



Case study – “How would the Three Conditions-Approach work for the German National Biodiversity Strategy and Action Plan (NBSAP)?”

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Content

Executive Summary	4
1 Introduction.....	4
1.1 Three Global Conditions for Biodiversity Conservation (WCPA Post-2020).....	5
1.2 World map of Three Global Conditions.....	6
1.3 Why use the Three Global Conditions for Biodiversity Conservation?	8
1.4 Area-based conservation targets in the Post-2020 debate.....	9
2 Germany and its measures to protect biodiversity	12
2.1 Nature conservation in Germany	12
2.2 German actions and expenditures for biodiversity protection worldwide	13
2.3 German contribution to the EU-nature conservation and biodiversity strategy	14
2.4 German impact on biodiversity worldwide (examples)	15
3 Areas of Wilderness and Protected Areas in Germany	19
3.1 Areas of wilderness	19
3.2 (Large Scale) Protected Areas.....	20
3.2.1 National Parks.....	21
3.2.2 National Nature Monuments	23
3.2.3 Nature Conservation Areas	23
3.2.4 Biosphere Reserves	24
3.2.5 Nature Parks	26
3.2.6 Landscape Protection Areas	27
3.2.7 Specially Protected Habitats under Section 30 of the Federal Nature Conservation Act	29
3.2.8 Natura 2000-sites	30
3.2.9 German marine and coastal areas.....	32
3.2.10 Wetlands of International and National Importance	33
3.2.11 Inland waters / floodplains.....	34
3.3 Classification of landscapes in Germany and their conservational evaluation	35
4 Cultivated landscapes: Agriculture and Forestry / Hunting and Fishing	39
4.1 Agriculture	39
4.2 Forestry.....	42
4.3 Hunting	44
4.4 Fishing.....	44
5 Urban landscapes: Human settlements and transportation / Mining and Energy	46
5.1 Human settlements and transportation.....	46
5.2 Mining and Energy.....	46

6	The Three Global Conditions-Approach in Germany	49
6.1	Assignment of German landscape types to the Three Global conditions	49
6.2	New maps of Three Conditions for Germany.....	53
6.3	Biodiversity conservation action areas, measures and objectives in Germany compared with those of the Three Global Conditions	55
7	Conclusions.....	67
7.1	Does the Three Conditions-Approach work for Germany? Our view	67
7.2	Results of expert consultation (Workshop at BfN on 10th of July 2019)	70
7.3	Open questions and recommendations	73
7.3.1	Open questions that the Three Conditions-Approach should/could address.....	73
7.3.2	Recommendations for Germany	74
7.4	Final conclusions.....	75
8	References.....	76
	Annexes	85
	Imprint.....	90

Executive Summary

The current study investigates how the Three Conditions-Approach developed by IUCN's World Commission on Protected Areas (WCPA) Post-2020 task force would work for the environmental conditions given in a densely populated and highly industrialized country like Germany and how it relates to current German National Biodiversity Strategy (of 2007) as well as to Germany's global cooperation under the CBD. A Three Conditions map for Germany shows that most areas fall into Condition 1 (Cities and Farms) and Condition 2 (Shared Landscapes) while Condition 3 (Large wild areas) is almost no longer existent.

The study presents information about the situation in Germany with respect to different categories of protected areas and types of land use and compares the conservation measures undertaken in Germany for the implementation of the NBS with the activities proposed for each of the Three Conditions. The author's findings and conclusions were discussed with German experts in a workshop.

Overall, the study finds that the Three Conditions-Approach would work well for Germany as its proposed conservation objectives are to a large extent in line with the German NBS and the Nature Conservation Action Programme 2020, as well as with the implementing actions Germany is undertaking currently. The application of the approach could also add value to country level activities in Germany and help to develop implementation priorities. The Three Conditions-Approach could make Germany's national efforts more comparable on the global scale and it could provide a rational basis for measures to decrease Germany's footprint in the world and take tele-coupling effects into account. It could also help to prioritize Germany's efforts in nature conservation abroad, e.g. provided through Official Development Assistance (ODA).

Therefore, if the Three Conditions-Approach would be used for shaping the Post-2020 Biodiversity Framework it could help to advance Germany's nature conservation efforts domestically to some degree and significantly in the global context.

1 Introduction

Although the Convention on Biological Diversity (CBD) exists since 1992 and reaches nearly global coverage through its 196 Parties, the global biodiversity is still rapidly declining. As the recent Global Assessment on Biodiversity and Ecosystem Services of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) shows, most of the 20 global targets the CBD set until 2020 (Aichi Targets) will not be reached and the loss of biodiversity goes on faster than ever. Currently, the CBD is collecting ideas on how to build a global biodiversity framework for the decade until 2030 and beyond, which can help to stop this trend. Area based conservation measures have always been a very useful instrument to conserve biodiversity and will for sure also play an important role in this upcoming framework.

Under the current CBD system, the implementation of global targets is completely in the hands of individual countries, who are obliged to formulate National Biodiversity Strategies and Action Plans (NBSAPs). One shortcoming is that there is no mechanism which requires Parties to consider how

their national actions fit together to reach the global targets, or that NBSAPs of neighboring countries jointly protect shared ecosystems or consider the needs of migratory species.

In this situation the IUCN's World Commission on Protected Areas (WCPA) Post-2020 task force proposed an approach called 'The Three Conditions for Biodiversity Conservation' in Annex III of the IUCN views on the preparation, scope and content of the Post-2020 Biodiversity Framework (IUCN 2018). This approach suggests conservation to be brought together under one coherent framework for action on land, addressing area-based conservation as an important tool. A compatible approach for marine areas should be developed in the future.

The IUCN World Commission on Protected Areas Beyond the Aichi Targets Task Force, represented by Harvey Locke and with funding provided by Gordon and Betty Moore Foundation (grant #7544) and by the Campaign for Nature to the Yellowstone to Yukon Conservation Initiative, contracted the Institute for Biodiversity - Network e. V. (ibn, based in Regensburg, Germany) to conduct a study on how a Three Conditions-Approach would work for the current German NBSAP, the environmental conditions given in a densely populated and highly industrialized country like Germany, and Germany's global cooperation under the CBD. The chairman of the ibn, Axel Paulsch, is a co-author of the publication Locke et al. (2019), that introduces the Three Conditions-Approach.

1.1 Three Global Conditions for Biodiversity Conservation (WCPA Post-2020)

The definition of the Three Global Conditions for Biodiversity Conservation is based on the combination of the human footprint and anthromes (Anthropogenic Biomes, or Human Biomes) after Sander-son et al. 2002 and Venter et al. 2016. The Human Footprint indicates that there are human dominated areas with defined breakpoints where nature is, in general, highly diminished; intermediate areas where nature is doing relatively better and maintaining the majority of their natural condition, and large wild areas that have a very low human footprint and are relatively intact (Locke et al. 2019). This approach is meant to address all aspects of the CBD's 2050 vision. For biodiversity aspects especially there are more detailed strategies for the below mentioned three global conditions (Locke et al. 2019):

Condition 1 (Farms and Cities): Heavily settled/agricultural and highly populated (crowded), fertile and developed areas with significant agricultural and commercial forestry areas (c. 18% of land worldwide).

Increase conservation efforts to secure endangered species and protect all remaining primary ecosystem fragments. Mainstream sustainable practises such as protecting good farmland and practising productive regenerative agriculture. Maintain pollinators and increase ecological restoration. "Green" cities to reduce carbon emissions, prevent urban sprawl, and provide access to nature for urban dwellers' health and well-being.

Condition 2 (Shared landscapes): Open landscape with low human population densities which practise grazing, fishing, forestry, mining, and oil and gas extraction, which have some resource extraction and with large existing or potential protected and conserved areas (c. 56% of land worldwide).

Establish “ecologically representative and well-connected systems of protected areas (PAs)” while increasing coverage of Key Biodiversity Areas (KBAs); restore and maintain ecological processes and viable populations of native species (ensure area protected is in the range of 25-75% per ecoregion). Across landscapes integrate sustainable natural resource extraction and activities such as tourism, grazing and use of wildlife (where appropriate and sustainable) with indigenous knowledge and well-managed, equitable and properly funded PA networks.

Condition 3 (Large wild areas): The wild places are “least impacted”. These are large areas with a high level of ecosystem integrity (wilderness), with very low population densities or no humans, and no road or minimized linear infrastructure. These are interconnected protected areas. A few nodes of intense industrial development enveloped in a largely wild matrix could be present; ecological processes are the priority (c. 26% of land worldwide).

Retain overall ecological integrity and associated global processes such as carbon storage and rainfall generation, fluvial flows and large migrations; prevent further fragmentation allowing only rare nodes of intense industrial development enveloped in a largely wild matrix. Remove and restore anomalies. Establish large PAs and indigenous and community conserved areas. Secure indigenous knowledge and livelihoods.

1.2 World map of Three Global Conditions

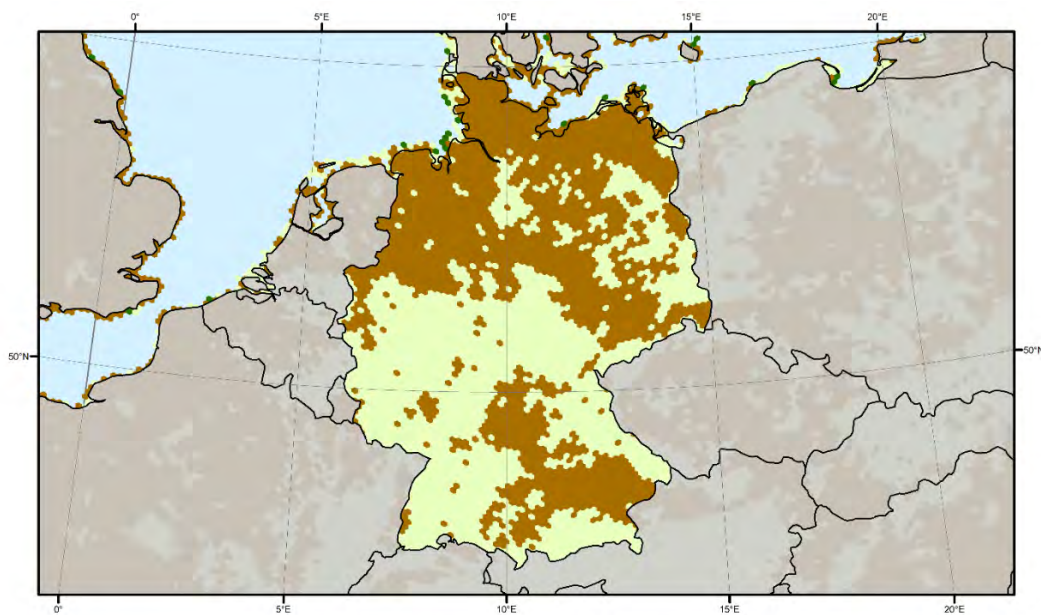
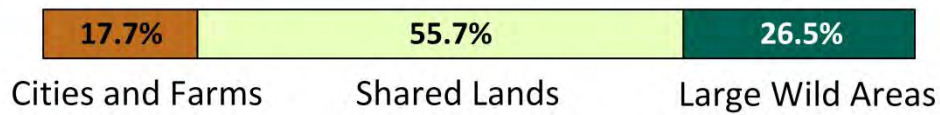
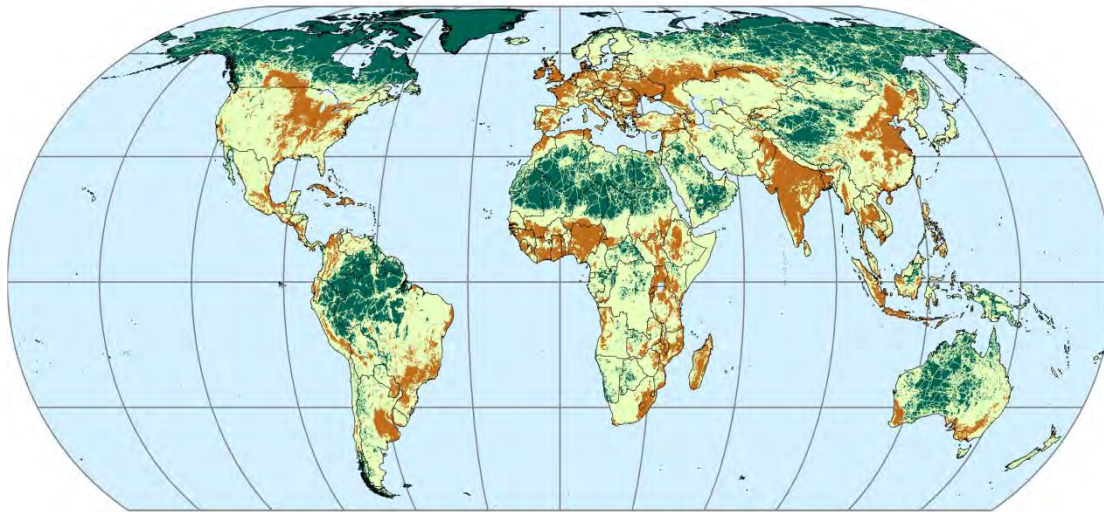
An expert group of global authors (Australia, Brazil, Canada, China, Germany, United Kingdom, USA) developed and published a global map on which the distribution of Three Global Conditions is shown (Locke et al. 2019).

To make the map the authors combined global maps of intensive human land uses (Ellis 2015) and eight human-caused pressures on land determined by the Human Footprint version 2.0 (Venter et al. 2016).

A break point of half the land transformed by cities, cultivation and intensive grazing was set for the boundary between C1 and C2. For the boundary between C2, which has both significant untransformed natural conditions and substantial land uses, and C3, which is still predominantly natural with light land use, the authors used a human footprint pressure of <4 out of 50 and intensive land use covering <0.5% of regional landscape hexagons of approximately 100 km². Within each of the conditions might be found small elements of other conditions (Locke et al. 2019).

The global map can be scaled down to country level and Figure 1 shows a first map with Three Conditions for Germany based on the above mentioned parameters. Within this study, we wish to test the validity of this map by comparing it with other maps for Germany generated by using different parameters and in accordance to national nature conservation measures (see Chapter 5).

The Three Global Conditions



Three Conditions of the World (version 2; March 7, 2019)



ETRS 1989 LAEA Projection

Figure 1. The distribution of Three Conditions worldwide (above) and in Germany (bottom). The map is in ETRS 1989 projection (Source: Ellis 2019, Locke et al. 2019).

1.3 Why use the Three Global Conditions for Biodiversity Conservation?

Generally, the National Biodiversity Action Plans (NBSAPS) of the different Parties to the CBD focus on the respective country and lack the dimension on how the countries activities fit into a global picture. NBSAPs are not developed in a way to ensure that the sum of national actions adds up to the fundamentally important global goal of conserving, protecting, and restoring the health and integrity of the earth ecosystem. The parties need something like the Three Global Conditions Framework to add a global conservation dimension to their NBSAPs. This would create a rational and mutually understood system for both domestic and international action to secure the Earth's ecosystem in accordance with Rio Principle 7 ("Earth_Summit", www.un.org):

“States shall co-operate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command”.

Principle 7 was reaffirmed by the UN General Assembly in 2012 in association with the Sustainable Development Goals (SDGs). However, current actions under CBD lack the global scale of Rio Principle 7. While the CBD sets global targets, the actual implementation mechanism is applied at country level through the NBSAPs.

Although CBD Decision IX/8 (paragraph 80) requires the parties to ensure that NBSAPs take into account the Rio Principles, there is no global framework that would enable this to happen. Nothing in the NBSAP process currently requires the parties to consider how their national actions aggregate to conserve, protect and restore the health of the global ecosystem nor require NBSAPS to fit together with those of neighboring countries for the needs of migratory species.

The Three Conditions-Approach aims to:

- establish a baseline state of three broad terrestrial conditions,
- deliver a scientifically grounded base easy to understand and visualize by non-scientists,
- support area-based conservation measures (neighboring countries may jointly and more effectively protect shared ecosystems and consider the needs of migratory species),
- bundle and better focus conditions,
- provide a coherent framework for countries to commit to global goals through realistic measures suitable for their current national conditions,
- provide a basis for common but differentiated responsibilities for international cooperation to protect the earth ecosystem that can also serve as a guide for the participation of non-state actors,
- enhance awareness on sustainability.

It should be well understood that the Three Conditions-Approach is not meant to replace the current mechanism of NBSAPs or the possible instrument of national determined contributions, but in contrary it is meant as a basis to make the use of such instruments more effective. As it visualizes and defines the current status of biodiversity in three basic conditions worldwide, it can help to prioritize

actions at the national level and to combine such actions to regional measures. The approach is also not meant to replace existing national measures in specific countries, which are of course best adapted to local circumstances. It wants to widen the perspective with a view at the different national responsibilities and possibilities in the face of a global crisis of biodiversity loss.

It should also be understood that this approach does not value one condition over the other and does not want for example to blame any country for not having much wild areas left under condition 3. By showing which conditions are predominant in which country, the approach wants to help countries to focus on what is feasible and urgent in their specific situation and at the same time add national actions up to a coherent global undertaking.

1.4 Area-based conservation targets in the Post-2020 debate

As mentioned above the current Strategic Plan for Biodiversity 2011-2020 of the CBD and the Aichi Biodiversity Targets include an area-based conservation target, Aichi Target 11, which is part of the strategic goal C“ to improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity”.

“Target 11: By 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.” CBD COP 10 Decision X/2.

The 4th Global Biodiversity Outlook divided the target in six components (CBD 2014):

11.1 At least 17 % of terrestrial and inland water areas are conserved
11.2 At least 10 % of coastal and marine areas are conserved
11.3 Areas of particular importance for biodiversity and ecosystem services conserved
11.4 Conserved areas are ecologically representative
11.5 Conserved areas are effectively and equitably managed
11.6 Conserved areas are well connected and integrated into the wider landscape and seascape

According to the IPBES Global Assessment, only progress towards the first two components is on track (at the end of 2018 14.9% of the world’s terrestrial and freshwater environments was covered by protected areas, with 7.4% of the marine realm area covered), while progress towards components 3 to 6 is described as moderate (IPBES 2019, p. 38). Only 20.7% of Key Biodiversity Areas are completely covered by protected areas and about 9.3-11.7% of the land covered with adequate connected protected areas (ibid. p. 40-41). The IPBES Assessment also assumes that in many countries, less than half of protected areas are effectively managed. The quality of management is often poor and not systematically assessed.

Many scientists and several NGOs are of the opinion, that even reaching Aichi Target 11 will not stop or reverse the loss of biodiversity and are calling for more ambitious area-based targets, that could

also be part of the 2030 mission or 2050 vision of a Post-2020 Global Biodiversity Framework of the CBD. A synthesis of the submissions made by CBD parties and observers starting from December 2018 on the scope and the content of the Post-2020 Framework is listing 15 proposals for targets, which are related to protected areas and other effective area-based conservation measures (CBD 2019, p. 22-23). A few proposals call for 30% of protected areas for marine and terrestrial areas by 2030, some for an increase to 50% by 2050 (see below). Areas conserved by indigenous people and local communities should be better recognised as well as so called “other Effective Area-Based Conservation Measures” (OECMs), mainly referring to privately managed areas.

The 30% by 2030 target was also reiterated in a joined call by several NGOs, e.g. Birdlife International, The Nature Conservancy, Conservation International, the Wildlife Conservation Society and WWF in January 2019 (Birdlife et al. 2019). IUCN proposed in the same submission, that is introducing the Three Conditions-Approach, an area related minimum conservation target for the Post-2020 Biodiversity Framework based on the voluntary commitments for Protected Areas and Conserved areas (including OECMs) in each country (IUCN 2018, p. 23).

In 2009, the “Nature Needs Half” movement was launched by Harvey Locke of the WILD Foundation, aiming to start a larger social movement and calling for the protection of “approximately 50% of each the 846 ecoregions that provide habitat for all of Earth’s biodiversity” (<https://natureneedshalf.org>). The idea to set aside half of the planet for conservation efforts goes back to the seventies and was formulated in a publication by R. Noss (1992). The idea got further traction with an article by Soule & Sanjayan (1998) that concludes, that 50% of wildlife will be lost if 90% of habitat is disrupted.

The target to protect 50% of marine and terrestrial areas or “half-earth” was also promoted by the biologist E.O. Wilson, who is arguing in his latest book, that only if half of the planet’s surface is left to nature, a critical amount of ecosystems and about 85% of species can be preserved (Wilson 2016). The proposal by Wilson is supported by the Half-Earth Project, which is aiming to identify the areas with the highest species richness by using e.g. remote sensing technologies and other mapping tools. The mapping also includes protected areas (strict reserves, biosphere reserves, community based and other conserved areas) as well as areas with high land use and fishing activities (Figure 2).

The “Nature Needs Half” and the “Half Earth” approach are two ways to a similar goal, but with different origins. While the “Nature Needs Half” idea derived from an ecoregion planning as well as from an indigenous and more holistic perspective on land use, “Half Earth” has a focus on species-area calculations and the question, where to protect the highest number of species (Locke 2018). Both approaches also consider the need for sustainable transformation in the areas not under conservation, to reduce the human-induced pressures on biodiversity. Further, they do not exclude human intervention in the protected half of the earth completely, which can e.g. include the sustainable use and practices of indigenous peoples and local communities.



Figure 2. Half-Earth map with a focus on Germany, showing a heat map for species richness on land and areas with high land-use pressures. Source: www.half-earthproject.org.

Büscher et al. (2017) criticise that the Half-Earth approach is falling short in recognising the humans as part of nature and as cause for the global loss of biodiversity. They argue, that by protecting 50% of the planet's surface from human interference, the overexploitation of resources and unsustainable consumption and production as main drivers in the other 50% are not sufficiently addressed. Further, strict conservation would lead to displacement of people from areas with high value for biodiversity and that would fuel inequality. Questions like who should decide which areas should be protected and who would control that these areas are restored and remain untouched, as well as the role of indigenous peoples and local communities for conservation remain open. For the authors, solutions to protect nature and its contributions to people should always consider humans as part of the solution, e.g. as the actors that can change a growth-based economy and enable transformative change that can reduce or eliminate the drivers of biodiversity loss (Büscher et al. 2017).

2 Germany and its measures to protect biodiversity

Germany has already a 100-year-long tradition of Government nature conservation. In 1986 the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU¹) was founded, followed in 1993 by the creation of the Federal Office for Nature Conservation (BfN). The German Government's environmental policy has been continuously advanced and developed during the last decades (BMU 2007).

Germany's State Area is 357,582.23 km² large and densely populated (the population density by the end of 2017 was of 232 citizens/km²), with a large variation between its 16 federal states (Länder), e.g. 4,055 inhabitants per square kilometre in Berlin and only 69 in Mecklenburg-Vorpommern (DESTATIS-Website¹). States have their own administrations and laws and are responsible for a wide range of nature conservation issues, for instance the designation and management of large nature conservation areas (BfN Website¹).

More than 9,500 species of plants, around 14,000 of fungi and more than 48,000 of animals occur in Germany. One-third of all native taxa included in the National Red Lists are endangered and 5.6% already extinct. Despite its low endemism rate, Germany still has special responsibilities for the preservation of 161 animal taxa, among which are 7 endemic species. Populations of many taxa listed in the Red Lists are decreased by 34% in the last 150 years. Nearly 500 native species are highly protected (417 animals, especially birds and butterflies, 52 ferns and flowering plants and 1 lichen) (BfN 2016). Information on the richness of landscapes and their distribution is reported under Chapter 3.

According to the NBSAP (BMU 2007), the landscapes of the German territory can be divided into three main groups:

- 1) **Areas of wilderness** (Chapter 3.1),
- 2) **Cultivated landscapes:** Agriculture and silviculture / hunting & fishing (Chapter 4) and
- 3) **Urban landscapes:** Human settlements and transportation / mining and energy (Chapter 5).

Visions for the future and actions for each category are also described in the NBSAP.

A detailed description of German landscapes together with a conservational evaluation of them has been available since 2004 (Chapter 3.3). The most relevant human activities threatening species and habitats in Germany are intensive agriculture, shipping, hydraulic engineering, construction measures, emissions, sport and tourism activities, transport and energy production, infrastructure and spatial planning, fishery and biological invasions (BMU 2007; BfN 2016).

2.1 Nature conservation in Germany

Almost two-thirds of all habitat types ("*Biotope*"; 863 habitat types, other than 'technical') occurring in Germany are under threat and the country has some of the highest threat levels in Europe (BfN 2016). About 76% of these threatened habitat types are protected by law and are part of the Natura

¹ The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) was called "Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)" in the period from 2013 to 2017. Therefore, some citations from that period report this name and abbreviation as well.

2000 Network (see Chapter 2.3). Several types of protected areas are designated and defined in the Germany's **Federal Nature Conservation Act ("BNatSchG")** (BfN 2016).

The **National Strategy on Biological Diversity (NBS)** was formulated and adopted by the German Federal Government in 2007 in response to article 6 of the CBD. It was developed through a comprehensive consultation process involving a large group of actors and stakeholders (Herber et al. 2015). The NBS contains 330 targets and 430 measures in 16 action areas. Its achievements are measured periodically by indicators (BMU 2007).

In addition, the BMUB (2015) launched in 2015 a **Nature Conservation Action Programme 2020** with updated action areas and corresponding objectives and measures until 2020. This Action Programme was reported to the CBD as update of the German NBSAP (CBD-Website). The initiative of the BMUB highlights those 10 areas with the biggest deficits and set out a total of 40 urgent measures. For its success, it requires political support at Federal, Länder and municipal level, as well as a concerted effort by stakeholders. Most Länder and even municipalities have also developed own strategies and programs on biological diversity during the last years (BMU 2018).

Furthermore, Germany established in 1998 the Birds and Habitats Directives committed by the European Union (EU) to the protection of nature and a Natura 2000 network of protected areas (see Chapter 2.3).

A detailed list of protected areas and nature conservation measures in Germany is reported in Chapter 3.

2.2 German actions and expenditures for biodiversity protection worldwide

Germany, together with EU Institutions and Japan, is one of the largest providers of bilateral biodiversity-related Official Development Assistance (ODA). Jointly, they provided 44% of total biodiversity-related ODA in the period 2011-13 (Drutschinin & Ockenden 2015).

The German government is supporting programs and projects in over 30 partner countries, aimed at conserving biodiversity and has worked continuously since 2008 to expand its engagement. Since 2013 about **500 million euros** have been provided **annually** by the German government for the conservation of forests and other ecosystems worldwide. These are funded by the Federal Ministry for Economic Cooperation and Development (BMZ) (80%) and by the BMU (20%). Around 90% of BMZ funds are spent on bilateral cooperation (BMZ-Website; BMZ-BMU 2018). The remaining funds are channeled through multilateral institutions.

Funds are used, for instance, to improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity, to support the establishment of a global network of protected areas on land and in the oceans, to combat wildlife crime, to reduce the direct pressures on biodiversity and promote sustainable use, to support forest conservation and Access and Benefit-Sharing (ABS) and to enhance knowledge management and capacity building (BMZ-BMU 2018).

2.3 German contribution to the EU Biodiversity Strategy and to nature conservation in Europe

Nature Conservation in Germany is also in agreement with the **Biodiversity Strategy** of the European Union (EU), which aims to halt the loss of biodiversity and ecosystem services in the EU and helps to stop global biodiversity loss by 2020 (EC-Website²).

Germany has contributed to the development of the EU Biodiversity Strategy to 2020 and its implementation at national level. The EU Biodiversity Strategy set out 6 targets (1. Protect species and habitats, 2. Maintain and restore ecosystems, 3. Achieve more sustainable agriculture and forestry, 4. Make fishing more sustainable and seas healthier, 5. Combat invasive alien species and 6. Help stop the loss of global biodiversity) and 20 actions to implement these targets (EC-Website²). The progress towards the national implementation was reported in the 5th national report to the CBD (CBD-Website¹).

Currently, a new EU Strategy is going to be developed in parallel to the Post-2020 Global Biodiversity Framework of the CBD.

Since 1998, Germany contributes to the EU wide Natura 2000 network. This protects over 1,000 animal and plant species and over 200 types of habitats EU-wide. Natura 2000 is a network of core breeding and resting sites for rare and threatened species, and some rare natural habitat types which are protected in their own right. It stretches across all EU countries. The aim of the network is to ensure the long-term survival of Europe's most valuable and threatened species and habitats, listed under both the Birds Directive and the Habitats Directive. The network includes both terrestrial and marine sites (Marine Protected Areas (MPAs)) (BfN 2010; BfN-Website¹¹; EC-Website¹).

Altogether, 18% of the territorial surface of all EU member states is covered by Habitats and Birds Directives sites (EU¹-Website). According to the Federal Agency for Nature Conservation (BfN), Germany reported 4,621 sites under the Habitats Directive (2011) and 738 sites under the Birds Directive (2010). The 5,200 areas, that can overlap, cover 15.5% of Germany's terrestrial surface and 45% of its marine waters (in 2017) (BfN-Webseite¹¹, EU¹) (further details can be found in chapter 3.2.8).

The following map (Figure 3) shows the Habitats and Birds Directives sites as part of the Natura 2000 network in Germany and its neighboring countries. Many sites cover areas across boards, especially the marine sites in the North and the Baltic Sea.

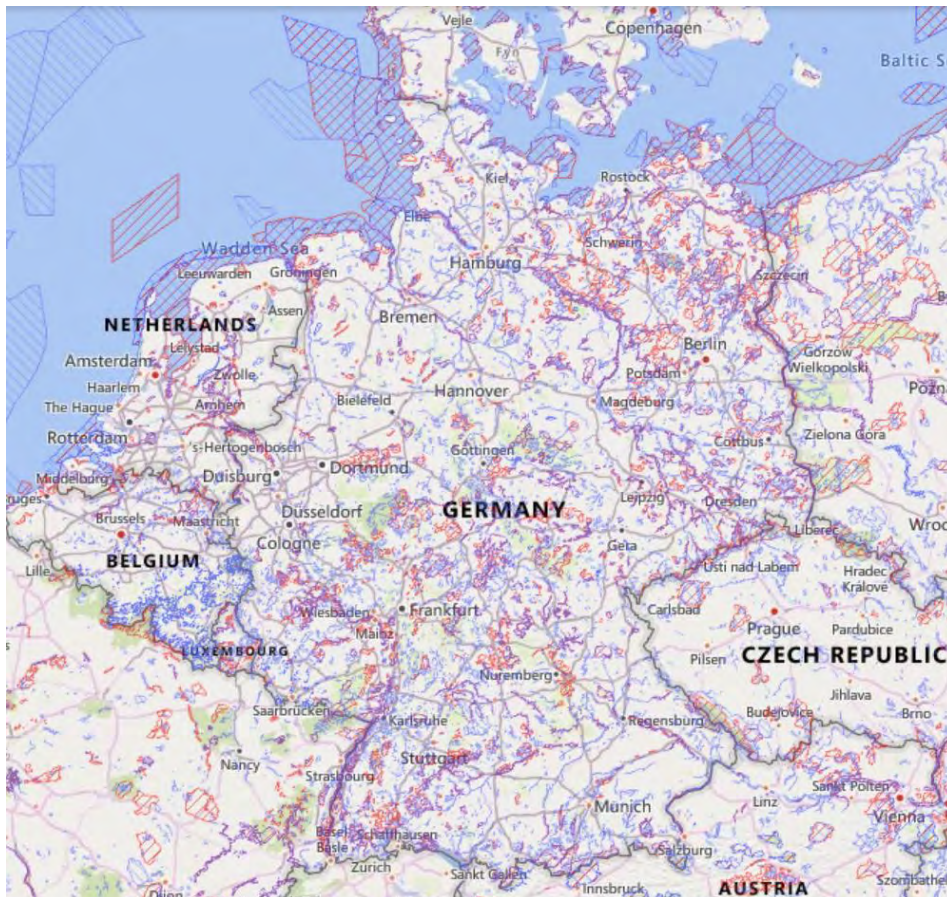


Figure 3. Habitats Directive Sites (pSCI, SCI or SAC) - blue hachured; Birds Directive Sites (SPA) – red hachured; Overlapping Habitats and Birds Directive Sites – blue and red hachured. (Natura 2000 Network Viewer, European Environment Agency (EEA), accessed 9 June 2019, <http://natura2000.eea.europa.eu>).

2.4 German impact on biodiversity worldwide (examples)

Germany imports food, raw materials, goods and services from all over the world to meet the demands of its industry and consumers. Further, it exports goods as well as waste to other countries. Most countries depend on food and products from abroad and cannot meet their needs alone with national resources. According to the Global Footprint Network, Germany's Ecological Deficit was of 396,532,115 global hectares (gha) in 2016 compared to 132,533,188 gha biocapacity. If all humans worldwide would have a demand for land as German citizens, we would need the surface of 2.97 earths (Global Footprint Network-Website 2019).

Science, for example the IPBES Global Assessment on Biodiversity and Ecosystem Services, describes the interconnection of land use as tele-coupling: “*Socioeconomic-environmental interactions over distances...*” (Liu et al. 2013). It is an umbrella concept that encompasses various types of distant interactions, such as international trade, tourism, migration, foreign investment, species invasion, payments for ecosystem services, water transfer, information dissemination, knowledge transfer, and technology transfer (Liu et al. 2013, in IPBES 2019, Glossary, p. 42). The IPBES Assessment on Land Degradation and Restoration concluded, that “High income countries use land abroad to increase their agricultural land (also referred to as “virtual land use”, “displaced land use”, or “tele-

coupling”, causing displacement in land and water resources needed for food production, and “transferring” the environmental impacts to the source low-income producing countries, such as in the case of soy production and exports to Europe from Brazil and Argentina (Boerema et al. 2016, D’Odorico et al. 2013, both in IPBES 2018).

Tele-coupling related research is a relatively new interdisciplinary field that includes questions on complex interrelations among different sectors and on different scales over distance. The international research project COUPLED, hosted by the Humboldt-University of Berlin is trying, for instance, to improve the understanding of land-use over distance, to develop approaches to measure the implications and to provide solutions for decision-makers. According to Paitan & Verburg (2019): *“...methods capable of allocating the negative direct and indirect social, environmental and economic impacts occurring along the supply chain of products can help to make trade more sustainable”* (Paitan & Verburg 2019). The COUPLED project illustrates a simplified example for tele-coupling between meat production in Europe, soybean export for feed from Latin America and meat demand in China. It also shows how governance and conservation approaches are “exported” (see Figure 4).

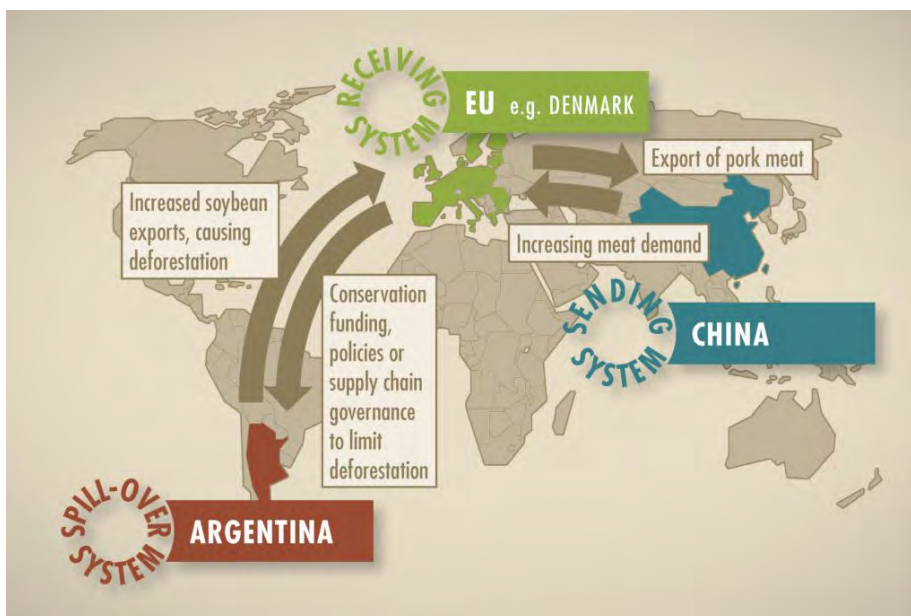
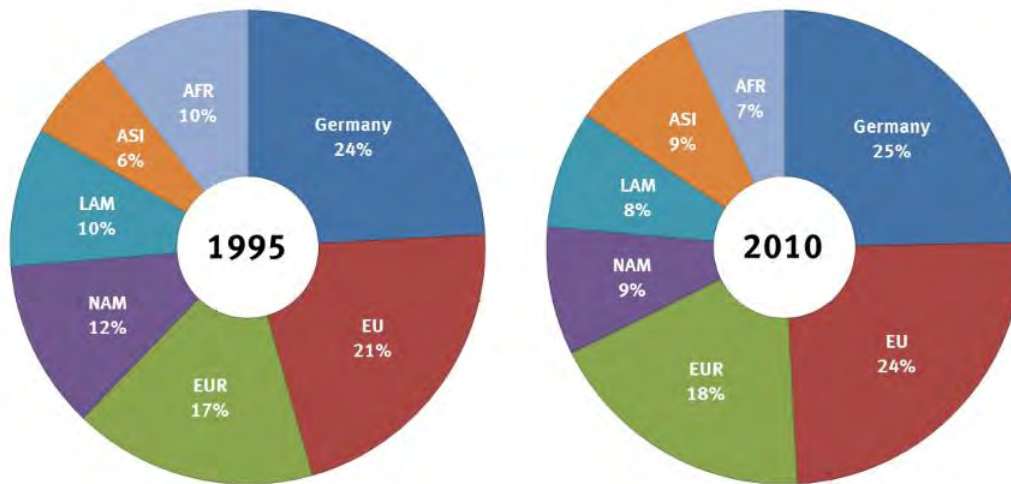


Figure 4. Example of a tele-coupling (COUPLED Project, 2019). Source: <http://coupled-itn.eu/about-us/>.

A study on the behalf of the German Environment Agency (UBA) developed land use indicators to estimate the land footprints of Germany and the EU. The study showed that half of Germany’s 22 million ha crop and footprint relies on land resources abroad (Bruckner et al. 2017). The footprint for grassland differentiates between the related products, e.g. meat, dairy and non-food products and the productivity of the land. Depending on the accounting methodology, Germany relies on 38% to 66% grassland areas in other countries.

Using another approach to calculate the footprint for forestland, the study showed that only 25% were located in 2010 in Germany (Figure 5).



Note: AFR = Africa; ASI = Asia; LAM = Latin America; NAM = North America; EUR = Europe excl. EU; EU = European Union.

Figure 5. Geographical composition of Germany's forestland footprint, in 1995 and 2010. Source: Bruckner, M. et al. (2017), p. 32.

An often-referenced example for tele-coupling between two regions is discussed by Lenschow et al. (2016). Their study looked at the links of soy production and trade between the regions of Rio Grande do Sul in Brazil and Lower Saxony in Germany under different governance options. They describe how soy production in Brazil is causing loss of biodiversity, soil erosion, pesticide contamination, proliferation of genetically modified organisms (GMOs), nutrient runoff and groundwater depletion. Germany's meat production depends on soy imports from Brazil to feed its livestock. The meat industry in Lower Saxony is causing soil and water pollution, increasing greenhouse gas emissions, bioaccumulation of pharmaceuticals and loss of agrobiodiversity also in Brazil. The agroindustries in both regions are contributing to the global loss of biodiversity, CO₂ emissions and risks associated to the use of genetically modified organisms (GMOs). The increasing meat consumption in Germany and Europe are increasing environmental impacts in Latin America, but also in the consumer countries. Lenschow et al. (2016) discuss different policy responses and argue, that not only global environmental governance should be considered to deal with tele-coupling effects, but also bilateral treaties and national policies. A study by WWF Germany has pointed out, that not only the production of meat and dairy products has a land footprint, but also fishery (Noleppa & Carlsburg 2015). About half of the fish consumed worldwide originates from aquacultures that partly use plant-based feed, however available data is limited and therewith an assessment of used land.

Another example for interlinkage is the demand for rare metals for electronics in Europe from Africa and the export of electronic waste to Africa, which causes the contamination of the local environment in both ways (Newig 2018).

The German government recognized the impact Germany has on other regions in its National Biodiversity Strategy (NBS) (BMU 2007). In vision B 2.3, the strategy states that "in its actions, Germany comprehensively considers the effects of its activities outside its borders and is increasingly taking responsibility for the worldwide conservation of biological diversity".

Further, the strategy from 2007 lists a few goals, e.g. that by 2020, 25% of the imported natural products (agricultural, forestry and fishery products, medicinal and collector's plants, collector's

breeds of animals) should be sustainably produced or obtained, investments abroad should follow environmental standards of the World Bank and OECD guidelines, sustainable tourism should be increased and life cycle assessments prepared by the German industry should include the impacts of raw material use and waste management in other countries. The NBS also states that Germany was aiming to increase its Official Development Aid (ODA) to 0.51 by 2010 (percentage of gross national income - GNI) and that ODA projects should consider conservation of biodiversity where relevant. As mentioned above, Germany is already among the main contributors of biodiversity related ODA. According the OECD ODA statistics website, the country was spending 0.67% ODA per GNI in 2017 of which over 1.1 billion USD were used for activities related to environmental protection (OECD-Website¹).

Also the Nature Conservation Action Programme 2020 by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB 2015) which, in contrast to the National Biodiversity Strategy of 2007, was not agreed as government programme, included a section on international responsibility for nature conservation as one of the ten key priorities to implement the NBS (BMUB 2015, p.12). The programme contains a call for an increase of conservation related development aid, an education initiative on the impact of national consumption on biodiversity worldwide and aim to include biodiversity related criteria in eco-label standards and the assessment of global supply chains (see also Chapter 6). The ministry wanted to increase the dialog with the industry to support the development of more sustainable management tools. It also promised to lobby for more control of trade with wild species and to increase the support for regional projects that are part of Bonn Challenge (Bonn Challenge – Website) for restoration and reforestation of woodlands, tackling climate change and loss of biodiversity at the same time. The Bonn Challenge is aiming to restore 150 million ha of the world's degraded and deforested lands by 2020 and 350 million ha by 2030. In July 2019 about 170 million ha had been pledged. The BMU is supporting restoration projects as part of its International Climate Initiative (IKI).

3 Areas of Wilderness and Protected Areas in Germany

3.1 Areas of wilderness

Wilderness areas fall under the **Category Ib of IUCN** Protected Area Management Categories, the main objective of which is “to protect the long-term ecological integrity of natural areas that are undisturbed by significant human activity, free of modern infrastructure and where natural forces and processes predominate” (Worboys et al. 2015) (see Annex 1). According to the IUCN, a wilderness area should be ‘*unmodified or slightly modified land and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to reserve its natural conditions*’ (Dudley 2013; Schumacher et al. 2018).

In Germany **wilderness** is defined as follows: ‘*Wilderness areas in the sense of the NBS are sufficiently large, (predominantly) non-fragmented areas, free of intrusive or extractive human activity. They serve to permanently provide for the ecological functioning of natural processes without human interference*’ (Finck et al. 2013).

There is almost no wilderness left in Germany. Presently, ca. **0.6% of the national territory** is protected as large-scale wilderness areas (roughly **210,000-225,000 ha**) and 1.9% of the forested area was designated to be permanently unused woodland in 2018 (Schumacher et al. 2018). Most of the wilderness areas in Germany are situated in core areas of national parks and within a few larger nature conservation areas (BfN-Website²) (see Annex 2).

The National Strategy on Biological Diversity (NBS) aims to reactivate the natural processes on a certain proportion of Germany’s territory by exempting them from human influence. In particular, this concerns the remaining residues of natural ecosystems, but it may also include areas where human use has been discontinued and which are able to develop into a „new wilderness“ in future (BMU 2007). The NBS set the following goal for preserving and establishing more wilderness areas in Germany (BMU 2007):

- **By the year 2020**, nature is able to develop according to her own laws throughout **at least 2%** of Germany’s national territory, for example in post-mining landscapes, in former military exercise zones, on watercourses, along coastlines, in peatlands and in the high altitude mountains”.

Aspired actions are:

- To create adequately sized areas of natural development for specific habitats by 2020;
- To create withdrawal zones and stepping stones for endangered species;
- To integrate wilderness regions into the transboundary system of interlinked biotopes.

There is however still a gap to fulfill the 2% targets of the NBS (Schumacher et al. 2018). This means that new wilderness areas have further to be established and protected. Forests are an important element for the establishment of (secondary) wilderness areas and there are also specific targets for coastal areas and sea, watercourses and peatlands as well as High Mountain ranges. Furthermore, large potential wilderness areas are identified in post-mining landscapes and former military estates. In recent Research and Development (R&D) projects experts identified about 517,292 ha of potential

wilderness areas. These represent a good spatial potential for fulfilling the 2% target (Schumacher et al. 2018).

The Federal Act on Nature Conservation and Landscape Management (**Federal Nature Conservation Act, abbreviation in German “BNatSchG”**) sets the legal framework also with regards to wilderness. Other important instruments, other than the NBS (2007), are the ‘**Nature Conservation Action Programme 2020**’ by BMUB (2015) and the establishment of the ‘**German National Nature Heritage**’ (Schumacher et al. 2018). To support the wilderness targets, the Federal Government has made 156,000 ha of federal land available as ‘**National Natural Heritage**’ since 2007 (BMU 2007).

Due to the German situation – especially the lack of spacious pristine nature – it was **not possible to unconditionally adopt existing international criteria** so far (Schumacher et al. 2018).

3.2 (Large Scale) Protected Areas

Protected areas are classified by size, protection purpose and conservation objective, and by the resulting restrictions on land use. The main protected area types in Germany are nature conservation areas, national parks, biosphere reserves, landscape protection areas, nature parks and Natura 2000 sites (BfN-Website³) (see below). Many nature conservation areas are at the same time designated as Natura 2000 sites and large areas of the nature parks are partly landscape protected areas. Therefore, the total area of protected sites in Germany is not the equivalent of the sum of all areas of the different protected area types (BfN-Website³).

National parks, biosphere reserves and nature parks are also defined as “**large-scale conservation areas**” (*Großschutzgebiete*) because of their size.

The categories of protected areas set out in the BNatSchG also form the main basis for legally protecting areas making up the European Natura 2000 network (§§31-36 of the act) and the global network called for at the Fifth World Parks Congress in Durban (see CBD COP 7 Decision VII/28). For international comparability of the different types of protected areas across countries and regions, IUCN (International Union for Conservation of Nature) has published guidelines for protected area management categories in 1994, which shall be applied within reporting frameworks particularly to the Convention on Biological Diversity (CBD) (BfN-Website³).

According to the Federal Agency for Nature Conservation (BfN-Website³), the following priorities are important for the future development of protected areas in Germany, and in particular for large-scale conservation areas:

- Improvement of quality criteria and standards for (large) protected areas;
- Development of a national action plan for protected areas;
- Periodical evaluation of protected areas;
- Improving protected area management and communication of best practice examples, strengthening the resilience of protected areas against negative influences;
- Strengthening research and monitoring, establishment of an integrative monitoring for national parks and biosphere reserves;
- Securing long-term funding;

- Cross-border cooperation;
- Enhancement of the portion of areas without management according to the targets of the National Biodiversity Strategy (NBS);
- Realization of projects funded by the federal government in large scale conservation areas.

In November 2005, EUROPARC Germany² launched '**National Natural Landscapes**' ('Nationale Naturlandschaften'), an umbrella brand for large-scale conservation areas with the following aims (BfN-Website³):

- To provide a joint marketing and communication vehicle for all German large-scale conservation areas;
- To establish a uniform corporate design for all large-scale conservation areas;
- To boost awareness and the appreciation of national natural landscapes;
- To enhance the national and international importance of large-scale conservation areas, for example in sustaining biodiversity in Germany;
- To attract additional funding for large-scale conservation areas.

3.2.1 National Parks

National parks ('Nationalparke' under Section 24 of the BNatSchG) are defined as (BfN-Website⁴):

- large-scale landscapes of national importance, largely unfragmented and with special characteristics;
- areas that fulfil the requirements for a nature conservation area in the greater part of their territory;
- that have not been affected by human intervention at all, or to a limited extent only, in the greater part of their territory;
- that are suitable for developing, or being developed, into a state which ensures the undisturbed progression, as far as possible, of natural processes in their natural dynamics, with little or no human impact over most of their area.

National parks also serve purposes of scientific environmental observation, education and public experience of nature (recreation), if protection purposes allow it. Commercial exploitation of natural resources by farming, forestry, water use, hunting or fishing must be largely prevented or can only be allowed subject to strict requirements laid down by the nature conservation authorities. National parks help to protect nature and biodiversity and to provide safe habitats for wild plants and animals. They leave space for natural development processes and for the self-regulation of nature. Most of Germany's national parks are still in a development phase and they only partly meet the criteria of leaving nature untouched over large areas (BfN-Website⁴).

National parks are designated by the German states (Länder) in consultation with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the Federal Ministry of Transport and digital infrastructure (BMVI) (Art. 22 para. 5 BNatSchG).

² The EUROPARC Federation is the network for Europe's natural and cultural heritage. It represents hundreds of responsible authorities and thousands of protected areas in 38 countries.

National parks fall under the **Category II of IUCN** Protected Area Management Categories, the main objective of which is to protect natural biodiversity and to promote education and recreation (Worboys et al. 2015) (see Annex 1). To comply with IUCN guidelines, at least three quarters of a protected area must be managed for its primary purpose. For national parks under EUROPARC/IUCN, this means 75% of the area must be maintained in a largely natural or near-natural state. The area must also be large enough to contain one or more entire ecosystems. A minimum size of 10,000 ha is recommended for Germany.

Germany currently has 16 national parks covering a total of **1,047,859 ha**. Excluding marine areas, national parks cover **0.6%** of German territory (Figure 6) (BfN-Website⁴; Europarc-Deutschland 2016).



Figure 6. National parks in Germany. Source: Federal Agency for Nature Conservation (BfN) 2019 using data provided by the federal states, basic spatial data: © GeoBasis-DE/BKG 2018.

3.2.2 National Nature Monuments

This category of protected areas was added to the BNatSchG in 2010. "National Nature Monuments" are areas of outstanding importance for reasons of science, natural and cultural history or national heritage and because of their rarity, special characteristics or beauty. National nature monuments are not completely natural and untouched areas, but mostly influenced by human activities (BfN-Website⁵).

They have to be protected in the same manner as nature conservation areas, as cultural value is here as important as natural value. Natural monuments are distinguished from national nature monuments by their local or regional importance and the fact that they preserve objects, not areas. This new type of protected area borrows from **Category III of IUCN "Natural Monument or Feature"**, the primary objective of which is to protect specific outstanding natural features and their associated biodiversity and habitats (Worboys et al. 2015) (see Annex 1).

The designation of national nature monuments can lead to an overlap of nature conservation and monumental protection. One of the management principles should be to permanently safeguard and conserve the area and, where applicable, improve the characteristics of the national nature monument giving it its particular value. Management requires therefore considering the pressure due to visitors, given the attractiveness of national nature monuments. National Nature Monuments can fall under Natura 2000 sites or other protection areas (BfN-Website⁵).

3.2.3 Nature Conservation Areas

Nature conservation areas ('*Naturschutzgebiete*' under Section 23 of BNatSchG) are set up with the following aims (BfN-Webseite⁶):

- to conserve, develop or restore habitats, biotopes or communities of certain species of wild fauna and flora,
- for science, natural history or national heritage, or
- because of their rarity, special characteristics or outstanding beauty.

Most nature conservation areas are designated by authorities in charge of nature conservation at regional government level, although some are created by state ('Länder') or local government-level authorities (BfN-Webseite⁶).

In 2016 there were 8,816 nature conservation areas on a total of **1,402,802 ha** in Germany (**3.9%** of the country's land surface) (Figure 7). The average size of a nature conservation area is 159 ha (excluding North Sea and Baltic marine and mudflat areas). About 60% of conservation areas are smaller than 50 ha, which means they are not large enough to be safe from negative outside factors such as water loss, eutrophication and pesticide effects. Only 15% have an area of 200 ha or larger (BfN-Webseite⁶).



Figure 7. Nature Conservation Areas. Source: <https://geodienste.bfn.de/schutzgebiete?lang=de&layers=NSG>.

Although any activity causing destruction, alteration or damage in a nature conservation area is prohibited, many nature conservation areas continue to be affected by land use. Legal uses include forms of recreation, forestry and farming, use of water resources, and transport, but any land use must be compatible with the protection purpose (BfN-Webseite⁶).

Nature conservation areas fall under **Category IV of IUCN “Habitat/Species Management Areas”**, the primary objective of which is to protect particular species or habitats and the management should reflect this priority (Worboys et al. 2015; WWF 2008) (see Annex 1).

3.2.4 Biosphere Reserves

Biosphere reserves (‘Biosphärenreservate’ under Section 25 of the BNatSchG) protect, develop or restore large-scale natural and cultural landscapes shaped by traditional uses, along with their historically evolved diversity of species and habitats (BfN-Website⁷). They are part of other “International protected areas and conservation types” and have been established by UNESCO since 1976 under the Man and the Biosphere (MAB) Programme. Their objective is to promote and demonstrate a bal-

anced relationship between humans and the biosphere (Worboys et al. 2015). In Germany biosphere reserves

- are terrestrial and coastal/marine, large and typical representatives of certain ecosystem or landscape types,
- fulfil the requirements for nature conservation areas in essential parts of their territory, and the requirements for landscape protection areas throughout the greater part of the rest of their territory,
- serve the primary purpose of conserving, developing or restoring landscapes shaped by traditional, diverse forms of use, along with their species and biotope diversity as evolved over time, including wild forms and formerly cultivated forms of commercially used or usable animal and plant species, and
- illustrate ways of developing and testing forms of economic activity that are especially conserving of natural resources (BfN-Website⁷).

Biosphere reserves can have **any or no IUCN-Category**. MBA biosphere reserves have in general a highly protected core zone (IUCN category I-IV), a buffer zone which might be category V or VI and a transition zone that would not correspond to an IUCN category (Dudley 2008) (see Annex 1).

Biosphere reserves are particularly well suited for establishing sustainable land use approaches and regional marketing structures for sustainably farmed products. The total area of all 17 biosphere reserves in Germany is **1,994,276 ha**, excluding North Sea and Baltic marine and mudflat areas (666,046 ha). This represents **3.7%** of German territory (Figure 8). UNESCO has recognized 16 of the 17 German biosphere reserves (BfN-Website⁷).

Biosphere reserves in Germany



Figure 8. Biosphere reserves in Germany. Source: Federal Agency for Nature Conservation (BfN), 2019 using data provided by the federal states, basic spatial data: © GeoBasis-DE/BKG 2018.

3.2.5 Nature Parks

Nature parks ('Naturparke' under Section 27 of BNatSchG) are areas that are to be developed and managed in a consistent way and that (BfN-Website⁸):

- are large in size,
- consist mainly of landscape protection areas or nature conservation areas (protect and conserve both cultural and natural landscapes with their diverse habitats and species),
- are particularly suitable and intended for recreational purposes, nature-friendly and environmentally compatible tourism, sustainable land use (e.g. organic farming, extensive grassland farming) and also Education for Sustainable Development (ESD),
- serve the conservation, development or restoration of landscapes characterized by diverse uses and the conservation of species and biotope diversity, and
- are particularly well-suited to the promotion of sustainable regional development (BfN-Website⁸).

Through various protection, management and development measures nature parks contribute to the conservation of habitats and promote biodiversity. Additionally, nature parks are supposed to be part of the implementation of a protected areas network and decrease the increasing fragmentation of landscapes and habitats by supporting biotope networking (BfN-Website⁸).

Nature Parks fall under **Category V of IUCN “Protected Landscape/Seascape”**, the primary objectives of which are to protect and sustain important landscape/seascapes and the associated nature conservation and other values created by interactions with humans through traditional management practices (Worboys et al. 2015; WWF 2008) (see Annex 1).

Germany currently has 105 nature parks. With a total area of **10.1 million ha**, nature parks cover **28.4%** of Germany's land surface (Figure 9) (BfN-Website⁸).



Figure 9. Nature parks in Germany. Source: Federal Agency for Nature Conservation (BfN), 2018 from data provided by the federal states, spatial base data: © GeoBasis-DE/BKG 2015.

3.2.6 Landscape Protection Areas

Landscape protection areas (LPAs) ('Landschaftsschutzgebiete' under Section 26 of BNatSchG) are created on large areas that require special protection regarding nature and landscape to maintain,

develop or restore the functioning of the ecosystem and its services and to conserve, develop and restore the capability of natural resources to regenerate themselves. Landscape protection areas not only conserve pristine natural landscapes but also cultural landscapes (agricultural areas and forested lands). Even human settlements can be included in landscape protection areas if they are regarded as part of the surrounding conservation area (BfN-Website⁹).

Because of the diversity, special characteristics, beauty or special cultural-historical significance of their landscapes, LPAs are available for sustainable use, to protect habitats of certain wild fauna and flora species, and for human recreation. Compared to nature conservation areas, landscape protection areas are commonly larger-scaled, imply less usage restrictions and have a rather weak protection force. LPAs often serve as a buffer zone around nature conservation areas, where public accessibility and availability are allowed (BfN-Website⁹).

Therefore, a LPA can be designated because of:

- ecological importance,
- aesthetical reasons,
- cultural-historical meaning or
- recreation purposes.

It is not necessary that all four reasons are met at the same time, but at least one of them is required. Landscape protection areas are usually designated by ordinance of the federal nature conservation authorities. Actions, which change the character of the landscape, are prohibited, especially house building. Agriculture, forestry and hunting are permissible if the activities are not opposed to the protection purposes. In some cases, land management (e.g. a certain grazing regime) is even necessary to conserve the character of the cultural landscape (BfN-Website⁹).

Landscape protection areas fall under **Category V of IUCN “Protected Landscape/Seascape”** (Worboys et al. 2015; WWF 2008) (see Annex 1).

Because of their numerousness and their partly considerable magnitude, they make an important contribution to the German protected areas network and help to conserve cultural landscapes that might not meet the higher requirements of a nature conservation area, but are nevertheless important for nature and landscape conservation. By the end of 2016, 8,818 landscape protection areas existed in Germany. Together, they sum up to a total area of **10.18 million ha**, which represents **28.4%** of the area of Germany (Figure 10) (BfN-Website⁹).



Figure 10. Landscape Protection Areas. Source: Federal Agency for Nature Conservation (BfN), 2018 using data provided by the Länder. Basic Spatial Data: © GeoBasis-DE/BKG 2015

3.2.7 Specially Protected Habitats under Section 30 of the Federal Nature Conservation Act

Section 30 of the BNatSchG provides protection for a range of habitat types to safeguard them from significant and lasting impacts (specially protected habitats). The quality of the protection provided should correspond to nature conservation areas. The following habitat types are protected by law (BfN-Website¹⁰):

- Natural or semi-natural areas of flowing and standing inland water bodies, including their banks and the associated relevant natural or semi-natural vegetation, together with their sedimentation areas, backwaters and areas which are regularly flooded.
- Bogs, swamps, large sedge swamps, reeds and large-sedge reed beds, wetland meadows rich in sedges and rushes, springs and inland salt deposits.
- Open inland dunes, open natural boulder, rubble and scree slopes, clay and loess walls, dwarf-shrub, broom and juniper heaths, matgrass communities, dry meadows, heavy metal grassland, forests and bushes in xerothermic locations.

- Fen and bog woodlands, riparian forests, forests of ravines, slopes and scree, subalpine larch forests and riparian larch forests.
- Open rock formations, alpine grassland, snowbeds and elfin woodland.
- Rocky shores and cliffs, coastal dunes and beach ridges, coastal lakes, badden with terrestrialisation zones, salt meadows and tidal shallows in the coastal region, seagrass meadows and other marine macrophyte populations, reefs, sublittoral sandbanks and silty bottoms with boring bottom megafauna and species-rich gravel, coarse-sand and shell layers in marine and coastal regions.

Some of these habitat types were first added to the catalogue of legally protected habitats with the revision of the BNatSchG in 2009. They are all endangered habitat types (BfN-Website¹⁰).

3.2.8 Natura 2000-sites

The Natura 2000 Network covers in Germany all designated areas under the Habitats and Birds Directives, which may partially overlap (Figure 11 and Figure 12) (see 2.3). The greatest share of these areas falls under National Parks and Biosphere Reserves, followed by Nature Parks (BfN 2008). 9.3% of the land area of Germany is designated under the Habitats Directive and 11.3% under the Birds Directive (BfN 2016). Taking overlaps into account, Natura 2000 sites account for 15.4% of the national land area.

The condition of Natura 2000-sites has become worse since 2007 and about 50% of the areas are in poor conservation status (BfN 2016).

Natura 2000 sites can have **any or no IUCN-Category**; wilderness areas or national parks can for instance include Natura 2000 sites (Dudley 2008; EU 2013) (see Annex 1).



Figure 11. Sites of Community Importance (Habitats Directive) in Germany. Source: https://www.bfn.de/fileadmin/BfN/natura2000/Dokumente/ffh_engl.pdf.



Figure 12. Special Protection Areas (Birds Directive) in Germany. Source: https://www.bfn.de/fileadmin/BfN/natura2000/Dokumente/spa_engl.pdf.

3.2.9 German marine and coastal areas

Germany is the European leader in the designation of marine protected areas with regard to the percentage of national waters covered by protected areas (WWF-Website). Nature conservation in German coastal waters is under responsibility of the country's coastal Länder. The responsibility for marine nature conservation in the German Exclusive Economic Zone (EEZ), between 12 and 200 miles from the coastal baseline, lies with the German Federal Government under the guidelines from the UN Convention on the Law of the Sea (UNCLOS). This responsibility is assigned to the BMU and BfN. A vital part of the nature conservation work consists of monitoring and assessing the conservation status of protected species and habitats (BfN-Website¹²).

The national maritime area consists of coastal waters and the Exclusive Economic Zone (EEZ) (Figure 13). The North Sea covers 41,034 km², 70% of which is EEZ. The Baltic Sea consists of an area of 15,507 km² with 29% EEZ. Human activities include, e.g. fisheries, marine aquaculture, shipping, military use, aviation, usage of pipelines and submarine cables, wind energy, oil and gas production, sand and gravel extraction and seismic surveys to explore deposits (BfN-Website¹³).

About 45% of the total German marine area is under protection (approximately 43% of the North Sea and c. 51% of the Baltic Sea). About 70% of the Germany's coastal waters (up to 12 nautical miles off the coast) of the North and Baltic Sea comprise Natura 2000 sites, while in the adjacent German EEZ (12 to 200 nautical miles off the coast) only about 32% is designated as Natura 2000 sites (BfN-Website¹⁴). The selection of the Natura 2000 sites is based on the occurrence and distribution of special species of seabirds, marine mammals and fish, as well as ecologically significant habitat types such as "sandbanks" and "reefs", which are also protected under section 30 of the "BNatSchG". The species and habitats concerned are listed in the annexes to the Birds Directive and the Habitats Directive (BfN-Website¹⁵).

The aim of designating the sites is to protect these special, threatened habitats and species. But there are hardly any areas in the sea in which no human use is present or planned, even in the marine protected areas.

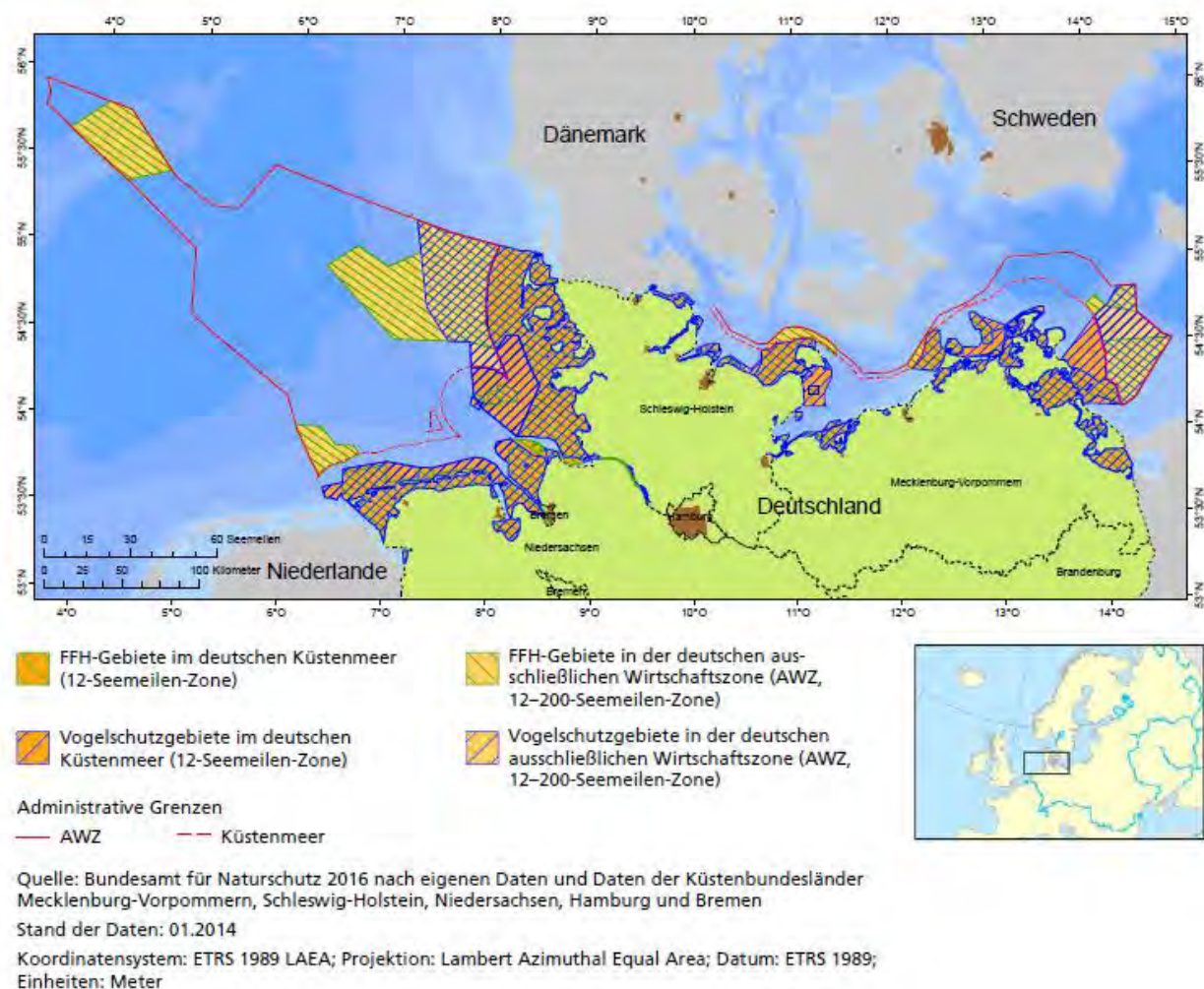


Figure 13. Marine Natura 2000 sites in the German North Sea and Baltic Sea within the German coastal waters and Exclusive Economic Zone (EEZ), from the outer edge of the 12-nautical mile zone to the outer edge of the 200-nautical mile zone bordering international waters. Source: <https://www.bfn.de/en/service/facts-and-figures/nature-conservation/nature-conservation-areas/marine-natura-2000-areas-in-the-north-sea-and-baltic-sea.html>.

Coastal landscapes are the Wadden Sea landscape of the North Sea, the Wave-eroded coastal landscape of the Baltic Sea and the Littoral reef landscape of the North Sea (Heligoland) (BfN-Website¹⁶). The first coastal national park was established in Schleswig Holstein in 1985 (BfN-Website⁴). Meanwhile, 5 coastal national parks have been designated. The coastal national parks are supplemented by biosphere reserves (e.g. the Halligen of the North Sea). In 2009, the United Nations declared the Wadden Sea a World Heritage Site of mankind. Some of the coastal landscapes are Ramsar sites, which serve the protection of wetlands of international importance in Germany (BfN-Website¹⁷).

The marine and coastal protected areas fall under IUCN-Category II “National Park” or V “Protected Landscape/Seascape” or have no IUCN-Category (see Annex 1).

3.2.10 Wetlands of International and National Importance

The Convention on Wetlands of International Importance especially as Waterfowl Habitat (**Ramsar Convention**) was designated in 1971. Germany joined the convention in 1976 and has reported **34 Ramsar sites** located in 12 Länder with a total area of **868,226 ha** so far. ‘Wetlands of International

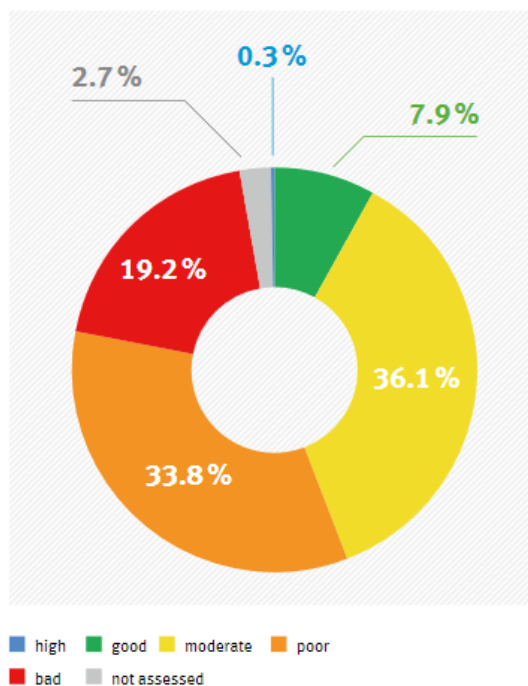
Importance' are so called predicate sites, which are not part of the federal law on nature conservation (BfN-Website¹⁷).

Ramsar sites can have any or no IUCN-Category (Dudley 2008).

3.2.11 Inland waters / floodplains

The Water Framework Directive (WFD) of the European Community (EC) requires that **inland waters** such as rivers, lakes, transitional and coastal waters, and groundwater achieve **"good status"** by the **year 2027** at the latest (UBA 2016). To this end, the European Union has promulgated a clearly defined timeline and three six-year management cycles for the member states. The main management instruments in this regard are the management plans, which contain stipulations concerning status, inputs, goal, achievement, and measures. During the first management cycle, whose management plans and programmes of measures were completed in late 2009, it emerged that the Water Framework Directive management objectives had only been reached in less than 10% of surface water bodies and in 62% of groundwater bodies in Germany. The second cycle is currently running and ends in 2021, but evaluations show that the further targets of the WFD will also not be achieved: only 0.3% of the river sections have reached "high", or 7.9% "good" ecological status, while 36.1% are "moderate", 33.8% "poor" and 19.2% even "bad" (Figure 14) (UBA 2016).

Ecological status of Germany's surface water bodies.



Source: Berichtsportal WasserBLICK/BfG; last updated 23 March 2016. Adaptation/editing: Umweltbundesamt, based on Bund/Länder-Arbeitsgemeinschaft Wasser (LAWA) data.

Figure 14. Ecological status of Germany's surface water bodies (UBA 2016).

Floodplains are hotspots of biodiversity and central elements of an ecological network. They are also flood protection areas, greenery of waterways, and areas of agricultural as well as urban use. Along

large parts of streams like Rhine, Elbe, Danube, and Odra only 10-20% of the former river basin can still be flooded. Only a small share of the German floodplains are nearly unmodified (1%) or slightly modified (9%), however 36% of the floodplain sections are considered to have changed significantly but still have floodplain character, whereas 54% are heavily or very heavily modified (BfN 2016).

The **inland waters / floodplain areas** fall under **IUCN-Category V “Protected Landscape/Seascape”** or have **no IUCN-Category** (see Annex 1).

3.3 Classification of landscapes in Germany and their conservational evaluation

The landscapes of Germany are highly diverse with 24 main landscape types (

Figure 15), which are composed of 858 individual landscapes, 59 of which are urban environments. These are classified into six main groups (BfN 2016):

- 1) coastal landscapes,
- 2) forest landscapes and landscapes rich in forest,
- 3) structurally rich cultural landscapes,
- 4) open cultural landscapes,
- 5) mining landscapes, and
- 6) conurbations.

Landscapes are also an important target for conservation in Germany, but they have received attention only recently. Conservational analysis shows that landscapes of conservation importance account for more than half of the German territory (see map in

Figure 15 and Table 1). The objective of conservation measures is to conserve landscapes for their distinctiveness and as habitats (BfN-Website¹³).

Landscapes of conservation value (see map in Figure 16) are identified on the basis of landscape fragmentation, the percentage of land accounted for by historical old forest, the percentage of land of importance for ecological networks and the importance for habitat and species conservation, based on the percentage of land accounted for by protected areas (national parks, nature conservation areas, Natura 2000 sites and core zones of biosphere reserves).

A five-point conservation scale has been developed (Table 1) by Gharadjedaghi et al. 2004 and later updated by the BfN (BfN-Website¹³).

Of the 858 landscapes designated in the analysis, 89 (12.3% of the land surface) classify as landscapes of special conservation importance. 99 (10.8%) are classified as landscapes of conservation importance, while 273 (31.6%) are landscapes of conservation importance with deficits. Landscapes of conservation importance make a total of 54.7% of the land area.

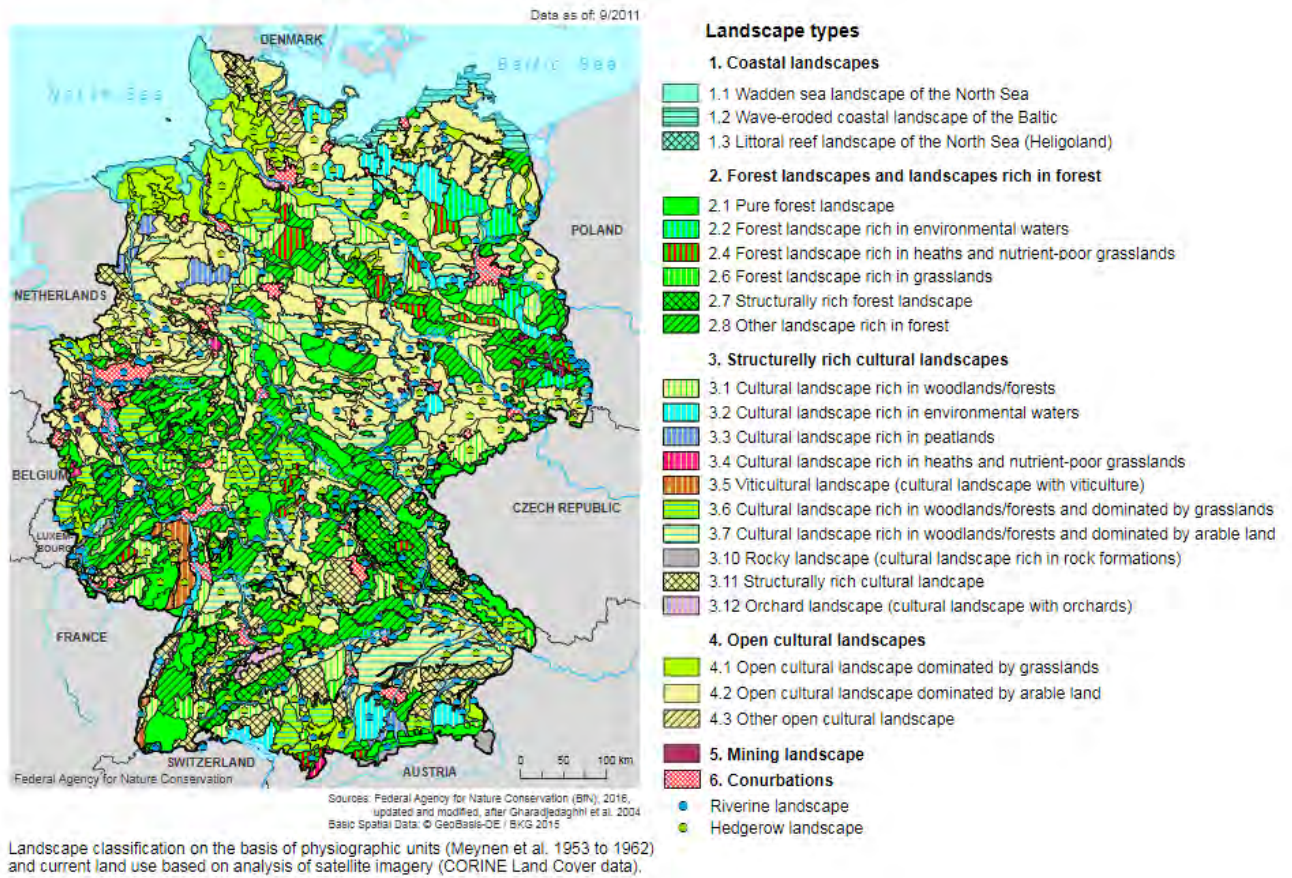
Landscapes of lower conservation importance are 338 (41.7% of the land area) and conurbations are 59 landscape units (3.6% of the land area).

Important populations of species and habitats must of course be protected in all landscapes, regardless of their conservation importance, including in those with lower conservation importance and in urban conurbations (BfN-Website¹³).

Table 1. Conservational evaluation of landscapes in Germany (Source: BfN-Website¹³).

Rating	Number of Landscapes	Proportion of the total area of Germany (%)	Characteristics
Landscapes of special conservation importance	89	12.3	Occurrence of valuable habitat types; home to endangered flora and fauna species; large share of protected areas; above-average share of undissected low-traffic areas
Landscapes of conservation importance	99	10.8	Smaller share of protected areas than landscapes of special conservation importance; similar share of protected areas but greater fragmentation by roads and railways
Landscapes of conservation importance, with deficits	273	31.6	Share of protected areas around national average; variable share of undissected low-traffic areas
Landscapes of low conservation importance	338	41.7	Below-average share of protected areas; below-average share of undissected low-traffic areas
Conurbations	59	3.6	Aggregation of urban and commercial areas; very small share of valuable landscape elements

Landscapes in Germany



Conservational evaluation of landscapes in Germany

Data as of: 11/2011

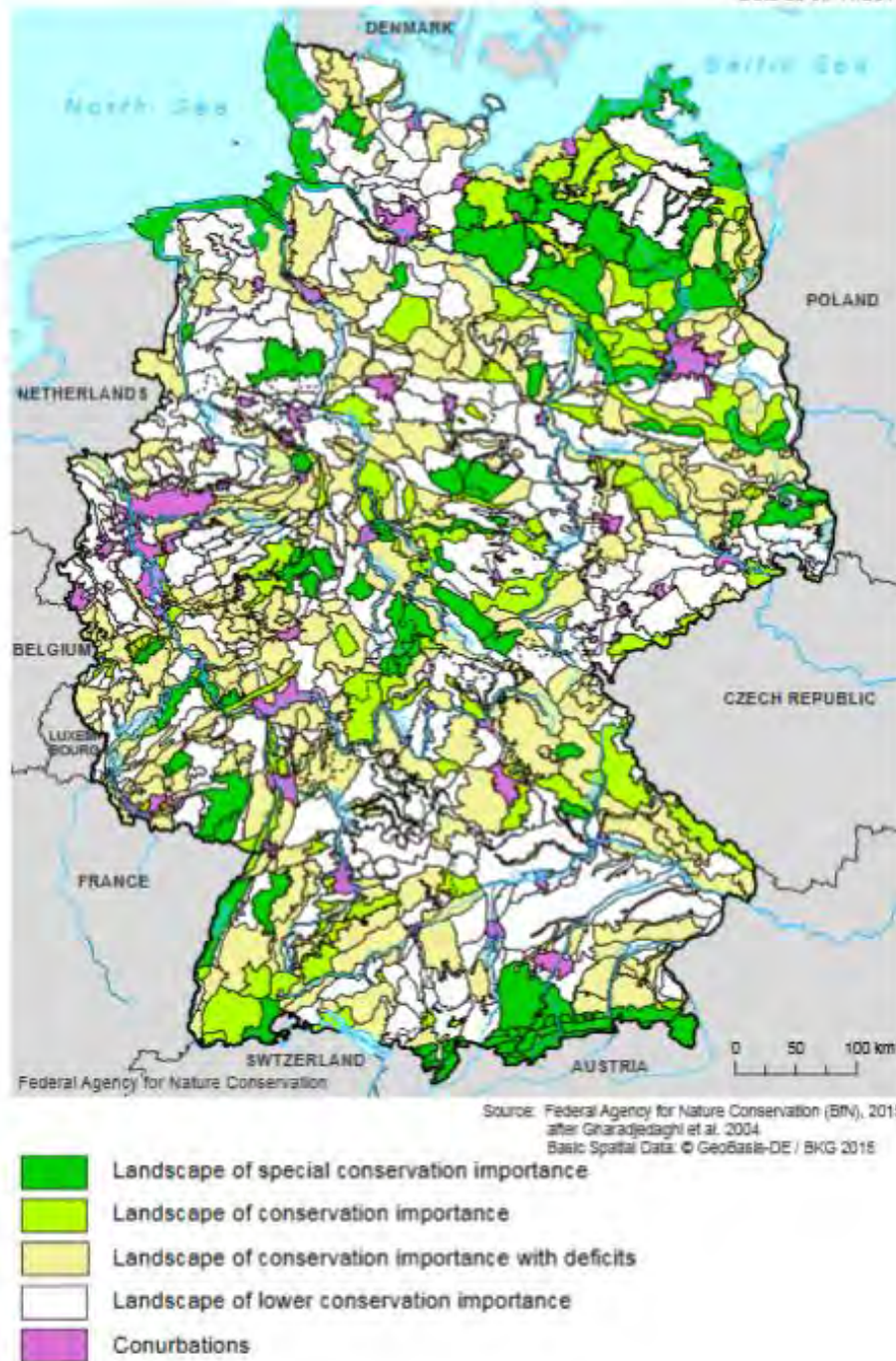


Figure 16. Conservation evaluation of landscapes in Germany (2015). Source: <https://www.bfn.de/en/service/facts-and-figures/the-state-of-nature/landscapes/conservational-evaluation-of-landscapes-in-germany.html>

4 Cultivated landscapes: Agriculture and Forestry / Hunting and Fishing

Agriculture is Germany's biggest land user (see Figure 17, UBA 2018). About half of the German land surface is farmed (over 18 million ha, 51.1% of total area of Germany according to UBA (2018)), 16.4 million ha, 47% according to BMEL (2018a). The second largest land user is forestry, which takes up 29.7% of the land area (11,045,162 ha) (UBA 2018).

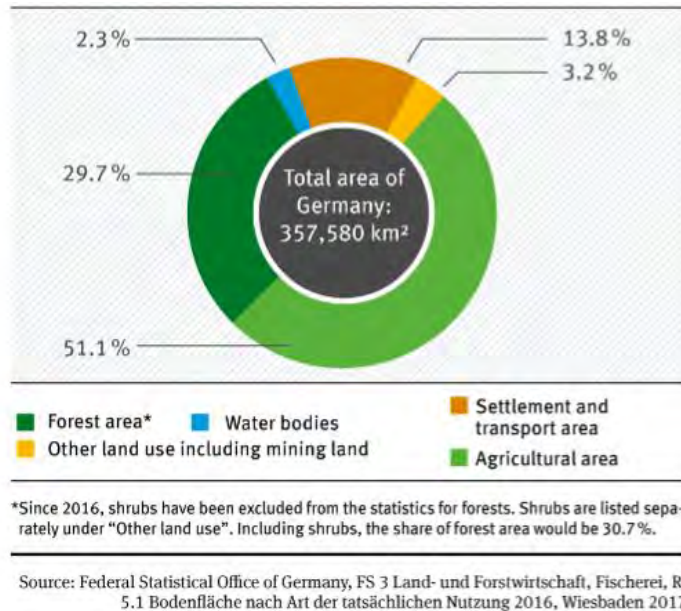


Figure 17. Land use in Germany (Federal Statistic Office of Germany 2017, in UBA (2018)).

Agriculture and forestry are on the one hand the biggest causes for biodiversity loss, especially because of fragmentation, land consume and environmental pollution, and on the other hand their diverse cultural landscapes support biodiversity and host 39% of the flora and fauna of Natura 2000 sites, which are under special protection. The conservation of numerous endangered species and biotopes depend on land use to survive (BfN 2017b).

4.1 Agriculture

Of the total agricultural area, more than 70% is used as **arable land and permanent crops** (12 million ha, of which about 1% are permanent crops) and nearly 30% is **permanent grassland**, mainly meadows and pastures (4.7 million ha) (BMEL 2018a). In 2016 about 275,400 farms were recorded for Germany having an average size of 60.5 ha (see Figure 18). Approximately half of all farmers keep cattle in order to produce milk, meat or both (BMEL 2018a).

Farming has changed greatly over recent decades. In the course of the technical development since the 1950s, the original farming has developed in many parts of Germany into an **intensive agriculture** (BMEL 2018a).

In recent years, however, agricultural areas have declined by about 1,293,400 ha between 1992 and 2017 (DBV 2019). The most important reason for this was the increase in land use for settlements and transport infrastructure. But also the increase of forests and woodlands and the open-cast mining reduce the availability of agricultural areas (UBA 2018, UBA-Website¹).

While the number of farms and farmers has decreased, the quantities of goods produced have, in contrast, risen dramatically, because of the intensification of agricultural practices. Fewer farms use presently more land and are becoming bigger in terms of average size in ha (see Figure 13) (BMEL 2018a).

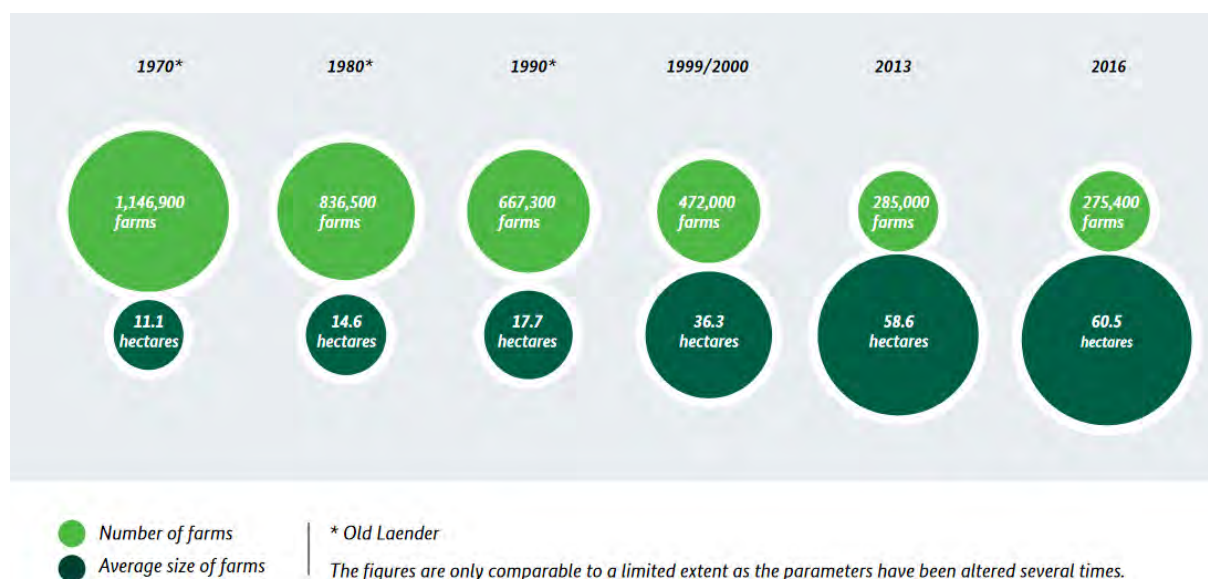


Figure 18. Decrease of number of farms and increase of average size of farms in Germany over the last 46 years (BMEL 2018).

Grassland is intensively or extensively farmed and used for food and feed production as well as biomass production for energy generation. It is also important for nature conservation. Nevertheless, grassland in Germany has come under severe pressure in recent years. It was only after 2013 that permanent grassland and the share of permanent grassland in the area used for agriculture rose again slightly. This is due to the regulations of the EU agricultural reform in 2013 aimed to the maintenance of permanent grassland. In different regions, large areas of grassland shape the appearance of the countryside. Grassland is an indispensable part of modern multifunctional agriculture. Apart from food and non-food production, grassland has great value to human society in conserving biodiversity and for leisure and recreation. More than half of all plant species found in Germany depend on grassland habitats and 44% of them are threatened or already extinct in the wild (BfN-Website¹⁹).

Farmers provide a variety of services for society which are not remunerated by market earnings for their products. The German Federal Government and the Länder, together with the EU support therefore the farming sector financially. Most funds are provided under the **Common Agricultural Policy (CAP)** of the EU. One main component of the subsidies is the **direct payments** ("first pillar", funded 100% by the EU), through which farmers receive a uniform quantity of money for every hec-

ture they farm, irrespective of what or how much they produce. However, given standards, e.g. on soil erosion, animal health, public health and the environment, have to be guaranteed (cross-compliance). 30% of the direct payments are spent specifically for the “Greening Programme”. These payments are received by farmers in addition to the basic payments, but are linked to compliance with specific climate- and environmentally friendly cultivation methods, the farmers should apply to. Funds of the so-called “**second pillar**” of the CAP are devoted to rural development, including activities for the improvement of organic farming, of the environment and for nature conservation. These are mobilized by the Federal Government and the Länder (60%) as well by the EU (40%). From 2014 to 2020, around 6.2 billion euros per year have been made available for agricultural support in Germany (BMEL 2018a).

Organic farming is a highly resource-conserving and environmentally-friendly practice that is oriented towards the principle of sustainability (BMEL-Website¹). The positive contribution of organic farming compared to integrated and conventional agriculture to the preservation of cultural landscapes, protection of soil and water and biodiversity has been proven in numerous studies (e.g., Weiger & Willer 1997, Stolze et al. 2000, Bengtsson et al. 2005, Tuck et al. 2014).

In 2018, a total of 31,1200 farms (approximately 11.7% of all farms) produced according to the organic farming regulations in Germany. In comparison to 2017, there was an organic farm plus of 5.9% and an area plus of 8%. Altogether, the area used by organic farming amounts presently to 8.9% of the total agriculturally-used land (more than 1.4 million ha) (BÖLW 2019).

In 2017, organic products accounted for approximately 5.2% of the total turnover in the food sector. Labelling of food as “Bio” and “Öko” is protected under German law and only permitted if the respective products comply with precisely defined regulations defined in the EU Organic Regulation (BMEL 2018a). In addition, there are other organic labels (e.g. Bioland, Demeter) issued by the various organic farming associations, some of which have stricter regulations (BÖLW-Website).

However, organic farming still remains at a low level and the target set in the National Strategy on Biological Diversity of **20% of the utilized agricultural area** has not been achieved so far (BfN 2016). With the "Future Strategy for Organic Farming" (ZÖL) in 2017, the Federal Government provided first impulses to promote organic agriculture. The Common European Agricultural Policy (CAP) of the European Union is of crucial importance for the increase of organic production. The CAP must be improved to reward farmers for protecting biodiversity and its services that society needs and that are not compensated by the market (BMEL 2018a).

Organic farming is widespread across Germany with differences in percentage of agricultural land in the different federal states (see Figure 19). There are large proportions in Saarland (11.4%), in Hessen (10.5%) and in Brandenburg (10.3%) and significantly lower proportions in Lower Saxony (2.9%), Saxony (3.8%), Schleswig-Holstein (3.4%) and Thuringia (4.4%).



Figure 19. Organic farming in Germany in 2014: percentage of agricultural land in each state. Source: <https://www.bfn.de/en/service/facts-and-figures/the-utilisation-of-nature/agriculture/organic-farming.html>.

4.2 Forestry

Only about 213,000 ha out of roughly 11,000,000 ha of forested area in Germany (about 2%) can be addressed as naturally developing woodlands or forests without human interference (Schumacher et al. 2018). Almost all forests in Germany are influenced by humans. But structural diversity and naturalness have been further increased since 2002 due to more sustainable forest management (BMEL 2017). Nevertheless, the national forest condition survey, carried out annually by the Länder since 1984 as part of the forest environmental monitoring, shows that the crown condition of all tree species has significantly deteriorated in 2018 compared with the previous years due to the prolonged drought in the last vegetation periods (BMEL 2018b). Trees suffered from extreme water shortage and deciduous trees lost their leaves prematurely. Due to climate change it is likely that extreme weather conditions become more frequent in future and that they will further aggravate forest condition.

Forest distribution in Germany is quite diverse across Länder. While the North German plains are characterized by agriculture and the percentage of land covered by forests is low, the mid-elevation mountain ranges, especially in the south and in the eastern part of the country, are particularly rich in forests (BMEL 2017). More than half of the German forests are made up of coniferous forests as

especially spruce and pine were planted for commercial reasons. Deciduous forests (31%) and mixed forests (13%), which would form most of the potentially natural vegetation of Germany, are proportionately underrepresented (Figure 20). Between 2002 and 2012, the forest area increased slightly by 0.4% (50,000 ha, BMEL 2015a).



Figure 20. Distribution of forest types in Germany (BfN 2016).

The principle of **sustainability in forest management** was already introduced 300 years ago in Germany, i.e. to secure the diverse services rendered by forests for the benefit of the current and future generations on a permanent basis and in the best possible way (BMEL 2017). The aim was to implement close-to-nature forest management on a long term basis across Germany (BMEL 2011a).

The ecological value of the forests in Germany has improved significantly in recent decades. The latest monitoring of the NATURA 2000 network (2007-2012) showed that 79% of German forest habitat types have a favorable conservation status. 12% were rated unfavorable-insufficient and 9% unfavorable-poor. The Red List of endangered biotope types of Germany shows that development to naturalness has stabilized in many forest biotopes. However, Germany's Red Lists still report species

of animals, fungi and plants growing in forests, which are considered as endangered and threatened with extinction. These include many species that are dependent on old forest stands, undisturbed forest development and old and deadwood components (BMEL 2017).

Overall, the proportion of **certified forests** is **at least 66.6%** of the total forest area. However, an exact estimate of the total area of certified forests is not possible due to overlap of certified sites (ownership of several certifications types) and to ongoing certification processes.

The main certifications for sustainable forestry are:

- Programme for the Endorsement of Forest Certification Schemes (PEFC): 66.6% of total forest area (7,353,000 ha);
- Forest Stewardship Council (FSC): 8.7% of total forest area (965,000 ha);
- Naturland: 0.5 % of total forest area (53,000 ha).

The **National Biodiversity Strategy** formulates the goal of achieving certification for **80%** of the total forest area according to high-quality ecological standards (BMU 2007).

The goal of the **Forest Strategy 2020** is to develop a balance, adapted to future requirements, between the growing demands made on forests and their sustainable performance. The basis for this is an equal consideration of the three dimensions to sustainability (ecological, economic and social) (BMEL 2011b).

Cultivated landscapes fall under any **IUCN-Category except IUCN-Category I b Wilderness area** or have **no IUCN-Category** (see Annex 1).

4.3 Hunting

Forests are important habitats for many wild animals. Some of these are subject to hunting law and are hunted (BMEL 2017). According to the **Forest Strategy 2020**, hunting specifically serves the purposes of sustainable forestry, as strict, efficient hunting ensures the preservation of the forest ecosystem and promotes natural forest regeneration (BMEL 2011b). This is due to the fact that larger predators like wolf or bear have been extinct for long time in the past and the regulation of ungulates (e.g. deer and wild boar) depended therefore only on hunting. However, Germany's wolf population is on the rise again. Since the 1990s wolves have spread from Poland to Germany. The first packs have established themselves in Saxony. Meanwhile, there are wolves in seven Länder (EU-RO-NATUR Stiftung-Website).

4.4 Fishing

The fishing sector in Germany comprises large and small scale deep-sea fishing, cutter and coastal fishing, inland waterway fishing, fish industry, fish import industry, fish wholesale, fish retail and fish gastronomy (BMEL 2010). With its fishing fleet, the German fisheries sector catches an average of roughly 210,000 tonnes of fish and seafood every year (BMEL 2014).

Fishing and environmental protection are interdependent. The fishing industry is dependent on an intact natural environment and fish availability, but it also impacts on the maritime environment itself. The sector can only have a stable future if fishing is conducted in a sustainable manner, i.e. in harmony with nature and with future generations in mind (BMEL-Website²). Wherefore, the basic principle of the reformed **European Common Fisheries Policy (CFP)** in 2013 is to ensure that all fishing activities are environmentally sustainable. Fishery management must aim to restore fish stocks to maximum sustainable yield. This maximum sustainable return should be gradually achieved for all stocks by 2015 or 2020 at the latest. The gradual introduction of a general discard ban by 2019 will also serve the objective of sustainable fisheries (BMEL 2014).

One of the Federal Government's key priorities is also to promote sustainable fisheries in Germany's rivers and lakes. It aims, in co-operation with the federal states (Länder), which are responsible for inland fishery, to improve the protection of migrating species of fish at European level, through research projects and restocking measures. The Federal Ministry of Agriculture supports the expansion of fish passes, co-operation between the Länder themselves, and cooperation between the Länder on the one hand and other riparian states and power plant operators on the other (BMEL 2014).

5 Urban landscapes: Human settlements and transportation / Mining and Energy

5.1 Human settlements and transportation

13.8% of the land surface in Germany is occupied by human settlements and transportation (see Figure 17). This includes buildings and related land, transport infrastructure, industrial land (excluding mining land), recreational areas and cemeteries. In the period from 1992 to 2014, the number of settlements and traffic areas in Germany has increased by more than 834,000 ha to about 4,848,234 ha (from 11.2% to almost 14% of state area). The increasing use of land for settlement and transport leads to a shortage and isolation of habitats for animals and plants and has huge impact on biodiversity (BfN 2016).

In the period 2013-2016 the area converted to new settlement and traffic areas amounted to approximately 62 ha per day (BMEL 2018a). This is above the Federal Government's objective of not claiming more **than 30 ha per day by 2030**, which is unlikely to be achieved.

In 2010, Germany had a total of 471 undissected low-traffic areas larger than 100 km². This is equivalent to 23.2% of German territory. Such areas are mostly concentrated in regions of low population density such as in the northeast of Germany and in the heavily forested central uplands and in the Alpine foothills. In Mecklenburg-Vorpommern, Brandenburg and Sachsen-Anhalt, the proportion of the land surface consisting of areas undivided by major transport routes (between 35% and 55% of their territory), is significantly larger than in other large federal states (with between 0.6% and 24%). These areas should be retained wherever possible, as they are important spaces where animals can retreat and are free to move around undisturbed or as places where people can enjoy nature (BfN-Website²⁰).

In addition, innovative concepts should be developed that allow for efficient and environmentally sound land use for homes, businesses, industrial and commercial areas, public buildings, sport and recreational areas, roads, shipping and aviation. Greater inner urban development and the clearing and use of derelict sites are key elements in reducing land-take (UBA-Website¹).

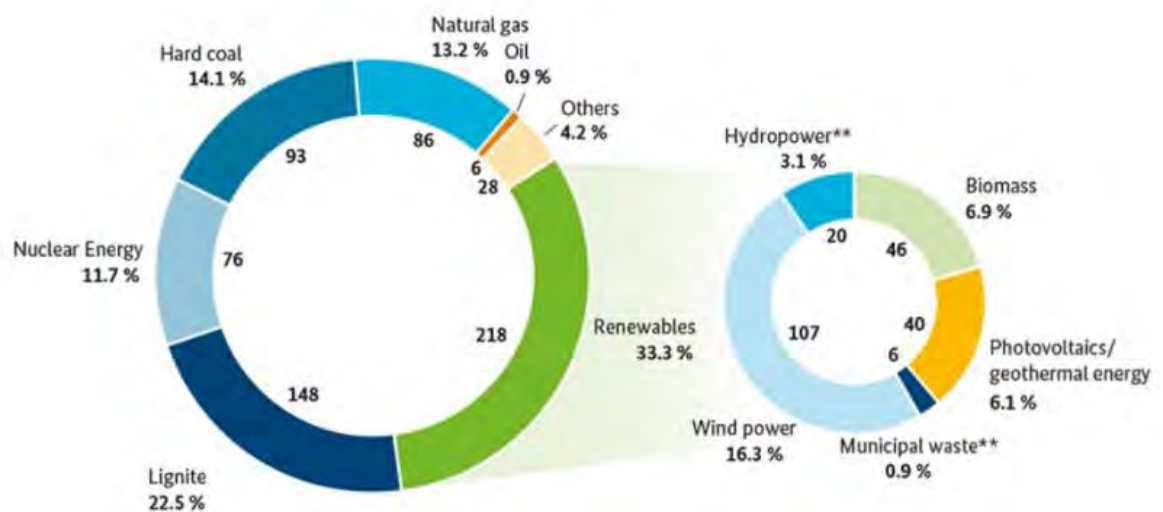
Urban landscapes follow under different IUCN-Categories or have no IUCN-Category (Dublely 2008, WWF 2008).

5.2 Mining and Energy

Land use by mining together with other land uses amounts to 3.2% of German territory (Figure 17). At first glance, mining landscapes are seen as areas in which mining has destroyed vegetation and living soil layers. Actually, they harbor valuable and significant nature conservation potential, because the environmental conditions found in mining landscapes rarely occur in cultural landscapes untouched by mining. This is why, in many cases, nature conservation activities are aimed at saving the habitats that have evolved in these areas over time (BfN-Website²¹).

The energy production in Germany is primarily based on the usage of fossil fuels such as lignite (22.5%), hard coal (14.1%), nuclear power (11.7%), natural gas (13.2%) and oil (0.9%) (Figure 21). The energy supply of the future should be transformed into a stronger usage of renewable energies (wind and solar energy, water power and bioenergy). Currently, the share of renewable energies in Germany amounts to 33.3%. The expansion of renewable energy continues to be one of the key pillars of the energy transition. The share of renewable energy has to be increased from its present level up to 40-45% in 2025 and up to 65% in 2030 according to the coalition agreement. The **2017 Renewable Energy Sources Act** is the key instrument to achieve these targets and to bring renewable energies closer to the market (BMWI-Website¹). The change should take place in the realm of electricity, but also in transportation and heating, and is based on the implementation of international and national climate protection goals, long term security of the energy supply regarding limited fossil resources, declared ending of nuclear power usage by the German government and the reduction of dependence on imported fossil fuels (BfN-Website²²).

Energy generation in Germany differed significantly from energy consumption in 2015 (Figure 22). Therefore, Germany relies heavily on imports of primary energy sources to meet its energy needs. Since Germany only has relatively small reserves of energy raw materials, specific parts of the energy supply must be covered by the import of energy sources (BMWI-Website²).

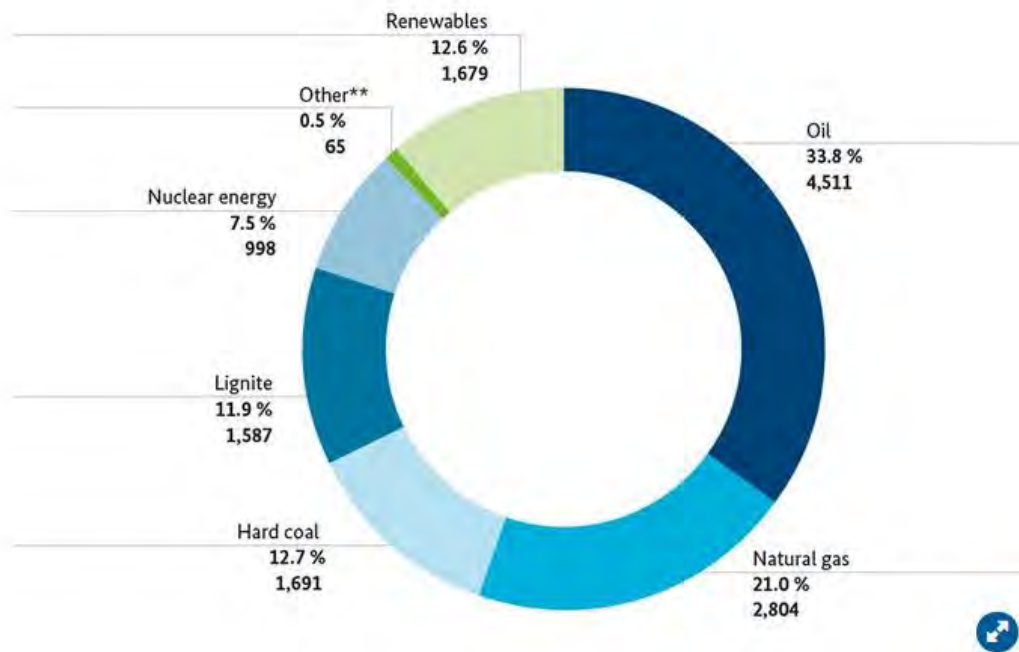


The share of geothermal energy is very low and therefore included in the share of PV
 *preliminary figures, **regenerative part

Gross electricity generation in Germany in 2017 in TWh; preliminary figures incl. some estimates;
 **regenerative part; last updated: February 2018

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Figure 21. Overview of Germany's gross electricity generation (2017). Source: <https://www.bmwi.de/Redaktion/EN/Dossier/renewable-energy.html>.



Source: AGEB, December 2015

Figure 22. Primary energy consumption in Germany (2015). Source: <https://www.bmwi.de/Redaktion/EN/Infografiken/energy-primary-consumption.html>

6 The Three Global Conditions-Approach in Germany

6.1 Assignment of German landscape types to the Three Global Conditions

An assignment to the Three Global Conditions of landscape types in Germany, as defined in different publications and according to their features or to their conservation importance, has been attempted in Table 2.

The first column reports the classification in the three main **“landscape types”** “of the German NBS (BMU 2007): Areas of wilderness, Cultivated landscapes and Urban landscapes. Urban landscapes are fully assigned to Condition 1, while Cultivated landscapes are split in intensive (under Condition 1) and sustainable forms of cultivation (under Condition 2). All protected areas, except wilderness areas, fall under Condition 2 as well. Overlapping among the German categories of protected areas is possible, i.e. forests are parts of protected areas or sustainable agriculture is practiced in nature parks. Wild areas were fully assigned to Condition 3.

In the second column the percentages of total area for these main land use types are reported. Data were gathered from different literature sources as reported in Chapters 3-5. After the consulted literature, about **62%** of the national territory should be assigned to Condition 1, ca. **36%** to Condition 2 and **0.6%** to Condition 3.

In the third column the classification in **“landscape types”** of Gharadjedaghi et al. 2004, later modified by BfN (2016), is reported. Also for this classification, an assignment of each category to the Three Conditions was attempted. “Conurbations”, “Mining landscape”, “Open cultural landscapes” and “Structurally rich cultural landscapes” (if not protected areas) of this classification are assigned to Condition 1. “Costal landscapes” (mostly protected), “Forest landscapes and landscapes rich in forests” (mostly sustainable managed or in many cases under protection), together with protected “Structurally rich cultural landscapes” are assigned to Condition 2. As the category “Wilderness” was not available in this classification, data (description, location, size) were assessed from the website “Wildnis in Deutschland¹” (see Annex 2). The data were gathered by different projects on wilderness area carried out by German nature conservation organizations and supported by BfN with funds from BMU. Coordinates were however not available and therefore estimated by Google Earth. These areas cover presently ca.**0.6%** of the national territory.

Gharadjedaghi et al. (2004) also define **“landscapes according to their conservation importance”** as shown in the fourth column of the table. For this classification also values of percentage coverage of each category on the total area of Germany are available from the above mentioned publication and these are reported in column 5. “Conurbations” and “Landscapes of low conservation importance” are attributed to Condition 1 and sum up together to **45.5%** of the total area. “Landscapes of special conservation importance (without wilderness)”, “Landscapes of conservation importance” and “Landscapes of special conservation importance, with deficits” amount to **54.1%** of the total area. “Landscapes of special conservation importance (only wilderness)” is part of Condition 3. As the category “Wilderness” was not available in the classification of Gharadjedaghi et al. (2004), the data of

BfN (2016) from the map "*Suchkulisse Wildnisgebiete 2016*" were used to represent areas which could potentially become wild areas according to the **2%** target.

Table 2. Assignment of German landscape categories to the Three Global conditions (continued on next page).

German Classification of Landscape types according to NBS (BMU 2007), modified (not used for mapping Three-Conditions)	% of total area	German Classification of Landscape types according to BfN 2016, modified after Gharadjedaghi et al. 2004 Basis for the new Map 1	Classification of Landscapes according to conservation importance (BfN 2016, modified after Gharadjedaghi et al. 2004) Basis for the new Map 2	% of total area	Three Global Conditions
Urban landscapes (13.8%), incl. Mining and Energy + other uses (3.2%)	17%	„6. Verdichtungsraum”(Conurbations)	Conurbations	3.6%	Condition 1 - Farms and Cities
		„5. Bergbaulandschaft”(Mining landscape)			
		„4. Offene Kulturlandschaften” (Open cultural landscapes)			
Cultivated landscapes (intensive agriculture)	45.2%	„3. Strukturreiche Kulturlandschaften” (Structurally rich cultural landscapes) (if not Protected areas)	Landscapes of low conservation importance	41.7%	
Tot.	62.2%			45.3%	
All protected areas, except wilderness areas fall under this condition		„1. Küstenlandschaften” (Coastal landscapes)	Landscapes of special conservation importance (without wilderness)	11.7%	Condition 2 - Shared landscapes

Cultivated landscapes (forests: most are declared as sustainable)	29.7%	„2. Waldlandschaften und walddreiche Landschaften“ (Forest landscapes and landscapes rich in forest)	Landscapes of conservation importance	10.8%	
Cultivated landscapes (sustainable agriculture, i.e. organic farming and extensive grasslands)	11.7% of 51.1% = 5.9%	„3. Struktureiche Kulturlandschaften“ (Structurally rich cultural landscapes) (if Protected areas)	Landscapes of special conservation importance, with deficits	31.6%	
Tot.	35.6%			54.1%	
Areas of wilderness: Core areas of National Parks, Nature Conservation Areas and few other areas	0.6	Note: As the category „Wilderness“ was not available in this classification, data were assessed from the Website „Wildnis in Deutschland ¹ “ (see Annex 2).	Landscapes of special conservation importance (only wilderness) As the category “Wilderness” was not available in this classification, data were assessed from the map „Suchkulisse Wildnisgebiete 2016“ available from BfN	2%	Condition 3 - Large wild areas
Tot.	0.6%			2%	

6.2 New maps of Three Conditions for Germany

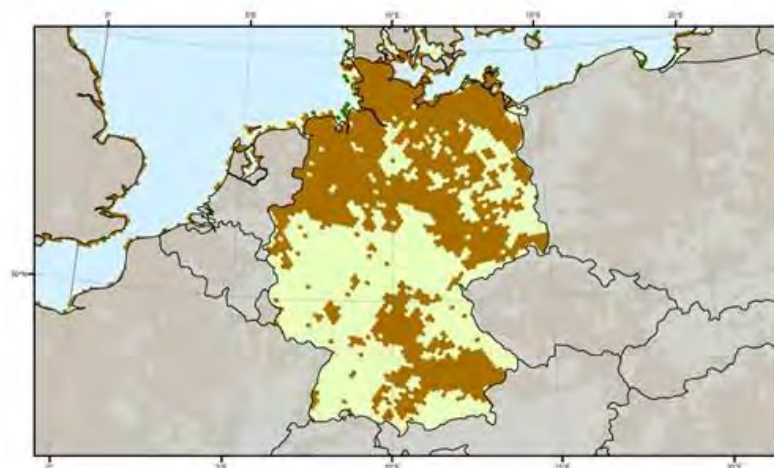
On the basis of data and maps available from BfN (Figures 6-10 and 15-16) as illustrated in the former chapters, new Three Conditions maps for Germany were developed using different data than the one applied for the map in Figure 1 (Ellis 2019, unpublished). In particular, the following maps were elaborated:

- A map based on **landscape types** (Figure 23, Annex 3, Map 1), elaborated with the map of Figure 15 and data reported in Table 2, according to BfN (2016). The categories “Conurbations”, “Mining landscape”, “Open cultural landscapes” and „Structurally rich cultural landscapes, excluding protected areas” were assigned to Condition 1. “Coastal landscapes”, “Forest landscapes and landscapes rich in forest” and „Protected areas”, falling under “Structurally rich cultivated landscapes”, were assigned to Condition 2. Wilderness areas belong to Condition 3 (see 6.1 for details).
- A map based on **the conservation importance of landscapes** (Figure 23, Annex 3, Map 2), elaborated using the map of Figure 16 and data reported in Table 2, according to BfN (2016). The categories “Conurbations” and „Landscapes of low conservation importance” were assigned to Condition 1. “Landscapes of special conservation importance, with deficits” and “Landscapes of special conservation importance (without wilderness)” were assigned to Condition 2. “Landscapes of special conservation importance with only wilderness” belong to Condition 3 (see 6.1 for details).

Map 1 (Figure 23, Annex 3) reflects the present condition of landscape types and land use in Germany. It shows which areas fall under Condition 1 (Cities and Farms), the most intensively used, and which areas are under Condition 2 (Shared Lands), which are more sustainably managed. This condition comprises also all categories of protected areas, i.e. with high and low conservation status. In addition, Condition 2 includes all forest areas in accordance to the Three Conditions-Approach, regardless of whether they are used sustainably or unsustainably. As shown in Map 1, Condition 2 is often surrounded by Condition 1, which has negative impact on biodiversity as already reported by Hallmann et al. (2017) with regard to insect mortality in nature conservation areas of Germany.

Map 2 (Figure 23, Annex 3) shows that actually more landscapes could belong to Condition 2, if their conservation value would be taken into consideration. In this case, more than 50% of the national territory would fall under Condition 2 (see also values in Table 2). This map could be regarded as a vision for the future for Germany, to be achieved through more ambitious goals, the designation of more protected areas and the promotion of sustainable land use. Loss of biodiversity has not yet been stopped in Germany. Thus, sustainable management of natural resources as well as restoration, conservation and protection of nature have to be further promoted in order to comply with the National Biodiversity Strategy and also international agreements.

These strategies can help to shift the geographical focus of existing conservation actions and measures in the future, if the Three Conditions-Approach is applied (see also the following chapter).

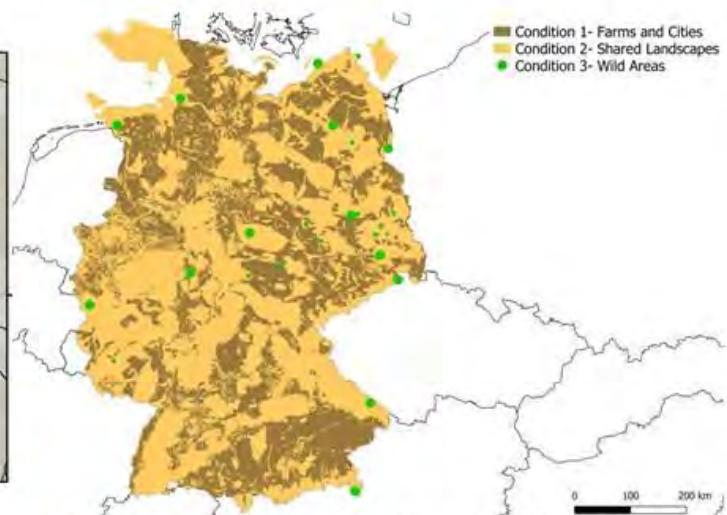


Three Conditions of the World (version 2; March 7, 2019)

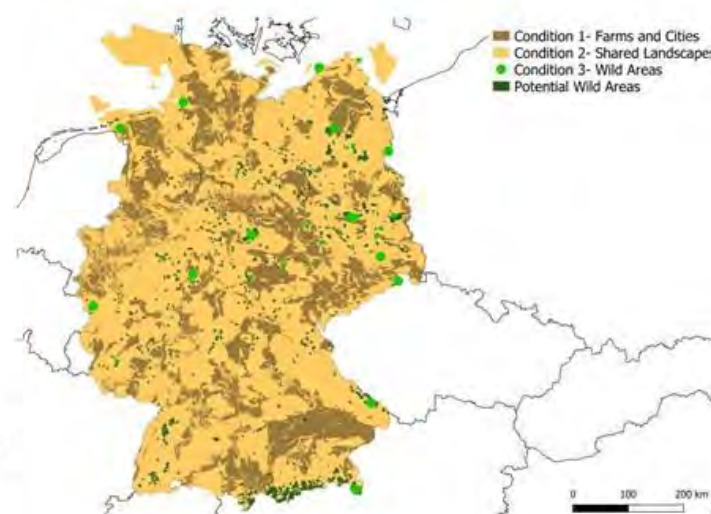
Cities and Farms
Shared Lands
Wildlands

ETRS 1989 LAEA Projection

Ellis 2019, Locke et al. 2019 (s. Fig. 1)



New map based on „Landscape types“ (Map 1)



New map based on the „Conservation importance of landscapes „ (Map 2)

Figure 23. Comparison of Three Conditions-Map by Ellis 2019 and the new maps elaborated within this study.

6.3 Biodiversity conservation action areas, measures and objectives in Germany compared with those of the Three Global Conditions

In Table 3 and in the following text the action areas, measures and prioritised objectives for biodiversity conservation in Germany until 2020 as reported by BMUB (2015) in its Nature Conservation Action Programme 2020 are compared with the objectives of the Three Global Conditions (MacKinnon et al. 2018).

I. FIELDS AND MEADOWS – CULTIVATED LANDSCAPES FOR MAN AND NATURE

This Action area is assigned to Condition 1 and 2.

Urgent changes in agricultural policy and agricultural subsidies are necessary to halt the loss of biodiversity on farmland in Germany, which covers about half of the territory. The environmental goals of "Greening" and "Cross Compliance" from the first pillar of the EU CAP can hardly be achieved by the end of the present funding phase. The BMUB aimed in 2015 to ensure that economic privileges for farmers are suspended in the next EU financial period from 2021 and that the funds released are channeled in specific nature conservation services. Furthermore, more funds from the first pillar of the CAP could be re-allocated to support rural development in Germany starting from 2018. At EU level, there is a need to increase ecological priority areas from 5% to 7% of the total agricultural area as an eligibility criterion to obtain agriculture subsidies under the first pillar.

Moreover, BMUB intended to pay greater attention to structurally weak rural areas, which are subject to demographic change. Nature and landscape should become a funding priority within the framework of the revised Joint Task of "Rural development". With regard to grasslands, the BMUB aims to enforce high standards of protection nationwide, with particular consideration for bird sanctuaries and fens. It called in 2015 for the rapid adoption of the Federal-Länder target agreement on the protection and rewetting of peatlands according to the Federal Government's "Climate Action Programme 2020".

In addition, a long-term pilot project to revitalise Germany's intensively used and degraded moorland as part of the Federal biodiversity programme has been initiated.

Furthermore, the BMUB developed a comprehensive Nitrogen Strategy for all sectors. At national level, it was calling in 2015 for a tightening of the nitrogen fertiliser regulations up as part of the ongoing revision of the Fertilisers Ordinance and for a rapid change in the licensing practice for pesticides.

Biological diversity should be also protected or restored by reducing other impacts such as genetically modified organisms (GMOs), critical levels of acidification and heavy metals or by the generation and use of renewable energies. Concerning genetic engineering, the BMUB was of the opinion that the Federal Government should prohibit the cultivation of genetically modified seeds even if licensed at EU level. The Federal Government's Biomass Action Plan set a use limit of 2.5 million ha for the cultivation of plants for material and energy use on arable land by 2020.

Similarity with objectives of Condition 1-2:

In this Action Area referring to agriculturally fertile areas (Condition 1) and open landscapes with lower human densities and grazing (Condition 2) there are many similar targets with the objectives of the Three Conditions-Approach. Both have a focus on nature conservation and intend to conserve endangered habitats and native species and support ecological processes. As in Condition 1-2, active ecological restoration is an important point in Germany. Both strategies aim to increase biodiversity in agricultural ecosystems, to achieve the extensification of intensely used landscapes and the recreation of endangered semi-natural habitats. In Germany different sub-strategies are available for intensive agricultural and urban areas. The reducing of nitrogen inputs and the maintenance of pollinators through the reduction of the use of chemical pesticides are important tasks of both plans.

II. COASTS AND MARINE WATERS – MORE THAN AN ECONOMIC ZONE

This Action area is assigned to Condition 2.

The EU's revised Common Fisheries Policy (CFP) has created opportunities for more eco-friendly fisheries. The BMUB (2015) supported these measures, e.g. through regeneration of fish populations by catch quotas for all fish species, minimizing of by-catch, restriction of destructive fishing practices and ecological multi-year fishery management plans. At European level, the BMUB intended to demand a widespread ban on destructive fishing practices in Natura 2000 areas in Germany's Exclusive Economic Zone (EEZ), and the careful monitoring of compliance. Nevertheless, large-scale protected areas in the North and Baltic Seas currently lack sufficient No-Take Zones (NTZs), where fauna and flora can develop and regenerate. This situation must change. Wherefore, BMUB urged the Conference of Environmental Ministers to call for a corresponding resolution by the Federal Government and Länder.

Similarity with objectives of Condition 2:

Large existing or potential protected and conserved marine areas are classified as Condition 2.

Action Area II as well as Condition 2 refers to open landscapes with fishing and some resource extraction and with large existing or potential protected and conserved areas. Both approaches aim to further develop ecologically representative and well-connected systems of protected areas, integrated into the wider seascape, in order to conserve all existing native species. Furthermore, these areas are intended to be ecologically restored and effectively managed. BMUB (2015) specified that this can be achieved especially through international conservation activities and networks. The Three Condition-Approach calls for an ambitious percentage target appropriate in this condition, however, it is not clear, which percentage would be appropriate for Germany.

III. FLOODPLAINS – MORE SPACE TO SUPPORT LIFE BETWEEN WATER AND LAND

This Action area is assigned to Conditions 1-2.

In 2015 only 10% of the floodplains were ecologically intact. The reform of the Federal Waterways and Shipping Administration created a subsidiary network of almost 2,800 km of waterways that were no longer needed for goods transportation. These could be used for the renaturation of rivers and floodplains, flood protection, nature conservation and recreation. The "National Blue Ribbon Programme" of the Federal Ministry of Transport and Digital Infrastructure (BMVI) and BMUB intended to promote river development in Germany. Furthermore, the German Government's special framework programme on "Preventive Flood Protection" set aside more than 300 million Euros for preventive flood protection. Possible measures were, for instance, dyke relocation, ecological flooding of polders and creation of natural polders by reconnection of oxbow lakes.

Similarity with objectives of Condition 1-2:

The focus of Action area III and the Condition 1-2 is on restoring connectivity and ecological processes through the restoring and renaturation of rivers and floodplains as well as protection of their habitats and species. The support of ecosystem services such as recreational uses and flood protection is also an important target.

IV. FORESTS – WOODLAND MANAGEMENT IN HARMONY WITH NATURE

This Action area is assigned to Condition 2 in accordance to the Three Conditions-Approach regardless of whether forests are sustainably managed or not.

According to BMUB (2015), the programs to support forests in line with nature conservation principles were in 2015 not sufficiently long-term or reliable to be attractive. Financial support should have gone above and beyond the legal minimum. Especially in publicly-owned forests, the importance for humans and for biological diversity should be recognized and reflected to an exemplary degree.

In contrast to farmers, forest owners have limited opportunities for financial remuneration for nature conservation. Suitable programmes and funding should therefore be developed and contract-based nature conservation promoted in at least 10% of private forests. The natural development has to be increased also in publicly-owned forest land, where at least 10% of woodland should become unmanaged and allowed to develop naturally. Half of the wood harvested in German forests is used for energy, primarily for heating purposes. This renewable energy resource should be used as efficiently and eco-friendly as possible.

Similarity with the objectives of Condition 2:

In line with Condition 2, Action Area IV intends the improvement of biotic communities and the effective management of forests, by means of sustainable practices and natural development of a larger amount of forests.

As one tool to achieve these objectives, BMUB (2015) indicated for instance the financial remuneration for specific conservation services in forest environments, especially in those privately-owned. It is not clear whether the goal of 10% respectively for public and private woodlands allowed to develop naturally is ambitious enough for the Three Conditions-Approach.

V. WILDERNESS-FREEDOM FOR NATURAL ADVENTURES

This Action area is assigned to Condition 3.

Germany has no large wilderness areas, but aims to reach at least 2% of wilderness in the national territory by 2020. Furthermore, Germany supports wilderness worldwide by international cooperation and the mobilization of financial resources (see Chapter 2.2).

The national target of 2% can only be met through the co-work of the Federal Government and the Länder. The BMUB intended to launch in 2015 an initiative at the Conference of Environmental Ministers for more wilderness in Germany and to encourage the Länder to incorporate wilderness areas into their future regional plans. Surveys indicated that people in Germany love the idea of wild nature, but there is still a need for more information about this topic (BMUB 2015). Different R+D projects and initiatives have been carried out in Germany in the last years to support this target (BfN-Website²³).

Similarity with the objectives of Condition 3:

Action Area V as well as Condition 3 aim to maintain ecological intactness and very low human footprint on wilderness areas to ensure high level of ecosystem integrity. The entire natural systems are protected and conserved as they are.

VI. PROTECTED AREAS, NATURA 2000 AND INTERLINKED BIOTOPES – HABITATS AND LIFE-LINES FOR FAUNA AND FLORA

This Action area is assigned to Condition 2.

There are still gaps in the national network of protected areas and an unevenly distribution of financial resources. The initiative for a “National Action Plan for Protected Areas” launched by BMUB aimed to improve this situation. Rapidly visible improvement in the conservations status of many species and habitats is urgently needed, as more than two-thirds of the species and habitat-types of the Natura 2000 network are in unfavourable conservation status. A network of interlinked biotopes has to be created. This should cover at least 10% of the area of each Federal state in Germany. The establishment of a functioning management system for all large nature reserves and Natura 2000 areas is planned by 2020. Sustainable practices are planned for different sectors and land demand should be reduced. The aimed “Green Infrastructure Concept” has been drawn up in 2017 and supports the national system of interlinked biotopes (BfN 2017c). Further measures for land protection were planned by BMUB in a “Land Protection Action Plan” by 2017. Regional planning instruments for suitable eco-friendly sites for renewable and conventional energies should be more widespread.

Similarity with the objectives of Condition 2:

Action Area VI and Condition 2 have many similarities. Both intend to develop ecologically representative and well-connected systems of protected and conserved areas in an ecologically connected way (“Cross-Länder network of interlinked biotopes”) and to improve the conservation status of species and habitats”.

It is, however, not clear if “Other Effective area-based Conservation Measures” (OECMs) are already applied in Germany and if the goal of 10% Natura 2000 sites is ambitious enough.

VII. GREENING OUR CITIES – ENGAGING WITH NATURE AT HOME

This Action area is assigned to Condition 1.

Greening measures have to be incorporated more extensively into urban development programs as a cross-sectoral task, so that more funding can be made available for nature conservation (BMUB 2015). The Ministry collaborates closely with municipalities in the biodiversity alliance called “*Kommunen für biologische Vielfalt e.V.*” in order to develop green infrastructure, improve management and limit the use of pesticides in public green spaces. The BMUB planned in 2015 to provide more reliable funds for the UN Decade of Biodiversity by 2020 and starting from 2016 by supporting the new UN Programme “Education for Sustainable Development” (ESD). Urban areas in Germany are home to large numbers of people with different cultural backgrounds and religions. Involving them in biodiversity projects is important for nature conservation. Therefore, a dialogue process was initiated by the BMUB and BfN in 2014 with nine religious communities and has been continued and extended during the last years. Germany is also contributing to the interreligious international dialogue on sustainable development and peace, led by the Federal Ministry for Economic Cooperation and Development.

Similarity with the objectives of Condition 1:

Action Area VII and Condition 1 refer to the highly populated and developed areas. A different strategy for urban areas in comparison to agricultural areas is available for Germany as indicated for Condition 1. Both strategies aim to preserve urban and agricultural habitats and protect endangered species in both areas.

This should be achieved through desisting from the use of pesticides in public green spaces, an appropriate spatial planning, the greening of human habitations and improvement of the dialogue and cooperation with municipalities and inhabitants (mainstreaming). The access to nature for urban dwellers should be also more effectively provided. The German strategy offers more detailed information in comparison to the Three Conditions-approach on how to achieve mainstreaming in society, for instance through ESD, an inter-religious international dialogue or by mobilizing more reliable funds.

VIII. INTERNATIONAL RESPONSIBILITY – NATURE KNOWS NO BORDERS

This Action area can be assigned to all Conditions. Nevertheless, the measures of this action do not focus on nature conservation in Germany and are therefore not included in Table 3. Germany is however also responsible for the loss of biodiversity worldwide (see Chapter 2.4 on tele-coupling). For this reason, the BMUB and the German Government are involved in a range of bilateral, European and international processes for biodiversity (see Chapter 2.2). The following measures were planned in the Nature Conservation Action Programme 2020 (BMUB 2015):

- **More funding for biological diversity worldwide:** The protection and sustainable use of biodiversity should be more extensively integrated into all relevant cooperation areas and sectors. Funding for international biodiversity activities had to be significantly increased (50% by 2015).

- **Consumer behaviour and biological diversity initiative:** Education of the general public on the impact of own consumption and lifestyle on biodiversity worldwide had to be supported; biological diversity should be more strongly anchored in certification systems (eco-labels).
- **Make the international trade in wild species sustainable:** BMUB planned in 2015 to campaign to halt the trade in animals and to continue its participation in the global fight against poaching.
- **Economic dialogue on biodiversity:** further anchoring of biodiversity aspects in corporate management was aimed, through the already established platform “Companies for Biological Diversity 2020”, considering also the effects of commercial trade on biodiversity across the entire supply chain (also internationally).
- **Strengthen global forest protection and reforestation:** The German Government is committed to halting to the loss of woodland worldwide and is active in the protection, conservation and restoration of forests with bilateral and international activities.

IX. KNOWLEDGE AND UNDERSTANDING – PRESERVING AND SHARING OUR KNOWLEDGE OF NATURE

This Action area is important for all Conditions.

According to BMUB (2015), a comprehensive biodiversity monitoring at national level is essential to assess the status and trend of biodiversity as well as of nature conservation efforts. A nationwide monitoring system should be implemented to transcend the activities of individual Länder. Standards for data comparability should be defined. Sampling areas for monitoring have been already defined. In addition, legal and administrative obstacles to the establishment of a central database with publicly accessible information on flora and fauna should be removed. The BMUB intended to petition the Federal Ministry for Education and Research (BMBF) for the creation of a new funding priority “Taxonomy and biodiversity monitoring” to improve university training for taxonomists, as the number of specialists is decreasing. Furthermore, BMUB planned to set up a “Red List Centre” at the Federal Agency for Nature Conservation (BfN), which has been implemented.

Similarity with the objectives of Condition 1-3:

The Three Conditions-Approach does not mention explicitly the specific measures listed under action area IX.

X. FINANCING – NATURE IS A PROFITABLE INVESTMENT

This Action area is important for all Conditions.

Government and municipal expenditure for nature conservation and development of nature and landscape has decreased in recent years in Germany. Nature conservation requirements should not

and cannot be funded only from tax revenues. Farmers and forest owners, as well as other individuals, should be remunerated by society when providing nature services and these services should not be provided for granted (BMUB 2015).

Most of nature conservation measures have been funded by the EU so far, but such measures and biodiversity interests played hitherto a minor role in EU funds. The BMUB (2015) declared to be in favour of a new EU funding programme for nature conservation, to be founded by at least one-third of EU funds released by the elimination of agricultural subsidies. This could help achieving a favourable conservation status of species and habitats and establishing trans-European green infrastructure networks. The program should also be extended to water protection and reward other stakeholders (forestry, fishing, nature conservation organisations etc.), not only farmers, for their services to environmental and nature conservation.

The BMUB (2015) wanted to gradually increase funding for the “National Biological Diversity Programme” („Bundesprogramm Biologische Vielfalt“) between 2017 and 2020 to double its level, especially to promote projects in the fields where the NBS indicator report had identified deficits. Also funds for the campaign “*chance.natur*” had to be increased.

Similarity with the objectives of Condition 1-3:

The management effectiveness and financing of existing Protected Areas is an important issue for the IUCN World Commission on Protected Areas. The mobilization of substantially increased financial resources and the development of new financial mechanisms from governments and the private sector are extremely important to support effective management of protected and conserved areas in order to preserve biodiversity (MacKinnon et al. 2018). This is in line with the Action Area X.

Table 3. Objectives of the "Three Global Conditions" in comparison to actions and measures in Germany (continued on next pages).

Three Global Conditions	Action areas (Germany) according to BMUB 2015	Measures (Germany) according to BMUB 2015	Prioritised objectives in Germany according to BMUB 2015
Condition 1 - Farms and Cities Objectives (MacKinnon et al. 2018): <ul style="list-style-type: none"> • Preserve all the remnants of an ecoregion • Protect endangered species and ecosystems • Active ecological restoration • Restoration of connectivity • Area-based conservation mainstreamed with appropriate spatial planning, sustainable production and sustainable consumption, maintaining pollinators, reducing nitrogen inputs and providing access to nature • Different strategies for urban and intensive agricultural areas 	I. FIELDS AND MEADOWS – CULTIVATED LANDSCAPES FOR MAN AND NATURE	<ul style="list-style-type: none"> • Abolish agricultural subsidies after 2020 - Pay farmers for specific nature conservation services • Review the 2017 CAP - Strengthen greening • Joint Task of "Rural Development" with a focus on nature conservation • Grassland initiative to extensify fens • Ban the cultivation of genetically modified agricultural products • Adopt a comprehensive strategy on nitrogen • Give appropriate consideration to biodiversity impacts when approving pesticides • No further arable land to be used for biomass cultivation once Germany has reached the 2.5 million hectare limit 	<p>By 2020,</p> <ul style="list-style-type: none"> • biodiversity in agricultural ecosystems will have been increased significantly; • the critical loads and levels for acidification, heavy metal and nutrient discharges (eutrophication) and far ozone will be complied with, so that even sensitive ecosystems will enjoy sustained protection; • significant portions of intensively farmed lowland moors will have been extensified and only used as grassland. Typical biotic communities are able to develop once more; • the generation and use of renewable energies does not occur at the expense of biological diversity; • continuation of the programme to reduce the use of chemical pesticides with the aim of further reducing the risks that may arise in conjunction with the use of chemical pesticides. <p>By 2015,</p> <ul style="list-style-type: none"> • the proportion of land used for agro-biotopes (high-grade grassland, orchard meadows) with a high nature conservation value will have increased by at least 10% compared with 2005; • Conservation and recreation of endangered semi-natural habitats (grasslands, heaths, hedges, orchard meadows, wine-growing on slopes with dry stone walls etc.) by means of adequate management, partly using government incentives; • In future, there will continue to be no threat to biological diversity, particularly in nature conservation areas, from genetically modified organisms; • Reduction in excess nitrogen in the overall balance sheet to 80 kg/ha by 2010, with the aim of a further reduction by 2015.
	III. FLOODPLAINS – MORE SPACE TO SUPPORT LIFE BETWEEN WATER AND	<ul style="list-style-type: none"> • "National Blue Ribbon Programme" for eco-friendly river development • National flood protection pro- 	<p>By 2020,</p> <ul style="list-style-type: none"> • watercourses and their water meadows will be protected in their function as habitats to such an extent that a diversity typical of the natural area in Germany is guaranteed;

	LAND	gramme: Giving back space to our rivers	<ul style="list-style-type: none"> the majority of watercourses once again have more natural flood plains.
	VII. GREENING OUR CITIES – ENGAGING WITH NATURE AT HOME	<ul style="list-style-type: none"> Use urban development funding to make cities greener Help municipalities to conserve local biological diversity More funding for the United Nations Decade on Biodiversity “Cultural and religious diversity and nature conservation” alliance 	<p>By 2020,</p> <ul style="list-style-type: none"> the greening of human habitations, including the green spaces close to residential environments (such as courtyard plantings, small areas of lawn, roof and façade planting), will have been significantly increased. Publicly accessible green spaces with a diverse range of qualities and functions are generally available within walking distance; the significance of biological diversity is firmly anchored in the social consciousness. Human activity is increasingly geared towards this, leading to a significant decline in the pressures on biological diversity; promote the appropriate participation and involvement of migrants in innovations, knowledge and dialogue on the conservation of biological diversity.
	IX. KNOWLEDGE AND UNDERSTANDING – PRESERVING AND SHARING OUR KNOWLEDGE OF NATURE	<ul style="list-style-type: none"> Introduce comprehensive, nationwide biodiversity monitoring Central, publicly accessible information system on flora and fauna Taxonomy training initiative by the Federal Government and Lander Establishment of a “Red List Centre” 	<ul style="list-style-type: none"> improve the database on the status and development of biological diversity in Germany
	X. FINANCING – NATURE IS A PROFITABLE INVESTMENT	<ul style="list-style-type: none"> New EU funding programme for nature conservation Develop and strengthen the National Biological Diversity and “chance.natur” nature conservation programmes 	<ul style="list-style-type: none"> no information

Three Global Conditions	Action areas (Germany)	Measures (Germany)	Prioritised objectives in Germany
Condition 2 - Shared landscapes Objectives (MacKinnon et al. 2018): <ul style="list-style-type: none"> • Develop systems of protected and conserved areas in an ecological connected way, consistent to Aichi Target 11 • Target both areas of ecological representation and of particular importance for biodiversity • Conserve all existing native species and support ecological processes • Ensure that protected areas are effectively managed • Ecological restoration important for connectivity • An ambitious percentage target is appropriate 	I. FIELDS AND MEADOWS – CULTIVATED LANDSCAPES FOR MAN AND NATURE	<ul style="list-style-type: none"> • see above 	<ul style="list-style-type: none"> • see above
	II. COASTS AND MARINE WATERS – MORE THAN AN ECONOMIC ZONE	<ul style="list-style-type: none"> • Adopt eco-friendly fishing policies • Manage Germany's marine protected areas in the North and Baltic Seas in line with best conservation practice, and enforce environmentally friendly fishing methods • No-take zones (NTZ) in marine and coastal protected areas 	By 2010, <ul style="list-style-type: none"> • the decline in species and the degradation of habitats (of the coastlines and oceans) will have been halted; • realisation of a joint OSPAR/HELCOM network of well-managed coastal and marine protected areas, including core zones of natural development, by 2010, and their integration into international networks. By 2020, <ul style="list-style-type: none"> • a significant improvement in the conservation status for all species and habitats (of the coastlines and oceans) will have been achieved.
	III. FLOODPLAINS – MORE SPACE TO SUPPORT LIFE BETWEEN WATER AND LAND	<ul style="list-style-type: none"> • see above 	<ul style="list-style-type: none"> • see above
	IV. FOREST – WOODLAND MANAGEMENT IN HARMONY WITH NATURE	<ul style="list-style-type: none"> • Contract-based nature conservation programmes for forests • Best nature conservation practice in public forests • 10% of public woodland allowed to develop naturally • Practice fuel wood production 	By 2020, <ul style="list-style-type: none"> • the conditions for the typical biotic communities in forests have further improved. The trees and bushes of the natural community are rejuvenated completely, primarily via natural means. Semi-natural management forms use natural processes to strengthen the ecological functions. Old and dead wood is available in adequate quantities and quality; • natural forest development accounts for 5% of woodland;

		on an eco-friendly scale	<ul style="list-style-type: none"> • natural development is found on 10% of publicly-owned forest land; • contract-based nature conservation is promoted in 10% of private forests.
	VI. PROTECTED AREAS, NATURA 2000 AND INTER-LINKED BIOTOPES – HABITATS AND LIFELINES FOR FAUNA AND FLORA	<ul style="list-style-type: none"> • “National Action Plan for Protected Areas” • Improve the conservation status of species and habitats • Cross-Länder network of inter-linked biotopes • “Green Infrastructure Concept” • “Land Protection Action Plan” • Careful, eco-friendly siting of renewable energy installations 	<p>By 2010,</p> <ul style="list-style-type: none"> • the decline and degradation in endangered habitat types has been halted. Biotopes identified in the Red Lists as currently under threat of completely destruction or severely endangered will increase in terms of area and number. Regeneration will have begun; • development of cooperative concepts and strategies for the avoidance and minimisation of conflict between the various space demands in the extraction of renewable energies and renewable raw materials (competing uses) and their implementation by 2015. <p>By 2020,</p> <ul style="list-style-type: none"> • a functioning management system for all large nature reserves and Natura 2000 areas will have been established; • Germany will possess a representative system of interlinked biotopes on 10% of its territory. This network is suitable for permanently protecting the habitats of wild species and is an integral component of a European system of interlinked biotopes; • the additional land use for human settlement and transport will be no more than 30 ha per day; • new transport routes (primarily road, waterways and rail) indicate an adequate level of ecological passability e.g. fish ladders in water-courses and green bridges on transport routes); • the existing transport routes will no longer cause any significant impairments to the system of interlinked biotopes. Ecological passability of dissected areas will have been achieved.
	IX. KNOWLEDGE AND UNDERSTANDING – PRESERVING AND SHARING OUR KNOWLEDGE OF NATURE	see above	see above
	X. FINANCING – NATURE IS A PROFITABLE INVESTMENT	see above	no information

Three Global Conditions	Action areas (Germany)	Measures (Germany)	Prioritised objectives in Germany
Condition 3 - Large wild areas Objectives (MacKinnon et al. 2018): <ul style="list-style-type: none"> • Protect and conserve the entire natural system as it is now (not a percentage) • Linear infrastructures (roads) are minimized • Industrial development is an exception and subject to mitigation • Indigenous people and communities governance systems are of major importance • Maintain ecological intactness and a very low human footprint • Protect in-situ biodiversity as well as global-scale ecological processes (carbon sequestration, regional hydrology etc.) 	V. WILDERNESS-FREEDOM FOR NATURAL ADVENTURES	<ul style="list-style-type: none"> • Initiative for more wilderness in Germany • Public relations work for more wilderness 	By 2020, <ul style="list-style-type: none"> • Mother Nature is once again able to develop according her own laws on at least 2% of the national territory, i.e. in post-mining landscapes, in former military exercise zones, on watercourses, along coastlines, in peatlands and in the high altitude mountains.
	VI. PROTECTED AREAS, NATURA 2000 AND INTER-LINKED BIOTOPES – HABITATS AND LIFELINES FOR FAUNA AND FLORA	see above	see above
	IX. KNOWLEDGE AND UNDERSTANDING – PRESERVING AND SHARING OUR KNOWLEDGE OF NATURE	see above	see above
	X. FINANCING – NATURE IS A PROFITABLE INVESTMENT	see above	no information

7 Conclusions

7.1 Does the Three Conditions-Approach work for Germany? Our view

Germany, like other developed countries, has a huge variety of landscape and land use types, with high level of landscape fragmentation, which fall mainly into Conditions 1 and 2. Also conservation strategies and categories of protected areas are very diverse, each category having a more or less stronger focus on biodiversity conservation and natural heritage (Figure 24). Despite this variety, the Three Conditions-Approach with its simplified structure and only three conditions could be useful to evaluate and further develop national conservation strategies and by giving national activities a stronger link to global area-based biodiversity goals.

The proposed conservation objectives of the Three Conditions-Approach are to a large extent in line with the National Biodiversity Strategy (NBS, BMU 2007) of Germany and the Nature Conservation Action Programme 2020 launched by BMUB in 2015. Some of the planned measures have been already implemented by the German authorities, some however still need to be implemented or improved to contrast the still persisting biodiversity decline nationally and internationally (BMU 2018).

The NBS and the Nature Conservation Action Programme 2020 are in many cases more detailed and adapted to local conditions than the objectives of Three Conditions-Approach, which follow a more global perspective. For instance, concerning knowledge transfer and other communication aspects, Germany proposes “Biodiversity Monitoring”, “Central database”, “Training for Taxonomists” and “Red List Centre” as important tools. To improve the engagement of people with nature and for the preservation of biodiversity in urban environments, specific measures such as Education for Sustainable Development, the interreligious-international dialogue and the availability of more reliable funds are considered as important measures in Germany. The NBS and the related Action Programme also recognize Germany’s impact on biodiversity abroad and highlights the need for sustainable consumption and production, biodiversity friendly supply chains and environmental standards that are applied beyond borders.

The application of the Three Conditions-Approach for Germany combined with the identification of areas to be protected under a higher conservation status can help to develop a vision for the near future, which is useful to improve landscape planning and areas-based conservation strategies. To develop a land use or landscape planning vision requires however that national data on species and on habitats/landscapes of conservation importance are available.

As shown in Chapter 6.1, it is important to visualize the present land use/conservation status of the territory (Map 1, Figure 23 and Annex 3) and at the same time to display an improved status to achieve (Map 2, Figure 23 and Annex 3). Map 2, representing a sort of vision for the future, shows that areas currently part of Condition 1 (Farms and Cities) could shift to areas under condition 2 (Shared landscapes), increasing these areas to **more than 50%** of the territory. An improvement is urgently necessary as the loss of biodiversity in Germany has not been halted yet, despite the many conservation efforts (BMU 2018). In addition to the establishment of protected areas and the implementation of national and international biodiversity strategies, sustainable development should also

be more strongly promoted, in particular on farms and in cities, through communication activities and an Education for Sustainable Development (ESD).

Though maintaining the already existing protected areas and conservation strategies in Germany, the Three Conditions-Approach can help to go beyond, shifting currently intensively used areas (under Condition 1) to more shared landscapes (Condition 2). Map 2 shows, which areas currently part of Condition 1 (see Map 1) could improve their status to fall into Condition 2. This could be particularly important for areas presently under Condition 1 and bordering or surrounding protected areas such as nature conservation areas, included, for instance, in municipalities.

We feel that the Three Conditions-Approach could evolve in a sort of modeling tool or Decision Support System (DSS) for decision makers, offering different scenarios on the potential evolution (in negative or positive) of nature and biodiversity under different management types, at national and especially international level.

To reflect the impacts of a given country on biodiversity in another countries (tele-coupling effects), data for e.g. imported and exported agriculture products, certain supply-chains and material flows as well as development aid (ODA) distribution could be included in such a modeling tool. This could help to visualize on a case base, how changes in economic or political decisions in one country might have positive or negative effects on the biodiversity conditions of another country. In the case of Germany, even changes in nature conservation in Condition 1 and 2 on national level could for example have effects on Condition 2 and 3 in other regions. However, to detect and show these effects on a global scale, comprehensive data sets and proper methodologies would be required.

In conclusion, not only maps of a present condition of biodiversity are useful, but also future visions to be achieved with appropriate targets and nature conservation planning and management. These visions of improved landscape conditions, especially for highly fragmented, intensively used and populated countries such as Germany, could help countries by developing their actions and measures in the future.

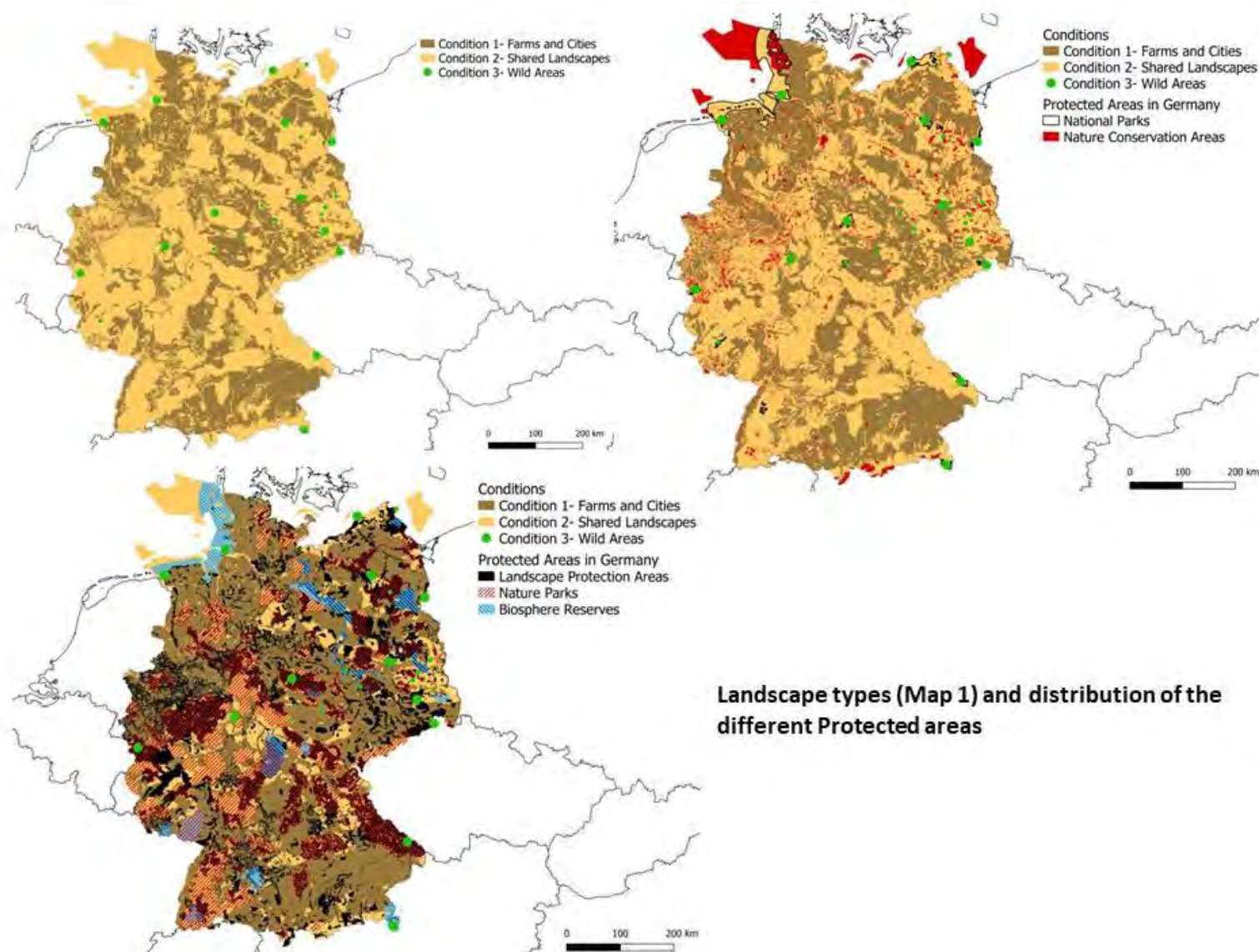


Figure 24. Map 1 of three conditions in Germany based on „landscape types” (current situation) and the same map overlaid with all the different protected area types.

7.2 Results of expert consultation (Workshop at BfN on 10th of July 2019)

To discuss the methodology, the preliminary results of the case study and the feasibility of the Three Conditions-Approach for Germany as well as the approach in general, an expert workshop was held at 10th July 2019 in Bonn, hosted by the German Federal Agency for Nature Conservation (BfN). Experts and practitioners from the BfN and the Federal Office for Agriculture and Food (BLE), non-governmental organizations and scientific institutions took part in the consultations (see Table 4).

The participants were introduced to the Three Conditions-Approach, the process towards the Post-2020 Global Biodiversity Framework of the Convention on Biological Diversity (CBD) and currently discussed area-based conservation targets as well as to the methodology and preliminary results of this case study. After a round of clarifying questions, the potential advantages and problems in the application of Three Conditions-Approach were discussed, both for the global level and the next CBD framework and for the national level in Germany.

Table 4. Workshop participants: Experts from the listed organizations participated at the Three Conditions-workshop at 10th July 2019. The participants took part in their own capacity, statements and comments do not represent official positions of their organizations.

Organization	No.
Federal Agency for Nature Conservation (BfN)	4
Federal Office for Agriculture and Food (BLE)	1
Wyss Campaign for Nature	1
Pro Natura Switzerland (member of Friends of the Earth International) / German NGO Forum for Environment and Development, Working Group on Biodiversity,	1
German Centre for Integrative Biodiversity Research (iDiv), Halle-Jena-Leipzig	1
University of Göttingen	1
Institute for Biodiversity – Network (ibn), Regensburg	5

Comments from expert workshop

Is the Three Conditions-Approach relevant at the global level and for the development of the Post-2020 Global Biodiversity Framework? What are the advantages of the approach? Where do you see disadvantages/problems?

Advantages at the global level:

- The Three Conditions-Map is useful for visualization of a global status quo and easy to understand, especially as a global view of nature condition is currently missing.
- The approach can serve as a communication tool to underline the “sense of emergency” for the state of biodiversity.
- The strength of the Three Conditions-Approach is its simplicity which could motivate and attract more decision-makers. It may provide guidance in prioritizing or restructuring goals and be suitable for mainstreaming. In addition, the approach seems promising to let new ideas arise from intuition. It could be useful for standardizing NBSAPs and the respective national reporting or make it at least better comparable (adding up to a global picture or global targets).

- The approach could help to understand and define the different responsibilities of different countries and this could help to prioritize national actions. This can also help to formulate nationally determined contributions (NDCs) or voluntary commitments to the global biodiversity framework.
- It shows that Germany has obligations/responsibilities in different areas worldwide and should concentrate on drivers like consumption, production, pollution, fragmentation and tele-coupling having negative effects on other countries; Germany should in particular contribute to global conservation of areas under Condition 3.
- The Three Conditions-Approach is especially important to point out tele-coupling, showing the impact of the different countries on other countries, including also a footprint approach. This may help to decrease the impact.
- Furthermore, it may help to address more sustainable land use. Three Conditions is complementary to other concepts like Key Biodiversity Areas. It should not be seen as a stand-alone instrument, but rather as an additional offer among others and as a framework for further discussion and for integration of other concepts.
- It is an important guideline by researchers for Parties, but it should formulate more concrete targets till 2020-2030; the Three Conditions can be an inspiration for negotiators and help to structure the targets of a new biodiversity framework.
- The concept of shared landscapes can help to involve all stakeholders from different sectors (agriculture, urban, transport etc.); their involvement is urgently needed to overcome biodiversity loss (compare lack of progress under Aichi targets 3 and 4).
- Three Conditions could be useful for trans-boundary initiatives.

Problems/Concern:

- The discussion of an additional approach on how to identify and prioritize actions in certain areas could further distract the discussion from current implementation strategies and the need for financial resources for such actions.
- The global Three Conditions-Map looks like a hemeroby³ map showing a present world situation. But, how is the vision for the future? Is the focus of the Three Conditions-Approach more on nature conservation or on sustainability? Should conservation focus on the protection of species, biotopes or landscapes or consider all these elements equally?
- Focusing the debate too much on protected areas and separating important sectors into different categories (i.e. farms and cities from protected areas) might be dangerous and distract from other urgent topics (e.g. drivers of loss, consumption, production, flow of finances, subsidies).
- The Three Conditions should adopt a multi-sectorial approach, to more closely link to other disciplines rather than only focus on nature conservation aspects.

³Hemeroby describes the totality of human interventions in the natural world. The term is derived from the Greek hemeros (tamed, cultivated) and bios (life), and thus can be seen as the impact of human culture on nature. The final state of an ecological succession of potential natural vegetation (PNV) can be taken as a reference for the classification of current land use forms in regard to cultural influence.” Source: Leibniz Institute of Ecological Urban and Regional Development, Monitor of Settlement and Open Space Development (IOER Monitor), <https://www.ioer-monitor.de/en/methodology/glossary/h/hemeroby/>.

- It should also link to other existing global activities, i.e. under climate change mitigation and adaptation. The comparability and linkage with Climate-Targets, SDGs and Aichi-Targets should be ensured.
- If Three Conditions is used for prioritization, it should also develop a concept or instrument to better detect tele-coupling in order to compensate those countries most affected by activities of industrialized countries on their territories, and to maintain not only Condition 3 but also to improve the other two conditions and support sustainability there.
- The Three Conditions-Approach is not immediately self-explanatory and confusing, especially regarding the differences between Condition 1 and 2. It is recommended to add a narrative to the approach.

Is the Three Conditions-Approach relevant at the national level, i.e. for the development and/or the implementation of the Post-2020 Global Biodiversity Framework in Germany? What are the advantages of the approach and where do you see problems?

Advantages for Germany at national level:

- The results of the case study show that Germany has a lot to do in areas under Condition 1 and should concentrate on drivers of biodiversity loss like consumption, production, pollution and fragmentation. The small percentage of wilderness areas in Germany only provides a minor contribution to global nature conservation, however could still have an important role for biodiversity conservation from a local or national perspective.
- The NBSAP could be improved with a stronger focus on sustainability, rather than investing efforts in establishing more areas of wilderness and according to global responsibilities; it should link to the Three Conditions-Approach with more ambitious targets.

Problems/Concern:

- The added value for the national nature conservation activities of Germany was not obvious for some workshop participants. Their feeling was that the approach is not suitable for concrete conservation planning and management in Germany.
- How does the Three Conditions-Approach support the implementation of existing or new targets, for instance of the current German NBSAP and beyond it?
- The Three Conditions global map does not very well reflect national circumstance for several reasons:
 - It takes forests per se into Condition 2, whereas in Germany a part of forests are intensively managed plantations. They would rather belong partly to Condition 1.
 - Areas that can be considered wilderness are already part of protected areas and it is rather impossible to reach more wilderness in Germany.
 - In Germany important species and biotopes are strictly bound to cultural landscapes, not necessarily only to wild areas; the conservation should therefore especially take place under Condition 2. Also in urban areas there is a need for improvement of nature.

- It seems that the Three Conditions-Approach takes farmland per se into Condition 1, whereas in Germany the cultural landscape with traditional ways of farming (e.g. extensively used grassland) is especially rich in biodiversity. Such areas would rather belong to Condition 2. Organic farming should also not fall under Condition 1 due to its more sustainable land use practices.
- Germany has already very good and well established nature conservation instruments and management plans (i.e. Natura 2000) than Three Conditions can provide and also the data base is much more developed. Therefore, Three Conditions may have merits especially on a global level and although it matches many action areas, measures and objectives we have in Germany, it does not add much value to what is already in place in the country.
- Sustainable land use, involving different sectors, should however get more priority also in Germany, as it has been demonstrated that nature conservation alone, with its strategies and laws, is not effective enough to stop biodiversity loss.
- If the Three Conditions-Approach would give a higher priority to certain categories around the globe, e.g. Condition 3, it could be difficult to push for national/regional conservation strategies that focus on Condition 1 or 2. The approach could be used to argue that conservation of Condition 3 areas abroad is more valuable than conservation measures for a certain species or ecosystem at home.

7.3 Open questions and recommendations

7.3.1 Open questions that the Three Conditions-Approach should/could address

- The holistic idea of the approach seems not to be self-explanatory; it needs to be better explained. It should be mentioned explicitly that the approach does not give condition 3 a higher priority over the other 2 conditions. Otherwise, it is not obvious, why the approach is more suitable than e.g. Key Biodiversity Areas or Biodiversity Hotspots.
- Currently, the Three Conditions-Approach is only showing the status quo for land-use in countries on global level. Depending on national data, this map can be more or less precise. The Three Conditions-Approach has the potential to include the pressures of one country/region on other regions. However, to show tele-coupling effects, another layer or dimension and additional data, e.g. flows of goods and materials, on specific sectors or supply chains would be needed and the mapping would be more complex.
- Which conclusions could the Three Conditions-Approach draw if it would include tele-coupling effects and which implications would that have for its recommendations? The Three Conditions-Approach should consider the latest scientific findings on tele-coupling effects, ecosystem service flows and governance options for sustainable production and consumption in producer and receiver countries.
- How are Key Biodiversity Areas and their current protection status reflected in the Three Conditions?

- How are changes in the Three Conditions reflected? Should Condition 3 be expanded and Condition 1 reduced in the long run? If so, how to facilitate this land-use change transition? How and where to use restoration and rehabilitation based on the Three Conditions?
- Are the conservation/land-use recommendations for the single conditions valid for all three conditions? The differences in recommendations between the Three Conditions need further development.
- How does the approach incorporate the challenges of currently available global forest data? Tree and forest cover do not automatically mean that an area has high biodiversity value. How are monocultures and plantations, especially by exotic trees considered in the approach? Why should an area covered by cultivated oil palms or with closely planted conifer forests qualify for Condition 2?
- Which land-use data would be necessary to develop land-use visions using the Three Conditions-Approach? Is the data available in all regions?
- How are trans-boundary conservation strategies such as the Natura 2000 network of the European Union reflected in the Three Conditions?
- How can other sectors like the agricultural industry or transport be better involved in the development of the approach? For instance, linking to SDGs, e.g. where an indicator for sustainable agriculture has been developed, and better communicating the approach to the other relevant sectors?
- Is modelling supported by decision tools a way to improve the approach?

7.3.2 Recommendations for Germany

To reach the vision illustrated in Map 2 (Figure 23) in line with the Three Conditions-Approach (IUCN 2018; MacKinnon et al. 2018, Locke et al. 2019), it will be particularly important **at national level** to fully implement the actions laid out in the National Biodiversity Strategy and the Nature Conservation Action Programme 2020, and especially to:

- improve area-based conservation, ensuring representation of all biomes, ecosystems and habitats, especially through a stronger cooperation with neighboring countries (network of conserved areas),
- improve the effectiveness of the management of protected areas and related financing, conserving especially areas of importance for biodiversity, intact ecosystems and ecosystem processes,
- reduce and mitigate fragmentation and ensure or restore ecological connectivity, especially of protected and conserved areas, in agreement with Aichi Target 11,
- increase the areas of no human interference by means of restoration and rewilding of Condition 2 areas, also in agreement with the recommendations of IPBES (2018), as in many countries and in Germany no or just a few areas that can be classified as wild areas are left,
- engage a broader range of stakeholders and partners in conservation management,
- increase sustainable agriculture and forestry,
- promote more strongly sustainable production and consumption of goods.

As described in chapter 2.4, Germany's footprint and impact on biodiversity goes beyond its borders. Besides trying to shift its national land use from intensively used areas under Condition 1 to more shared areas managed sustainably in Condition 2, Germany also has an obligation **at international level** to support other countries in maintaining as many wild areas as possible under Condition 3 and to enable a proper management of Condition 2 areas, as well as by increasing financial support.

7.4 Final conclusions

The present study as well as the discussion of the findings with German experts leads to the following main conclusions:

- a) The Three Conditions-Approach and its proposed conservation objectives are to a large extent in line with the German National Biodiversity Strategy (of 2007) and the Nature Conservation Action Programme 2020 (of 2015), as well as with the implementing actions Germany is undertaking currently.
- b) The application of the Three Conditions-Approach could add value to country level activities in Germany, e.g. if combined with the identification of areas to be protected under a higher conservation status. The approach could help to develop implementation priorities.
- c) If used by the CBD for the Post-2020 Biodiversity Framework the Three Conditions-Approach would provide a rational basis for Germany's conservation efforts in an European and global context, e.g. for connected protected areas or the conservation of migratory species. It would help to fit Germany's efforts into a global picture.
- d) On a global scale the Three Conditions-Approach could provide a rational basis for measures to decrease Germany's footprint in the world if tele-coupling effects would be taken into account. It could also help to prioritize Germany's efforts in nature conservation abroad, e.g. provided through Official Development Assistance (ODA).

Therefore, if the Three Conditions-Approach would be used for shaping the Post-2020 Biodiversity Framework, it could help to advance Germany's nature conservation efforts domestically to some degree and significantly in the global context.

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External links:

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- BfN – Bundesamt für Naturschutz²: <https://www.bfn.de/en/activities/protecting-habitats-and-landscapes/wilderness-areas.html>
- BfN – Bundesamt für Naturschutz³: <https://www.bfn.de/en/activities/protected-areas.html>
- BfN – Bundesamt für Naturschutz⁴: <https://www.bfn.de/en/activities/protected-areas/national-parks.html>.
- BfN – Bundesamt für Naturschutz⁵: <https://www.bfn.de/en/activities/protected-areas/national-nature-monuments.html>; Schumacher et al. 2014
- BfN – Bundesamt für Naturschutz⁶: <https://www.bfn.de/en/activities/protected-areas/nature-conservation-areas.html>
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- BfN – Bundesamt für Naturschutz¹³: <https://www.bfn.de/en/activities/marine-nature-conservation/pressures-on-the-marine-environment.html>
- BfN – Bundesamt für Naturschutz¹⁴: <https://www.bfn.de/en/activities/marine-nature-conservation/national-marine-protected-areas/overview-and-key-facts.html>
- BfN – Bundesamt für Naturschutz¹⁵: <https://www.bfn.de/en/activities/marine-nature-conservation/national-marine-protected-areas/selection-and-criteria.html>
- BfN – Bundesamt für Naturschutz¹⁶: <https://www.bfn.de/en/activities/protecting-habitats-and-landscapes/landscapes-of-conservation-importance/landscape-types.html>
- BfN – Bundesamt für Naturschutz¹⁷: <https://www.bfn.de/en/service/facts-and-figures/nature-conservation/protected-areas-under-international-law/wetlands-of-international-importance-ramsar-convention.html>
- BfN – Bundesamt für Naturschutz¹⁸: <https://www.bfn.de/en/activities/gewaesser-und-auenschutz/status-report-on-german-floodplains.html>
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- BfN – Bundesamt für Naturschutz²⁰: <https://www.bfn.de/en/service/facts-and-figures/the-utilisation-of-nature/settlement-and-transport/undissected-low-traffic-areas-a-valuable-finite-resource.html>
- BfN – Bundesamt für Naturschutz²¹: <https://www.bfn.de/en/activities/post-mining-landscapes.html>
- BfN – Bundesamt für Naturschutz²²: <https://www.bfn.de/en/activities/renewable-energies.html>
- BfN – Bundesamt für Naturschutz²³: <https://www.bfn.de/themen/biotop-und-landschaftsschutz/wildnisgebiete.html>
- BMEL - Federal Ministry of Food and Agriculture¹: https://www.bmel.de/EN/Agriculture/SustainableLandUse/SustainableLandUse_node.html
- BMEL - Federal Ministry of Food and Agriculture²: https://www.bmel.de/EN/Forests-Fisheries/Marine-Conservation/marine-conservation_node.html
- BMWI – Federal Ministry for Economic Affairs and Energy¹: <https://www.bmwi.de/Redaktion/EN/Dossier/renewable-energy.html>
- BMWI – Federal Ministry for Economic Affairs and Energy²: <https://www.bmwi.de/Redaktion/DE/Artikel/Energie/energiedaten-gesamtausgabe.html>
- BMZ – Federal Ministry of Economic Cooperation and Development: <https://www.bmz.de/en/issues/biodiversitaet/arbeitsfelder/index.html>
- BNatSchG – Federal Nature Conservation Act: <https://www.bfn.de/fileadmin/MDB/documents/themen/monitoring/BNatSchG.PDF>
- BÖLW – Bund Ökologische Lebensmittelwirtschaft: <https://www.boelw.de/themen/eu-oeko-verordnung/kennzeichnung/>
- Bonn Challenge / Global Partnership on Forest Landscape Restoration: www.bonnchallenge.org
- CBD – Convention on Biological Diversity¹: <https://biodiversity.europa.eu/countries/germany>
- DESTATIS -Federal Statistical Office¹: <https://www.destatis.de/DE/Themen/Laender-Regionen/Regionales/Gemeindeverzeichnis/Administrativ/02-bundeslaender.html>
- EC – European Commission¹: http://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm
- EC – European Commission²: <http://ec.europa.eu/environment/nature/natura2000>
- EU – European Union¹: <https://www.eea.europa.eu/data-and-maps/dashboards/natura-2000-barometer#tab-based-on-data>
- EURONATUR Stiftung: <https://www.euronatur.org/en/what-we-do/endangered-species/wolf/wolves-in-europe/projects/protecting-wolves-in-germany/>
- EUROPARC – Nationale Naturlandschaften: www.nationale-naturlandschaften.de
- Global Footprint Network: <https://data.footprintnetwork.org/#/countryTrends?cn=79&type=earth>
- OECD – Organisation for Economic Co-operation and Development¹, Aid statistics by donor, recipient and sector: <https://www2.compareyourcountry.org/aid-statistics?cr=oeed&lg=en>

- UBA– Umweltbundesamt¹: <https://www.umweltbundesamt.de/en/topics/soil-agriculture/land-use-reduction#textpart-1>
- Wildnis in Deutschland¹: <https://wildnisindeutschland.de/gebiete/>
- WWF – Meereschutzgebiete: <https://www.wwf.de/themen-projekte/meere-kuesten/meeresschutz/meeres-schutzgebiete/meeresschutzgebiete-in-deutschland/>

Annexes

Annex 1 - IUCN Protected Areas Categories.

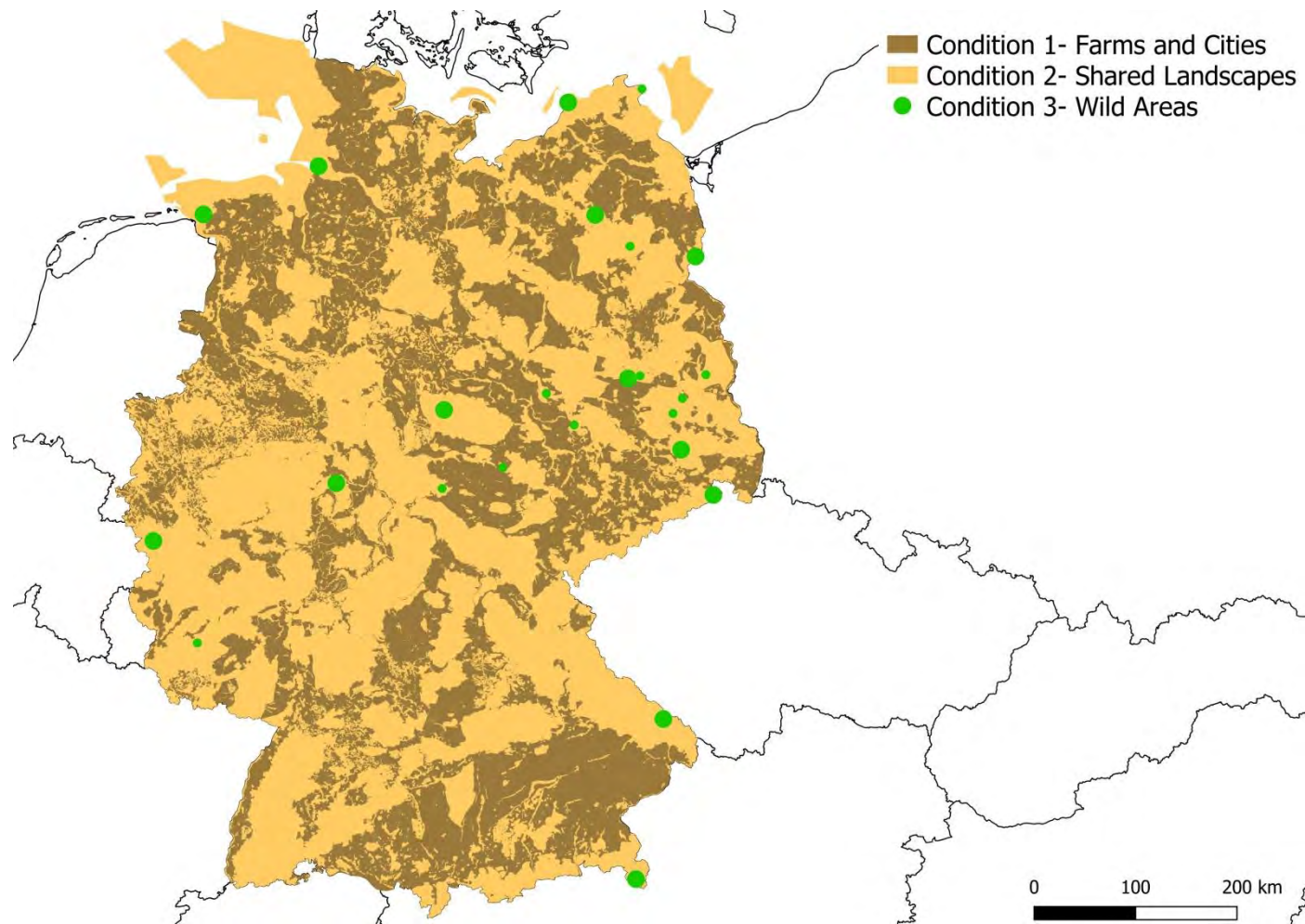
IUCN Protected Areas Categories (Dudley 2008)	
Category	
Ia: Strict nature reserve	Strictly protected areas, which are set aside to protect biodiversity and also possibly geological/geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring.
Ib: Wilderness area	Protected areas, which are usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.
II: National park	Protected areas, which are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities.
III: Natural monument or feature	Protected areas, which are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.
IV: Habitat/species management area	Protected areas, which aim to protect particular species or habitats and management reflects this priority. Many category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.
V: Protected landscape / seascape	Protected area where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.

Annex 2 – Wild areas in Germany (Source: Wildnis in Deutschland¹) (continued on next page).

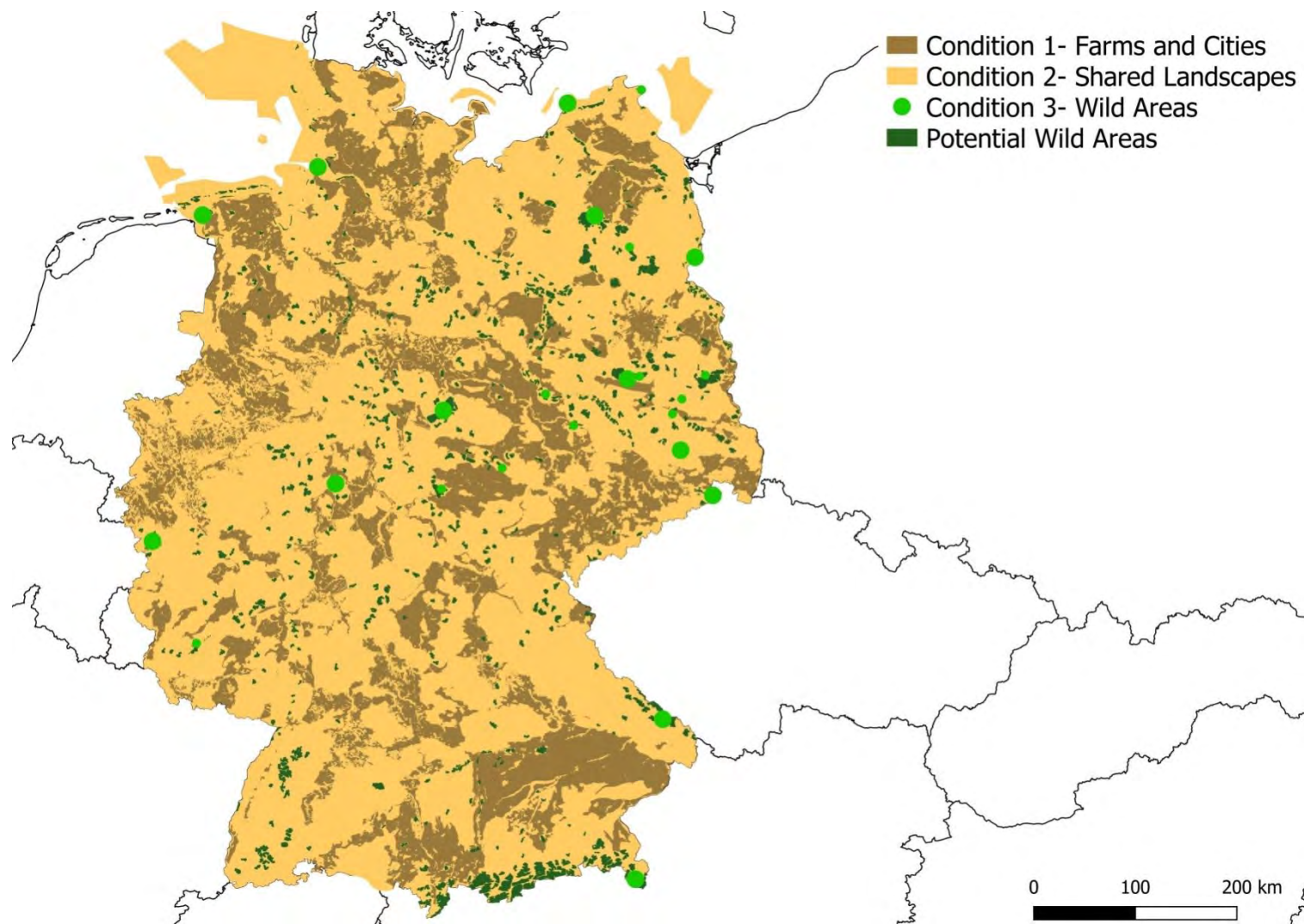
	Total protected areas (ha)	Wild areas (ha) (Land)	Wild areas (ha) (Land+Water)	Link
National parks				
Nationalpark Bayerischer Wald	24.222	10.000		https://wildnisindeutschland.de/gebiete/bayerischer-wald/
Nationalpark Berchtesgaden	21.000	13.860		https://wildnisindeutschland.de/gebiete/berchtesgaden/
Nationalpark Eifel	10.800	6.325		https://wildnisindeutschland.de/gebiete/eifel/
Nationalpark Hainich	7.500	2.000		https://wildnisindeutschland.de/gebiete/hainich/
Nationalpark Harz	24.732	14.839		https://wildnisindeutschland.de/gebiete/harz/
Nationalpark Hunsrück-Hochwald	10.200	450		https://wildnisindeutschland.de/gebiete/hunsrueck-hochwald/
Nationalpark Jasmund	3070	3.049		https://wildnisindeutschland.de/gebiete/jasmund/
Nationalpark Kellerwald-Edersee	5.738	5.234		https://wildnisindeutschland.de/gebiete/kellerwald-edersee/
Müritz-Nationalpark	32.200	9.338		https://wildnisindeutschland.de/gebiete/mueritz/
Nationalpark Niedersächsisches Wattenmeer	345.800 (Water: 188.600 ha; Mudflats: 138.100; Land + Islands: 19.100		235.144	https://wildnisindeutschland.de/gebiete/niedersaechsisches-wattenmeer/
Nationalpark Sächsische Schweiz	10.800	5.508		https://wildnisindeutschland.de/gebiete/saechsische-schweiz/
Nationalpark Schleswig-Holsteinisches Wattenmeer	441.000	12.500		https://wildnisindeutschland.de/gebiete/schleswig-holsteinisches-wattenmeer/
Nationalpark Schwarzwald	10.062	3.282		https://wildnisindeutschland.de/gebiete/schwarzwald/
Nationalpark Unteres Odertal	10.323	5.183		https://wildnisindeutschland.de/gebiete/nationalpark-unteres-odertal/
Nationalpark Vorpommersche Boddenlandschaft	78.700	13.580	83 % Water	https://wildnisindeutschland.de/gebiete/vorpommersche-boddenlandschaft/
Foundations and other properties				
Hohe Schrecke	7.350	2.000		https://wildnisindeutschland.de/gebiete/hohe-schrecke/
Goitzsche Wildnis	1.300	1.250		https://wildnisindeutschland.de/gebiete/goitzsche-wildnis/
Naturparadies Grünhaus	1.930	1.730		https://wildnisindeutschland.de/gebiete/gruenhaus/
Naturschutzgroßprojekt Mittlere Elbe	9.050	800		https://wildnisindeutschland.de/gebiete/mittlere-elbe/
Naturschutzgebiet Königsbrücker Heide	6.932	5.600		https://wildnisindeutschland.de/gebiete/koenigsbruecker-heide/

Sielmanns Naturlandschaft Wanninchen	3.100	2.160		https://wildnisindeutschland.de/gebiete/wanninchen/
Stiftungsfläche Heidehof	1.800	1.400		https://wildnisindeutschland.de/gebiete/heidehof/
Stiftungsfläche Jüterbog	9.280	6.370		https://wildnisindeutschland.de/gebiete/jueterbog/
Stiftungsfläche Lieberose	3.150	2.100		https://wildnisindeutschland.de/gebiete/lieberose/
Stiftungsfläche Tangersdorf	680	600		https://wildnisindeutschland.de/gebiete/tangersdorf/
Tot.	734.919	129.158		

Annex 3 – Maps of Three Conditions for Germany.



Map 1, based on landscape types (large green dots show where wild areas larger than 5,000 ha occur, small dots the wild areas smaller than 5,000 ha; the size of dots do not reflect the real size of land areas, but only indicate their localization).



Map 2, based on the conservation importance of landscapes and including areas where new wild areas could potentially be established (2% target).

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