderate-to-good status

70. This indicator shows the total area of forests and other wooded land, its ratio to the overall area of the countries, the share of forest areas that are natural and planted, and the contribution of forests designated for production, soil or water protection and the protection of ecosystem services and biodiversity. Figures V and VI overleaf show these statistics for all pan-European countries combined,[43] for 10-year intervals over the period 1990–2020.

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[42] The indicator could be calculated for marine protected areas (PAs). However, this would compromise comparability of data from across the ECE region in the case of this assessment.

[43] The Russian Federation alone accounts for 77 per cent of the ECE region's forest area.

Figure IV
Protected areas, total area under protection, 1,000 km², and share of country area, per cent (right axis) (1990–2019)
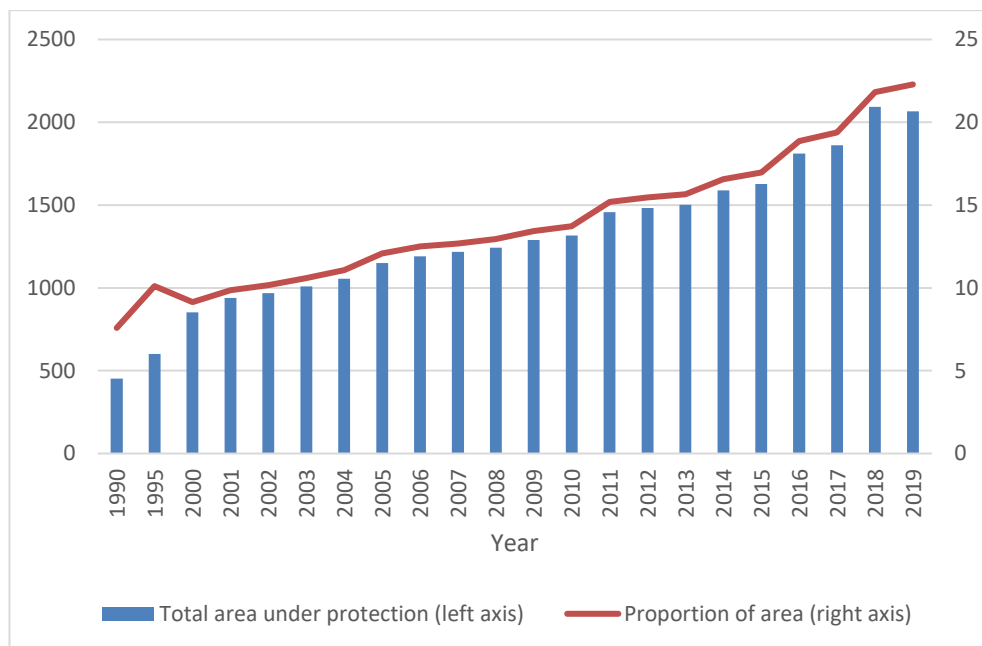

Figure V
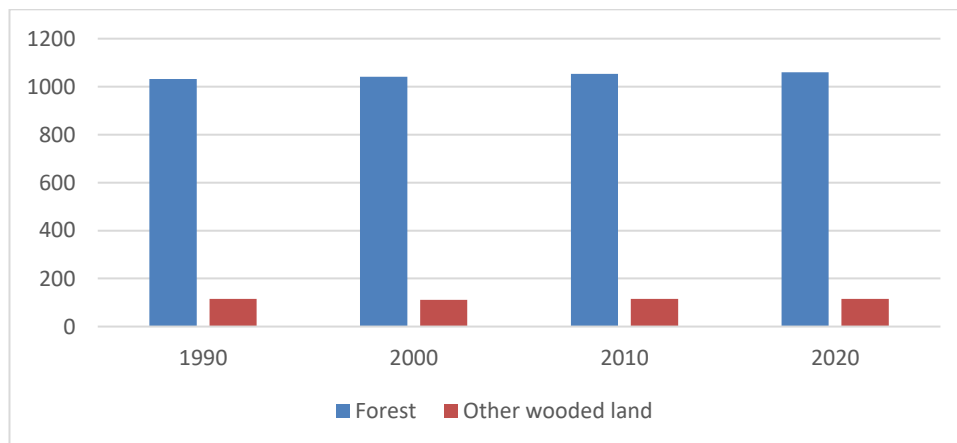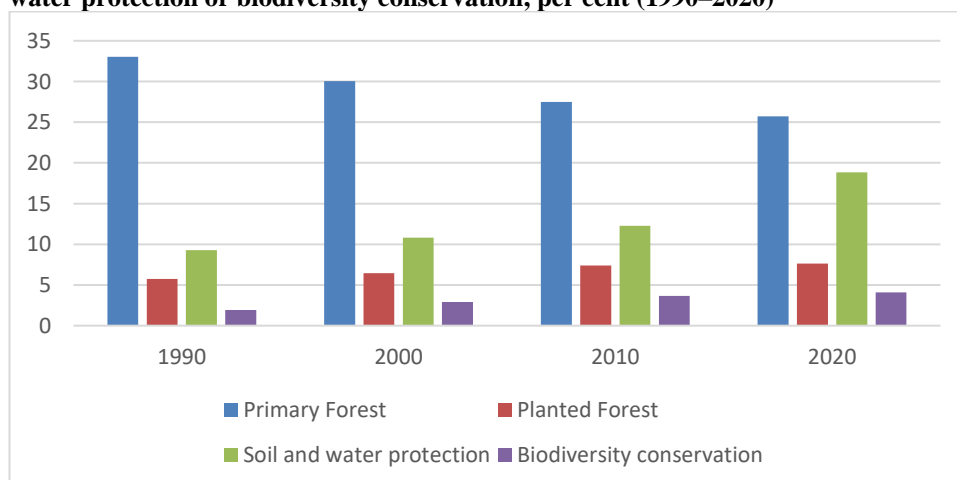**Total area of forest and other wooded land, million ha (1990–2020)**

Figure VI
Share of primary and planted forest and share of forest area designated for soil and water protection or biodiversity conservation, per cent (1990–2020)

71.   The data for this indicator were sourced from Global Forest Resources Assessments of the Food and Agriculture Organization of the United Nations. Data availability for ECE countries from this source is good-to-very-good.

72.   Forest area has increased by 2.6 per cent since 1990, and by 0.5 per cent since 2010. The share of forest area has increased by 1 per cent to 39.2 per cent over the past 30 years. Other wooded land has changed little and contributes another 4.3 per cent, as of 2020. This means that the pan-European region has met target 15.1 of the Sustainable Development Goals and Aichi Target 5 in quantitative terms.

73.   The share of primary forests, which tend to be particularly biodiversity-rich, decreased from roughly a third to roughly a quarter over the same period, with a slight flattening of the curve during the 2010–2020 interval. Planted forests became absolutely and relatively more important, increasing from 5.7 per cent in 1990 to 7.6 per cent in 2020. Expansion of planted forest does not always occur at the expense of primary forest; as seen in the previous paragraph the total forest area increased.

74.   Over the past 30 years, forest designation has seen a diversification from a narrow focus on production in 1990 to a broader spectrum including protection of soil, water and biodiversity. This diversification of forest designations can be interpreted as a management response aimed at improving the quality of existing forests, including from a biodiversity conservation perspective. Forest areas designated for water and soil protection more than doubled, from 9.3 to 18.8 per cent, and those for biodiversity conservation doubled from 1.9 to 4.1 per cent.

Land uptake (ECE indicator): overall moderate-to-poor status

75.   A modified version of ECE indicator E-1, based on European Environment Agency indicator "Land take in Europe" (i.e. net conversion of land from non-artificial to artificial land-use categories), has been used in this assessment. The indicator shows only part of the overall relationship between land-use changes and biodiversity. While agriculture is considered a non-artificial use, pressures on biodiversity from habitat loss or degradation are often associated with conversion to agricultural land or change of agricultural practices.

76.   The indicator results are most conclusive for European Environment Agency member countries and cooperating countries, while there are some gaps regarding data completeness and consistency of land take data from other ECE countries. Figure VII overleaf shows the indicator for three six-year intervals from 2000 to 2018 for the different subregions.

77.   Net land take continues in all subregions, though the rate is decreasing. Land take figures for the countries that joined the European Union since 2004 peaked in the 2006–2012 interval (0.11 per cent) and declined thereafter (0.09 per cent for the 2012–2018 interval), possibly reflecting the adoption of European Union policies and standards. Land uptake in in other ECE countries decreased substantially in the period 2012–2018. This trend shows considerable variability across European Environment Agency countries and there are countries where land take rates continued to increase over the entire 2000–2018 period.

78.   Land uptake and land take data from European Environment Agency member and cooperating countries are difficult to compare to those from other countries. This is due to differences in methodology, including the availability of reliable remote-sensing data and consistent criteria to analyse them, the continuity of national monitoring efforts, and apparently also shifts in land classification in the early 2000s. This highlights the need to continue investing in consistent land-cover classifications and monitoring capacity, agree on consistent national information to be fed into the Shared Environmental Information System, and carefully retrofit actual land-cover categories to past data, in order to obtain reliable trend information.

Figure VII
Land take in different subregions across three six-year time periods, per cent of total land area (2000–2018)
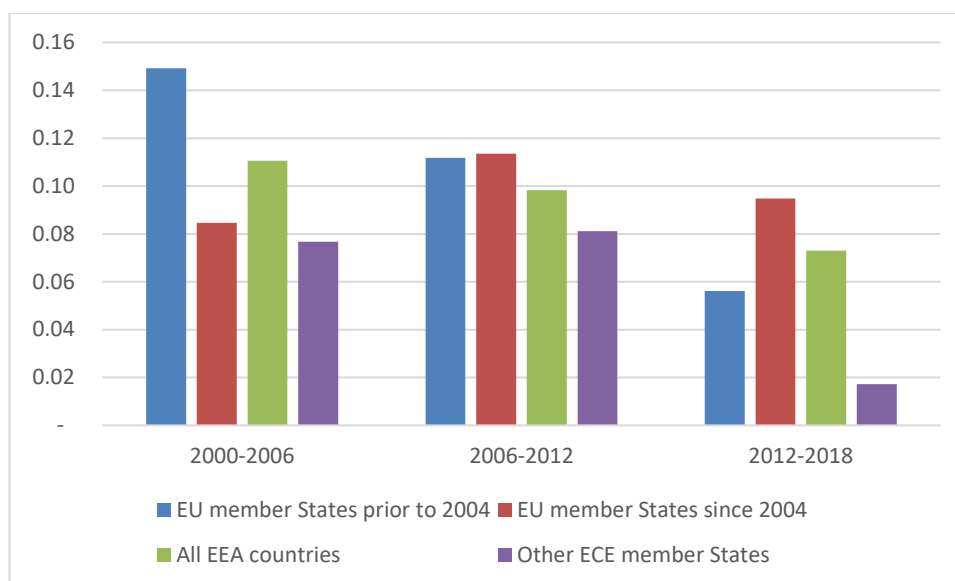
Abbreviations: EEA, European Environment Agency; EU, European Union.

5. Case studies

Enhancing area-based biodiversity conservation by recognizing other effective area-based conservation measures

79. Other effective area-based conservation measures are areas under management not primarily dedicated to biodiversity conservation, but where management nevertheless contributes to improved biodiversity status. Examples include cultural heritage areas, military training areas and sustainably managed production forests that generate biodiversity benefits. These sites, which occupy a significant share of the area in many countries, went largely unrecognized and attracted only limited resources and efforts to enhance their biodiversity benefits in the past. This started to change with the 2010–2020 Strategic Plan for Biodiversity under the Convention on Biological Diversity and the inclusion of other effective area-based conservation measures in Aichi Target 11, but is likely to be further enhanced in the post-2020 global biodiversity framework.

80. Other effective area-based conservation measures represent a significant but largely untapped opportunity to extend and consolidate area-based conservation networks in the pan-European region. They could contribute greatly to extending overall ecological representation, linking up existing PAs and engaging additional actors to contribute to better biodiversity status.

81. For the European Union and countries with European Union association agreements transposing European Union water legislation into national legislation, the Water Framework Directive[44] and Floods Directive[45] have the potential to result in land and water management that would be in line with criteria for other effective area-based conservation measures. National forest categories of many States of Northern Eurasia, the Caucasus and Central Asia, such as "protective forest" (i.e., forest with the purpose of protecting groundwater reserves

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[44] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, *Official Journal of the European Union*, L 327 (2000), pp. 1–73

[45] Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, *Official Journal of the European Union*, L 288 (2007), pp. 27–34.

or protecting against landslides on slopes), also generate substantial biodiversity benefits and might be recognized as other effective area-based conservation measures.

82. ECE member States should systematically explore and use the emerging designation of other effective area-based conservation measures to further consolidate their area-based conservation networks.

International cooperation to control pressures from linear infrastructure to migratory mammals in Central Asia

83. Many of the iconic migratory mammals of the Central Asian steppes, such as the Saiga antelope, the Goitered gazelle and the Khulan, are globally threatened, partly owing to significant pressure from habitat fragmentation and degradation along linear infrastructure, for instance roads and railways, pipelines and fences. This is directly relevant to the first conference theme "Greening the economy in the pan-European region: working towards sustainable infrastructure".

84. To reduce and mitigate these pressures, ECE member States from Central Asia are cooperating on various initiatives under the Convention on the Conservation of Migratory Species of Wild Animals, including the Memorandum of Understanding concerning Conservation, Restoration and Sustainable Use of the Saiga Antelope and the Central Asian Mammals Initiative. These are aimed at removing barriers to migration, developing and supporting regional ecological networks and, ultimately, preserving animal migrations in the Central Asian region as one of the last global "migration hotspots".

85. The ECE member States in the Central Asian region should continue their cooperation to manage linear infrastructure in such a way that impacts on migratory mammals are minimized.

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