

National Peatland Protection Strategy

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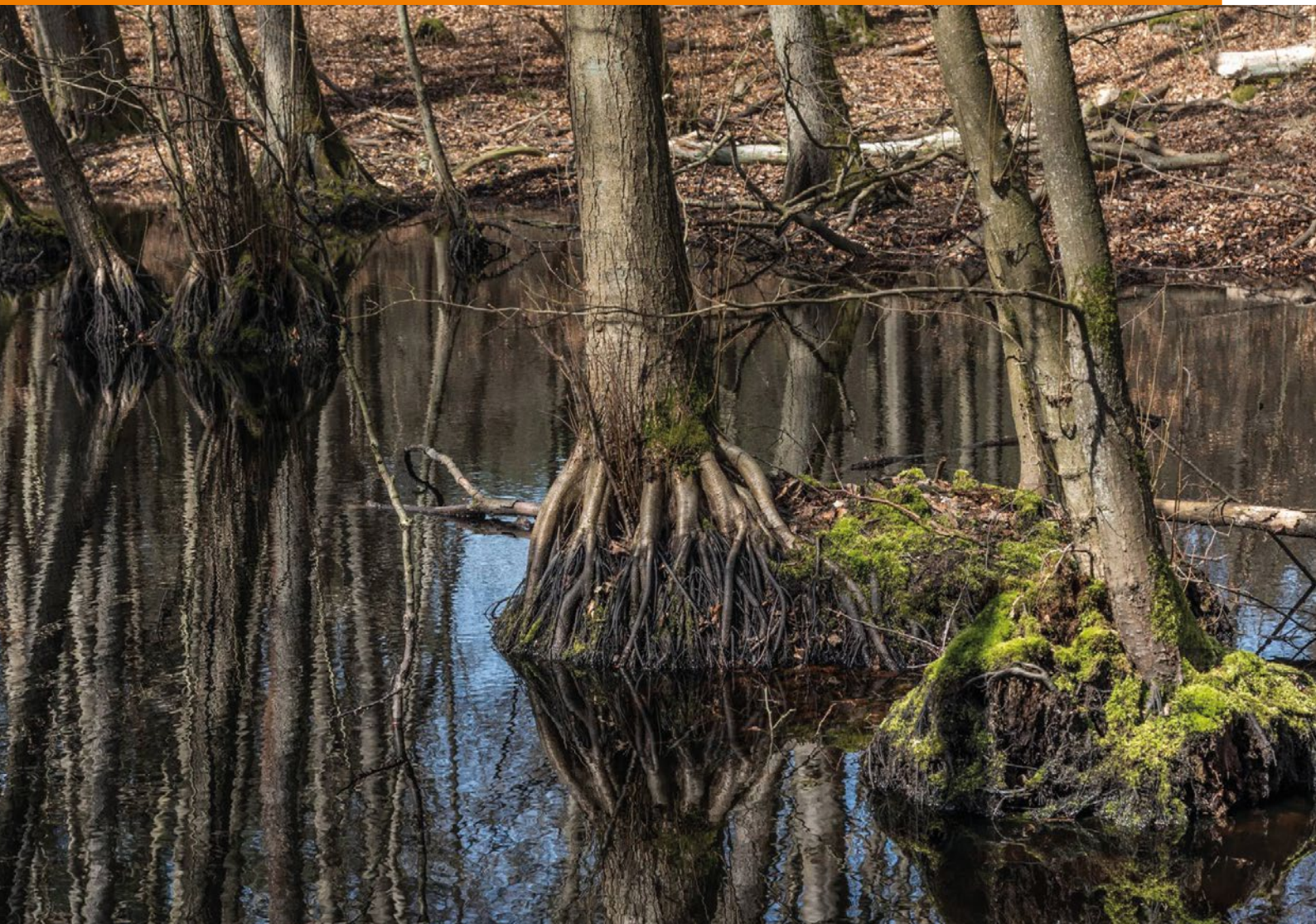
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Introduction: Peatland protection – more than protecting intact peatlands



Alder fen forest with low water level in spring; exposed roots show peat loss



Intensively grazed grassland on a fen and a drainage ditch with a lowered water level; the grassland's degradation is already clearly visible

Peatlands are unique habitats of highly specialised animal and plant species and function as an archive of cultural history that allows us to trace our own development. Peatlands are also long-term carbon sinks and thus a key component of nature-based climate action. Damaging them can seriously affect the global climate system. They have regulating effects on the water and nutrient balances and an evaporative cooling effect that is important for local and regional climates. They are increasingly being used as places for recreation and experiencing nature. This is why the restoration and sustainable management of drained peat soils, along with the protection of intact peatlands, are core issues of the National Peatland Protection Strategy.

Peatlands have long been viewed as hostile environments, and peatland cultivation and the extraction of peat for use as fuel and later as a growing medium has been seen as an important step towards improving the lives of the local communities. Because of this, today only a small part of the peatlands in Germany are recognisable as near-natural peatlands (for example bogs, fens, heaths). In Germany, more than 90 percent of peat soils have been drained and are now used for agriculture and forestry or as land for settlements and transport infrastructure.

We now understand that draining peatlands has given rise to major challenges for climate change mitigation, biodiversity conservation and sustainable use. When peat soils are drained, the peat they are made of comes in contact with the air, starting a decomposition process that releases large amounts of carbon dioxide. Essentially, the peat dissolves. The severe

subsidence of peat soils is one of the visible consequences of this process. Depending on the region, raised bogs subside up to 1 centimetre/year (up to 1 metre in 100 years), and fens up to 3 centimetres/year (up to 3 metres in 100 years). In Germany, the amount of greenhouse gases released annually by this decomposition process is equivalent to one fourth of the respective gases emitted by the transport sector. This demonstrates the importance of peat soils for the climate.

However, there is a considerable need for action, not just from the perspective of climate change mitigation and achieving our climate targets by 2030 and 2045. Over the long term, peat decomposition causes most organic soils to lose their value for agricultural production. This process will continue until the drained peat layer is completely depleted or the water level in the soils is increased again. Decomposing peat also releases nutrients that are discharged into water bodies. In terms of long-term economic prospects, this means it is important to find sustainable ways to manage this land, from both a macrosocial and economic standpoint. For these reasons, as many areas as possible should be rewetted in the medium and long term.

In drawing up a National Peatland Protection Strategy, the German government is fulfilling a mandate in the coalition agreement and wants to reflect the peatlands' key role in climate change mitigation, biodiversity and soil conservation and landscape hydrology. The strategy is addressed not only to administrative institutions at various levels but to all relevant stakeholders. The German government believes that peatland protection, the rewetting of drained peatlands and peat soils and their sustainable use can be successful only in close collaboration with local residents, land owners and land managers, as well as those who may be negatively affected by future peatland protection measures, for example owners whose land borders protected peatlands. This is why the National Peatland Protection Strategy of the German government is based on cooperative approaches and robust public outreach activities with the aim of supporting a transformative shift to sustainable land use practices that preserve peatlands.

With a view to the particular challenges peatland protection poses for climate change mitigation and agriculture, close cooperation between the Federation and the Länder is necessary. The National Peatland Protection Strategy will be supplemented by the target agreement between the Federation and the Länder adopted in 2021, which is a link to the peatland protection strategies of the Länder.



Dactylorhiza majalis – a once common and widespread species found on wet meadows and fens; sharp decline due to drainage and more intensive cultivation

Expansive meadows cut for hay for animal bedding on peatlands in the Alpine Foreland as a vestige of land that was once in widespread use



Alder fen forest along a stream in a fen; exposed roots as a direct result of drainage and peat loss



Birch bog forest in a transitional bog, in the foreground floating mat with *Menyanthes trifoliata*



Coastal flood mires on the Baltic Sea; flowering *Limonium vulgare*

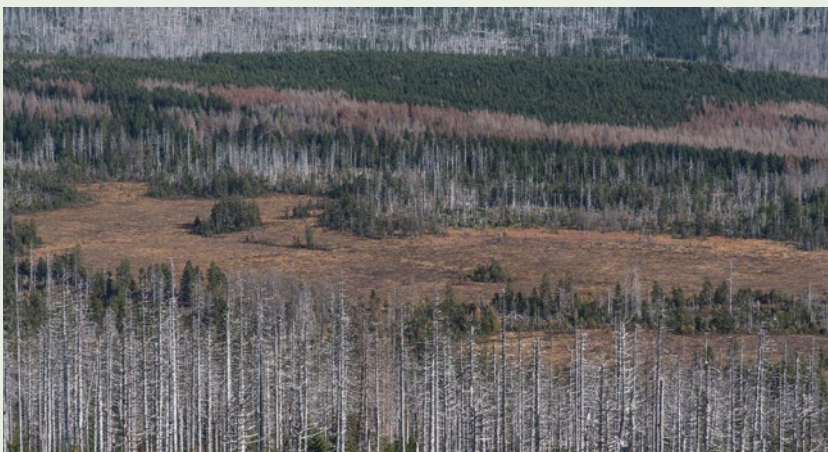




Near-natural marshy calcareous fen; gully with *Charophyceae* algae and *Amblystegiaceae* mosses



Terrestrialising fen waterbody with flowering *Hottonia palustris*



Raised bogs in the uplands, surrounded by dead spruce forests



Flow-through moor in a river valley with abandoned areas; birch trees indicate low nutrient contents of the peat

1. Background



Peat moss (*sphagnum*) on a growing and near-natural raised bog

1.1 Peatlands in Germany

The formation of the peatlands of Central Europe began at the end of the last Ice Age around 12,000 years ago and required the cool, temperate climate and surplus water in the landscape. Peatlands are composed of peat formed from dead plant material that can store water like a sponge. In contrast to other domestic landscapes, a special diversity of species can be found in these in part nutrient-poor ecosystems; many plants and animals that are now threatened with extinction call this habitat their home.

It is already foreseeable now that the impacts of climate crisis will significantly affect peatlands. The expected rise in temperatures will lead to more evaporation. In addition, changes in the levels and annual distribution of precipitation can also have an impact on peatlands. Both can lead to more drastic reductions in water level, particularly in the summer months. That is why it is predicted that various peatland habitat types will disappear or significantly change, especially if this development is not countered with stepped-up peatland protection measures. Threats to peatland habitats also threaten the species that depend on them. Considerable efforts are necessary to curb these changes as much as possible.

The majority of peatlands in Germany today have been drained and are contaminated with excess nutrients. More than three fourths of these areas are used for agriculture or forestry and are often no longer recognisable as peatlands. In many cases only the name of the area is a reminder of the former conditions. The soils in these areas are generally referred to as “peat soils” or “organic soils”. The National Peatland Protection Strategy addresses all organic soils as defined by the Intergovernmental Panel on Climate Change (IPCC). The 2006 definition is the basis for Germany’s climate reporting. This definition includes peat soils according to the German pedologic definition and other carbon-rich soils that are comparable to peat soils in terms of their emission behaviour, such as humic gley soils and peat succession soils. For the sake of clarity, the term “peat soils” is used in this strategy to refer collectively to these organic soils. Around 92 percent of these peat soils have been drained.

There are around 1.8 million hectares of peat soils in Germany, concentrated in particular in the North German Plain and the Alpine Foreland. Although they make up only about 5 percent of the total surface area of Germany, they store as much carbon as all of Germany’s forests. Reduced water levels expose these soils to decomposition processes because the peat comes into contact with the air. This releases large amounts of stored carbon into the atmosphere as carbon dioxide. Peat fires, which are increasingly more likely to happen as the climate crisis intensifies, can also cause the release of carbon. To ensure that the German government can achieve the goal of greenhouse gas neutrality in Germany by 2045, it is important that we effectively protect the carbon stocks in peat soils over the long term. This is only possible if the water levels are raised again.



Section of a near-natural raised bog, with *Drosera rotundifolia*



Early morning scenery on a terrestrialisation mire



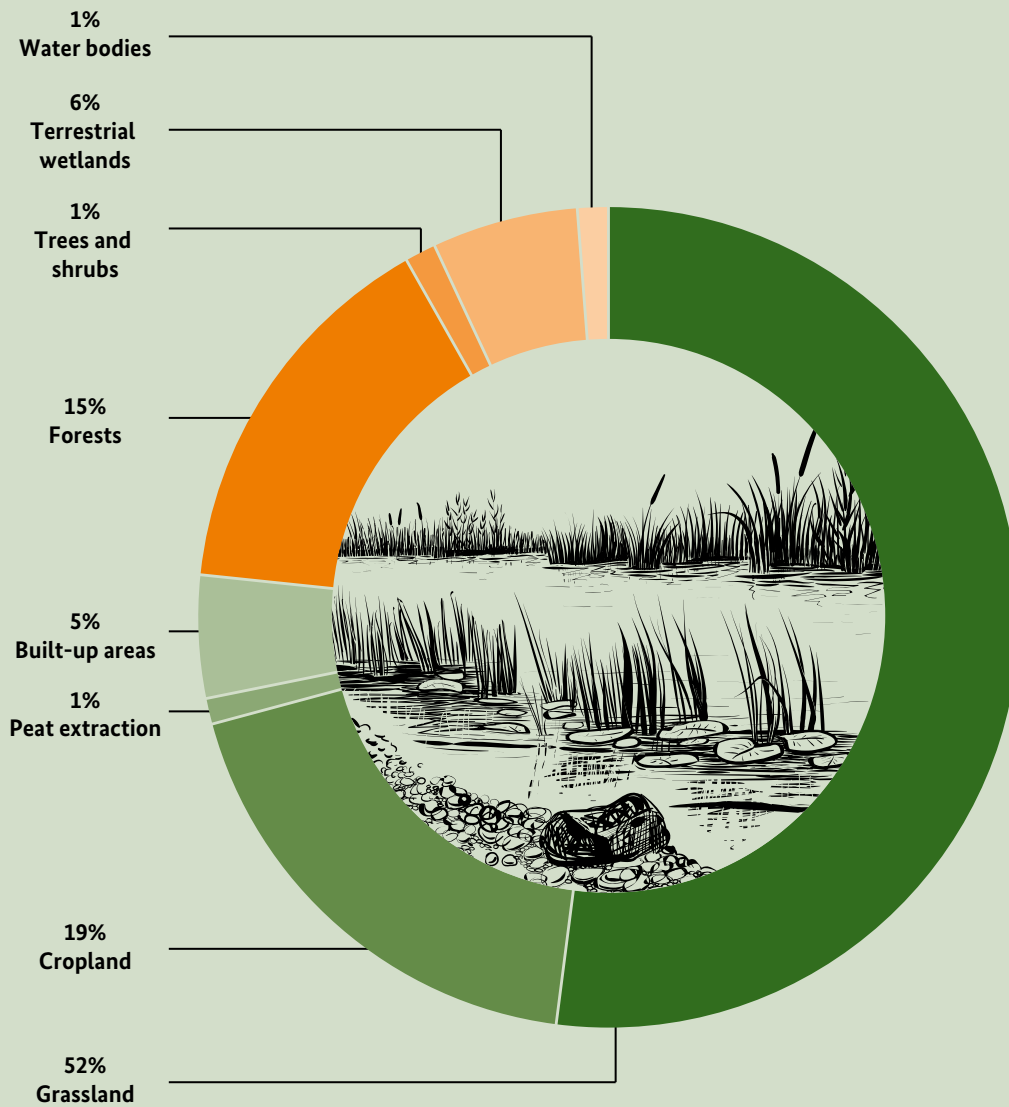
Intensively used grassland on a cultivated and drained moor

Currently, around half of peat soils are used as grassland, another 19 percent for growing crops and 15 percent for forestry. Today's predominant forms of use mostly depend on deep drainage of the peat soils. Drainage increases the carrying capacity of the soils so that the land is suitable for grazing and easier to access with vehicles and machinery. Raising the water levels of the land would require developing new uses for it or discontinuing use entirely.

Barriers to rewetting beyond agriculture and forestry may include existing built-up areas and transport and industrial infrastructure, but

Figure 1

Overview of the current uses of peat soils in Germany



Source: Federal Environment Agency (UBA) 2020 Reporting under the United Nations Framework Convention on Climate Change and the Kyoto Protocol 2020 – National Inventory Report on the German Greenhouse Gas Inventory 1990–2018

also, for example wind and solar power installations erected on drained peat soils. This applies not only to the directly affected areas but also to adjacent or adjoining areas. It can be assumed, therefore, that only parts of the land can be rewetted and that considerable greenhouse gas emissions will still be released from peat soils in future. Construction of other buildings and infrastructure on drained peat soils, however, should be prevented or carried out in line with peatland protection to avoid creating additional barriers to ambitious climate action. In future, it will be important to avoid misguided investments, for example by designating land for development on drained soils.

Other obstacles to rewetting may include changes to the site as the result of long-term uses made possible by drainage, such as soil compactions, significantly reduced water conductivity and subsidence of groundwater levels in the catchment area of peatlands. Precipitation conditions may change as a result of the climate crisis, to the point that sufficient water for rewetting may not be available in some areas in the summer months or year round.

Peat is mainly extracted in Germany to produce growing media and potting soil products for commercial and private gardens. After extraction, the carbon stored in the peat is released very quickly. For this reason, phasing out peat extraction and use is an integral part of transitioning to a greenhouse gas-neutral society. With production of 11 to 12 million cubic metres of growing media in 2021, Germany's substrate industry is by far the largest in Europe. According to industry stakeholders, peat extraction in Germany is clearly in decline. However, the use of peat to produce growing media remains high and demand is increasingly met by imports, mostly from the Baltic countries. Because peat and potting soil are freely tradable goods within the European Union (EU), it is important to harmonise measures in this area with the other Member States to prevent the relocation of peat extraction to other countries.

Because peatlands are often unsuited for residential areas, some serve as military exercise facilities. Land formerly used by the military, particularly in the former East German Länder, was dedicated to nature conservation after 1990 and partially restored. Peatlands in active military use are addressed in this Peatland Protection Strategy in 4.6 as land belonging to the Federation.



Oil production in a raised bog in Lower Saxony



Lakes with no outlet and silted-up bogs with a visible decline in water levels; afforestation with pine trees and climate change altered the landscape hydrology and reduced groundwater recharge



Peat-mined raised bog with the old tracks of a former peat train



Raised bogs are extreme habitats: bog water with a pH value of 3.7

1.2 Peatlands as habitats

Near-natural, undrained peatlands provide habitats for a special variety of flora and fauna. Today, they make a key contribution to preserving biodiversity and have special importance for species and biotope conservation.

Raised and transitional peat bogs are home to relatively small numbers of species. Only highly specialised species adapted to permanent dampness, low pH values and low nutrient levels can survive in them. In contrast, fens are richer in species with their reeds, reed banks and fen forests. Alkaline-rich peatlands are hotspots of biodiversity in Germany with their low-intensity use meadows cut for animal bedding, sedge reeds and rushes registering the highest species numbers of all peatland biotopes in Germany.

Various species groups including insects, amphibians, reptiles, birds and other vertebrates benefit from near-natural peatland habitats. Because of their diversity, the peatlands provide irreplaceable habitats for many species subject to national species conservation provisions or international agreements such as the Ramsar Convention and the Habitats and Birds Directives of the EU. Due to the drastic loss of wetland habitats, the remaining raised bogs and fens have special importance as refuges for species that were still common in the pre- and early industrial rural cultivated landscapes, such as the short-eared owl (*Asio flammeus*), the European adder (*Vipera berus*) and the curlew (*Numenius*).



Effects of lowering groundwater level: small water bodies terrestrialise rapidly with a core peatland area that dries out

Table 1

Conservation status of the major peatland habitat types in Germany as defined in the Habitats Directive according to the 2019 national Habitats Directive report

| Code | Habitat type | Biogeographical regions according to the Habitats Directive | | |
|-------|---|---|-------------|--------|
| | | Atlantic | Continental | Alpine |
| 1330 | Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) | □ | ▼ | - |
| 3160 | Natural dystrophic lakes and ponds | □ | □ | ● |
| 4010 | Northern Atlantic wet heaths with <i>Erica tetralix</i> | ▼ | ▼ | - |
| 6410 | Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) | ▼ | ▼ | ● |
| 7110* | Active raised bogs | ▼ | □ | ● |
| 7120 | Degraded raised bogs still capable of natural regeneration | ▼ | ▼ | □ |
| 7140 | Transition mires and quaking bogs | ▼ | □ | □ |
| 7150 | Depressions on peat substrates of the <i>Rhynchosporion</i> | □ | □ | ● |
| 7210* | Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> | ▼ | □ | ● |
| 7230 | Alkaline fens | ▼ | □ | □ |
| 91D0* | Bog woodland | ▼ | ▼ | ● |

● favourable □ unfavourable-inadequate ▼ unfavourable-poor
 Key: * – priority habitat type

Source: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) 2020: prioritised action frameworks (PAF) for NATURA 2000 in the Federal Republic of Germany

The national reports on the implementation of the Habitats Directive and the Red Lists show urgent need for action. The majority of the protected peatland habitat types under the Habitats Directive must currently be classified in an “unfavourable – inadequate” or even “unfavourable – poor” conservation status. Status is also inadequate or poor for secondary habitat types in peatland sites (for example Molinia meadows) and species adapted to them.

The current unfavourable status of peatlands is also reflected in the extent and endangerment status of peatland-dependent species on the Red Lists. A considerable share of the moss species that play a major role in peat formation are on the Red Lists, and peat mosses (*Sphagnum*) are specially protected species in accordance with Section 7 subsection 2 no. 13 of the Act on Nature Conservation and Landscape Management (Federal Nature Conservation Act, BNatSchG). Among fauna, it is mainly insects, such as dragonfly and butterfly species, that are classified as endangered or at risk of extinction.



Clearly visible peat layers of the remnants of a drained raised bog

Comprehensive hydrological measures that have an impact on the overall water balance of peatlands are generally necessary to improve the conservation status of the peatland habitats and their characteristic species, to help maintain the landscape hydrology and prevent the discharge of nutrients. The overall water balance of peatlands can be affected by the long-term subsidence of groundwater levels due to increasing periods of drought and heat and consequently the release of greenhouse gases. It is often necessary to include adequate buffer areas and the hydrological catchment of the peatland in restoration plans and to reduce the nutrient contamination of the sensitive peatland biotopes. With regard to biotopes of low-intensity agricultural landscapes, appropriate maintenance or options for low-intensity use must additionally be ensured for the long term.

1.3 Peatlands as carbon sinks

Peatlands play a special role in the carbon cycle and thus in climate change mitigation. The IPCC points this out in its Special Report on climate change and land. While other terrestrial ecosystems store carbon for a limited time, releasing it again when plants die, carbon can be stored in peatlands as peat over the long term. The peat layers in peatlands can form over thousands of years. According to the IPCC Special Report on climate change and land, 26 to 44 percent of the estimated global soil organic carbon is stored in peatlands, although they only cover 3 to 4 percent of the Earth's land area.

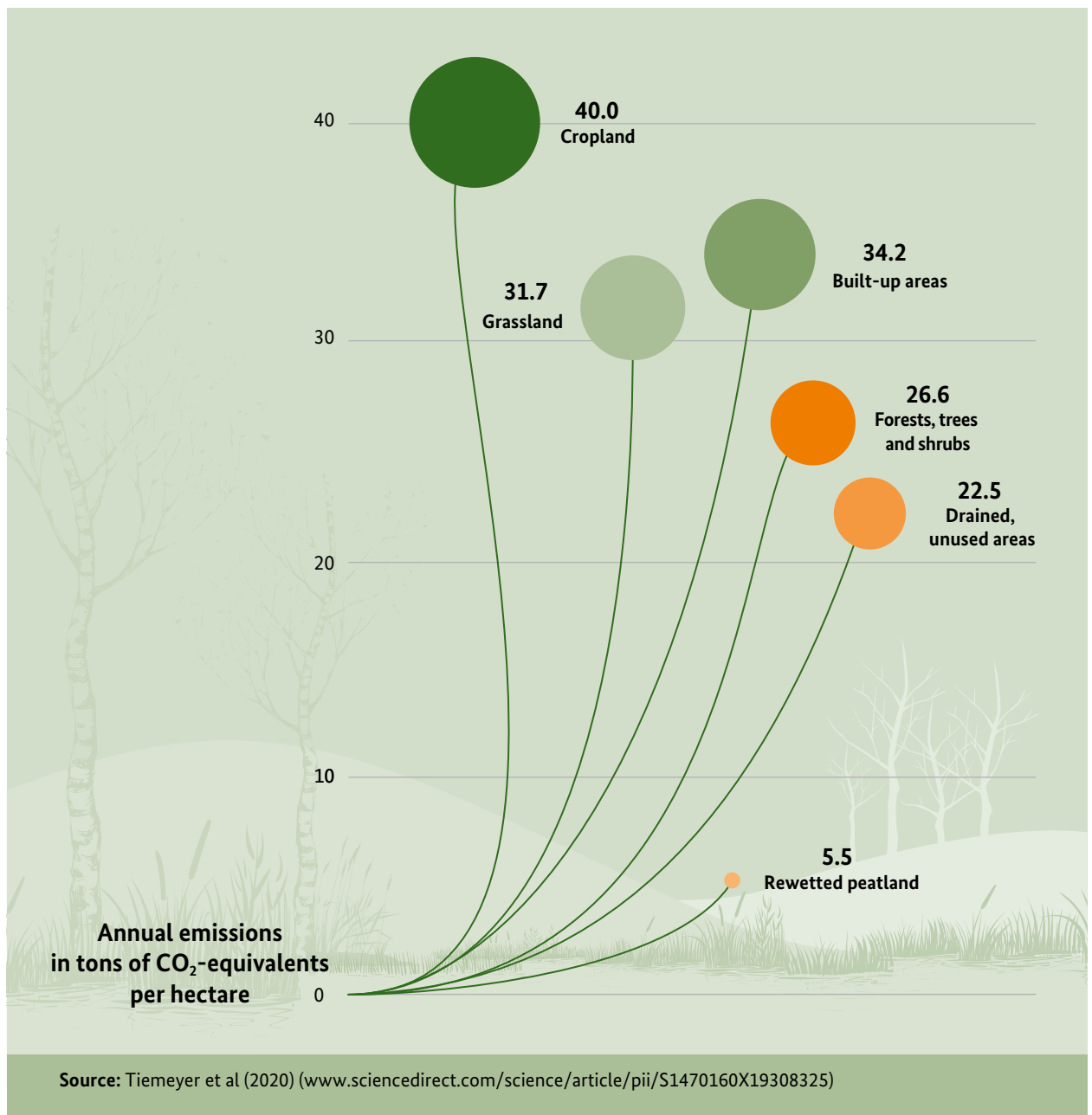


Test area for determining greenhouse gas emissions of a fen

Intact peatlands have an important function as carbon sinks. Carbon is absorbed in large quantities by peatland plants and then stored in the peat. When peatlands are drained, their organic components gradually decompose and the sequestered carbon is released again. Depending on the water level and oxygen supply, different greenhouse gases are produced. When peat comes into contact with air, the main gas released is carbon dioxide (CO₂); in conditions where air is kept out (for example, as a result of changing water levels), methane (CH₄), a particularly potent greenhouse gas, can also be produced – although to a much lesser extent.

Figure 2

Greenhouse gas emissions from peat soils in Germany per hectare per year



Globally, around 80 percent of peatlands are in a natural or near-natural state; more than half of these peatlands continue to sequester carbon. The remaining 20 percent (around 80 million hectares) have been modified to such an extent that peat no longer forms. Many of these degraded peatlands release their stored carbon incrementally and are responsible for around 6 to 7 percent of global carbon dioxide emissions. After Indonesia, the EU is the second largest emitter of carbon dioxide from degraded peatlands. Within the EU, Germany is the largest emitter of this greenhouse gas.



Peat moss (*sphagnum*): upper green part is alive and growing, lower brown part is already dead

In Germany, 92 percent of peat soils have been drained and account for around 53 million tonnes of CO₂ equivalent per year, which is about 7.5 percent of Germany's total greenhouse gas emissions (including methane [CH₄] and laughing gas [N₂O]). The overwhelming majority (83 percent) of these emissions from peat soils come from land used for agriculture. Historically, Germany was a global leader in the cultivation and agricultural use of peatlands. As a result, seen internationally, Germany is now among the countries where the most peatland areas have been degraded or destroyed on a large scale.

The process of carbon sequestration in peatlands is very slow. The amount of carbon stored in peatlands is only so high due to their long formation history. Near-natural peatlands are climate neutral or weak sources overall of the three major greenhouse gases. Drained peatlands, in contrast, are relatively intense sources of greenhouse gas emissions because the carbon release processes happen very quickly. If water levels in degraded peatlands are raised to near-natural levels again, emissions can be decreased and substantially reduced in the medium term.

The levels of greenhouse gas emissions are directly linked to the intensity of drainage; deeper drainage leads to larger amounts of peat drying out or decomposing. The climate impact of degraded peatlands depends on the type of peatland, how natural it is and the intensity of its use. The emissions of intensively used fen soils are generally higher than those of raised bog soils due to their more easily degradable organic substance.

Raising the water levels is the only way to reduce these emissions. In the past, limited rewetting was undertaken as part of restoration projects, primarily for nature conservation reasons. Extending rewetting measures on a larger scale to support climate change mitigation requires shifting land use to wet management practices or discontinuing use. On average, rewetting can prevent the release of between 10 and 35 tonnes of carbon dioxide emissions per hectare per year. Rewetting peat soils that were previously used for agriculture and forestry is a very efficient way to contribute to nature-based climate action.

1.4 Peatlands as water reservoirs and nutrient sinks

Peatlands help regulate the landscape hydrology. Water retention in peatlands has increasing importance, especially in light of the advancing climate crisis and more frequent and longer periods of drought or heavy rainfall events. In addition, peatlands have a cooling and balancing effect on the regional climate due to their evaporation capacity.

Healthy peatlands and their soils fulfil additional key functions by absorbing nutrients and pollutants and breaking them down or converting them in various biogeochemical processes. They are called the “kidneys of the landscape” for this reason. Draining peatlands alters these processes. Peat decomposition releases significant amounts of nutrients that are subsequently discharged from the peatland into surface waters. Degraded peat soils are a major source of nutrient discharge. They can significantly increase the risk of eutrophication of these water bodies. The remaining nutrient-poor peatland biotopes can be seriously endangered by nutrient input. Peat soil conservation, in contrast, can make a positive contribution to long-term water conservation.

The hydrologic situation of peatlands cannot be viewed in isolation from the overall water balance of the landscape. The water balance of peatlands directly depends on the situation and trends in the water balance of their entire catchment area, which means that they can also be negatively impacted by changes in use, also outside the peatlands. To drain the peatlands, an extensive network of drains, ditches and channels was created with the aim of draining water from the land quickly and extensively.

Due to the subsidence of the soils associated with draining the peatlands, it was and is necessary to continually deepen the drainage system to continue drainage-based agricultural use. If the soils subside too far (below the level of what is referred to as the “natural drainage capacity”), water can then only be removed using pumping stations. The longer drainage-based land management is pursued and the greater the extent of peat decomposition and land subsidence, the greater the ongoing dependence on systems ranging from deeper and deeper drainage structures to active drainage technologies. Stopping these processes and steering development towards proactive water retention requires improving water retention in the entire area and drawing up comprehensive strategies for the landscape hydrology, including all



Nutrient-rich rewetted fen with extensive mudflat vegetation including flowering *Senecio congestus*



Clearly visible subsidence of the peat soil next to a barn on the peatlands

hydrological units. These strategies should take into account the climate crisis and the associated changes in precipitation and temperatures. Rewetting can also have negative effects (for example in the form of restrictions on use and damage to infrastructure and buildings) or beneficial effects (for example stabilisation of yields) outside the actual areas of intervention. The potential consequences of these measures must therefore be assessed in each case. In the North Sea region, additional measures will be required in the marshes with continued drainage-based agriculture due to the expected sea level rise. The ongoing subsidence of peat soils due to drainage-based agricultural use further exacerbates the situation. The necessary adjustments to the drainage outlets and pumping stations will then significantly increase the costs of drainage. A special challenge for rewetting measures is convincing all of the stakeholders in the catchment area that such measures are necessary and advantageous and ensuring that they are appropriately compensated.

1.5 Peatlands as archives of natural and cultural history

The water saturation and lack of oxygen in peatlands strongly inhibits the decomposition of various materials. This makes intact peat soils excellent archives of our natural, landscape and cultural history. They can contain a variety of indicators that are easy to date. For example, water-saturated peatlands preserve pollen and spores, animal and vegetal deposits and mushroom hyphae and algae in their peat layers. Analysis of pollens stored in undisturbed peat soils can lead to conclusions about the past development of vegetation and the climate. In addition, they can also provide information on historical environmental conditions and events that had considerable impacts on the natural environmental system.

Remnants of human settlements found in peatlands are, in some cases, very well-preserved; these provide us with valuable information about the settlement history of the areas. The well-preserved “bog bodies” and the pre-historic pile dwellings (stilt houses) around the Alps, now part of a UNESCO World Heritage site, are particularly well-known discoveries and give us impressive insight into the living conditions of that time. Numerous peatland pathways constructed millennia ago provide information on the history of how our landscapes, the peatlands and historical routes were used.



Undecomposed plant residues from a peat coring sample

2. Links to other strategies and programmes of the federal government



Fructifying *Eriophorum vaginatum*, a characteristic species of nutrient-poor bogs and important in the formation of peat

This National Peatland Protection Strategy, which fulfils a mandate in the coalition agreement, is closely linked to a number of other federal strategies and programmes. The most important of these are described in this section. For the implementation of local peatland protection, the federal states' peatland protection strategies, programmes and plans should be referred to; these are available for Baden-Württemberg, Bavaria, Brandenburg, Lower Saxony, Mecklenburg-Western Pomerania and Schleswig-Holstein. The National Peatland Protection Strategy closes a gap at federal level.

Peatlands are a core field of action of the Federal Action Plan on Nature-based Solutions for Climate and Biodiversity. The Action Plan creates synergies between nature conservation and climate change mitigation and adaptation. An important component here is the protection, renaturation and restoration of natural ecosystems, especially peatlands. This enables natural and near-natural habitats to be preserved and restored, providing a home for a rich and diverse flora and fauna. A transition to sustainable and locally adapted forms of use is required on farmed land. At the same time, this strengthens the resilience of ecosystems to the effects of the climate crisis and stores carbon in the long term. Thanks to the funding provided by the Federal Action Plan on Nature-based Solutions for Climate and Biodiversity, it is now possible to quickly begin implementing concrete measures on a large scale through incentives and funding opportunities.



Dianthus superbus, an endangered species of nutrient-poor wet fens and meadows cut for animal bedding

The 2007 National Strategy on Biological Diversity (NBS) contains around 330 goals and 430 measures on all issues relevant to biodiversity, including peatland protection. The aim of ending the decline in biodiversity and starting a positive trend has not been achieved, despite many measures in a variety of areas, and is thus still very current. The National Peatland Protection Strategy further enhances the peatland conservation targets from the NBS.

At international level, a new global post-2020 biodiversity framework is currently in development and will provide new target systems based on the Convention on Biological Diversity (CBD). The NBS will also be updated based on these new goals (see 4.1). This update will take the National Peatland Protection Strategy into account.

The Climate Action Plan 2050, adopted in 2016, is the federal government's long-term climate strategy required under the Paris Agreement. The updated federal Climate Change Act of 2021 contains annual emission budgets until 2030 for the energy, industry, buildings, transport, agriculture, waste and miscellaneous sectors adapted to the new national climate target for 2030 (reduction of at least 65 percent) and the goal of greenhouse gas neutrality by 2045. The carbon dioxide emissions from peat soils are attributed to the land use, land-use change and forestry sector (LULUCF), which plays a special role in contrast to the other sectors. The law emphasises the role of natural ecosystems such as peatlands and forests in climate change mitigation. The updated federal Climate Change Act of 2021 for the first time sets quantified targets for carbon sinks. The new Section 3a stipulates that this sector's average emissions balance must be minus 25 million tonnes of CO₂ equivalent by 2030, minus 35 million tonnes by 2040 and minus 40 million tonnes by 2045. The Federal Action Plan on Nature-based Solutions for Climate and Biodiversity and the National Peatland Protection Strategy will make a significant contribution to achieving these goals. Currently, the emissions from peat soils are offset in the sector's balance by carbon sequestration in forests. The predicted decline in the carbon sink function of Germany's forests as well as the need to offset unavoidable residual emissions in other sectors make it necessary to reduce greenhouse gas emissions from peat soils.



Cladium mariscus, an endangered species of alkaline-rich bogs, mainly found in northeast Germany and the Alpine Foreland; important in peat formation



Well-maintained wet meadow in a percolation mire in spring with flowering *Trollius europaeus*



Near-natural, unused alder fen forest in a terrestrialisation mire with a dense layer of ferns

The Climate Action Programme 2030 was adopted in 2019 and further specifies the Climate Action Plan 2050. The federal Climate Change Act states that this programme must be regularly updated. The Climate Action Programme 2030 includes a package of measures for the conservation of peat soils including reduction of peat use in growing media. This National Peatland Protection Strategy and the Peat Reduction Strategy (focused on reducing peat extraction and use as growing media) incorporate the Climate Action Programme measures.

For the large-scale implementation of rewetting measures to reduce greenhouse gas emissions from drained peat soils, a target agreement has been concluded between the Federation and all federal states on climate change mitigation through peat soil conservation, specifically to address the concerns of agriculture and forestry. The agreement is based on a joint understanding between the Federation and the Länder that the climate mitigation targets established in Germany can only be achieved if swift, ambitious measures are taken in the area of peat soils to reduce their greenhouse gas emissions in the long term. The aim of the agreement is to reduce annual carbon dioxide emissions from peat soils by at least five million tonnes of CO₂ equivalent by 2030. The implementation of the targets and measures is based on voluntary participation and requires cooperation between the Federation, the Länder and, above all, among land owners and users. The target agreement builds on the state and federal activities that have been under way for many years to protect and renature peatlands, and systematically develops them further, in particular to address climate change and the necessary resources.

The Peat Reduction Strategy published by the Federal Ministry of Food and Agriculture (BMEL) on this basis in 2022 aims to reduce the use of peat as a growing medium and soil conditioner to the greatest possible extent and to completely eliminate the use of peat where it can be replaced with climate-friendly alternatives. It also defines a phase-out target for peat use in private gardens and a reduction target for commercial horticulture.

The second progress report on the German Adaptation Strategy and the Adaptation Action Plan III make reference to rewetting peatlands. This highlights their importance for adaptation to the climate crisis (increasing the resilience of ecosystems).

There are also close, two-way links to the draft of the National Water Strategy. The stakeholder proposals in the final document of the national water dialogue provide important impetus for the National Peatland Protection Strategy. With the focus on rewetting and restoring peat soils, the National Peatland Protection Strategy supplements the strategic issues raised in the national water dialogue and lists concrete measures for implementation in practice. These must be incorporated in a comprehensive hydrological approach to sustainable integrated management of the landscape hydrology. The German government's National Peatland Protection Strategy thus contributes directly to achieving the strategic goals and Mission 2050 of the draft National Water Strategy. In turn, the water strategy supports the measures of peat soil conservation.

The planned integrated national Nitrogen Reduction Strategy intended to reduce discharge of nitrogen into the water, air and soils to a level that is environmentally compatible will also have positive impacts on peatland protection. Peatlands are already severely degraded due to eutrophication from the air or water or at considerable risk of becoming so. Generally, intensive use of agricultural land in peatland catchments is in part responsible for the deteriorating status of peatland ecosystems.

The BMEL is planning on developing a grassland strategy that will also address grassland uses of peat soils. This ministry is also planning to further develop its Forest Strategy 2020 into a Forest Strategy 2050. Here, too, peatland protection must be given priority and appropriate consideration, reflecting its great importance for climate change mitigation in forested areas as well.

The National Bioeconomy Strategy, adopted early in 2020, aims to identify and tap potential in the bioeconomy within environmental limitations and to develop bioeconomy solutions related to the 2030 Agenda for Sustainable Development. The use of the biomass from rewetted peatlands is part of the bioeconomy. The implementation measures that are still to be developed and research funding will link to and develop the measures in the National Peatland Protection Strategy on the sustainable and climate-neutral use of heavily drained peat soils.

Sometime in 2023, the German government will adopt the National Biomass Strategy. It is intended to ensure the sustainable production and use of biomass and will be consistently aligned with climate, environmental and biodiversity goals.

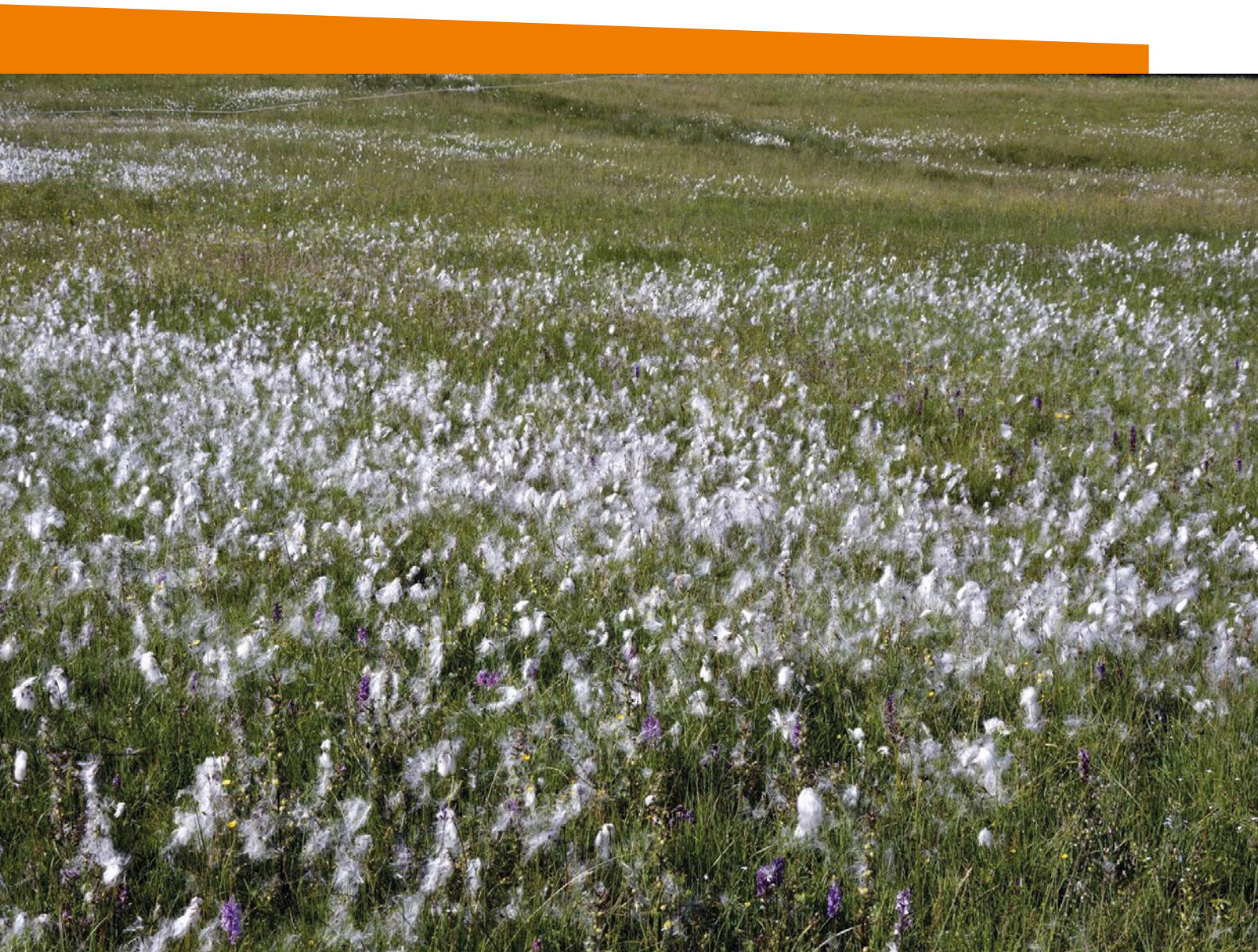
Finally, the National Peatland Protection Strategy helps implement the United Nations 2030 Agenda for Sustainable Development and its global Sustainable Development Goals (SDGs). In Germany, the German Sustainable Development Strategy (DNS) focuses in particular on implementing the SDGs with 75 national goals. The National Peatland Protection Strategy contributes to the achievement of key SDGs and DNS goals, in particular protecting terrestrial ecosystems, achieving land degradation neutrality (SDG 15), reducing greenhouse gases (SDG 13), cutting nitrogen emissions (SDG 2), protecting and restoring wetlands and water ecosystems (SDG 6) and promoting sustainable consumption (SDG 12).



Angelica palustris, a rare and highly endangered species found in fens in Germany with an eastern European distribution (a species listed in Annex II of the Habitats Directive)

3. Protect, restore, promote sustainable use

Principles and goals of the National Peatland Protection Strategy



Extensively grazed hill slope mire with spring water influence with fructifying *Eriophorum angustifolium* and flowering orchids

Increased awareness of the special characteristics of peatlands and peat soils is an integral component of successful peatland protection. Germany's peatland landscapes are diverse and differ widely from region to region: raised bogs and fens in the peatland hotspots of the northwest, coastal flood and percolation mires in the northeast, small raised bogs in the uplands and raised bogs and fens in the Alpine Foreland. This rich variety of peatlands in Germany requires specific, nuanced approaches, measures and a combination of instruments. A large number of previous nutrient-poor peatlands have been irreparably damaged and substantially altered by intensive land use in the surrounding area. Even if the original ecosystem cannot be restored in the foreseeable future, rewetting can still lead to a significant reduction in greenhouse gas emissions. The expected changes in landscape hydrology will further limit the options for protective measures. On this basis, locally adapted strategies for peatland protection and peat soil conservation must be developed together with local land owners and managers. The German government relies on voluntary cooperation between actors and local stakeholders for implementation of the measures. However, it is also clear that peatland protection is in the public interest. Investment projects on peatlands must not be an obstacle to implementation if rewetting is planned.

The protection of still intact, near-natural peatlands must continue to be rigorously pursued. Where possible, degraded habitats must be restored, protected areas enlarged and implementation of peatland protection measures strengthened. The aim is to achieve favourable conservation status of peatland habitat types and species. Should conflicting objectives arise between peatland protection and conservation of protected species and habitat types, these must be resolved taking into account the unique features of the case and existing legal provisions. Guidelines for planning and implementing measures can provide guidance.

A return to appropriate water levels must be realistically considered from the outset as a key objective in peatland renaturation measures. Potential sources of nitrogen contamination within the catchment area must be taken into account for successful protection or restoration of nutrient-poor biotopes. By creating additional renatured peatland areas, peatland protection can and will help achieve the national wilderness targets.

Where drained peat soils are in commercial use, the introduction of alternative, in part new, sustainable management practices needs to be promoted with the voluntary cooperation of the land owners and managers, so that new economic foundations are created. Climate-friendly use of peat soils is only possible in combination with adequately high water levels and in compliance with the provisions and targets of nature conservation and environmental protection.

The German government will create financial incentives to support land owners and managers in changing their management practices and to offset lost income. To this end, a set of tailored incentive and funding measures is being developed that takes into account the different environmental and socio-economic conditions.



Rewetting of a raised bog; plastic sheet driven into a peat embankment to retain water



Fens used for agriculture with little peat soil depth; rocks in the gravelly subsoil are already visible



Motorised mower suitable for mowing in wet fens

Locally adapted forms of management such as paludiculture have now also been taken into account within the framework of the Common Agricultural Policy of the European Union (CAP), thus more strongly promoting sustainable management of peat soils. In addition, the further development of the European Union's Common Agricultural Policy (CAP) should provide greater support for new management methods and therefore incentives for rewetting.



Low-intensity use meadow cut for animal bedding in full bloom in a calcareous fen before mowing

New management practices and value chains on rewetted peatlands that continue to be used will be further developed through more funding for research and development. The focus here should not be solely on growing new crops or low-intensity livestock farming. It is also important to encourage and support the development of innovative, environmentally beneficial products and services and the creation of a marketing chain. These include, for example, sustainable, environmentally responsible energy production, such as photovoltaic installations on rewetted, formerly intensively used peat soils. The pilot projects funded by the BMUV and the BMEL model and demonstration projects currently being planned are intended to show how promising management practices can be introduced in a way that benefits biodiversity and is economically sustainable without harming the climate. Investments for the development of downstream value chains should be promoted to develop attractive economic models.

Overall, there must be greater public awareness of peatland protection. More knowledge needs to be shared about peatlands and their significance for climate change mitigation and biodiversity conservation as well as the impacts of drainage measures and the use of peatlands for agriculture and forestry. More attention should be devoted to the issue in professional training and education in apprenticeships, vocational schools and at universities specialising in agriculture, forestry and water management.

As a whole, the implementation of the National Peatland Protection Strategy is meant to contribute to fulfilling national and international commitments in climate change mitigation and biodiversity conservation and is thus in the public interest. To this end, it addresses the main uses and threats to peatlands in Germany. It identifies concrete measures that are important for maintaining and restoring the functions of peatlands and must be implemented to improve their status, but also potential conflicting goals and interests. The measures are specifically designed to achieve the set goals and are tailored to fit the intended purpose. All additional funding requirements at federal level will be funded in the framework of the relevant departmental budgets or under the Climate and Transformation Fund. Adverse effects on adjacent areas will be minimised and compensated wherever possible. An important building block here is the development of a role model function for the Federation and implementation of peatland protection measures on federal property.



Restoration of a wet meadow in a terrestrialisation mire by raising the water level and mowing an area that has been unused for years

4. Fields of action



Orchid species of alkaline-rich fens

4.1 Protection and restoration of near-natural peatlands

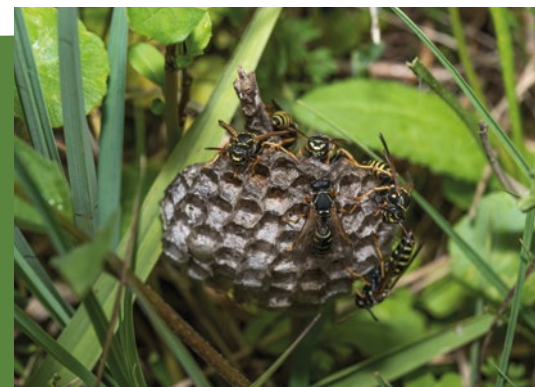
4.1.1 Current situation

In Germany, there are only a few remaining near-natural peatlands or remnants of them. There are no longer any completely natural peatlands. Many of the peatland biotopes that are important for nature conservation are in locations that are currently drained and increasingly degraded to the point that the quality of these biotopes is impaired and their continued existence at risk. Today they fall under biotope conservation laws, and many are designated protected areas and part of the coherent European protected area network Natura 2000, established under the Habitats and Birds Directives. The implementation of the Habitats Directive is particularly important for peatland protection because many peatland habitats and species fall under the protection of this directive. Specific peatland habitats and species are defined as having priority, meaning that they are subject to an especially strict protected status under this EU law. The aim of the directive is to help safeguard biodiversity by protecting natural habitats and wild animal and plant species. To this end, measures must be taken to ensure that natural habitats and wild animal and plant species of community interest retain or regain favourable conservation status. Particularly in the case of peatlands, area-based and area-limited measures in Natura 2000 sites are often not sufficient to achieve these targets, and clearer provisions and binding implementation targets are needed that reach beyond the borders of designated areas in order to, in particular, improve and restore the hydrological situation.

Many of the typical peatland biotopes are classed in the most endangered Red List categories in Germany. Peatlands are also included in the list of legally protected biotopes in accordance with Section 30 subsection 2 no. 2 of the Federal Nature Conservation Act. Generally, peatlands with intact water and nutrient balances require no maintenance, and their existence does not depend on active management. However, peatlands are often maintained for nature conservation reasons in order to preserve certain use-dependent, nutrient-poor peatland biotopes. To support restoration measures, trees and shrubs are sometimes removed in large numbers in order to reduce water losses via evaporation from the peat body. However, this is generally a sign that conditions in the water and nutrient balance are already impaired, that optimal wetting is not possible because of changed topography due to peat extraction, mineralisation or peat subsidence or that the conservation targets are not adapted to the local conditions. Improving the hydrological situation of many peatland areas over the long term usually requires the entire, and thus much larger, catchment area of the peatlands to be incorporated. It is likely that the planned rewetting will lead to the development of nutrient-rich fens on raised bog sites in the foreseeable future. At present, it is not sufficiently understood to what extent degraded, drained peat soils give rise to potential conflicts between nature conservation goals (preservation of species and biotopes) and climate change mitigation goals (rewetting).



Near-natural raised bog in the uplands



Polistes nimpha on its nest in a low-intensity use fen



Beaver dam in a ditch on a fen

Near-natural and unused peatlands cannot be treated as equivalent. Unused peatlands are not currently used for commercial purposes. How natural the peatlands are does not play a role here. In many cases, this is unused land that was previously used for agriculture, forestry or peat extraction. Generally, this land is damaged to varying degrees and will continue to degrade with high greenhouse gas emissions as long as the water levels are not raised. These more severely degraded peat soils are more difficult to restore. However, they are usually of great importance for nature and biotope conservation and are in many cases protected. Here, land maintained with nature conservation measures is considered unused land as long as no commercial aims are pursued related to use of the land.

Key objectives of the EU Biodiversity Strategy with relevance for peatland conservation

1. Coherent network of protected areas

- At least 30 percent of the land area of the EU should be legally protected. At least a third of the protected areas of the EU – 10 percent of the EU's land area – should be strictly protected.
- [...] Significant areas of other carbon-rich ecosystems, such as peatlands, grasslands, wetlands, mangroves and seagrass meadows should also be strictly protected, taking into account projected shifts in vegetation zones.
- All protected areas will need to be effectively managed with the definition of clear conservation objectives and appropriate monitoring.

2. An EU Nature Restoration Plan: restoring ecosystems across land and sea

- The Commission will put forward a proposal for legally binding EU nature restoration targets in 2021, subject to an impact assessment, to restore degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters.
- The Commission will, in particular, ask member states to ensure no deterioration in conservation trends and status of all protected habitats and species by 2030. In addition, member states will have to ensure that at least 30 percent of species and habitats not currently in favourable status are in that category or show a strong positive trend.

Source: European Commission (2019): Biodiversity strategy for 2030 (https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030_de#documents)

Lycopodium annotinum, a relatively common species in moist bog forests



In May 2020, the European Commission published the EU Biodiversity Strategy for 2030 as part of the European Green Deal. It is closely tied to the EU Farm to Fork Strategy for a fair, healthy and environmentally friendly food system. The Council endorsed the objectives of the EU Biodiversity Strategy on 23 October 2020. The Biodiversity Strategy includes concrete targets for the next ten years, including creating a Trans-European Nature Network with at least 30 percent of the EU land area and 30 percent of the sea area, requiring restoration of degraded ecosystems and enabling transformative change. In addition, the EU needs to take a leading role in combating biodiversity loss at global level. The Commission proposed legally binding targets for restoring nature in degraded ecosystems relevant for climate change mitigation and presented specific proposals for their implementation in 2022.

Laelia coenosa, a highly endangered and rare species found in fens



4.1.2 Goals

a

Preserve all near-natural peatlands

Highest priority is given to preserving all near-natural peatlands and securing their natural development. This also serves the legal mandate to maintain or restore favourable conservation status of peatland habitat types in line with the Habitats Directive.

b

Preserve and rewet unused peatlands

Currently unused peatlands will not be subject to any future use regardless of their hydrological condition. The hydrological status of the land will be improved. Wherever possible, the land will be completely rewetted.

c

Strengthen sink function

Near-natural, unused peat soil land must be able to develop in the long term into growing peatlands and enhance its carbon sink function.

d

Improve peatland protection in the national and EU protected area network

Peatlands that are protected areas will be enlarged, taking into account adequate buffer zones, their hydrological catchment area and the landscape hydrology while minimising nutrient discharges.

e

Improve the situation of bog woodlands

Bog and fen woodlands corresponding to a habitat type of Annex I of the Habitats Directive or a legally protected biotope type will no longer be used for forestry by 2030. In the medium to long term, the aim is to enlarge the areas and bring about a significant improvement in the hydrology. In line with the obligations arising from the EU Biodiversity Strategy and the Habitats Directive, bog woodlands must be designated as strictly protected areas.

f

Consolidate peatlands in the protected area network

By 2035, all peatlands in Germany with high relevance for nature conservation and climate change mitigation will have been rewetted and permanently secured.

4.1.3 Measures

I

All remaining near-natural peatlands as habitats and locations will be rigorously protected from further pressures, independent of their status as protected areas. Use of these areas for commercial purposes will be prohibited. Where peatland protection measures are carried out on land with a defined public purpose (especially national defence), the lands' functionality for this purpose will be kept intact.

II

The German government is working to ensure that additional peatland sites are allowed to develop naturally and placed under protection. Funding is possible under the provisions of the funding guidelines of the Wilderness Fund (Wildnisfond).

III

Land consolidation is also effective and necessary for peatland protection. The German government therefore supports measures designed to ensure that rewettable and restorable units of peatland plots are consolidated or that land consolidation is carried out for this purpose.

IV

The German government supports the federal states within the legally available financial framework in meeting their nature conservation obligations, particularly in achieving favourable conservation status of species and habitat types listed in the Habitats Directive.

V

The German government supports the federal states in nature-based climate action within the scope of the financial responsibilities established in the constitution in rewetting and improving peatlands for nature conservation by 2035.

VI

The German government advocates considering the needs of species and biotope conservation when rewetting peat soils and better leveraging the synergies between nature, water and soil conservation and climate change mitigation. Guidelines for resolving and mitigating potential conflicting goals between nature conservation and climate change mitigation are being developed in consultation with the federal states.

VII

The German government is working, in part under the target agreement between the Federation and the Länder on climate change mitigation through peat soil conservation, to ensure that unused peatlands remain intact as habitats and locations and are rewetted to the point that peat decomposition stops and peat growth is possible.

VIII

The German government advocates further development of existing EU funding programmes available for protecting near-natural as well as unused peatland areas.

4.2 Use of peat soils for agriculture

4.2.1 Current situation

The agricultural use of peat soils has great economic significance in many parts of Germany, particularly its use as grassland for dairy cattle. Reclamation and drainage measures have generally been more extensive on land used to grow crops. The drainage, mostly carried out decades ago and associated with a high overall cost to society, led to subsidence and shrinkage of the peat soil due to water and peat loss. Depending on the location, this can lead to long-term loss of agricultural utility. Use of this drained land for agriculture is therefore finite and economically and environmentally unsustainable. Subsidence processes can also cause serious damage to buildings and infrastructure. Use as cropland is also associated with increased vulnerability of dry peat soils to wind erosion, which accelerates degradation processes. During extended dry periods, the risk of fire from drained peat soils is expected to increase, especially in extreme heat. Individual plots and peatland areas have reached or will reach a condition in the foreseeable future beyond which further agricultural use of the land is no longer reasonably feasible. On the coasts, the expected rise in sea level is creating additional challenges and costs to maintain drainage, especially for drained peatlands subject to heavy subsidence.



Crop farming on a deep, heavily drained fen; muddy topsoil with stubble of corn crops

The farming practices and procedures currently predominantly used to farm peat soils are generally not compatible with year-round, close-to-the-surface water retention. The drainage systems of peatlands used for agriculture must be dismantled as far as possible by the time climate neutrality is achieved in Germany in 2045 at the latest, or redesigned in such a way that they can contribute to stabilising the soil water balance and landscape hydrology (to balance phases of precipitation and drought). The shift from drainage-based to wet use of peatlands requires a new orientation in management practices as well as considerable investment in hydraulic facilities and adapted land use technologies. Most farms will not be able to handle this transition on their own.



Species-poor intensively used grassland on a deep, heavily drained fen; molehills show mull-enriched peat soil

Successful rewetting projects on agricultural land and piloting of innovative paludiculture approaches to using wet land are not yet widespread. Sustained rewetting of agricultural land is therefore moving forward only very slowly to date. In many cases, sometimes very small-scale ownership structures are an obstacle to rewetting. Most current completely rewetted land is used for nature conservation purposes with maintenance in some cases, and falls out of regular agricultural use.



Herd of cattle (*Uckermärker breed*)
on a drained fen

The key framework conditions are set out in the EU's Common Agricultural Policy (CAP). The way direct payments under the CAP have been structured to date supports the agricultural use of drained peat soils and is thus partly responsible for high greenhouse gas emissions, detrimental environmental impacts and high macroeconomic costs. On the other hand, CAP's pillar II and potentially also the organic regulations of pillar I provide options to financially support implementation of peatland protection and management measures in agriculture that must be exploited further. Agricultural subsidy policy is a key lever for peat soil conservation on land used for agriculture.



Rewetting measure by installing an
adjustable ditch gate

One year after implementation of the
measure at the same location: the vegetation
is already growing again



4.2.2 Goals

a

Reduce the greenhouse gas emissions from peat soils used for agriculture

Management practices that stop the loss of peat are the medium to long-term goal for the agricultural management of peat soils. This type of management will therefore contribute to reducing annual greenhouse gas emissions from peat soils by at least 5 million tonnes of CO₂ equivalent by 2030.

b

Maintain and improve biodiversity and water quality

Synergies with climate change mitigation, biodiversity, water and soil conservation and landscape hydrology are consistently leveraged in managing and restoring peat soils.

c

Increase resilience to the impacts of the climate crisis

New forms of use help increase the resilience of agriculture in peatland regions in light of expected adverse impacts of the climate crisis, such as drought or flooding.

d

Create value chains compatible with the climate and biodiversity

Value chains compatible with the climate and biodiversity will be created to secure economic prospects for the agricultural management of peat soils. This will include new products and services that can be produced and used to benefit the environment, nature, the climate and biodiversity. The potential of rewetted peat soils for the sustainable production of food and feed as well as biomass for cascaded use as material or energy will be fully tapped in harmony with nature conservation and climate action.

e

Better incorporation of peat soil conservation in the EU Common Agricultural Policy (CAP)

The CAP considers agriculturally active rewetted peat areas (for example paludiculture) the same way it does other land in agricultural use. Existing barriers such as the requirement to provide areas to replace grassland when permanent grassland is converted to paludiculture or the obligation to use or maintain land annually have been removed. Peat soil conservation is supported through pillar II funds.

f

Refocus funding on peat soils used for agriculture

The redesigned national funding instruments do not create misguided incentives for management practices that promote peat loss and appropriately reflect the social benefits of management practices that stop peat loss.

4.2.3 Measures

Strengthen cooperation with the federal states:

I

The German government is implementing a target agreement between the Federation and the Länder on climate change mitigation through peat soil conservation, which includes, in particular, the use of peat soils for agriculture. It will be reviewed on a regular basis to determine if it needs updating. The target agreement forms the basis for uniform action by the state and federal governments to achieve the targets of peat soil conservation.

II

Together with the Länder, the German government is reviewing the existing funding measures and programmes for their suitability to meet the needs of peat soil conservation and harmonising them to avoid possible inefficiencies and duplicate funding. The German government is working together with the federal states to improve funding of peat soil conservation and remove barriers in funding rules and misdirected incentives nationally and within the EU, in conformity with the review of climate-damaging subsidies in the federal government's Climate Action Plan 2050.

Support for voluntary rewetting measures:

III

In the interest of peat soil conservation, the German government is working to ensure the efficient use and continuation of the funds made available for nature-based climate action in the federal budget for 2022 and for the financial planning period. The aim is to implement incentive programmes for peat soil conservation on peat soils used for agriculture on the basis of the target agreement between the Federation and the Länder.

IV

In voluntary partnerships with agricultural enterprises and taking into account the regional conditions, management practices will be introduced and funded that contribute to the achievement of climate change mitigation targets and are in harmony with peat soil and biodiversity conservation. Permanently raising the groundwater level on land used for agriculture will be funded where this is appropriate for stopping or at least considerably reducing peat decomposition. Winter water levels of at least 10 centimetres below surface and summer water levels of at least 30 centimetres below surface or higher are the aim.

V

New forms of management that are compatible with fully raising water levels, especially the establishment of a variety of paludiculture with native species (peat mosses, reeds, bulrushes and sedges) are to be specially funded until they become competitive. The German government is testing climate-friendly uses of peat soils in pilot projects and is committed to the further development of the processes used (if appropriate, also linked to other innovative uses, see number 4.9.3 XII) as well as new products and the establishment of sales and use channels. The insights into new value chains compatible with peatlands, biodiversity and the climate, especially peat for use as a material, will be communicated nationally and internationally.

VI

Measures with a particularly positive impact on biodiversity conservation, a major effect on climate change mitigation and a favourable cost-benefit ratio should be given priority for funding and the data made publicly accessible.

Measures related to the Common Agricultural Policy of the EU (CAP):

VII

The national scope in CAP for the funding transfer from pillar I to pillar II starting in 2023 will also be used in the interest of peatland protection.

VIII

The German government is working to develop CAP for the funding period from 2027 in the interest of peatland protection and to make agricultural use of organic soils compatible with the climate through rewetting (see IV) and will draw up relevant proposals to this end in due time.

Review and adapt the general conditions for agriculture:

IX

Existing legal frameworks for agriculture will be systematically used to address peat soil conservation issues and, if necessary, further developed as appropriate.

X

The German government advocates a general ban on ploughing up peatlands converted to grassland for grassland regeneration.

XI

Recommendations and guidelines on peatland and peat soil conservation will be developed for the use of organic soils for agriculture. This includes, in particular, forgoing expansion and further deepening of drainage.

XII

Incentives for agricultural infrastructure (for example animal housing) should only be granted if the measures do not impair potential future rewetting measures.

XIII

The German government supports stepping up agri-environmental consulting provided by the authorities and is working to expand agricultural experimental research on the sustainable management of peat soils.

XIV

The German government supports land consolidation when it leads to or is for the purpose of merging rewettable and restorable units of peatland plots and enabling uses adapted to peat soil.

XV

The German government is reviewing whether and to what extent peatland cooperation projects can be funded to support efforts to rewet and manage rewetted peat soils.

XVI

The German government is assessing whether measures to dismantle and redesign drainage systems can be promoted and, if so, how, in order to support projects for the rewetting and sustainable management of peat soils used for agriculture.

4.3 Use of peat soils for forestry

4.3.1 Current situation

In Germany, forests cover around 300,000 hectares of peat soils. These peat soils, particularly fen soils, are also used for forestry. Both bog forests in the strict sense and secondary forests on drained peatland sites provide a diverse range of functions and ecosystem services, also for the unforested peatland sites associated with them. They are therefore subject to protection under forest law. They include both drained sites with secondary forest communities used for forestry and very low-intensity use or unused bog and fen forests. Due to their importance for nature conservation, many of the semi-natural bog and fen forests are designated as protected areas or the associated biotopes are protected under the Federal Nature Conservation Act (BNatSchG) and may thus be subject to restrictions on use. This means that they generally play a more minor economic role in forestry in Germany, with some regional exceptions. In many cases, forestry on wet peat soils is only economically viable to a limited extent (timber harvesting is problematic and the use of suitable technology is generally very expensive) and are therefore often only used for low-intensity purposes.

Managed sites on drained peat soils are much more important for forestry. As is generally the case on drained peat soils, using these sites for forestry can lead to continued peat decomposition and high greenhouse gas emissions from these soils, making use unsustainable. Challenges for rewetting areas used for forestry can be the result of the sometimes very small-scale ownership structures in private forests. When peat soils are rewetted, near-natural bog landscapes must be restored and their use for forestry also be adapted accordingly and, depending on the location, may even have to be abandoned. The drainage systems of peatlands used for forestry must be dismantled as far as possible by the time climate neutrality is achieved in Germany in 2045 at the latest, or redesigned in such a way that they can contribute to stabilising the soil water balance and landscape hydrology (to balance phases of precipitation and drought).

Regardless of this, maintaining and improving the forest soil's capacity to retain water is crucial to efforts to tackle and adapt to climate change, especially in the case of droughts. They must become a more prominent focus of forestry and be pursued more vigorously. Greater importance will also have to be attached to these goals in the future to increase the resilience of forests to the climate crisis.



Moor birch forest (*Betula pubescens*) on already moderately drained peat soil



Well-growing alder on a fen site

4.3.2 Goals

a**Reduce the greenhouse gas emissions from peat soils used for forestry**

Management practices that stop the loss of peat are the medium to long-term goal for peat soils used for forestry. This will contribute to reducing annual greenhouse gas emissions from peat soils by at least 5 million tonnes of CO₂ equivalent by 2030.

b**Preserve and improve biodiversity and water quality**

The goals of nature, water and soil conservation are given special consideration in forestry management and the restoration of near-natural bog forests, and the synergies between climate change mitigation and biodiversity as well as landscape hydrology are consistently leveraged.

c**Increase resilience to the impacts of the climate crisis**

On rewetted peat soils that continue to be used for forestry, new sustainable forms of use and adaptation measures help to increase resilience to the expected negative impacts of the climate crisis, especially to drought and natural disasters, and to near-natural forest development.

d**Create value chains compatible with the climate and biodiversity**

To ensure economic opportunities for the management of rewetted peat soils for forestry purposes, support is provided for value chains compatible with the climate and biodiversity with innovative products and services that can be produced and used without harming the environment, nature, climate or biodiversity. The potential of rewetted peatlands for the sustainable production of biomass for cascaded use as a material or for energy is harnessed in harmony with nature conservation and climate action.

e**Create new, specific funding opportunities for peat soils used for forestry**

The newly aligned funding instruments at national level support owners of forests on rewetted peat soils with specifically adapted forms of use and adaptation measures, prevent misguided incentives and take appropriate account of the intended social benefits of peat conservation management. Priority should be given to promoting suitable near-natural management.

4.3.3 Measures

Strengthen cooperation with the federal states:

I

The German government is implementing the target agreement between the Federation and the Länder on climate change mitigation through peat soil conservation that includes, in particular, the use of peat soils for forestry. It will be reviewed on a regular basis to determine if it needs updating. The target agreement forms the basis for uniform action by the state and federal governments to achieve the targets of peat soil conservation.

II

Together with the Länder, the German government is reviewing the existing funding measures and programmes for their suitability to meet the needs of peat soil conservation in forests and harmonising them to avoid inefficiencies and duplicate funding. In cooperation with the federal states, the German government is working to improve support for peat soil conservation in forests and eliminate funding obstacles and misdirected incentives.

Support for voluntary rewetting measures:

III

In the interest of peat soil conservation in forests, the German government is working to ensure the efficient use and continuation of the funds made available for nature-based climate action in the federal budget for 2022 and for the financial planning period. The aim is to implement effective incentive programmes for peat soil conservation on peat soils used for forestry on the basis of the target agreement between the Federation and the Länder.

IV

In voluntary partnerships with forestry undertakings and affected forest owners and with consideration for the prevailing regional conditions, management forms will be introduced that are consistent with peat soil conservation, biodiversity conservation and the goal of greenhouse gas neutrality. Permanently raising the groundwater level on land used for forestry should be funded if it stops peat decomposition.

V

Forms of forestry management that are compatible with fully raising water levels should be specially funded until they become competitive. The German government is testing climate-compatible uses of peatlands in pilot projects and is committed to the further development of the processes and new products and to the establishment of channels for marketing and use.

VI

The German government is assessing whether measures to dismantle and redesign drainage systems can be promoted and, if so, how, in order to support projects for the rewetting and sustainable management of peat soils used for forestry.

VII

Measures with a particularly significant impact on climate change mitigation, a favourable cost-benefit ratio and positive effects on biodiversity conservation will be given priority for funding.

Review and adapt the general conditions for forestry:

VIII

The existing legal framework for forestry will be systematically used to address peat soil conservation issues and, if necessary, further developed as appropriate.

IX

The German government is working to ensure that, in protected areas, the use of pesticides on peat soils used for forestry is limited to special applications requiring authorisation.

X

Recommendations and guidelines on peat soils used for forestry will be developed. This includes, in particular, forgoing expansion and further deepening of drainage. The interests of owners and managers of adjacent areas should not be adversely affected.

XI

The German government supports and promotes the development of processes for timber harvesting less harmful to the soils on peatland sites with high water levels.

XII

The German government does not finance any measures for reforestation on drained peat soils that conflict with peatland protection as part of the Climate Action Programme 2030, nature-based climate action or other programmes. The German government is working to ensure that the federal states adopt the same approach.

4.4 General conditions for water management

4.4.1 Current situation

Peatlands are completely dependent on water and cannot exist without it. The availability and quality of water directly impact how peatlands develop. This means that the future of all peatlands is inextricably linked to the landscape hydrology. In Germany, the water balance has generally been significantly altered by land use and land ameliorations in the past, as well as regionally by water withdrawals, for example by deep wells. In addition, water is intensively used as a resource. This means that the hydrological conditions today are no longer the same as the conditions that gave rise to the peatlands initially and encouraged their growth. Restoring the landscape hydrology to a state closer to the one necessary to conserve peatlands is also made more difficult by the expected changes in the climate. On the other hand, intact peatlands can make a contribution to slowing down climate change.

Water and soil associations and the authorities responsible for communal water regulation facilities currently still too often narrow their focus to drainage and improving drainage capacity. A new awareness of the impacts of water management in peatlands is a prerequisite for peat soil conservation. Priority must be given in the future to rewetting and maintaining or restoring the water balance with a view to the necessary climate change mitigation, soil and nature conservation, but also from the perspective of flood protection and climate adaptation, including precautions for periods of drought. One central challenge in peatland protection is structuring the interaction between the water sector, water and soil associations, land managers and owners and administrative authorities. Involving these stakeholders early on in all strategies and planning is a prerequisite for ensuring that the needs of water supply, irrigation, coastal and flood protection, climate change mitigation as well as nature and soil conservation are consolidated and adequately taken into account.

Water management in the peatland catchment area must primarily focus on creating the conditions needed for successful rewetting measures. The water supply in Germany is subject to greater seasonal fluctuations. Currently, it is often below average in the summer months and will continue to decrease as the climate crisis intensifies. This is why water retention and the reduction of runoff must also be taken into account in rewetting measures in the context of integrated water management. It is important to keep in mind that, on the one hand, success depends on measures in the peatland catchment area and, on the other hand, that rewetting measures can affect adjacent land and areas situated downstream. Changes in water management must therefore always be adapted to local conditions and can only be successfully implemented in close cooperation with all stakeholders.

Coastal protection poses an additional challenge, particularly in regions along the coast with areas partly below sea level. Further degradation of peat soils combined with continued subsidence of soils will further intensify these challenges. Preventing further degradation of peatlands is thus also necessary in the interest of long-term coastal protection.

Large-scale rewetting measures can change the conditions for drainage capacity. This can be addressed by appropriate adaptation measures in water management and, in some cases, may also require polders to be installed. Especially in raised bog areas, the problem of nutrient discharge from the water catchment areas must be considered in all restoration measures. Rewetting measures must also take into account possible nutrient discharge from the peat soil, also with regard to the quality objectives set out in Directive 2000/60/EC establishing a framework for Community action in the field of water policy (Water Framework Directive).



Deep ditch in a completely drained fen



Old weir with visible need for repair in a fen

4.4.2 Goals

a

Close link between the National Peatland Protection Strategy and the strategic focus of the German government's water and water conservation policies

The measures and objectives of the German government's water and water conservation policies and the National Peatland Protection Strategy complement one another and together contribute to effective peatland protection.

b

Develop water management practices that aim to achieve the required water retention

Summer dry periods and fluctuations in the water supply are prevented by integrated water management designed to increase water retention. Sustainable water management practices make economical use of existing water resources and provide sufficient water for rewetting measures.

c

Establish the prerequisites for water management necessary for peatland protection

Peatland protection is promoted by water management in peatland regions as a key element in comprehensive integrated water management and the hydroengineering infrastructure meets needs of peatland protection. The application procedures required for rewetting measures are implemented, supported and actively promoted by the competent authorities.

d

Ensure long-term peatland protection by stabilising a sustainable usable groundwater regime as a prerequisite for lasting peatland protection

The measures for peatland protection support groundwater recharge, water retention over a wide area and the regional landscape water balance.

4.4.3 Measures

I

When developing strategies and measures related to water and water body policy, the German government takes into account the requirements of effective, voluntary peat soil conservation and specifically defines the necessary measures in the area of water management. The requirements for protecting drinking water must be reviewed and taken into account in all measures.

II

Together with the federal states, the German government is exploring how the competent water authorities can be empowered to carry out their duties in peatland protection.

III

The German government supports the realignment of water and soil associations and competent authorities to focus more on water management focused on climate change mitigation, with due consideration of measures to adapt to the climate crisis.

IV

The German government is working with the federal states to ensure that drainage measures cannot be carried out on peat soils without legal authorisation.

V

The German government supports the early involvement of the competent water authorities and the responsible water body maintenance associations, water and soil associations, drinking water and wastewater associations at regional and local level in the design of rewetting and renaturation measures.

VI

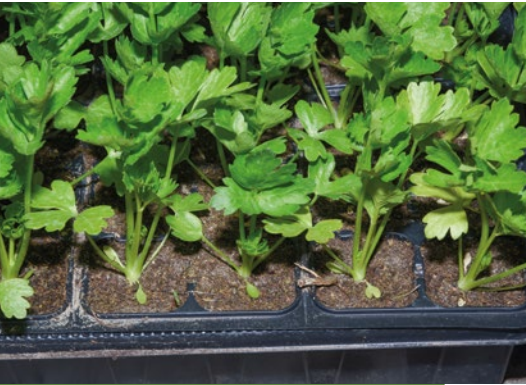
Peat soil conservation is integrated into the guiding principles to be developed for the regional, near-natural water balance in rural and urban areas. This is intended to ensure that the impacts of the climate crisis and the use requirements are adequately taken into account to ensure that the goal of greenhouse gas neutrality is achieved by 2045.

VII

Together with the federal states, the German government is assessing how to promote the transformation of the hydroengineering infrastructure and other supporting water management measures necessary for peatland protection, taking into account the water supply from groundwater and surface water in the hydrological catchment area of the peatlands. Stabilising the groundwater level plays a key role in this process. This requires groundwater monitoring measures in the hydrological catchment area of the peatlands.

VIII

In the hydrological peatland catchments, the German government is consistently leveraging synergies with the integrated nitrogen mitigation strategy that is currently being developed.



Celery seedlings in planting soil containing peat

4.5 Peat extraction and use

4.5.1 Current situation

Peat is only still extracted in Germany in a few federal states. State laws determine how permits to extract peat are issued. Since permits are due to expire, the peat industry assumes that peat extraction in Germany will largely come to a standstill by 2040. This will contribute to reaching the goal of achieving greenhouse gas neutrality in Germany by 2045.

To reduce greenhouse gas emissions from peat use, it is not enough to merely focus on peat extraction in Germany. Even today, peat is imported on a larger scale from other countries of the European Union for the potting soil industry. Unlike in Germany, where peat may only be extracted from land that is already used for agriculture and drained, in other EU member states extraction takes place mainly on near-natural peatlands, a practice that is associated with significant impacts on biodiversity and climate.

The BMEL's Peat Reduction Strategy focuses on alternatives to peat in potting soil, growing media and as a soil conditioner in Germany. In addition, a unified approach is sought at European level to phase out peat extraction, restrict the import of peat-based products and growing media and encourage more climate-friendly alternatives.



Industrial peat extraction on a raised bog

4.5.2 Goals

a

Phase out peat extraction

Peat extraction in Germany will be phased out in the medium term. At the same time, peat extraction is prevented from shifting abroad and causing the destruction of peatlands elsewhere. The carbon sink function of the rewetted extraction areas will be restored as quickly as possible.

b

Use of peat alternatives

Sufficient quantities of suitable quality peat alternatives are available. Circular economy principles are practised by all stakeholders.

c

Reduce peat use for hobby and commercial horticulture

The use of peat in hobby gardening will be replaced by sustainable alternatives by 2026. In commercial horticulture the aim is to largely replace peat in growing media by 2030.

4.5.3 Measures

I

Together with the federal states, the German government is working to ensure that peat extraction is properly phased out and that no new applications for peat extraction are approved at state level.

II

The German government is taking advantage of the market leadership of the German potting soil industry to intensify international cooperation on using peat alternatives in growing media for horticulture.

III

The German government is promoting research, development and use of high-quality peat alternatives.

IV

The German government is undertaking measures to raise environmental awareness and provide consumer information on peat alternatives.

4.6 Land owned by the German government and the government's function as a role model

4.6.1 Current situation

Around 1 percent of the land in Germany is currently owned by the federal government. Most of it is used for military purposes. To a lesser extent, these areas are forested, used for agriculture or have buildings on them. Specifically due to the way they are used, some of the military properties have a distinctive biotope and species composition. As a result, considerable parts of these areas are also included in the European network of Natura 2000 protected areas. In addition, large areas are subject to biotope protection under federal and state law.

A significant amount of land with peat soils is located on federally owned properties. Peatlands and peatland sites on federal properties were drained a long time ago and are, as a result, in a degraded state and/or in need of improvement. This became particularly evident in the large peatland fire in the Tinner Dose in 2018, which affected extensive areas of degraded peat soils. Since military or former military properties can undergo harmful soil changes, be contaminated or contain warfare agents and munitions and can also form hydrological units with adjacent, intensively farmed areas, it can be difficult to implement wetting measures for individual peatland sites. Most of the federally owned peatlands and peat soils are used for military purposes.

Peatland protection is a major undertaking for society as a whole, which will entail considerable effort over the long run for everyone involved and affected. The German government's function as a role model is therefore of particular importance in the current peatland protection strategy. The strategy addresses the peatland sites owned by the federal government regardless of their use, whereby the regulations of Section 4 of the Federal Nature Conservation Act (BNatSchG) on ensuring proper function in connection with areas for public purposes must be respected. The goals correspond in many cases to those in 4.1 to 4.5.

In the implementation of the National Peatland Protection Strategy, the commitments of the Federal Republic of Germany under international law, the defence duties of the Federal Armed Forces (Bundeswehr), the military interests of foreign armed forces and the interests of the Federal Police (Bundespolizei) are fully ensured. The strategy is implemented in consultation with the official users.



Rehabilitated weir in a ditch for rewetting a fen

4.6.2 Goals

a

Reduce the greenhouse gas emissions from peat soils

The potential for climate change mitigation that arises from rewetting drained peat soils is identified by the German government on its properties as part of its function as a role model and this potential is tapped as fully as possible. By 2024, the German government will set ambitious greenhouse gas reduction targets for the years 2030 and 2040 on the basis of a peatland protection plan for federal properties, which will reflect the government's function as a role model in achieving greenhouse gas neutrality.

b

Maintain and improve biodiversity and water quality

The impacts on biodiversity and water conservation are taken into account in the management and rewetting of peat soils on federal properties. This will also contribute to achieving existing goals in these areas.

c

Reduce peat use on land under the German government's remit

The use of peat and peat substrates on lands under the federal government's remit will be reduced and discontinued as outlined in the BMEL's peat reduction strategy. The public sector will take ambitious steps forward here.

4.6.3 Measures

I

On federal properties, all possibilities for implementing peatland protection measures will be rigorously pursued, taking into account the specific purpose of the land as defined in Section 4 of the Federal Nature Conservation Act (BNatSchG).

II

For peatlands on federal properties that are still in or have been restored to a favourable condition (that stops peat loss), the German government ensures that they do not deteriorate either in size or their condition.

III

The German government will take the necessary measures to maintain or restore an ecologically favourable conservation status of protected species and habitat types associated with peatlands in the Natura 2000 sites on its properties.

IV

The responsible federal authorities, in particular the Federal Institute for Real Estate Management (Bundesanstalt für Immobilienaufgaben – BImA) and Bodenverwertungs- und -verwaltungs GmbH (BVVG), will determine in the short term which properties on peat soils are owned by the federal government.

V

The BImA is developing a peatland protection plan for rewetting the peatlands on its properties by 2024. This plan will take into account aspects of climate change mitigation as well as water, nature, and soil conservation.

VI

For properties used by the German military, the plan components will be developed together with the German armed forces. For larger peatland areas, the necessary measures will be integrated into existing management plans as far as possible by 2025, while guaranteeing the specific purpose of the federal properties and third-party involvement. If no management plans exist, new plans will be developed on the basis of the peatland protection plan.

VII

The management plans will be implemented quickly so that rewetting can have a rapid impact, contributing to climate change mitigation. The interests of owners and managers of adjacent areas should not be adversely affected. Measures to stop peat loss take priority over measures to reduce peat decomposition, provided the cost-benefit ratio is the same.

VIII

By 2024, the responsible federal authorities will systematically assess their properties for unused peatlands in protected areas designated under nature conservation law with the aim of rewetting them as completely as possible, taking into account the military purpose of the land. The interests of owners and managers of adjacent areas should not be adversely affected.

IX

The near-natural forested peat soils owned by the federal government are permanently protected by appropriate measures by 2024 and no longer used for forestry to the extent permitted by the specific purpose of the federal properties.

X

By 2023, the German government will define good agricultural and forestry practices for the use of peat soils on federal properties with special consideration for climate change mitigation and biodiversity, soil and water conservation.

XI

The BImA will not construct, deepen or rehabilitate drainage systems on peat soils used for agricultural and forestry purposes, and will refrain from expanding and further deepening drainage. The interests of owners and managers of adjacent areas should not be adversely affected.

XII

Priorities for the implementation of measures will be set in particular on the basis of climate relevance and the cost-benefit ratio, taking into account biodiversity (especially Natura 2000), feasibility and possible conflicts between goals.

XIII

Forests will not be planted on peat soils on federal properties. Forestation of near-natural or rewetted peat soils is left to natural succession as far as possible, provided this is permitted by the specific purpose of the federal property.

XIV

Land previously used for agriculture and drained grassland on peat soils owned by the federal government will be rewetted by 2030 where possible and the forms of use adapted accordingly. The interests of owners and managers of adjacent areas should not be adversely affected.

XV

If land on peat soils is sold or leased for agricultural purposes, in particular by the BVVG, the possibility of its future use for farming must be ruled out by drafting the leases or purchase agreements accordingly. Similarly, the leases and purchase agreements must be structured by the BVVG to ensure that any rewetting must be accepted by the new owners or tenants. The interests of owners and managers of adjacent areas should not be adversely affected.

XVI

The competent federal authorities require the users of federal properties on peat soils to largely refrain from the use of pesticides.

XVII

The competent federal authorities prohibit the users of federal properties on peat soils from ploughing up the land for grassland regeneration.

XVIII

The German government is developing guidelines for peat reduction and peat substitution in public procurement and sensitising the employees responsible in the service of the federal authorities to how these guidelines are applied.

XIX

When the federal government awards contracts for gardening and landscaping, the use of peat-free growing media will be required, especially when creating beds and green spaces, for soil improvement and landscaping.

XX

The federal administrations also require the use of peat-free substrates in federally funded projects and measures.

4.7 Activities at international and EU level

4.7.1 Current situation

Challenges for peatland protection do not just exist in Germany, but also in Europe and worldwide. Due to the importance of peatland protection for biodiversity and climate change mitigation, peatland degradation in other countries has a significant impact globally and affects living conditions in Germany. Efforts to protect peatlands must be intensified at international and EU level.

In this context, it is important to limit the increasing global pressure on peatlands as fully and effectively as possible – in line with the 2030 Agenda for Sustainable Development and the SDG Decade of Action proclaimed at the 2019 SDG Summit – and, where peatlands are used, to make their use sustainable.

For peatland protection to be successful, it is important that international agreements and regulations at EU level are designed to facilitate and promote ambitious peatland protection. The EU has legal frameworks, strategies and action plans to protect nature and restore habitats and species. Of particular importance is the Water Framework Directive, which is very closely linked to the issue of water availability and landscape hydrology, which are both central to peatland protection.

Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy policy framework and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU (LULUCF Regulation) defines a European accounting framework for emissions and removals from the land use sector (forests and soils). The nationally binding climate targets for this sector for each member state and the respective accounting rules also apply to peatlands. This provides an incentive for climate-friendly management of peatlands and wetlands.

To date, protection is incomplete, the scope of restoration is limited and implementation and enforcement of legislation inadequate. The further development of peatland protection must become an important aspect in shaping the new EU climate policy. The European Commission has emphasised the important role that natural ecosystems and their impact on climate change will play in achieving the goal of greenhouse gas neutrality. Peatland protection is equally important as a contribution to medium and long-term climate goals and as support for the new Biodiversity Strategy and the EU Soil Strategy. The European Commission presented the 2030 EU Biodiversity Strategy as part of the European Green Deal (see 4.1). In summer 2022, it published a draft law on nature restoration with the aim of keeping ecosystems from collapsing and preventing the worst effects of the climate crisis and



Greenhouse gas monitoring station in a fen

biodiversity loss. The European Commission also adopted the EU Soil Strategy 2030, and intends to draft a Soil Health Law on this basis by mid-2023.

At the same time, it is important to promote the integration of peatland protection in national policies in dialogue with other countries. In the context of bilateral and multilateral cooperation, related advisory services and an exchange between stakeholders, specific model peatland protection projects can result in multiplier effects.

Peatlands are directly and indirectly affected by economic activities in many forms throughout the world, which are also influenced by Germany's international policies. Worth highlighting are the BMWK's (formerly BMU's) International Climate Initiative (IKI) and European Climate Initiative, the activities of the Federal Ministry for Economic Cooperation and Development (BMZ), but also support for investment projects provided by the Kreditanstalt für Wiederaufbau (KfW) and the export credit guarantees of the German government. It is important here for climate change mitigation and peatland protection to be given greater consideration in relevant decisions.

In March 2019, the United Nations Environment Assembly adopted a resolution on peatland protection, urging all member states to step up their efforts to protect, sustainably use and restore peatlands and peat soils worldwide.

The United Nations General Assembly has declared the years 2021 to 2030 to be the UN Decade on Ecosystem Restoration. A decade of restoration following a century of massive natural and environmental destruction is long overdue. Many ecosystems, including peatlands, are in an alarming state.

In addition, parties to the Paris Agreement have recognised the essential role of sinks in meeting climate targets. In Section 5 of the Agreement, they commit to taking measures to preserve and, where appropriate, expand sinks and reservoirs of greenhouse gases. Improving peatland protection, especially the preservation of intact and near-natural peatlands, but also their rewetting and restoration, makes an essential contribution to climate change mitigation and the preservation of global biodiversity. The German government sees this as a priority in the implementation of the UN Decade.



Information board for a project to protect a wetland as part of the International Climate Initiative in Turkey



Construction of a dam to retain water in a valley mire in Turkey

4.7.2 Goals

a

Implement overarching EU strategies to promote peatland protection

The favourable conditions created by the European Green Deal are rigorously pursued to benefit peatland protection. Particular importance is attached to the EU Biodiversity Strategy, the EU Farm to Fork Strategy and the EU climate and energy framework.

b

EU peatland protection strategy

In the EU, a peatland protection strategy is being developed that takes into account the concerns of climate change mitigation, biodiversity and soil conservation as well as landscape hydrology, including aspects of use.

c

EU strategy to end peat use and extraction

The European Commission's awareness of the issue is being raised, and peat will no longer be extracted across the EU in the medium term. Peat use will be reduced across the EU in such a way that peat use is rapidly ended, but also the impacts on the affected economic sectors are minimised. The German Peat Reduction Strategy provides a good framework for these measures.

d

Strengthen cooperation in peatland protection and stop the loss of peat in the EU and internationally

Bilateral and multilateral cooperation to preserve and restore peatlands, mitigate climate change affecting peat soils, end peat extraction and develop peat-free growing media has been strengthened.

e

Further develop financial instruments for peat soil conservation

Sufficient financial resources are available for peatland protection over the necessary time periods, and they are efficiently used to meet goals.

f

UN Decade on Ecosystem Restoration

In the context of the UN Decade on Ecosystem Restoration, peatland protection is a priority both nationally and internationally.

g

Ensure that peatland protection is taken into account in foreign, trade and economic policy, as well as in development cooperation

Peatland protection concerns are taken into account in relevant international policy and economic areas. Foreign, trade and economic policies as well as development cooperation are consistent with the requirements of global peatland protection.

4.7.3 Measures

I

The German government actively supports the EU's efforts to implement the European Green Deal with a view to peatland protection.

II

In the interest of peatland protection and climate change mitigation, the German government supports the European Commission's intention to introduce new incentives for the expansion of natural sinks and to eliminate existing barriers.

III

The German government supports the development of an EU Soil Health Law based on the EU Soil Strategy.

IV

The German government supports efforts to develop a European peatland protection strategy.

V

The German government advocates for a uniform EU approach and increased cooperation between member states to end peat extraction in the medium term and reduce the use of peat in growing media. In particular, it seeks to ensure that peat is no longer used for energy production in the EU.

VI

The German government advocates for peatland protection to be part of the climate change mitigation efforts of all countries that have peatlands.

VII

The German government supports the UN Decade on Ecosystem Restoration, both nationally and internationally.

VIII

The German government will continue to pursue the International Climate Initiative (IKI) as a proven financing instrument of international climate change mitigation and biodiversity conservation and will also promote other international peatland protection projects and initiatives.

IX

The German government supports international scientific exchange (for example research and monitoring networks) and further research on issues related to peatland protection and the use of peat soils compatible with efforts to tackle climate change.

X

The German government supports the integration of peatland protection issues in the development of international agreements.

XI

Peatland protection issues will be taken into account in foreign, trade and economic policy as well as in development cooperation.

XII

In the interest of coherent economic policy, peatland protection will be taken into account in decisions to support international investments and projects and when export guarantees are granted by the German government and loans by KfW Bank.

XIII

When funding international development, climate change mitigation and biodiversity projects, the German government is working to ensure that they do not result in the degradation of peatlands and peat soils.

XIV

The German government will continue to advocate internationally that peatland protection be taken into account by relevant bodies and institutions to tackle climate change mitigation and adaptation as well as biodiversity conservation. The Decade for Ecosystem Restoration declared by the United Nations will also be used to promote measures to benefit peatland protection.

4.8 Research and education

4.8.1 Current situation

Peatland protection issues have already been and are being addressed in a number of research projects. This means that there is already some knowledge about the basic correlations that shape these ecosystems. The German government has been funding both basic and applied research projects for more than ten years. This includes, for example, projects that explore the potentials of paludiculture.

There continues to be a need for research in various areas. In addition to technological aspects, research questions relate mainly to acceptance, suitable forms and formats of participation. Transdisciplinary approaches are generally lacking. Areas where experts see a need for research include:

- Effects of rewetting measures and changes in land use on various ecosystem services (in particular long-term studies, for example on the nutrient and climate balance caused by changes in the water balance, of forms of use such as paludiculture or different types of forest and forest uses)
- Hydrological and water management issues, such as water availability, water and nutrient flows, hydrological modelling
- Impacts of the climate crisis on peatlands and required adaptation measures
- Identification of suitable processes for transferring paludiculture into agricultural practice, including technology and product development as well as accompanying research
- Re-evaluation and creation of new perspectives on peatlands within current and future agricultural structures in the context of the challenges of the climate crisis, as well as the identification of new regional value chains and impacts on the region
- Innovative combinations of use, for example photovoltaics on rewetted areas previously used for intensive agriculture
- Socio-economic issues and policy impact assessment

In education and training, there is already a considerable need for qualified personnel in the area of peatland and peat soil management. The availability of qualified personnel in peatland protection, even beyond nature conservation, is an important prerequisite for advancing nature conservation and successfully implementing measures.

Advisory services for farmers on issues related to the management of peat soils and the adaptation of agricultural production methods must also play a key role and should therefore be further developed. The same applies to qualified planning offices that plan rewetting projects and can support technical implementation.



Trials to restore typical peatland vegetation in a raised bog



Climate farm, a BMUV pilot project with the aim of developing economically and environmentally viable grassland management that conserves peat soils



Reeds as a raw material for building materials

Empirical studies showed that administrations also have a considerable need for training on issues related to climate change mitigation as well as peatland, soil, water and biodiversity conservation. This applies in particular to reconciling interests and the interpretation and further development of legislation adapted to the climate crisis, as well as to the monitoring and management of rewetting projects.

In addition, greater attention must be paid to peatland protection in education for children, young people and adults. Education programmes in line with the Education for Sustainable Development model can offer a scalable approach.



Child with peat moss during a peatland excursion

4.8.2 Goals

a

Effective peatland protection research

An effective research environment is strengthened for issues related to peatland protection in Germany, in particular also taking into account biodiversity, climate and climate change mitigation as well as aspects related to soil and water conservation.

b

Step up research on peatland management

Research on the sustainable use of rewetted peatland sites is supported and expanded through additional funding measures. New solutions for peatland management are developed in the process, taking into account issues of public acceptance and the participation of relevant stakeholders.

c

Improve education and study programmes

The transfer of knowledge about soil and peatland protection issues is an integral part of education and training as well as of university studies.

d

Expand advisory services for land owners and users

Advisory services for land owners and users will be expanded and strengthened on issues related to climate change mitigation, peatland protection, soil and biodiversity conservation.

e

Train administrations

The administrations and authorities are trained in issues related to climate change mitigation as well as peatland, water, soil and biodiversity conservation.

f

Improve education for children, young people and adults

Education for children, young people and adults is improved in issues related to climate change mitigation as well as peatland and biodiversity conservation.

4.8.3 Measures

I

The German government is increasing research support to create a sustainable basis for decision-making and implementation. The development of new, innovative approaches to peat soil conservation and socio-economic research approaches are to receive targeted support.

II

The German government is supporting and testing the introduction of particularly ambitious approaches to management of peatland sites that is climate-compatible or even contributes to climate change mitigation, especially through long-term pilot projects and model and demonstration projects. Among other things, issues related to crop farming, management methods, options for crop use and economic viability will be addressed. Research work is being carried out to identify possibilities for the sustainable use of rewetted areas that were previously used intensively for agriculture as a place to install photovoltaic systems and developed with a view to practical application.

III

The German government supports, among other things, long-term studies on the effects of rewetting measures and their impact on greenhouse gas emissions and biodiversity through pilot projects and model and demonstration projects focusing on peat soil conservation.

IV

As part of the Research for Sustainability (FONA) Strategy, the German government supports the study of greenhouse gas emissions and the potential for carbon storage in peat soils by testing and monitoring environmentally friendly methods of removing carbon dioxide from the atmosphere.

V

As part of the Research for Sustainability (FONA) Strategy, the German government supports the maintenance of healthy soils and their sustainable use, as well as the further development of agricultural and food systems through research geared towards sustainable and climate-friendly farms.

VI

As part of the European Biodiversity Partnership Biodiversa+, the German government funds collaborative projects that address trade-offs between biodiversity conservation and the agricultural use of peatlands and the restoration of wetlands.

VII

The German government supports advisory services (for example funding advisors) for interested land owners and users before and during the application process and the implementation of targeted funding measures.

VIII

The German government is working to minimise methane emissions caused by inundation, particularly in the initial phase of rewetting, by offering appropriately tailored content for advising and qualifying those involved in targeted water level management or topsoil removal.

IX

In the context of research on the bioeconomy, the development of sustainable products, services and value chains that can be produced and used without harming the environment, nature, biodiversity and the climate and may even contribute to climate change mitigation and are supported both nationally and globally. The insights into new value chains compatible with peatlands and the climate, especially for material uses, will be communicated nationally and internationally.

X

Support is provided for the integration of peatland protection in education and training in agriculture and forestry as well as landscape planning and water management.

XI

The German government supports initiatives to improve the distribution of information and education and training to raise awareness of peatland protection among stakeholders in the water sector.

XII

The German government supports the federal states in their efforts to improve agricultural and forestry research and development with the aim of establishing long-term time series and further developing rewetting technology and advising land owners and users based on the division of responsibilities between the federal government and the federal states.

4.9 Legal framework and funding measures

4.9.1 Current situation



Paludiculture: stand of *Typha latifolia*

The applicable laws and subordinate regulations in Germany generally allow for the protection of peatlands within the scope of the financial responsibilities established in the constitution. However, they have so far not been consistently geared towards providing the best possible support for peatland protection oriented to climate change mitigation and biodiversity conservation on a voluntary basis. Changes in the area of funding can help to coordinate the various existing funding instruments as efficiently as possible and improve their quality.

Germany has a diverse funding landscape for peatland protection measures, with the Federal Action Plan on Nature-based Solutions for Climate and Biodiversity leading the way with its focus on peatland protection. All of the federal states abundant in peatlands have established peatland protection programmes or strategies and promote peatland protection projects, in some cases backed by specific area-based targets. They support peatland protection projects primarily with funding from the European Agricultural Fund for Rural Development (EAFRD) and/or from the European Regional Development Fund (ERDF), the Joint Task for the Improvement of Agricultural Structures and Coastal Protection (GAK) and other EU, federal and state programmes. This means that considerable financial resources are available for contract-based nature conservation measures in agriculture. The measures mainly pursue species and biotope protection goals. Private initiatives that provide economic incentives for peatland protection measures are another option.

The federal government's large-scale nature conservation projects (chance.natur) are designed to create and protect parts of the natural environment and landscapes meriting protection with representative significance nationwide. With this initiative, the German government has been making a significant contribution to the protection of biodiversity and the conservation of valuable natural areas in Germany since 1979. A total of over 500 million euros in federal funding was made available for more than 80 projects. The funding period of up to ten years is intended to ensure that comprehensive measures are also promoted and can lead to lasting improvement in the natural environment. A large number of peatland projects have already been implemented under this programme.



Pressed and dried cuttings from a wet meadow

There are also other programmes that include aspects of peatland protection. The German government funds projects related to peatland protection in Germany and internationally under the Federal Biological Diversity Programme and the International Climate Initiative. The federal government's Forest Climate Fund can be used to support model projects designed to protect, preserve and restore peatlands in forests as well as bog forests. The German government has established a Wilderness

Fund to support the achievement of the two-percent wilderness target established in the National Strategy on Biological Diversity. Funding for climate projects through the National Climate Initiative (NKI) may also include projects related to peatland protection, provided this is covered by the funding criteria. Funding for peatland protection projects is also provided by the German Federal Environmental Foundation, one of the largest environmental foundations in Europe.

4.9.2 Goals

a

Use existing legal framework for peatland protection

The existing legal regulations are used to promote ambitious peat soil conservation.

b

Review and adapt legal regulations

Legal regulations, especially in the areas of agriculture, forestry and water management, nature conservation and soil conservation, as well as in spatial planning law, support ambitious peatland protection. To prevent new conflicting goals and difficulties from arising in peatland protection, new buildings and infrastructure are not built on drained peat soils or are built with consideration for peatland protection.

c

Legally establish peatland protection as a matter of public interest

Peatland protection is clearly established by law as a matter of public interest. Peatland protection must be taken into account in all relevant deliberations and discretionary decisions.

d

Secure peatlands for planning purposes

Planning instruments at federal, state and regional level are used to ensure that future rewetting measures on peatlands and peat soils can be implemented as efficiently as possible.

e

Improve funding for peatland protection

A targeted funding structure, also outside the CAP, and adapted legal frameworks for funding enable effective peat soil conservation and the climate-compatible use of peat soils, taking into account issues related to soil and nature conservation as well as water management. There are economically viable and climate-compatible opportunities for the use of rewetted peatland sites for agriculture or forestry, especially within the framework of the CAP.

f

Compensate for disadvantages and impairments

The planning and implementation of rewetting measures must be in line with goals and appropriate. In cases of unintended adverse hydrological impacts on adjacent land, appropriate compensation is made.

4.9.3 Measures

I

The existing legal framework is consistently used to benefit peatland protection. The German government is working to ensure that this also happens in the federal states.

II

The German government is assessing the existing legal regulations at federal level, especially in the areas of agriculture, forestry and water management, nature and soil conservation, as well as building, planning and water authority law, for coherence and to determine whether they need to be adapted with the aim of enabling effective peatland and biodiversity conservation to be achieved, preventing and removing obstacles and at the same time sufficiently taking the interests of land owners and managers into account. If necessary, these regulations will be adapted.

III

As part of the target agreement between the Federation and the Länder on climate change mitigation through peat soil conservation, the legal framework for peat soil conservation is also being reviewed within the federal states. This assessment will include all levels of administration and have a special focus on water regulations. The water and soil associations and the respective administrations have a special role to play here.

IV

The German government is working to ensure the inclusion of peatland protection in spatial development plans and the designation of priority or reserved areas for peatland protection and peat soil preservation. This supports the achievement of climate neutrality by 2045 and, at the same time, can also strengthen nature and soil conservation.

V

Together with the Länder, the German government is working to ensure that special consideration is given to peat soil conservation, especially in regional and development planning as well as in all project-related approval procedures, and that the actual ability to enforce this protection is improved when assessing all regionally significant interests. To this end, the Federal Soil Protection Act should legally establish that peatland protection is a matter of public interest. The further use of peat soils for built-up areas and transport purposes must be prevented in the future. In particular, it must be ensured that no new barriers to rewetting measures are created or existing barriers solidified when peat soils used for agriculture and forestry are converted into built-up and transport areas.

VI

The German government is working with the federal states to ensure that the scope for action in landscape planning is systematically leveraged for peatland protection and peat soil conservation.

VII

The German government is working to create delimited areas for peatland protection, which are taken into account in decisions in building and water law.

VIII

The German government is creating the legal prerequisites for voluntary rewetting measures and extensive water retention in peatlands.

IX

The German government advocates for the establishment of a pre-emptive right of the public sector to purchase peat soils and coordinates this with the federal states.

X

The BMUV's funding programmes will be continued under the auspices of the Federal Nature Conservation Fund (Bundesnaturschutzfond), for example

- the Federal Biological Diversity Programme
- chance.natur
- the floodplains funding programme (Germany's Blue Belt programme)
- the Forest Climate Fund together with the Federal Ministry of Food and Agriculture
- the Wilderness Fund

XI

Funding measures for the adaptation and permanent rewetting of peatlands will be established, further developed, monitored and, if necessary, adapted within the framework of the German government's Climate Action Programme 2030 and the Federal Action Plan on Nature-based Solutions for Climate and Biodiversity.

XII

The German government supports specific funding for innovative photovoltaic strategies on peatland sites that have been or will be rewetted with benefits for nature conservation. The use of renewable energy must be developed as a sensible climate change mitigation measure and contribute to the long-term economic outlook for the peatland regions.

XIII

The German government will review existing incentives to determine whether they have an adverse effect on peatland protection and, if necessary, they will be adapted so that they are compatible with peatland protection and, in particular, do not create additional barriers to rewetting in the future.

4.10 Public outreach, data and monitoring

4.10.1 Current situation

For successful public discourse, the availability of suitable information is a basic prerequisite. But the implementation of specific peatland protection measures also requires the stakeholders to have the right knowledge.

In addition to the involvement of the people who are affected and interested, providing comprehensive information to the public is a prerequisite for peatland protection to make a successful contribution to a climate-neutral society. Today, a wide range of media resources and activities already exist that can be used extensively. In addition to information about near-natural areas that have already been the focus of nature conservation for quite some time, more attention must be paid to the use of peat soils for agriculture and forestry and peat use with its impacts on climate and biodiversity.



Presentation of the peatland theme at the International Green Week in Berlin: the BMUV's peatland pavilion

In the case of peatland protection measures, acceptance by the land owners, land managers, public and policymakers can determine the success or failure of projects. One prerequisite is that the measures do not create unacceptable disadvantages and impairments for the surrounding land owners. Media support can often play an important role in this process. Along with transparent communication of the measure and its impacts, fact-based information and public outreach are essential. In addition, greater attention must be paid to peatland protection in education for children, young people and adults. Educational programmes in line with the Education for Sustainable Development model can offer a scalable approach.

Compared to other countries, Germany has extensive data and information on the environment and land use, which has been further improved in recent years. This is indispensable for a modern, capable and efficient administration. The EU's Common Agricultural Policy (CAP), with its high level of regulation, also requires the data to be largely harmonised, even outside of business and financial areas. It forms the basis for defining goals in peatland protection and for effectively planning and implementing projects. It is also needed for monitoring purposes to report on measures taken and their impact.

Due to the federal structures in Germany, there are sometimes considerable differences in the structure and methodology of the data as well as how current it is. Some of the data is more than 50 years old and can no longer be used for specific peatland protection measures. The need to ensure that data on peat soils is complete and continuously updated therefore remains a priority. Data on the development of peatland status and peat protection management is often not available and information on rewetting projects is often only available in decentralised and analogue form. Measurements of greenhouse gas emissions in the field and measurements of peatland and (ground) water levels in representative action areas are important for monitoring.

It is important to use clear terminology and standards in data collection, processing and analysis. A reliable and transparent methodology for data collection and analysis (as is the case with, for example, GHG reporting) is also a prerequisite when accounting for greenhouse gas emissions and complying with international reporting obligations for climate change mitigation. The much-discussed issue of translating greenhouse gas savings into monetary terms is also closely linked to data.



Excursion group on a footbridge in a raised bog

4.10.2 Goals

a

Inform the public

The public is well-informed about the principles and measures of peatland protection and peat use and is also aware of the role peatland protection and the reduction of peat consumption play in climate change mitigation.

b

Uniform and standardised monitoring

Data collection and processing for climate change mitigation and peatland protection will be continued based on a nationally uniform standardised method, using recognised definitions, and include data on biodiversity, water quality and nutrients. The data can be used for implementation, monitoring and reporting obligations at national, EU and international level.

c

Transparent data administration

In addition to improving peatland protection, the data and databases can also be used for research in other areas and made available to the public – while still respecting data privacy. In Germany, a standardised, nationwide monitoring system for peatland protection is in place.

4.10.3 Measures

I

The German government is working to improve public outreach on peatland protection. It provides information on the principles and measures of peatland protection and the contributions peatland protection and the reduction of peat consumption, including the availability of peat-free products, make to climate change mitigation. It also provides information on the progress made in implementing the measures of the National Peatland Protection Strategy and the climate change mitigation achieved in the process.

II

The German government supports and promotes goal-oriented modern digitalisation processes and the use of uniform methods and standards also for issues related to the implementation of peatland protection.

III

The data required for effective peatland protection will be continuously improved in cooperation with the federal states and using existing structures and potential synergies. Redundant data collection must be avoided and the continuity of data storage and maintenance must be ensured.

IV

A uniform monitoring system for peat soils will be set up on the basis of the data already available to the federal states that must be provided to the federal government. Regulations (peatland data strategy) governing the collection and provision of data and reporting will be coordinated between the federal and state levels.

V

The German government supports the federal states in the creation of a nationwide organic soils inventory that enables climate reporting with sufficient precision, the targeted implementation of support measures and the implementation of mandatory standards from regulatory law. For measures under the CAP, information about peat soils should be available at plot level in the Integrated Administration and Control System (IACS) and be usable for administration and reporting.

VI

Greenhouse gas reporting under the United Nations Framework Convention on Climate Change and the Kyoto Protocol 2019 will be further developed to better reflect the impact of peatland protection measures.

VII

The German government is developing national recommendations and minimum standards for the planning and implementation of peatland conservation projects for nature-based climate action, with special consideration of hydrological aspects and landscape hydrology.

VIII

The German government, with the participation of the Länder, will use this data and results from, for example, federal pilot projects, to develop evaluation methods and criteria for reviewing the measures and resources used, particularly with regard to their emission prevention costs, socio-economic impacts and transferability, also to other countries.

IX

For the purposes of climate change mitigation, permanent measuring stations will be set up on suitable sites in cooperation with the federal states and the data will be made publicly available.

X

The German government is working to make the information from monitoring available to the general public as far as possible, while respecting data privacy. The scope of the data and its collection remains limited to the minimum required for peatland protection.

5. Reporting requirements and evaluation



Richly structured end moraine landscape with unused and drained smaller peatlands



Common lizard (*Zootoca vivipara*)
in a raised bog

To track progress on the measures and achieving the goals of the National Peatland Strategy and to identify any need for potential adjustments at an early stage, the German government will engage in regular reporting on implementation. A progress report on the status of implementation of the National Peatland Protection Strategy will be drawn up and published every five years. The federal ministries support reporting and document the progress made in implementing the National Peatland Protection Strategy in their respective areas of responsibility.

The National Peatland Protection Strategy will be regularly reviewed to determine whether it needs to be adapted, especially if significant general conditions change. These include, for example, the adaptation of climate targets to an ever more rapidly advancing climate crisis and its consequences, or when new scientific findings or technical developments become available.

In 2025, the German government will evaluate the process of rewetting peatlands and peat soils for the first time. Based on the results, we will define a target trajectory for the further phase-out of peatland drainage, including specific greenhouse gas mitigation targets for the period up to 2045. The trajectory will take into account the need for ambitious biodiversity and climate change mitigation while respecting intergenerational equity. This will include an assessment of whether the basic approach of the peatland protection strategy has proven successful or whether it is necessary to realign and strengthen the legal framework.

Annex

Glossary

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| Amelioration | Soil cultivation measures to improve the soil-moisture, soil-gas and nutrient balance with the aim of increasing soil fertility and increasing yields. |
| Biodiversity | Generic term for the diversity of ecosystems, biotic communities, species and genetic diversity within a species. |
| Biotope | Habitat of a biocoenosis with uniform characteristics, which may be clearly delimited from its environment to a greater or lesser extent. |
| Biotope protection | Measures for the protection and maintenance of biotopes. Biotope protection measures are usually aimed at endangered or rare biotopes (particularly protected biotopes). |
| Birds Directive | Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. It aims to conserve wild bird species native to the European territory of its member states and govern the protection, management and regulation of these birds, their eggs and their habitats. |
| Climate | The typical atmospheric conditions of an area and its characteristic average weather patterns. |
| Climate action | Collective term for all efforts to counteract climate change. |
| Climate change | Anthropogenic changes to the climate on the planet over a long period of time, or global warming in our lifetime. |
| CO₂ equivalent | Unit of measurement to standardise the climate impact of the different greenhouse gases. |
| Drainage capacity | Drainage capacity refers to the ability of water to flow away. |
| Ecosystem | Biological community of organisms of several species and their non-living environment, referred to as habitat or biotope. |
| Emissions | Output of substances (gases, dust) and energy (waste heat, radiation, noise) to the environment. The output substances themselves are likewise known as emissions. |
| Emitter | Source of emissions. |
| European Green Deal | Roadmap for a sustainable EU economy; it includes an action plan to promote more efficient use of resources by moving towards a clean and circular economy, restoring biodiversity and reducing environmental pollution. |

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| Eutrophication | Accumulation of nutrients leading to changes in an ecosystem or parts thereof; a commonly used term for the overfertilisation of surface waters and oceans due to the natural or artificial accumulation of nutrients. |
| Farm to Fork Strategy | EU strategy, also part of the European Green Deal. |
| Fen | Peatland fed by groundwater, with significantly more nutrients and higher alkaline levels than raised bogs. |
| Growing medium | Mixtures of various substrate materials such as peat, clay, bark humus, wood fibres, substrate compost and many other mineral and organic components. |
| Habitat | Monotope (“residence”) of a plant or animal species, which satisfies all the living conditions required of that site by the species. |
| Habitat type | Originally the German equivalent of the term biotope type. With the implementation of the Habitats Directive, it now usually refers solely to the habitat types of Community interest referred to in Annex I of the Directive. It is therefore a subset of the biotope types found in Germany for which the EU member states have undertaken to establish a network of protected areas. |
| Habitats Directive | Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. The focus of interest is the protection of habitats. Areas protected under the EU Birds Directive and the EU Habitats Directive make up the European system of protected areas known as Natura 2000. |
| Hydrological measures | Measures that affect the water balance. |
| InVeKos | The Integrated Administration and Control System (InVeKoS) comprises regulations to enforce a single agricultural policy in the EU. |
| Natura 2000 | European system of protected areas, which includes areas under the Birds Directive and Habitats Directive. |
| Natural | Unaltered by humans, in an original state; belonging to nature, resulting from nature, designation for a degree of naturalness. |
| Near-natural | Close to the natural state. |
| Net sink | System that stores more carbon than it releases. |
| Oligotrophic | Low in nutrients or with a low nutrient supply. |
| Paludiculture | Paludiculture (“palus” – Latin for “swamp, morass”) is the use of wet raised bogs and fens for agriculture or forestry. |

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| Peat soil | The National Peatland Protection Strategy addresses all organic soils (as defined by the IPCC, 2006, which is the basis for climate reporting) in Germany. In other words, both peat soils according to the German pedological definition and other carbon-rich soils that are comparable to peat soils in terms of their emission behaviour, such as humic gley soils and peat succession soils. For the sake of clarity, the term “peat soils” is used in this strategy to refer collectively to these organic soils. |
| Peatland | Both a landscape type (raised bogs and fens, including bog forests) and the soil type. Peatlands are formed when the soil contains so much water that the decomposition of organic matter is hindered due to the lack of oxygen in the water (peat formation). |
| Priority habitat | Habitat type listed in the Annex to the Habitats Directive that is subject to particularly strict protection regulations. |
| Raised bog | Peatland fed by precipitation, with significantly fewer nutrients and lower alkaline levels than fens. |
| Ramsar Convention | The Ramsar Convention refers to the Convention on Wetlands, particularly as a habitat for waterbirds and waders, of International Importance of 1971. |
| Resilience | An ecosystem’s ability to return to its original state after a disruption. |
| Restoration | Restoration of anthropogenically altered habitats to their original or near-natural state with a timeline of several decades or centuries. |
| Rewetting | Raising the water level up to the surface of the terrain to create conditions conducive to peat protection or growth. |
| Sectors | Greenhouse gas emission reduction targets are allocated to different sectors, for example the energy or LULUCF sector. |
| Sink | Natural and technical systems that remove carbon dioxide from the air. Ecosystems that remove carbon dioxide from the atmosphere are called natural sinks. They include forests, peatlands and oceans. |
| Species protection | Collective term for measures to protect all species of wild plants and animals. |
| Succession | In botany, the gradual succession of plant communities or vegetation phases: Grass phase – Shrub phase – Bush phase – Tree phase. |
| Unused areas | Fallow and/or currently unfarmed land. |
| Water Framework Directive | Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. |

List of abbreviations

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| BImA | Bundesanstalt für Immobilienaufgaben (Institute for Federal Real Estate) |
| BMEL | Bundesministerium für Ernährung und Landwirtschaft (Federal Ministry of Food and Agriculture) |
| BMUV | Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz (Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection) |
| BMZ | Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (Federal Ministry for Economic Cooperation and Development) |
| BNatSchG | Bundesnaturschutzgesetz (Federal Nature Conservation Act) |
| BVVG | Bodenverwertungs- und -verwaltungs GmbH |
| CAP | Common Agricultural Policy of the EU |
| CO₂ | Carbon dioxide |
| CO₂ equivalent | Carbon dioxide equivalent |
| ERDF | European Regional Development Fund |
| ELER | European Agricultural Fund to Promote Rural Development |
| EU | European Union |
| GAEC | Good agricultural and environmental conditions to achieve sustainable agriculture |
| IKI | Internationale Klimaschutzinitiative (International Climate Initiative) |
| IPCC | Intergovernmental Panel on Climate Change |
| KfW | Kreditanstalt für Wiederaufbau |
| LULUCF | Land use, land-use changes and forestry |
| NBS | National Strategy on Biological Diversity |
| NKI | Nationale Klimaschutzinitiative (National Climate Initiative) |
| SDG | Sustainable Development Goal |
| UN | United Nations |

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