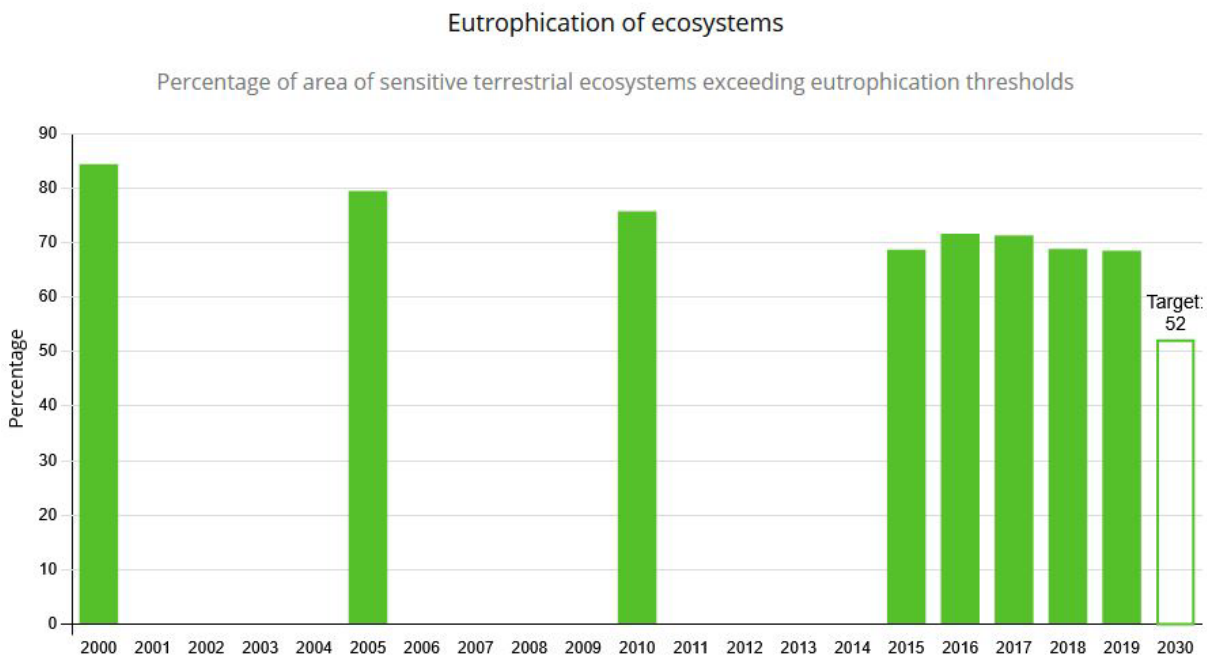
Ecosystems – *Protecting ecosystems, conserving ecosystem services and preserving habitats*

15.2 Eutrophication of ecosystems



Note(s):
The target value of 52% corresponds to a 35% reduction in land use compared to 2005. Due to methodological changes, the results are not comparable with those from previous publications.

Data source(s):
German Environment Agency

Definition
The indicator represents the proportion of the area of sensitive terrestrial ecosystems (in %) where the ecological critical loads were exceeded due to atmospheric nitrogen deposition, measured against the total assessed area of sensitive ecosystems.

Intention
The ecological load limits are a measure of the sensitivity of an ecosystem to the input of a pollutant. If the input of air pollutants is below these critical loads, no harmful effects on the structure and function of an ecosystem are to be expected according to the current state of knowledge. Almost half of all ferns and flowering plants on the Red List in Germany are endangered by nutrient inputs.

Target
Reduction by 35% by 2030 compared to 2005

Content and progress
Nitrogen, which enters the atmosphere in the form of ammonia or nitrogen oxides, can be deposited into ecosystems as a gas, dissolved in rain, or as a component of particulate matter. Excessive deposition of nitrogen compounds from the air into terrestrial ecosys-

tems can lead to nutrient imbalances. This affects, among other things, species composition: plant species that prefer nitrogen-poor sites are displaced by nitrogen-loving species. Furthermore, altered nutrient availability increases the susceptibility of many plants to frost, drought, or pests. The consequences of elevated nitrogen deposition often manifest only with a temporal delay. Similarly, positive effects of reduced deposition frequently only become apparent after several years.

Emissions of ammonia and nitrogen oxides, which are recorded in indicator 3.2.a Emissions of Air Pollutants, have a direct impact on the eutrophication of ecosystems. Ecosystems included in the indicator's calculation comprise in particular forests, semi-natural grasslands, bogs, marshes, and heaths. Ecosystem-specific critical loads are used to assess nitrogen deposition. When these limits are adhered to, the structure, function, and species communities of an ecosystem are preserved according to current scientific understanding. Approximately eleven million hectares are assessed in this manner, representing nearly one third of Germany's total area.

In 2019, nitrogen deposition exceeded the critical loads on 69% of the assessed sensitive ecosystems in Germany. Particularly high exceedances occur in parts of northern Germany, where intensive agriculture releases large amounts of reactive nitrogen compounds. Between 2000 and 2015, the proportion of affected areas was reduced by 15 percentage points. Since then, no further reduction in the share of impacted areas has been observed.

The calculation of the indicator is performed by the German Environment Agency (UBA) and is based on two datasets: The first is the Critical Load dataset provided by the UBA within the framework of international reporting to the Geneva Convention on Long-Range Transboundary Air Pollution (CLRTAP). This is based, among other data, on the soil overview map of Germany, the map of average annual leachate rates, land use distribution, and climate data. The second dataset comprises a time series of nitrogen deposition in Germany, calculated within the framework of the PINETI IV project (Pollutant INput and EcosysTem Impact).

Type of target
Target with specific target value

Assessment
The proportion of sensitive terrestrial ecosystems exceeding critical loads for eutrophication should be reduced to a maximum of 52% by 2030.

According to the target formulation, if the trend observed over the past six years continues, indicator 15.2 is projected to be around 60% by 2030. Given the substantial gap to the politically defined target, indicator 15.2 is therefore assessed as cloud for 2019.