



Federal Ministry
for the Environment, Nature Conservation,
Nuclear Safety and Consumer Protection



Federal Action Plan on Nature-based Solutions for Climate and Biodiversity

– key issues paper –

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Nature-based Solutions for climate and biodiversity (NbS) will play a substantial role in achieving the German government's climate and biodiversity goals and in measures to adapt to the impacts of the climate crisis. They will therefore significantly contribute to general crisis prevention in Germany. For that reason, the German government's coalition agreement envisages the development of an Action Plan on Nature-based Solutions for Climate and Biodiversity (referred to in the following as the Action Plan). With this paper, the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) sets out the key issues and lays the foundations for the Action Plan.

What are Nature-based Solutions for climate and biodiversity?

Forests and floodplains, soils and peatlands, seas and water bodies, urban green spaces – these ecosystems all contribute to climate action as Nature-based Solutions. They can absorb carbon dioxide from the atmosphere and store it for the long term – as long as they are in good ecological condition. However, if their functions are impaired, that is to say, if these same ecosystems are degraded, they can also become a source of greenhouse gas emissions. Causes of this include intensive use by the agriculture or forestry sectors and impacts of the climate crisis such as droughts. In such cases, these ecosystems actually release the carbon dioxide stored in them, exacerbating the climate crisis.

Intact ecosystems also provide habitat and food for plants and animals. This makes them indispensable for fighting species extinction and conserving biological diversity. Biodiversity is a prerequisite for fertile soils and the pollination needed to produce our food and for clean rivers, drinking water and air.

At the same time, healthy ecosystems can help us adapt to the impacts of the climate crisis – again, only if their ecological functions are intact. For example, healthy soils store water and regulate the water balance, intact floodplains promote flood protection by retaining water. The healthier the ecosystems, the more resilient they are to extreme weather events like droughts or heavy rainfall and the better they can help protect us.

NbS policy aims at this interface between climate action, biodiversity conservation and climate change adaptation. It does not look at individual measures in isolation, but deliberately seeks synergies between climate action and nature conservation to generate win-win solutions. NbS policy considers interdependencies, such as the benefits of a near-natural water balance for the ecosystems connected to it.

NbS policy includes measures for directly protecting, strengthening and restoring natural ecosystems. Moreover, they establish the conditions needed for such measures through actions ranging from assessing ecosystem status and determining the causes of degradation

to developing suitable countermeasures, applying them for the long-term and preventing leakage of environmentally harmful or climate-damaging impacts into other areas.

Funding Programme for Nature-based Solutions for climate and biodiversity

Nature-based Solutions for climate and biodiversity need reliable and long-term funding. To secure this, the Action Plan will be supported by a funding programme. The draft federal budget for 2022 allocates a total of four billion euros for the period 2022 to 2026. A new budget item will be established in the climate and transformation fund to this end. In this way, the German government will reorganise financing of NbS for climate and biodiversity. This funding will benefit three areas: climate change mitigation, nature and biodiversity conservation and climate change adaptation.

Whereas traditional nature conservation policy is predominantly regionally bound in its effects and therefore carried out first and foremost by the Länder, NbS policy helps achieve our national climate targets. For that reason, the Federation should take the lead, while implementation should be undertaken in close cooperation with the Länder, municipalities, land users, nature conservation organisations and other stakeholders.

Insofar as the Federation has financing competence and other funding programmes do not already exist, the Federal Environment Ministry intends to establish an NbS funding programme for the measures outlined below.

Fields of action

1. Protection of intact peatlands and rewetting

Protecting peatlands and restoring drained bogs can both reduce greenhouse gas emissions significantly and support biodiversity conservation. At present, 92 percent of Germany's peatlands are drained. With 53 million tonnes of CO₂ equivalent emission each year, peatlands account for some 6.7 percent of the total national greenhouse gas inventory. Most of these emissions come from agricultural land. The majority of the few remaining near-natural and unused peatlands have a poor conservation status. To reduce greenhouse gas emissions from peatlands, water levels of the drained areas need to be raised.

We will support farms in the implementation of rewetting measures and the introduction of new management practices and their value creation. We want to work with the Länder to identify suitable sites for renaturation and improve the status of unused and protected peatlands.

To this end we will, in particular, adopt and implement the National Peatland Protection Strategy and establish a federal programme on climate action through peatland protection, aimed at comprehensive rewetting. We will also support the development of new value

chains for paludiculture and marketing of the produce. With the Länder, we will agree on the designation of priority areas for peatland protection, draw up a plan for phasing out peat extraction and use, and develop the bases needed to accelerate planning and approval for rewetting projects. Alongside this, we will advance the development of substitutes for the potting soil industry. Via the Renewable Energy Sources Act (EEG), we will give farmers further incentive to implement rewetting measures by providing financial support for the installation of photovoltaic systems on restored peatland. We will also provide targeted support for optimising water management on existing wetlands.

2. Near-natural water balance with vibrant rivers, lakes and floodplains

Intact water bodies – rivers and lakes – and their floodplains are hubs of biological diversity. Flowing water bodies and their floodplains can play a particularly important role in the biotope network. However, many rivers have been straightened and are practically cut off from their floodplains. Today, a good third of potential floodplains are used for farming, settlements, transport infrastructure or commercial activities. Only nine percent of floodplains are ecologically intact.

The protection of water bodies particularly lends itself to exploiting the synergies of Nature-based Solutions for climate and biodiversity: Restoring water body systems and reconnecting floodplains secures refuges for a range of flora and fauna. Moreover, floodplains filter surface water and keep it in the landscape, thus preventing droughts. They provide flood protection in the form of retention spaces.

The goal is to retain water in the landscape to a greater degree and reverse the rapid draining of large areas. This can prevent the rise of localised inundations after the heavy rainstorms that have been aggravated by the climate crisis, and lays the groundwork for more far-reaching renaturation and restoration measures such as peatland rewetting.

With this goal in mind, we will focus on developing measures for restoring and enhancing the ecological status of land in floodplains, identifying potential sites for these measures. To pave the way for this we will create investment incentives for reconnecting floodplains and provide financial support for the remediation of contaminated sediments in water body systems. We will strengthen biodiversity-friendly management and use of floodplains, encouraging cooperation between nature conservation and agriculture to that end.

3. Seas and coasts

Marine ecosystems such as seagrass beds, salt marshes and kelp forests, as well as the sediments on the sea floor, absorb carbon dioxide from the atmosphere and so act as natural carbon sinks. Intact marine ecosystems are therefore an important part of NbS policy.

However, our seas have a poor conservation status. The degradation of these ecosystems leads to additional greenhouse gas emissions. Besides suffering from overuse and pollution, the North and Baltic Seas are also affected by the climate crisis. They absorb heat and carbon dioxide, causing their temperature and acidity to rise. As a result, the marine flora and fauna are becoming less resilient.

We failed to achieve good environmental status by 2020, as laid down in the EU Marine Strategy (Marine Strategy Framework Directive, MSFD). At present, the species and habitats in the German marine protected areas of the exclusive economic zone (EEZ) do not have a favourable conservation status in accordance with the Natura 2000 directives.

We need to recognise the seas as a foundation of life and a crucial part of the climate system, and strengthen their natural functions through protection and nature-compatible use. We still have to add to our knowledge of ecosystemic connections in the North and Baltic Seas.

Working with the Länder, we will elaborate a binding marine strategy and develop a programme to strengthen and expand seagrass beds, kelp forests, salt marshes and other marine and coastal ecosystems with the aim of improving their natural CO₂ storage capacity. We will seek to create synergies between nature conservation, extensive grazing and coastal defence.

4. Wilderness and protected areas

Protected areas include ecosystems that are relevant for climate action and have a central role in our NbS policy. Protected habitats have particularly positive effects when they have a favourable conservation status. According to the Habitats Directive Report 2019, however, many protected areas in Germany have not achieved this status.

We are therefore aiming to increase the number and improve the quality of ecosystems in protected areas that support climate action, climate change adaptation and biodiversity conservation. The goal is to secure habitats through sufficiently large protected areas, ensuring functioning connections between them in order to strengthen the resilience of the protected areas network.

The EU Biodiversity Strategy for 2030 contains the goal of placing ten percent of land and marine areas under strict protection. Areas which are left to their natural dynamic are especially important in this context, but habitats that depend on use, such as extensively farmed, species-rich meadows, can also contribute to the ten-percent target.

Two percent of the terrestrial area in Germany is to be secured as large-scale wilderness sites. Smaller areas will also contribute to the wilderness targets of the National Biodiversity Strategy, for instance as part of the goal to permanently set aside five percent of the country's forested area for natural development. Areas where nature can follow its own development path over the long term are vital for biodiversity conservation and climate change mitigation.

To this end, we will strengthen protected areas and advance their management. We will secure wilderness areas and smaller wilderness spaces and promote their targeted management. Measures to restore degraded ecosystems will be implemented in the landscape as a whole, with an additional special focus on protected areas. To achieve the EU restoration targets, we will draw up and implement a national restoration plan.

5. Forest ecosystems

Healthy forests can absorb large volumes of CO₂. Extending forest area enhances this sink function for the long term. It furthermore creates valuable habitats and contributes to the goal of planting three billion additional trees in Europe, as laid down in the EU Biodiversity Strategy for 2030 and the EU Forest Strategy. By increasing forest area we aim to enhance diversity in the landscape and improve habitat quality for many species. This will also strengthen the biotope network and have positive effects on the local climate and landscape hydrology.

The last National Forest Inventory, published in 2012, identifies only 36 percent of Germany's forest as near-natural. Near-natural forest ecosystems can develop if we systematically convert existing non-natural forests and reforest damaged forest areas. The climate change adaptability and resilience of forests hinge on the biodiversity and structural richness of near-natural forest ecosystems. These ecosystems also improve the water balance in the landscape.

Under the lead responsibility of the Federal Ministry of Food and Agriculture (BMEL), we will jointly create an incentive system to support conversion to near-natural forests, afforestation measures and natural forest development and promote soil-friendly forestry. Public forests will be at the forefront of the transition to near-natural, climate-resilient and sustainably managed forests. We want to put a stop to logging in state owned, mature, near-natural beech forests.

6. Soils as carbon sinks

Soils are the largest land-based carbon sink, and perform a vital function in the release and absorption of greenhouse gases such as carbon dioxide and methane. Healthy soils make ecosystems more resilient to the climate crisis. Long-term food security depends on good management of our soils. As the main user of land, agriculture plays a major role in this context, since impacts on soil vary greatly according to the type of farming being practised.

Soil protection and soil-friendly management are needed to prevent greenhouse gas emissions and stabilise or increase soil carbon in the form of humus. In this context, it is especially important to avoid leakage and additional pollution. Soil management will be focused on strengthening the function of soil for water storage and as a substance filter, and on conserving and promoting soil biodiversity. Not least in view of their key role in the hydrological cycle, we need to treat our soils with greater care.

With that in mind, we will give targeted support to the conservation and creation of structural elements and areas, especially in agrarian landscapes, with a positive climate and biodiversity impact. These include hedges, hedge banks, agroforestry systems, tree rows and copses. We will support the conversion of cropland into permanent grassland, especially on sites vulnerable to erosion or in floodplains, and promote its extensive use. We will review the Federal Soil Protection Act with the aim of protecting ecologically valuable soils against sealing. We want a greater focus on unsealing surfaces and on land recycling.

7. Nature-based Solutions in settlement and transport areas

Urban green and open spaces play an important role as NbS in climate action and adaptation, at the same time enhancing quality of life. Through their shade and transpiration, urban trees and roadside greenery have a cooling effect and absorb air pollutants and CO₂. Contiguous green spaces provide channels for cool and fresh air and are habitats for many animal species. By cultivating trees in towns and cities, we can contribute to the goal of planting at least three billion additional trees in the EU by 2030, as laid down in the EU Biodiversity Strategy. As well as planting additional trees, conserving the existing stock is also an important NbS.

In line with the objectives of the German National Sustainable Development Strategy, we want to swiftly reduce land consumption, which still stands at an average of more than 50 hectares per day. The goal is to achieve circular flow land-use management (net zero land consumption) by 2050. This aims to counteract further urban sprawl in the landscape. Encroachment into nature and landscape by settlements and transport must be avoided as far as possible. Links between already fragmented habitats are to be improved and ecological connectivity restored.

We will support the municipalities in the transition to near-natural green space management and flank this with appropriate framework conditions. These include providing financial support for planting new urban trees, re-greening urban forests for climate adaptation and supporting inner city biodiversity. We will also improve the connection of habitats by creating near-natural, well-connected wildlife crossings at federal transport routes and planting hedges and copses alongside train tracks. This will improve the resilience of the interconnected ecosystems.

8. Data gathering, monitoring, modelling and reporting

To pursue biodiversity conservation and climate action effectively, we need to systematically record the status and development of our ecosystems.

We want to expand our knowledge base of the conditions and trends in ecosystems, in order to recognise developments from an early stage and counteract them if necessary. Data gathering should be connected more effectively and will include new data sources such as Satellite Remote Sensing. Using the expanded data basis, we also want to adapt and improve the tools for ecosystem modelling. A more robust characterisation of the current conditions allows more reliable forecasts of future ecosystem developments, also with a view to the goals of the Climate Change Act.

Therefore, under the lead responsibility of the BMEL, we will review the intervals and form of the National Forest Inventory and establish a digital forest monitoring system. We will set up a soil monitoring centre at the German Environment Agency (UBA) and create the legal bases for recording and reporting greenhouse gas emissions in the land sector. Another focus will be financial support for research to improve the modelling of terrestrial and marine ecosystems.

9. Research and capacity building

Further research is needed regarding interactions in changing ecosystems, policy options for Nature-based Solutions and suitable ways of supporting the transformation process. We want to put the available knowledge on NbS to general use.

We will set up a specific research programme on NbS for climate and biodiversity. This will examine the impacts of actual interventions in a range of ecosystems and assess the vulnerability of different ecosystem types. The programme will also draw up proposals for the sustainable management of near-natural ecosystems and potential value chains, and strengthen monitoring and modelling in the land-use sector. Moreover, we will place greater emphasis on NbS in other federal research programmes as well.

10. Cooperation in the EU and the global community

Nature-based Solutions for climate and biodiversity can only succeed in close cooperation at international and EU level. In bilateral and international cooperation and all relevant EU processes, the BMUV will continue to promote NbS and advocate an ambitious approach.

Germany has made NbS a cross-cutting topic for the climate and environment track of the G7 negotiations. At European level, the EU Commission has drawn up a number of legislative proposals and initiatives geared to NbS which are based on the Green Deal and the Fit for 55 package.

We will continue to advance NbS in these EU processes, especially urging the Commission and the Council to take an ambitious approach, and work to prevent greenwashing.

We will support NbS at both international and EU level. We will maintain our role in the Convention on Biological Diversity and implementation of the Paris Agreement, continue to support the UN Decade on Ecosystem Restoration and implementation of the United Nations 2030 Agenda, especially Sustainable Development Goals 13, 14, 15, and further contribute to many other NbS provisions and initiatives. NbS will become an important part of bilateral cooperation such as the International Climate Initiative (IKI) and the German government's development cooperation.

Embedding the Federal Action Plan on Nature-based Solutions for Climate and Biodiversity

The Action Plan will be embedded in a range of other projects:

Measures which especially influence the emissions balance of the land use sector will also be part of the Immediate Climate Action Programme. Under the Action Plan these measures will be fleshed out and implemented.

The Action Plan measures will also be harmonised with the National Biodiversity Strategy, the National Water Strategy, the National Peatland Protection Strategy and the planned Marine Strategy. The same applies to ongoing federal funding initiatives such as the Blue Belt Programme and species recovery programmes.

To enable the measures of the Action Plan to be implemented as quickly as possible, the BMUV will examine feasible options for accelerated planning.

We will work closely with all relevant ministries and provide appropriate impetus.

In addition, the Action Plan will be a central tool for the national implementation of the EU legal instrument for nature restoration. A Commission draft of this legislation is expected to be presented before summer 2022. It will lay down legally binding ecosystem restoration targets in accordance with the objectives of the EU Biodiversity Strategy for 2030.

Dialogue and participation

The transformation to sustainable and climate-neutral lifestyles and economies has an impact on every area of life. That is why it needs wide public support. To ensure the measures of the Federal Action Plan on Nature-based Solutions for Climate and Biodiversity are effective, the BMUV will conduct an intensive dialogue with all relevant stakeholders in administrations and associations, with land managers, land owners and other affected groups. We are particularly interested in the experiences of local knowledge holders.