7th EAP Priority Objective 1:
To protect, conserve and enhance the Union's natural capital

European Environment Agency

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Eutrophication of terrestrial ecosystems due to air pollution

Indicator	Indicator past trend		Selected objective to be met by 2020	Indicative outlook of the EU meeting the selected objective by 2020
Exposure of terrestrial ecosystems to eutrophication due to air pollution	EU	EEA	Reduce areas of critical load exceedance with respect to eutrophication by 43 % from 2000 levels — Air Pollution Thematic Strategy	

The area where ecosystems are exposed to eutrophication because of excess atmospheric nitrogen deposition has decreased. According to a scenario assuming that current legislation is fully implemented, it will, nevertheless, fall short of the 2020 objective

For further information on the scoreboard methodology please see Box I.3 in the EEA Environmental indicator report 2017

The Seventh Environment Action Programme (7th EAP) includes the objective of reducing the impact of air pollution on ecosystems and biodiversity, with the long-term aim of not exceeding critical loads and levels. Critical loads represent the upper limit of the levels of one or more air pollutants deposited to the Earth's surface that an ecosystem can tolerate without being damaged. Currently, the most important impact of air pollution on ecosystems and biodiversity is eutrophication. The EU Thematic Strategy on Air Pollution includes a milestone for 2020 relative to 2000, of a 43 % reduction in the areas of ecosystems exposed to eutrophication as a result of air pollution, i.e. areas where eutrophication critical loads are exceeded.

The EU ecosystem area where the critical loads for eutrophication were exceeded was approximately 78 % in 2000. The area in exceedance is projected to decrease to 54 % in 2020 for the EU, assuming that current legislation is fully implemented. The reduction in ecosystem areas exposed to eutrophication as a result of air pollution is estimated to be approximately 31 % between 2000 and 2020, which is below the 43 % reduction milestone suggested by the air pollution thematic strategy for this period. The improvements are primarily a result of reductions in eutrophying nitrogen emissions to the air. However, these emissions and, in particular, ammonia (NH_3) and nitrogen dioxide (NO_2) emitted from the agriculture and transport sectors, respectively, will remain significant contributors to eutrophication caused by air pollution. The eutrophication reduction milestone will therefore not be met unless further specific and targeted mitigation measures are put in place. Dietary changes resulting in less meat and dairy farming and the reduced use of petrol and diesel in cars could also contribute to reductions.

Setting the scene

The 7th EAP (EU, 2013) includes the objective of reducing the impact of air pollution on ecosystems and biodiversity, with the long-term aim of not exceeding critical levels and loads. Currently, the most important impact of air pollution on ecosystems and biodiversity is eutrophication caused by airborne nitrogen deposition to ecosystems. In certain terrestrial sensitive ecosystems such as grasslands, excessive atmospheric loads of nitrogen can alone result in loss of sensitive species, increased growth of species that benefit from high nutrient levels, changes to habitat structure and function, the homogenisation of vegetation types, etc. This briefing addresses ecosystem eutrophication from air-borne sources. There are also other sources that cause ecosystem eutrophication (e.g. use of fertilisers on cropland and pastures if not applied correctly – see AIRS_PO1.2, 2017).

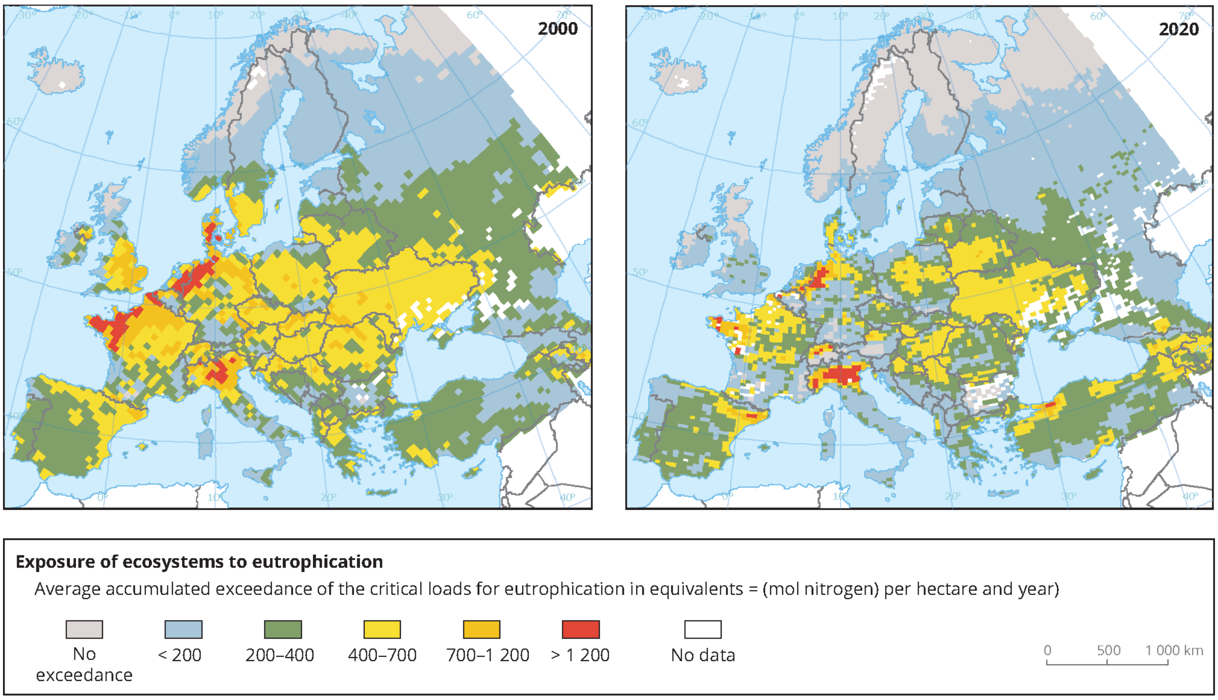
Policy targets and progress

The EU Thematic Strategy on Air Pollution includes a milestone for 2020, relative to 2000, of a 43 % reduction in areas of ecosystems exposed to eutrophication, i.e. areas where eutrophication critical loads are exceeded (EC, 2005a, 2005b). This milestone is in line with the long-term objective of not exceeding critical loads.

In 2000[1], the area of ecosystems where the critical load was exceeded was about 78 % of the total in the EU Member States (approximately 60 % in all 33 EEA member countries for which data were available, including the 28 EU Member States) and decreased in 2010 to 63 % in the EU (55 % in all 33 EEA member countries). Assuming that current legislation is fully implemented, the area in exceedance is projected to be 54 % in the EU (48 % in all 33 EEA member countries) in 2020 (EEA, 2017a). The relative reduction is approximately 31 % for the EU, as well as for all the 33 EEA member countries, between 2000 and 2020, which is below the 43 % reduction milestone suggested by the air pollution thematic strategy for this period.

Nevertheless, as illustrated in Figure 1, the magnitude (though not the area) of the exceedance is projected to decline considerably in most areas, except for a few ‘hot spot’ areas, particularly in Belgium, Germany and the Netherlands, as well as in northern Italy.

Figure 1. Exposure of ecosystems to risk of eutrophication due to airborne deposition of nutrient nitrogen – area and magnitude of exceedance in 2000 and 2020.



Sources:

a. EEA – Indicator CSI005

b. CCE (Coordination Centre for Effects), CLRTAP, UNECE.

Note: The maps show areas where critical loads for eutrophication of freshwater and terrestrial habitats are exceeded

The main sources of eutrophication are emissions of nitrogen compounds (i.e. nitrogen oxide, ammonia) to the atmosphere. Nitrogen oxide (NO_x) emissions for the EU decreased by approximately 41 % between 2000 and 2015 (EEA, 2017b). This reduction was primarily due to the introduction of three-way catalytic converters for cars. However, emission reductions from modern vehicles have not been as large as was originally anticipated. Standard diesel vehicles, for example, can emit up to seven times more NO_x in real-world conditions than in official tests (EEA, 2016).

Ammonia (NH_3) emissions have not fallen by as much. In 2015, they had fallen by approximately 8 % compared with their value in 2000 for the EU (EEA, 2017b). Actually, both in 2014 and 2015 EU ammonia emissions increased by 1.1 % and 1.8 % respectively (AIRS_PO3.2, 2017). Agriculture is the main source of NH_3 emissions; they amount to approximately 95 % of total emissions in the EEA-33 region. Emissions primarily arise from the decomposition of urea in animal wastes and uric acid in poultry wastes.

A key driver behind the observed reductions was the implementation of the National Emission Ceilings Directive (EU, 2001), which set air pollutant emission ceilings to be achieved by 2010 for, inter alia, emissions of the eutrophying air pollutants NO_x and NH_3. However, eutrophying emissions primarily from the agriculture and road transport sectors, but also from shipping and air travel, have been and will remain significant contributors to eutrophication caused by air pollution.

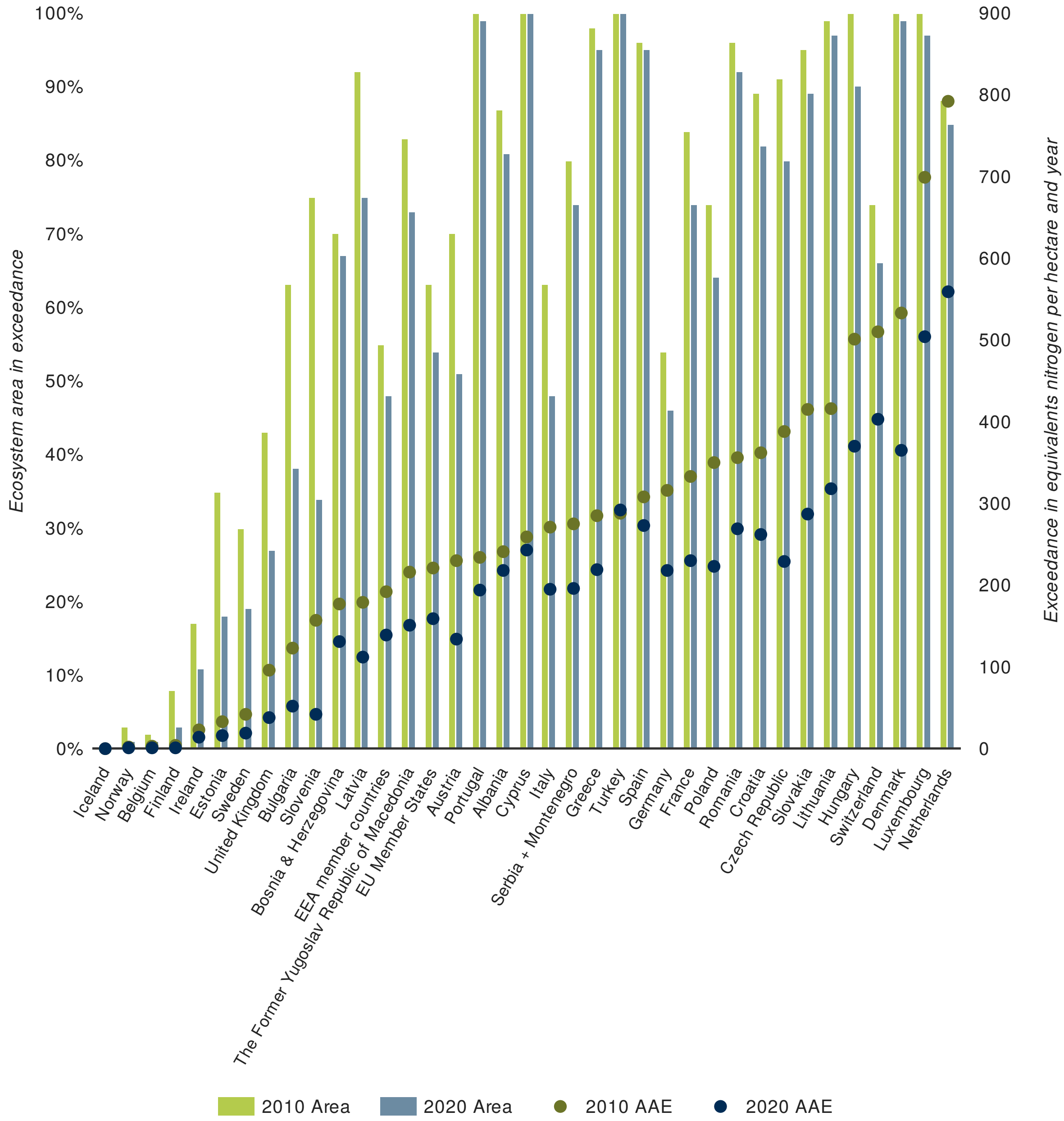
Further reductions in eutrophying air pollutant emissions are expected by 2020, among other things, as a result of the 2012 amended Gothenburg Protocol, which set stricter air pollutant emission ceilings for 2020 (UNECE, 2012) and of the revised National Emission Ceilings Directive which, inter alia, reflected these ceilings into EU legislation (EU, 2016).

Nevertheless, as illustrated at the start of this section, the decreases anticipated for 2020, under a scenario that assumes current legislation (including the revised National Emission Ceilings Directive) is fully implemented, are not expected to contribute sufficiently to reductions in the ecosystem area exposed to excess atmospheric nitrogen deposition and affected by eutrophication. The relative reduction over the 2000 to 2020 period is expected to be only about 31 %, which is below the EU thematic strategy’s suggested milestone of a 43 % reduction for that period. Deeper reductions could take place through additional specific and targeted (technical) mitigation measures, particularly in the agriculture and transport sectors. Dietary changes resulting in less meat and dairy farming and the reduced use of petrol and diesel in cars could also contribute to reductions.

Country level information

Figure 2 shows the percentage of the area by country where the critical loads for eutrophication were exceeded in 2010 and the areas where exceedance is expected in 2020. Although a decrease is predicted by 2020, if current legislation is implemented, the area showing exceedance will be above 50 % in most countries (see bars). Extremely high magnitudes of exceedance can be found in Denmark, Hungary, Luxembourg, the Netherlands and Switzerland, caused by high deposition rates and/or ecosystems that are very sensitive to an excess supply of nitrogen from the atmosphere (see dots), for example nutrient-poor grasslands.

Figure 2. The ecosystem area at risk of eutrophication due to airborne nitrogen deposition and the magnitude of exceedance in each country



Data sources: a. UNECE. Coordination Centre for Effects (CCE) , LRTAP convention b. EEA – Indicator CSI005

Note: AAE is the average accumulated exceedance, showing the magnitude of exceedance in equivalents (mol nitrogen/ha per year). The data are based on the revised Gothenburg Protocol emission reduction agreements of 2012 (assuming for the 2020 scenario that current legislation is fully implemented). Data for Serbia and Montenegro are presented as aggregated data.

Outlook beyond 2020

The updated EU air pollution strategy aims, inter alia, to achieve a situation in which the EU ecosystem area exceeding critical loads for eutrophication is reduced by 35 % by 2030, relative to 2005 (EC, 2013a).

The revised National Emission Ceilings Directive not only transposed the amended Gothenburg Protocol 2020 air pollutant reduction commitments, it also set more ambitious air pollutant reduction commitments for 2030. These commitments – in particular the reduction commitments for the two eutrophying air pollutants, NO_x and NH_3 – will contribute to the achievement of the objective of 35 % by 2030.

However, this objective would not be met if only current legislation was fully implemented.

It would be met if the maximum number of technically feasible reduction measures was implemented (EC, 2013b).

Beyond 2030, the EU aspires towards ‘achieving levels of air quality that do not give rise to significant negative impacts on and risks to human health and the environment’ (EU, 2002).

About the indicator

The indicator shows area and quantitative information for ecosystems where atmospheric nutrient nitrogen deposition is above the critical load. A critical load is a 'quantitative estimate of an exposure to one or more pollutants, below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge' (UNECE, 2015). Deposition loads of eutrophying airborne pollutants above the critical loads are termed an 'exceedance'.

Exposure in an ecosystem for which information on critical loads is available, is calculated as the average accumulated exceedance (AAE). The AAE is the area-weighted average of exceedances, accumulated over all sensitive habitats (or ecosystem points) defined in a grid cell.

Footnotes and references

[1] The 2000 data presented here were provided by the Coordination Centre for Effects, a data centre under the UNECE Convention on Transboundary Air Pollution, on 21 November 2014 and can be obtained on demand from the EEA. Similarly, the 2010 and 2020 data presented here and in the related EEA indicator (EEA, 2017a) are from the same source and time stamp.

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EU, 2016, Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC (OJ L 344, 17.12.2016, p. 1–31) (http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2016.344.01.0001.01.ENG) accessed 27 June 2017.

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AIRS briefings

AIRS_PO3.2, 2017, Air pollutant emissions

Environmental indicator report 2017 – In support to the monitoring of the 7th Environment Action Programme, EEA report No21/2017, European Environment Agency

Published on 30 Nov 2017

Natural capital

Agricultural land: nitrogen balance

Indicator	EU indicator past trend	Selected objective to be met by 2020	Indicative outlook of the EU meeting the selected objective by 2020
Gross nutrient balance in agricultural land: nitrogen		Manage the nutrient cycle in a more sustainable way (nitrogen) — 7th EAP	

Overall, the past trend in agricultural nitrogen balance was improving from 2000 to 2014, although since 2010 it flattened out. The EU, on average, still has an unacceptable level of nitrogen losses from agricultural land to the environment and further efforts are needed to manage the nutrient cycle for nitrogen sustainably in the EU.

For further information on the scoreboard methodology please see Box I.3 in the EEA Environmental indicator report 2017

The Seventh Environment Action Programme (7th EAP) calls for further efforts to manage the nutrient cycle in a more sustainable way and to improve efficiency in the use of fertilisers. The key nutrient in this context is nitrogen (N), which is the main element of many fertilisers used in the agricultural production. High nitrogen losses from agricultural land to the environment have a significant negative impact on biodiversity and ecosystems. Nitrogen losses to the environment from agricultural land decreased in the EU between 2000 and 2014, with expected positive effects on soil, water and air quality and, consequently, on biota and ecosystems. An important factor behind this decrease is enhanced nitrogen management practices; in particular changes in fertiliser application techniques. However, since 2010 nitrogen losses have not decreased further. In addition, the EU, on average, still has an unacceptable surplus of nitrogen in agricultural land in view of the consequent losses to the environment, and further efforts are needed to manage the nutrient cycle for nitrogen in a sustainable way in the EU.

Setting the scene

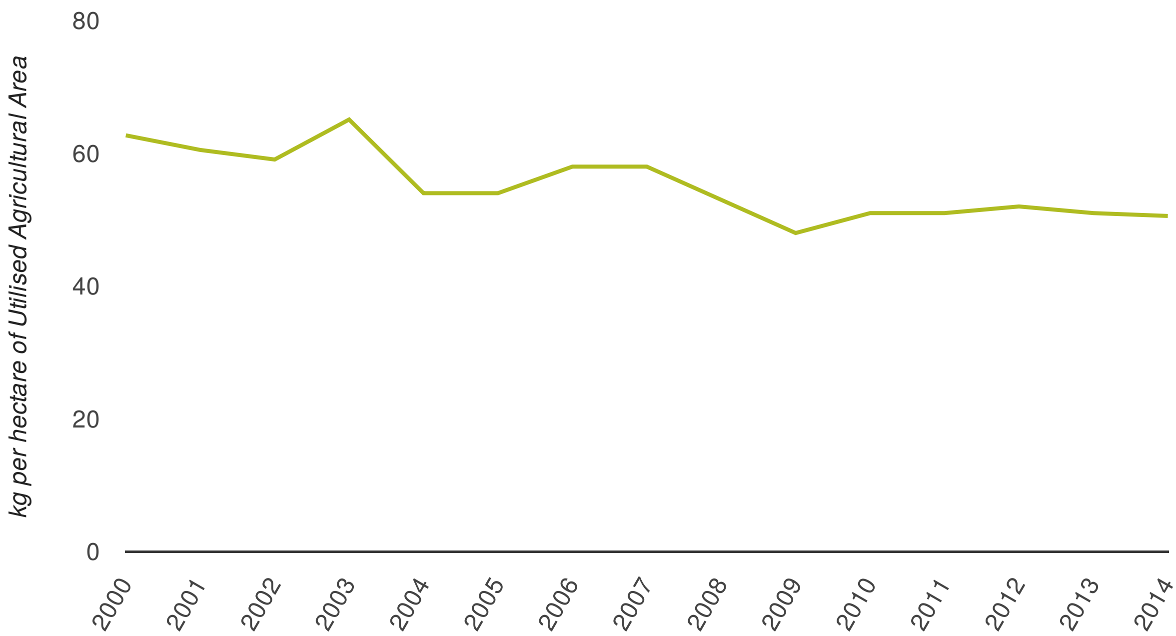
The 7th EAP (EU, 2013) calls for further efforts to manage the nutrient cycle in a more sustainable way and to improve efficiency in the use of fertilisers. Excessive nutrient losses affect soil, air and water quality, have a negative impact on ecosystems and have the potential to cause significant problems for human health. This nutrient pollution also results in significant economic losses and increased costs for society (for example in relation to drinking water treatment, human health, tourism and recreation). If not applied correctly (e.g. taking account of weather conditions, stage of crop growth, dosage, etc.), fertilisers lead to excess nutrients that can be released to the wider environment, for instance by run-off into surface water (AIRS_PO1.9, 2017) or leaching into groundwater. Eutrophication caused by excess nutrients can result in increases in weeds and algae, reduced oxygen levels and subsequent biodiversity loss. These impacts can be reduced by balancing nutrient inputs with the outputs of the agricultural system (i.e. nutrients contained in grazed and harvested crops/grassland and in crop residues) in order to limit nutrient losses to the environment. This briefing focuses on nitrogen which is a key element with respect to managing the nutrient cycle in a more sustainable way – it is the main element of many fertilizers (Eurostat, 2017b). More specifically, the briefing addresses nitrogen losses from agricultural land. This is one of the main contributors to nitrogen emissions (EEA, 2005).

Policy targets and progress

There are no environmental acquis objectives that match the 7th EAP objective of managing the nutrient cycle in a more cost-effective, sustainable and resource-efficient way. Nevertheless, several directives relate to the nutrient cycle. The EU Nitrates Directive (EU, 1991) aims to reduce water pollution by nitrates from agricultural sources and prevent pollution of ground and surface waters. To achieve this, the Directive identifies polluted waters based on maximum concentrations of nitrates and trophic status and establishes requirements related to the use of fertilizers and livestock manure, including, balanced fertilization and periods during which nitrogen application is prohibited. There are several other EU directives that are relevant to the impact of excessive nutrient use in agriculture, namely the EU Water Framework Directive (EU, 2000) through its legal obligation to protect and restore the quality of all inland and coastal waters across Europe, and the Directive on Sewage Sludge (EU, 1986) through its regulation of the use of sewage sludge in agriculture. Also relevant to the management of nutrients from agricultural sources are targeted agri-environment-climate measures in Rural Development Programmes and, other Common Agricultural Policy instruments that encompass environmental requirements such as cross-compliance, and with the new 2014-2020 funding period also “greening measures” associated with direct payments. Achieving a gross nutrient balance that implies acceptable losses to the environment, although not a stated aim of these policy instruments, is key to achieving some of their objectives.

Between 2000 and 2014, the gross balance between nitrogen added to and removed from agricultural land in the EU showed an improving trend (Figure 1), meaning that the gap between inputs and outputs is closing and, therefore, the overall potential nitrogen surplus decreases. The surplus of nitrogen applied to agricultural land fell by about 19 %, from 63 kg per hectare in 2000 to 51 kg per hectare in 2014 (Figure 1).

Figure 1. Gross nitrogen balance, EU



Data sources: Eurostat. Gross Nutrient Balance [aei_pr_gnb]

Note: Eurostat estimates

It is important to take a series of years (3-4 years) instead of individual years as reference in order to identify trends in the development of nitrogen surplus as e.g. extreme weather conditions can influence annual nitrogen surplus rates (Eurostat, 2017a). Indeed, over the last four years (2011-2014) the level of surplus did not decrease further and remained relatively stable.

Over the period examined (2000-2014), an increased nitrogen-use-efficiency can be regarded as an important factor behind the improving trend in the nitrogen balance (Eurostat, 2017a, see also EU Nitrogen Expert Panel, 2015). These efficiency gains may have been achieved through adapted nitrogen management practices, such as changes in fertiliser application techniques (Eurostat, 2015) and may have been driven by the implementation of other specific measures of the Common Agricultural Policy and of EU legislation, such as the Water Framework Directive (WFD). Economic motives, such as ambitions to reduce production costs may have also led to efficiency gains. In most countries, implementation of the Nitrates Directive and other agricultural improvements has tended to stabilise or reduce nitrogen inputs, potentially reducing environmental pressures (EC, 2017, Eurostat, 2015).

Assessing whether the nitrogen cycle is managed sustainably, as stipulated by the 7th EAP (see above), holds many challenges, and determining a sustainable level of nitrogen balance is not trivial.

In practice, in agricultural production, losses of nitrogen to air (mainly ammonia) and water (mainly nitrate) are inevitable.

Yet, the main focus should be on reducing nitrogen losses to the environment to the minimum level possible and on reaching a better understanding of acceptable losses of nitrogen to the environment. Acceptable rates of nitrogen surplus can be estimated through a critical loads approach, which is a quantitative estimate of the upper limit of pollution exposure at which harmful effects to the environment (ecosystems, species) can be avoided. Work is ongoing to improve our understanding of critical loads. Critical loads (nitrogen in the surface waters and emissions to the air) vary for different types of ecosystems (APIS, 2017), and reference values for nitrogen surplus have to account for the type of agricultural system, the climate-soil-environmental conditions, and the types of nitrogen input (EU Nitrogen Expert Panel, 2015).

When considering critical loads of nitrogen in surface water and in air with respect to biodiversity (habitat quality), the amounts of nitrogen applied to the system were still found to substantially exceed acceptable inputs and related losses in several European regions in 2010, despite the improving trend in the nitrogen balance in previous years (EEA, 2016). This is confirmed by the reported eutrophication pressure on the EU's protected species and habitats (EEA, 2015a), (AIRS_PO1.7, 2017), (AIRS_PO1.8, 2017).

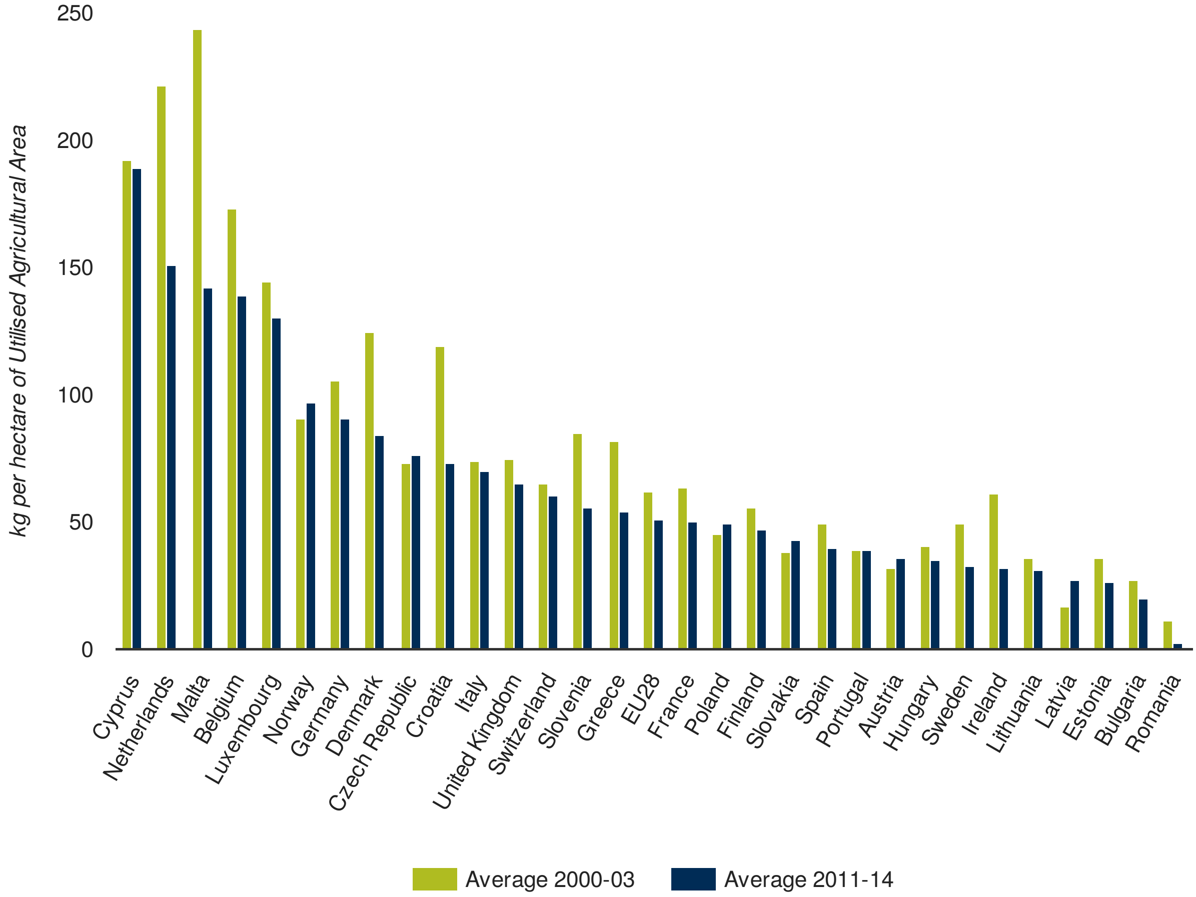
Despite an increasing nitrogen-use efficiency (Eurostat, 2017a), agriculture remains an important source of nitrogen in surface waters (EC 2017, EU, 2010). Agriculture, which is the biggest user of nitrogen in the world (EU Nitrogen Expert Panel, 2015), and especially runoff from agricultural land, typically contribute 50–80 % of the total nitrogen load in European surface waters (EEA, 2005; see also EC 2010; EEA 2012), affecting nitrogen levels in freshwater (EEA, 2015c) and transitional, coastal and marine waters (EEA, 2015b). Mineral fertilisers deliver, on average, around 45 % of the nitrogen input in the EU, while nearly 40 % comes from organic fertilisers, i.e. manure (Eurostat 2017a). The different types of nitrogen source have different impacts on the environment (for an extended overview, see e.g. Eurostat 2017a). Within the EU, mineral fertilisers are applied to agricultural soils mainly as straight nitrogen fertilisers in the form of ammonium nitrate. Nitrogen in mineral fertilisers is particularly soluble to facilitate uptake by crops, but this also makes it susceptible to run-off following heavy rainfall and to leaching to groundwater (Eurostat, 2017a). Manure inputs typically contribute to ammonia emissions.

In conclusion, overall, the agricultural nitrogen balance showed, on average, an improving trend in the EU over the 2000-2014 period. However, since 2010, there has been no discernible improvement. In addition, the EU, and some regions in particular, still has an unacceptable surplus of nitrogen in agricultural land in relation to losses to the environment, so further efforts are needed in the EU to manage the nutrient cycle for nitrogen in a sustainable way.

Country level information

A country comparison of the average agricultural nitrogen balances for the years 2000–2003 and 2011– 2014 show an improvement in the majority of European countries, with the exception of some countries: Austria, Czech Republic, Latvia, Norway, Poland and Slovakia (Figure 2).

Figure 2. Gross nitrogen balance by country



Data sources: Eurostat. Gross Nutrient Balance [aei_pr_gnb]

Notes:

1. Eurostat estimates for EU-28, Austria, Belgium, Bulgaria, Croatia, Cyprus, Denmark, Greece, Italy, Latvia, Lithuania, Luxembourg, Malta, Romania, Slovakia and Spain.

2. For the period 2000-03, data for Estonia are from 2004.

3. For the period 2011-14, data for Germany, Ireland, Sweden and Switzerland are from 2010-13.

Although decreasing in most Member States, agricultural nitrogen surpluses are still high in some parts of Europe, in particular in Western Europe and in some Mediterranean countries. Even in countries with low national averages, there can be regions with high loadings, depending on agricultural intensity, including livestock density.

Outlook beyond 2020

Future trends in the use of mineral fertilisers will depend on a number of factors, in particular on future EU agricultural and environmental policies, but also on the implementation of policies in other fields such as on circular economy (EC, 2015). An increase in fertiliser use may be expected to 2050 (Bruinsma, 2012).
Nevertheless, this does not necessarily mean a future increase in the surplus of nitrogen from agricultural land as the fertilisers may be applied more efficiently.

Some of the actions that will encourage optimal fertiliser application and therefore might possibly improve the nutrient balance in EU countries in future, and which may be initiated in the context of the further implementation of the Common Agricultural Policy, the Water Framework or the Nitrates Directives, include promoting precision agriculture, fertiliser advice programmes, the increased use of soil sampling, nutrient bookkeeping, adapted livestock feeding schemes, and the further uptake of agri-environmental measures.

About the indicator

The indicator estimates the potential surplus (or deficit) of nitrogen in agricultural land. It calculates the balance between nitrogen added to an agricultural system and nitrogen removed from the system annually in kilograms of nitrogen per hectare of utilised agricultural area (UAA). The input side of the balance counts mineral fertiliser application and manure excretion as well as atmospheric deposition, biological fixation and biosolids (compost, sludge and sewage) input. The output side of the balance represents the removal from grassland (grazing and mowing) and the net crop uptake (removal) from arable land. The gross nitrogen balance takes an ‘extended soil’ surface, or ‘land’ surface, as the system boundary, meaning that it also includes the nitrogen losses from animal housing and manure management (e.g. storage) systems. For further information on the indicator scope and methodology see Eurostat (2017a).

The data used are partly based on expert estimates of various physical parameters for the individual countries as a whole. Differing assumptions mean that the balances should only be considered as consistent within a country and that comparisons between countries should be made with caution. There may also be large regional variations within a country, and therefore national figures should be interpreted with care.

To assess the trend in the development of the nitrogen-balance, it is necessary to draw on average values over several years, for accounting for annual outliers, e.g. extreme weather conditions, may influence the annual nitrogen surplus. In this case, 2000-2003, and 2011-2014 were taken as reference periods (Figure 2).

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Annual Indicator Report Series (AIRS)

AIRS briefings

AIRS_PO1.9, 2017, Surface waters

AIRS_PO1.7, 2017, EU protected species

AIRS_PO1.8, 2017, EU protected habitats

> Environmental indicator report 2017 – In support to the monitoring of the 7th Environment Action Programme, EEA report No21/2017, European Environment Agency

Published on 30 Nov 2017

Natural capital

Urban land take

Indicator	Indicator past trend		Selected objective to be met by 2020	Indicative outlook of the EU meeting the selected objective by 2020
Land take	EU	EEA	Keep the rate of land take below 800 km^2 on average per year from 2000–2020 in order to keep on track to achieve the aim of no net land take by 2050 — Resource Efficiency Roadmap	

Although the EU average annual land take over the 2000-2012 period declined, it remained above the 800-km2 milestone. Significant reductions in the rate of annual land loss are therefore required from 2012 to 2020 if the 2020 objective is to be met. Key land take drivers and complementary data sources point to developments in the opposite direction - an increase in land take since 2012 – making it unlikely that the objective will be met

For further information on the scoreboard methodology please see Box I.3 in the EEA Environmental indicator report 2017

The Seventh Environment Action Programme (7th EAP) includes an objective that land is managed sustainably and promotes the objective of no net land take by 2050. Losing land to the development of buildings and other artificial surfaces affects biodiversity and the delivery of ecosystem services. Between 2000 and 2012, the average area of land taken for development in the EU was estimated to be 926 km^2 per year. This is above the 800 km^2 per year for 2000–2020 that was identified in the Roadmap to a Resource Efficient Europe as an upper benchmark in order to stay on target to achieve the objective of no net land take by 2050. Key drivers behind land take have been increasing urban population, economic activity and increased mobility. On average there was less annual land take in the latest assessment period (2006–2012) compared with the assessment period of 2000–2006. This is mainly because less land was taken for housing during the period 2006–2012. In order to stay on target the average land loss for the period 2012–2020 should have to be no more than 611 km^2 per year. It is unlikely that such a drastic reduction in the annual land take will take place up to 2020. Complementary data sources show that land take accelerated between 2009-2012 and 2012-2015. In addition, key land take drivers – urban population, economic activity and transport activity – have been on the increase since 2012 while at present there seem to be no further policy plans to drastically limit land take.

Setting the scene

The 7th EAP includes an objective that land is managed sustainably and promotes the objective of no net land take by 2050 (EU, 2013). Agricultural land and, to a lesser extent, forests and other semi-natural and natural areas are lost to the development of buildings and other artificial surfaces. This leads to loss of fertile land and affects biodiversity as it decreases habitats, the living space of important species, and fragments the landscapes that support and connect them. Land occupied by man-made surfaces and dense infrastructure is also a significant source of water, soil and air pollution. The sealing of land by these surfaces can also have a negative impact on the water balance and increase the frequency and intensity of flooding. Land take is also a matter of land use efficiency and an aspect of the wider land degradation issue, which is addressed by the United Nations (UN) Sustainable Development Goals (UN, 2015), particularly goal 15.3 on land.

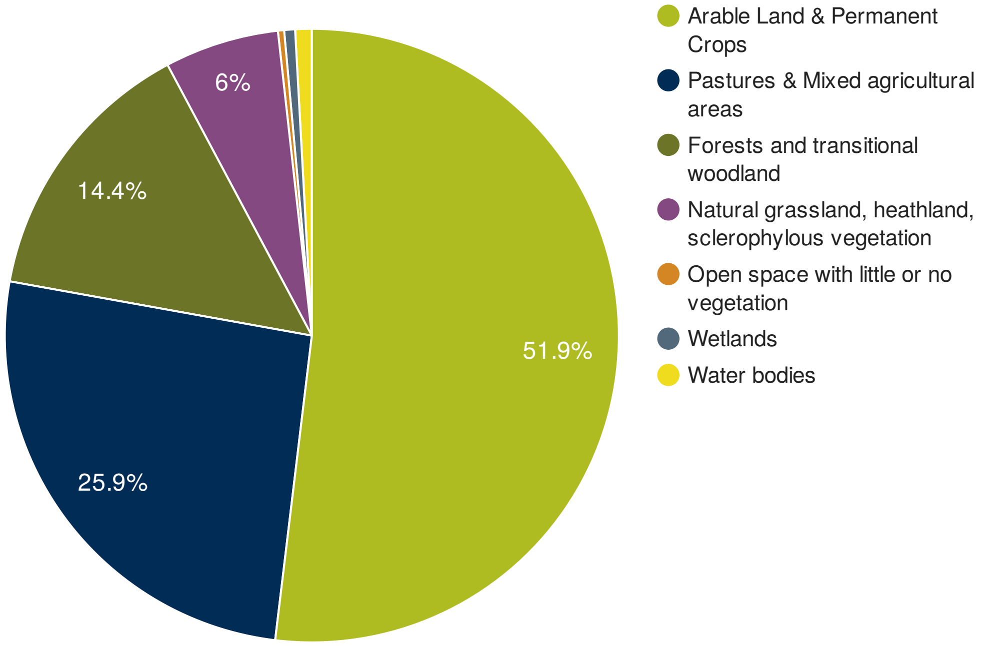
Policy targets and progress

There is no specific objective in the environmental acquis that matches the 7th EAP objective of sustainable land management and the promotion of no net land take by 2050. However, the Roadmap to a Resource Efficient Europe (EC, 2011) states that 'if we are to reach the state of no net land take by 2050, following a linear path, we would need to reduce land take to an average of 800 km^2 per year (for the EU) in the period 2000–2020'. This average figure is used in this briefing as the benchmark to assess progress. In the 2000–2012 period, the estimated average annual land take for the EU was 926[1] km^2 (1 073 km^2 for the EEA-33[2]) (EEA, 2017), which is considerably above the level required to achieve the long-term objective of no net land take. However, estimated average annual land take decreased from 1 048 km^2 (1 148 km^2 for the EEA-33) per year in the 2000–2006 period to 848 km^2 (1 043 km^2 for the EEA-33) per year in the subsequent 2006–2012 period (EEA, 2017).

Based on the average for the EU-28 during the 2006-2012 assessment period, 52 % of all areas that changed to artificial surfaces were arable land or permanent crops in 2006 (47 % for the EEA-33) (Figure 1). Pastures and mixed farmland were the next most taken category of land, representing 26 % of the total (27 % for the EEA-33), while forests and transitional woodland shrub made up 14 % (16 % for the EEA-33). A similar pattern emerged in the 2000-2006 period.[3]

As these land cover types are substituted to varying degrees by impervious cover, the provision of important services provided by soils, such as storing and filtering water, and the transformation of nutrients and contaminants deteriorates. This specific issue is discussed in more detail in the soil section of the EEA report The European environment — State and outlook 2015 (EEA, 2015).

Figure 1. Relative contribution of land-cover categories lost to uptake by urban and other artificial land development (2006-2012), EU



Data sources: EEA. Corine Land Cover 2006 - 2012 changes (Copernicus)

From the perspective of the types of development that occur on the land that is taken, at the EU level, the largest area (33 %) was taken by construction sites between 2006 and 2012. These sites represent transitional areas that will turn into some form of urban development in the future. The second largest area (24 %) was taken for industrial and commercial sites. The proportion of newly created mines, quarries and dumpsites was 19 % in the EU-28, while housing, services and recreation made up 18 % of the overall increase in urban and other artificial areas. Although land take for transport infrastructure is underestimated in the Corine Land Cover dataset, it still covered 7 % of the area taken. A similar pattern emerges when looking at all 33 EEA member countries (EEA, 2017).

Overall, during the 2000-2012 period, land take in the EU was shaped by the increased urban population (Eurostat, 2016), economic activity, increased mobility and growth in transport infrastructure; and a number of other drivers, such as the increasing demand for living space per person. Comparing 2000-2006 and 2006-2012 shows that the reduction in land take in the second period was primarily due to less land being taken for housing. At the EU level, between 2000 and 2006, housing, services and recreation took the largest area (32 %), contributing to urban sprawl, while between 2006 and 2012, the same land category was only the 4th largest land take area — a 53 % decrease in terms of km^2.[4]

Regional urbanisation rates vary substantially (see Figure 2), with coastal and mountainous regions among the most affected because of the increasing demand for artificial surfaces related to transport, recreation and leisure in these areas.

Figure 2. Spatial development of land take in EEA member and cooperating countries

Data source: EEA, Spatial development of landtake

As the proportion of land used for production (agriculture, forestry, etc.) in Europe is one of the highest in the world, conflicting land use demands require decisions that involve difficult trade-offs. The decisions on trade-offs between land uses are effectively implemented through spatial planning and land management practice in the individual countries. Although the subsidiarity principle assigns land and urban planning responsibilities to national and regional government, most European policies have a direct or indirect effect on land planning and urban development. Where properly implemented, the Strategic Environmental Assessment (SEA; EC, 2001) and Environmental Impact Assessment (EIA; EC, 2014) Directives can improve the consideration of environmental aspects in spatial planning.

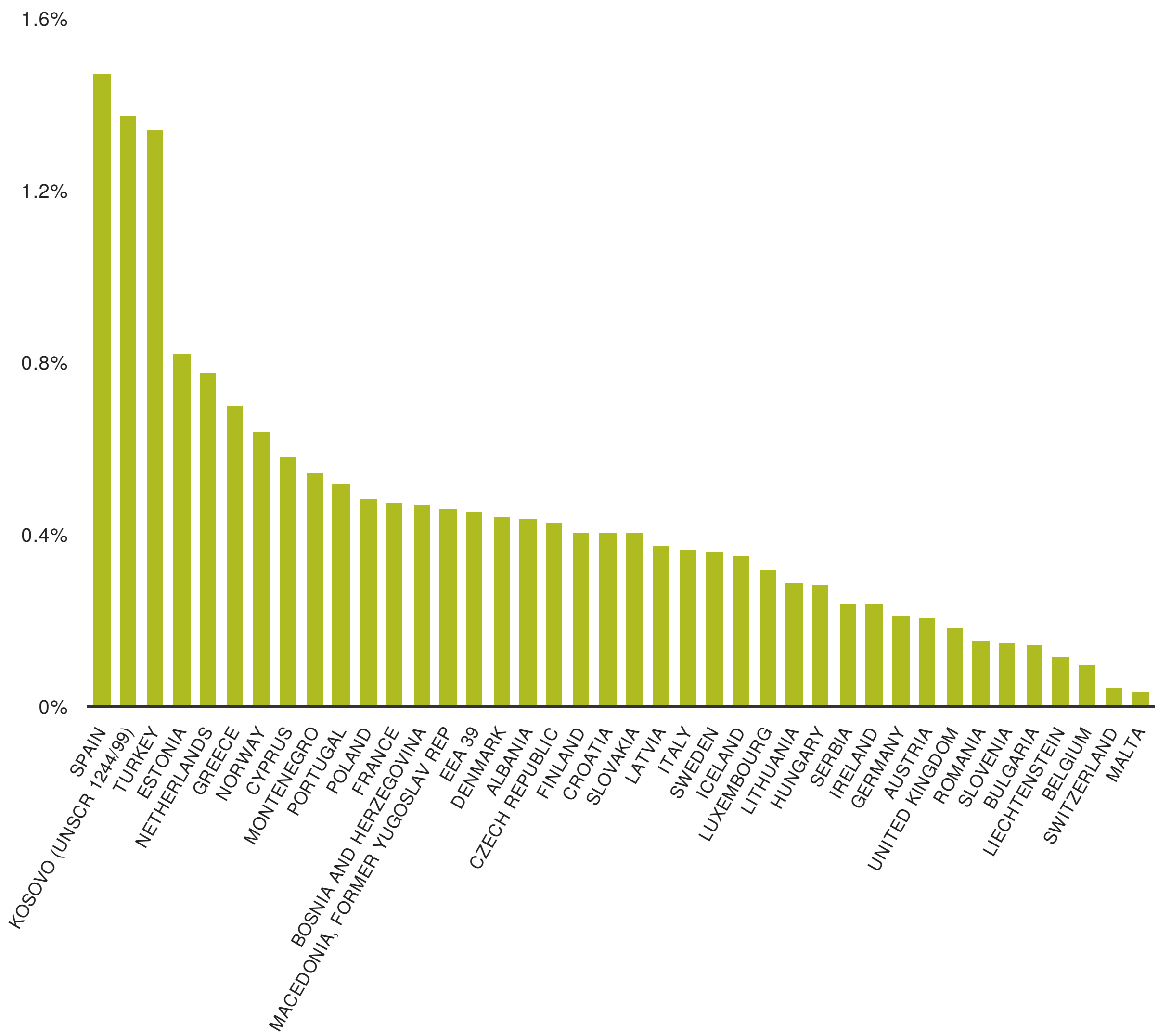
The average annual land take between 2000 and 2012 lay above the trajectory required to achieve the long-term goal of no net land take. However, annual land take declined between the 2000–2006 and 2006–2012 observation periods. The EU could reach the required trajectory, if the amount of land taken reduces significantly during the period 2012-2020 – i.e. to no more than 611 km^2 per year on average. It is unlikely that such a reduction in the annual land take will take place up to 2020. Complementary data sources from the land use/cover area survey (LUCAS) statistics (Eurostat, 2017) show that land take accelerated between 2009-2012 and 2012-2015. In addition, key land take drivers – urban population, economic activity and transport activity – have been on the increase since 2012 while at present there seem to be no further policy plans to drastically limit land take. It is therefore unlikely that the 2020 objective of keeping the rate of land take below 800 km^2 on average per year from 2000–2020 would be achieved.

One way to reduce the rate of land take in future is through the redevelopment of brownfield land. Brownfield sites are derelict and underused or even abandoned former industrial or commercial sites, which may have real or perceived contamination problems (EC, 2012). These sites are mainly found in urban areas of industrialised regions. Redevelopment of brownfield sites gives many environmental advantages: relieving pressure on rural areas and greenfield sites, reducing the costs of pollution, allowing more effective use of energy and natural resources and facilitating economic diversification. Another way to reduce the rate of land take in future is by higher density development, i.e. more buildings or a higher population on a given area of land (EEA, 2016). However, compact urban form can and should come with improved quality of life, reduction of climate change risks and implementation of environmental and human health standards.

Country level information

Figure 3 shows the mean annual rate of land take in the EEA-39 countries, — the 33 EEA member countries (including the 28 EU Member States) and the six EEA cooperating countries — between 2006 and 2012. The graph ranks countries according to increases in land take as a percentage of the initial artificial land stock in 2006. Perhaps surprisingly, the countries with the highest percentage of land take include those that are already highly urbanised and therefore had an already high initial percentage of artificial land stock in 2006. Countries that enjoyed strong economic growth between 2006 and 2012 also had high levels of land take, indicating the need for further decoupling.

Figure 3. Mean annual land take per country, 2006–2012, as a percentage of 2006 artificial land



Data sources: EEA. Corine Land Cover 2006 - 2012 changes

Note: EEA 39 comprises the 39 countries presented in this chart. These are the country members of the European Environment Agency (EEA) and the EEA cooperating countries.

Outlook beyond 2020

If the urban population of Europe continues to grow, the pressure to develop on natural and semi-natural land will continue. If the objective of no net land take by 2050 is to be met, future developments should increasingly either take place on brownfield land or fill in gaps between existing developments (densification), or land take should have to be compensated for by returning artificial land to agricultural, forest or semi-natural land cover types. Such developments could be driven by establishing incentives for 'land recycling', e.g. encouraging developers to use brownfield land or encouraging spatial planning that favours increasing urban density. The extent to which land take can be reduced in the longer term will also be influenced by the ability of the EU and individual Member States to coordinate their spatial planning and environmental protection objectives.

About the indicator

The indicator shows the amount of land that is converted from natural and semi-natural areas, including forested and agricultural areas, to artificial surfaces used for urban and economic purposes. It includes areas sealed by the construction of buildings and infrastructure, as well as pit mining, urban green areas and sport and leisure facilities.

The indicator is based on the interpretation of satellite imagery from 2000, 2006 and 2012 (the most recent) and ancillary data by the countries. The main dataset (Corine Land Cover) used by the indicator does not map features with an area of less than 25 ha (5 ha for change) and less than 100 m across. This leads to the exclusion of small areas of land and small changes due to man-made features, particularly in the peri-urban countryside. It also means that land taken by linear transport infrastructure (e.g. roads and railways) is underestimated, as it is too narrow to be picked up. On the other hand, land take areas accounted for contain unsealed surfaces such as suburban gardens and other smaller green plots.

Footnotes and references

[1] Differences in the EU estimated average annual land take figures for 2000-2006, 2006-2012 and 2000-2012 in this briefing compared to the 2016 version of the briefing are due to some re-submissions as well as due to the use of an improved accounting methodology (ETC-ULS, 2016).

[2] EEA-33 comprises the 28 EU Member States and the 5 non-EU countries that are member of the European Environment Agency (Iceland, Liechtenstein, Norway, Switzerland, Turkey)

[3] In the EU (EEA-33), over the 2000-2006 period, 49 % (47 %) of all areas that changed to artificial surfaces were arable land or permanent crops, 29 % (29 %) were pastures and mixed farmland and 13 % (14 %) were forests and transitional woodland - the underlying data are available on demand.

[4] The underlying data are available on demand.

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Natural capital

Forest utilisation

Indicator	EU indicator past trend	Selected objective to be met by 2020	Indicative outlook of the EU meeting the selected objective by 2020
Forest: growing stock, increment and fellings		Forest management is sustainable — 7th EAP (focus solely on the use of forest resources)	

Since 1990, EU forests overall have been felled at a lower rate than they have grown (at around 65 %), indicating sustainable use of forest resources. Despite a possible increase in the fellings of forests, the overall utilisation of forest resources is expected to remain sustainable up to 2020

For further information on the scoreboard methodology please see Box I.3 in the EEA Environmental indicator report 2017

The Seventh Environment Action Programme (7th EAP) includes an objective that forests be managed sustainably. One aspect of sustainability is the sustainable use of forest resources. The utilisation rate of forests describes how much of the forest has been harvested in relation to its increase in growing stock. More explicitly, this indicator expresses the ratio between the fellings of trees and the annual increment (in terms of forest volume on forest land available for wood supply). This ratio is commonly used as a proxy for the sustainable production and use of forest resources. Forest utilisation rates below 100 % indicate that the amount of timber taken out of the forest is in balance with what is left within the forest. Since 1990, the utilisation rate has remained around 65 % for the EU. It is likely that the utilisation rate will increase in the coming years because of increased harvesting of forests to meet increased demands for wood and because of the older age-class structure of forests in Europe. Nevertheless, it is not expected that the average utilisation rate of forests will increase above 100 %.

Setting the scene

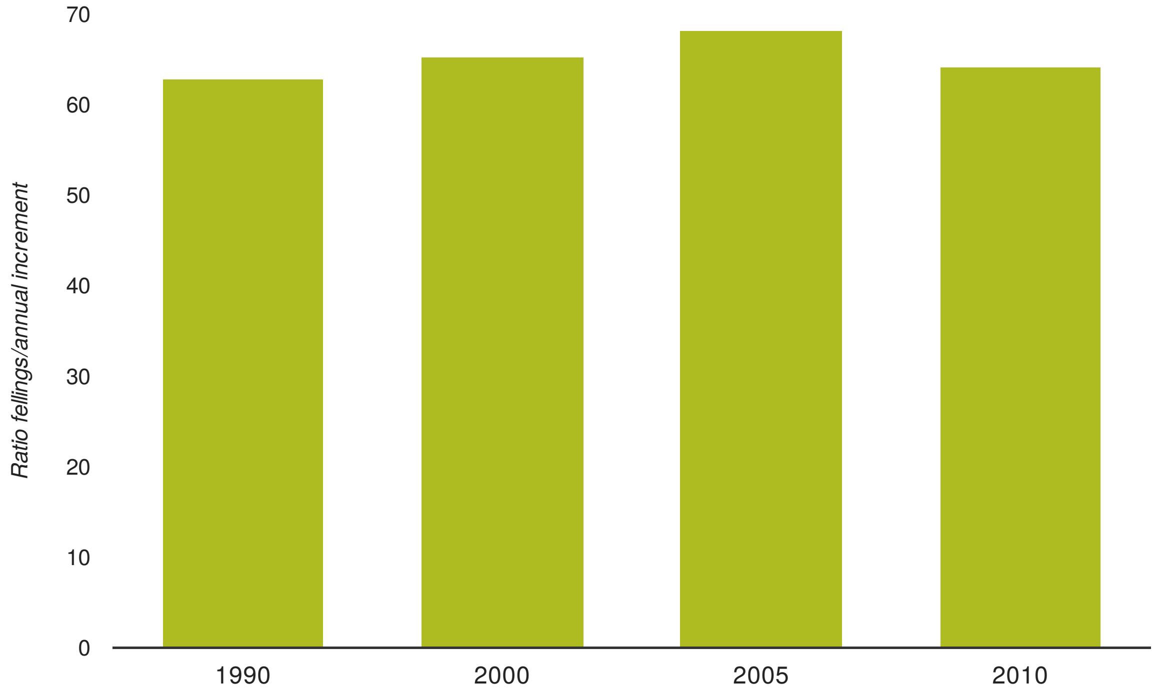
The 7th EAP sets out to ensure that ‘forest management is sustainable’ by 2020 (EU, 2013). Sustainable forest management means ‘using forests and forest land in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems’ (EC, 2013). Forests are essential natural resources that host a major part of the biodiversity in Europe. Forests also sequester and store carbon, filter water and provide recreational opportunities. This briefing focuses on one aspect of sustainable forest management, namely forest resources, in terms of how the forest utilisation rate affects the forest growing stock. This is used as a measure of the sustainability of the production and use of forest resources. The utilisation rate does not reflect the structures and processes necessary to maintain biodiversity and the various forest ecosystem services.

Policy targets and progress

The environmental acquis does not include a specific target addressing sustainable forest management and the EU does not have a common forest policy. Forest issues are, nevertheless, embedded in almost all the nature and environmental policies of the EU. The EU Forest Strategy (EC, 2013) aims to coordinate these forest-related policies and to identify the key principles that are needed to ensure the sustainability and multifunctionality of forests in Europe. The strategy will be reviewed in 2018 in order to assess progress in its implementation.

Figure 1 shows that the forest utilisation rate (the ratio between the fellings of trees and their annual growth) for the EU has remained relatively constant – around 65 % - during the period examined (1990–2010). On average, the indicator stayed well below 100 % indicating a sustainable use of production and use of forest resources.[1] (Forest Europe, 2015; EEA, 2016).

Figure 1. Forest utilisation rate, EU



Data sources: Forest Europe. Forest Europe 2015

Note: The indicator covers the following 26 EU countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

The forest utilisation rate reflects the development of fellings as well as the development of annual increment. Both components of the indicator have increased over the period examined (Forest Europe, 2015; EEA, 2016).

The forest area in the EU has increased by 13.1 million hectares (ha) (8.9 %) since 1990. The growing stock has also increased by 7.4 million m^3 (38 %) over the period examined (EEA, 2016). This increase in growing stock is not only linked to the increase in forest area but also to a number of other factors across the EU, in particular the high growing densities (m^3/ha) in Central Europe, the increased growth rates, low levels of harvesting and increased focus on multifunctional use of forests (ecosystem services from forests) (EEA, 2016).

The expected trend to 2020 in the EU is an overall increased use of renewable materials and energy (EC, 2016). This could potentially lead to the use of more wood extracted from forests in the EU. There is nevertheless no evidence that this has happened in Europe so far (UNECE and

FAO, 2011b). The forest area is expected to remain stable or slightly increase (UNECE and FAO, 2011b). This means that the growing stock is also expected to stay relatively stable overall, albeit with regional differences. By 2020, the expected trend may be a slight increase in the forest utilisation rate indicator, mainly because of increased fellings due to the maturing age structure of forests in Europe and the increased demand for wood for energy purposes. Overall, despite expected increased fellings of forests, the forest utilisation is expected to remain by 2020 to less than 100 %, so it is considered sustainable.

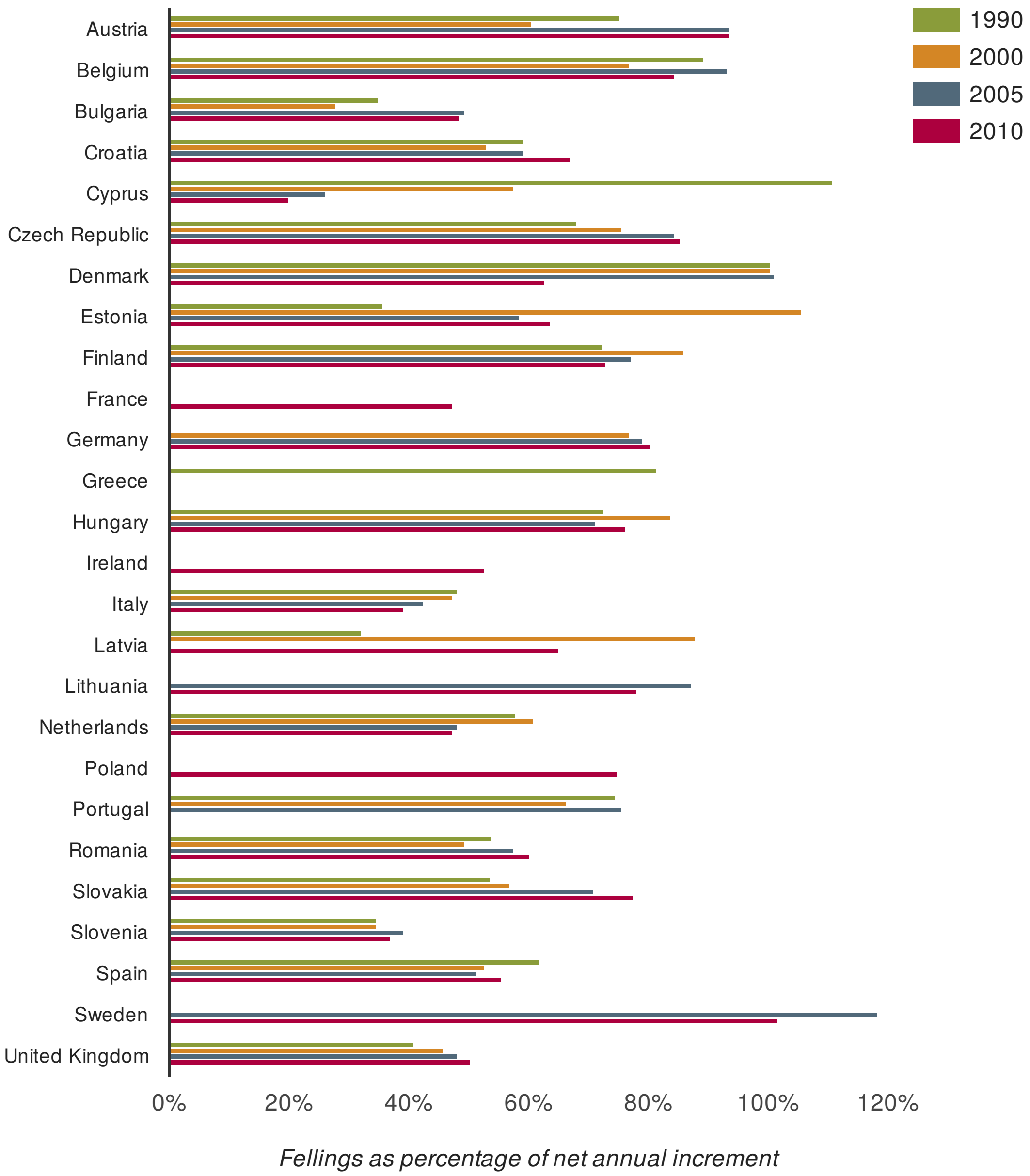
Country level information

A total of 26 EU countries reported on their forest utilisation rates during the 1990–2010 period (UNECE and FAO, 2011a and Forest Europe, 2015). The information underpinning this indicator has not been updated since 2010. In most countries that reported their forest utilisation rate, it remained below 100 % for the 1990–2010 period (Figure 2).

Forest utilisation rates vary widely across the countries and over time, from 20 % to more than 100 %. Some countries have experienced severe storms in recent decades, which caused large natural losses as well as reductions in increment. This partly explains some of the high utilisation rates of some countries.

It should be stressed that medium- or short-term exceedance of the forest utilisation rate does not necessarily mean that the use of forest resources is unsustainable, as it may reflect severe storms or the harvesting of mature forests, for example. From a sustainable forest management perspective, it is the long-term utilisation rate of forests that should stay below 100 %.

Figure 2. Forest utilisation rates, by country



Data sources: a. Forest Europe. Forest Europe 2015 b. EEA – Indicator SEBI017

Outlook beyond 2020

Overall, the expected outlook is a slightly increased forest utilisation rate; however, it is not expected to increase beyond 100 % in the long term (UNECE and FAO, 2011a). The outlook for the forest utilisation rate will depend on the demand for biomass as a renewable energy source (UNECE and FAO, 2011b). Biomass energy demand is expected to increase beyond 2020 as part of the EU's efforts to transition to a low-carbon economy by 2050 (EC, 2011) and in line with the 7th EAP's 2050 low-carbon economy vision.

An increased demand for biomass could increase the demand for wood and, hence, the utilisation rate (Berndes et al., 2016). However, some stakeholders consider that the use of wood directly from the forest for renewable energy may be neither carbon neutral nor an efficient use of this resource (Berndes et al., 2016) and this may run counter to a potential increase in demand for wood energy. It is also likely that wood use would be more efficient within a circular economy, in which nothing is wasted (EC, 2015). The EU's ambition to move towards a circular economy may, therefore, lead to less forest fellings for timber and fuel (Berndes et al., 2016).

Climate change is also a factor that will affect the composition and distribution of current forest resources. Desertification is expected to spread in the south of Europe while forest cover is projected to increase with higher altitudes and latitudes (EEA, 2017). The resulting impact of climate change on forest utilisation rates has not been explored.

About the indicator

The forest utilisation rate is the ratio between the annual volume felled and the volume of annual growth in the stock of living trees. The ratio is used widely to assess the current and future availability of wood. A ratio below 100 % indicates that the growing stock, the timber reserve, is stable. In the long term, the volume felled must not exceed the volume of growth. However, the indicator needs cautious interpretation, as it depends directly on the volume of annual growth.

Average annual increment is calculated as the increase in growing stock volume over a year. An increase in growing stock results from maturing forests and an increase in forest area. The correct assessment of the volume of growing stock in Europe should be based on additional information on diameter and/or age class distributions, which are not available in a harmonised way at European level; for example in some countries the measurement of increment includes only growth on trees with a diameter larger than 10 centimeters. In addition, natural losses are excluded from the annual increment while the fellings of these natural losses are not. There is therefore a need for further development of this indicator.

Furthemore, the forest utilisation rate indicator only partly describes sustainable forest management (see the setting the scene section for a definition of sustainable forest management).

The indicator has no link to biodiversity as it does not indicate whether or not biodiversity and forest ecosystem services are protected or maintained. Aspects of forest biodiversity are included in the EU protected species briefing (AIRS_PO1.7, 2017), the EU protected habitats briefing (AIRS_PO1.8, 2017) and the Common birds and butterflies briefing (AIRS_PO1.6, 2017). The indicator indirectly relates to an increased stock of carbon in forest biomass, which is a service provided by forests that mitigates climate change.

Footnotes and references

[1] It should, however, be noted that although this rate indicates a sustainable production and use of forest resources, other aspects of forest's status captured through other indicators give rise to concern. For example, climate change, pollution and encroaching human development are posing an increased threat to the long term stability and health of European forests and a high proportion of forest species and habitats' assessments (see AIRS PO1.7 and PO1.8, 2017) remain in an unfavourable conservation status.

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Environmental indicator report 2017 – In support to the monitoring of the 7th Environment Action Programme, EEA report No21/2017, European Environment Agency

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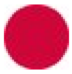
Natural capital

Marine fish stocks

Indicator	EU indicator past trend	Selected objective to be met by 2020	Indicative outlook of the EU meeting the selected objective by 2020
Status of marine fish stocks		Ensure healthy fish stocks — Common Fisheries Policy and Marine Strategy Framework Directive	

The EU is improving the state of its commercial fish and shellfish species in only North-east Atlantic and Baltic waters. As the objective of healthy commercial fish and shellfish populations applies to all marine waters, it is unlikely that it will be met by 2020

For further information on the scoreboard methodology please see Box I.3 in the EEA Environmental indicator report 2017

The Seventh Environment Action Programme (7th EAP), in line with the Marine Strategy Framework Directive (MSFD), requires the EU to meet its 2020 objective of achieving good environmental status (GES) of the marine environment, which means that the different uses made of Europe's seas are conducted at a sustainable level. Fishing is one of the main pressures affecting GES, in particular the state of commercial fish and shellfish species. Historically, fishing beyond sustainable levels has made it difficult to reach the objective of healthy fish and shellfish populations. Currently, around 74 % of fish and shellfish stocks in Europe's seas are not in GES when assessing both the level of fishing mortality and reproductive capacity; this assessment does not yet include the third GES criterion on age and size structure of the populations as this cannot be assessed at present. The situation has started to improve, albeit with strong regional differences. In the North-East Atlantic Ocean and the Baltic Sea, clear signs of the recovery of fish and shellfish stocks have been visible since the early 2000s. In the Mediterranean and Black Seas, the situation remains critical given the prevalence of overfishing, and a significant lack of knowledge on the status of fish and shellfish stocks. Given this context, the 2020 objective of healthy fish and shellfish populations is unlikely to be met for all of Europe´s seas, and further collective action is required.

Setting the scene

The 7th EAP stipulates that the EU shall ensure that by 2020 the impact of pressures on all marine waters is reduced to achieve or maintain GES, as required by the MSFD (EU, 2013a). Fishing is one of the main pressures affecting the marine environment, in particular the state of commercial fish and shellfish species. Ensuring healthy fish and shellfish populations is essential for well-functioning ecosystems, but also to sustain fishing as a source of healthy food in the long term.

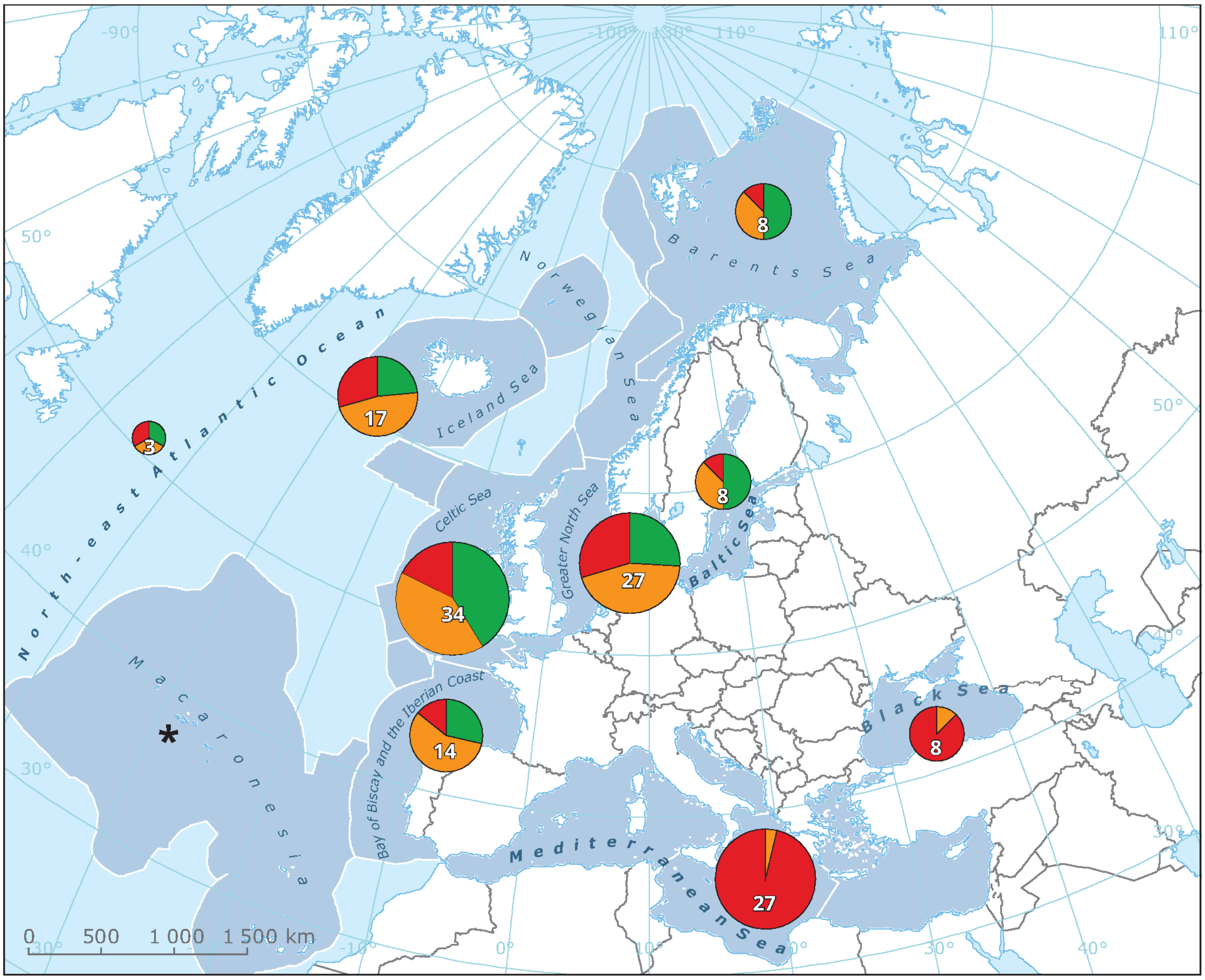
Policy targets and progress

Safeguarding healthy commercial fish and shellfish populations is one of the 11 descriptors of the MSFD (EU, 2008) for achieving GES. This objective is closely related to the objectives of the new Common Fisheries Policy (CFP) (EU, 2013b), in particular the objective of ensuring the maximum sustainable yield (MSY) for all stocks by 2015 where possible, and at the latest by 2020[1].

Currently, around 74 %[2] of the assessed fish and shellfish stocks in Europe's seas are not in GES, whereas only 26 % are in GES when assessing both the level of fishing mortality and reproductive capacity (EEA, 2017); this assessment does not include the third GES criterion on age and size structure of the populations as this cannot be assessed at present. In addition, there are strong regional differences, as shown in Figure 1.

Approximately 78 % of the stocks in the North East Atlantic (i.e. Barents Sea, Bay of Biscay, Celtic Sea, Greenland Sea, Iceland Sea, North Sea and Norwegian Sea) and the Baltic Sea meet at least one of the two GES criteria (fishing mortality and reproductive capacity) while 34 % are in GES according to both of these criteria. The status of fish and shellfish stocks is especially critical in the Mediterranean and Black Seas where only 6 % are in GES, a figure only based on one criterion (fishing mortality).

Figure 1. Status of fish and shellfish stocks in regional seas around Europe



Status of the assessed European fish stocks in relation to Good Environmental Status (GES) per regional sea

Stocks for which information to determine GES is available for:

- stocks in GES in relation to the criteria of fishing mortality and of reproductive capacity
- stocks in GES in relation to the criteria of either fishing mortality or reproductive capacity
- stocks not in GES in relation to neither of the criteria of fishing mortality and of reproductive capacity

5 Total number of assessed fish stocks

Note:

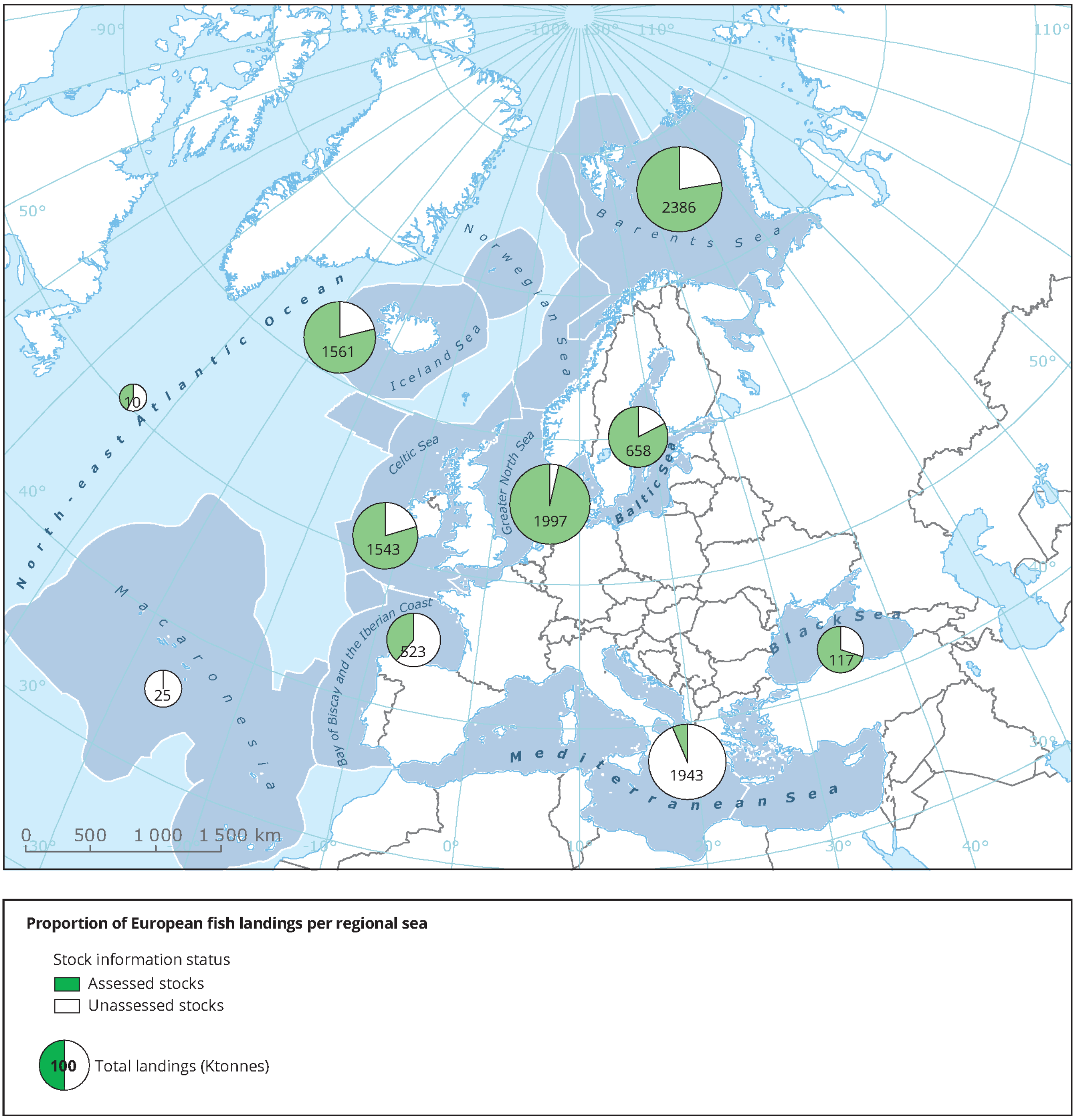
*: GES could not be calculated for the Azores as it only concerns unassessed stocks.

Sources: North-East Atlantic Ocean and Baltic Sea stock assessments provided by ICES; Mediterranean and Black Sea stock assessments provided by STECF.

Note: This figure shows the proportion of assessed stocks per regional sea that are in good environmental status (GES). The numbers on the charts indicate the number of fish and shellfish stocks. Status refers to fishing mortality (F) and reproductive capacity (SSB) criteria, as defined by Commission Decision 2017/848/EU, which sets criteria and methodological standards on GES of marine waters. The GES criterion on healthy age- and size-distribution cannot be assessed at present. Stocks in the Northeast Atlantic and Baltic waters were assessed based on advice from the International Council for the Exploration of the Sea (ICES) for 2016. Stocks in the Mediterranean and Black seas were assessed based on information from the Scientific, Technical and Economic Committee for Fisheries (STECF) for 2016.

Moreover, a lack of information on the status of stocks was observed for a large (33 %) proportion of fish stocks (EEA, 2017). Figure 2 shows that there are also strong regional differences in terms of availability of information. An assessment of status is not possible for 90 % of the total landings from the Mediterranean and Black Seas, compared with 20 % of those from the North-East Atlantic Ocean and Baltic Sea (EEA, 2017).

Figure 2. Proportion of fish and shellfish landings with Good Environmental Status information



Sources: Catch statistics North-East Atlantic Ocean and Baltic Sea provided by ICES; Catch statistics Mediterranean and Black Sea provided by FAO; North-East Atlantic Ocean and Baltic Sea stock assessments provided by ICES; Mediterranean and Black Sea stock assessments provided by STECF. It should be noted that FAO and ICES receive their catch statistics from Eurostat (http://ec.europa.eu/eurostat/web/fisheries/data/database).

Note: This figure shows the proportion of commercial fish and shellfish landings per regional sea with GES assessment information, as defined by Commission Decision 2017/848/EU, which sets criteria and methodological standards on the GES of marine waters. GES assessment information relates to fishing mortality (F) and reproductive capacity (SSB) criteria, since the criterion on healthy age- and size-distribution cannot be assessed at present. Landings data for all fish and shellfish stocks are from 2014, given the availability of data for the Mediterranean and Black Seas.

It is clear that the overall use of fish and shellfish stocks in Europe currently remains beyond the limit for long-term environmental sustainability. Nevertheless, historical trends in fish landings show that total landings in Europe's seas reached a peak in the mid-1970s, but have been mostly declining ever since (Pastoors and Poulsen, 2008; Gascuel et al., 2014).

Important signs of improvement are being observed in the North-East Atlantic Ocean and Baltic Sea. Since the early 2000s, better management of fish and shellfish stocks has contributed to a clear decrease in fishing pressure in these two regional seas (EEA, 2015; EC, 2015). Between 2002 and 2015, the number of stocks exploited at sustainable levels (i.e. fishing at or below MSY in accordance with the fishing mortality or the reproductive capacity criteria) increased from 2 to 26 (EC, 2015). Signs of recovery in the reproductive capacity of several fish and shellfish stocks have started to appear (EEA, 2017). If these efforts continue, meeting the 2020 objective for healthy fish and shellfish stocks in the North-East Atlantic Ocean and Baltic Sea could be possible based on two of the three criteria (i.e. fishing mortality and reproductive capacity). In contrast, there is little likelihood that the 2020 policy objective will be met in the Mediterranean and Black Seas (EC, 2015). This is because of fishing pressures, significant lack of knowledge on the status of fish and shellfish stocks and the difficulties in the Mediterranean Sea in adopting management measures for a single stock due to the high multi-specificity of Mediterranean catches. Given this, and despite the EU's commitment to ensuring better governance for sustainable fisheries in the Mediterranean region, the 2020 objective of healthy commercial fish and shellfish populations is unlikely to be met for all marine waters and further collective action is required.

Outlook beyond 2020

Fishing management measures, when effectively implemented, can have a positive effect on the state of fish and shellfish stocks, as can be seen in the North-East Atlantic Ocean and Baltic Sea. However, ensuring healthy fish and shellfish populations does not depend solely on fishing at environmentally sustainable levels, although it is a necessary condition. Healthy fish populations depend on healthy marine ecosystems but, today, our use of Europe's seas and their natural capital is not sustainable (EEA, 2015). Europe's marine ecosystems continue to display symptoms of degradation and loss of resilience, which will be exacerbated by the effects of climate change. These systemic changes are still complex and to a large extent poorly understood, but they are closely linked to the loss of biodiversity. Without an integrated approach to the management and protection of Europe's seas — which would make ecosystem-based management a reality, as required by both the MSFD and the CFP — the outlook beyond 2020 for productive seas and healthy fish and shellfish populations is a cause for concern.

About the indicator

The indicator assesses the status of fish and shellfish stocks in Europe's regional seas, which represent the populations of commercial fish and shellfish species, in relation to their GES. The indicator also provides an overview of the availability of information to provide a GES analysis. The indicator follows the GES methodological standards as currently defined by Commission Decision 2017/848/EU (EC, 2017). It measures GES by assessing two criteria — the level of fishing mortality (i.e. fishing pressure) and the reproductive capacity of fish stocks (i.e. spawning stock biomass) — against their sustainable reference levels (i.e. MSY or a proxy). The third GES criterion on healthy age and size distribution cannot be assessed at present. The indicator reflects the current level of implementation of the MSFD and data availability for an assessment at the EU level.

Footnotes and references

[1] According to Annex I, populations of all commercially exploited fish (and shellfish) are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock no later than 2020. Likewise, the scope of the CFP includes the conservation of marine biological resources and the management of fisheries targeting them. To that end, the CFP should adapt exploitation rates so as to ensure that, within a reasonable time-frame, the exploitation of marine biological resources restores and maintains populations of harvested stocks above levels that can produce the Maximum Sustainable Yield (MSY). This should be achieved by 2015 or no later than 2020.

[2] This estimate cannot be compared with the estimate provided in the 2016 version due to (i) methodological improvements on handling widely distributed stocks (in the most recent version catches for stocks that cover more than one ecoregion have been redistributed over the different ecoregions whereas stock information on the GES criteria has been attributed to all ecoregions the stock is part of) and (ii) working with updated (the most recent version of the ICES Stock database for the North East Atlantic and Baltic Sea) and different (STECF Mediterranean and Black Sea Working Group Reports for the Mediterranean and Black Sea) data sources.

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Gascuel, D., Coll, M., Fox, C., Guénette, S., Guitton, J., Kenny, A., Knittweis, L., Nielsen, J. R., Piet, G., Raid, T., Travers-Trolet, M. and Shepard, S., 2014, 'Fishing impact and environmental status in European seas: a diagnosis from stock assessments and ecosystem indicators', Fish and Fisheries, pp. 93–104.

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Natural capital

Common birds and butterflies

Indicator	Indicator past trend		Selected objective to be met by 2020	Indicative outlook of the EU meeting the selected objective by 2020
	EU	EEA		
Abundance and distribution of selected species (common birds and grassland butterflies)	Common birds Grassland butterflies	Common birds	Meet the headline target of the EU Biodiversity Strategy: to halt the loss of biodiversity and the degradation of ecosystem services and restore them in so far as is feasible	
It is highly unlikely that the objective will be achieved by 2020 given the continuing declining trends apparent for certain groups, such as common farmland birds and grassland butterflies For further information on the scoreboard methodology please see Box I.3 in the EEA Environmental indicator report 2017				

The Seventh Environment Action Programme (7th EAP) states that, by 2020, the loss of biodiversity and the degradation of ecosystem services should be halted. Population trends in common birds and grassland butterflies are among the key indicators in monitoring this. Between 1990 and 2014, common bird populations decreased by around 13 % in the EU. A significant decline of 32 % is also apparent for grassland butterflies.

The main reasons for the continued decline in these species' populations are changing rural land use, the intensification and specialisation of farming or land abandonment in areas with natural constraints.

Since 1990, there has been a continuing marked downward trend in populations of common farmland birds and grassland butterflies in the EU. Although the decline of all common birds has levelled off since 2000, no trend towards recovery has been observed, which signifies that loss of biodiversity has not been halted. Based on these historical trends and despite the increased introduction of biodiversity measures into the Common Agricultural Policy and the efforts already captured under the Nature (Birds and Habitats) Directives and the EU Biodiversity Strategy, it is highly unlikely that the objective will be achieved by 2020.

Setting the scene

The EU is losing biodiversity and the 7th EAP (EU, 2013) contains the objective of halting, by 2020, the loss of biodiversity and the degradation of ecosystem services, as well as restoring them in so far as is feasible. Biodiversity is not only important in its own right, it also provides society with a wide range of ecosystem services upon which we depend, such as food, freshwater, pollination etc. This briefing examines trends in populations of common birds and grassland butterflies. These are considered to be excellent barometers of the overall biodiversity and of the health of ecosystems, as they occur in many habitats and are sensitive to environmental change (EEA, 2017). For aspects of legally protected species and habitats, see the briefings on EU protected species (AIRS_PO1.7, 2017) and habitats (AIRS_PO1.8, 2017).

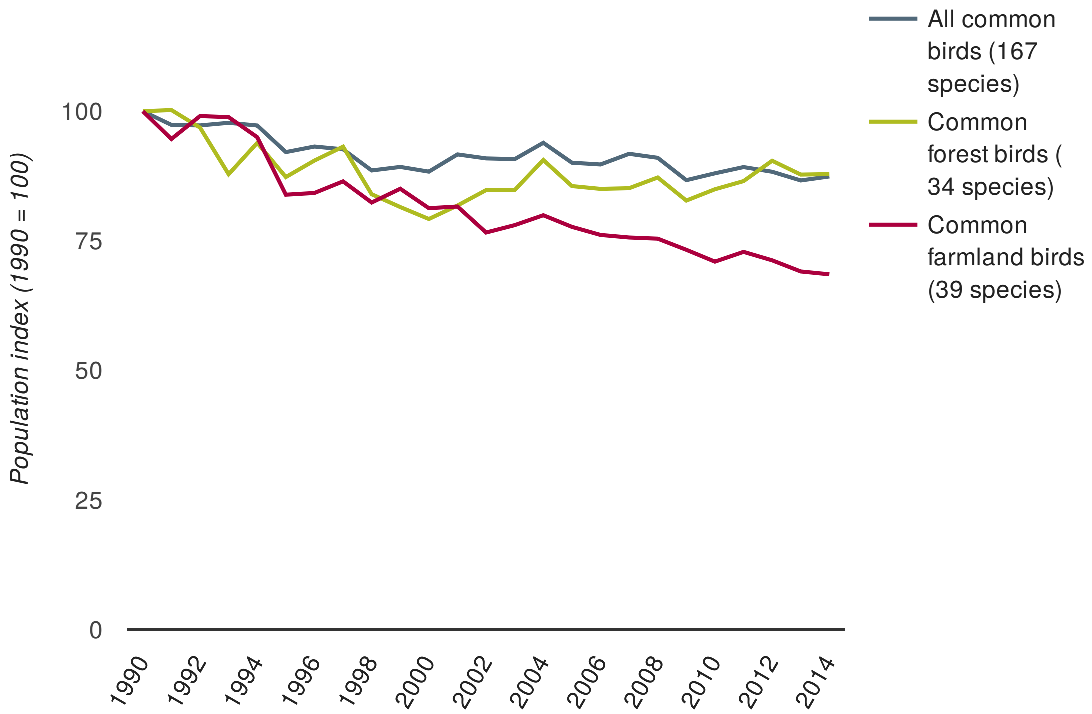
Policy targets and progress

Halting and reversing the loss of biodiversity and the degradation of ecosystem services by 2020 is the central aim of the EU Biodiversity Strategy (EC, 2011). This aligns with the 7th EAP objective of halting, by 2020, the loss of biodiversity and the degradation of ecosystem services.

Figure 1 shows that common bird populations decreased in the EU between 1990 and 2014 by around 13 %. The indicator assesses 167 common bird species including farmland and forest species (EEA, 2017). The decline of common farmland birds was more pronounced at 31.5 %, whereas common forest birds declined by 13 % over the 1990-2014 period. Although the decline of all common birds has levelled off since 2000, no trend towards recovery has been observed. The trends remain very similar when Norway and Switzerland, two other EEA member countries for which data are available, are included in the indicator coverage; for more information see the EEA indicator: abundance and distribution of selected species (EEA, 2017).

The common birds indicator takes 1990 as a starting point. It should be borne in mind, however, that significant losses had already occurred before this date.

Figure 1. Long term trends for common bird species, EU

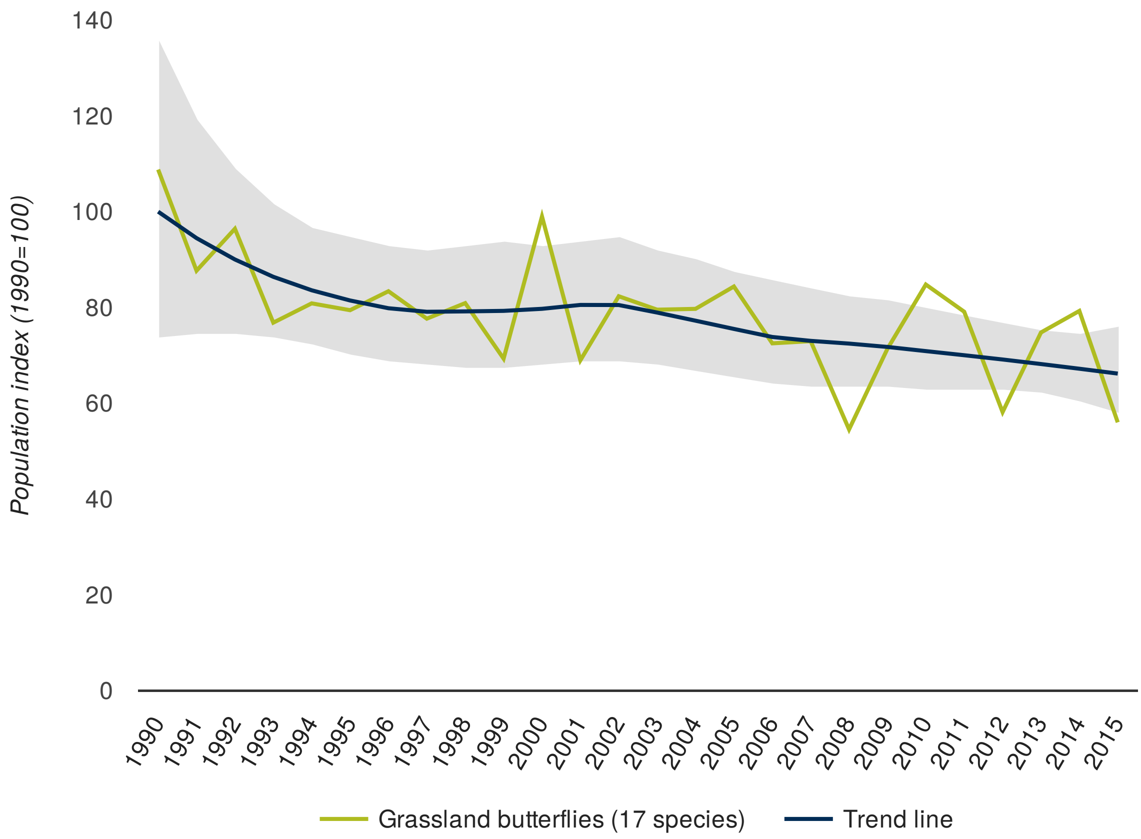


Data sources: a. EBCC. Common Birds in Europe, population index b. EEA – Indicator CSI050

Note: Croatia and Malta are not included in the EU total due to lack of data.

The negative trend in farmland-related biodiversity is supported by the population index of 17 grassland butterfly species, with a high sensitivity to habitat degradation and loss – see Figure 2. In spite of year-to-year fluctuations, which are typical features of butterfly populations, grassland butterfly numbers are declining significantly. Populations have decreased by around 32 % between 1990 and 2015.

Figure 2. Long term trends for grassland butterflies in 15 EU countries



Data sources: a. BCE. European Butterfly Indicator for Grassland species b. EEA – Indicator CSI050

Note: The shaded area represents 'confidence limits'.

The long-term trends for common farmland birds and forest birds, as well as grassland butterflies, as shown in Figures 1 and 2, demonstrate that the EU has experienced a major decline in biodiversity associated with agro-ecosystems and grasslands (EEA, 2015). This was primarily due to habitat change — including loss, fragmentation and degradation — of natural and semi-natural habitats. The habitat change was mainly caused by homogenisation and loss of habitat as a result of agricultural intensification and land abandonment, intensely managed forests and some loss of habitats to urbanisation (EEA, 2015).

This negative trend shows no sign of changing, despite progress in enacting and implementing European policies (such the Birds and Habitats Directives (EU, 1992 and 2009) and the Water Framework Directive (EU, 2000)), as well as the environmental measures within the Common Agricultural Policy (CAP).

To date the CAP has not influenced agricultural practices enough to reduce overall loss of biodiversity. The outcomes of the latest Habitats Directive reporting round demonstrate the lack of any substantial progress in the conservation status of natural and semi-natural grasslands targeted by the Directive. The vast majority of assessments of the conservation status of agricultural habitats, as well as of woodland and other forest habitats, remain unfavourable (AIRS_PO1.8, 2017).

The environment-related elements set out in the EU reform package, in particular for EU agriculture and cohesion policies, backed by the initiatives for greening the EU budget under the Multi-Annual Financial Framework 2014–2020, are designed to support these objectives. Greening of the CAP aims to promote environmentally beneficial agricultural and forestry practices such as crop diversification, the protection of permanent grassland and grazing land, and sustainable agroforestry. Rural Development Programmes 2014–2020 address restoring, preserving and enhancing ecosystems through payments to cover the cost of farmers adopting environment- and climate-friendly land management practices.

The mid-term review of the EU Biodiversity Strategy comprehensively assessed progress towards the headline target (and towards all six targets) and concluded that the EU is not on track to meet the objective of halting biodiversity loss and the degradation of ecosystem services by 2020 (EC, 2015). Despite environmental measures implemented so far, the continuing declining trends apparent for regularly monitored groups, such as grassland butterflies and farmland birds, illustrate well that it is highly unlikely that the objective will be achieved by 2020.

Outlook beyond 2020

It is difficult to forecast how soon biodiversity, as illustrated by the abundance of bird and grassland butterfly populations, will recover, as their state is influenced by a complex combination of environmental factors and policy measures. Substantial positive impacts of the CAP reform and the measures anticipated under the Multi-Annual Financial Framework 2014–2020 on common species associated with farmland might become visible in the 2020–2030 period, as long as these policies are implemented thoroughly and on a large scale throughout the EU. On the other hand, other factors that could adversely impact the outlook beyond 2020 include the negative impact of climate change on biodiversity and ecosystems, particularly on these specialist species groups that are dependent on non-intensive agriculture and forest ecosystems. The increased competition for land could also intensify agricultural production in the EU, through land take via urbanisation (AIRS_PO1.3, 2017), as well as for the production of renewable energy and biofuels (AIRS_PO2.6, 2017).

About the indicator

This indicator shows trends in the abundance of common birds and grassland butterflies over time across their European distribution. It is an index indicator (relative values, 1990 set to 100). Birds and butterflies are excellent barometers of the overall health of ecosystems, mainly because they occur in many habitats and are sensitive to environmental change. The data collection methods are scientifically sound, and birds and butterflies are familiar groups of species well known to the public. It should nevertheless be noted that butterfly monitoring has a relatively limited – albeit consistently increasing – geographical coverage, with data currently available from 15 EU countries (Belgium, Estonia, Finland, France, Germany, Ireland, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, and the United Kingdom).

Footnotes and References

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EU, 2009, Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (OJ L 20, 26.1.2010, p. 7–75).

EU, 2013, Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 ‘Living well, within the limits of our planet’, Annexe A, paragraph 28a (OJ L 354, 28.12.2013, p. 171–200).

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AIRS_PO1.8, 2017, EU protected habitats, European Environment Agency.

AIRS_PO1.3, 2017, Urban land take, European Environment Agency.

AIRS_PO2.6, 2017, Renewable energy sources, European Environment Agency.

> Environmental indicator report 2017 – In support to the monitoring of the 7th Environment Action Programme, EEA report No21/2017, European Environment Agency

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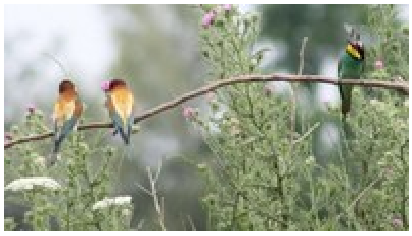
Natural capital

EU protected species



Indicator	EU indicator past trend		Selected objective to be met by 2020	Indicative outlook of the EU meeting the selected objective by 2020
Species of European interest	*Birds* ▲	*Other species* ▲	Ensure that 34.5 % of species assessments under the Habitats Directive are in a favourable or improved conservation status, and that 78 % of species assessments under the Birds Directive show a secure or improved status — EU Biodiversity Strategy.	●

The EU has shown limited progress in improving the conservation status of EU protected species and the pressures on species remain. It is therefore unlikely that the 2020 target will be met

For further information on the scoreboard methodology please see Box I.3 in the EEA Environmental indicator report 2017

The Seventh Environment Action Programme (7th EAP) includes the objective of halting biodiversity loss and the degradation of ecosystem services by 2020. Preserving and restoring species of European interest is a key element in this. The overall aim of the EU Birds and Habitats Directives — the cornerstones of EU biodiversity legislation — is to ensure that species of European interest are in a good status. According to the EU Biodiversity Strategy to 2020, 34.5 % of species assessments (under the Habitats Directive) should be in a favourable or improved conservation status [1] and 78 % of birds assessments (under the Birds Directive) should show a secure or improved status. The latest assessments (from 2007–2012), show that 28 % of species assessments are in favourable status or have shown improvement compared with the 2001-2006 assessment period, while 61 % of bird species assessments have a secure or improved status. Also, during the 2007-2012 period, and for all the taxonomic groups, the number of species assessments whose status has been deteriorating was higher than that for which the status has been improving.

Overall, despite the recovery of some species due to dedicated conservation efforts and improved site management, species continue to face pressures including habitat loss and modification, and pollution arising from factors such as agriculture. It is therefore unlikely that the 2020 target will be met.

Setting the scene

The 7th EAP (EU, 2013) includes the objective of halting the loss of biodiversity and the degradation of ecosystem services by 2020. Preserving and restoring species of European interest, which constitute an important part of the EU's biodiversity, is a key element, not only for the intrinsic value of these protected species, but also because protecting their habitats supports a wider range of biodiversity and contributes to ensuring the continued delivery of ecosystem services — water purification, pollination, recreation etc. — which benefit EU citizens.

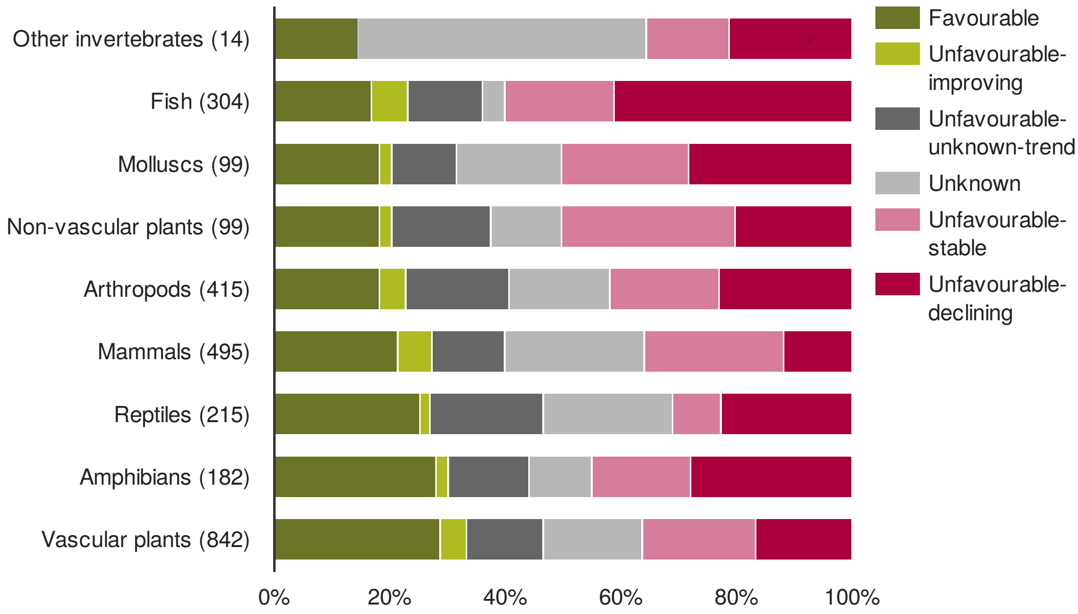
Policy targets and progress

In line with the 7th EAP objective, the overall aim of the EU Biodiversity Strategy (EC, 2011) includes halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020. The EU Birds and Habitats Directives (EU, 1992 and 2009) aim to ensure that species of European interest are maintained or restored to good status throughout their natural range within the EU. Target 1 of the Biodiversity Strategy sets out the specific goal that, by 2020, 34.5 % [1] of species assessed under the Habitats Directive should have a favourable or improved conservation status, and that 78 % of species assessed under the Birds Directive should have a secure or improved status.

The latest assessments for the conservation status and trends for species under the Habitats Directive (covering the 2007–2012 period) show that the total proportion of these species having either favourable (23.1 %) or improved (4.7 %) status was 28 %, compared with the 2001-2006 period. A total of 22 % are still deteriorating and 17.1 % are without a known trend (EEA, 2015a).

As can be seen in Figure 1, the majority of species are assessed as being in unfavourable status (60 %). For all taxonomic groups, moreover, the number of species whose status is deteriorating is significantly higher than those whose status is improving towards favourable status. The largest negative trend is observed in fish, molluscs and amphibians. With more than 66 % of assessments categorised as ‘unknown’ and only 7 % as favourable, the status of marine species gives rise to particular concern.

Figure 1: Conservation status and trends for species assessed as unfavourable under the Habitats Directive (2007-2012), EU



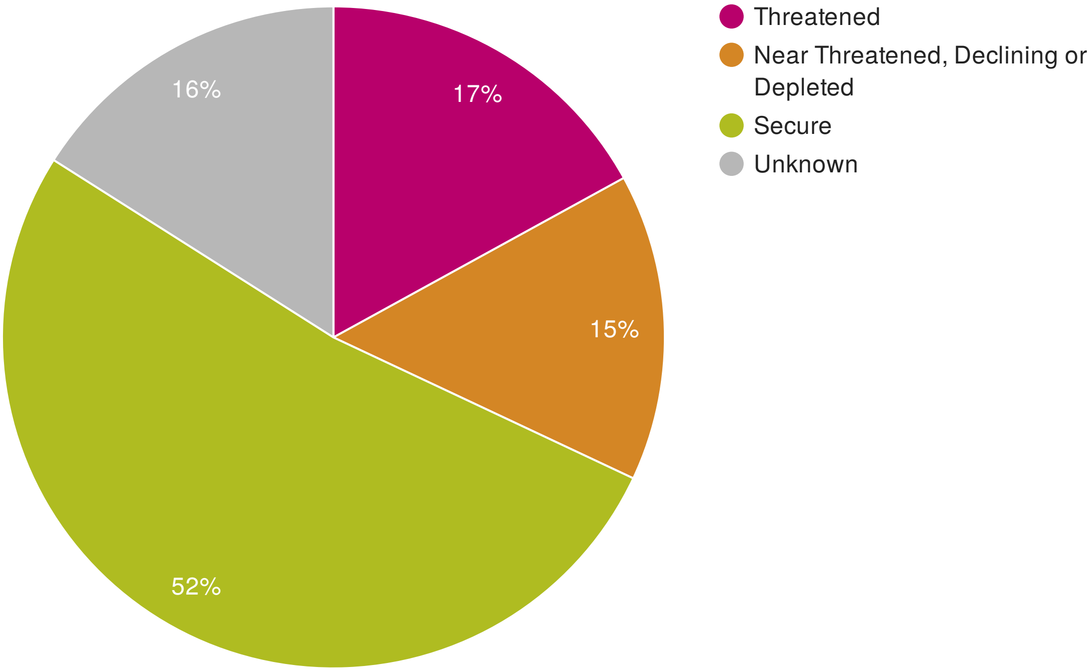
Data sources: a. DG ENV. Conservation status of habitat types and species (Article 17, Habitats Directive 92/43/EEC)
b. EEA. Conservation status of habitat types and species (Article 17, Habitats Directive 92/43/EEC)
c. EEA – Indicator CSI007

Note:
The number of assessments is indicated in parenthesis and does not include assessments from Greece. The total number of assessments is 2 665.

For birds, the latest assessments (for the 2008-2012 period compared to the 2004 baseline, (BirdLife International, 2004)) show that the total proportion of species assessments with either secure status (52 %) or non-secure but improving status (8.5 %) was around 61 % of species (the target for 2020 is 78 %). The proportion of secure species did not change compared with the assessment in 2004 (EC, 2015; EEA, 2015a).

The EU population status of bird species (see Figure 2) indicates that around 15 % are near threatened, declining or depleted, while another 17 % of species are threatened. It should also be noted that the EU population status for another 16 % of bird species remains unknown. Populations of some common birds appear to be stabilising but other species — especially those linked to wetlands, coastal and agricultural ecosystems — continue to decline (EC, 2015).

Figure 2: EU population status of bird species (2008–2012)



Data sources: a. EEA. Status and trends of bird populations (Article 12, Birds Directive 2009/147/EC)
b. DG ENV. Status and trends of bird populations (Article 12, Birds Directive 2009/147/EC)
c. EEA – Indicator CSI007

Note:
The total number of assessements is 447.

Overall, over the 2007–2012 period and for all taxonomic groups, the number of species assessments whose status has been deteriorating was higher than that for which the status has been improving.

Nevertheless, there has been limited progress, with the recovery of some species due to dedicated conservation efforts and improved site management. The EU-wide network of nature conservation areas (Natura 2000) has been expanded to cover 18 % of EU land and is now considered complete (the coverage of protected marine areas has increased to 6 % but still requires additional effort). Conserving and managing the Natura 2000 network effectively through implementation of conservation measures under the Birds and Habitats Directives is central to improving the conservation status of EU protected species. It is also important to enhance the network's coherence through developing green infrastructure, such as wildlife corridors.

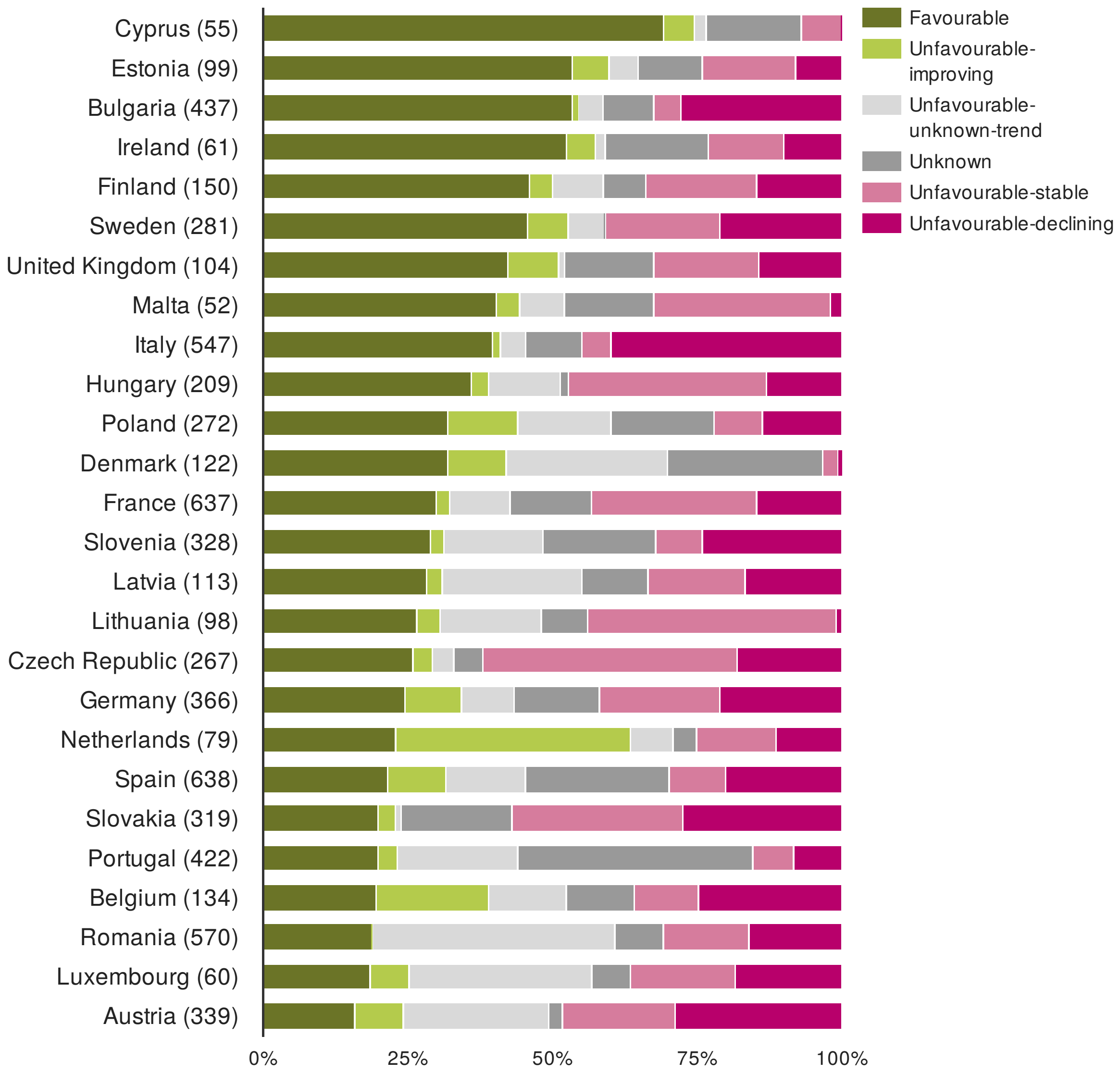
However, EU protected species continue to face many pressures: the highest ranked pressures and threats to terrestrial species are reported to be agriculture (including both intensification and abandonment) and changes to hydrology (especially in wetlands) (EEA, 2015a). Many of these threats and pressures arise from a wide range of sectors and policies (including agriculture, fisheries, forestry, transport etc.) and are expected to continue. Consequently, the fate of European biodiversity is closely intertwined with developments in these areas, including implementation of the Common Agricultural Policy reform. The adequate integration of biodiversity considerations into certain economic sectors and regional policies therefore remains critical in attempting to reduce pressures on biodiversity (EEA, 2015b).

Given the limited progress in improving the conservation status of species and the ongoing cumulative pressures on their habitats (AIRS_PO1.8, 2017), it is unlikely that the 2020 target will be met.

Country level information

At the EU Member States level, almost half of the countries have 30 % or less of species assessments considered as favourable, and only four Member States (Ireland, Bulgaria, Estonia and Cyprus) have more than 50 % of species assessments as favourable (see Figure 3). The proportion of species assessments classified as unfavourable–declining exceeds 20 % in nine countries: Austria, Belgium, Bulgaria, Germany, Italy, Slovakia, Slovenia, Spain and Sweden, while for Italy, up to 40 % of its species assessments are classified as unfavourable–declining (see Figure 3).

Figure 3: Conservation status and trends of species assessed under the Habitats Directive (2007-2012), by country



Data sources: a. EEA. Conservation status of habitat types and species (Article 17, Habitats Directive 92/43/EEC)
b. DG ENV. Conservation status of habitat types and species (Article 17, Habitats Directive 92/43/EEC)
c. EEA – Indicator CSI007

Note:
The number of assessments is indicated in parentheses. The total number of assessments is 6 759. Greece did not provide an Article 17 report.

Outlook beyond 2020

Dedicated conservation efforts under the Habitats and Birds Directives can be expected to result in the recovery of some species, but achieving favourable conservation status for all EU protected species in the longer term is very challenging. Many species are expected to continue their decline beyond 2020 since widespread pressures are expected to be ongoing (EEA, 2016a). Intensification of agriculture is expected to continue or increase in Eastern Europe, for example, and some pressures (including climate change and invasive alien species) are set to increase (EEA, 2016b). The fate of marine species is a particular concern given the high proportion of ‘unknown’ assessments and given also that a substantial increase in the network of marine protected areas still needs to be implemented.

About the indicator

This indicator (EEA, 2016b) covers the status of and trends in: (1) around 450 wild bird species that are naturally present in the EU (Birds Directive, EU, 2009); and (2) more than 1 250 other species of wild animals and plants (Habitats Directive, EU, 1992) considered to be rare, threatened or endemic. The protected species are often collectively referred to as species of European interest. They cover many taxonomic groups, trophic levels and habitats.

Conservation status of species under the Habitats Directive is assessed every 6 years (latest period 2007–2012) at the national and EU biogeographical levels. Population status of species of the Birds Directive is also assessed every 6 years (the first period 2008–2012 covered nevertheless 5 years) at the EU level.

Assessments cover the status of the species and their evolution during this period (trend). The indicator thus reflects combined results for both status and trend.

For bird species, the population status is categorised as ‘secured’, ‘near threatened, declining or depleted’, ‘threatened’ or ‘unknown’, and conservation trends (for ‘near threatened, declining or depleted’ and ‘threatened’ species) are categorised as ‘increasing’, ‘stable’, ‘fluctuating’, ‘deteriorating’, or ‘unknown’.

For other species, conservation status is categorised as ‘favourable’, ‘unfavourable–inadequate’, ‘unfavourable–bad’ and ‘unknown’, and conservation trends (for unfavourable assessments) as ‘unfavourable–improving’, ‘unfavourable–stable’, unfavourable–deteriorating’ and ‘unfavourable–unknown’.

Footnotes and references

[1] The official target is that 25 % of assessments must be favourable or improving. Due to changes resulting from better data or changes in methodology, the target has been ‘backcasted’ so that 34.5 % of assessments must be favourable or improving. See also page 146-148 in EEA, 2015a.

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Annual Indicator Report Series (AIRS)

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AIRS briefings

AIRS_PO1.8, 2017, EU protected habitats

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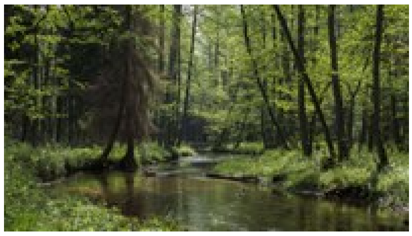
Natural capital

EU protected habitats



Indicator	EU indicator past trend	Selected objective to be met by 2020	Indicative outlook of the EU meeting the selected objective by 2020
Habitats of European interest	▲	Ensure that 34 % of habitat assessments under the Habitats Directive are in a favourable or improved conservation status — EU Biodiversity Strategy	●
The EU has shown limited progress in improving the conservation status of EU protected habitats and the pressures on these habitats remain. It is therefore unlikely that the 2020 target will be met For further information on the scoreboard methodology please see Box I.3 in the EEA Environmental indicator report 2017			

The Seventh Environment Action Programme (7th EAP) includes the objective of halting loss of biodiversity and degradation of ecosystem services by 2020. The Habitats Directive is one of the cornerstones of EU biodiversity legislation and aims to preserve and restore EU protected habitats. According to the Biodiversity Strategy to 2020, 34 % of habitat assessments should be in a favourable or improved conservation status by 2020. The latest assessment (from 2007-2012) shows that 16 % of the assessments of habitats have a 'favourable' conservation status, while 4 % of assessments have shown an improvement compared with the 2001-2006 assessment period and 30 % have declined. Overall, habitats continue to face pressures from, for example, land use change and pollution. In addition, habitat status often takes a long time to improve when conservation and other measures are first implemented. It is therefore unlikely that the 2020 target will be met.

Setting the scene

The 7th EAP (EU, 2013) includes the objective of halting loss of biodiversity and degradation of ecosystem services by 2020. Preserving and restoring the EU's protected habitats is a key element in achieving this. An EU-wide network of protected habitats in good conservation status is crucial, not only for the intrinsic value of these habitats and the species that depend on them, but also because protecting them is important to ensure provision of a wide range of ecosystem services —natural flood protection, air and water quality regulation, pollination, recreation, etc. — for the benefit of EU citizens.

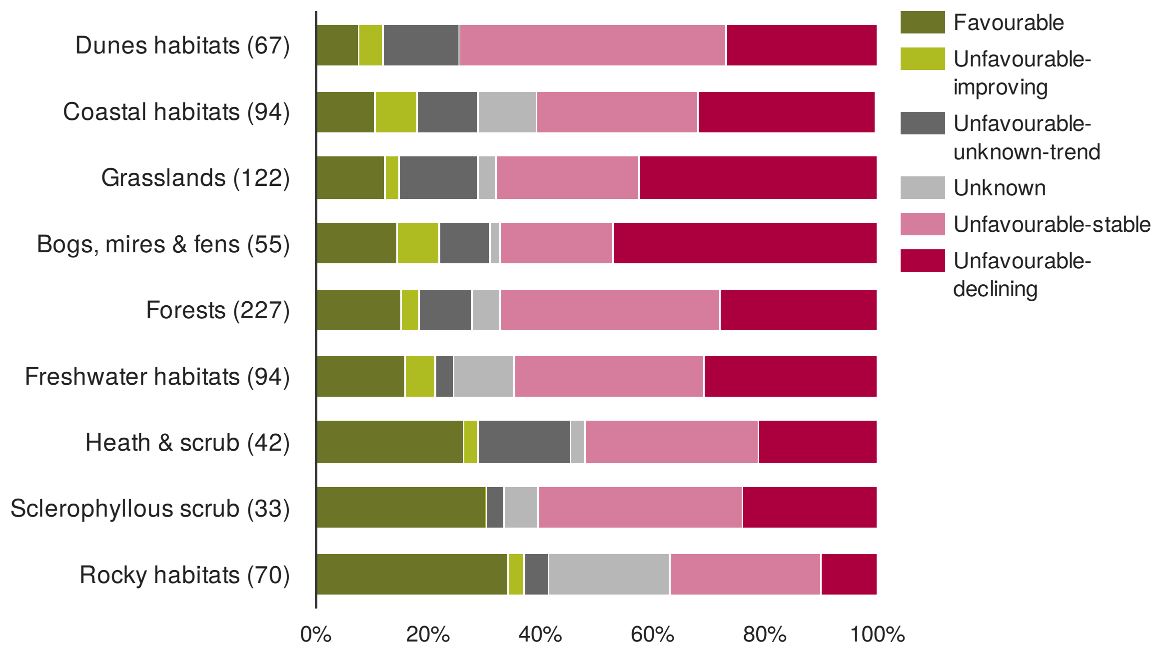
Policy targets and progress

In line with the 7th EAP objective, the overall aim of the Biodiversity Strategy to 2020 (EC, 2011) is to halt loss of biodiversity and degradation of ecosystem services in the EU by 2020. The Habitats Directive (EU, 1992) aims to ensure that the habitats of European interest are in a good status. Target 1 of the Biodiversity Strategy to 2020 sets out the specific goal that, by 2020, 100 % more habitat assessments under the Habitats Directive show a favourable or improved conservation status. In practice this means that, by 2020, 34 % of the Directive's habitat assessments should have either reached a favourable conservation status or shown a significant improvement in their status.

Overall results for conservation status and trends reported under the Habitats Directive (for the 2007–2012 period) show that only 16.4 % of habitat assessments have a favourable conservation status, while 77 % are unfavourable. Of the unfavourable assessments, only 4.4 % have improving trends compared with the 2001-2006 period, 33 % are stable and 30 % show ongoing deterioration. Consequently, only around 21 % of habitat assessments have reached the target condition, which is still some way short of the 2020 target of 34 % (EC, 2015; EEA, 2015a). For habitats associated with agricultural ecosystems (grassland), 39 % of assessments showed deterioration compared with the previous reporting period (EC, 2015).

Looking at conservation status by main habitat group (see Figure 1), favourable conservation status is lowest for dune habitats (mainly due to coastal development activities) and highest for rocky habitats (which are mostly in high mountain areas and therefore away from human activities). For conservation status trends, 'unfavourable and deteriorating' is particularly high for bogs, mires and fens, but also for grasslands. This is primarily due to conversion or drainage of bogs, mires and fens for agricultural and forestry purposes, past extraction of peat from bogs for energy production and abandonment or intensification of agricultural production in grasslands. Marine habitat assessments also give cause for concern: only 9 % were in a favourable conservation status, 66 % were considered to be in an unfavourable status and 25 % were categorised as having ‘unknown’ status. However, it should be noted that the number of marine habitats covered under this Directive is very low.

Figure 1. Conservation status and trends of habitats assessed under the Habitats Directive (2007-2012), EU



Data sources: a. DG ENV. Conservation status of habitat types and species (Article 17, Habitats Directive 92/43/EEC)
b. EEA. Conservation status of habitat types and species (Article 17, Habitats Directive 92/43/EEC)
c. EEA – Indicator SEBI005

Note:
The number of assessments is indicated in parentheses. The total number of assessments is 804, and does not include assessments from Greece.

Overall, despite limited progress the conservation status of EU protected habitats deteriorated, with more declining than improving habitat assessments in the 2007-2012 reporting period. It is also worthwhile noting that habitats of European interest show a worse conservation status and trend than species of European interest (AIRS_PO1.7, 2017).

Several factors contribute to this overall picture.

First, habitat restoration can often take a long time to get from the initial implementation of measures to the achievement of tangible improvement in conservation status. A key component in the implementation of the Habitats and Birds Directives is the Natura 2000 network, an EU-wide network of nature conservation areas. The terrestrial Natura 2000 network designation is now considered largely complete (18 % of EU land). The coverage of protected marine areas has increased to 6 % but still requires substantial additional effort. The effective management and restoration of Natura 2000 sites is central to improving the conservation status of habitats. In 2012, however, only 58 % of Natura 2000 sites had management plans, or had such plans in development (EEA, 2015a). Similarly, other measures that can benefit conservation status are still being implemented across the EU, e.g. policy measures anticipated under the Birds and Habitats Directives, the Common Agricultural Policy reform and the increased integration of biodiversity objectives in the EU’s financial instruments.

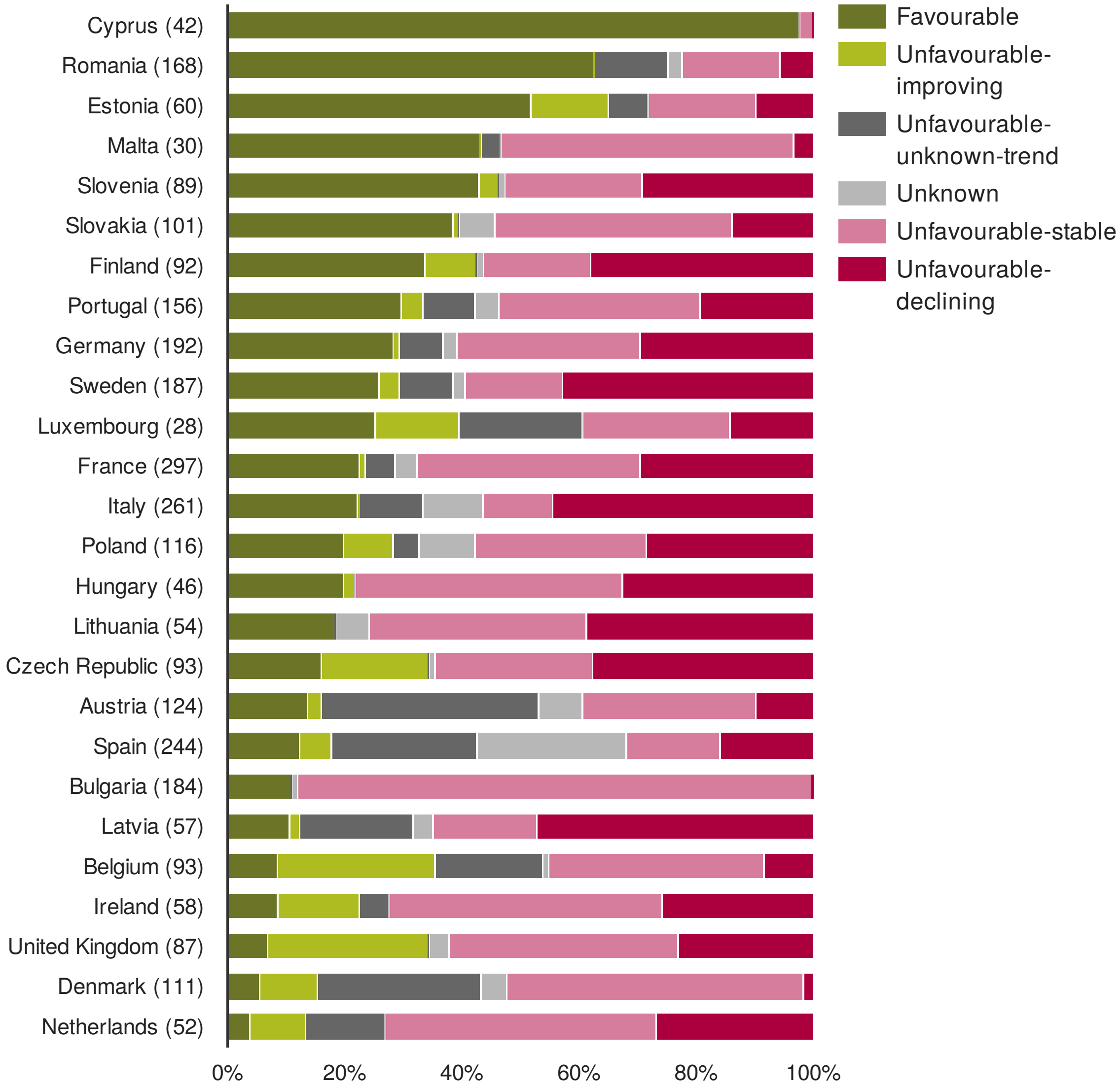
Finally, EU terrestrial habitats continue to be subject to many pressures, including agricultural practices such as modification of cultivation techniques, overgrazing, abandonment of pastoral systems, and the use of fertilisers and pesticides, as well as human-induced modifications of natural conditions (mostly related to hydrological changes). For marine habitats, the main reported pressure and threat is pollution. Many of these threats and pressures arise from a wide range of sectors and policies (including agriculture, fisheries, forestry and transport) and are expected to be ongoing. Consequently, the fate of European biodiversity is closely intertwined with developments in these areas. The adequate integration of biodiversity considerations into certain economic sectors and regional policies remains critical, therefore, in attempting to reduce the pressures on biodiversity (EEA, 2015b).

Given the limited progress in improving the conservation status of some EU protected habitats, continuing deterioration in others and the ongoing cumulative pressures on habitats, it is very unlikely that the 2020 target for conservation status of habitats will be met.

Country level information

At the level of EU Member States, the majority of assessments indicate a low proportion of habitats in a favourable condition, with notable exceptions — Cyprus, Estonia, Malta, Romania and Slovenia — reporting more than 40 % of habitat assessments as ‘favourable’. The countries reporting the most habitat assessments with ‘unfavourable’ status are all in north-western Europe — Belgium, Denmark, the Netherlands and the United Kingdom (see Figure 2). This pattern can probably be attributed mainly to the relatively intensive agriculture practiced in these Member States.

Figure 2. Conservation status and trends of habitats assessed under the Habitats Directive (2007-2012), by country



Data sources: a. DG ENV. Conservation status of habitat types and species (Article 17, Habitats Directive 92/43/EEC)
b. EEA. Conservation status of habitat types and species (Article 17, Habitats Directive 92/43/EEC)
c. EEA – Indicator SEBI005

Note:
The number of assessments is indicated in parentheses. The total number of assessments is 3022. Greece did not provide an Article 17 report.

Outlook beyond 2020

Achieving favourable conservation status for EU protected habitats in the longer term is challenging. This is due to the expected continuation of many environmental pressures, with some pressures such as climate change set to increase (EEA, 2016a), and to the time lag between the implementation of restoration measures and the desired outcomes in terms of habitat conservation status. Marine habitats are especially challenging because of their currently poor status, and a substantial increase in the network of protected marine areas still needs to be implemented.

About the indicator

The indicator (EEA, 2016b) covers habitats that are considered to be of European interest (listed in Annex I of the Habitats Directive). The Habitats Directive protects 233 rare and characteristic natural and semi-natural habitat types (e.g. types of grassland, wetlands, dunes) within the territory of the EU. Their conservation status is assessed by all EU Member States every 6 years, and these assessments and other data from the Member States are subsequently used to make EU-level assessments. There have been two reporting rounds so far (2001-2006 and 2007-2012).

The indicator measures conservation status for habitat types in terms of ‘favourable’, ‘unfavourable–inadequate’, ‘unfavourable–bad’ and ‘unknown’. Furthermore, the indicator measures trends for assessments with unfavourable conservation status: ‘unfavourable–improving’, ‘unfavourable stable’, ‘unfavourable–deteriorating’, ‘unfavourable–unknown’. The assessments are based on four parameters: (1) trends and status of range; (2) trends and status of the area; (3) structure and function including typical species; and (4) future prospects.

Footnotes and references

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AIRS Briefings

AIRS_PO1.7, 2017, EU protected species

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Natural capital

Surface waters

This briefing was not updated in 2017. It will be updated in 2018 when the assessment of the second river basin management plans data is finalised.

Indicator	EU indicator past trend	Selected objective to be met by 2020	Indicative outlook of the EU meeting the selected objective by 2020
Status in surface waters	NA(1)	Achieve good status of transitional and coastal waters and freshwaters — Water Framework Directive	(red circle)
Considering the large proportion of surface waters failing to meet 'good' ecological status, it is unlikely that the objective of achieving good status of waters will be met by 2020			
For the further information on the scoreboard methodology please see Box I.3 in the EEA Environmental indicator report 2016			

The Seventh Environment Action Programme (7th EAP) includes the goal of the Water Framework Directive (WFD) that good status should be achieved, enhanced or maintained in transitional, coastal and fresh waters. Achieving good ecological status in surface waters is a critical aspect of this. The quality of Europe's surface waters has improved over the past decades, thanks to higher standards of wastewater treatment, for example, and reductions in agricultural inputs of nitrogen and phosphorus. Pollution from agriculture (in particular nitrogen losses from agricultural land) and urban and industrial wastewater nevertheless remain significant. Hydromorphological pressures are also affecting many surface water bodies, mainly from hydropower, navigation, agriculture, flood protection and urban development resulting in altered habitats. Overall, in 2009 only 43 % of surface water bodies were in good or high ecological status and, in 2015, 53 % of water bodies are expected to reach good ecological status, making it unlikely that the objective of achieving good status of waters will be met. Full implementation of the management measures under the Water Framework Directive, in combination with full implementation of other relevant directives (e.g. Urban Waste Water Treatment, Nitrates Directive) is needed in order to restore the ecological status or potential of surface waters.

Setting the Scene

One of the goals of the 7th EAP (EU, 2013) is that the impact of pressures on transitional, coastal and freshwaters (including surface and groundwaters) should be significantly reduced to achieve, maintain or enhance good status, as defined by the Water Framework Directive. This briefing addresses only surface waters. Surface waters are the majority of the volume of EU waters and are important habitats, providing key support to society and the economy throughout Europe, while clean, unpolluted waters are essential for our ecosystems. Surface waters have traditionally been the disposal route for human, agricultural and industrial waste, which has damaged their water quality. They have also been altered (by dams, canalisation etc.) to facilitate agriculture and urbanisation, to produce energy and to protect against flooding, all of which can result in damage to their hydromorphology.

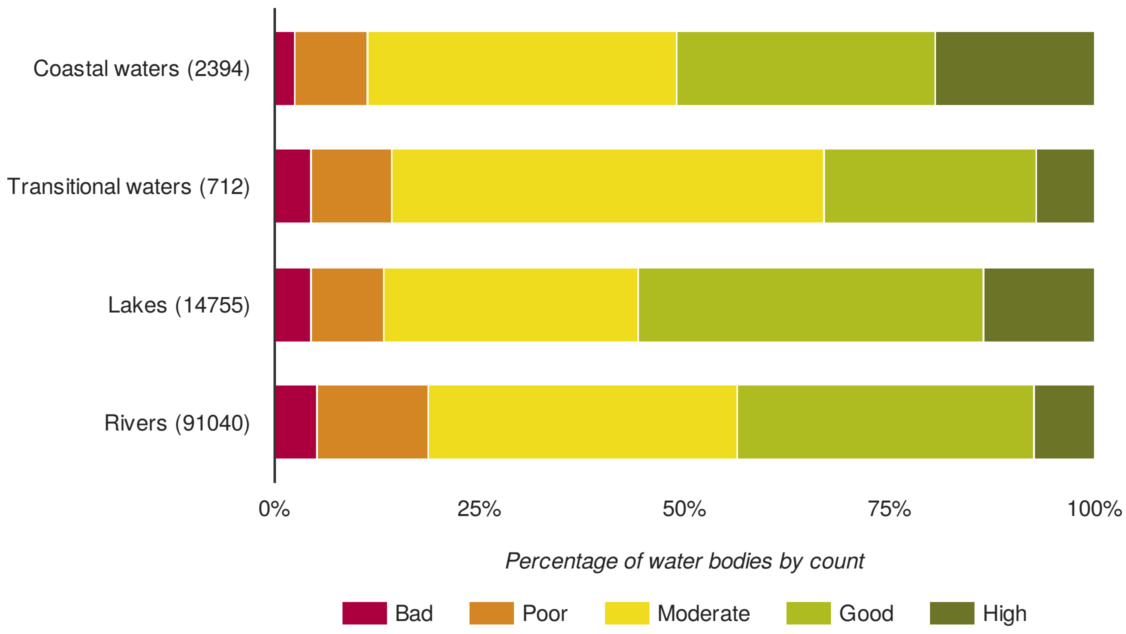
Policy targets and progress

The main aim of EU water policy is to ensure that a sufficient quantity of good quality water is available for people's needs and the environment. The Water Framework Directive (EU, 2000) stipulates that EU Member States should aim to achieve good status in all bodies of surface water and groundwater by 2015 unless there are grounds for exemption. The 7th EAP mirrored this objective and called for all European water bodies to reach 'good' status by 2020.

During the last 30 years, significant progress has been made in reducing the pollution in numerous European water bodies, in particular thanks to improved wastewater treatment. Water quality in Europe has therefore improved significantly in recent decades, and the effects of pollutants have decreased (EEA 2015a, 2015b). Pollution from agriculture (in particular nitrogen losses from agricultural land) and urban and industrial wastewater nevertheless remain significant. For decades, sometimes centuries, humans have altered European surface waters (straightening and canalisation, disconnection of flood plains, land reclamation, dams, weirs, bank reinforcements, etc.) to facilitate agriculture and urbanisation, produce energy and protect against flooding. These activities have resulted in damage to the morphology and hydrology of the water bodies, i.e. to their hydromorphology.

Based on the first river basin management plans reported in 2008, more than half of the surface water bodies in Europe are in less than good ecological status or potential, and will need mitigation and/or restoration measures to meet the Water Framework Directive objective (Figure 1). Rivers and transitional waters are on average in a worse condition than lakes and coastal waters. Concerns about the ecological status of surface water bodies are most pronounced for central and north-western Europe, in areas with intensive agricultural practices and high population densities. The status of coastal and transitional waters in the Black Sea and greater North Sea regions is also of concern.

Figure 1. Ecological status or potential of classified rivers, lakes, coastal and transitional waters, EU



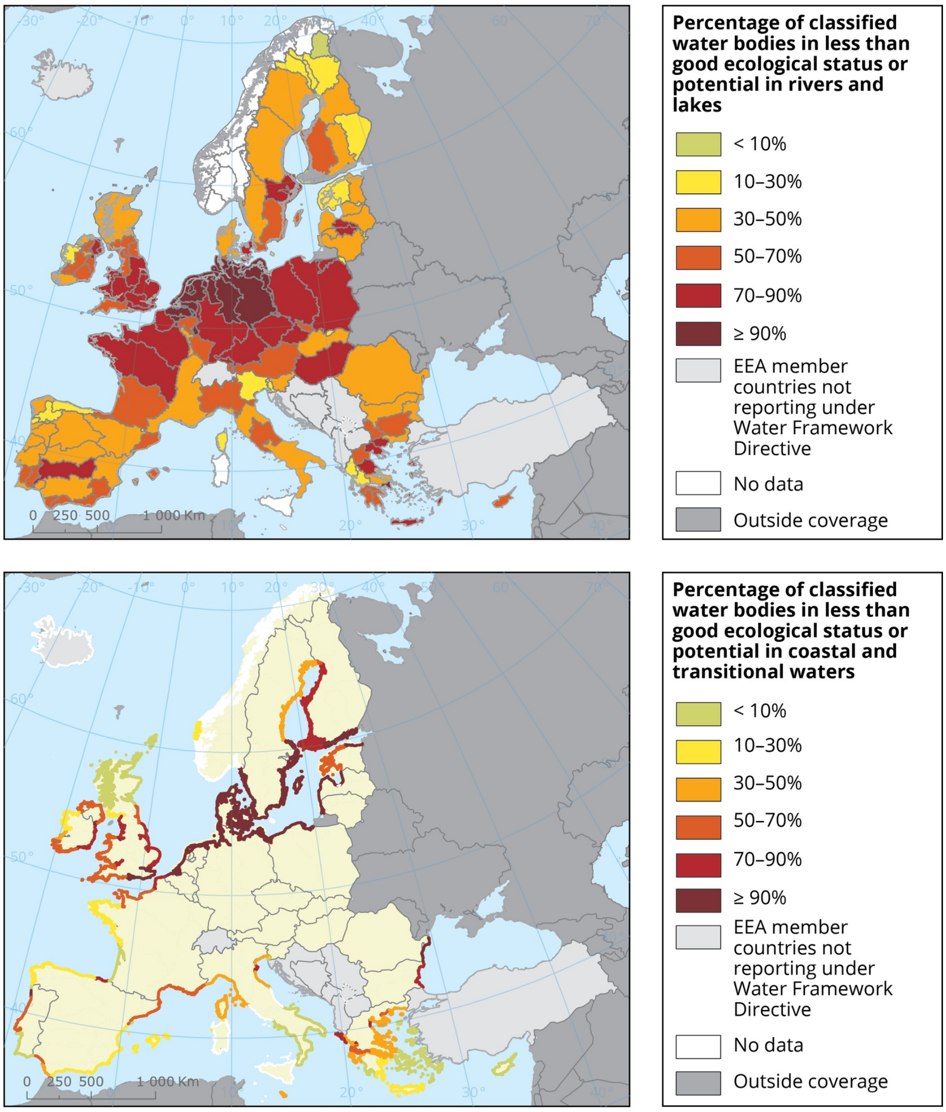
Data sources: EEA. WISE WFD Database

In 2009, 43 % of surface water bodies were in good or high ecological status and, in 2015, 53 % of water bodies were expected to reach good ecological status. This is far from meeting the objective of good ecological status and only constitutes a modest improvement in ecological status. Given this modest improvement and despite ongoing efforts, it is unlikely that the objective of achieving good status of waters will be met.

Country level information

As Figure 2 illustrates, there are differences between river basin districts with regard to the percentage of their water bodies that have 'good' ecological status. Surface water bodies in north-western Europe have the lowest status and/or greatest potential for improvement. In Belgium (Flanders), northern Germany and the Netherlands, more than 90 % of surface waters are reported to be in 'less than good' (i.e. moderate, poor or bad) ecological status or potential. Other problem areas are in the Czech Republic, southern England, northern France, southern Germany, Hungary and Poland, as well as several individual river basin districts in other EU Member States, where 70–90 % of freshwater bodies (lakes and rivers) are reported to be in 'less than good' status or potential. The status of coastal and transitional waters, in the Black Sea and greater North Sea regions is also of great concern.

Figure 2. Percentage of classified surface water bodies in different river basin districts holding less than good ecological status or potential, for rivers and lakes (top panel) and for coastal and transitional waters (bottom panel)



Note: Switzerland data sets on river and lake water quality reported in the framework of EEA priority data flows are not compatible with the EU Water Framework Directive assessments and are not included above.

Source: WISE WFD Database.

Outlook beyond 2020

Further efforts will be required beyond 2020 to achieve a ‘good’ status for all surface waters. To achieve good status, Member States will have to address the pressures affecting water bodies. Pollution will be one pressure (e.g. run-off from agriculture, wastewater from households and industry); morphological changes, overabstraction and hydrological changes affecting water flow would also play a role. Full implementation of the Water Framework Directive throughout all sectors will be needed to reduce these pressures, and in individual river basins it will be necessary to commit users from each sector (e.g. the agriculture sector) to focusing on delivering healthy water bodies with good status.

About the indicator

Achieving good status involves meeting certain standards for the ecology, chemistry, morphology and quantity of waters. In general terms, good status means that water shows only a slight change from what would normally be expected under undisturbed conditions (i.e. with a low human impact). This indicator is defined as the number of surface water bodies reaching at least ‘good’ ecological status or ‘good’ ecological potential. Ecological status and potential is a criterion for the quality of the structure and functioning of surface water ecosystems. More specifically, a surface water body has reached good ecological status when ‘the values of the biological quality elements for the surface water body type show low levels of distortion resulting from human activity, but deviate only slightly from those normally associated with the surface water body type under undisturbed conditions’ (EU, 2000).

The ecological status is used here as a proxy for the overall status of waters. This is because the ecological status is influenced by water quality (e.g. pollution levels of all types) as well as by the amount of available water. In addition, surface waters constitute the majority of EU waters. Water quantity issues are addressed in the Freshwater use briefing (AIRS_PO2.4, 2016),[1] which covers both surface and groundwaters.

The indicator covers only the current status of surface waters and not past trends. New data will become available in 2017 and the next version of the indicator will include trends.

Footnotes and references

(1) Time Series not yet available

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AIRS briefings

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