SAXONY-ANHALT

Ministry of
Science, Energy,
Climate Protection and the
Environment

Lower Saxony Ministry for the
Environment, Energy, Construction and Climate Protection

Biosphere Reserve Drömling

Application of the federal states
Saxony-Anhalt and Lower Saxony
for the designation of a
UNESCO Biosphere Reserve Drömling

Biosphere Reserve
Drömling

Preface

The Drömling is an ecologically and aesthetically particularly valuable, historically evolved cultural landscape with peatland character on the border between the federal states of Lower Saxony and Saxony-Anhalt in Northern Germany.

The region can look back on 1,000 years of eventful history, which is characterised by multi-layered issues of border demarcation, both in the political-social and in the natural areas. For centuries, it was a disputed border area between Slavs and Germanic peoples, between the great German ruling dynasties, and ultimately between the European West and East. The transformation from the dividing Iron Curtain along the inner-German border to a functional regional unit along the European Green Belt is currently one of the greatest challenges and opportunities at the same time. Ecologically, it is characterised by the succession of an impenetrable marshland to unique forms of land use with subsequent rewetting, as well as by permanent habitat diversification due to small-scale changes and shifts in the site bases at the watershed of two major German rivers. This has led to a supra-regionally significant biodiversity and one of the highest water network densities in the world, which has earned the area the name 'Land of a Thousand Ditches'.

Boundary areas are particularly exposed to change, and transformations and adaptations are a constant challenge. The Drömling therefore has a lot of experience with these issues. The future challenge, task and objective of the Drömling is to put these experiences to good use, to develop them further in the global context of the 21st century and to make them available to other regions.

In the last decade, the region has started a far-reaching participation process, carried out extensive preliminary work and made advance payments for the required zoning with numerous legal safeguards for protected areas. With the creation of the prerequisites, the next phase on the way to becoming a model region for sustainable development is now to be initiated and the international recognition of the Drömling as a UNESCO Biosphere Reserve is to be applied for.

On the one hand, the region hopes for a noticeable impulse for the further shaping of the human-environment relationship in the Drömling; on the other hand, an essential contribution can certainly be made to the urgent questions at national and global level.

Figure 1: The Green Belt on the border of Saxony-Anhalt and Lower Saxony in the Drömling.

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List of Abbreviations

ATL	Terrestrial Atlantic Region
Bfn	Federal Agency for Nature Conservation
BMU	Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection
BNatSchG	The Federal Nature Conservation Act
BR	Biosphere Reserve
CBD	Convention on Biological Diversity
CDC	Climate Data Centre
CON	Terrestrial Continental Region
CORINE	Coordination of Information on the Environment
EAFRD	European Agricultural Fund for Rural Development
ELER	European Agricultural Fund for Rural Development
ESD	Education for Sustainable Development
EU	European Union
FFH	Fauna-Flora-Habitat-Directive
GDR	German Democratic Republic
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
LEADER	Liaison Entre Actions de Développement de l'Économie Rurale (Links between actions for the development of the rural economy)
MAB	Man and the Biosphere
MWU	Ministry of Science, Energy, Climate Protection and the Environment of Saxony-Anhalt
MU	Lower Saxony Ministry for the Environment, Energy, Construction and Climate Protection
NC	National Committee
SDG	Sustainable Development Goals
SPA	Special Protection Area
UNESCO	United Nations Educational Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change

Part I: Overview

1. PROPOSED NAME OF THE BIOSPHERE RESERVE

UNESCO Biosphere Reserve Drömling

2. NAME OF THE COUNTRY

Federal Republic of Germany
Federal states: Saxony-Anhalt and Lower Saxony

3. FULFILMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES

3.1 Conservation function

The Drömling is a peatland-rich and grassland-dominated lowland area of international importance for nature conservation and an example of a culturally and historically unique land use system along Europe‘s largest biotope network system, the European Green Belt.

The planned UNESCO Biosphere Reserve comprises **peatland depressions characterised by groundwater and flooding, as well as sandy, higher-lying geest landscapes**[1]. The extremely diverse and small-scale structured landscape is characterised by a mosaic-like network of habitat types with numerous transitions from terrestrial to limnic ecosystem types and additionally by a varying anthropogenic use overlay. This is characterised by a very high proportion of valuable biotopes, which clearly distinguishes the Drömling from the surrounding landscape. It is listed as a separate cultural landscape type according to national mapping.

The connecting characteristic of the central nature conservation habitats such as moist forests, wet meadows or peatlands is the **supra-regionally significant watercourse network and groundwater impact of the soils**. The area divides and connects the Weser and Elbe water catchment areas through a dense watercourse network (2,200 km of watercourses). 40% of the total soils are characterised as peat and peatland soils. This makes it the largest fen in the federal state of Saxony-Anhalt and one of the most important in the Middle Pleistocene region, from which great importance for **climate protection** can be derived.

It was only 250 years ago that the marshy lowland, formerly covered with alder swamp forest, was transformed into a unique **cultural landscape** through the construction of ditches and canals. The so-called **Rimpau‘sche Moordammkulturen** (Rimpau‘s peatland dam culture) emerged as a special utilisation system, ensuring agricultural use and at the same time preserving the peat body. The name **‘Land of a Thousand Ditches’** is derived from the network-like ditch system, which already indicates one of the highest managed water network densities in Europe.

The network-like interconnected biotope system along the waters of the Drömling results in extraordinary importance with regard to biodiversity. The Drömling provides a habitat and refuge for numerous endangered and threatened **animal and plant species**. Today, the Drömling is considered a refu-

Figure 2: Peatland dam cultures in the Kusey Drömling.

[1] ‘Geest landscapes’ refer to dry, barren land, mostly formed from sandy deposits of the Ice Age.

Figure 3: Location in Germany.

gial area with a steppingstone and biotope network function between the Elbe and the Weser. It is part of the Green Belt, which is protected as a **national natural monument** in Saxony-Anhalt. The Green Belt contributes to the **biotope network** at both national and international level (see excursus Green Belt). Large areas of the Drömling are designated as **Natura 2000 sites** and thus contribute to compliance with international nature conservation obligations.

The restoration of a water balance characterised by water retention forms the basis for the most important protection and development functions in the Drömling, and these are to be further developed in the future. In addition to the conservation of peatlands for climate protection reasons, this also applies to the protection of organic soils as a production basis for agriculture, the protection of moist forests and wet meadows as biotopes and species protection (for example, for the highly endangered snipe), the storage of water in the area as flood protection for towns below the Drömling, as well as the experiential value of a water-dominated large fen landscape for experiencing nature and education for sustainable development.

Further description: Chapters 4.1, 4.2, 4.4, 4.5, 11.6, 12, 13.1, 13.2, 14 and Annexes 9-30

3.2 Development function

The potential of the Drömling is the development towards a model region that tries to exemplarily implement the unique interplay between historical land use and water management with the current challenges of peatland protection and climate change (prevention and adaptation).

The area has an extremely rich and interesting **cultural-historical** basis, which has always been influenced by its **border location**. For many centuries, the Drömling formed a border area between the Slavs and the Saxons, and later between Prussia, Hanover and Brunswick. Until 1990, Germany was divided right through the middle of the Drömling (formerly the Iron Curtain – today the Green Belt). The cross-border merger of the Lower Saxony and Saxony-Anhalt parts of the Drömling into a biosphere reserve can therefore be seen as a **milestone in the process of 'growing together'** and the formation of a common identity. It represents a special challenge and at the same time an opportunity for sustainable regional development.

Hydraulic engineering, cultural and settlement technology have created significant witnesses of cultural history in the Drömling. This open cultural landscape, characterised by grassland, reflects a history of more than 200 years of reclamation of a formerly impenetrable 'marshland' into a cultural landscape emphasising groundwater. Of particular importance for the preservation of the Drömling cultural landscape is the long-term establishment of uses that are compatible with conservation objectives and at the same time economically viable, which are to be continued in dialogue with the farmers. It is planned to use the hydraulic engineering structures formerly built to drain the area to achieve a climate change-adapted and innovative further development of the historical **water management system** and to open up **new forms of use in the energy sector**. All of this is done against the background of **preserving the large-scale fen body**.

There are only a few settlements around the areas of the Drömling that are valuable for nature conservation, and intensive agriculture is practised. The opportunities for sustainable, cross-sectoral management are currently still limited. With the tourism and marketing concept (see Annex 37), first objectives in the field of recreation and tourism

Excursus – The Green Belt

The Drömling has always been on the border between different spheres of power. With the division of Germany after the Second World War, a border was once again drawn through the Drömling. This border, which in the Drömling area even separated entire villages, consisted of a system of border barriers with barbed wire fences, vehicle moats and border posts.
Today, the 1,400 km long border strip along the former inner-German border is home to a unique system of interconnected biotopes in which nature was able to develop almost undisturbed over decades. The 'Green Belt' is the longest biotope network system in Germany and at the same time forms part of the European 'Green Belt', which stretches from the Arctic Ocean in northern Norway to the Black Sea on the border with Turkey.
The goals of the Drömling Biosphere Reserve are, on the one hand, to protect this unique biotope network and, on the other hand, to bring together the long-separated parts of the country with the vision of developing them jointly from now on.

were already developed in 2015. This concept will be updated in the context of the framework programme to be drawn up and expanded to cover the entire area of the biosphere reserve. Currently, an **umbrella brand** is being developed with stakeholders from the biosphere reserve, which includes the establishment of **regional brands** and a **partner programme**. In the future, this should lead to better marketing of regional produce and products that naturally arise from regional value chains.

Through a continuous expansion of the development function in several stages, the opportunities for sustainable management are to be strengthened in the future. As a first development phase, the economic and socio-cultural bridge-building between the differently developed parts of the area due to the division of Germany should be mentioned as a priority. In a subsequent phase, a high potential for development and expansion is also seen in the immediate **vicinity of the city of Wolfsburg** or the **metropolitan region of Hanover-Brunswick-Göttingen-Wolfsburg**. An increased interweaving of urban-rural relations seems to offer particularly many opportunities for the Drömling in terms of the orientation of its future development function.

Further descriptions: Chapters 4.3, 4.4, 4.5, 10.6, 12, 13, 15, 17.4

3.3 Logistic function

Due to its exceptional natural features, the Drömling offers a unique outdoor research, education and demonstration laboratory on the most pressing issues of the day, such as water balance, peatland protection, climate protection and climate change adaptation, from which other areas can benefit.

The proposed UNESCO Biosphere Reserve can already draw on a wide range of programmes and activities in the field of research, monitoring and education. Since 1990, the Drömling has been the **experimental and field research laboratory** for over 300 studies and papers. One focus is applied research on the management of grassland, in particular, in a way that is both appropriate to the conservation objectives and economically viable. Sustainable land use concepts, special animal species (e.g., beaver management, oak processionary moth) or the energetic use of biomass are further examples of research topics. In the future, the existing monitoring system, which records the development of specially protected species and valuable habitats, is to be expanded to include socio-economic aspects in the sense of a holistic approach and will then cover the entire biosphere reserve.

Excursus – Rimpau‘s peatland dam cultures: a historical use in a changing climate

A unique feature in the world network of UNESCO biosphere reserves are the Rimpau‘s peatland dam cultures. They represent the characteristic form of land management in the Drömling. Peatland dam cultures occupy approx. 2,500 ha. About 80% of this is used agriculturally as grassland and partly still as arable land.
Originally, the method was developed at the end of the 19th century to drain and cultivate the peat soil. The method involves rutting unproductive areas of ditches at intervals of about 20 metres. The sandy excavated material is spread on the areas in between. This procedure creates the so-called peatland dams. The overlay is always moist due to the underlying peatland. Peatland plants are smothered, valuable cultivated plants can make good use of the available nutrients.
In this way, the yields of potatoes, beet or cereals, for example, could be increased enormously. The yield capacity of meadows and pastures was also increased, so that the Drömling also became attractive as a livestock breeding area. In the following years, however, the focus was on further draining the Drömling. This resulted in the loss of peatlands, which could only be stopped in the 1990s. Since then, water retention has been pushed in the landscape. Together with the conversion of arable land to grassland and forest and the extensification of grassland use, it was possible to avert further demineralisation of the fen body.
In the future, management concepts in the sense of paludiculture are to be developed and tested, especially on the organic soils in the Drömling, which are to ensure peatland conservation also outside the core areas on the agriculturally used wet and wet meadows.

In addition, the certified nature and landscape guides are to pick up on the special beauty of the landscape and, together with the themes of the biosphere reserve, bring it closer to local residents and visitors in guided tours. The training of further certified nature and landscape guides is planned for 2022.

The existing activities in the field of **education for sustainable development (ESD)** and public relations are to be extended to Lower Saxony and beyond the boundaries of the biosphere reserve.

Two **decentralised information centres** for the biosphere reserve are currently in the planning stage. Together with the existing information centre in Kämkerhorst, there will be three contact points for regional and national visitors. On the one hand, the information points will serve as starting points for guided tours and events in the field of ESD, and on the other hand, they will provide information on topics and offers in the biosphere reserve.

With the establishment of the joint trans-regional protected area, the actors in the region are to try out **new forms of participation** in order to contribute to the topics of the biosphere reserve. The establishment of an advisory board with corresponding working groups is a first step in this direction.

Further descriptions: Chapters 4.7, 13.1, 13.2, 13.3, 16, 17.4

4. CRITERIA FOR DESIGNATION AS A BIOSPHERE RESERVE

4.1 Mosaic of ecological systems

The landscape of the Drömling is an area of nationally representative importance within the Federal Republic of Germany. It contains a mosaic of internationally and nationally representative and unique water-bound ecosystems with a continuous gradient, beginning with exclusive self-regulation and ending with intensive human influence. So far, these natural features are not sufficiently represented in Germany's network of biosphere reserves.

Particularly noteworthy is the original designation of the area as an extensive 'marshland' and thus its transitional character to limnic ecosystems. With a high proportion of fen soils of approx. 40% (approx. 16,800 ha), the Drömling represents the largest contiguous **wetland and fen area in the North German Middle Pleistocene** and at the same time, with its area proportions, the largest fen in Saxony-Anhalt. The numerous efforts to preserve and restore the ecosystem services appropriate to the site (flood retention function, filtering effect for drinking water, peatland protection as habitat protection and carbon store, etc.) show a consistent development path towards peatland-rich cultural landscape types. To date, this type is not represented in Germany's network of biosphere reserves (Heitepriem, Bethwell, Nowak, & Niclas, 2017).

Figure 4: Bird watching at the wet meadow area 'Buschbleeke'.

Around 54% of the Drömling's area is included in the European network of protected areas **Natura 2000** as a European bird sanctuary (BfN, 2020a), which underlines the high responsibility for achieving or complying with international agreements on the conservation of representative ecosystems. Furthermore, the Drömling is home to fourteen habitat types according to Annex 1 of the Habitats Directive (see Annex 7). The alder swamp forests found here also form the largest and most representative stands in the federal state of Lower Saxony.

Further descriptions: Chapters 8, 11.6, 12, 13.3, 14

4.2 Conservation of biological diversity

The Drömling is characterised by an immensely high density of borderline effects[2], which contribute to a high level of biodiversity and nature conservation value of water-bound habitats on land. The national and international importance of the area for biodiversity and biotope connectivity is underlined by the high proportion of designated protected areas that are home to a variety of different landscapes, biotopes and animal and plant species.

Due to its location on the former inner-German border, the Drömling is also part of the **Green Belt** and thus contributes significantly to the Europe-wide and cross-state biotope network in Germany. As early as 2005, the Green Belt was classified as a national **natural heritage site** and subsequently included in the Federal Government's National Strategy for the Conservation of Biological Diversity.

The special location in the metropolitan area as well as the interlocking of terrestrial and aquatic habitats in a very confined space – in many cases further differentiated by influences of use – lead to countless transitional stages. These form one of the central foundations for the diversity of habitats, biotopes, animal and plant species. In particular, the extensive and species-rich wet meadows and tall herbaceous meadows of the Drömling serve as habitats for numerous rare and endangered **aquatic plants**. The Drömling is an important **breeding ground** for many bird species. Many of these and other valuable species occur in the Drömling in much higher numbers than in other areas of Germany. The wide lowland landscape in the Drömling is also of great importance as a **resting and wintering area as well as a refuge** for a large number of bird species (Seelig et al., 1996). The conservation of **rare livestock breeds and cultivated plants** was promoted even before the national designation as a biosphere reserve. The extensive grassland areas of the Drömling, which are ideally suited for grazing with cattle, horses or donkeys, deserve special mention.

Further descriptions: Chapters 11.6, 12, 13.2, 14

4.3 Research and sustainable development

The Drömling has a long tradition as an outdoor laboratory for colleges and universities and can point to an attractive open space for a gentle environmental experience and tourist use. The currently still limited possibilities for integrative and sustainable regional development are to be gradually expanded through various approaches.

Figure 5: Rewetted peatland dam cultures in the northern Drömling region.

[2] Term for the marginal areas of overlapping habitats. As a rule, the more overlapping areas there are, the higher the species diversity.

In the past, the main focus of research was on **nature conservation issues** related to the rewetting and preservation of the peatland body and the economically viable management of grassland in particular in line with conservation objectives. With the designation of the cross-border UNESCO Biosphere Reserve, this focus is to shift towards research into sustainable forms of land use on fenlands and the effectiveness of measures against climate change. The research coordination will cover the entire setting of the biosphere reserve.

The sparse settlement structures typical of the landscape, with an alternation of village-like and settlement-free spaces in the transition area with their heavily agricultural use, offer the best conditions for exploring and testing concepts of sustainable primary production and related value chains (‚energy from the region for the region'). The expansion of renewable energies (also) through photovoltaic systems is an important component of the climate protection strategies of the federal and state governments and is classified as sustainable energy production for the energy transition. Synergy effects between the conservation of biodiversity and the expansion of renewable energies as well as the further development of nature conservation expert concepts for the integration of renewable energies into spatial planning could be specifically worked out in the BR Drömling. The testing and establishment of new approaches for economically viable utilisation systems that are compatible with conservation objectives should be supported. At the same time, there are opportunities to generate added value locally through citizen participation models and to test participatory approaches already in the planning phase.

At the same time, the sectors within the area that are currently still weak but relevant to the area, such as tourism, crafts and trades, and services, are to be expanded and networked with each other. The Biosphere Reserve Administration sees itself primarily as a mediator between different actors. In this respect, the Advisory Board should give impulses to initiate future projects and to create a field to bring together the different actors from the various sectors of the biosphere reserve. A first step will be the formation of working groups on various topics such as tourism, water management, agriculture and education for sustainable development. With regard to the **framework concept**, it is planned to intensively involve the actors of the region in its preparation and thus to offer them the opportunity to participate in the future thematic setting of the biosphere reserve and to strengthen and further develop the potentials of the region.

Further descriptions: Chapters 4.7, 13.2 and 15

4.4 Size

The demarcation of the biosphere reserve was primarily based on the geographical conditions. To a very large extent, it corresponds to the historically grown, naturalistically meaningful and spatially structured regional unit of the Drömling.

The setting of the UNESCO Biosphere Reserve Drömling is taken into account as an **independent spatial unit** in the spatial development plans of both federal states. The typical habitats found here are represented in several locations and include the settlements associated with their use. As the landscape extends on both sides of the former inner-German border of Saxony-Anhalt and Lower Saxony, a **cross-state approach** is considered to be expedient.

The cross-border UNESCO Biosphere Reserve Drömling covers an **area of 45,220 ha** (core area 3.6%, buffer zone 31.3% and transition area 65.1%). The demarcation of the transition area is the result of the consultation process in the region. It is suitable for testing model projects for sustainable development. At the same time, the first phase focuses on harmonising the formerly separate parts of the territory. In order to better exploit the possibilities, especially in the area of the development function, an **enlargement of the transition area is conceivable** in the future.

Further descriptions: Chapter 7, 11.1 and Appendix 2

4.5 Zonation

The zones were secured in the best possible way through differentiated target definitions and protected area categories and legally enacted in accordance with the requirements of the MAB National Committee and the state laws: core area – 100% nature conservation area and Natura 2000 area; buffer zone – 100% nature conservation area, predominantly also Natura 2000 site; transition area – 67% landscape conservation area, partly also Natura 2000 site.

The Green Belt runs through all three zones of the biosphere reserve. It is legally protected as a national natural monument in Saxony-Anhalt.

4.5.1 Core area

The core areas in the trans-regional biosphere reserve cover a total area of 1,650 ha. This corresponds to a share of 3.6% of the total area of the biosphere reserve.

In the biosphere reserve, the core area is protected by the nature reserves 'Ohre-Drömling', 'Giebelmoor', 'Südlicher Drömling' and 'Politz und Hegholz' (see Annexes 14 to 18). These areas are mainly covered by original, site-appropriate moist forests. In addition, there are also areas that are allowed to develop through the various stages of succession from grassland or anthropogenically shaped forests to the primeval forest of tomorrow and are to form central objects of research.

The corresponding nature conservation area regulations exclude any economic use of the forest in the core areas. In the core areas of Saxony-Anhalt, access is prohibited. In the core areas of Lower Saxony, management has been completely discontinued. This means that the development goal of natural self-development is permanently set. This also explicitly means that natural succession, and thus process protection due to the natural wetness of the site, is given priority over the conservation of existing FFH habitat types. The disappearance of existing habitat types or the emergence of new ones is to be expected.

With the designation of the core areas, the Drömling Biosphere Reserve also contributes to the achievement of the 5% and 10% target of use-free, natural forests according to the National Strategy on Biological Diversity (BMU, 2007).

4.5.2 Buffer zone

In both countries, the buffer zone corresponds to the designated nature reserve areas minus the core areas and amounts to 14,220 ha or **31.3%** of the total area. It encloses the individual core areas and shields them from possible pressures.

The buffer zone is thus **protected by sovereignty**, analogous to the core areas in both federal states, through the designation of nature conservation areas.

The buffer zone consists of different types of land use, ranging from near-natural to anthropogenically influenced forests and grassland through the various stages of succession. The peatland soils of the buffer zone are largely managed as pasture and mown grassland.

Activities in the buffer zone are restricted and are governed in detail by the regulations of the nature conservation areas. The development objectives and specifications of the buffer zone are prescribed by the two maintenance and development plans of the large-scale nature conservation projects in Lower Saxony and Saxony-Anhalt and the maintenance and development plan for the 'Klüdener Pax-Wanneweh' Nature Conservation Area. For grassland, the maintenance and development plans recommend, for example, late mowing (July to September), low grazing densities or the renunciation of any fertilisation.

4.5.3 Transition area

The transition area has an area of 29,430 ha. This corresponds to **65.1%** of the total area.

Due to the given spatial structures, the majority of the transition area is located in Saxony-Anhalt, which is largely protected by the existing 'Drömling' Landscape Conservation Area (approx. 19,180 ha) (cf. Chap. 7.2). In the Lower Saxony part of the transition area, nature conservation protection is limited to the areas worthy of protection. The objectives of the transition area and the spatial boundaries of the Lower Saxony part of the transition area are laid down in the spatial planning programme of Lower Saxony (LROP) (cf. Chap. 17.1.1).

In Lower Saxony, the transition area (6,880 ha) consists largely of the areas of the municipalities of Tülau and Brome as well as the district of Croya, the area of the village of Kaiserwinkel and the Lower Saxony section of the Mittelland Canal. These areas are characterised by intensive arable farming and forestry. They comprise the majority of the biosphere reserve's settlement areas. In the transition area, the focus is on developments in the sense of a model region for sustainable regional development and sustainable economy, which also includes a more ecological orientation of land use. Restrictions on use within the transition area exist only in the nature conservation and landscape protection areas. Thus, all actions that lead to the destruction, damage or alteration of the respective protected area or its components or to a lasting disturbance are prohibited there.

4.5.4 Interaction between the three areas

The **Green Belt** forms a **corridor** within the Drömling that extends from the core area to the transition area. It is of particular importance as a biotope network axis. All three protected zones are directly connected via the 2,200 km long **watercourse network**. This is the main way in which the refugial function of the core area via the buffer zone to the transition area has become effective for many species and biotopes. An example of this is the recolonisation of the Drömling by beavers and otters, which is now spreading from the large populations established in the Drömling to the surrounding area. On a supra-regional scale, the Drömling is

of great importance as a refuge for surviving populations of species such as the snipe, moor frog and large fire butterfly, which can recolonise the surrounding landscape from the buffer zone via the transition area. This applies all the more if the **land use models of wet grassland management** tested in the buffer zone, which are increasingly being visited on site from other protected areas throughout Germany and questioned in dialogue with land users, are also applied. There is still great potential here, both within and beyond the borders of the BR Drömling.

The **use of characteristic grassland as grazing land** is an essential prerequisite for preserving the mosaic of land use and the landscape in the Drömling. Grazing animals, in the Drömling mainly cattle, can serve as vectors between the maintenance and transition areas, especially where grazing areas extend across the zone boundaries. The transition area consists largely of intensively used **arable land** (see Chapter 9.2). This intensive use leads to animal and plant species being displaced from the transition area and finding new habitats in the core and buffer zones. Nevertheless, if arable land is abandoned or converted to grassland, the transition area can be recolonised from the other two zones by some formerly displaced animal and plant species.

Environmental education and sustainable tourism development are another aspect of the interaction between the three zones of the biosphere reserve. Local recreation by bicycle in particular represents an opportunity to experience the many varied landscape elements of the Drömling in a short time. Interactions between the buffer zone and the transition area are also possible in the **socio-economic sphere**. The requirements of the nature conservation area regulations bring about the use of resource-conserving or alternative forms of land use. These can then also be applied in the transition area under favourable conditions.

Further descriptions: Chapters 7, 9, 11, 13.1, 13.2, 14, 15.1, 15.5, 16.3, 17.1.

4.6 Organization and participation

The organisational arrangements for the involvement and cooperation of, among others, an appropriate number of authorities, local communities and private stakeholders were taken into account through a long-term, coordinated and participatory development process with a cross-state working group, the establishment of a biosphere reserve administration and the formation of a wide range of steering mechanisms and participation platforms.

4.6.1 Arrangements in place or foreseen

In the **discussion process** (2014–2016) conducted in parallel **across the federal states** to prepare a key issues paper ‚Towards a Biosphere Reserve Drömling' (Annex 37) by the Drömling cross-border working group, numerous proposals on the objectives and area boundaries for the joint Biosphere Reserve were drafted, discussed and submitted to the relevant stakeholders for critical debate. In this way, participation in the zoning of the Biosphere Reserve was emphasised from the very beginning.

In 2019, a **Biosphere Reserve Administration** was established, which serves as a central contact and service point for the entire Drömling region. Citizens and stakeholders from the region can obtain information or support the management of the reserve by providing information and advice.

In general, the Biosphere Reserve Administration has come to realise that decisions that directly affect the region must be supported by a broad consensus. One way that has become established is to work with **thematic working groups**. These are to be set up from within the **Advisory Board** and deal, for example, with the topics of water management, renewable energy supply, tourism and environmental education. The working groups are a good way to bring together actors with a specific thematic background and to discuss problems in a circle of 5–10 people and to point out possible solutions that affect the biosphere reserve as a whole.

This approach is also to be followed for the preparation of the **framework concept**, in which a broad-based participation process is planned.

The new path of broad public participation in the sense of the MAB programme, which was taken in the discussion and development phase with the local population from 2014 onwards, is to be consistently continued and expanded. The advisory and cooperation networks in the fields of agriculture, partner enterprises, education for sustainable development and regional brands, which have been in the process of being established for the past two years, are to be strengthened and extended to the fields of renewable energies, water management and research, among others.

In this sense, the development of the Drömling Biosphere Reserve into a sustainability and quality region, here above all with the claim of preserving and ecologically and economically sustainable development of the unique lowland moor landscape, is to be filled with life.

4.6.2 Cultural and social impact assessments

The Drömling benefits from the fact that it has been established as a protected area since 1990. The local residents identify with this natural area. For this reason, the zoning of the biosphere reserve was deliberately chosen to initially cover only the natural area in large parts. Within the biosphere reserve, UNESCO recognition and the associated expansion to the Drömling in Lower Saxony is also seen as an opportunity for overarching socio-cultural development. Beyond this, however, no assessments have been made of the consequences of designation as a UNESCO Biosphere Reserve.

4.7 Mechanisms for implementation

The implementation mechanisms for regulating land use are in force on the included areas in a graduated form. These include the mandatory regulations anchored in the protected area ordinances as well as supplementary voluntary agreements with land users (e.g., regulated by lease agreements). The basis for this is an already established monitoring programme for the Drömling as well as maintenance and development plans that are regularly updated. In addition, the Drömling has its own protected area administration in the form of the Biosphere Reserve Administration, which is supported by various advisory councils, working groups and partner networks. There is a relatively well-developed infrastructure and educational offer to fall back on.

4.7.1 Regulations on human use and activities in the buffer zones

A large part of the buffer zone is designated as priority or reserved areas for nature and landscape, flood protection and water extraction in the **federal state development programme of Saxony-Anhalt** and in the regional development plans. The current **federal state regional planning programme of Lower Saxony** designates the Drömling as a priority area for the biotope network, for drinking water abstraction and for Natura 2000. It is currently being updated. In addition to the priority areas mentioned above, the planned UNESCO Biosphere Reserve Drömling is to be designated as a biosphere reserve safeguard area, which will be adopted as a spatial planning objective for the Lower Saxony part of the area (Annex 13).

The federal state regional planning programmes provide the framework for the municipalities' **urban land use planning**. The buffer zone consists mainly of Natura 2000 sites. Legal protection is provided by the designation of **nature conservation and landscape protection areas**. These regulate human use and activities in the buffer zone through prohibitions and restrictions, supplemented by voluntary agreements. In the Saxony-Anhalt part of the area, the **Regulation on the Drömling Biosphere Reserve Saxony-Anhalt** combines the protected areas there under a common objective of protection and sustainable development. For the operational management of the areas, there are also maintenance and development plans and FFH management plans. In addition to the legal requirements of the protected area regulations for agricultural use and the maintenance of public land, implementation is carried out through the formulation of the lease agreements. Corresponding provisions for the sustainable use of the areas in terms of the protection and development goals are included in the lease agreements.

4.7.2 Framework concept

For the first time, a corresponding planning in the form of a **framework concept for the biosphere reserve** is to be developed in a participatory manner for the area overview (Falter et al., 2018). According to the guidelines of the MAB-NC, this concept is to be developed within three years of UNESCO recognition at the latest and, using the Theory of Change (ToC), is to ensure a transformative and sustainable orientation of the planned UNESCO Biosphere Reserve (for details see 17.4).

4.7.3 Biosphere Reserve Administration

With the national designation of the biosphere reserve on the Saxony-Anhalt side in 2019, the existing protected area administration became the Drömling **Biosphere Reserve Administration**. The office is located in Oebisfelde. In addition, there is a permanently staffed information centre in Kämkerhorst. A further Natura 2000 information centre at the old pumping station in Buchhorst is currently being planned.

The Administration is an independent authority directly subordinate to the Ministry of the Environment of Saxony-Anhalt and already assumes numerous cross-state tasks in connection with development by means of an **administrative agreement** with the state of Lower Saxony (see Annex 9). In addition to the technical area management, it also assumes the function of the **upper and lower nature conservation authority** on about 68% of the total area. In the Lower Saxony part of the biosphere reserve, enforcement of the nature conservation area regulations remains with the lower nature conservation authorities of the respective administrative districts. The joint Biosphere Reserve Administration for the planned UNESCO Biosphere Reserve will be much more active in networking stakeholders in the future.

4.7.4 Research, monitoring, education and training

The planned UNESCO Biosphere Reserve Drömling is used as an **experimental and field research laboratory** for scientific work and publications as well as projects. The numerous activities and collaborations in the field of research and monitoring have created a very good data situation. In addition, the biosphere reserve has its own research budget.

The next step after recognition as a UNESCO Biosphere Reserve is to extend the **Drömling monitoring concept** to the entire biosphere reserve with regard to the framework concept to be developed. This must also be expanded to include socio-economic aspects. In future, questions of climate protection can be examined against the background of peatland restoration, land use changes and the energetic utilisation of biomass. The use of renewable energies in the biosphere reserve is another challenge that is to be accompanied by research work.

The projects in the field of **environmental education and education for sustainable development (ESD)** are already setting an example and having an impact beyond the boundaries of the biosphere reserve. In addition to the work with kindergartens, schools and adult education, volunteers are offered the opportunity to get involved in the Drömling under the title ‚Ehrensache Natur'. This explicitly includes people with disadvantages. The Drömling was one of the first regions in Germany where this was implemented in such way. In this respect, the challenges for the coming years are to meet the high expectations of the Biosphere Reserve Administration and at the same time to extend its reach to the entire area of the UNESCO Biosphere Reserve.

Figure 6: Appointment of Junior Rangers at the 1st Dömling festival.

5. ENDORSEMENTS

5.1 Signed by the authorities in charge of the management of the core areas

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Place, date Signature

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Place, date Signature

5.2 Signed by the authorities in charge of the management of the buffer zones

Lower Saxony Ministry for the Environment, Energy, Construction and Climate Protection

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Place, date Signature

Ministry of Science, Energy, Climate Protection and the Environment of Saxony-Anhalt

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Place, date Signature

5.3 Signed as appropriate by the National (or State or Provincial) administration responsible for the management of the core area(s) and the buffer zone(s)

District of Börde

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Place, date Signature

5.4 Signed by the authority/authorities, elected local government recognized authority or spokesperson representative of the communities located in the transition area(s).

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Signature

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Signature

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Place, date Signature

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Place, date Signature

Municipality Tülau

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Place, date Signature

5.5 Signed on behalf of the MAB National Committee or focal point

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Phone number:	+49 228 305 2670

Place, date Signature

Part II: Description

6. LOCATION

6.1 Geographical coordinates

Cardinal points	Latitude	Longitude
Most central point	52° 29‘ 46“ N	11° 4‘ 36“ E
Northernmost point	52° 37‘ 58“ N	10° 54‘ 11“ E
Southernmost point	52° 21‘ 32“ N	11° 20‘ 11“ E
Westernmost point	52° 36‘ 43“ N	10° 48‘ 57“ E
Easternmost point	52° 22‘ 4“ N	11° 22‘ 17“ E

Table 1: Standard geographical coordinates of the UNESCO Biosphere Reserve with projection according to WGS 84

6.2 Topographic map

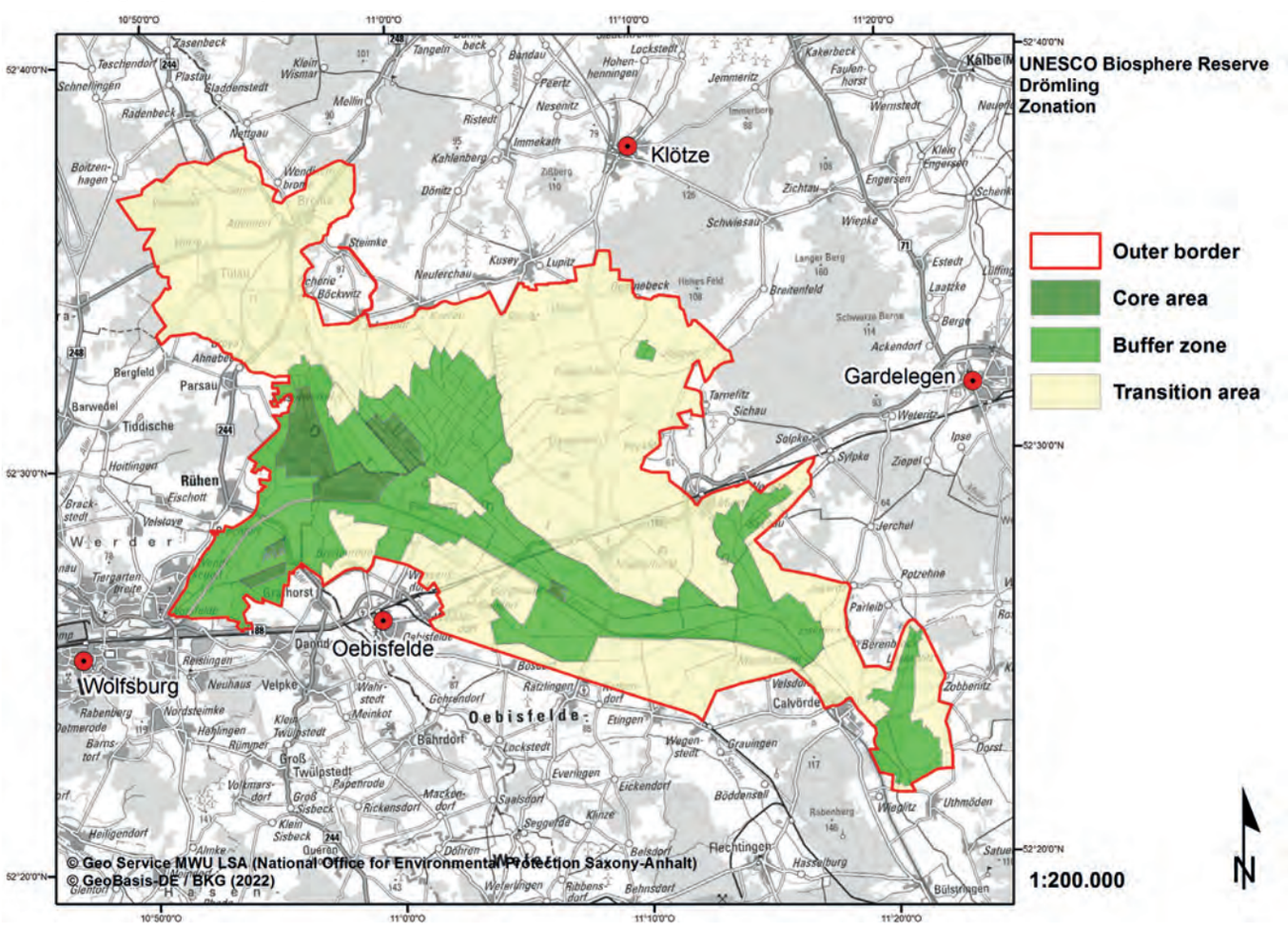

Figure 7: Topographic map with location and area boundaries as well as the zonation of the proposed UNESCO Biosphere Reserve.

The detailed location and zonation maps can be found in Annexes 1 and 2 or can be accessed online at www.biosphaerenreservat-droemling.de.

7. AREA

7.1 Core, buffer and transition area

The proposed UNESCO Biosphere Reserve has a **total size of 45,220 ha** (see Table 2).

	Saxony-Anhalt	Lower Saxony	Total	%
Transition area	22,550	6,880	29,430	65.1
Buffer zone	10,680	3,460	14,140	31.3
Core area	840	810	1,650	3.6
	34,070	11,150	45,220	100

Table 2: Area size [ha] of the three zones of the biosphere reserve and distribution among the federal states of Saxony-Anhalt and Lower Saxony.

7.2 Rationale of zonation

The area outline and zoning of the BR Drömling have evolved in several discussion phases with the local population. The starting point were in each case completed large-scale nature conservation projects in Saxony-Anhalt and Lower Saxony, from which the rewetted fen areas were secured as core and buffer zones. The transition area also includes surrounding parts of the Drömling nature reserve that are not protected by the state as nature conservation areas and whose structure was expanded in later rounds of discussion and participation.

Coreareas:

The zonation was chosen in such a way that the most relevant and vulnerable areas for process protection and the preservation of the watercourse and peatland body fall within the core areas. Due to their location on the inner-German border on today's Green Belt, the core areas include the forest areas with the highest degree of closeness to nature in the Drömling. At the same time, due to the hydrological and pedological conditions, they have the highest potential for natural alder swamp forest development, for the reintroduction of peatland growth and for the recovery of the function as a carbon and nutrient sink.

The core areas have already been successfully rewetted. In addition, these are the areas that correspond to the original natural features of the Drömling before it was drained. In the Drömling, these are alder swamp and alder-ash forests and their succession stages. These primeval forest-like lowland forests and peatlands are, without exception, left to natural succession, which also results in the need for zoning that is as large and spatially concentrated as possible for process protection. Only the two core areas ‚Hegholz' and ‚Bekassinenwiese' are smaller than 50 ha, but are completely surrounded by the buffer zone.

The core areas are almost entirely owned by the public sector (99.97%), which is a key success factor for the designated core area and guarantees long-term security.

Buffer zones:

The peat soils of the buffer zones perform an important buffer function for the core areas in that the winter flooding there stabilises the water and material balance of the core areas. The buffer zones contain the particularly dense and characteristic water network of the Drömling and thus have a refugial and connecting function for the surrounding transition area and beyond.

In addition, there are two buffer zones in the northeast (Jeggau) and southeast (Klüdener Pax-Wanneweh) without direct connection to the core areas. These are also valuable areas for nature conservation. The Jeggau peatland is a particularly valuable intersection of Atlantic and continental flora and fauna elements typical of the peatland. The Jeggau peatland in particular contains the habitat types of peatland forests, transition mires and quaking bogs, which are also very rare in the Drömling. This small exclave is connected to the large buffer zone of the biosphere reserve via the Flötgraben.

Approximately 54% of the buffer zone is publicly owned. Other owners include foundations and the special purpose association for nature and cultural landscape (Zweckverband Natur- und Kulturlandschaft) Drömling. These ownership conditions are of great advantage for a sustainable orientation of the buffer zone in the future.

Transition area:

The transition area includes the landscapes of the Drömling basin proper and, in the northwest and southeast, the transitions to the adjacent Ohre valley. Here, the Ohre as the main watercourse of the Drömling, again with the connected watercourse and dam system, is the connecting element for the UNESCO Biosphere Reserve.

Initially, the biosphere reserve was to cover only the Drömling natural area. The 60 m contour line is usually assumed for this. This also explains why, especially in the Saxony-Anhalt part of the biosphere reserve, many settlements are not located in the transition area. These are located on the drier uplands and not in the Drömling lowlands. Nevertheless, due to the socio-cultural perception of the population of these localities, there is a sense of belonging to the Drömling. In recent years, the surrounding villages have become more interested in the sustainable regional development approach pursued in the transition area. A future expansion of the transition area to include the localities immediately outside the biosphere reserve therefore seems possible. There is reason to hope that the regional development projects already initiated will send positive signals beyond the boundaries of the biosphere reserve, so that the neighbouring localities will also decide to be part of the transition area in the future. For the time being, however, the demarcation in Saxony-Anhalt largely follows the boundaries of the ‚Drömling' Landscape Conservation Area. In Lower Saxony, the original demarcation of the biosphere reserve according to the above-mentioned natural spatial aspects was deviated from, because several localities actively spoke out in favour of being part of the transition area. This consists of the areas of the municipalities of Tülau and Brome, the district of Croya and the village of

Kaiserwinkel, as well as the area of the Mittelland Canal. A large part of the population of the biosphere reserve also lives here. Accordingly, this is also where the greatest potential for testing and researching sustainable ideas for doing business and living together in the region is seen.

In the overall view of the zonation of the biosphere reserve, it is noticeable that the southwestern part has no transition area. Here, the outer boundary of the biosphere reserve again largely follows the natural boundaries of the Drömling. In the southwest, the biosphere reserve extends far into the highly urbanised area of the city of Wolfsburg. For the future, a great potential for an expansion of the transition area is seen here, if the support for this will grow in the local population on the basis of positive experiences with model projects.

It is also striking that the zoning of the transition area in the north still follows the course of the river Ohre for about four kilometres without going any further. Here, an attempt was made to include the Ohre, as a significant natural water body of the biosphere reserve, for the most part in the setting. The transition area here follows the corresponding 'Drömling' Landscape Conservation Area. Here, too, an attempt is to be made to round off the transition area in the future and to include the adjacent municipalities in the biosphere reserve. However, this still requires further participation steps by the local population. It should be mentioned that the designation of the many protected areas in the last 15 years has meant a great effort for the region. Therefore, there is currently a lack of will, especially among the representatives of agriculture, to allocate further areas to the biosphere reserve. Nevertheless, the aim is to expand the area in the future with a view to integrating larger parts of the population in order to expand the development functions.

In the transition area in particular, the initial focus is on the integration of the Lower Saxony and Saxony-Anhalt parts of the area. The cooperation of the municipalities in the Biosphere Reserve's Advisory Board as well as the agricultural advisory service and ESD are important bridgeheads here to achieve this goal.

8. BIOGEOGRAPHICAL REGION

The Drömling lies between two biogeographical regions, on the one hand the Atlantic (ATL – Terrestrial Atlantic Region) and on the other hand the Continental (Central European;

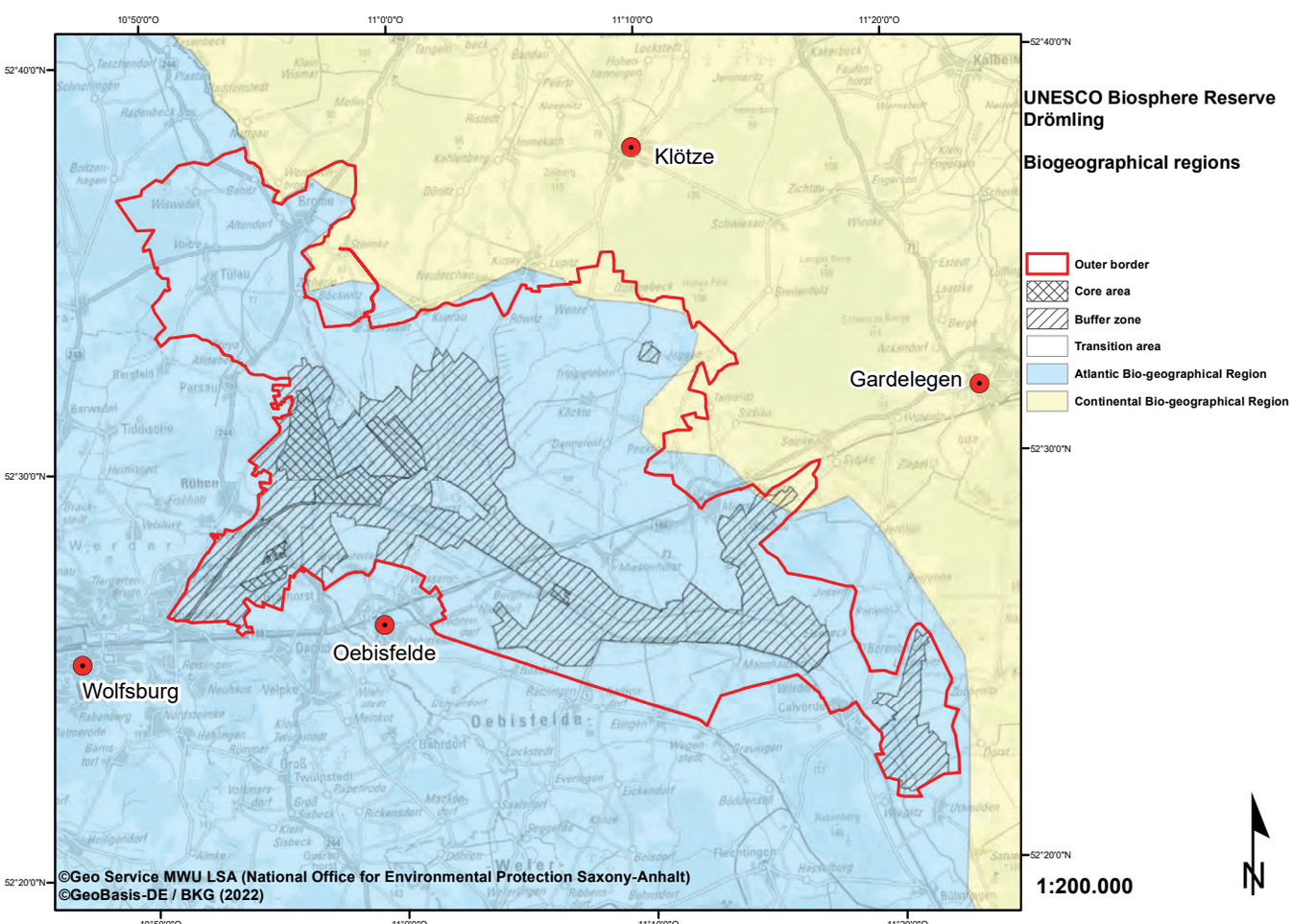

Figure 8: Biogeographical regions of the UNESCO Biosphere Reserve.

CON – Terrestrial Continental Region) according to the European Environment Agency, the European Commission as well as the BfN. The planned biosphere reserve also belongs to the following main natural units in Germany (natural spatial division): D31 (Weser-Aller lowlands) and D29 (Wendland and Altmark). The Drömling belongs to the deciduous forest biome. It is located in the transition region between the Atlantic Province and the Central European Forests. Both provinces are also part of the ‚Palaearctic Empire' (Udvardy, 1975).

9. LAND USE

9.1 Historical use of the Drömling

Around 1000 AD, the first use of the Drömling began with isolated clearings. The Drömling was an impassable forest marsh and therefore lay on the fringes of the neighbouring dominions for many centuries. Individual periglacial valley stands, island-like mounds within the peatland, were settled during this period (Palis & Peitschner, 2010). In 1737, the chronicler Samuel Walther describes the Drömling as a:

> *'Very large, thick, uninhabited copse known from time immemorial [...]. No one can live in the Drömling, partly because of the mire, partly because there is no passage in it, and the wood grows so thickly in it that if you only get 10 or 20 steps into it, you no longer know where you are' (Translated from German).*

The use of the extensive alder swamp forests continued until the middle of the 18th century. In addition to firewood, charcoal and various wooden tools, fences and baskets were produced (Seelig et al., 1996). The most important and for a long time only traffic route through the Drömling can be documented from the 14th century onwards. In the middle of the 18th century, increasing swampiness in the Drömling rapidly worsened the situation of the farmers. As a result, the Prussian King Frederick II ('the Great') ordered the cultivation of the Drömling in 1770. This initiated the transformation of an inaccessible moorland landscape into a cultivated landscape over several phases (Palis & Peitschner, 2010).

In a **first** phase between 1770 and 1805, the Prussian Drömling was reclaimed. The Ohre was regulated, canals and ditches with a total length of about 200 km were constructed. In addition, numerous locks, bridges and four dams were built. In a **second** phase, the Hanoverian and Brunswick Drömling was reclaimed (1864 to 1874). This period also saw the beginning of the cultivation of peatland dams. The resulting meliorated areas were safe to walk on and could be used as pasture or arable land, the ditches for fish farming. The construction of the Mittelland Canal ushered in the **third** phase (1928 to 1935). The Mittelland Canal initially caused a hydrological division of the area into a North and a South Drömling. In addition, the danger of flooding for the Drömling was further reduced, as the canal could absorb water from the Drömling during floods. This meant that water could also be channelled into the area during dry periods. The **fourth** phase took place between 1969 and 1989. With the division of Germany (1949 to 1989), land use developed differently west and

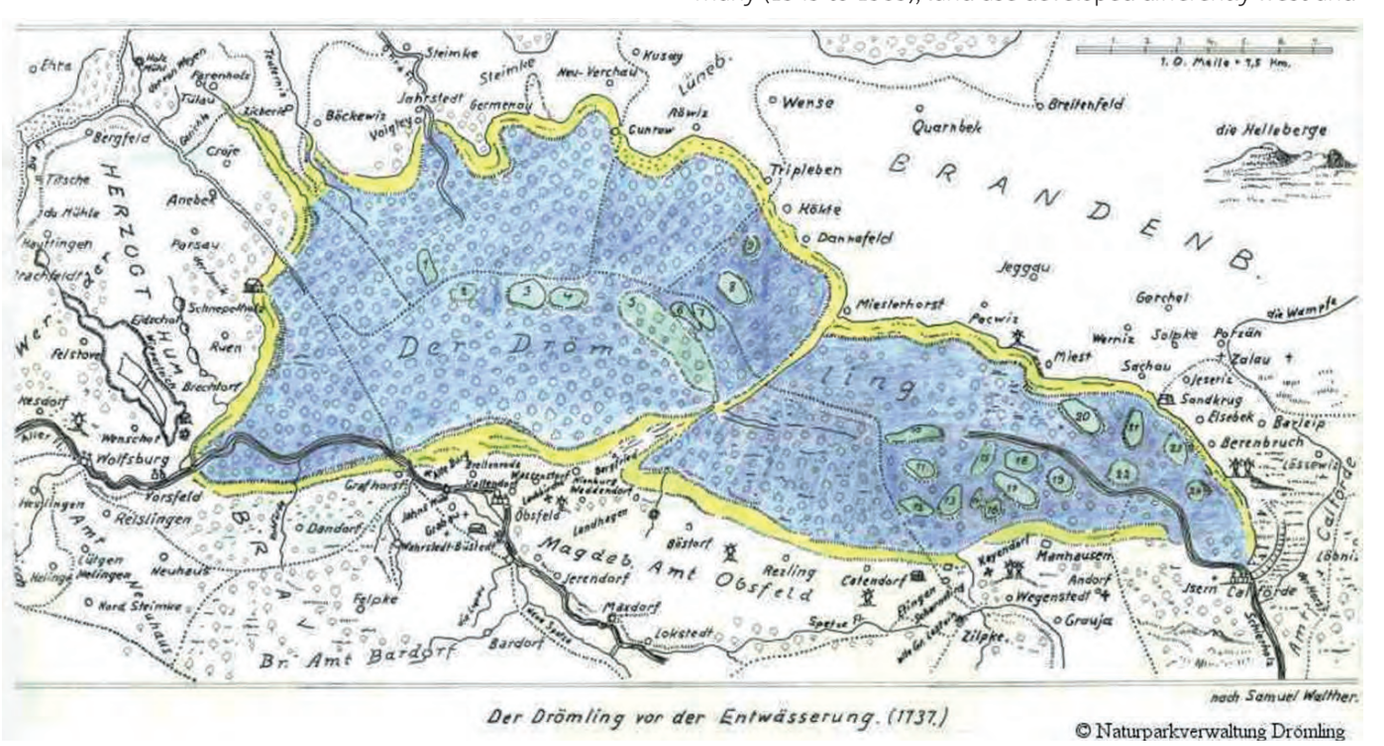

Figure 9: The Drömling before the drainage (1737) after Samuel Walther.

east of the inner-German border (the Wall). In Lower Saxony, small-scale structures still predominate. In Saxony-Anhalt, large areas were further drained in the course of complex amelioration[4]. Moor ditches were filled in and replaced by so-called pond ditches at greater intervals. This resulted in larger plots. Large parts of the grassland were converted into arable land. Thus, within 200 years, large parts of the moor were drained. The once impenetrable forest was almost completely converted into arable land or grassland.

After the melioration phases, activities for the **renaturation and rewetting of the area** began. The funding programme 'Large-scale nature conservation projects' (later better known as 'chance.natur'), launched by the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMU) and the Federal Agency for Nature Conservation (BfN) in 1979, designates significant **areas with nationwide representativeness** in the Federal Republic of Germany in order to place them under protection and safeguard them in the long term. Within this project, large-scale nature conservation projects were carried out in the Drömling in both Lower Saxony (2002 – 2012) and Saxony-Anhalt (1992–2012).

For over 200 years, attempts were made in several melioration phases to drain the formerly impenetrable moorland of the Drömling and to cultivate it for agriculture. With the reorientation of water management in the Drömling after 1990, there was a paradigm shift from purely agricultural drainage to multi-functional water retention. Starting from the core areas with year-round water retention without any drainage, the fen peatlands of the buffer zones are managed as wet as

Excursus – Maintenance Association (Drömling Corporation)

The Prussian administration's realisation that without maintenance and care the created facilities would soon shrivel up again led to the founding of the Drömling Corporation (1805). From then on, all landowners of areas in the Drömling had to pay their maintenance share into a common fund (Palis & Peitschner, 2010).

After the Drömling Corporation was dissolved in the GDR in 1952, the water bodies with wide riparian strips became public property. After 1990, the riparian strips were assigned to the state of Saxony-Anhalt and the municipalities and today form the basis for a unique biotope network system along the Drömling's waters.

The maintenance association ‚Upper Ohre', which is responsible for a large part of the current management of the extensive system of watercourses and dams, is also part of this tradition. Other watercourse maintenance associations look after the ‚Lower Ohre' and the Aller area in Lower Saxony.

Figure 10: Ditch diggers during melioration in the Drömling in the 1920s.

[4] The phase of complex amelioration lasted from 1960 to 1990. The complex reconstruction of the drainage system and flora-forming measures led to the drainage of large peatland sites.

possible with extensive use concepts. Here, rather, the process of cultivation of the Drömling can now be protected. This includes the historical peatland dam cultures and the open grassland complexes in combination with the many widely ramified ditches.

9.2 Main users of the biosphere reserve

A systematic and quantitative survey of the main users of the Biosphere Reserve does not yet exist but will be carried out during the preparation of the framework concept. Therefore, only a qualitative assessment based on the land use for the respective zones can be made at this point. Most of the land in the buffer zones and transition areas is used for agriculture (arable farming and pasture farming). Another user is forestry. Settlements and transport areas also account for a small proportion of land use (see Annex 3).

In the **core areas**, the use of natural resources is prohibited. This also applies to interventions for maintenance. There are no settlement areas in the core areas. The core area is used for environmental education and nature tourism on a few designated interpretive trails.

There are no settlements in the **buffer zone**, only isolated settlements or farmsteads. Agriculture is the main user of the buffer zone. Most of the land is used as grassland and pasture, and under certain conditions for hunting and fishing.

Excursus – 'Horsts' and 'colonies'

A special feature in the Drömling are the individual farmsteads, the so-called ‚Horsts'. They are distributed over the entire area and were usually initially built only on the sand islands relatively protected from floods. From these sites, the inhabitants farmed their arable and meadow land. Examples include Krügerhorst and Birkhorst. Meanwhile, the settlements referred to as ‚colonies' did not emerge directly in the peatlands (e.g., Wassensdorf Colony, Mannhausen Colony) until after drainage work began in the late 18th century (Palis & Peitschner, 2010).

‚Colonies' and ‚horsts' are today important elements in the rural cultural landscape of the Drömling. Some of the former settlements are now only partially inhabited and preserved (LPR , 1996).

Figure 11: Rätzlingen 'colony'

Since traffic routes cross the buffer zone, road users are also among the users of the buffer zone. The Mittelland Canal, a federal waterway with shipping traffic, is one of the transport routes. The Hanover-Berlin high-speed railway line with the parallel Wolfsburg-Stendal trunk line crosses the Biosphere Reserve roughly in a south-westerly and north-easterly direction between Oebisfelde and Mieste.

Forestry plays a subordinate role in the buffer zone. Only about 13% of the Biosphere Reserve‘s area is covered by forest and woody plants, and only a small part of this is managed for forestry. Of the 1,960 ha of forest areas in the buffer zone, around 34% are privately owned (approx. 676 ha). In Saxony-Anhalt, the private forest is managed by the forest management offices of the State Centre for Forests in Klötze, Letzlingen and Flechtingen; in Lower Saxony, the Count Schulenburg Forestry Administration manages its forest areas itself. In accordance with the obligations arising from the large-scale nature conservation project, the 480 ha of forest and 100 ha of woodland belonging to the administration union nature conservation project Drömling/Saxony-Anhalt and the state forest are not managed for forestry purposes, but left to develop naturally.

The settlements of the Biosphere Reserve are exclusively located in the **transition area**. Most of them are even located on the plateaus outside the Drömling basin and thus not directly in the Biosphere Reserve. However, the historical rights of use have always allowed the surrounding communities to use the pastureland of the Drömling. This use explains why they belong to the Drömling. Some communities even still have exclaves in the Drömling (e.g., Tiddische or Jübar).

9.3 Rules of land use and access to biosphere reserve

The basic regulations for land use are provided by laws at the state and federal level (Federal Forest Act, Agriculture Act, etc.), regional and municipal planning instruments (e.g., spatial development plans) as well as directives of the Common Agricultural Policy (CAP) of the European Union on land use and its promotion (requirements for measures, cross compliance, greening, etc.). Specific regulation takes place in particular through the respective ordinances of the protected area categories in the zones. There are no further-reaching, explicit rules under customary law for land use within the biosphere reserve. The biosphere reserve‘s land use is implemented in the spatial-functional planning of the two federal states. There are no rules governing general access to the biosphere reserve.

In Lower Saxony‘s Drömling region, there was opposition from the outset to the designation of a biosphere reserve under state law, since a large part of the biosphere reserve lies in Saxony-Anhalt and the area is also administered from Saxony-Anhalt. From Lower Saxony‘s point of view, the Drömling is not an independent Lower Saxony biosphere reserve and therefore does not require designation under state law.

Core area:

All core areas are completely protected as nature conservation areas. Furthermore, all core area areas are internationally designated as FFH and bird sanctuaries. The only exception is the core area ‘Bekassinenwiese’, which has been designated as a bird sanctuary, but not as an FFH area.

There are differences in the use of the respective core areas in the federal states. In Saxony-Anhalt, there is a general ban on entering the core area. The exception is the core area that is accessible by a path for educational and research purposes. In this case, however, leaving the path is prohibited, and measures to keep the path in the adjacent area remain limited to what is necessary. Subsequently, it is planned to erect information boards at suitable places in order to sensitise visitors to process protection and at the same time to guide them. The core areas are regularly inspected by the forest supervisory bodies and representatives of the Biosphere Reserve Administration.

In Lower Saxony, it is permitted to enter the core areas on public roads. The core areas are left to natural forest development, so any economic use is prohibited in all parts of the area. Process protection has explicit priority over the conservation of existing FFH habitat types.

Hunting takes place in the core areas in accordance with the maintenance and development plan drawn up in both large-scale nature conservation projects as wildlife regulation. In particular, this concerns the avoidance of disproportionately high game damage in the surrounding buffer zones, as occurred in 1995 after 5 years of complete hunting rest in the Saxony-Anhalt core areas, mainly due to massive grassland conversion by wild boar. In addition, there is currently the threat of the spread of African swine fever, which is why several alarm hunts for wild boar are carried out every year.

Buffer zone:

The buffer zones are fully **protected by sovereignty** as nature conservation areas. The rules for land use within the buffer zones (and also the core areas) are therefore also derived from the area-specific conservation purposes or the resulting

protection provisions or prohibitions of the respective nature conservation area regulations. In general, all actions are prohibited that could lead to the destruction, damage or alteration of the respective nature reserve or its components or to a lasting disturbance. Activities under customary law, such as hunting and fishing, are expressly permitted.

On existing agricultural land, land use is permitted in accordance with the principles of good professional practice as laid down in the Land nature conservation laws, in harmony with the aims and principles of nature conservation and landscape management. For example, the conversion of grassland into arable land is not permitted.

Transition area:

The transition area in Saxony-Anhalt comprises the existing landscape protection area ‚Drömling' (Saxony-Anhalt), which also safeguards EU bird protection areas, as well as areas with protected area status according to § 15 of the Nature Conservation Act of Saxony-Anhalt, which are located within the biosphere reserve but not within the landscape protection area Drömling (see Annex 14).

In principle, all actions are prohibited in the landscape conservation area which could destroy or damage the landscape conservation area or individual components thereof, or which could lead to a lasting disturbance and, in particular, to a significant impairment of the defined protected assets.

The regulations for land use within the nature conservation and landscape protection areas are derived from the associated ordinances (see Annex 24 to 30). In the Lower Saxony transition area, protection regulations exist only in the small 'Ohreaue bei Altendorf und Brome' and 'Mittlere Ohreaue' Nature Conservation Areas and the 'Drömling', 'Lütjes Moor' and 'Kaiserwinkel' Landscape Conservation Areas.

A large part of the Lower Saxony transition area has no protection status. Therefore, there are no restrictions on land use here that go beyond the legal and planning rules.

9.4 Differences between women's and men's levels of access to resources

There are no documented differences in access to resources between men and women in the Drömling. Article 3 of the Basic Law applies (Article 3, Basic Law for the Federal Republic of Germany).

10. Polpulation

10.1 Local Communities

The general demographic change in Saxony-Anhalt is characterised by declining population figures, changes in the age structure and selective migration processes (Leibert, 2013). In Lower Saxony, an opposite trend can be observed. There, the population increased in the same period.

Shrinking population figures can therefore also be observed in the biosphere reserve's area. For the evaluation of the population figures for the Drömling, all municipalities that have a share in the biosphere reserve were analysed. The city of Wolfsburg was not taken into account, because this would strongly distort the statistics. The municipalities of Brome, Bülstringen, Jübar and Uthmöden were also not taken into account because they only have shares of the biosphere reserve where no people live.

In the municipalities of Lower Saxony, an increase of about 3,800 people has been observed since reunification, whereas the municipalities of Saxony-Anhalt have shrunk by about 33,700 people. Overall, a negative development can thus be observed. A total of 210,000 people (including the city of Wolfsburg) live in all cities and municipalities that have an area share in the UNESCO Biosphere Reserve. As of December 31, 2021, approximately 15,500 people live in the actual UNESCO Biosphere Reserve Drömling. Of these, about 5,100 live in Lower Saxony and 10,400 in Saxony-Anhalt.

The unemployment rate of 5.8% (2020) is rather low due to the proximity to the business location of Wolfsburg. This is below the average values for Saxony-Anhalt (approx. 7.7%) and at the same level as the entire federal state of Lower Saxony (approx. 5.8%).

The villages of Bergfriede, Buchhorst, Dannefeld, Elsebeck, Frankenfelde, Keindorf, Köckte, Mannhausen, Miesterhorst, Niendorf, Taterberg, Trippigleben, Wenze and Kaiserwinkel as part of the municipality of Parsau, Voitze and Tülau lie entirely within the biosphere reserve. The remaining villages are only partly located within the biosphere reserve or are arranged in chains around the Drömling area (see Annex 2).

10.2 Settlements

In total, there are about 70 smaller and larger settlements in the Drömling or on its edges, which are divided among 15 municipalities (Figure 12). The area balance shows that 4 municipalities (Gardelegen, Oebisfelde-Weferlingen, Klötze and Calvörde) account for almost 75% of the area. It should be noted that most of the municipalities are very extensive and only part of their municipal areas can be assigned to the Drömling in terms of natural space. The community centres immediately outside the proposed biosphere reserve generally have a good basic infrastructure. Self-sufficiency is ensured by several shops, craft enterprises, and in some cases also restaurants and service enterprises. The small villages, districts and colonies directly in the biosphere reserve are poorly developed in terms of infrastructure. The older population suffers most from this.

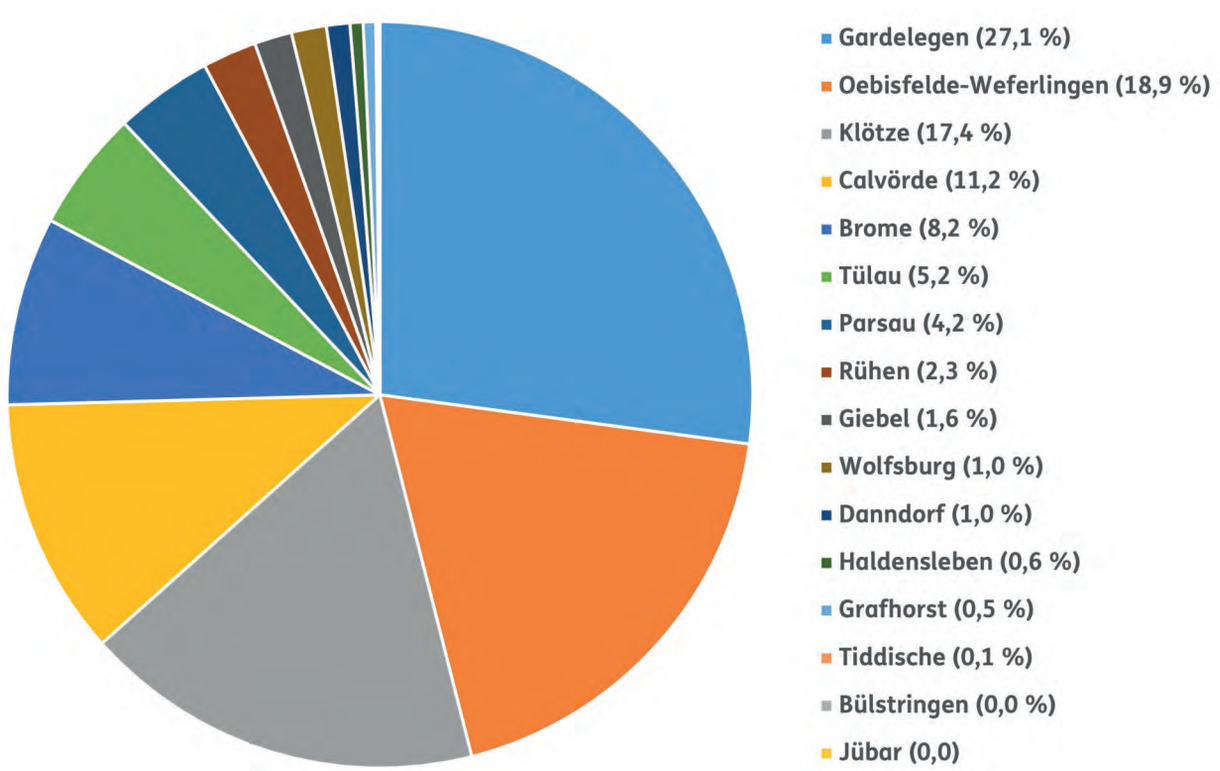

Figure 12: Municipalities with a share of land in the planned UNESCO Biosphere Reserve Drömling.

Figure 13 shows the population development for the most important localities and municipalities in the Drömling. A clear decrease in the population can be observed in the period from 2010 to 2021 (-8%). This decrease is somewhat more pronounced in Saxony-Anhalt (-12%) than in Lower Saxony (-3%). Within a buffer of 50 km are three cities with a population ≥ 100,000 (Braunschweig, Magdeburg and Wolfsburg). In the total catchment area of all municipalities with a maximum distance of 50 km live about 1,400,000 people. If this buffer is extended to 100 km, it includes four more cities with a population ≥ 100,000 (Hanover, Salzgitter and Hildesheim). A survey of the tourist catchment area has not yet been carried out.

Due to its central importance, the development and design of the town of Oebisfelde as the seat of the administrative community has an influence on the overall development of the biosphere reserve. The proximity to Wolfsburg (see Annex 2) is also of particular importance, which means that it offers a high potential for the Drömling with diverse development opportunities with regard to the human-environment relationship. Currently, there is a reciprocal relationship especially for day tourism, local recreation and environmental education, peri-urban settlement development in the western peripheral municipalities as well as the job situation and for the commuter flows related to it.

10.3 Cultural significance

10.3.1 Intangible heritage

Some pre-Christian customs have been preserved in the Drömlings villages. They mostly relate to the course of the year. In some northern villages of the Altmark, the Faslom[5] is celebrated. Young men in disguise go singing from house to house to drive away winter and are given sausages or money in return. In the evening, what has been collected is eaten and the is party goes on until late into the night. In Jahrstedt, the procession is accompanied by a bear figure wrapped in woven straw, the so-called Bärenleier[6].

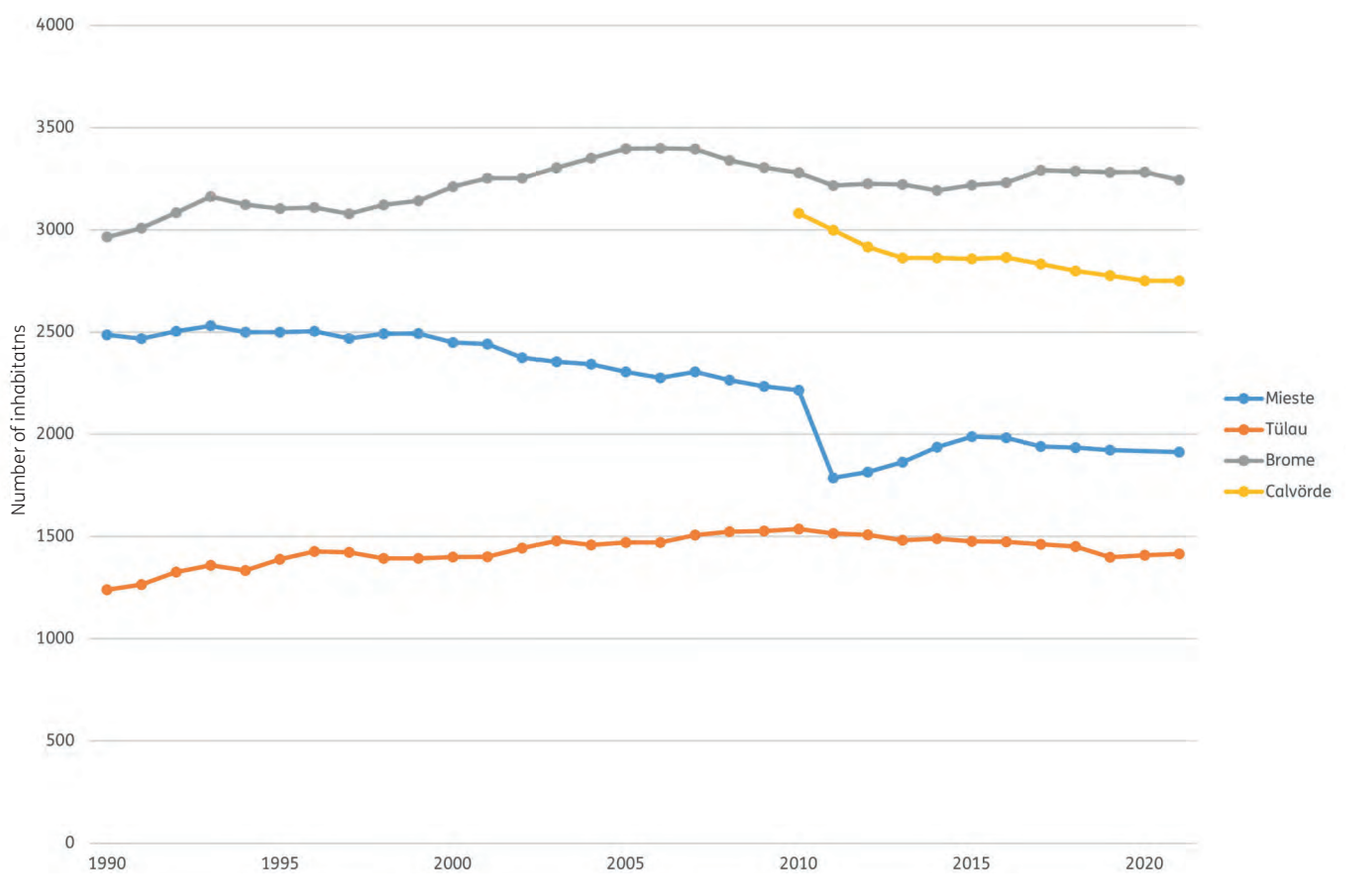

Figure 13: Population development for the localities of Mieste and Calvörde[7] (Saxony-Anhalt) and the municipalities of Tülau and Brome.

[5] 'Faslom' (or Fasslam) is a rural custom in northern Lower Saxony and Saxony-Anhalt to drive away winter.

[6] The 'Bärenleier' is a bear figure that accompanies the Faslom procession.

[7] The municipality of Calvörde was newly founded in 2010 from the former municipalities of Berenbrock (with Lössewitz and Elsebeck), Dorst, Grauingen, Klüden, Mannhausen, Velsdorf, Wegenstedt, Zobbenitz and the district of Calvörde.

Easter fires burn in many places on Easter Saturday. This is to banish winter. The people of the Drömling see Pentecost as the celebration of spring and the liberation of nature. That is why many Pentecost customs have been preserved.

The night of Pentecost Sunday is the 'free night'. There is a certain fool's freedom, accompanied by harmless mischief. Many residents place May greens (*Lonicera nitida*) in front of their gates and doors. In many places people go around singing and asking for gifts during the Pentecost season. The young male villagers go from house to house with the Fischkemeier[8] or Maikerl[9] singing Heischegesang[10]. The Fischkemeier is a person completely involved in birch green whose name remains secret (Rattey, 1989). In Dannefeld, the Maikerl is additionally accompanied by young men who dress up as devils and goblins. These are called Hunnebrössel[11].

On Ascension Day, **an open-air service** has been held at the historic wooden locks in the Friedrich Canal near the village of Dannefeld for about 25 years.

In earlier times, the Altmark was a **centre for hop growing**. In the Drömling region this was mainly limited to the villages of Dannefeld, Mieste, Miesterhorst, Köckte and Röwitz. Hop dams were built around the villages, giving the landscape a typical appearance. Most of the hops were used in Gardelegen, which was one of the largest brewery towns in Northern Germany in the 17th and 18th centuries. In the middle of the 19th century, hop cultivation in the region came to a standstill. Today, some old field names such as Hopfenhorst still refer to the once very widespread cultivation of hops (Palis & Peitschner, 2010).

Cultural associations: The Biosphere Reserve Administration Drömling Saxony-Anhalt is a member of the board of the Cultural Club Drömling. Cultural events are held together.

Local history and tradition associations: The local history and tradition associations are supported by the Biosphere Reserve Administration Drömling Saxony-Anhalt in cultural events.

Landesheimatbund Sachsen-Anhalt e. V. (state heritage society of Saxony-Anhalt): Together with the Landesheimatbund Sachsen-Anhalt e. V., the label 'Kultur-Natur-Pur' (Culture-Nature-Pure) was established with the focus on bringing culture to rural areas. For example, it is possible to move from farm to farm and offer cultural events such as concerts, readings, theme days or lectures. Culture can take place in the most diverse places and in the most diverse ways. A network of associations and volunteers can strengthen culture in the Drömling Saxony-Anhalt biosphere reserve.

Urban-rural network: The network has the task of supporting various local actors through innovative project funding and networking. The Biosphere Reserve Administration Drömling Saxony-Anhalt is a member of the network.

Figure 14: Hunnebrössel in Dannefeld.

[8] The 'Fischkemeier' is a person decorated with leaves or twigs who leads the procession at Pentecost.

[9] The ‚Maikerl' (see Fischkemeier).

[10] The 'Heischegesang' is a custom in which people go around singing to ask for gifts.

[11] The 'Hunnebrössel' (see Fischkemeier).

10.3.2 Museums

The **Oebisfelde castle and local history museum** is located in the former servants‘ quarters of the Oebisfelde castle complex. The collection includes many items from the ‘Drömling museum’, which was located in the castle in the 1950/60s. The museum is not located directly in the biosphere reserve, but its impact extends far into it. On the one hand, many exhibits bear witness to life in the Drömling, and on the other, the building also houses a tourist information centre. Thus, the museum usually serves as a point of contact from which the biosphere reserve can be explored. The castle‘s premises are also used time and again for events organised by the biosphere reserve. The first meeting of the Biosphere Reserve‘s Advisory Board also took place in the castle‘s Knights‘ Hall.

The **Breitenrode local history room** is open to visitors once a month from May to September. Exhibits on the history of the village are on display.

Since 1996, the Böckwitz border and agricultural museum has been presenting its visitors with a lively exhibition on agriculture that spans generations. The museum‘s collection includes more than 10,000 exhibits. Furthermore, the historical uniqueness of the divided double village of Böckwitz/Zicherie on the former inner-German border is presented in a detailed border exhibition. The theme plays a role in many places along the former inner-German border within the biosphere reserve. Growing together with the Drömling in Lower Saxony is also a central theme of the biosphere reserve.

The **museum in Brome** is located in a moated castle from the 12th century. The permanent exhibition focuses on the theme of ‘old crafts’. Many exhibits are hands-on. The museum represents an anchor around which the transition area around Brome can be excellently enhanced and developed. Topics such as old crafts and nature experiences can be linked well with the biosphere reserve. There are also guided tours and themed walks in the Drömling, as well as concerts. There is a castle café, which is a suitable starting point for hikes and cycling tours through the Drömling. The museum is a partner of the biosphere reserve. Most of the visitors are day trippers.

10.3.3 Settlement structure and buildings

Two village forms can be distinguished in the Drömling, which have, however, been reshaped by village extensions. North of the Ohre, **round villages**[12] predominate (e.g., Kunrau, Jeggau, Mieste). The villages south of the Ohre are mostly **street villages**[13] (e.g., Kathendorf, Weddendorf, Breitenrode), although there are also a few round villages. In addition, some exceptions (Angerdorf in Miesterhorst) and mixed forms occur. It can be assumed that the villages belong to different settlement epochs. Another indication of this are the name endings, which are mostly of Slavic origin north of the Ohre and of German origin south of the Ohre (Engelien, 2007).

In 1859, Theodor Hermann Rimpau began building the manor house **Schloss Kunrau** on the immediate northern edge of today‘s biosphere reserve. A student of the famous master builder Schinkel designed the building in the style of the Berlin Zoo villas. Rimpau‘s own ideas and those of the architect resulted in the building with its attached 22.5 m high tower and beautiful stucco work as a harmonious manor house. In 1905, Wilhelm Beseler had the manor house extended into an Italian Renaissance-style palace by adding a stylistic extension around the tower, which until then had stood quite lonely by the house, and by changing the interior design.

There are **half-timbered churches** in Dannefeld, Jeggau, Miesterhorst, Peckfitz, Röwitz, Trippigleben, Wenze and Wernitz. Particularly worthy of mention is the church in Dannefeld with its winged altar from the 16th century and a churchyard portal from 1735. Because the area was poor in fieldstone towards the end of the 18th century, and in the meantime also in wood, material that had already been used before was used to build the church. The carpenters continued to use old timbers that were still stable and healthy enough despite the mortises and notches in the beams. In Dannefeld, they used them to build the rectangular hall church with the three-sided chancel and the indented, distinctive west tower. The church was renovated in 2018 with the help of the German Foundation for Monument Protection. The peasant flag in the Dannefeld church commemorates the expulsion of the Swedes by the Drömling peasants in 1675.

10.4 Language and dialects

The official language in the proposed UNESCO Biosphere Reserve is German. In addition, there are different dialects and dialects in the region. These differ in terms of phonetics, vocabulary and partly also in grammar. The border to the Altmark is also a border of the Low German dialects. In the Altmark, the Altmark dialect is spoken, and in the rest of the Drömling, the Magdeburg-Braunschweig dialect (Palis & Peitschner, 2010). The language area of the Altmark belongs to the Low German language family. Linguistically, this area is

[12] A round village is a village whose houses are arranged in a circle around a square.

[13] A street village is an elongated village whose houses are located along a street.

Excursus – On the origin of the term ‘Drömling’

The Drömling is first mentioned in the History of the Saxons (Res gestae Saxonicae) in the late 10th century AD. In it, the author Widukind von Corvey speaks of a ‘locus Thrimening’. This form of the name is based on the Old Saxon verb ‘thrimmen’ (to jump, leap, move). Analogously, the Middle High German word ‘trëmen’ means to sway (Lexer, 1878).

The Drömling would therefore be a swaying place that moves back and forth – a reference to the muddy ground (Zahn, 1905).

divided into East Altmark, and the area around Osterburg into West Altmark.

Börde Lower German belongs to the Elbostfäl dialect of Low German and is spoken mainly in the Börde district, which lies to the west of Magdeburg. According to recent studies, half of the adults in the Börde villages can still speak Low German, and in some villages up to 80% of adults can understand it (Föllner, Luther, & Sandt, 2002). The UNESCO Atlas of Endangered Languages classifies Low German as an ‘endangered’ language (Moseley, 2010).

11. BIOPHYSICAL CHARACTERISTICS

11.1 Site characteristics and topography of area

The core area of the proposed UNESCO Biosphere Reserve is the Drömling’s lowland, which represents an independent natural unit. The leaching of salt domes in the deeper subsoil created a basin-like depression with an area of approx. 32,000 ha.

Today, the Drömling is the largest contiguous fen within the Middle Pleistocene region. It represents all phases of land development and melioration of a peatland for over 200 years. Today, the peatland includes near-natural swamp forest areas, cultivated meadows interspersed with remnant forests and copses, extensive ditch systems, groundwater-near forest communities on mineral sites and small-scale former peat extraction areas with regenerating moorland vegetation. Due to its specific natural features, the Drömling is a nationally important refuge for endangered animal and plant species (LPR, 1996). The watershed between the Elbe and the Weser Rivers runs through the Drömling. However, the catchment area boundaries in the Drömling cannot be interpreted as exact linear watersheds. Due to the close interconnectedness of the receiving water system with numerous connecting ditches between the individual main receiving waters, a clear allocation – taking into account different discharges in the annual cycle – is often not possible. This is especially true for the Ohre-Drömling, where the receiving water system is even more interconnected than in the southern Aller-Drömling.

11.2 Altitudinal range

The 60-metre contour line is commonly assumed to be the boundary of the Drömling basin. The surface of the Drömling is mostly 55–58 m above sea level and is thus sunken approx. 10– 30 m into the surrounding Pleistocene plateaus (Braumann, 1993).

Highest elevation above sea level: 108 m
Lowest elevation above sea level: 51 m

11.3 Climate

According to the Köppen-Geiger climate classification, the Drömling lies in the area of the Atlantic climate of type Cfb. The climate of the Drömling can be described as moderately continental. Weak Sub-Atlantic influences are visible, among other things, in the distribution pattern of some Atlantic plant species, which have their easternmost occurrences in the Drömling (LPR, 1996). However, the microclimate varies greatly. Due to its basin shape, the Drömling is a natural precipitation sink compared to the surrounding area. In addition, lakes of cold air form regularly, causing a high risk of ground frost and late frost until the beginning of June. In addition, there are extreme temperature fluctuations between day and night due to the high absorption capacity and the poor heat storage capacity of the peatland soil. Thus, it is significantly warmer on sunny days and significantly cooler at night than in the surrounding areas (Seelig et al., 1996). The frequency of fog is high throughout the year (LPR, 1996).

The following data refer to the climate station of the German Weather Service in Gardelegen (see Chapter 11.3.1):

Average temperature of the warmest month: 17.9 °C (July, German Weather Service in Gardelegen 1981/2010)
Average temperature of the coldest month: 0,1 °C (January, German Weather Service in Gardelegen 1981/2010)
Mean annual precipitation: 534 mm (German Weather Service in Gardelegen 1981/2010) at 48 m above sea level

11.3.1 Meteorological stations

The German Meteorological Service operates a full-time climate station in Gardelegen (since 1947) and an honorary climate station in Wolfsburg (since 1931) in the vicinity of the biosphere reserve. The results from Gardelegen are considered the most representative for the Drömling and are therefore used for the descriptions (Figure 15). Directly within the proposed biosphere reserve, there is a volunteer-operated precipitation measuring station in Köckte (since 1969).

11.4 Geology, geomorphologie and soils

The Drömling and its immediate surroundings are tectonically shaped by the Flechtingen-Rosslauer clod in the south, the Calvörde clod and the Altmark adjoining it in the north. The Flechtingen-Rosslauer clod is bounded in the north by the large Haldensleben fault and represents a Hercynian-striking fault wedge. North of it is the Calvörde clod, which is completely covered by Pleistocene sediments. The oldest rocks of the Flechtingen range are greywackes and clay slates from the Lower Carboniferous. The western part of the plateau is made up of red-lying conglomerates, sandstones and siltstones and partly also volcanic rocks.

Excursus – Peatlands and climate change

Organic soils cover about four percent of Germany's total area, of which peatland and fens account for 70 to 75% and bogs for 25 to 30%. Near-natural peatlands, however, comprise only five per cent of all peatlands; more than 90 per cent are drained or in use. Therefore, peatlands are still responsible for more than four percent of Germany's total CO_2 equivalent emissions. Although organic soils account for only about seven percent of agricultural land, inappropriate agricultural use on peatland soils is responsible for about 37% of greenhouse gas emissions from agriculture. In addition to ecological enhancement, rewetting thus also makes a substantial contribution to climate protection. According to the National Strategy on Biological Diversity of 2007, by 2020 regenerable peatlands should be permanently restored, substantial parts of intensively used fens should be extensified and about 20% of extensively used fens should be subject to natural development (BfN).

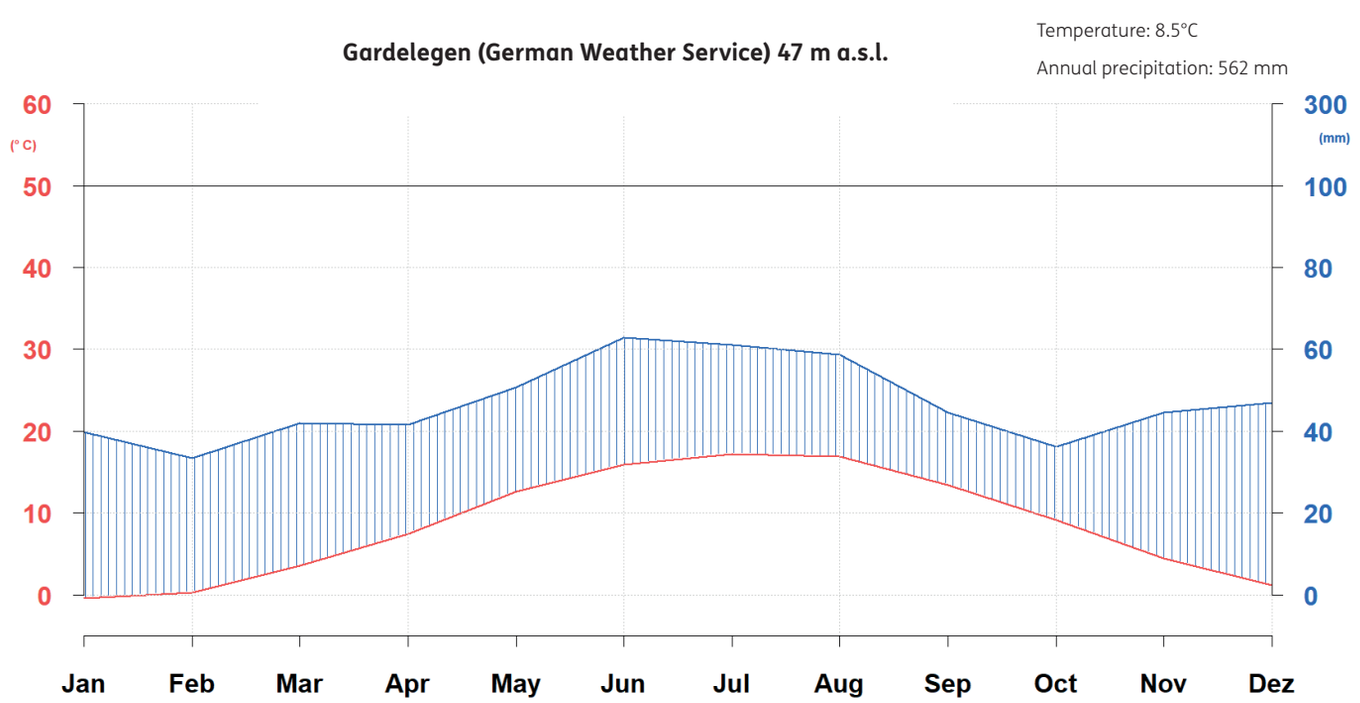

Figure 15: Climate diagram according to Walter of the German Weather Service in Gardelegen for the period from 1981 to 2010.

However, the landscape of the Drömling and its surroundings was significantly shaped during the Quaternary. The southern border of the Altmark was mapped during the Warthe Stage of the Saale Ice Age by the Planke push moraine (Calvörde mountains). This represents a terminal moraine chain that extends as far west as Oebisfelde. The Letzling Heath to the east of the Drömling forms the associated Warthe Stage outwash plain, so that sands were deposited on the northern edge of the Drömling. In addition, the Drömling area was influenced by halotectonic structures. The basin of the Drömling was probably formed by leaching of a diapir of Zechstein salt.

The actual formation of the Drömling is thus marked both glacially and postglacially. On top of the basin-shaped boulder clay of the Elsterian ground moraine, which is up to 30 m thick, lie sands of great thickness. These were mainly deposited as valley sands of the Saale Ice Age period. At that time, the Breslau-Magdeburg-Bremen glacial valley ran through the area of the Drömling. After the primeval Elbe broke through to the north at Hohenwarthe, the drainage was reversed towards the southeast due to the low gradient.

Initially, a large lake formed in the area of the Drömling. Already in the warmer periods of the Weichselian glaciation, the silting up of the lake probably began due to peat accumulation. The peat first filled in gullies and depressions gradually to the almost level surface of today. In this way, a 1 - 2 m thick lowland peatland developed, which covers the entire Drömling except for a few sand horsts (LPR, 1996). With the cultivation of the Drömling about 200 years ago, the process of peat formation largely stopped. Since then, the surface of the peatland has deepened continuously (Seelig et al., 1996).

Today, despite the homogeneous deposits of fen peat, a heterogeneous soil diversity is found. Four main soil areas can be distinguished:

- **Fen-Drömling** with the fens that still exist today;
- **Peatland-Drömling**, parts of the former fen, which today only have a humus content of 15–3% due to bog mineralisation;
- The **wet sandy Drömling**, which is composed of humus-rich sandy soils influenced by groundwater;
- the **dry sandy Drömling**, dominated by half gley, relict gley and spodic horizons.

In the course of reclamation, the entire area of the Drömling was anthropogenically influenced. Lowering of the groundwater, humus depletion, structural changes, over-sanding

Excursus – The challenges of the future climate in the Drömling

The future development of the regional climate in the Drömling depends largely on the global concentration of greenhouse gases in our atmosphere. Various scenarios are used by the *Intergovernmental Panel on Climate Change* (IPCC) to determine how this concentration will develop in the future.

Regardless of the future development of greenhouse gases in the atmosphere and the associated change in the climate, some effects are already being observed. It is getting warmer, both in the summer and winter half-year. This is associated with an increase in evaporation. Precipitation will shift slightly from the summer to the winter half-year. At the same time, extreme weather events (droughts, heavy rain, hail, storms, etc.) increase.

For the fen in the Drömling, the shift of precipitation to the winter half-year in combination with year-round higher temperatures means that the danger of summer dryfall increases. This is then associated with a mineralisation of the bound organic material and an increased release of greenhouse gases.
For agriculture, as the largest actor in the biosphere reserve, the climatic changes initially mean an extension of the growing season. At the same time, however, the need for irrigation for agricultural crops increases.

The shift in precipitation in conjunction with extreme weather events leads to large-scale dieback in the forests, an increase in the risk of forest fires and an increase in storm damage. At the same time, harmful organisms such as certain insects (e.g. oak processionary moth) and fungi can multiply, leading to losses of vitality and biodiversity in the weakened forests (Landesamt für Umweltschutz Sachsen-Anhalt, 2020).

and an associated change in the microbiological condition led to profound changes in the soils.

11.5 Bioclimatic zone

The aridity index was calculated on the basis of the German Weather Service in Gardelegen for the period 1991 to 2010. The mean annual precipitation (P) for the station during this period was **544 mm/a** (German Weather Service Climate Data Center (CDC)). The mean annual potential evaporation (ETP) over grass according to Haude was **706.3 mm/a** for this period (German Weather Service Climate Data Center). This results in an aridity index according to P-ETP of **0.77**.

11.6 Biological characteristics

Based on the current site and stand conditions, it can be assumed that the **potential natural vegetation** on poorer organic wet sites is the alder swamp forest (Carici elongatae-Alnetum, rarely Alno-Betulum pubescentis) and on richer organic wet sites the alder-ash forest (Pado-Fraxinetum). The spatial distribution of the forest communities has shifted to the disadvantage of the alder swamp forest compared to the natural vegetation as a result of groundwater lowering. On the better nutrient-supplied groundwater-influenced soils without organic cover, it can be assumed that there are oak-hornbeam forests.

The current vegetation and **land use,** evaluated with the current CORINE dataset (see Annex 3) for the entire biosphere reserve, consists mainly of meadows and pastures with 40% (ca. 18,360 ha) and non-irrigated cropland with 42% (ca. 19,130 ha). A further 6% of the area is covered by deciduous forest (approx. 2,850 ha) and coniferous forest with 7% (approx. 3,000 ha). Areas with a non-continuous urban character occupy about 814 ha (approx. 1.8%). The remaining 2.5% are divided between forest-shrub transition stages, complex parcels, natural grassland, agricultural land with areas of natural ground cover, and sports and leisure facilities.

An **area-wide mapping** of the Lower Saxony Drömling took place in the course of the large-scale nature conservation project. On the Saxony-Anhalt side, the area of the former nature park and the nature reserve 'Klüdener Pax-Wanneweh' were mapped. In the two federal states of Saxony-Anhalt and Lower Saxony, different mapping keys were used for mapping the biotope and use types, which have also been changed again in recent years. The different mapping methods must be harmonised for the biosphere reserve in order to be able to apply a uniform method in the future.

The most important habitat and use types are listed below. For further details, see Chap. 14.

11.6.1 Peatlands, fens, marshes and reedbeds – LOCAL

Importance: Carbon sequestration and water retention

Natural processes: Peat formation, succession, flooding and summer drought

Human impacts: Drainage, material input, peat extraction, agricultural use

Typical features/character species: Reed beds and reeds: common reed (*Phragmites australis*), great manna grass (*Glycerietum maximae*), reed canary grass (*Phalaridetum arundinaceae*), pond sedge reedUferseggenried (*Caricetum ripariae*) or acute sedge reed (*Caricetum gracilis*), common cottongrass (*Eriophorum angustifolium*) and purple marshlocks (*Potentilla palustris*), peat moss species (*Sphagnum squarrosum*, *Sphagnum fallax*), round-leaved sundew (*Drosera rotundifolia*).

Areas	Average annual rainfall / mm	Aridity index		Core areas	Buffer zones	Transition areas
		Penman	(UNEP-Index)			
Hyper-arid	P < 100	< 0.05	< 0.05			
Arid	100 – 400	0.05 – 0.28	0.05 – 0.20			
Semi-arid	**400 – 600**	0.28 – 0.43	0.21 – 0.5			
Sub-humid						
Dry Sub-humid	600 – 800	0.43 – 0.6	0.51 – 0.65			
Moist Sub-humid	800 – 1,200	**0.6 – 0.9**	**> 0.65**	•	•	•
Per-humid	P > 1,200	> 0.9				

Table 3: Aridity index when applying potential evapotranspiration (P/ETP) according to Penman using the United Nations Environment Programme index (UNEP index). Mean annual precipitation (P)/mean annual potential evapotranspiration (ETP).

Excursus – Peatland management in the Drömling

The two maintenance and development plans for Lower Saxony and Saxony-Anhalt recommend a year-round overstory for the fen body in the core area. In the buffer zone, however, the grassland is to be used economically. Therefore, after a winter overflow, the target water levels are kept at about ground level until the end of May, if possible. On the one hand, this should prevent the groundwater levels from sinking below the peat layer in summer, but on the other hand it should allow the wet grassland to be used from July onwards. However, the 20-30 cm groundwater level in average years is a balancing act between maintaining the peatland and agricultural cultivability. In wet summers, there is often water on the land, so that it is regularly not used and can only be used much later in the year or in the following year. The ways currently found together with agriculture to preserve grassland as agricultural land even when mowing is suspended and when maintenance cuts or grazing are carried out at other times are to be expanded and further developed in the future. The acceptance and participation of the farms is usually good here, as many areas adjacent to the wet zones have benefited from the increased water levels in the buffer zones in dry years in particular and have produced a good agricultural yield.

However, the dry years 2018 - 2020 also showed that the water supply in summer was not sufficient in many areas to prevent groundwater levels from dropping below the peat layer. That is why a feasibility study is to be launched in 2022 to investigate the transfer of water from the Mittelland Canal, an artificial waterway, to the Drömling. In view of the predicted climate changes with even less precipitation and higher temperatures in summer, the opening of an additional irrigation possibility may prove existential for the fen landscape of the Drömling. Otherwise, there would be increased loss of peatlands, the decline of moisture-bound species and biotopes, and increased greenhouse gas emissions.

11.6.2 Water bodies (rivers, natural eutrophic lakes, still waters) – REGIONAL

Natural processes: Water dynamics from fluctuating water levels, drying out and flooding, erosion and sedimentation, material turnover, natural water retention

Human impacts: Construction of dams, groundwater extraction, straightening, regulation of water levels, angling, local recreation, e.g., canoeing
Main water bodies: Ohre, Aller, Mittelland Canal, network of ditches and canals, Rimpau peatland dam cultures (40 km/km² watercourse length)

Typical features/character species: Rivers: Ohre, Aller, Mittelgraben, Kunrauer Vorfluter, Kalter Moorgraben, Flötgraben and some side ditches. **Natural eutrophic lakes:** Meadow ponds, pond ditches, moor dam ditches

11.6.3 Forests – REGIONAL

Natural processes: Natural forest dynamics from regeneration and decay

Human impacts: Forestry use, hunting, local recreation, groundwater lowering

Typical features/character species: Moor birch-alder forest: (LOCAL) (Vaccinio uliginosi-Betuletum pubescentis): Moor birch (*Betula pubescens*), purple moor-grass (*Molinia caerulea*) und bottle sedge (*Carex rostrata*). **Sedge-alder forest** (Carici elongatae-Alnetum glutinosae): Common alder (*Alnus glutinosa*). **Bird cherry-alder-ash forest** (Pruno-Fraxinetum): European ash (*Fraxinus excelsior*), common alder (*Alnus glutinosa*), moor birch (*Betula pubescens, B. pendula*), bird cherry (*Prunus padus*). **Starwort-oak-hornbeam forest** (Stellario holosteae-Carpinetum betuli): Mall-leaved linden (*Tilia cordata*), common oak (*Quercus robur*), common hornbeam (*Carpinus betulus*). **Moor grass-oak- forest** (Holco mollis-Quercetum incl. Molinio-Quercetum): Common oak (*Quercus robur*), moor birch (*Betula pendula*) und mountain-ash (*Sorbus aucuparia*)

11.6.4 Greenland – REGIONAL

Natural processes: Succession, winter flooding

Human impacts: Grazing, drainage, extensification or inten-

sification of use, underuse up to fallow, targeted flooding of the areas

Typical features/character species: Cabbage thistle wet meadow (Angelico sylvestris-Cirsietum oleracei), big trefoil wet meadow (Loto uliginosi-Holcetum lanati), originally also smooth brome meadow (Senecio aquatici-Brometum racemosi). **Extensive grassland**: Occurrence of common meadow species. **Hydrophilous tall herb fringe communities:** Hemp-agrimony (*Eupatorium cannabinum*), meadowsweet (*Filipendula ulmaria*), valerian (*Valeriana officinalis*), yellow loosestrife (*Lysimachia vulgaris*), yellow flag (*Iris pseudacorus*). **Marshy grassland**: Water foxtail (*Alopecurus geniculatus*), creeping buttercup (*Ranunculus repens*), creeping bentgrass (*Agrostis stolonifera*). **Lowland hay meadows**: Creeping buttercup-tussock grass meadow (Ranunculo repentis-Deschampsietum cespitosae) or carrot-bulbous oat grass meadow (Dauco carotae-Arrhenatheretum elatioris). **Nutrient-poor grassland** and arid hem vegetation: Maiden pink-thrift community (Diantho deltoides-Armerietum elongatae). **Molinia meadows:** Sneezewort (*Achillea ptarmica*), wood anemone (*Anemone nemerosa*), sweet vernal grass (*Anthoxanthum odoratum*), black sedge (*Carex nigra*), carnation sedge (*Carex panicae*).

11.6.5 Woody plants – REGIONAL

Natural processes: Succession

Human impacts: Tree maintenance and impacts during trench maintenance

Typical features/character species: Grey willow shrubs, for example, are developed along peatland dams, and rose-blackthorn shrubs on Drömling dams. Riparian shrubs and row plantations along ditches consist of e.g., English oak (*Quercus robur*), common ash (*Fraxinus excelsior*), but also fruit trees and hybrid poplars (*Populus × canadensis*). The stands of sugar maple (*Acer saccharum*) at prominent points are conspicuous.

11.6.6 Agricultural land – REGIONAL

Natural processes: Succession

Human impacts: Fertilisation, mowing, cultivation and harvesting of crops, soil cultivation, use of plant protection products

Typical features/character species: Cultivation of rye, barley, wheat, oats, maize and potato. **Orchard meadows** are located at historical settlement sites, the colonies: Apples, pears, plums, damsons

11.6.7 Settlements

Natural processes: These are exclusively anthropogenically created areas. It is difficult to exclude natural processes.
Human impacts: Sealing, fragmentation of the landscape, noise and pollutant input

Typical features/character species: Typical of the settlement biotopes is their punctual or linear occurrence. The settlement biotopes are interlinked with the open countryside in combination with hedge and woody structures. Examples: Smaller villages with structurally rich home gardens with old trees and fruit trees. Settlement areas consisting of stables, supply and disposal facilities, silos as well as traffic areas, especially paved paths and roads as well as active or disused railway facilities.

12. ECOSYSTEM SERVICES

12.1 Ecosystem services and their beneficiaries

Currently, there are no research activities related to ecosystem services in the planned UNESCO Biosphere Reserve Drömling. In the following, the ecosystem services are listed in a summarised overview in key points and a qualitative manner. Based on the Lima Action Plan, the planned UNESCO Biosphere Reserve also aims to implement the SDGs in connection with ecosystem services. According to the nomination requirements, the ecosystem services are divided into groups based on the Millennium Ecosystem Assessment (Kowatsch et al., 2011).

12.1.1 Utility services

Food: Food and fodder are partly grown on the arable land. The direct beneficiaries of the food grown are the farmers themselves and regional and national consumers. Animal husbandry is supplied with the cultivated fodder. The grazing areas are also used to supply the local livestock. In addition, meat and milk are produced. Another source of food for local residents and supra-regional consumers is game meat from deer, red deer and wild boar hunting. Anglers occasionally obtain food by taking fish from the waters of the Drömling. Mushrooms, berries and wild herbs collected in nature also serve as food. Honey from local beekeepers is also marketed regionally as food by the Biosphere Reserve Administration. Fruit from meadow orchards and avenue trees also serves as food for the regional population of the proposed UNESCO Biosphere Reserve.

Raw materials: The economic importance of the renewable resource wood plays a minor role in the proposed UNESCO Biosphere Reserve, as only about 11% of the area is covered by forest. Material use is made both of the managed state forest areas (in Lower Saxony) and of private forest areas managed by the state (in Saxony-Anhalt), e.g., in the pulp mill in Stendal and in the chipboard factory in Nettgau. The beneficiaries are the owners of the forest areas. In earlier times, the branches of the willow were used for the production of willow baskets. However, this tradition has almost died out.

Energy: Firewood from the few forest areas of the biosphere reserve is a source of heating energy. The beneficiaries are the owners of the areas who cut their own wood, or occasionally regional consumers who buy firewood. The mown grassland is either used as fodder or for the production of biogas in appropriate plants. The beneficiaries are the farmers who sell the grassland vegetation and the operators of the biogas plants. In addition, wood chips are produced from the pruning of the peatland dam ditches. These are produced by farmers themselves or by contractors and are usually used for combustion in heating plants. The production of renewable energy through wind power does not play a role in the Drömling. On the one hand, because this is excluded by nature conservation area and landscape conservation area regulations. On the other hand, because the areas with wind potential are located around the Drömling and not in the lowlands. For this reason, the three wind farms Rätzlingen/Lockstedt, Kusey/Neuferchau and Sichau were arranged around the Drömling for spatial planning purposes. There are also some larger solar energy plants. The beneficiaries are the operators of the plants and the consumers of the electricity generated.

Genetic resources: In grassland, there is a reservoir of plants on the remaining species-rich areas whose seeds could be used for hay mulch sowing[14] with regional plants. In a project trial for the lowland hay-meadow, this procedure for species enrichment has already been successfully tested on an impoverished area. The beneficiaries are the managers or owners of the grassland in question.

12.1.2 Regulatory services

Water filtration and regulation: A great filtering effect can be attributed to forest, grassland and peatland soils. Precipitation is effectively filtered in the soil and its runoff is regulated. During the change to the summer half-year, the saturated soils still serve as water reservoirs, at least initially. Before 1990, the water management use of the Drömling was almost exclusively geared to the intensification of agriculture, but at the same time there was a drinking water protection area for the Colbitz waterworks. The Ohre water is taken from Satuelle and pumped to the Colbitz-Letzlinger Heide. There it is mixed with heath groundwater and transported to Magdeburg. Although the drinking water protection area has been reduced in size in the meantime and no longer includes the Drömling, the importance of good Ohre water quality is still measured by the supply of drinking water to the greater Magdeburg area. The drinking water supply of the city of Wolfsburg is based on groundwater from the Drömling inflow area. The Drömling also serves as a flood retention area, and large parts of it are designated as flood plains on official maps. The beneficiaries of this natural storage and buffer function in the Drömling basin are the inhabitants of the Wolfsburg and Magdeburg metropolitan areas and, due to the improved drainage and retention of near-surface groundwater in the ditches, all land users in the Drömling.

Since the implementation of the measures of the large-scale nature conservation projects, large areas, especially in the core and buffer zones, have been deliberately flooded. The fen sites are to be flooded outside the vegetation period until the peat soils are saturated with water. This is to prevent the shrinkage of the peat body. At the same time, flooding reactivates important plant and animal dispersal routes (e.g., transport of marsh marigold seeds [Caltha palustris], fish spawn) of the wetlands. Winter flooding also maintains and improves the resting place function of the Drömling for protected bird species. Spring flooding creates the necessary site conditions for many plant and animal species to select breeding sites (e.g., water areas or vegetation-free areas) or conditions for successful reproduction (e.g., amphibians).

Air quality: With its large, protected zones of forest and grassland ecosystems and the resulting absence of large industrial plants, the Drömling contributes to supplying the surrounding area with fresh air. The beneficiaries are the inhabitants of the Drömling and the residents in the direct air catchment area of the Drömling. The formation of a cold air lake can be observed throughout the Drömling basin, which cools the surrounding area on hot days.

Carbon storage: The peatland body in the Drömling has acted as a carbon sink since the Pleistocene. Maintaining the functions of the peatland body through adapted management and water retention is one of the main objectives for the biosphere reserve. In this respect, the Drömling can serve as a good example for other lowland moor areas. And at the

[14] Hay mulch seeding or mown grass application is the application of seed or mown grass from neighbouring properties to the species-poor meadow.

same time, the preservation of the peatland body contributes to the targets of the federal government and the federal states to reduce future greenhouse gas emissions from peatland soils.Cultural services

12.1.3 Cultural services

Recreation and aesthetics: The varied cultural landscape of woodland and open land interspersed with many ditches has a very aesthetic and in part almost park-like character. Both residents and visitors appreciate the Drömling as an excursion destination. With the initiated development of local tourism infrastructure and improved marketing, the local population will also benefit from this in the future through the value chains to be developed.

Cultural heritage: The Drömling has a high cultural-historical significance. These include, for example, the castle and old town of Oebisfelde, Kunrau Castle, the old town of Calvörde or the many half-timbered or fieldstone churches in the region. But also small and hidden buildings such as bridges, ruins or border fortifications tell the turbulent history of the region.

In recent decades, the region has been strongly influenced by its location on the former Inner German border. Relics such as wall remains, watchtowers, barracks and the stories from this time can be experienced in many places in the western Drömling. The Drömling also offers a multifaceted rural culture (village life, Low German dialect, customs, traditional crafts).

Many festivals and traditions (e.g., Drömling Festival, Klötzer Besenbinder Festival, Bärenleier in Jahrstedt, Hunnebrössel in Dannefeld or the Calvörde festivities) are part of the cultural offer. The beneficiaries are local residents and regional and national visitors (BTE, 2015).

Spirituality and familiarity: Most residents know the Drömling as a region. This goes hand in hand with identification and familiarity with the Drömling natural area, and a feeling of home is created.

12.1.4 Basic services

The ecosystem services that form the basis for the existence of all ecosystems are not further elaborated here for the planned UNESCO Biosphere Reserve Drömling. They are supporting processes that cannot be separated or quantified for each ecosystem.

12.2 Evaluation of functions based on ecosystem services

So far, no indicators have been developed or applied to assess the biosphere reserve functions (conservation, development and logistics) (see Chapters 14.1.4, 15.1.2). This requires a scientifically exact method. At this point, reference must be made to the future framework concept for the planned UNESCO Biosphere Reserve (see Chapter 17.4) and to the Integrative Monitoring Programme for Large Protected Areas (Kowatsch et al., 2011). This has not yet been applied to the Drömling but is being planned. In the context of these projects, the crucial ecosystem services should also be quantified.

12.3 Biodiversity in the provision of ecosystem services

One of the main objectives in the Drömling is to safeguard the diversity of species and forms of a cultural landscape influenced by groundwater and characterised by forest and grassland sites, and to preserve and restore natural ecosystems of wet and humid sites.

Very valuable forest areas are located in the core areas. The grassland areas of equal value to the Drömling, on the other hand, are mainly located in the buffer zone. Here they are interlocked with the watercourses and merge into them. It is this **diversity of ecosystems and animal and plant species** that makes the Drömling a special landscape. The special conservation purpose of the Drömling results from this diversity. However, biodiversity is also a reason for many visitors to visit the Drömling. Among other things, biodiversity provides the basis for tourism in the Drömling.

These areas are home to the remaining populations of many endangered and threatened animal and plant species. This also means a reservoir of **genetic diversity** for species that are already extinct elsewhere and that can spread out again from the Drömling, which has served as a last refuge up to now (see Chapter 14).

12.4 Evaluation of ecosystems

So far, no assessment of ecosystem services has been carried out for the Drömling Biosphere Reserve (see Chapter 12.2), but this will be taken into account in the preparation of the framework concept.

13. MAIN OBJECTIVES FOR THE BIOSPHERE RESERVE'S DESIGNATION

13.1 Main objectives of the proposed biosphere reserve

The development of the Drömling into a model region for sustainable regional development has already been given a boost by the broad public discussion process of the last few years, and even more so in the phase of preparing the UNESCO application. Starting with the establishment of a Drömling information centre, a wide range of activities have taken place in the field of tourism, including the first publication of a cycling map for the UNESCO Biosphere Reserve in 2021. In the coming years, further efforts will be made to not only expand the range of hotels and restaurants, but also to link them to **regional cycles and value chains**. Under the umbrella brand 'Drömling', the brand 'Drömlingsrind' is to be successfully put into practice and gradually supplemented by other regional brands. The Drömling Festival, which has been held twice so far, is to be permanently established as a cultural hotspot and expanded by a variety of decentralised events under the label 'Culture-Nature-Pure' for the perception and further development of the regional identity. This range of offers, supplemented by thematically wide-ranging offers of guided tours, excursions and education for sustainable development by certified nature and landscape guides, is intended to meet the current trend towards holidays in Germany in a new quality. One current challenge is the intention to construct large-scale open-space photovoltaic plants in the transition area of the Drömling Biosphere Reserve. Here it is necessary to find a consensus among the population and with the municipalities and authorities that possibly combines the aspects of energy production, nature and landscape conservation as well as regional value creation through integrative model approaches.

The greatest importance for the long-term preservation of the Drömling cultural landscape lies in **securing agricultural use**. In particular, the wet grassland management and the management of the moor dam cultures with the maintenance of the dense ditch system are currently heavily dependent on temporary funding opportunities from EU programmes. Finding sustainable solutions for the future in connection with the establishment of regional value chains for grassland and woody plant growth, meat marketing, etc. is both a task and a criterion for success in preserving the Drömling fen landscape.

With the application for **international recognition** as a UNESCO Biosphere Reserve, the area hopes for a noticeable impulse for the further development of the human-environment relationship in the Drömling and beyond. The focus is on the holistic conservation and development of the area with its landscape, cultural, social and economic values and functions, as well as the promotion of sustainable uses, regional value chains and the sustainable development of the area in all economic and living areas. Of particular importance for the Drömling is the long-term establishment of uses compatible with conservation objectives, which are to be continued and further developed in dialogue with the managers (Drömling Inter-Länder Working Group, 2016).

At the same time, the area is recommended as a learning, experimental, research and model region that can make a valuable contribution to the world network of biosphere reserves and to the fulfilment of the Lima Action Plan, the Sustainable Development Goals and especially the **UN Decade for the Restoration of Degraded Ecosystems**. Based on the special features of the region, the following concrete development perspectives or main objectives are aimed at, which should give the region a unique selling point or a distinctive profile in the network of biosphere reserves:

- **Development of a model region that exemplarily researches, communicates and implements the unique interplay between the historically unique land use and water management with the current challenges of peatland protection and climate change (prevention and adaptation);**
- **Development/preservation of the uniqueness of the Drömling as a landscape of remembrance, which was shaped by the former Inner German border location, and careful transformation in the sense of an inner/common regional identity.**

Within three years after designation as a UNESCO Biosphere Reserve, a framework concept will then be developed, which will address the vision, guiding principles, goals, measures and projects of the entire Drömling more concretely and with the involvement of broad sections of the population (see Chapter 17.4; Falter et al., 2018).

13.1.1 Conservation function

The site-specific conservation objectives for the Drömling Biosphere Reserve, which spans several federal states, are to **conserve, develop and restore**:

- The performance and functionality of the natural balance;
- The characteristic bird communities of the open and semi-open cultural landscape;

- The extensive open landscape as a transit, resting and wintering area of European importance;
- The natural and near-natural quarry and moist forests;
- The extensive watercourse network by means of watercourse maintenance and care adapted to the conservation objectives;
- The culturally and historically significant peatland dam cultures;
- The water balance typical of the area and the preservation of water quality and peatland soil properties;
- The historical avenues of useful trees (pears, plums, oaks).

Excursus – From protection from water to protection of water

The use of water as a resource in the Drömling has changed considerably over the last 250 years. Initially, the aim was to drain the formerly impenetrable swamp. The Mittelland Canal was also laid in such a way that the Drömling could be drained via it. It was not until the reorientation of water management on the basis of the Nature Park Regulation of 1990 that a change began here. The maintenance and operation of the more than 250 dams were now geared to increased water retention, and a new and hitherto unique path was taken towards uniform management and financing of the dam system.

Not least in the last three dry years from 2018 to 2020, there was rather a deficit in the Drömling, and it can be assumed that this will worsen in the course of climate change. That is why a central demand, especially from agriculture, was to develop proposals to improve the water balance of the Drömling. The update of the cross-state water management model for the approx. 2,200 km of watercourses in the Drömling region, which will be jointly commissioned by the states of Saxony-Anhalt and Lower Saxony in 2019, is intended to create the basis for developing proposals for solutions with regard to the requirements of peatland protection and groundwater protection on the one hand and the need for agricultural irrigation for locations remote from groundwater on the other.

13.1.2 Development function

In cooperation with local authorities and stakeholders in the region, it is planned to take up and further develop the following **thematic priorities and development goals** within the framework of model projects across the federal states (Länderübergreifende Arbeitsgruppe Drömling, 2016):

- Sustainable regional development with a focus on establishing value chains in product marketing (especially also increasing product availability), tourism and education for sustainable development (ESD);
- Intensification of an advisory management geared to the biosphere reserve with a focus on sustainable land use systems on fenlands;
- Cross-state water management of the Drömling on the basis of the update of the cross-state water management model for the Drömling;
- Development of proposals for solutions to improve the water balance of the Drömling with regard to the requirements of peatland protection and groundwater protection on the one hand and the need for agricultural irrigation for sites remote from groundwater on the other;
- Development of proposals for solutions to improve the water balance of the Drömling with regard to the requirements of peatland protection and groundwater protection on the one hand and the need for agricultural irrigation for sites remote from groundwater on the other;
- Preservation of the settlement structures typical of the landscape with an alternation of village settlements, the existing scattered settlements, the so-called colonies and settlement-free areas, and overall, by avoiding additional built structures in the outer area.

The **tourism and marketing concept** is to be updated with regard to the development goals of the biosphere reserve together with the elaboration of a framework concept (see Chapter 17.4). The necessary coordination is taking place in the Tourism Working Group, in which, in addition to the Biosphere Reserve Administration and the Drömling municipalities, businesses and volunteers from the region are also represented. The aim is to find a tourism vision for the Drömling that is supported by a broad consensus, which on the one hand encompasses the development goals of the entire biosphere reserve and on the other hand is perceived by all participants as goal-oriented and feasible.

13.1.3 Logistics function

The new path of broad public participation in the sense of the MAB programme, which was taken in the discussion and development phase with the local population from 2014 onwards, is to be consistently continued and expanded. Since 2019, the Biosphere Reserve Administration has already been operating advisory and cooperation networks in the fields of agriculture, partner enterprises, education for sustainable development and regional brands.

These are to be extended to the areas of renewable energies, water management and research. In this sense, the development of the Drömling Biosphere Reserve into a sustainability and quality region, here above all with the claim of preservation and ecologically and economically sustainable development of the unique fen landscape, is to be filled with life.

Specific development objectives for the logistics function of the proposed UNESCO Biosphere Reserve include:

- Establishment of new forms of participation for the updating of the goals and the participation in measures from the thematic working groups of the Advisory Board
- New edition/continuation of the training of certified nature and landscape guides
- Expansion of activities in the field of education for sustainable development (ESD) and public relations, in particular updating of the concept and expansion of the range of offers to the Lower Saxony region and beyond the borders of the biosphere reserve
- Creation of new decentralised information points in the biosphere reserve, project implementation of the Natura 2000 Information Centre Buchhorst and the Nature Station Rühen.

13.2 The sustainable development objectives

With the strategies, objectives and measures presented in this application, the planned UNESCO Biosphere Reserve Drömling can contribute to numerous international agreements, such as the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD) or the Paris Agreement on Climate Change. In the context of the biosphere reserves, their function as model regions for the implementation of the **Sustainable Development Goals (SDG)**, which are specified in the Lima Action Plan for the Biosphere Reserves in an implementation-oriented manner and are to be integrated into the national indicator system in the future, is essential. Under the title ‚Transforming our world: the 2030 Agenda for Sustainable Development', the UN General Assembly resolution comprising 17 goals and 169 sub-goals was adopted in 2015. It is considered a guideline for sustainable development, especially for model regions like the Drömling. The following graphic and tabular list shows selected priority areas that result from the regional characteristics and strengths as well as objectives. It can be seen that in particular the conservation and restoration of water-bound ecosystems in connection with climate change and sustainable (energy) use as well as the supporting education and research component form the essential and unique functional structure for the strategic and supra-regionally significant orientation of the biosphere reserve.

Another essential mandate stems from the current **UN Decade for the Restoration of Degraded Ecosystems** 2021 to 2030, which builds on the UN Decade of Biological Diversity 2011 to 2020. This UN Decade has already been signed by more than 70 states, including Germany, and a large number of important international organisations. The UN Decade aims to restore degraded or destroyed ecosystems and to anchor awareness broadly in society.

In order to achieve the Paris Agreement on climate protection, the functional capacity of peatlands is of particular importance. 'The Paris Agreement implies the rewetting of 500,000 km² of drained peatlands worldwide by the period between 2050 and 2070. In Germany, approximately 50,000 ha per year [...] would have to be rewetted to achieve this goal' (Meßerschmidt, 2021).

Rewetted peatlands are to be considered functionally different from near-natural peatlands. For these and many other reasons, experts are calling for an increase in research activities on rewetted peatlands. The Drömling Biosphere Reserve is ideally placed to develop as a state-wide and international centre of excellence on the ‚path back to the peatlands'.

Figure 16: SDG fingerprint for the Drömling Biosphere Reserve according to functions. The larger the target symbol, the more important is the international responsibility of the region to fulfil it. In the course of the discussion on the framework concept, new goals may arise or priorities may shift.

13.3 Main stakeholders involved in the management of the biosphere reserve.

At the joint cabinet meeting in Helmstedt in 2014, the state governments of Lower Saxony and Saxony-Anhalt decided to set up a **cross-state working group**. The task of the working group was to explore the possibilities for the development of a UNESCO Biosphere Reserve across the federal states and a uniform area development in the Drömling with the involvement of regional actors.

The cross-border working group is composed of representatives of the ministries responsible for nature conservation and landscape management of both federal states, the Biosphere Reserve Administration Drömling and the district of Gifhorn, which also represents the district of Helmstedt and the city of Wolfsburg. In order to ensure the highest possible degree of transparency and the consideration of the most diverse interests of those affected in the discussion process leading to a UNESCO Biosphere Reserve, the meetings of the cross-state working group were held at regular intervals with an extended group of participants.

This included all municipalities, the locally founded interest groups, professional representatives (especially from agriculture and water management) as well as large landowners and nature conservation associations. As a rule, 40–70 people took part in the events.

Partner businesses: see Chap. 15.4.2
Farms: see Chap. 15.3.1
Volunteers: see excursus in Chapter 16.2.1
Local Action Group 'Rund um den Drömling' (Around the Drömling): see Chap. 15.4.1

Beyond the discussion process on the development of the biosphere reserve, communication and cooperation structures have been in place for years, the most important of which are listed below.

Advisoryboard: As an independent advisory body for the development of the biosphere reserve, a trans-regional advisory board was set up at the beginning of 2021. The interest groups of the region are represented on it. The work of the **Advisory Board** is to be understood as complementary to the cooperation with the existing bodies. The Biosphere Reserve Advisory Board contributes to the conservation and development of the biosphere reserve. It promotes the local population's understanding of the value of the biosphere reserve and the tasks associated with it. It submits suggestions for the conservation and development of the area to the Biosphere Reserve Administration and other authorities (see Appendix 11).

Associations: Through the regional Association for the Promotion of Environmental Education in the Drömling Nature Park (Verein zur Förderung der Umweltbildung im Naturpark

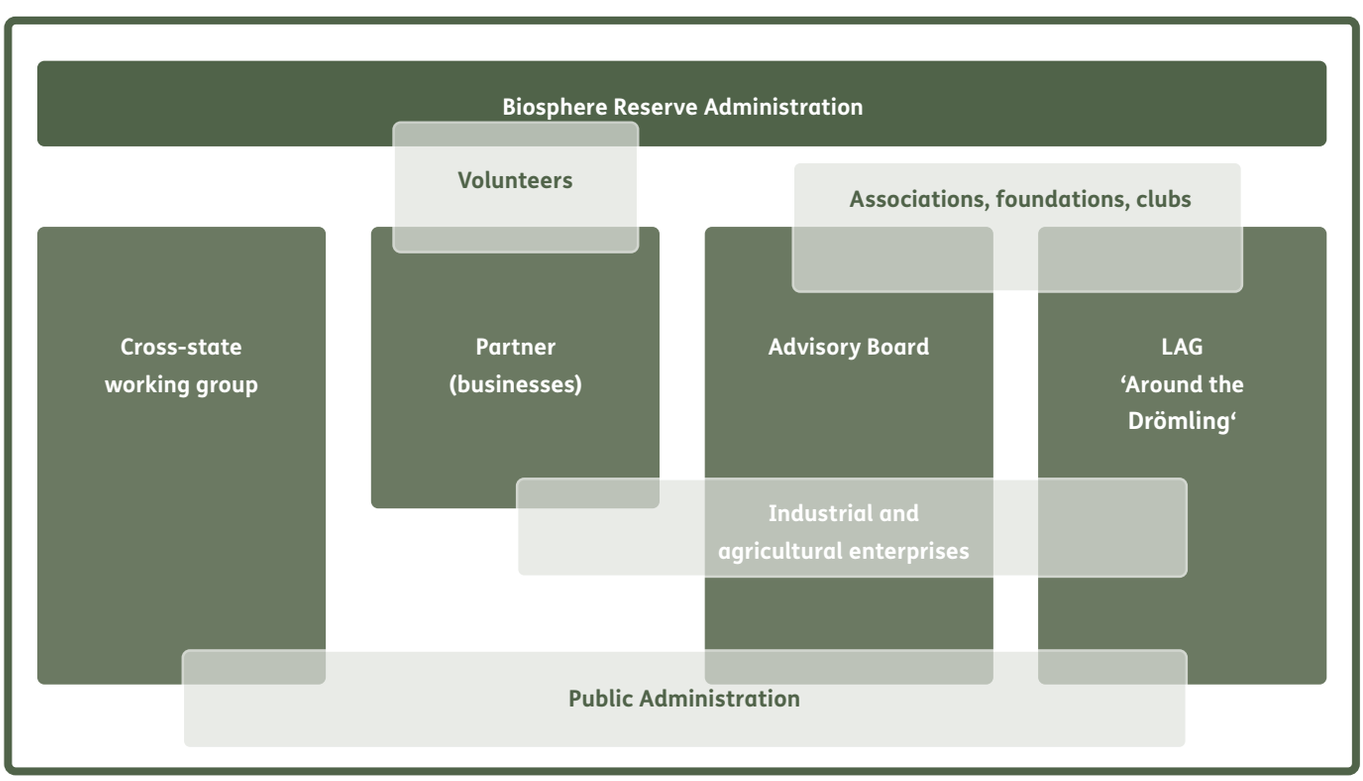

Figure 17: Stakeholders in the UNESCO Biosphere Reserve Drömling.

Drömling e. V.), several projects are usually carried out each year to support the work of the protected area administration. Private sponsors are also regularly involved, albeit on a modest scale. The nature conservation association 'Aktion Drömlingschutz' (Action Drömling Protection) was founded specifically for the Drömling area and is involved in local nature conservation projects, especially in land acquisition in the core areas.

Foundations: In the Drömling Biosphere Reserve, three foundations, as landowners of several hundred hectares, support the development of the biosphere reserve in line with the conservation objectives. The ‚Stiftung Naturlandschaft' (Natural Landscape Foundation), a foundation of the Lower Saxon Federation for the Environment and Nature Conservation Germany, has primarily acquired land in the core areas and thus contributed to the elimination of conflicts of ownership and use. The 'Stiftung Umwelt, Natur- und Klimaschutz' (Environment, Nature and Climate Protection Foundation) of Saxony-Anhalt mainly owns land along the Green Belt.

While natural forest development is taking place in the core areas along the state border, joint projects with the Biosphere Reserve Administration are planned in the open land area over the next few years to enhance the areas and provide information. In 1992, a business partner (AUGUST STORCK KG, one of the world's largest confectionery manufacturers) was won over to implement a white stork conservation programme in the Drömling with the foundation 'The Stork Foundation –Storks for our Children'. Since then, about 422 ha have been acquired in five project areas to enhance them as habitats for the white stork.

Clubs: The 'Zweckverband Natur- und Kulturlandschaft Drömling' (Drömling Nature and Cultural Landscape Association) was originally founded to implement the Drömling/Saxony-Anhalt large-scale nature conservation project. Today, the association manages and develops over 4,000 ha of grassland as well as forest and water areas in the Drömling Biosphere Reserve under nature conservation aspects.

The management of the Drömling waters in terms of the maintenance and development of the area is achieved through cooperation with the maintenance associations 'Obere Ohre' and 'Untere Ohre', with the Aller-Ohre Association and the Biosphere Reserve Administration Drömling both through the uniform management of the dam system and through the biotope networking of water bodies and water body margins (see also excursus in Chapter 9.1).

13.4 Consultation procedure used for designing the biosphere reserve

In the cross-state working group, objectives for the planned biosphere reserve were formulated with the involvement of the various interest groups, and a map of the area was drafted. The result was a jointly supported key points paper (see Annex 37).

The 14-page final version of the key issues paper, including a map of the area, was then sent to all contributors in April 2016, published simultaneously on the internet and presented in the regional press and on the radio. In addition, the contents of the key issues paper were summarised on four pages in the first courier called 'Drömlingskurier No. 00' and 23,500 copies were distributed to all households. On the one hand, this achieved the maximum possible transparency and, on the other, laid the foundation for the subsequent participation phase of the municipalities and towns in the Drömling. In 2016, all municipalities in Lower Saxony and Saxony-Anhalt with shares in the area of the proposed UNESCO Biosphere Reserve Drömling were asked to vote on whether they were in favour of an application for recognition as a UNESCO Biosphere Reserve.

At around 40 public meetings in the local, municipal and city councils of both countries, as well as at numerous bilateral meetings, representatives of the then nature park administration and the district of Gifhorn once again presented the planned steps in detail to the political representatives of the municipalities. By March 2017, it was possible to obtain positive votes on the application from all municipalities, in some cases under certain conditions.

The designation of the Drömling Saxony-Anhalt Biosphere Reserve was also accompanied by a public participation procedure on the draft ordinance. In October 2018, the text of the ordinance, maps and explanatory report were sent to around 120 addressees and publicly displayed in the municipalities and authorities concerned. The public participation procedure for the biosphere reserve ordinance was intensively accompanied by the press and radio. Once again, numerous appointments were made by the then nature park administration to explain the recommendations for resolutions on the opinions of the administrations in some municipal representations, mostly in committee and council meetings.

Comments received were weighed up by the Saxony-Anhalt Ministry for the Environment, Energy and Climate Protection and substantive changes or additions were made accordingly. Minister Prof. Dr. Claudia Dalbert sealed the 'Regulation the Drömling Biosphere Reserve Saxony-Anhalt' with her signatu-

Excursus: From Nature Park to Biosphere Reserve

In the run-up to German reunification, the 'Drömling Nature Park' was established in Saxony-Anhalt by the last GDR People's Assembly on 12 September 1990. This had a size of 27,800 ha and already covered a large part of the natural unit of the Drömling. The idea of a cross-border Biosphere Reserve Drömling also arose in 1990 during the first nature conservation contacts between Lower Saxony and Saxony-Anhalt. With the implementation of large-scale nature conservation projects on both sides of the border, the feeling of togetherness among all stakeholders grew. At the end of the two large-scale nature conservation projects in 2012, the cross-border project of a Drömling Biosphere Reserve was initiated from within the region. In continuation of the top-down nature park designation, this represented a milestone in the further development of the regional culture of participation.

By taking this step towards becoming a biosphere reserve, the region hopes to secure long-term support for the preliminary work on nature conservation. The cross-state approach is also intended to dissolve borders, strengthen cultural identity and develop the regional economy in a context that goes beyond the historical natural area.

re at the fifth extended state-cross working group meeting. It entered into force on 29 June 2019 following its promulgation in the Saxony-Anhalt Law and Regulation Gazette (GVBl. LSA 2019, 127) and repealed the 'Regulation on the Establishment of Nature Conservation Areas and a Landscape Conservation Area of Central Importance as the Drömling Nature Park of 12 September 1990' (see Chapter 17.1). The update of the Lower Saxony Regional Planning Programme takes up the intended application for recognition of the Drömling as a UNESCO Biosphere Reserve. Within the framework of the formal procedure, there was again an opportunity for participation.

A diverse range of opinions was expressed in the various participation processes. By its very nature, any significant change in regional orientation represents an intervention in established structures and processes, accompanied by fears, worries and concerns about adverse impacts. In addition, there are still reservations along the border of the two federal states, which are owed to the different development of the two areas before reunification.

In any case, the long-term and comprehensive participation process to establish a biosphere reserve that is ultimately generally recognised and accepted has led to a change in the regional participation culture and created a climate of trust for further cooperation.

13.5 Stakeholder involvement for implementation and management

As an independent advisory body for the development of the biosphere reserve, a trans-regional **advisory board** was set up at the beginning of 2021. The interest groups of the region are represented on it. The work of the Advisory Board is to be understood as complementary to the cooperation with the existing bodies. The Biosphere Reserve Advisory Council contributes to the conservation and development of the biosphere reserve. It promotes the local population's understanding of the value of the biosphere reserve and the tasks associated with it. It submits suggestions for the conservation and development of the area to the Biosphere Reserve Administration and other authorities (see Appendix 11).

The Wolfenbüttel Forestry Office, as part of the **Lower Saxony State Forest Management Organisation**, looks after about 1,280 ha of forest in the biosphere reserve. Of this, about 750 ha are natural forest areas. These are the Allerauenwald and almost the entire Große Giebelmoor. These stands are completely left to natural forest development. There is no management here.
Bilateral agreements are reached with the foundations active in the Drömling. In addition, the Saxony-Anhalt Foundation for the Environment, Nature and Climate Protection (SUNK) is a member of the Biosphere Reserve's Advisory Board.

The **Drömling Conferences** are to continue to be held as information and discussion events in an open format for all participants in order to ensure that a broad public has opportunities to participate in the development of the biosphere reserve and to inform them about the work of the Biosphere Reserve Administration.

Independent of the designation as a biosphere reserve, there is very intensive cooperation at the **direct bilateral level** between the Biosphere Reserve Administration, the municipalities and the users. Especially with the 150 farms operating

here, there are consultations on land use once or several times a year, as a result of which, as a rule, jointly supported solutions are found to safeguard the conservation objectives.

13.6 Main sources of resources (financial, material and human)

The Biosphere Reserve Administration in Saxony-Anhalt has budget allocations with its own management office in the state budget. The Land of Lower Saxony already makes a corresponding financial contribution to the Biosphere Reserve Administration for personnel and material resources on the basis of the administrative agreement, with a view to carrying out tasks that extend beyond the boundaries of the federal states. This is to be maintained.

Financial resources In 2017, the Biosphere Reserve Administration had an above-average budget compared to the other years, as material resources amounting to 1.4 million euros were allocated via the Saxony-Anhalt state emergency environmental programme (see Table 4).

The future budget of the Biosphere Reserve Administration will be financed on the basis of the administrative agreement (June 2019, amended May 2021) of both Länder. In this agreement, the federal states have agreed on an annual budget of 100,000 euros (personnel costs including a lump sum for material costs related to persons) and a lump sum for material costs (equipment for specialist tasks/publications/promotion of junior rangers) of 10,000 euros per year for 2019. The Lower Saxony contribution to personnel costs is to be successively increased to 116,200 euros by 2023. For the period after UNESCO recognition, Lower Saxony will adjust its funding.

Depending on the project, other funding instruments will also be sought for individual sub-areas. Detailed planning will be developed in the course of preparing the framework concept (Part III: Measures and Projects).

Material resources: The Biosphere Reserve Administration has its headquarters in Oebisfelde and an information centre in Kämkerhorst. The properties of the Biosphere Reserve Administration at the headquarters in Oebisfelde, at the information centre in Kämkerhorst and at the Natura 2000 information centre in Buchhorst are owned by the State of Saxony-Anhalt.

Human resources: Currently, 23 permanent employees work in the Biosphere Reserve Administration. Of these, one belongs to the higher and ten to the senior state service. Of these, three have a university degree, three a university of applied sciences degree and three a technical college degree. In addition, there are eight employees in the intermediate civil service and four in the lower civil service (see Figure 18). Due to the expansion to include Lower Saxony's Drömling region, the number of staff is to be further increased.

The Biosphere Reserve Administration has a total of four places in the Voluntary Ecological Year and Federal Volunteer Service programmes.

Year	Personnel funds	Material funds	IT budget	Research and service budget	Environmental projects	EU-Third-party funds (EAFRD)	Total
2015	906,700	437,500	20,950	105,700	-	-	1,470,850
2016	852,400	370,750	60,950	72,000	105,900	-	1,462,000
2017	921,700	349,400	48,600	47,400	1,425,500	-	2,792,600
2018	1,014,400	310,000	51,200	73,500	-	94,200	1,543,300
2019*	1,083,000 (100,000)	351,400 (100,000)	25,300	96,200	115,400	199,000	1,870,300
2020*	1,153,000 (100,000)	360,400 (100,000)	32,200	82,500	198,400	17,900	1,844,400
2021*	1,162,900 (100,000)	329,100 (100,000)	35,400	151,000	74,500	-	1,752,900

Table 4: Financial resources (€) of the Biosphere Reserve Administration

***Since 2019, the federal state of Lower Saxony has contributed to the personnel and material resources (see Annex 9). The Lower Saxony share is in brackets.**

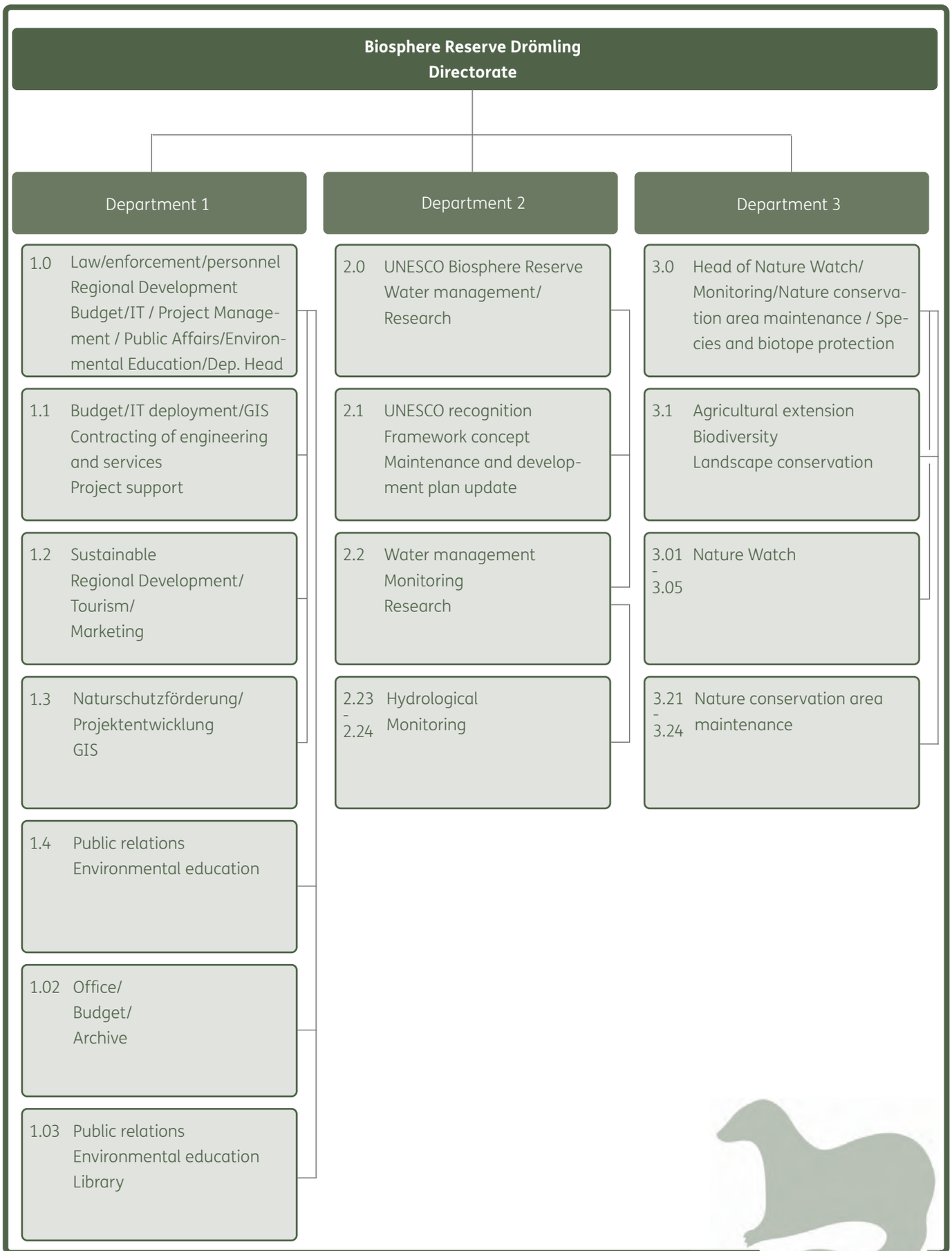

Figure 18: Biosphere Reserve Administration organisation chart.

Each number corresponds to a staff position.

14. CONSERVATION FUNCTION

14.1 Landscapes and ecosystems

14.1.1 Location of ecosystems and land cover types

Peatland ecosystems: Only relicts of the lowland peatland, which originally covered almost the entire area of the Drömling except for a few stands, remain today. Large reedbeds, large sedge-reeds or transition mires and quaking bogs are found in the core areas and buffer zones on the Stauberg mountain, in the Jeggau peatland and along lines of peatland dam ditches. Peatlands and fens can also occur in the agro-ecosystems of the Drömling. With regard to EU Directive 92/43/EEC (Habitats Directive), a habitat type is of importance for peatland ecosystems:

- Transition mires and quaking bogs (FFH habitat type 7140)

Water ecosystems: The Drömling is located in the former Breslau-Magdeburg-Bremen glacial valley. In addition, the watershed between the catchment areas of the Weser and the Elbe Rivers runs directly through the Drömling basin. The Aller River drains into the Weser River, the Ohre River into the Elbe River. Due to anthropogenic deformation, such as the construction of drainage and flood relief ditches, a clear demarcation of the two catchment areas is not possible. Due to its location in the border area of the Weser and Elbe catchment areas, the Drömling is also highly relevant for aquatic ecosystems. Today, the Drömling has an extensive network of watercourses that dissects the landscape and is closely interwoven with the other ecosystems. The protection of this ecosystem is based on this cultural landscape, which has grown for over 200 years, and its great importance as a habitat for endangered animal species. Of particular importance according to EU Directive 92/43/EEC (Habitats Directive) are the following:Natürliche und naturnahe nährstoffreiche Stillgewässer mit Laichkraut- oder Froschbiss-Gesellschaften (FFH LRT 3150)

- Natural eutrophic lakes with Magnopotamion or Hydrocharition (FFH habitat type 3150)
- Water courses with the Ranunculion fluitantis and Callitricho-Batrachion vegetation (FFH habitat type 3260)

Forest ecosystems: The current forest vegetation is characterised by diverse land use influences. Due to the meliorative lowering of groundwater and the resulting peat sacking and depletion, alder swamp forests are hardly found any more. The stands have changed into alder-ash forests. A number of nitrogen-loving species in the forest ecosystems indicate nutrient release as a result of peat depletion. Furthermore, the structure of the alder and ash forests indicates historical coppice use. In recent decades, the stands have often been converted into alder forests. These utilisation influences are also recognisable in oak and oak-hornbeam forests. The forests of the higher-lying valley sand areas have partly been converted into coniferous forests. Spruce has been introduced in small areas for hunting reasons. Nevertheless, large areas of hardwood forests have also been preserved, which also clearly indicate earlier middle forest management.

Forest ecosystems cover about 13% of the biosphere reserve‘s area. Nevertheless, the forest ecosystems are largely formed by protected habitat types according to Annex I of the EU Directive 92/43/EEC (FFH Directive) (*= priority habitat types):

Figure 19: Forest succession on a fen in the Jahrstedter Drömling core area.

- Luzulo-Fagetum beech forests (FFH habitat type 9110)
- Asperulo-Fagetum beech forest (FFH habitat type 9130)
- Sub-Atlantic and Medio-European oak or oak-hornbeam forests of the Carpinion betuli (FFH habitat type 9160)
- Old acidophilous oak woods with *Quercus robur* on sandy plains (FFH habitat type 9190)
- Bog woodlands (FFH habitat type 91D0*)
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (FFH habitat type 91E0*)
- Riparian mixed forests of *Quercus robur*, *Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia* (FFH habitat type 91F0)

Agroecosystems: Evaluations of the land cover 'CORINE Land Cover' data (2018) revealed that approx. 42% of the area of the biosphere reserve is occupied by non-irrigated farmland. Today, large-scale grassland complexes exist in the Drömling, which are structured by smaller wooded areas and copses. Wet meadows have developed in areas influenced by dams with higher groundwater levels. These are embedded in lowland hay meadows and extensive grassland. Bedding meadows develop on heavily wetted, late-mown areas. The grassland is largely used for mowing or grazing.

Some protected habitat types according to Annex I of EU Directive 92/43/EEC (Habitats Directive) occur on the grassland areas:

- Molinia meadows (FFH habitat type 6410)
- Hydrophilous tall herb fringe communities (FFH habitat type 6430)
- Alluvial meadows of river valleys of the Cnidion dubii (in Anklängen, Lower Saxony) (FFH habitat type 6440)
- Lowland hay meadows (FFH habitat type 6510)

Settlement ecosystems: Larger settlements are almost completely absent in the proposed UNESCO Biosphere Reserve, with the exception of a few smaller settlements and the colonies already mentioned. Industrial and commercial units are mostly located on the outskirts of the settlements. The home gardens and orchards are also located there. The home gardens in combination with hedges are mostly interlocked with the adjacent open land. The area of the proposed UNESCO Biosphere Reserve is criss-crossed by paths and traffic areas such as roads and railway lines. The Mittelland Canal also divides the area into North and South Drömling. Due to the degree of sealing and the punctual and diffuse input of pollutants, settlement ecosystems are to be assessed as disadvantageous for the protection of water and soil.

14.1.2 State and trends of the ecosystems and land cover types

Peatland ecosystems: Near-natural peatlands occur only in very small areas in the Drömling. They are wooded peatlands with birch bog woodland (bog woodland, FFH LRT 91D0) and open peatlands with various peat bog and sedge communities (transition mires and quaking bogs, FFH habitat type 7140). The areas with birch bog woodland are located in the core area and are thus subject to self-dynamic development. In the open peatlands within the buffer zones, emerging woody plants are removed in the course of landscape management. The protection of shallow groundwater and the prevention of nutrient inputs for these sites are ensured.

On the other hand, the rewetting measures of both large-scale nature conservation projects in Lower Saxony and Saxony-Anhalt focused on the forest sites on fenland, which are still present today as alder swamp forest, but which were used and often changed in historical times, as well as the wet meadows and wet grasslands on fenland. Through the closure of drainage ditches, the construction and reconstruction of dams and changed regulations for dam management, further peatland decline could be stopped, except in part, however, for the three dry years from 2018 to 2020.

Water ecosystems: The measures on water bodies focus on the objective of improving the water balance typical of the area, i.e., to achieve an increase in groundwater levels in the area by means of impoundments. These measures are linked to the objective of safeguarding the peatlands. The priority given to the water balance means that goals for restoring the ecological continuity of watercourses can only be achieved in priority areas along the major watercourses. In recent years, seven fish ladders have been built in the Ohre and in the Sichauer Beeke Rivers. Special importance is attached to watercourse maintenance as a maintenance measure for the preservation of the exclusively artificial watercourses. In accordance with the two watercourse maintenance plans drawn up for the large-scale nature conservation project, the Drömling watercourses are maintained in a spatially and temporally staggered manner.

Repeated mapping of the ditch vegetation has revealed an enrichment of the species inventory over the years, which can be attributed to successful nature conservation measures. Negative development trends are mainly associated with increasing sedimentation processes due to lack of ditch clearance and shading due to increasing scrub encroachment. Occasionally, strong algal development indicates eutrophication (LPR, 2006).

Forest ecosystems: In the last 200 years, the formerly extensive quarry and moist forests have been converted into arable land and grassland in the course of several melioration stages. Especially in the core areas and in the buffer zone in the Klüdener Pax-Wanneweh nature conservation area, there is still a large stock of near-natural forests. The biotope composition of these forest areas often corresponds to the potentially natural vegetation to be expected. The forests are richly structured and have a high proportion of old wood. These near-natural forests with their rich stratification and structure are particularly worthy of protection.

The core areas are excluded from forestry use. Here, succession is permitted so that the wet peatlands there can develop via reed and herbaceous stages into a complex of natural forests of alder swamp forest, alder-ash forest, oak-hornbeam forest and Molinia-oak forest. However, this does not preclude the natural development of open bogs and bog birch scrub forests. The core areas of the Giebelmoor peatland and the Breitenroder-Oebisfeld Drömling have the status of a natural forest. In combination with the core area Böckwitz-Jahrstedter Drömling, where closed forest vegetation will also develop in the medium term through succession, the contiguous natural forest area in the Drömling will grow to 1,470 ha. Since the implementation of the two large-scale nature conservation projects, rewetting has been promoted in the core areas. In the medium and long term, succession will also lead to the formation of the forest FFH-habitat type typical of the Drömling in the areas of the maintenance and transition areas owned by the public sector. In all core areas, succession is given priority over the still existing open land FFH habitat type.

In the last 30 years, new forests have been established mainly in the Drömling in Saxony-Anhalt. More than 100 ha of forest, often on former arable land, have been established through compensation and replacement measures for the German Unity transport projects and as part of the Drömling/Saxony-Anhalt large-scale nature conservation project. In Lower Saxony's Drömling, the forest area remained stable over the same period. However, in the course of the NGP, around 25 ha of former spruce forests were converted into alder forest and around 400 ha of commercial forests were converted into natural forests (Kaiser et. al., 2018).

Agroecosystems: The main user in the primary economic sector is agriculture, which manages about 84% of the proposed biosphere reserve area.

Landuse	Buffer zone		Transition area	
	[ha]	[%]	[ha]	[%]
Arable land	900	6.4	18,530	62.9
Grassland	11,535	81.6	6,827	23.2

Table 5: Management of the agricultural area in the maintenance and transition areas with percentages in relation to the total area of the respective zone.

While the long-term safeguarding of the conservation objectives on the majority of the grassland currently appears to be secured by the current conditions of use and support, there are two opposing tendencies – especially on farms that no longer keep livestock. On the one hand, there is the interest in intensifying mown grassland to supply biogas plants, and on the other hand, there is under-utilisation in order to minimise the effort of cultivation and thus the costs. Further problems exist for wet grassland on lowland moorland, because the general decline in livestock numbers and the changing quality of the growth require new utilisation options.

Particularly since the 1960s, species impoverishment has been observed on mowed grassland communities (e.g., habitat type 6510) in Saxony-Anhalt. The reasons are excessive fertilisation, bringing forward the first use and an increase in the frequency of use.

However, when comparing extensively used grassland over time, a conspicuous upgrading could be observed in the Drömling. This can be attributed to the omission of fertilisation and the maintenance of use in accordance with the standby mowing and grazing.

One problem of grassland extensification for the development of species-rich nutrient-poor meadows and wetlands is the lack of a seed bank in the soil. As a result, the stands can restructure under extensive use and take on a clear diversity of formations, but species enrichment does not occur. In the Drömling, too, it must be assumed that species richness has only increased on those areas where the relevant species have survived intensive use vegetatively or as seeds, or where there are still species-rich neighbouring grasslands that act as donor areas (TRIOPS / LPR, 2007).

A potential threat to grassland ecosystems comes primarily from a change in management. Fallowing would cause the medium-term disappearance of many rare and weakly competitive plant species. Intensification of management with fertilisation, ploughing and increased cutting frequency would also lead to species impoverishment.

Organic farming is taking up an ever larger share of agricultural land. In 2021, 909 ha in the buffer zone and 3,136 ha in the transition area were managed according to organic standards. This corresponds to a share of 10.7% of the agricultural area of the Drömling Biosphere Reserve. This share of organic farming is thus higher than that of Saxony-Anhalt at 9.1% (press release MULE No. 50/2020) and significantly higher than that of Lower Saxony at 4.7% (Lower Saxony Ministry of Food, Agriculture and Consumer Protection, 2020).

In addition, numerous farms have voluntarily committed themselves to agri-environmental and climate measures. As of 2021, this applies to a further 3,743 ha or 10.0% of the agricultural area, which is managed according to more extensive criteria than those prescribed in the protected area regulations (see also Chapter 15.3.2).

Special example of habitat type development: With regard to the habitat types, the maintenance and development plan 2007 carried out a comparative evaluation for the 10,340-ha nature reserve 'Ohre-Drömling' compared to the initial survey in 1994/1995. It was found that the proportion of habitat types with very low and low value levels decreased. At the same time, an increase in habitat types of medium and high value was determined. The last proportion in particular once again underlines the overall very positive development of the Drömling out of an intensively used cultural landscape.

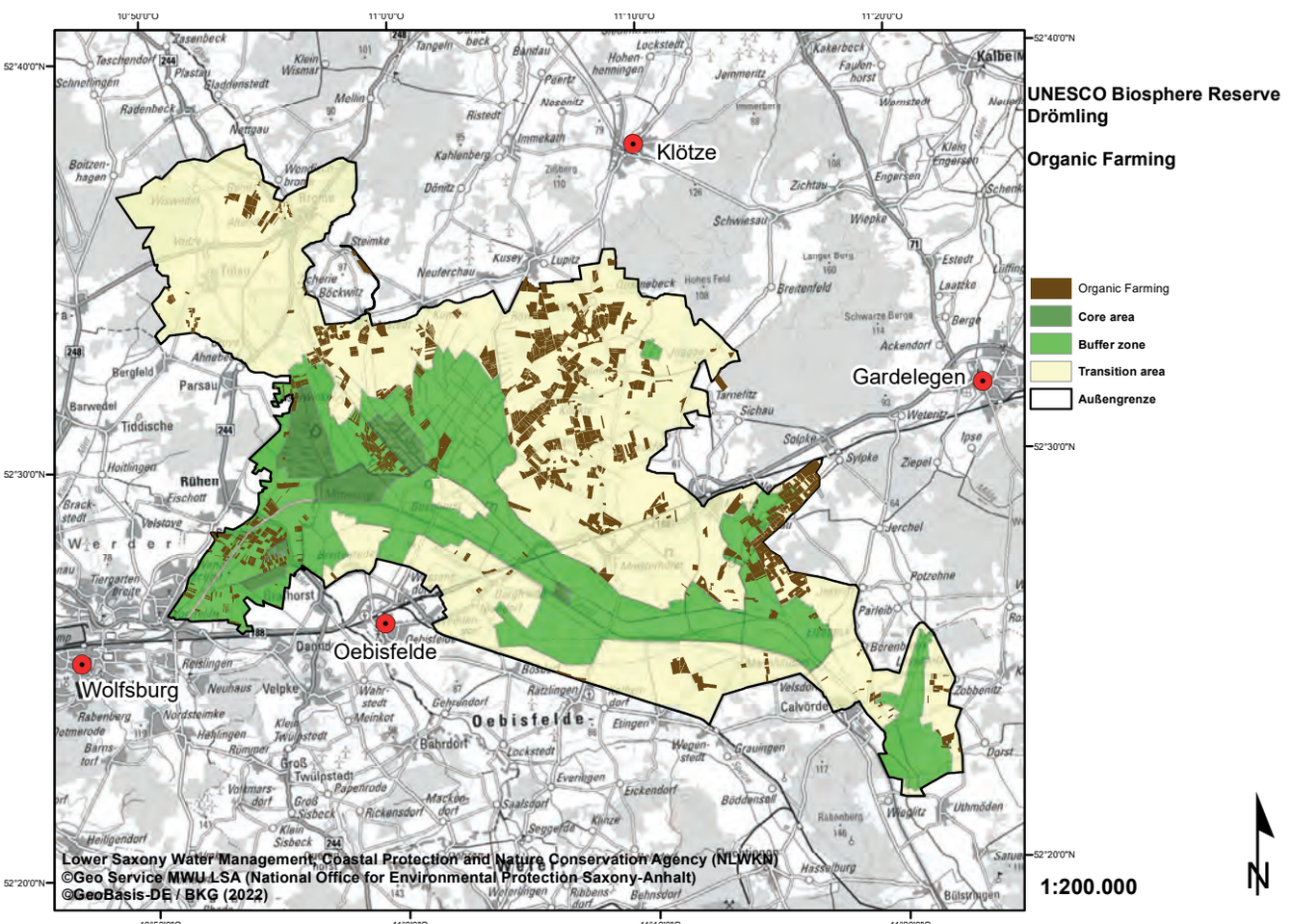

Figure 20: Organic farming UNESCO Biosphere Reserve Drömling.

14.1.3 Protection regimes for the core areas and the buffer zones

The protection regulations result from the individual ordinances for the nature conservation areas as well as Natura 2000 sites and are implemented through corresponding management and maintenance plans.

Core areas: The entire core area of the proposed UNESCO Biosphere Reserve is divided into six sub-areas, 100% of which have protection status under European law in addition to their national protection status as nature reserves (see Table 6 and Annex 6).

Buffer zones: Protection regulations for the buffer zones result from the regulations for the respective nature conservation areas and the requirements for the Natura 2000 sites. The core areas are surrounded by eight buffer zones, each corresponding to FFH and SPA protection status.

Another way of regulating use in the buffer zone and exerting influence on the respective users is to **lease the areas from public authorities**. In the event of non-compliant use, leases are terminated, or it is pointed out at the time of leasing that the respective area is to be managed exclusively in accordance with the nature conservation area regulation.

14.1.4 Indicators for assessment of efficiency of the protection actions

In the course of the two large-scale nature conservation projects, maintenance and development plans were drawn up for the Drömling in Lower Saxony and for the former Drömling Nature Park. In this context, test areas were created on which intensive floristic, faunistic and site investigations are being carried out. This is to serve the long-term control of habitat development as well as the efficiency control of nature conservation measures.

The Biosphere Reserve Administration has access to the repeated surveys carried out for this purpose, which can also be evaluated using geoinformation. In addition, the maintenance and development plan for the Klüdener Pax-Wanneweh Nature Conservation Area is also available in written form. The maintenance and development plan for the Ohre-Drömling Nature Conservation Area was updated in 2007 as a basis for management plans. Representative test areas from the maintenance and development plan (1996) could thus be

Name	Brief description	Internation protection status	Area [ha]
Hegholz	The Hegholz is characterised by larger alder and ash riparian forests. In addition, there are carrs and bottomland hardwood forests consisting mainly of mixed oak forests on wet sites.	FFH (DE3431-331) SPA (DE 3431-401)	40
Bekassinenwiese	The Bekassinenwiese consists of a complex of alder-ash forest and alder carr alternating with mixed deciduous forest that has emerged through succession.	SPA (DE 3532-401)	40
Allerauenwald	It is a very valuable oak-bottomland hardwood forest with a high proportion of oak and fluttering elm. Bird cherry-alder-ash floodplain forests and oak-hornbeam forests complete the ensemble of riparian forests living in the water regime of the river.	FFH (DE3431-331) SPA (DE 3431-401)	100
Breitenroder-Oebisfelder Drömling	In the large areas of this total reserve, there is already a predominant forest cover consisting of alder swamp forests, alder-ash forests and oak-hornbeam forests.	FFH (DE3533-301) SPA (DE 3532-401)	460
Böckwitz-Jahrstedter Drömling	In this total reserve, there are extensive successions on former grassland, which today are mainly occupied by Phalaris arundinacea and Glyceria maxima, certain reeds and reed beds or comparable succession stands	FFH (DE3533-301) SPA (DE 3532-401)	340
Giebelmoor	Characteristic of the area, which is almost entirely covered by forest, are the moist forests, especially alder and birch swamp forests, mixed oak forests, small areas of bird cherry-alder-ash forests and swamp scrub.	FFH (DE3431-331) SPA (DE 3431-401)	670

Table 6: Description, international protection status and area size of the six core areas of the UNESCO Biosphere Reserve Drömling.

Name	Brief description	Internation protection status	Area [ha]
Nature Conservation Area Ohre-Drömling – Wet zone[15]	On the fen soils in the wet zone with winter flooding, biotopes of wet meadows have predominantly developed, which are valuable habitats for lapwing (Vanellus vanellus) and white stork (Ciconia ciconia), moor frog (Rana arvalis) and rare grasshopper species.	FFH (DE3533-301) FFH (DE3532-301) FFH (DE3433-301) FFH (DE3531-301)	2,960
Nature Conservation Area Ohre-Drömling – Conservation zone[15]	The conservation zone is dominated by open meadow and pasture habitats on peatland, which are used extensively. They are structured by numerous canals and ditches, each with one-sided wooded strips and tall herbaceous vegetation, which create a small-scale and large-scale chambering of the landscape. The main occurrences of the lowland hay meadow habitat type 6510 and bird cherry-ash forests of the FFH habitat type 91E0 are found here. Beaver and otter have built up populations here that are rich in individuals	SPA (DE3532-401)	4,630
Nature Conservation Area Ohre-Drömling – Connection zone[15]	The connecting zone is mainly characterised by peatlands and sandy soils and forms the transition to the surrounding LSG Drömling. Grassland sites of varying intensity with hygrophilous or tropophilous grassland are widespread, which are particularly important as a feeding ground for birds of prey and white storks, among others.		1,910
Klüdener Pax-Wanneweh[16]	The nature reserve is characterised by a small-scale alternation of forest and open land sites with linear watercourse and wooded structures. The grassland areas are richly populated with hedges, wooded islands, copses and solitary trees and are structured by a dense network of watercourses. Small-scale alder swamp and alder-ash forests have survived on the fen and gley soils. In the southern part, there are contiguous mixed deciduous forests with typical carr and alder-ash forests and oak-hornbeam forests.	FFH (DE3634-301)	1,180
Kaiserwinkel [17]	The Kaiserwinkel buffer zone is characterised by low-flow ditches in small-scale alternation with reedbeds, large sedge-reeds, extensively used wet meadows and pastures, high herbaceous vegetation resulting from wet grassland, copses and swamp forests.	FFH (DE3431-331) SPA (DE 3431-401)	407
Politz[18]	The Politz is characterised by large open grasslands with smaller old alder and ash woodlands in the valley lowlands.	FFH (DE3431-331) SPA (DE 3431-401)	444
Schulenburgscher Drömling[17]	In the near-natural area, the northern part is characterised by moist forests, especially alder and birch swamp forests, small areas of bird cherry-alder-ash forests and their drainage stages, and oak-hornbeam forests of moist, moderately base-rich sites. On the western edge there are remnants of shrubby birch and pine peatland swamp forest. Characteristic in the southern part are mainly alder swamp forests.	FFH (DE3431-331) SPA (DE 3431-401)	519
Wendschotter und Vorsfelder Drömling[19]	Typical biotope types are partly extensively used grassland, which is strongly structured by water-filled ditches with reeds and willow scrub. In connection with occasionally high water levels, many near-natural forms of vegetation have been preserved.	FFH (DE3431-331) SPA (DE 3431-401)	609

[15] The enforcement is carried out by the biosphere reserve administration.

[16] The enforcement is carried out by the district of Börde.

[17] The enforcement is carried out by the district of Gifhorn.

[18] The enforcement is carried out by the districts of Gifhorn and Helmstedt.

[19] The enforcement is carried out by the city of Wolfsburg.

Name	Brief description	Internation protection status	Area [ha]
Northern Drömling Lower Saxony[17]	The northern part of the area is characterised by extensive grasslands with the typical structure of the Rimpau ditches and small moorland, alder-ash and mixed oak forests. The central part of the area, except for the village of Giebel, is a closed forest area with oak and beech forests and pine forests documenting the transition to the eastern heath. South of this, grassland clearly interspersed with ditches dominates with varying distribution of the Rimpau ditches.	FFH (DE3431-331) SPA (DE 3431-401)	1,113
Southern Drömling Lower Saxony[20]	The western part consists of carr and riparian forests with alder-ash forests, alder carr and swamp forests, bottomland hardwood forests and moist oak-hornbeam forests. In the eastern part there are species-rich grasslands, some of which are used as hay-meadows. There are wet meadows and wet grasslands or hydrophilous tall herb fringe communities, sedge meadows and reed beds.	FFH (DE3431-331) SPA (DE 3431-401)	404

Table 6: Description, international protection status and area size of the ten buffer zones of the UNESCO Biosphere Reserve Drömling.

mapped and evaluated again. Similarly, the success controls for the Drömling in Lower Saxony are also available.

With the completion of the large-scale nature conservation project in Saxony-Anhalt, a monitoring concept was drawn up in 2012 as a tabular list of ongoing or periodic mapping and surveys by the then nature park administration and confirmed by the Federal Agency for Nature Conservation. Important flagship species of the Drömling such as the Elbe beaver (*Castor fiber albicus*), white stork (*Ciconia ciconia*) or red kite (*Milvus milvus*) are recorded on an annual basis. On representative sampling areas, grasshoppers, dragonflies, fish and certain bird species groups, among others, are recorded every several years. Repeat surveys of the bog soil and succession in the core areas are carried out at intervals of about 10 years.

The long-term safeguarding of the buffer zone as a nature conservation area is already showing initial successes. For on the fen soils in the buffer zone with winter flooding, habitats of wet meadows have predominantly developed, which are valuable habitats for lapwing (*Vanellus vanellus*) and white stork (*Ciconia ciconia*), moor frog (*Rana arvalis*) and rare grasshopper species. In the border to the transition area, there are many 'lowland hay meadows'. In order to restore high population densities of birds of prey (including the red kite [*Milvus milvus*]) and, above all, to recolonise hay areas with insects, agricultural use with different use dates and intensities is particularly important.

14.2 Species and ecosystem diversity

14.2.1 Main groups of species and species

Plant communities of near-natural floodplains and lowland landscapes with Atlantic flora elements such as pillwort (*Pilularia globulifera*), ivy-leaved crowfoot (*Ranunculus hederaceus*) are characteristic and significant, the coral necklace (*Illecebrum verticillatum*) as well as continental flora elements such as shiny meadow-rue (*Thalictrum lucidum*), fen ragwort (*Jacobaea paludosa*) and marsh sow-thistle (*Sonchus palustris*). Also of great importance are the **tall herb fringe communities** formed along the numerous ditches and canals as habitats for numerous rare and endangered plants such as river water-dropwort (*Oenanthe fluviatilis*) and shiny meadow-rue (*Thalictrum lucidum*), and due to their abundance of flowers and seeds as habitats for a variety of animal species adapted to wetland habitats.

Characteristic of the area are the species of **ditch vegetation** present below the water surface with their multitude of endangered and protected species such as water purslane (*Lythrum portula*), bulbous rush (*Juncus bulbosus*), alpine pondweed (*Potamogeton alpinus*) and dwarf hairgrass (*Eleocharis acicularis*).

From a **zoological point of view**, the planned UNESCO Biosphere Reserve Drömling is of supra-regional importance as a **feeding and roosting site**, especially as a **migration, resting and wintering area** for migratory bird species. A 'bridgehead

[17] The enforcement is carried out by the district of Gifhorn.

[20] The enforcement is carried out by the district of Helmstedt.

function' to the west is primarily attributed to the white stork population of the Drömling. With 68 pairs of nests, the Drömling is home to the largest white stork population west of the Elbe and contributes significantly to the recolonisation of the neighbouring Lower Saxony region with more than 100 fledged young birds every year. In the dry years 2018 to 2020, it has been shown that due to the water retention in the Drömling, reproduction is significantly better than in the rest of the surrounding area. The Drömling has also become more important as a summer feeding area with stork groups of almost 100 birds in the last 30 years.

Similar biotope complexes are of particular importance for numerous **amphibian and reptile species as well as fish**. For example, the widespread distribution of the great crested newt (*Triturus cristatus)* should be emphasised. The Drömling can also be considered very species-rich in terms of its **dragonfly fauna**. The 59 species already recorded here represent about 70% of the species spectrum in Germany. All species of the genus Leucorrhinia occurring in Germany as typical peatland species are found in the Drömling. This is equally true for the genus Sympetrum, which underlines the diversity of habitats in the Drömling. The 2,200 km long **watercourses** also provide an ideal habitat for the **Elbe beaver** (*Castor fiber albicus*) and the **otter** (*Lutra lutra*), which are classified in Annexes II and IV of the Habitats Directive. The occurrences of both species in the Drömling can be regarded as source populations for dispersal and recolonisation in the European biotope network.

14.2.2 Pressures on key species and their habitats

The main pressures affecting the most important animal and plant species in the biosphere reserve are identified below.

Water management: In the past, hydraulic engineering measures to regulate the water balance were the decisive factor in the reclamation of the Drömling. Extensive ditch systems cutting through the landscape were constructed with a large number of dams. This led to the destruction and devaluation of peatland ecosystems and the displacement of the original vegetation. The dams have a negative impact on the ecological continuity of watercourses. Intensive maintenance measures on ditch and bank edges and margins lead to habitat disturbance. The regulation of water levels can lead to strong water level fluctuations and thus to areas drying out during the breeding season.

At the same time, the creation of the drainage ditches also led to the creation of habitats. These are protected from succession and the resulting loss of this habitat by desilting and weeding in accordance with a watercourse maintenance plan agreed with the Biosphere Reserve Administration.

Forestry: The landscape of the Drömling is characterised by ditches and grassland, as well as by marsh and wetland forests. Forestry use is clearly secondary to agricultural use in the Drömling. Nevertheless, the individual more compact forest areas as well as the scattered smaller forest areas have a specific significance for nature conservation.

Above all, due to the growing demand for energy wood and with regard to the small, parcelled forest ownership, which makes regulated forestry use difficult, there is a demand on forestry to ensure that the utility function does not take precedence over the protective and recreational functions of the forest and that, despite increased pressure of use, sufficient old-growth and deadwood are preserved in the forest stands from a nature conservation point of view. Intensive use can lead to direct disturbance by forestry machinery and to the

Figure 21: White storks on a meadow rich in flowers and insects in Drömling.

removal of small structures such as old and dead wood, etc., and thus to the devaluation of habitats.

In particular, the **dry years** 2018 to 2020, in which a complete average annual precipitation (600 mm) was missing, led to enormous drought stress in the old oaks that characterise the landscape. In connection with this, the frequent occurrence of the **oak processionary moth** can be observed at present, which causes an almost complete clear-cutting of the infested trees (see also section 16.1.2). The combination of these two calamities over several years led to the death of many oaks in the Drömling.

Agriculture: Agriculture is the most important user in the proposed UNESCO Biosphere Reserve. Over the last 200 years, human cultivation has created a unique and varied cultural landscape with extensive grassland areas criss-crossed by a multitude of ditches. This cultural landscape can only be preserved in its uniqueness through site-adapted management.

Due to the classification of the Drömling as a disadvantaged area with low soil value figures and a high **risk of waterlogging and drought,** especially on the peatland sites, agricultural use is fundamentally endangered from an economic point of view. If use were to be abandoned, the open land habitats would also be lost as the basis of life for many valuable species. The greatest agricultural pressures in the Drömling are **fertiliser and pesticide inputs** from arable land. As in other areas of Germany, these pose a major threat to the insect fauna as the basis of the food pyramid. The **eutrophication** of the landscape threatens rare species and entire biotic communities. Arable land also **introduces substances and sediments** into water bodies, which lead to reducing, anaerobic conditions there. In addition, **overfertilisation** leads to groundwater pollution.

In the grasslands of the Drömling, both **intensification and underuse** pose current threats to the conservation of biodiversity. Drivers for intensification are, on the one hand, market economy reasons, especially the enormous price pressure on milk. On the other hand, energy policy decisions, in this case the changed framework conditions for biogas plants, have also led to intensification pressure with regard to the highest possible yield and more frequent cutting. These lead to the fact that the times of use overlap with the breeding times of meadow birds, but also with the reproduction cycles of, for example, grasshoppers as an important food basis for many higher animal species and prevent successful reproduction. The mowing of large areas, often of several hundred hectares in one day, which is cheaper for farms, leads to 'grassland deserts' that lack any food base for birds of prey and storks, for example.

For the peatland soils outside the core and wet zones of the nature conservation areas, even normal agricultural cropping, which is not actually good practice here, poses a high risk. In particular, arable farming leads to the destruction of the peat soil as the basis of agricultural production, combined with considerable emissions of nutrients and climate-damaging gases.

The decline in livestock farming in the Drömling poses a threat to many species tied to pasture farming. The main cause is the predominantly low to very low value added from livestock farming under the current framework conditions and the insufficient monetary benefits for the conservation of nature and the maintenance of the landscape.

Traffic: The greatest threat to numerous animal species in the Drömling is posed by traffic routes. The high-speed railway line Hanover-Berlin, the federal road B 188 and the state roads L 22 and L 20 cross the Drömling and regularly lead to traffic fatalities for numerous animal species. Since 1990, for example, more than 80 Elbe beavers (*Castor fiber albicus*) and more than 10 otters (*Lutra lutra*) have been run over on roads. Even on field paths, albeit upgraded with concrete tracks, one Montagu's harrier (*Circus pygargus*), 5 white storks (*Ciconia ciconia*) and numerous grass snakes (*Natrix natrix*) have been run over. The main causes are the increased use of the paths after their extension, driving at higher speeds and disregarding no-passing signs.

Local recreation and tourism: Impairments due to local recreation and tourism are mainly caused by heavy use of path sections and particularly interesting vantage points. This applies, for example, to cycling and hiking trails directly on the shore. Potential challenges are angling in meadow breeding areas and free-roaming dogs in the entire area, which are considered a threat to cranes (*Grus grus*), black storks (*Ciconia nigra*) and meadow birds such as curlews (*Numenius arquata*) and lapwings (*Vanellus vanellus*).

14.2.3 Indicators to assess both species groups and the pressures on them

The measurements and indicators for recording species and their pressures have already been described in Chapter 14.1.4.

The mapping of **target groups** in the Drömling Biosphere Reserve (e.g., breeding birds, resting birds and birds of prey, beavers and otters, see Annex 31) is to a large extent also explicitly carried out in the Lower Saxony Drömling by the staff of the Nature Conservancy.

Special species (e.g., lichens, fungi and mosses) are surveyed sporadically and only if financial resources are available (see Table 4) by external engineering companies. This also applies to the mapping of **habitat types**. An important aspect of the performance monitoring for the two NGPs is the investigation of the development of the **peatland soils**. This was last carried out in 2011 and is to be repeated in 2025.

Furthermore, reference must be made to the integrative monitoring programme for large protected areas, which is to take place in the Drömling (see Chapter 12.2), as well as to indicators of other functions (see Chapter 15.1.2).

14.2.4 Actions to reduce these pressures

In the Drömling, numerous habitat and species protection measures were carried out, especially in the two large-scale nature conservation projects. In this sense, the instrument of land purchase was applied in both federal states and the subsequent consolidation of public nature conservation property created the prerequisite for large-scale renaturation and extensification measures. In Lower Saxony, for example, about 400 ha of land were gained for nature conservation (Kaiser et. al., 2018).

After completion of the large-scale nature conservation projects, nature conservation measures were and are usually implemented through funding projects from the EAFRD fund or special funding programmes. Both the Biosphere Reserve Administration and the Association for the Natural and Cultural Landscape of Drömling (Zweckverband Natur- und Kulturlandschaft Drömling) and third parties, e.g., currently Deutsche Umwelthilfe e. V. (Environmental Action Germany), act here as applicants and recipients of funding, with the measures being designed from the maintenance and development plans. Current programmes of the state of Saxony-Anhalt, from which extensive projects were implemented by the Biosphere Reserve Administration in 2017–2019, are the Environmental Emergency Programme (Umweltsofortprogramm), the Species Emergency Funding (Artensofortförderung) and the Programme for Combating Neobiota.

For the further development of the area, extensive measures were carried out in Lower Saxony with nature conservation funds from the state priority list for the conservation and restoration of the peatland dam ditches and shallow meadow clearings. In support of this, numerous additional amphibian waters were created in grazing areas as part of the EU-LIFE Floodplain Amphibian Project.

In addition, special measures for species protection are carried out in Saxony-Anhalt to safeguard species and species groups specific to the Drömling and particularly protected by national and international legal regulations. Examples are listed below.

Beaver and otter: Since its return to the Drömling in the mid-90s of the 20th century, the beaver (*Castor fiber*) has become firmly established in the area with an increasing population. The animals and their habitats are protected by legal regulations in the watercourse management plan. By maintaining the ditches and receiving waters only on one side, riparian protection strips with developing woody stands are protected and developed as feeding grounds and resting areas. Along the watercourses particularly suitable for beavers, which are to be used with little conflict, the food basis for the beaver is improved by planting softwood, especially crack willow. Almost all watercourses are provided with marginal strips, at the larger watercourses in the land consolidation areas from 10 – 50 m wide. A number of softwood plantings have been implemented here since 2017 in the Environmental Emergency Programme and Species Emergency Funding programmes to improve the food base. The otter (*Lutra lutra*) benefits greatly from the beaver protection measures and its dispersal, as it uses both the wood strips and the beaver burrows. The destruction of the trapezoidal watercourse structure as a result of beaver activities also improves the living conditions for fish and amphibians as the main food source of the otter.

In the exercise of its authority function by the Biosphere Reserve Administration, it is ensured that the planning of bridges takes into account a crossing of the traffic routes under the bridges for migratory animal species. On both sides of the watercourses, at least 2 to 3 m wide riparian areas (up to 12 m wide under the rapid transit line) are constructed as berms under the bridges to enable beavers and otters, among others, to cross under the roads.

Through measures taken by the Environmental Emergency Programme and the Species Emergency Funding, culverts obstructed by beavers have been widened or completely removed in such a way that obstructions can be limited and dams can be easily removed if they pose a threat to residential areas or certain uses. Beaver management in the Drömling is managed as a pilot project of the state of Saxony-Anhalt due to the high density of the watercourse network and the many associated problems caused by beaver construction activities. This applies both to the examination of applications for dam removal (> 100 per year) by the rangers, short decision-making paths between the Biosphere Reserve Administration and maintenance associations, and to the reimbursement of additional costs for watercourse maintenance due to beaver activities, which has been tested in the Drömling.

Bats: The positive forest development in the Ohre-Drömling Nature Conservation Area in terms of habitat type development, natural tree species composition and proportion of old wood and dead wood has led to an improvement in the quality of habitats for many bat species since the designation in 2005. After the drastic decline in bat populations in the second half of the 20th century, the number of species has increased to 16 in the last two years due to new records of the western barbastelle (*Barbastella barbastellus*) and the Bechstein's bat (*Myotis bechsteinii*), which are very likely to reproduce in the area. With the exception of the soprano pipistrelle (*Pipistrellus pygmaeus*) all bat species listed in the Annexes of the Habitats Directives II and IV were detected in the Drömling. This shows the high degree of responsibility for this animal group.

Through the species protection measures of Saxony-Anhalt, additional roosts for the bat species Daubenton's bat (*Myotis daubentonii)*, serotine bat (*Eptesicus serotinus*), brown long-eared bat (*Plecotus auritus*) and grey long-eared bat (*Plecotus austriacus*) have been created or upgraded in recent years by converting vacant buildings. Bat roosts were also specifically created in several forest areas by installing nest boxes.

Meadow breeding birds: Through the implementation of the rewetting measures, the meadow breeding areas for e.g., snipe (*Gallinago gallinago*), lapwing (*Vanellus vanellus*) and Eurasion curlew (*Numenius arquata*) on fens are usually flooded for several months in winter, so that basically good reproduction conditions exist. Agricultural use in the buffer zone takes into account the requirements of ground-nesting birds through the provisions of the nature conservation area regulations, the ongoing coordination with the newly established agricultural advisory office and the ongoing monitoring by the ranger. For some years now, the nests of the strongly declining curlew (*Numenius arquata*) and partly of the lapwing (*Vanellus vanellus*) have been searched for and fenced off to protect them from predatory mammals.

The strong increase in predators, which mainly include foxes, but also neozoa such as raccoons (*Procyon lotor*), raccoon dogs (*Nyctereutes procyonoides*) and minks (*Neovison vison*) currently pose the greatest threat to meadow breeding birds. There is good cooperation with hunting representatives through the Species Emergency Funding, and live traps are provided, for example.

Montagus's harrier (*Circus pygargus*): In the Drömling, the Montagu's harrier mainly breeds in fields and only rarely on grassland. To secure the nests, they are searched for and marked. To protect the nests, they are fenced off by the rangers. The fenced-off area is then excluded from cultivation.

Kingfisher (*Alcedo atthis*): Throughout the biosphere reserve, demolition walls are maintained as kingfisher habitats along water bodies and root plates of fallen trees. At widenings of watercourses and ditches or steep embankments, steep walls for the creation of breeding tubes for the kingfisher are maintained or created.

White stork (*Ciconia ciconia*): The white stork inhabits the Drömling in constantly secure or growing populations. The breeding sites of this species are secured by legal and organisational measures. Thanks to the support of 'The Stork Foundation – Storks for our Children', it is possible to react regularly at short notice when breeding sites need to be secured or newly created in order to prevent adverse effects on local residents.

The guidelines and regulations for the maintenance of grassland (and water bodies) ensure that the stork has the necessary food basis. Staggering the mowing dates of the grassland from the end of May to mid-July improves the accessibility of food for the white stork. The function of the moor dam ditches, the meadow ponds and burrow pockets as a secure spring food base in years when mice are scarce is ensured by keeping them open and periodically desedimenting them.

Crane (*Grus grus*): The crane has shown a positive population development in the past decade. In addition to its breeding occurrences in the core areas, the species is increasingly colonising breeding sites in the cultivated landscape. New breeding sites have been created for the crane through the creation of wooded small water bodies with islands and surrounding grassland. The new water bodies created in the 1990s as part of the large-scale nature conservation project or through compensation and replacement measures were so silted up after 20 years that the first desilting measures had to be carried out in order to maintain their function as crane breeding sites. In 2017, the Environmental Emergency Programme restored almost 30 small water bodies that had silted up. Hunting measures regulate the wild boar population so that clutch losses due to wild boar remain low. On the other hand, targeted information to hunters, including administrative measures, ensures that hunting stands and staging areas are not set up or operated in the vicinity of nests.

Black stork (*Ciconia nigra*), lesser spotted eagle (*Clanga pomarina*), white-tailed eagle (*Haliaeetus albicilla*), red kite (*Milvus milvus*), black kite (*Milvus migrans*), European honey buzzard (Pernis apivorus): The protection of large birds sensitive to disturbance is ensured by corresponding legal provisions in the nature conservation area and landscape conservation area regulations. Organisational measures, especially infor-

mation and coordination with hunting tenants and forestry managers, support the protection measures. The species use the areas of the core area in particular as undisturbed breeding sites. The measures to develop more complex forest stands in the Drömling are intended to improve the breeding opportunities for disturbance-sensitive large birds in the long term. As large birds sensitive to disturbance have extensive territories, the interaction of all measures is of particular importance. Overall, the rewetting of peatland sites and the promotion of wetland habitats with the aim of largely preserving the complex of open habitats are an important basis for the conservation, maintenance and development of the habitats of these species.

Tree frog (*Hyla arborea*), **moor frog** (*Rana arvalis*) and other amphibians of small water bodies and peatland dam ditches: The tree frog, which has significant populations in the Drömling, has undergone a positive population development through the creation of over 200 small water bodies in the last 30 years.

These small water bodies and moor ditches also serve as habitats for the moor frog, whose occurrence is also of national importance, and other amphibians (especially the great crested newt [*Triturus cristatus*], pool frog [*Rana lessonae*], European common spadefoot [*Pelobates fuscus*], natterjack toad [*Epidalea calamita*]). After the development phase of such small water bodies, measures to control habitat development and habitat management are necessary, which are regularly carried out by the ranger. Initial measures against the siltation of small water bodies and the increased ingrowth of woody plants, which cause the shading out of the small water bodies, were carried out in 2017 on almost 30 small water bodies via the Environmental Emergency Programme. The grazing of small water bodies is also being examined on a case-by-case basis to maintain the open habitat for amphibians and is being practised, for example, on large-scale permanent pastures.

Pond loach (*Misgurnus fossilis*) and **bitterling** (*Rhodeus amarus*): Pond loach and bitterling are rare fish species in the waters of the Drömling. The measures for the protection and maintenance of the water bodies and for water body maintenance ensure the occurrence of these species. In order to protect both species during mechanical weeding, there is a specific obligation in the management zone to carry out manual monitoring of the material removed during mechanical weeding in order to return removed species, including pond mussels, to the water body.
The fish ladders built so far in the Ohre and Sichauer Beek Rivers through large-scale nature conservation projects and EAFRD funding projects, as well as the culverts widened or reconstructed through the Environmental Emergency Programme and the Species Emergency Funding 58 (a further 13 have been applied for) have also improved ecological passability for these fish species.

Xylobiont beetles: In the buffer zone, old trees, especially old pedunculate oaks, must be preserved at the edge of the stand or as groups, rows or solitary trees in the open. This also applies to old fruit trees in orchards, in rows and groups of fruit trees and in individual stands. In addition to the stag beetle (*Lucanus cervus*) the protection of old English oaks in particular ensures the necessary habitat for a large number of xylobiont insects. In the past two decades, extensive planting of woody plants has taken place in the open landscape.

It can be assumed, especially with the planting of long-lived species such as the English oak (*Quercus robur*) that a sustainable and precautionary development of habitats will take

Figure 22: Moor frog in spawning colour in the Kusey Drömling.

place in the long term. However, this development requires continuity in the boundary conditions of the habitats, which cannot be guaranteed under the current development of the climate.

Dragonflies: The habitats of the large white-faced darter (*Leucorrhinia pectoralis*) which requires special protection, are linked to the small moorland areas in the Drömling. The habitats of these dragonflies are safeguarded by the specific habitat protection measures for these peatlands. The protection of other dragonfly species is also achieved for the large number of small watercourses and streams in the Drömling and their regulated protection and limited, but biotope-safeguarding maintenance. The almost 30 small water bodies that have been desilted in the Environmental Emergency Programme have interrupted the siltation processes that are far advanced at the selected water bodies and have upgraded the habitats. This also applies in particular to the moor dam ditches restored in two projects in 2017 and 2018 over a length of several kilometres in the ditch systems of the Jeggau peatland (via Environmental Emergency Programme) and at the newly emerging Natura 2000 information centre Buchhorst (via EAFRD).

Narrow-mouthed whorl snail (*Vertigo angustior*): The habitats of the narrow-mouthed whorl snail are linked to the marsh and reed vegetation in the succession areas of the core areas. By allowing long-term succession processes on these areas, the habitats of the narrow-mouthed whorl snail are secured.

As there has been no independent protected area management for the Lower Saxony Drömling so far, the species and habitat protection measures taken so far have been limited to achieving the development goals of the maintenance and development plan (Kaiser et al., 2001). These included, within the framework of the large-scale nature conservation project, the creation of 15 ponds to improve the habitat for amphibians, dragonflies and water birds, the maintenance of rows of willow bushes along the peatland dam ditches over a length of about 15 km to create stepped structures, the repair of silted-up moor dam ditches in some sections, the conversion of spruce stands into near-natural alder riparian forests and alder carrs, the removal of non-native tree species in the Giebelmoor peatlands and Aller riparian forests, the removal of woody vegetation in the grassland to restore the open land character, and the removal of sheds and recreational facilities to calm the area and establish a cycling and hiking trail on existing paths to direct visitors to areas less sensitive to disturbance. Furthermore, various hydraulic engineering measures were carried out to stabilise the water balance of the Lower Saxon Drömling.

These include:

- In the small and large Giebelmoor peatland, dams promote the development of peatland and fen forests;
- In the Aller riparian forest, the connection to the flood event for the promotion of the hardwood floodplain forest by slitting the Aller levee;
- In Kaiserwinkel in connection with protection measures for the village, such as a ring ditch and a pumping station as well as the construction of dams in the Politz to secure and develop the wet grasslands, the marsh habitats and the riparian forests and carrs.

Extensive grassland use on about 70% of the approximately 1,900 ha of grassland in Lower Saxony's Drömling today ensures that large-scale wet grasslands can develop and are maintained (Kaiser et. al., 2018).

Figure 23: Large white-faced darter in the core area of 'Bekassinenwiese'.

14.2.5 Actions to reduce these pressures

The Biosphere Reserve Administration already manages the measures for the entire Drömling region and will continue to do so in the future. In the future, in addition to the protection of the occurrence of protected animal and plant species and habitats, **sustainable economic cycles and environmentally sound forms of land use** are to be established, primarily in the transition area. The Biosphere Reserve Administration supports agricultural, forestry and water management users with advice on technical issues and funding opportunities. A special focus is to be placed on **agricultural advice**, for which the personnel requirements were created at the end of 2019.

With regard to potential conflicts with tourism, the Biosphere Reserve Administration, together with the municipalities, has drawn up a **trail plan for the entire Drömling**. This plan is to be updated as needed. The trail plan serves to develop the biosphere reserve in a way that is geared to the purpose of protection, taking into account the experiential values of nature and landscape and cultural-historical features in order to guide visitors in a targeted manner. It also takes into account the requirements of users, residents and owners. It contains coordinated descriptions of the network of paths and their public use as access routes, as well as their use and design as cycling, hiking, riding and driving paths for horse-drawn vehicles. In order to further reduce the hazards posed by road traffic, a project of the German Environmental Aid was launched in 2019 under the title **'Blaues Netz im Drömling'** (Blue Net in the Drömling). This is intended to support otter protection and allow the animals a safe route along the water system. One way to reduce the impact on aquatic life is to improve ecological passability. To this end, several dams along the Ohre have been equipped with **fishways** in recent years.

Regular fishing surveys are carried out to monitor the success of these measures. The species protection programmes of Saxony-Anhalt have improved the ecological passability of many small water bodies. Disturbing or no longer needed culverts were removed and deconstructed. The situation for many habitats that depend on the longest possible overflow during the course of the year could be significantly improved through the management of the dams. Thus, the management of the dams serves the **protection of species and habitats** on the one hand and the preservation of the fen body on the other. The equipment of further dams with an fishways is being planned.

Further descriptions: Chapter 15.2, 15.4, 17.2

14.3 Genetic diversity

14.3.1 Species and varieties

The extensive grassland areas of the Drömling are ideal for cattle grazing. Limousin or Charolais cattle have established themselves as suckler cow breeds. In addition, there are some Heck cattle, wild water buffalo (Bubalus arnee), Galloway, Angus and Scottish Highland cattle. The cattle breeds Blonde d'Aquitaine and White-Blue Belgian are also found in even smaller quantities.

As a model project for alternative land use options under the natural conditions of the lowland moorland, the establishment of the 'Semi-open Pasture Landscape at the Germenau Hay Trail' was included in the LEADER funding. On the project area, extensive grazing is carried out all year round by suitably robust horses.

Figure 24: Galloway cattle in the Steimker Drömling.

The grazing is carried out by six mares and one stallion of the Hucul pony breed. This horse breed has been listed by the Republic of Austria since 2001 as a horse breed worthy of preservation and threatened with extinction (ÖPUL, 2015). The project has already been successful in that the first offspring of the Hucul ponies could already be reported in 2020.

Another special feature of the Drömling are the many linear plantings along paths and roads that were established immediately after cultivation. Since 1990, numerous replantings have been established here, mainly with oaks, birches and fruit trees, about 10,000 trees in the last 30 years.

According to Heller (1995), there are about 120 fruit varieties in the self-sufficient gardens of the Altmark, including the different characteristic expressions in individual varieties. In recent years, scattered fruit stands have been established by the Biosphere Reserve Administration in the form of fruit tree avenues and an extensive scattered fruit meadow. Care was taken to plant old and native fruit varieties as far as possible. This also applies to the replanting of kilometre-long avenues of fruit trees along paths and roads in the Drömling.

Starting from the village of Solpke in the northeast of the biosphere reserve, donkey walks through the Drömling are offered. The walks are carried out with two Poitou donkeys. The Society for the Preservation of Old and Endangered Breeds of Domestic Animals (Gesellschaft zur Erhaltung alter und gefährdeter Haustierrassen e. V.). (GEH) lists the Poitou donkey in its Red List under the category 'breeds from other countries'. In addition to migration, the donkeys are also used to protect a herd of cattle from wolves.

In the Drömling area, at least ten willow species occur in natural distribution. The maintenance of the pollard willows and also of the fruit tree avenues is one of the main tasks of the landscape keepers of the Biosphere Reserve Administration.

Further descriptions: Chapters 10.3, 11.6

14.3.2 Ecological, economic or social pressures

Home gardens, avenues and orchards play an important role in the conservation of old regional fruit varieties. However, the preservation of these plants can only take place if there is a benefit. However, traditional fruit production and storage is increasingly being forgotten, and economic exploitation no longer makes sense against the background of the year-round fruit supply in the retail trade. As a result, orchard meadows fall fallow and fruit trees in home gardens have to give way to modernisation (Heller, 1995).

The keeping of old (and endangered) livestock is habitually practised by older people who still see it as a necessity in terms of self-sufficiency. With demographic change, it is to be feared that this knowledge or these habits will die out.

Further descriptions: Chapters 10.3, 11.6

14.3.3 Indicators to assess the evolution of population status and associated use

A survey of old domestic animal breeds, as in other biosphere reserves, has not yet taken place in the Drömling. In the course of the integrative monitoring programme for large protected areas, a survey is to be carried out in the future using the indicator ‚diversity of useful species/varieties' (Kowatsch et al., 2011).

In recent years, the Biosphere Reserve Administration has started to establish a cadastre of planted fruit trees and pollarded trees. The evaluation and expansion of this cadastre are being sought.

14.3.4 Measures and practices to conserve genetic diversity

Measures for the conservation, maintenance and development of orchard meadows in the biosphere reserve are derived from the management plan for the Ohre-Drömling Nature Conservation Area. Thus, orchard meadows are to be maintained by extensive management of the ground vegetation, in the case of grassland usually by mowing or grazing. The fruit trees are to be maintained by pruning.

Any trees that are lost must be replanted. In some individual cases, an orchard meadow that has become overgrown and has already taken on the character of a grove can be developed into an orchard meadow by clearing and supplementary planting of fruit trees (TRIOPS / LPR, 2007).

Wild fruit species are of particular importance, as they are among the rare and endangered plant species in Lower Saxony. The existing specimens should be protected and promoted as far as possible, for example by clearing them of the woody plants that oppress them. Replanting of wild fruit of autochthonous origin should be carried out on a case-by-case basis (Kaiser et al., 2001).

In the 1990s, a very large number of pollard willows were planted by the former nature park administration and many volunteers. Due to a lack of financial resources, only a small proportion of these pollard willows are subject to regular maintenance by the landscape managers of the Biosphere

Reserve Administration. Programmes such as the Environmental Emergency Programme 2017 could be taken advantage of.

During a survey of pollard willows in a digital pollarded tree register, approximately 3,500 pollarded trees were measured, recorded and divided into three categories. Head willows that are subject to regular maintenance were recorded, as well as a large number of trees that have been pruned before, but which are likely to break off or fall apart due to a long period of non-maintenance. These are different growth forms, which are also to be assessed differently in terms of maintenance effort.

15. DEVELOPMENT FUNCTION

15.1 Potential for fostering economic and human development

15.1.1 Potential as a site of excellence/model region for promoting sustainable development

The Drömling is a unique fen landscape whose municipalities, districts and federal states have historically always been in a border situation and still are today. The ongoing development process towards a UNESCO Biosphere Reserve offers the opportunity to sustainably develop the Drömling region beyond administrative borders and to make it known beyond the region (for details see Chapters 4, 12 and especially 13). In this respect, the development into a biosphere reserve can be described as an impulse for the formation of a regional identity. A large part of the region sees it as an opportunity, not only for nature and landscape, but also for regional development and promotion of regional identity (see Chapters 13.2, 13.4, 15.1, 17.5).

These developments are to be laid down in the course of the process of drawing up a framework concept for the biosphere reserve (see Chapter 17.4). The potential as an outstanding model region for sustainable development is based on a number of strengths and special prerequisites.

Since October 2020, there has been a biosphere reserve **partner network** that stands for a regional circular economy and sustainable management methods. Only companies that operate according to the principle of sustainability are recognised as partners of the biosphere reserve. This explicitly includes the use of regional products.

At the same time, a cultural upgrading of the region takes place on the initiative of the Biosphere Reserve Administration. Together with the strengthening of the tourism offer, the Drömling is thus also becoming more attractive for tourists. Cooperation with the national press and tourism associations further enhances this effect. The Drömling‘s **popularity and appeal** have already been increased immensely in recent years.

Here the region is at the beginning in that all those involved have become aware of this great task and want to work on its development.

The Drömling is also an exemplary area for the successful use of **formal procedural instruments of environmental and agricultural law** to manage land use conflicts. The most important instrument for conflict resolution in proposed rewetting measures were four large, officially ordered land consolidation procedures, through which private property could be almost completely exchanged out of the core and wetland zones of the ‘Ohre-Drömling’ Nature Conservation Area. Since 2019, two new procedures are being implemented on the Green Belt.

15.1.2 Assessment indicators for changes and successes

With the future recognition as a UNESCO Biosphere Reserve, the preparation of a **framework concept** is planned, in which the essential developments and goals of the biosphere reserve are to be formulated (see Chapter 17.4).

Until the framework concept is drawn up, the **key issues paper** as the result of the discussion process initiated in 2015 provides the basis for the further development of the Biosphere Reserve region and the associated evaluation of this development (Annex 37).

So far, no other specific indicators have been applied to assess changes and successes towards sustainable development of the region.

At this point, reference must be made to the Integrative Monitoring Programme for Large Protected Areas (Kowatsch, A., Hampicke, U., Kruse-Graumann, L. and Plachter, H., 2011).

Excursus – Wolfsburg and Volkswagen AG

The neighbouring city of Wolfsburg with its more than 120,000 inhabitants offers great potential for the development of the Biosphere Reserve. This applies not only to **tourism** as a source of day-trippers, but also to all three functions of the Biosphere Reserve. The first result of a partnership with the **Volkswagen Group** is the deployment of over 300 trainees and students each year in landscape management and species protection measures in the Drömling Biosphere Reserve. These often physically demanding tasks are integrated into the young people's social training as team building and often create a connection between the often metropolitan young people and the Drömling nature area for the first time. They strengthen environmental awareness through practically experienced reference to the protection of species and biotopes. Through the project, the trainees act in accordance with Volkswagen's environmental mission statement 'goTOzero', in which environmental impacts are minimised in order to keep ecosystems intact and have a positive impact on society.

Other results from the working group formed between Volkswagen AG and the Biosphere Reserve include the designation of the ‚Käferweg' as a **cycle path** running between the 'Autostadt' car city and the Kämkerhorst information centre, technical support for Volkswagen gastronomy in the **development of the ‚Drömlingsrind' (Drömling beef) regional brand,** and conceptual support for the Biosphere Reserve administration for the ‚Autostadt goes wild' project. Future plans for cooperation with Volkswagen and the city of Wolfsburg include the marketing of 'Drömlingsrind' (Drömling beef) meat in Volkswagen restaurants, the development of a traffic concept for the Drömling and the joint development of tourism, environmental education and cultural offers (e.g., STADTRADELN – city cycling campaign).

15.2 Tourism

15.2.1 Types of tourism and touristic facilities

A **tourism and marketing concept for the Drömling** was commissioned by the town of Oebisfelde-Weferlingen in cooperation with the Drömling communities in Saxony-Anhalt and the nature park administration at the time. A large number of proposals for measures were developed by over 120 participants from the local population and various interest groups and have already been partially implemented. The following information is the result of this study (BTE, 2015): The offer in the Drömling Biosphere Region is characterised by the structures of the rural area and the biosphere reserve. Central themes are experiencing nature and landscape-related recreation, e.g., cycling, walking, horse riding. The existing offer is mainly aimed at locals and day visitors. The main tourist attractions of the region are:

- The planned UNESCO Biosphere Reserve Drömling with its extraordinary cultural and natural landscape, nature experience offers (Piplockenburg shallow water zone, observation towers, cycling and hiking tours, etc.) and information stations, first and foremost the Kämkerhorst station (others: Buchhorst, Oebisfelde, Kunrau);
- Hikes along the Green Belt as a National Natural Monument;
- The town of Oebisfelde with the Swamp Castle and the Castle and Local History Museum
- The old town of Calvörde;
- Kunrau Castle (with the Nature Experience Centre) and
- The Böckwitz Border Museum and Brome Castle Museum.

Cycling is of great importance for the region. There is a large number of cycling routes. These include the long-distance cycle routes Altmark Circuit, Aller Cycle Route and Green Belt as well as the local cycle and hiking routes of the biosphere reserve and the tourist associations. In addition, the Drömling has a network of cycle paths with corresponding infrastructure.

The cycle path network was completely revised and newly signposted in cooperation with the municipalities and the AG Radfahren (Cycling Working Group), also with regard to Lower Saxony's Drömling. This also includes a cycle route map for the entire Drömling. The reasons for the revision of the cycle route network are, on the one hand, the increased demands of cycle tourists in the supra-regional environment (quality before quantity), and on the other hand, new attractive rou-

tes that have been made possible, for example, as a result of path construction measures in land consolidation procedures. In addition, throughout the biosphere reserve there are lookout points, observation facilities and special cultural-historical or natural history points, such as fish ladders, which are equipped with information stations and information boards.

The Biosphere Reserve Administration Drömling, the Association of Nature and Cultural Landscape Drömling and the tourist associations Jeetze-Ohre-Drömling and Mieste also offer thematic guided tours, cycling and hiking tours (e.g., beaver, goose hike), junior ranger programme, activities for (school) children as well as barrier-free offers, activities for people with disabilities (such as special guided tours for people with disabilities or flyers in easy-to-understand language for the general public).

The Drömling is a traditional horse region, and its landscape is attractive for riders. There are many horses and horse-related traditions (horse routes, traditional festivals and parades with horses), and equestrian sports are also successfully practised. The Altmark and the town of Klötze have been recognised by the German Equestrian Federation as horse-friendly regions and communities. In the Altmark, a lot has been done in the past to develop equestrian tourism.

Most of the 'horse-related' offers are aimed at locals (boarding horses, riding lessons, etc.). Guests are offered carriage and horse-drawn carriage rides, riding holidays for children, children's birthday parties on the farm/pony farm and some unusual offers such as trekking tours with reindeer or therapy holidays with horses. For trail riders, there are overnight accommodation offers including special services such as luggage transport and riding accompaniment. It is interesting to note that the German Equestrian Trail No. 2[21] runs along the edge of the Drömling near Calvörde.

The destinations Altmark and Magdeburg Region are in charge of **hiking and walking** in the Drömling. They market the topic of hiking intensively, also promoting the offers from the Drömling region.

In Lower Saxony's Drömling region, there is only a weakly developed tourism infrastructure apart from the 'Lower Saxony Drömling Cycle and Hiking Trail' created in the large-scale nature conservation project. Since the joint administrative agreement between the federal states of Saxony-Anhalt and Lower Saxony (2019), tourism management for the entire Drömling has been handled centrally by the Biosphere Reserve Administration. The Lower Saxon municipalities are actively involved in the development of a joint tourism infrastructure. A first success is the designation of joint cross-state cycle paths with the associated cycle touring map.

Figure 25: Bike tourists at the Infocenter Kämkerhorst.

[21] The German Equestrian Trail No. 2 is a long-distance equestrian trail 1,100 kilometres in total, leading from the Baltic Sea (near Rerik) to France (near Merzig-Silvingen).

15.2.2 Visitors

In the region of the Drömling Biosphere Reserve, elaborate empirical surveys were carried out for a whole year in 2020/21 according to the established standard procedure of JOB et al. (2013) (financed by the BMUV, supervised by the BfN). The number and structure of visitors were recorded. For this purpose, 639 valid long interviews and 2,515 flash interviews were conducted in paper and pencil for all seasons. Some of the main results of this analysis are presented below.

In total, the area recorded 665,000 visitor days in the period in question. Of these, 88.2% are day visitors, which is the highest value in a Germany-wide comparison of all biosphere reserves. Accordingly, only 11.8% overnight guests were recorded. The unsurprising result documents the situation of a tourist destination that does not yet exist.

When asked about the protected area status of the Drömling, 31.3% named the correct protected area category biosphere reserve (multiple answers possible). Although the biosphere reserve is still in its infancy, 13.1% of the visitors can already be classified as biosphere reserve tourists in the narrower sense. For them, the existence of the biosphere reserve nature conservation designation plays a major or very major role in their decision to visit the Drömling region. Not unexpectedly, the majority of these biosphere reserve tourists in the narrower sense are found at the ‚Kämkerhorst' visitor information point. The latter, however, is in urgent need of reinvestment in order to comprehensively renovate the ideal attraction point for nature tourism as well as for possible ESD activities of the biosphere reserve's rangers.

In addition to the indisputably important contribution to biodiversity conservation and cultural landscape protection of the biosphere reserve, the question of the regional economy is also of interest in this context. The average daily expenditure of day visitors is only 7.80 euros. The expenditure of overnight visitors per day is also relatively low, averaging 46.90 euros. For both visitor groups, the average expenditure is thus clearly below the level of the other biosphere reserves studied in a Germany-wide comparison.

This is essentially explained by the existing large deficits in the tourist offer. The management of the biosphere reserve is aware of this, and in the future it will be necessary to raise this immense potential together with other actors in the area. In any case, day visitors and overnight guests in the Drömling Biosphere Reserve currently generate a total tourism value added of 4,218,999 euros per year. As the map (Annex 8) shows, day visitors to the Drömling Biosphere Reserve come in particular from the two affected postcode areas of Magdeburg (including Stendal, Oschersleben and Staßfurt) and Braunschweig (including Salzgitter, Wolfsburg, Halberstadt, Gifhorn and Wernigerode). The region also attracts secondary tourists who spend their holidays in the wider surroundings of the Drömling and then come to the biosphere reserve for a day trip. The source areas of the few overnight visitors are mainly in Northern and Western Germany (Job, H., Engelbauer, M., Majewski, L., Woltering, M., 2022).

15.2.3 Tourism management

Since 2018, the area of tourism and regional development has been managed from the Drömling's Information Centre, which was established as part of the 2015 tourism and marketing concept (cf. Chapter 15.2.1).

The Drömling's Information Centre takes over the central part of the current ‚tourism marketing' of the Drömling. It is part of the Biosphere Reserve Administration. Its tasks include:

- Participation in the development of the Drömling Biosphere Reserve into a sustainability and quality region and in the establishment of a partner network;
- Planning, implementation and monitoring of sustainable regional development measures and organisation of related cooperation with local authorities, associations and other regional actors;
- Implementation of the results of the Drömling tourism and marketing concept;
- Networking and advising regional actors on nature conservation and funding issues;
- Mediation of tourism offers.

15.2.4 Positive and negative impacts of tourism

The biggest challenge in establishing sustainable tourism development is the lack of infrastructure. There are only a few places to stay overnight. Very few villages have a café or a restaurant.

So far, the focus of tourism offers has been on quiet nature experiences and educational tourism as well as the offers and aspirations of the proposed UNESCO Biosphere Reserve (see Chapter 15.2.1). This offer rather attracted day tourists from the closer surroundings of the biosphere reserve.

The challenge in the field of tourism has been that an attractive infrastructure can only be established if enough visitors come to the Drömling. However, they only come if this infrastructure already has a pull effect.

The Biosphere Reserve Administration is doing important pioneering work with regard to the joint marketing of all Drömling communities and actors. With the creation of a uniform image (e.g., through the corporate design of the National Natural Landscapes), tourism management will be strengthened and made more efficient. This is linked to the hope that an improvement in the offer situation for guests and locals in the areas of nature experiences, cycling, horse riding, rural holidays, hospitality, culture and history will strengthen the local economy and create new jobs in tourism. The partner network that has been in place since 2020 has already been able to generate synergy effects in this regard.

The networking of offers with neighbouring regions and destinations should contribute to synergy effects and to the further anchoring of the biosphere reserve as a tourism destination.

Tourism can also have negative impacts, especially on the protective function of the biosphere reserve, through the direct disturbance of animals, pollution caused by the removal of plants or by motor vehicles driving along closed paths. In order to prevent these impacts, the nature conservation areas of the buffer zone are generally closed to cyclists and hikers, and motor vehicles are prohibited from entering. In the core areas, only a few paths may be accessed outside the breeding season from 1 July.

However, there are risks if the tourist offers meet with a low response from guests and locals. This could be the case especially if the development of a common tourist identity is not successful. In this case, an investment in tourism offers would represent an economic risk.

If tourism management were to run at a loss, this could lead to a negative image for the whole region, which would make it difficult to develop new offers and to involve local actors. These risks should be dealt with in a participatory manner during the development of the framework concept.

15.2.5 How will these impacts be managed, and by whom?

The framework conditions for tourism use result from the respective protected area ordinances as well as from the requirements for the FFH and bird sanctuaries (in future also from the framework concept; see Chapter 17.4).
The management of tourism impacts is carried out by the Biosphere Reserve Administration. At least in Saxony-Anhalt, the Biosphere Reserve Administration is also responsible for enforcing the respective ordinances in the nature conservation areas and landscape conservation areas of the Drömling.

The impacts are recorded and evaluated at several levels and, if necessary, measures are derived from them. The first level concerns the number of visitors and the recording of event activities, which are determined by the Biosphere Reserve Administration in cooperation with the Association for the Natural and Cultural Landscape of the Drömling and the tourist and local heritage associations. The second level concerns the determination of direct and indirect impacts of tourism through species monitoring, which is largely carried out by the field staff of the nature reserve. These can be, for example, declines of sensitive species due to an increase in disturbances, as well as increases in species due to the development of habitats or, for example, roosting sites in connection with tourist offers for nature observation (e.g., shallow water zone Mannhausen, see Chapter 15.2.1).

In addition, the rangers and all other field staff of the Biosphere Reserve Administration carry out monitoring activities. Information talks are held, and in the case of offences, charges are also brought.

15.3 Agricultural and other activities

15.3.1 Type of agricultural and other activities

Agriculture: In the biosphere reserve, about 150 farms of various legal forms and company sizes currently manage the agricultural land. All agriculturally usable areas are completely divided among the currently existing farms. There are hardly any possibilities of leasing land to increase the farm area or to start a new farm. In contrast to Lower Saxony, there are often large plots in the Drömling in Saxony-Anhalt that have been taken over by the former agricultural production cooperatives. These plots are also managed by large enterprises, usually cooperatives and limited liability companies.

The level of production is differentiated by farm, both in the arable sector and in livestock farming, and can be classified as low overall due to unfavourable production and yield conditions (LPR, 1996).

The predominant site types in the transition area require the predominant cultivation of rye, potatoes, silage maize and other arable fodder (e.g., field grass). In the buffer zone, the agriculturally used soils are characterised above all by their oversaturated water balance. In particular, waterlogging due to high groundwater levels often only allows moderate yields. However, harvest losses also occur in the summer months when there is no rainfall.

Grassland use in the Drömling is above average at about 18,360 ha. It is mainly found on areas with shallow to medium sandy lowland moorland or sand cover crops. Most of the grassland is located in the buffer zone.

The grassland areas are considerably more difficult to manage when used for agricultural purposes. This applies in particular to the rewetted moorland soils in the area of the buffer zone. During the winter months and into spring, they are deliberately flooded in order to maintain water levels as close to the floodplain as possible in the summer months, which should prevent the peat from drying out and subsequently degrading. However, even in normal precipitation years, this can cause problems for agricultural users in terms of trafficability or grazability.

In wet years, grassland use, which is also absolutely necessary for the conservation objectives of the nature conservation areas in the Drömling, can be extremely difficult and even lead to loss of use in some areas.

In this respect, the agricultural use of the wet grassland in the Drömling is a balancing act between peatland conservation, habitat and species protection on the one hand, and securing the use of the land as agricultural land with adequate conditions for the farms on the other.

Therefore, close cooperation between the farms and the Biosphere Reserve Administration is indispensable to ensure economically viable management for the long-term conservation of the landscape. The legal basis for on-site management are the ordinances of the respective nature conservation areas and landscape conservation areas.

The Ohre-Drömling Nature Conservation Area, the largest in Saxony-Anhalt with more than 10,000 ha, occupies a special position. In three of the four (i.e., outside the core area) agriculturally usable protected areas, there are different specifications for use and maintenance dates and periods, stocking rates and densities, fertilisation types and heights, and for almost all variants there are still possibilities for permission for deviations.

Forms of use derived from this often do not remain conflict-free in practice, or in turn require greater coordination efforts. This is associated with about 50 notices under nature conservation law per year on permits for earlier or other forms of use than specified in the regulation.

Typical examples are mowing 50 percent of a field in strips four weeks earlier or earlier grazing with lower stocking density. For the farmer, this has the advantage of being able to obtain protein-rich, silageable fodder. For nature conservation, short-grazed areas are created earlier in the year in meadow breeding areas, which are important for many bird species for foraging during the rearing of young.

In addition, the strip-like mosaic of mown and unmown areas makes it possible for grassland that has already been mown to be recolonised, for example by grasshopper species for which mowing is a disaster.

In order to present the possible forms of land use to farmers on the one hand and to ensure the implementation of nature conservation goals on the other, regular advisory meetings are held with individual farms.

With the creation of an agricultural advisory service, these farm talks are gradually being extended to Lower Saxony‘s farms. Thus, with regard to the framework concept, concrete figures on the farms in the entire biosphere reserve are to be collected (see Chapter 17.4).

Animal husbandry: Animal husbandry is of great importance for the Drömling. On the one hand, it is the basis of income for many farms, and on the other hand, it is an important prerequisite for preserving the cultural landscape that has developed over the past centuries in its present form and developing it further in the interests of nature conservation. Cattle farming is crucial for this, as other forms of grassland use (sheep, goats, horses, fallow deer, etc.) do not play a significant role. Official results on the systematisation of farms with regard to their main activities and income are not available.

Therefore, it has not yet been possible to carry out an analysis of the workforce broken down by women and men. This also applies to the commercial sectors listed below. However, it is recognisable that the number of livestock has decreased significantly over the last 30 years. A number of dairy farms have ceased operations, others have kept only a few suckler cows.

Forestry: In both federal states there are large forest areas in state ownership which are not used in the core areas. Similarly, the forest areas of the Association of Nature and Cultural Landscape Drömling were transferred to natural forest development after the forest conversion measures on 490 ha were completed.

The managed forest of the Lower Saxony State Forest Management Organisation in the biosphere reserve is certified according to the PEFC system. In Saxony-Anhalt, FSC certification is being sought.

In Saxony-Anhalt, the privately owned forest areas are often small parcelled and small in size. Some of these forest owners are organised in forestry associations, which in turn are advised by three forestry offices of the State Centre for Forests.

In Lower Saxony, a large area of forest in the Kaiserwinkel region is managed by the Gräfliche Schulenburg Forestry Administration.

Hunting and fishing: There are ten private hunting grounds in Lower Saxony's Drömling, which together cover about 3,100 ha. The remaining areas (two hunting districts) are managed by the Lower Saxony Forestry Office Wolfenbüttel.

One or two driven hunts for wild boar are carried out per private hunting ground per year. In addition, there are occasional community hunts for small game. Depending on the weather conditions, the number of community hunts varies from year to year.

The game is hunted by stalking. The areas of the Lower Saxony State Forest Management Organisation are hunted within the framework of the hunting law according to current scientific knowledge with the objective of efficient hunting of cloven-hoofed game. The hunting methods are aimed at effective game population regulation and keep hunting pressure as low as possible.

The current hunting concept of the Wolfenbüttel Forestry Office provides for the following hunting methods. Individual hunting takes place at intervals from April to January. Hunting is closed from 1 February to 31 March and from 1 June to 15 July. There is no stalking of wild boar.

Community hunts are held in April/May, in the leaf season, at the beginning of September and in January. In each hunting district, depending on the hunting needs, several movement hunts are carried out annually with flushing dogs and beaters, if possible with the involvement of the hunting neighbours.

Management of the Saxony-Anhalt Drömling is mainly carried out in communal hunting districts. The boundaries of the hunting districts are not identical with the boundaries of the biosphere reserve.

Currently, proprietary hunting districts are being established on the areas of the Association for the Natural and Cultural Landscape of the Drömling and the Land of Saxony-Anhalt that were rounded out in the land consolidation procedures. This process will take a few more years, depending on the leases and the time at which the proprietary hunting districts come into being. Reliable estimates of game densities and the population situation of individual game species are not yet available for the Drömling Biosphere Reserve.

In the Drömling, there are opportunities for angling at several ditches and ponds, most of which are located in the transition area. There are no commercially used waters by professional fishermen.

15.3.2 Possible positive and negative impacts of these activities on biosphere reserve objectives

Agriculture: Differentiated agricultural grassland use is an essential prerequisite for the conservation of the mosaic of land use and the landscape in the Drömling. It is existential for the conservation of a number of FFH habitat types and of such biotope types that are necessary for the survival of the populations of FFH species and species of the Birds Directive.

The abandonment of grassland areas with this special conservation function represents an impairment of Habitats Directive and Birds Directive objectives in relation to specific conservation targets. Sole land management is only possible in selected areas with a smaller surface area (e.g., on areas that can be developed into habitat type 6410).

Financing large-scale maintenance alone, i.e., mowing and removal without a subsequent recycling option ('disposal' of the green cuttings), is difficult to realise due to the large area. The only practicable way is therefore a subsidised agricultural or, in the future, possibly also energetic use of the growth, in which the restrictions on use resulting from the fact that the areas belong to the FFH and bird sanctuary are financially compensated.

In this sense, the Biosphere Reserve Administration, in cooperation with the farmers and their professional associations, as well as the agricultural offices, have made extensive use of the possibilities for generating income from the promotion of voluntary nature conservation services and other agri-environmental measures.

Each year more than 2 million euros were paid out to farms for special nature conservation services. On the one hand, this concerns species protection measures, such as very late grassland mowing after 15 July for meadow birds (including corncrake) on 241 ha or the creation of flowering and protective strips for arable wild herbs, insects and birds on 649 ha, 240 ha of which were specifically for the ortolan.

On the other hand, grazing concepts were agreed with many farms, for the year 2021 on 1,188 ha, which take into account

both the site conditions and the occurrence of species and biotopes as well as the individual farm conditions.

Animal husbandry: The use of permanent pasture has so far been promoted in some pilot projects under the EAFRD Directive. With landraces of domestic animals or with alternative grazing animals (e.g., Heck cattle, Koniks) with very low stocking rates, permanent grazing leads to the formation of a semi-open pasture landscape.

A combination of different animal species, e.g., horses with cattle, proves to be favourable because of the different feeding behaviour.

Existing woody plants are included in the grazing area. Such landscapes are very effective in maintaining and developing the populations of several bird species protected under the Birds Directive and other FFH species dependent on small-scale structures, such as the red-backed shrike (*Lanius collurio*), barred warbler (*Sylvia nisoria*), greater mouse-eared bat (*Myotis myotis*) or European tree frog (*Hyla arborea*).

Forestry: The forest areas in the core areas are subject to natural succession in accordance with the conservation objectives. In the managed forests, use in the buffer and transition area is carried out while preserving and developing the biotopes and FFH habitat types, which may be equally necessary for the conservation of the habitat type in the case of oak.

For the development of the forests, which are often small parcelled under ownership law, in the sense of the conservation objectives, targeted funding opportunities are used for the establishment of new forests and forest conversion.

The primary use of wood as a material in the sense of sustainability and regional economic cycles can be opposed by its use as a fuel if habitat trees or valuable old-growth forests are affected.

The use of wood as a source of energy will always be attractive to the extent that the cost development for other energy sources allows it. Some farmers use wood from their own forests to generate heat, and occasionally wood chips from the hedgerows of the moor dam cultures are used.

Hunting and fishing: The hunting restrictions on huntable species and hunting periods in the nature conservation areas and landscape conservation areas regulations formally ensure that hunting does not have a negative impact on the conservation objectives for the maintenance and transition area.

In practice, however, there are isolated violations, which are usually detected by the rangers and sometimes punished with administrative offence procedures.

In addition to the fishing waters located in the transition area, some of the state‘s own fishing waters are also leased in the conservation zone, provided that the use of the fishing waters is not expected to have an adverse effect on the natural balance.

15.3.3 Indicators to assess the state and its trends

So far, no socio-economic indicators have been collected in the Drömling Biosphere Reserve - with the exception of the survey in the context of the tourism and marketing concept. However, this is to be realised in the future with the help of the Integrative Monitoring for Large Protected Areas (Kowatsch et al., 2011).

Further descriptions: Chapters 12.2, 14.1.4, 14.2.3, 15.1.2

15.3.4 Measures to strengthen positive impacts and reduce negative impacts on the biosphere reserve objectives

Agriculture: The most effective measure is the Biosphere Reserve Administration‘s performance of its function as an authority for the user-friendly regulation of the diverse use specifications contained in the nature conservation area and landscape conservation areas regulations in Saxony-Anhalt‘s Drömling.

In recent years, a way of coordinating land use has been established with the farms operating in the Drömling, as a result of which jointly supported solutions have generally been found to safeguard the conservation objectives. In order to intensify these efforts, a position for agricultural nature conservation and biodiversity advice was created in the Biosphere Reserve Administration.

With the recruitment of a permanent employee for agricultural advisory services from the end of 2019, from Lower Saxony‘s funding within the framework of the administrative agreement with Saxony-Anhalt, the direct dialogue with farmers will be expanded in the future.

The processing of the nature conservation parts of the agricultural applications will be carried out for the first time by the staff member in the Biosphere Reserve Administration from the application year 2020 onwards, which is seen as a significant step forward in the biosphere reserve by all those involved.

The objective of the agricultural advisory service is to advise farmers on new funding opportunities and marketing.

In this way, the conservation objectives in the management of grassland can be secured in the long term and the farms operating in the Drömling can be shown opportunities in the management and marketing of their products.

Another aspect of the advice is aimed at the management of agricultural land.

The Biosphere Reserve Administration aims to ensure that measures that make sense in terms of nature conservation and work well in the buffer zone are also adopted by farmers in the transition area (e.g., extensive use of grassland or strip mowing).

In the future, the aim is to work together with the farmers to ensure that, in addition to an expansion of these measures in terms of area, the local orientation towards the goals of peatland protection and species and biotope conservation is also improved.

15.4 Other types of activities of sustainable development

15.4.1 Type of activities

Water management: Due to the reclamation of the Drömling with the creation of an artificial water network, the storage function of the Drömling basin was largely lost - in connection with a considerable reduction of the peat layer. In order to preserve the moorland soil that still exists today, water rights procedures for rewetting and extensive hydraulic engineering measures were carried out. In the areas relevant to nature conservation, this is intended to ensure different reservoir levels over the course of the year to safeguard the bog body on the one hand and to manage the grassland on the other. At a decisive point, namely in the inspection committees of the maintenance association, the cooperation of the Biosphere Reserve Administration in the form of a transparent technical discussion proved to be an indispensable prerequisite for the implementation of higher damming targets and thus of the fundamental conservation objectives in the Drömling. Sustainable management of the groundwater body is crucial for compliance with the nature conservation objectives of the

Figure 26: Staggered grassland mowing in the Drömling.

Drömling. Several hydrological reports have increased the level of knowledge of all stakeholders on this point. Particularly with regard to water abstractions in the Drömling's sphere of influence for agricultural and commercial use, the Biosphere Reserve Administration has been able to raise the awareness of all stakeholders, even beyond the boundaries of the biosphere reserve, for the sustainable use of the Drömling's hydrological resources.

Regional development: The **Local Action Group 'Around the Drömling'**, founded in 2007, has proved to be particularly effective in terms of its regional networking function. For the first time, municipalities from the northern part of the Drömling, located in the Altmarkkreis Salzwedel district, joined forces with municipalities from the southern Drömling in the Börde district.

As of 2015, the Local Action Group area could be extended to the entire biosphere reserve area in Saxony-Anhalt. An extension to the biosphere reserve area in Lower Saxony is being sought for the next funding period. The Drömling Biosphere Reserve Administration has a seat on the board and in the general meeting of the Local Action Group ‚Around the Drömling'. Regionally related projects are evaluated and discussed together. The aim is for project promoters to add value to economic, cultural or even tourist development in the Drömling. This concerns in particular the promotion of economic and social development that is socio-culturally and ecologically sustainable.

The main objective of the Local Action Group is to accompany the transformation process of the Drömling Nature Park into a biosphere reserve. Other fields of action are the development of sustainable tourism and the provision of public services and support for demographic change.

Commercial enterprises: The Altmark is considered a structurally weak region and is little used industrially. There are cafés and restaurants in the biosphere reserve's transition area. Therefore, in the periphery of the biosphere reserve there are only medium-sized and small businesses of minor importance.

Industrial enterprises do not exist in the Drömling. The biosphere reserve borders directly on the business location of Wolfsburg in the southwest. Volkswagen AG in combination with numerous supplier companies is the most important employer in the region. However, the indirect importance of

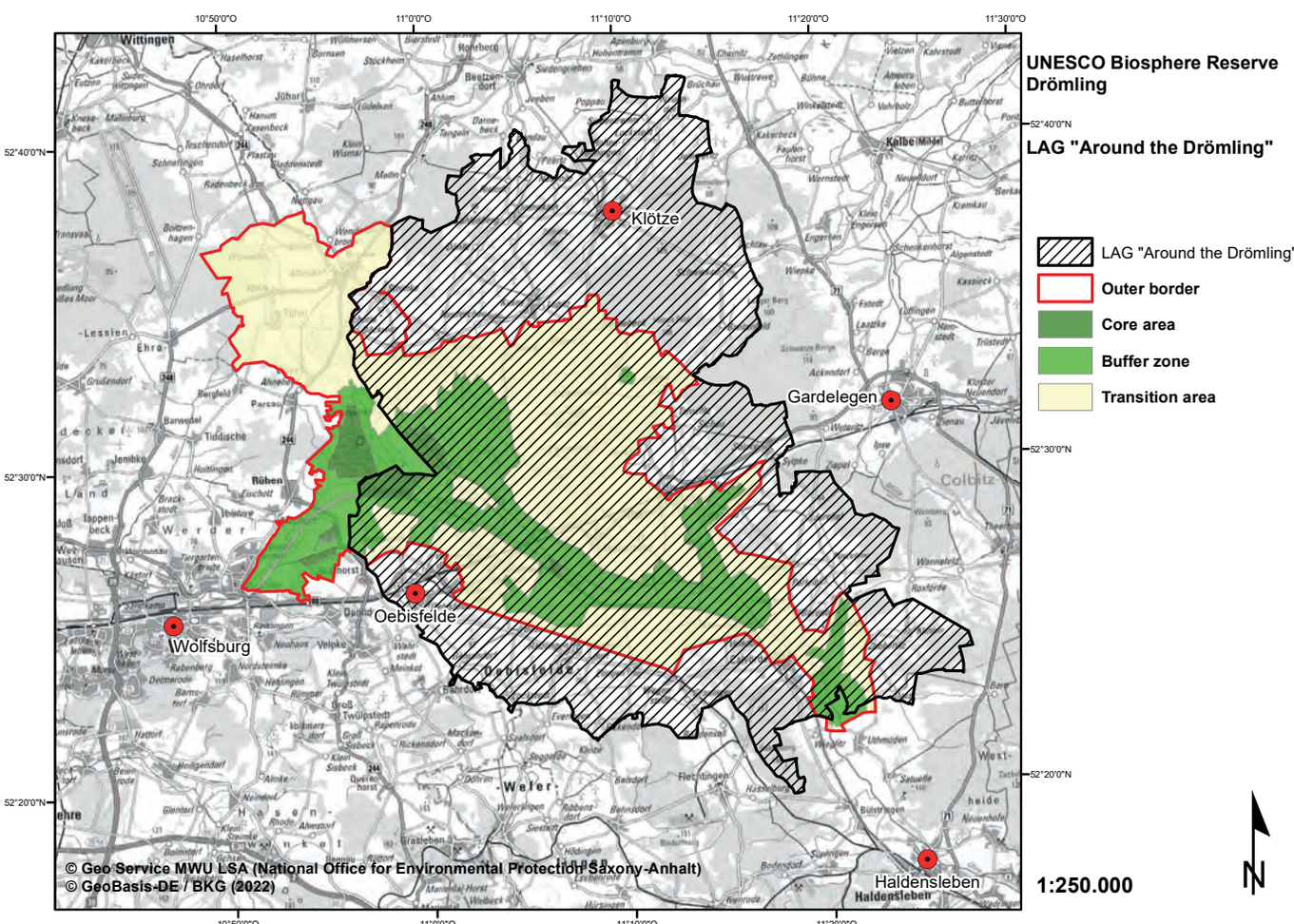

Figure 27: Area of the Local Action Group 'Around the Drömling'.

the industrial sector for the further development of the biosphere reserve is eminent (for details see Chapters 10.2 and 15.4.2 respectively).

Energy industry: There is still development potential in the Drömling with regard to electricity generation from renewable energies. The construction of new plants is severely restricted by the regulations of the nature conservation and landscape protection areas. There are about 20 biogas plants in the immediate vicinity of the biosphere reserve. In addition, there are four plants for electricity generation from wind energy in the transition area in Lower Saxony.

With regard to the protective functions in the BR Drömling, the erection of wind power plants has so far proved to be conflictual. Due to the important function of the Drömling as a waterfowl resting place (> 20,000 geese, cranes, etc.) as well as the importance as a breeding place for birds of prey (especially red kite), further wind farms could not be erected around the Drömling.
Furthermore, there are a few plants for energy generation from fuel cells and solar energy (written information N. Hinze (20.01.2020), Ministry for the Environment, Agriculture and Energy, Department 32).

While in the case of photovoltaics there have so far only been a few larger installations on the roofs of large stables, there is currently a boom in applications for large photovoltaic power stations. While in the core areas and buffer zones of the BR Drömling photovoltaic power stations are excluded according to the nature conservation regulations, they may be possible in the transition area if the conservation and development objectives of the BR Drömling are implemented with the construction of the photovoltaic power stations.

In a research project of the German Biomass Research Centre Leipzig, the basic suitability of grassland cuttings in the Drömling for incineration and energy generation was demonstrated. Depending on the development of energy prices, it could become profitable in the coming years to use the overhanging growth, which was mown late for nature conservation reasons, and thus make ecological and economic sense. The study prepared in 2013 favoured three to five decentralised incineration plants in which either whole hay bales or, after upstream pelletisation, these should be burnt.

15.4.2 Possible positive and negative impacts of these activities on biosphere reserve objectives

Water management: It can be assumed that the water deficit in the Drömling will worsen in the course of climate change. That is why one of the main demands, especially from agriculture, was to develop proposals for improving the water balance of the Drömling.

The update of the cross-state water management model for the Drömling, jointly commissioned by the federal states of Saxony-Anhalt and Lower Saxony in 2019, is intended to create the basis for developing joint proposals for solutions to the requirements of peatland protection and groundwater protection on the one hand, and the need for agricultural irrigation for sites remote from groundwater on the other. In addition, the basics for a uniform management of groundwater in both countries are to be worked out, in particular with regard to the approaches to be taken when issuing permits under water law.

Rewetting measures have halted the loss of peatlands in the core area, thus supporting the positive development towards more biodiversity and species diversity.

The Biosphere Reserve Administration works closely with the maintenance associations in the region and the Association of the Drömling Natural and Cultural Landscape. In this way, measures for the revitalisation of water bodies can be planned, coordinated and initiated. This applies in particular to measures that achieve an increase in ecological passability and contribute to water retention in the landscape. Negative effects relate in particular to water abstraction for field irrigation in the marginal area (inflow area) of the Drömling. In addition, new construction projects are planned to increase ecological passability (fish ladders at dams). The work of the Water Management Department also includes the evaluation and application of the new water management model for the Drömling.

Currently, the water supply in the catchment area of the Drömling is not sufficient for the various demands of nature conservation, resource and climate protection as well as agriculture and water extraction. During dry periods, as recently in 2018 and 2019, the water level drops below the peat layer, which leads to drying out and subsequent peatland loss.

Regional development: In order to create a recognition value and to increase the visibility of the Drömling Biosphere Reserve beyond the region, an umbrella brand is currently being developed.

The aim is to increase the level of awareness of the biosphere reserve through a common logo and a slogan. The umbrella brand includes the projects partner network, the label ‘Kultur-Natur-Pur’ (Culture-Nature-Pure) and the development of regional brands (e.g., Drömlingsrind). Through the label ‘Kultur-Natur-Pur’, cultural events are to be re-established in

rural life, for example book readings, small concerts or themed commissions on farms or at unusual venues.

Regional development also consists in the initiation of a **partner network**. The partners of the biosphere reserve stand for sustainable tourism development in the Drömling region and are at the same time ambassadors of the Nationale Naturlandschaften e.V. (National Natural Landscapes).

Partner enterprises are awarded according to nationwide uniform quality and environmental standards and are committed to the environment and nature. There are currently **34 partner enterprises** in Lower Saxony and Saxony-Anhalt, mainly in the fields of tourism and agriculture. The partners are to complement each other's offers and mutually compensate for any deficits. The partnership is intended to create a network both with and among the participating partner businesses.

Regional producers, processors, traders and businesses can exchange information, offer their goods and thus boost the regional economic cycle. Together they can strengthen the region economically. This has an impact on the economic development of the region, as the economy and tourism are boosted by the initiation of the partner businesses.

This could cause more businesses to invest in the region and existing businesses to create new jobs. Offers in the field of tourism and regional management strengthen the rural area and counteract migration. In addition, this increases acceptance for the biosphere reserve among the local population and political decision-makers. Development in rural areas is strengthened.

Type of business	Number of businesses
Agriculture	13
Tourism	7
Environmental education	5
Gastronomy	4
Cultural events	2
IT	1
Retail trade	1
E-mobility	1

Table 8: Number of partner businesses and type of business.

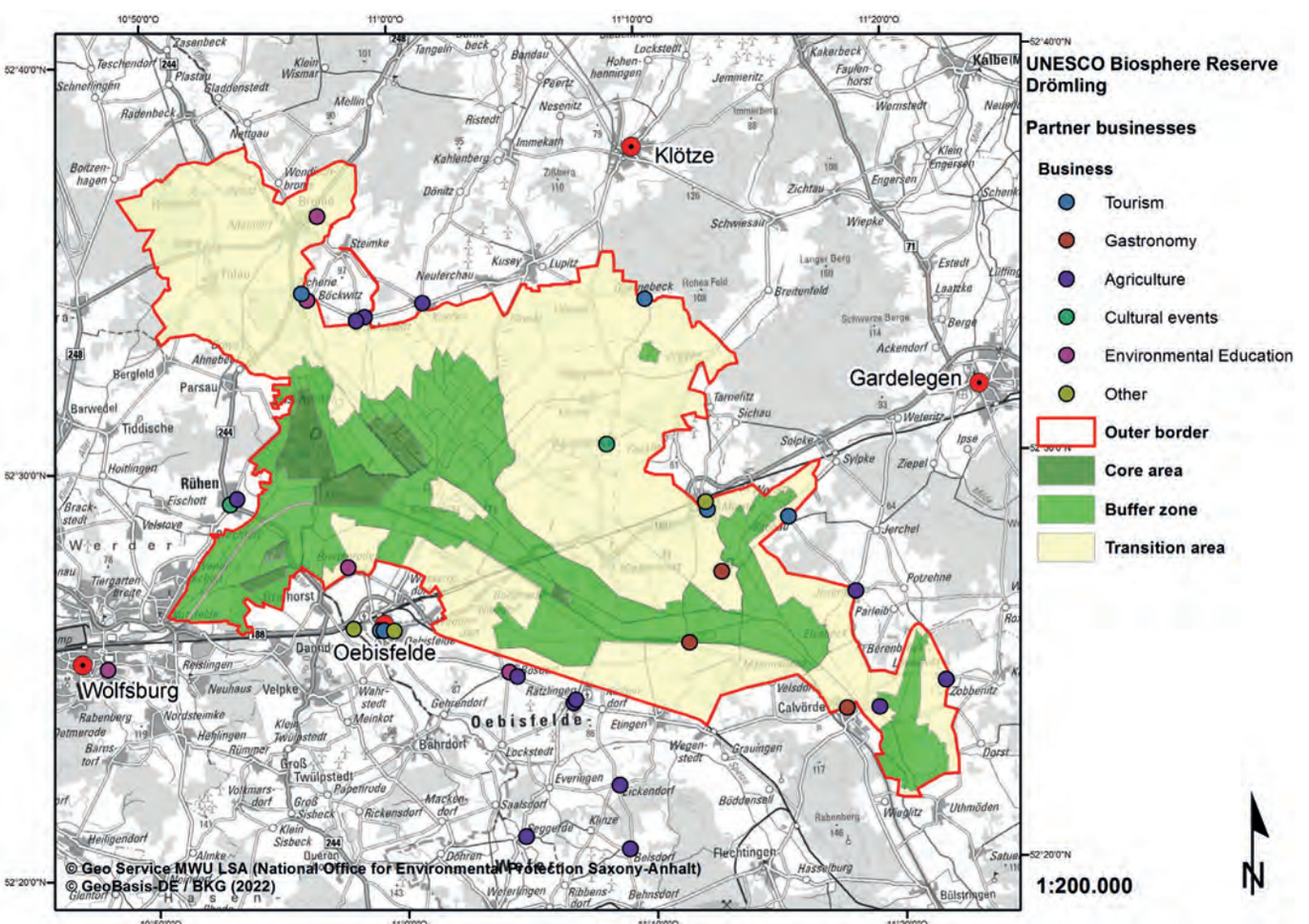

Figure 28: Location and type of partner businesses of the UNESCO Biosphere Reserve.

Commercial enterprises: The region's gastronomic offer is still weakly developed. Nevertheless, there are some businesses that deliver excellent quality and can be considered flagships of the region.

Drömlingsklause: The Drömlingsklause restaurant in Piplockenburg has existed since the founding of the former nature park and has steadily expanded its offer and capacity since then. With its close proximity to the information centre in Kämkerhorst and the shallow water zone, the Drömlingsklause is a popular place for visitors to stop after a thematic tour of the Drömling. The Drömlingsklause is a partner of the biosphere reserve.

Denni Nitzschke show bakery: The show bakery is also a partner of the biosphere reserve and also supports activities in the field of regional development and ESD. In addition, the upgrading of the village of Calvörde is being carried out starting from the show bakery. For example, an intergenerational garden has been set up for visitors in the car park behind the bakery.

Glupe Inn: The Glupe Inn in Tülau was reopened in 2018 after extensive renovation. The aim is to revitalise the old centre of the village and to give families and clubs the opportunity to hold events again.

Industrial companies: The western Altmark benefits from its proximity to the Wolfsburg economic area. Suppliers to the automotive industry have settled in Gardelegen in particular. The industrial region of Lower Saxony also provides jobs for many people in Altmark. Due to this location advantage, the region as a whole can benefit both with its own business settlements and through significant income transfers and increased purchasing power (Regionalverein Altmark e.V., 2015).

Through ongoing cooperation and support from Volkswagen AG, smaller projects in nature conservation can be implemented. Due to rising property prices in the metropolitan region around Wolfsburg, the influx is shifting to the peripherally located municipalities and thus also to the transition area of the biosphere reserve.

Energy management: Renewable energies do not conflict with the conservation objectives of the biosphere reserve and are understood as an opportunity to contribute to sustainable energy production (see also Chapter 15.4.1).

15.4.3 Indicators to assess the state and its trends

The Biosphere Reserve Administration has its own department for **water management** issues with five staff members who regularly measure water levels and flows in the biosphere reserve. The staff members are also responsible for the follow-up monitoring of watercourse maintenance.

A separate post has been set up in the Biosphere Reserve Administration to deal with the issues of sustainable **regional development**, tourism and marketing.

Through participation in the relevant committees, all relevant information comes together here and can thus be centralised and evaluated in a timely manner. Further relevant information is to be collected and evaluated in the context of integrative monitoring for large protected areas.

In the area of commercial enterprises, industrial enterprises, extraction of mineral resources and the energy industry, it will be necessary to collect statistical data in the future. Some socio-economic data will be collected in the course of the Integrative Monitoring Programme for Large Protected Areas.

Excursus – Regional brand 'Drömlingsrind' (Drömling beef)

The regional brand 'Drömlingsrind' has existed in the Drömling Biosphere Reserve since 2020. Knowing that beef from the Drömling is of special quality and that there is great potential for marketing here, a total of 15 farms from Saxony-Anhalt and Lower Saxony were won over.

The aim is to bring the entire economic cycle to the Drömling. Breeding and sales are to take place among the partners. Long transport routes are to be avoided. Gastronomy will thus be given the opportunity to establish regional products on their menus.

The criteria for the recognition of 'Drömlingsrindfleisch' focus particularly on animal welfare and sustainability. Marketing via an online platform already exists. Other buyers in the region, such as Volkswagen AG and EDEKA, have already expressed their interest.

15.4.4 Measures to strengthen positive impacts and reducing negative ones on the biosphere reserve objectives

The coordination of the biosphere reserve‘s regional development is centralised in the Biosphere Reserve Administration. Here, measures are bundled and actors are brought together. The actual projects are then developed by the participants themselves. At the same time, the reserve Administration works in the Local Action Group for the LEADER region ‚Around the Drömling‘. The development of various regional brands under a common umbrella brand for the Drömling region goes hand in hand with this. By proceeding with pooled responsibilities and with the Biosphere Reserve Administration as the central point of contact, targeted regional planning is intended to generate synergy effects and to create a general upgrading of the region together with all those involved. In this way, negative side effects can be minimised, and the protected area objectives can be maintained at all times. The challenges currently lie in the lack of cross-border networking among the actors. In addition, there is currently a lack of ideas for concrete measures for the successful development of the biosphere reserve. These will be developed and defined in a participatory manner in the course of the development of the framework concept over the next three years (see Chapter 17.4).

15.5 Benefits of economic activities to local people

15.5.1 Direct income and benefits for local communities

The general quality of life is to be improved by the designation as a UNESCO Biosphere Reserve. The tourism and marketing concept for the LEADER region ‘Around the Drömling’ forecasts a primary gross turnover of approx. 59.2 million euros for tourism. The tourism income could finance 1,165 jobs. The authors estimate the tax effects (mainly through their share of wage and income tax) at around 1.3 million euros (BTE, 2015). Concrete figures for the other economic sectors have not yet been collected.

15.5.2 Indicators to measure such income or other benefits

As indicators for the general upgrading of the region as well as the general economic development of the biosphere reserve, fixed socio-economic variables such as employees subject to social insurance contributions, unemployment figures or a possible commuter movement can be used. Concrete statistics are currently not available, as the figures cannot be collected for the biosphere reserve as a whole, but only for the respective municipalities. Furthermore, these indicators could only be used as a proxy for regional development, as direct conclusions cannot be drawn from, for example, the number of employees subject to social insurance contributions to regional development activities. Within the framework of the Integrative Monitoring Programme for Large Protected Areas, indicators that provide information on the economic development of the biosphere reserve are also to be collected in the future (Kowatsch et al., 2011).

15.6 Spiritual and cultural values and customary practices

15.6.1 Languages, rituals and traditional livelihoods.

See explanations in Chapters 10.6 and 10.4.

15.6.2 Activities aimed at identifying, safeguarding, promoting and revitalising such values and practices

In today‘s globalised world, customs and traditions are in danger of dying out. The future will show whether, for example, the special **dialects** spoken north and south of the Ohre in some places and tending to be spoken by the older population will also be passed on to future generations. The use of historical **domestic animal breeds** and **cultivated plants** is also subject to change (see Chapter 14.3.1).

The intensification of livestock farms, especially in GDR times, meant that traditional breeds and varieties are no longer competitive. Only recently have they regained a certain amount of attention - also used as a unique selling point or special feature in marketing. The preservation and use of home gardens for self-sufficiency and the associated use of old fruit varieties have also declined recently (Chapter 14.3.1). The same applies to avenues of fruit trees.

Traditional crafts are also in decline. Two particular examples are basket weaving and ‘Mollenhauen’[22] .

Historical **cultural landscape elements** are also being lost. Especially in the course of village redevelopment, rural road construction and structural change in agriculture, these effects are leading to the gradual disappearance of formerly characteristic elements in the landscape. Until recently, **beekeeping** was an endangered profession in the Drömling region. In many cases, bee colonies were only kept by hobby beekeepers. The Biosphere Reserve Administration has

[22] In the process of ‘Mollenhauen’, a piece of wood is hollowed out so that it becomes a tub.

been working together with volunteers for about two years to counteract this trend. At the request of the committed volunteers, a bee project was initiated in 2018. A beekeeper was recruited to set up bee colonies on the information site in Kämkerhorst and on the orchard meadow in Kämeritz. Since then, more than 20 adults and children have been working together in a bee project.

The main actors in safeguarding, promoting and reviving the values and customs in the Drömling Biosphere Reserve are the associations mentioned in Chapter 15.6.1. But also, a number of private actors have contributed to regional development with many new ideas, especially in the last 3 years. With the new position in the Biosphere Reserve Administration for regional development, these activities are supported, and, in addition, the local population is encouraged to take the initiative. Since 2021 there has also been a song composed for the residents of the Drömling on the occasion of the 2nd Drömling Festival. The women‘s choir from Miesterhorst and the men‘s choir from Mieste could be won for the recording. A version of ‘Das Lied vom Drömling’ (The Song of the Drömling) is available on YouTube. An important instrument for communicating cultural values and customs are the lectures given by the staff of the Biosphere Reserve Administration and the thematic walks offered through the biosphere reserve. In this way, the certified nature and landscape guides and other local residents with thematic knowledge use the opportunity to communicate old customs and traditions and to support those interested in reviving them. Some examples are listed below.

Project Hof 7 e. V.: Hof 7 e. V. is an association of young and dynamic actors. The project combines the topics of demographic change, culture and tourism, social issues and environmental education as well as sustainability and environmental protection. These different pillars interlock and can also support each other individually. Thus the ‘House of Life - Courtyard of Knowledge’ stands for a successful, appealing and future-oriented project that increases the attractiveness of the Drömling region and beyond. The increase in cultural offerings is achieved through events such as music, theatre, open-air cinema and creative workshops. Future-oriented, the farm stands out as a place for the arts and the promotion of creative ideas.

Experience farm Quarnebeck: The experience farm in Quarnebeck is geared towards making agriculture, old craft traditions and culture come alive for those interested. Regional products are also sold. Visitors have the opportunity to see the agricultural machinery, some of which is very old. Concerts are held and the first farm festival was celebrated in September 2019.

Creative Farm Kunrau: Various workshops on nature-related topics take place at the Creative Farm in Kunrau. The varied programme is organised by Kreativhof participants (e.g., in the ‘DekoNatur-Werkstatt’ and the ‘NähCircus’), but also by external artists (e.g., handlettering, wicker weaving) and cooperation partners. In addition to many different creative courses, there are annual cultural highlights such as the Irish Evening, the Advent Barn and participation in the Wagen & Winnen art festival. Thanks to many years of LEADER funding, the multi-generation farm of the Bartels and Treichel families has been able to develop steadily, and many ideas have been implemented.

15.6.3 Integration of cultural values in the development process

One of the aims of the development of the biosphere reserve is to create a common identity for the inhabitants of the Drömling through regional development. The Biosphere Reserve Administration can raise awareness of special customs, values and traditions in the course of regional development. It can collect factual information, make it available to a larger public and continue to provide a stage for local associations and initiatives by organising the Drömling Festival. In the future, too, knowledgeable people are to be encouraged to pass on their traditional knowledge in the biosphere reserve‘s educational programmes.

15.6.4 Indicators to evaluate these activities

So far, no indicators have been applied to evaluate these activities. All initiatives, efforts and projects that take place directly through the biosphere reserve or that are presented through bodies in which the Biosphere Reserve Administration is represented are documented on an ongoing basis. In addition, indicators on these topics will be collected as part of the Integrative Monitoring for Large Protected Areas.

16. LOGISTIC SUPPORT FUNCTION

16.1 Research and monitoring

16.1.1 Existing and planned research programmes, projects and activities and 16.1.2 Past research and monitoring activities

Since 1990, more than 300 scientific research topics have been dealt with in the Drömling Biosphere Reserve (see Annex 33).

The proposed UNESCO Biosphere Reserve is obliged to carry out **status, impact and success monitoring in the large-scale nature conservation projects**. This is done partly through the maintenance and development plans, moreover through the implemented nature conservation measures and also in the course of Natura 2000 site management. All this serves to constantly monitor current management and to derive necessary changes in management. The thematic research focus was initially on basic research on the **area-specific water balance**. The corresponding hydrological model is currently being expanded and updated for the entire planned UNESCO Biosphere Reserve. With the goal of sustainable use of the groundwater resources of the Drömling, the updated water management model is intended to expand the knowledge of all those involved.

The dry years 2018 to 2020 have shown that the rewetting measures taken so far have not been sufficient to prevent the fen body in the central areas of the Drömling from drying out. A **feasibility study** should clarify whether additional irrigation in the summer months using water from the Mittelland Canal is possible (see excursus in Chapter 13.1.1).

For the preparation of the **maintenance and development plans**, numerous species groups were mapped over a large area in the Drömling in Lower Saxony and Saxony-Anhalt on a scale that can only be realised in large-scale nature conservation projects (see Annex 32). In addition, the protected area administration participated in several large-scale, multi-year research projects, such as the project 'Ecosystem Management of Fens' funded by the Federal Ministry of Education and Research and the EU project 'PROWATER'. With the preparation of the application documents necessary for the water rights and land consolidation procedures from 2003 onwards, the tendering of research services was carried out primarily for practice-related or expert topics, insofar as they were necessary for the implementation of nature conservation measures, both for reasons of limited budgetary resources and personnel capacities (for the monitoring of the research). Another example of a research project currently running in the Drömling are test areas for the possibility of **controlling the oak processionary moth**. Various measures are being tested here for their effectiveness. The results are later to be applied throughout Saxony-Anhalt.

Already in the maintenance and development plans of the two large-scale nature conservation projects, a **monitoring concept** based essentially on the periodic examination of permanent plots and transects was established. This was updated in Saxony-Anhalt in 2007, taking into account the requirements of the Natura 2000 network, the Water Framework Directive and the data to be collected for the reporting obligations. The maintenance and development plan also contains special monitoring programmes related to the objectives of the large-scale nature conservation project, which are based on the indicator species concept. At the state level of Saxony-Anhalt, the monitoring concept is coordinated with all relevant authorities. In particular, there is a lively exchange of data with the State Office for Environmental Protection, the State Office for Flood Protection and Water Management, the Upper Ohre Maintenance Association and the Offices for Agriculture, Land Consolidation and Forestry, for example with regard to beaver management, wet grassland mowing (Anhalt University of Applied Sciences) and projects on the otter and game browsing areas in the core area.

In this regard, the nature conservation authorities have promised to set up a hunting working group during the preparation of the framework concept and to strive for harmonisation of wildlife management. This also includes the establishment of a uniform **wildlife monitoring** system in order to align wildlife management with forest development, wildlife damage development and the latest wildlife biology findings.

While biotic and abiotic data have been collected in the area for many years, there are **deficits in socio-economic data**. The existing monitoring concept must now be expanded for the planned cross-border UNESCO Biosphere Reserve Drömling. This concerns on the one hand the extension of the monitoring to the entire area of the Biosphere Reserve Drömling, especially for the area-wide surveys by the rangers according to the monitoring concept.

On the other hand, a qualitative extension of the monitoring is to be carried out by aligning it with the criteria of the **Integrative Monitoring Programme in large protected areas**. Integrative monitoring is implemented in almost all German national parks and biosphere reserves and is to be continued. The aim of this integrative monitoring in the biosphere reserve is to safeguard the protected area in the long term and to fulfil international and national reporting obligations. In addition, a nationwide overview of the development of the unique habitats of the National Natural Landscapes is to be created, combining ecological, economic and socio-cultural aspects (Gehrlein, Süß, Baranek, & Schubert, 2014).

Socio-economic data on tourism in German biosphere reserves are available on the basis of a recent study headed by Univ.-Prof. Dr. Hubert Job and commissioned by Federal Agency for Nature Conservation. The study has not yet been published. Initial results on the Drömling Biosphere Reserve can be found in Chapter 15.2.2. In addition to the continuation of the existing long-term research and monitoring activities,

future programmes, projects and measures will be defined in the course of the preparation of the framework concept and adapted to the biosphere reserve's orientation (see Chapters 13 and 17.4).

16.1.3 Research infrastructure

For many years, a separate office has existed for **research coordination** (see Figure 18), which reports directly to the head of the proposed UNESCO Biosphere Reserve and is equipped with the necessary capacities in terms of both personnel and technology. The research infrastructure in the proposed UNESCO Biosphere Reserve has largely been established by the Biosphere Reserve Administration itself and is maintained under its own responsibility, regularly reviewed and adapted to current developments. In addition, the Biosphere Reserve Administration has its own budget for the distribution of research contracts to third parties. In the last 10 years alone, approximately 60 smaller and larger research contracts have been awarded to universities, technical colleges and engineering offices. The Drömling Biosphere Reserve currently has a system of more than 100 test sites and permanent observation plots, on which studies are carried out in different cycles. Some of these test areas are also important reference areas for the Natura 2000 national concept of Saxony-Anhalt. The test sites are set up and supervised both by scientific institutions bound by cooperation agreements, e.g., the Helmholtz Centre for Environmental Research Leipzig-Halle, the Anhalt University of Applied Sciences and the Magdeburg-Stendal University of Applied Sciences, and by external experts or offices, as well as by our own staff.

The most important **scientific partners** are the Magdeburg-Stendal University of Applied Sciences, the Anhalt University of Applied Sciences, the Martin Luther University Halle-Wittenberg and the Technical University of Braunschweig. For some long-term research projects, cooperation agreements have been concluded with both universities and scientific institutions.

The research results are presented and discussed at specialist colloquia and continuing education events and are also published in the specialist press. Project, **Bachelor's and Master's Theses** are regularly assigned by the Biosphere Reserve Administration through the specification of corresponding tasks and the maintenance of contacts with professors, among others with the universities of Magdeburg-Stendal and Anhalt, with the University of Halle-Wittenberg and the Technical University of Braunschweig (see Annex 33).

The actual implementation and support of the research work is carried out by **Department 3 (Nature Watch/Monitoring/ Nature Conservation Area Maintenance/Species and Biotope Conservation)**.

16.2 Education for sustainable development and public awareness

16.2.1 Existing and planned activities in the area concerned

The Biosphere Reserve Administration's target group related **environmental education** and **education for sustainable development (ESD)** are important instruments for the identification of the local population with the protected area. The Biosphere Reserve Administration is actively involved in the 'North German and Sustainable Commission' for Saxony-An-

Figure 29: Ranger during a thematic tour at the shallow water zone in Piplockenburg.

halt. There, a state-wide concept for the certification of ESD institutions is being developed. In a further step, **the ESD concept for the biosphere reserve** is also to be revised. Special importance is attached to communicating the conservation goals to children and young people from the region, which is why about 150 project days are organised with over 3,000 schoolchildren and kindergarten children.

Currently, 75 volunteers are involved in the project '**Ehrensache Natur' (Honouring Nature)** by supporting the work of the Biosphere Reserve Administration in various areas.

One of the projects that is being pursued vigorously in the Drömling and which has meanwhile also developed supra-regional appeal is the **project** '**Miteinander engagiert im Drömling' (Engaged with each other in the Drömling)**.

People with mental and emotional disabilities work in their free time together with Biosphere Reserve Administration staff, junior rangers and volunteers from the Drömling Biosphere Reserve. In doing so, they get to know and appreciate the animal and plant world and habitats as well as conservation measures. Through joint actions, excursions, events and camps, the sense of belonging is promoted and self-confidence is strengthened.

In 2018, a total of 27 volunteers were trained as **certified nature and landscape guides** in cooperation with the Börde District Adult Education Centre. Most of the topics covered in the training were taught by the staff of the former Drömling Nature Park. In addition to the courses on topics such as nature conservation, management of the Drömling and its history, there were three full-day excursions and one evening excursion to show the participants all the touristically relevant points in the area. In the meantime, the certified nature and landscape guides complement the biosphere reserve's educational programme with thematic hikes and lectures. The training of further certified nature and landscape guides is planned for November 2021.

Since 2003, more than 400 children have been trained as **Junior Rangers** in the Drömling; 48 children in 3 groups are currently on their way to the title. With the project 'Junior-Ranger:innen auf Entdeckertour' (Junior Rangers on a discovery tour), young people beyond the borders of the biosphere reserve are to be addressed with their own booklet for the Drömling.

Thanks to the high level of commitment of the staff, it has been possible to motivate 50 children over primary school age to take part in further regular activities in the overarching **group 'Beaver Gang**'. Similarly, there is also a project for volunteers of kindergarten age. As **'Moorwichtel' (peatland elves)**, children between the ages of four and seven can get involved in the Drömling.

Other environmental education projects include **forest fox sponsorships** with monthly visits to the 14 kindergartens in the region and the annual schoolchildren's drawing competition. Up to 1,000 children from schools far beyond the borders of the biosphere reserve regularly take part in this

Excursus – Volunteering in the Drömling

Volunteers have been involved in the Drömling Biosphere Reserve for many years, in addition to the staff. These include about 35 residents of counselings in Altmark West GmbH, Wolfsburg GmbH and the evangelic foundation Neinstedt (with residential homes in Calvörde and Etingen), as well as the ‚Junior Rangers' of the Drömling Biosphere Reserve. Together they carry out work assignments as well as excursions, thematic training and activities. People of all ages, with and without restrictions, regardless of their origin, are brought into contact and integrated. They are taught about nature conservation and environmental protection, culture, history, old crafts and healthy food, and they are also brought closer to their environment. Bridges are built between the participants, reservations are reduced, and the participants learn new skills. Their self-esteem and sense of self-efficacy is thus strengthened, as well as a sense of shared responsibility for our nature and environment. The volunteers are not only active in the Drömling Biosphere Reserve, but also in their personal environment as environmental ambassadors. This project was awarded a **UN Decade Project in the special competition 'Social Nature - Nature for All'** in 2020.

In the context of work with volunteers, there is cooperation with the neighbouring Biosphere Reserve 'Niedersächsische Elbtalaue' and 'Lebenshilfe Lüneburg'.

competition, and their best drawings are rewarded with publication in a children's calendar. Many of the more than 100 **guided tours, excursions and lectures** given by Biosphere Reserve Administration staff each year are also thematically oriented towards protected area related environmental education and ESD. The Drömling has also been presented on various occasions at national **trade fairs**. The presentations are aimed at a wide range of target groups, including those outside the biosphere reserve. Every year, about 10,000 people are introduced to the beauty of the Drömling through the Biosphere Reserve Administration.

Lectures are also given to local interest groups such as hunters, anglers and farmers' associations. These often lead to fruitful technical discussions, which usually result in a growing understanding of the protected area. Another nature conservation project with an inclusion character, in which sustainability aspects are taught, is the **bee project** of the Biosphere Reserve Administration.

The volunteers involved in this project not only learn about handicraft activities, but also about the care and maintenance of the bee colonies and the subsequent use of the products. The topic of bees provides excellent access to other aspects of nature conservation.

Another ESD project with inclusion aspects that could take place for the first time in 2020 was the **climate camp** of the Biosphere Reserve Administration. Youths and young adults with and without impairments between the ages of 13 and 25 were able to participate in this five-day camp. Through experiments, excursions and outings, the participants learned about various aspects of climate change. The camp will take place annually in the future.

In keeping with its great importance, **public relations work** is a focal point of Department 1 of the Biosphere Reserve Administration. In addition to the staff of the department, public relations work is also supported by all other staff members. Above all, the rangers, but also the landscape conservation staff, perform important tasks both at the numerous events and in their daily presence in the area. Every year, an event plan is drawn up with about 20 fixed dates, which are supplemented by numerous activities in the course of the year. In addition, the regional festivals and events, partly also supra-regional fairs, are supported by information stands. The Biosphere Reserve Administration's ESD activities already extend to the entire Drömling region of Lower Saxony and, in part, beyond the borders of the biosphere reserve. In this respect in particular, the Drömling was a model region for several projects, from which these projects were also extended to the national level.

16.2.2 Facilities and financial resources

Financial resources: see Chapter 13.6

The Biosphere Reserve Administration Drömling provides various **educational offers in the field of experiencing nature and education for sustainable development** (ESD). These are

Figure 30: Ranger on a bike tour with school children.

among the core offers of the region. Central contact points for this are:

The information centre Kämkerhorst: The information centre for the Drömling is run by the Biosphere Reserve Administration and is located in the middle of the biosphere reserve in Kämkerhorst. The information house with its permanent exhibition, including a film screening room, and the large outdoor area are looked after full-time all year round. A large part of the biosphere reserve's events and environmental education activities take place in Kämkerhorst, as both the possibilities for imparting knowledge and practical applications as well as the necessary infrastructure are available here. About 8,000 of the 10,000 visitors to the information facilities registered each year come to Kämkerhorst. Despite regular suggestions from staff and visitors, the Kämkerhorst information centre, built in 2000, is no longer up to date in terms of environmental education and technology and needs to be redesigned, especially for the Drömling Biosphere Reserve, which now spans several federal states.

Natura 2000 Information Centre Buchhorst: The conversion and expansion of the old Buchhorst Pumping Station into a Natura 2000 Information Centre Drömling is intended to create a modern location for the Drömling to impart knowledge about Natura 2000 in the biosphere reserve and at the same time improve the tourism infrastructure with regard to nature observation and recreation. The focus will be on the moor, the core area and rewetting. The extensive conversion and extension of the former pumping station will be carried out under functional, climate-relevant and aesthetic aspects. The building envelope is to be retained, but will be made more translucent, energy-efficient and externally appealing. For the interior, among other things, the visualisation of water management is planned. The entire Natura 2000 information area will be designed to be barrier-free.

In Lower Saxony, another **nature station** or information point is to be established at the site of the former customs station on the Mittelland Canal to serve as a contact point for visitors coming from Wolfsburg. The land was acquired by the district of Gifhorn.

Shallow water zone in Piplockenburg: As a compensatory and replacement measure for the extension of the Mittelland Canal, this standing water body was created in 2002–2003 with several islands and peninsulas. The shallow water zone is located in the biosphere reserve's buffer zone and provides a habitat for many bird species. It is also used as a resting place by many migratory birds during the bird migration period. There are numerous hiking trails and observation huts. The shallow water zone is used by the rangers and certified nature and landscape guide as a starting point for thematic guided tours.

Headquarters of the Drömling Biosphere Reserve Administration and Drömling Information Centre: The management of tourism and regional development, as well as public relations and ESD, are run from the Drömling Information Centre. This is located together with the headquarters of the Biosphere Reserve Administration in Oebisfelde. Information can be obtained here, and suggestions and tips for exploring the biosphere reserve are provided.

Kunrau Nature Experience Centre: This educational facility is run by the Zweckverband Natur- und Kulturlandschaft Drömling. Kunrau is located in the northern Drömling within the biosphere reserve. This extracurricular place of learning offers projects for schools in the area on the topics of water and water science, soil and forest science, history, flora and fauna of the Drömling, ecology and the way of life of native animal species, renewable raw materials and energy of the future.

Kämeritz orchard meadow with Drömling apple hut: The orchard meadow on the eastern edge of the biosphere reserve was established in the 1990s with the support of the Stork Foundation and other regional companies. In recent years, the meadow orchard has been repeatedly expanded and supplemented. The focus is on processing the resulting fruit from old regional varieties in the Biosphere Reserve Administration's inclusive projects (e.g., ‚Ehrensache Natur' and ‚Miteinander engagiert im Drömling', see Chapter 16.2.1). An annual regional festival is held in the apple hut on the same site. The hut also serves as a contact point for thematic guided tours.

There are cooperative relationships with other environmental education institutions, such as **Magdeburg Zoo**, the **museums** in Oebisfelde, Haldensleben, Brome and Magdeburg, the Haus des Waldes **(House of the Forest)** in Hundisburg and other **educational institutions in Saxony-Anhalt**, which are, for example, places of employment for the Voluntary Ecological Year, for mutual support and presentation. The information centres of the **museum association in Böckwitz**, the tourist association in Mieste and the **local history association** in Oebisfelde were supported by the Biosphere Reserve Administration in their development. Special regional accents are still set here, such as the pioneering agricultural achievements on the Kunrau manor or the problems of the inner-German border. Knowledge about biological diversity – about animals, plants and their habitats – can be conveyed in easily understandable language. **Nationale Naturlandschaften e. V.** (national natural landscapes association) has developed appropriate learning materials together with part-

ners. Staff from the Drömling Biosphere Reserve were also involved in the development of the booklets. All the thematic booklets are used in environmental education work in the Drömling for people with and without disabilities as well as for children and adults. A separate booklet in easy-to-understand language – ‚The water habitat in the land of a thousand ditches' – was produced in 2015 and has since also been used in environmental education work.

16.3 Contribution to the World Network of Biosphere Reserves

16.3.1 Contribution to the World Network of Biosphere Reserves, its Regional and Thematic Networks

The Local Action Group 'Around the Drömling' is currently working on a transnational project with the Polish LAG 'Oberland Canal' around Elblag.

Further international partnerships are to be established in the future, for which there are links via the partnership with Volkswagen (Volkswagen's existing support for the Drömling Biosphere Reserve) and via membership of the National Natural Landscapes (NNL e. V.). In the course of the process of developing the framework concept (see Chapter 17.4), an international partner biosphere reserve is to be found. After the designation as a UNESCO Biosphere Reserve, the area would like to actively participate in EuroMAB.

16.3.2 Expected benefits of international cooperation

At the administrative level, an international partnership and the associated exchange of expertise would be beneficial in many respects. On the part of the Drömling, there is an enormous amount of expertise, especially on the topic of water management, which biosphere reserves could access under comparable conditions. At the same time, the proposed UNESCO Biosphere Reserve Drömling hopes that international cooperation will above all provide information and strategies on the subject of sustainable development, as this topic has played a subordinate role in the management of the protected area to date. Especially with regard to the further development of the biosphere reserve, strategies for sustainable management should take on more importance in the future. Another advantage of international cooperation is the promotion of an intercultural understanding of sustainability. The connection to the world network of biosphere reserves and the visit of international groups of experts and visitors increase the international and intercultural appeal of the region, which thus becomes more attractive for young people who live in a rural region but grow up in a globalised world.

Dealing with sustainability also means dealing with future issues that will have a significant impact on the quality of life in the region. For regional companies, international cooperation also offers good opportunities to present themselves to an international audience at events abroad or locally in the Drömling.

16.4 Internal and external communication channels and media

16.4.1 Biosphere reserve website

The internet presentation at www.biosphaerenreservat-droemling.de is an important part of the public relations work. However, the site has been little frequented so far (approx. 20 hits/month). It is planned to use the internet presentation more for announcing events in the future. It is then to be expected that the number of hits will also increase.

16.4.2 Electronic newsletter

At present, there is only one ‚Drömlingskurier' (Drömling Courier) with an annual circulation of 73,000 and three annual editions so far, which is distributed as a supplement in the regional newspapers in the Magdeburg and Braunschweig regions and informs about current developments on the subject of the biosphere reserve (see Annexes 34 to 36).
The publication of leaflets and other publication material is also an important part of the public relations work. Every year there are around 150 articles in the local press and up to five television reports.

16.4.3 Social networks

The exact design of communication via social media is to be worked out in a public relations concept. This will be prepared in the course of developing the framework concept.

When communicating, it is particularly important to observe the requirements of the two federal states with regard to data protection and data security. This has made work with social media more difficult in the past.

17. GOVERNANCE, BIOSPHERE RESERVE MANAGEMENT AND COORDINATION

17.1 Management and coordination structure

17.1.1 Legal status of the biosphere reserve

As the proposed UNESCO Biosphere Reserve spans two German federal states, it is subject not only to the **Federal Nature Conservation Act (§ 25 BNatSchG)** but also to the respective legislations of the states of Saxony-Anhalt and Lower Saxony. The Saxony-Anhalt part of the area has already been legally secured across its entire territory since June 2019 by the **'Regulation on the Drömling Biosphere Reserve Saxony-Anhalt' (BioResDrömlV ST)** of 22 June 2019, which came into force on 29 June 2019. The legal safeguarding of the Lower Saxony Drömling is based on the nature conservation areas already designated. The core areas and buffer zones are fully legally secured by these nature conservation areas. The spatial delimitation of the biosphere reserve, the zoning as well as the conservation purpose and the objectives for the maintenance and development of the entire Lower Saxony part of the biosphere reserve are laid down as legally binding spatial planning objectives in the **Lower Saxony Regional Planning Programme**.

This regional planning programme is a legal regulation of the Lower Saxony Ministry of Food, Agriculture and Consumer Protection. The LROP is currently being updated. The intended recognition as a UNESCO Biosphere Reserve is taken into account by a textual objective and a cartographic representation in the current draft of the Lower Saxony Regional Planning Programme:

> *'03 The biosphere reserve safeguard area defined in the Drömling area in Annex 2, whose core, maintenance and transition areas are defined in the map attached as Annex 3, serves to safeguard the area with a view to future recognition as a UNESCO Biosphere Reserve. In the core and buffer zones as defined in Annex 3, the protection and development of nature have priority over other uses; spatially significant planning and measures which are incompatible with this according to the provisions of nature conservation law are excluded. Sustainable, environmentally sound uses are to be developed, tested and implemented in the transition area of the biosphere reserve conservation area; model projects to this end are to be promoted' (Translation from German).*

In this way, the presentation in the Lower Saxony Regional Planning Programme also serves to formally inform the public about the planned UNESCO Biosphere Reserve Drömling.

The protective purpose and objectives for the maintenance and development of the planned cross-state UNESCO Biosphere Reserve as a whole and in the individual zones shall be published in a supplementary announcement by the Länder of Saxony-Anhalt and Lower Saxony. The announcement is to be made immediately after recognition by UNESCO. It also serves to inform the public about the joint Biosphere Reserve Administration and the joint Advisory Board. A **joint publication in the ministerial gazettes of the federal states** is planned after UNESCO's recognition. The draft version of the announcement is attached to the application for designation as a biosphere reserve (Annex 11).

17.1.2 Legal status of the core areas and buffer zones

A detailed list of the main legal bases can be found in the Annex (9 to 30).
See also Chapters 4.5 and 9.3.

17.1.3 Administrative authorities for each zone of the biosphere reserve

The responsible administration of the proposed cross-state UNESCO Biosphere Reserve Drömling is to be formed by the already existing **Biosphere Reserve Administration** Drömling Saxony-Anhalt. This is based in Oebisfelde and as an independent authority is directly subordinate to the highest nature conservation authority of Saxony-Anhalt, the Ministry of Science, Energy, Climate Protection and the Environment (Ministerium für Wissenschaft, Energie, Klimaschutz und Umwelt).

The tasks of the Saxony-Anhalt Biosphere Reserve Administration for the Saxony-Anhalt part of the area are defined in the Biosphere Reserve Ordinance (see Annex 14). In fulfilment of Section 11 of the BioResDrömlV ST, the Biosphere Reserve Administration also assumes the enforcement tasks for the nature conservation areas and landscape conservation areas within the Saxony-Anhalt area boundary on the basis of Land-specific regulations as the responsible body for public concerns. For the remaining areas without nature conservation areas and landscape conservation areas protection status, the enforcement tasks remain with the lower nature conservation authorities of the Börde district and the Altmark district of Salzwedel.

On the basis of the ‚Agreement in preparation of the joint administration of the planned, trans-state UNESCO Biosphere Reserve in the Drömling' of 12 June 2019 (Annex 9), on the basis of the key points paper prepared in 2016 (Annex 37), the Biosphere Reserve Administration of Saxony-Anhalt is already assuming tasks during the application phase in connection with the development of the Drömling on the way to becoming a trans-state UNESCO Biosphere Reserve. This refers to the phase up to the recognition of the Drömling as a UNESCO Biosphere Reserve. Building on the existing agreement, an extended agreement is to be concluded after recognition by UNESCO, regulating the joint management of the area (Annex 10).

Accordingly, the Drömling Biosphere Reserve Administration of Saxony-Anhalt will be expanded to become the joint administration of the cross-state UNESCO Biosphere Reserve Drömling. The sovereign tasks for the Lower Saxony part of the area will continue to be carried out by the districts of Gifhorn and Helmstedt and the city of Wolfsburg as the responsible lower nature conservation authorities. The forest areas in the Lower Saxony core areas and buffer zones are managed by the **Lower Saxony State Forest Management Organisation**. In the core areas, the forest is left to develop naturally.

17.1.4 Respective competence of each of these authorities

The joint UNESCO Biosphere Reserve Administration should continue to be active across the federal states and perform coordinating functions for higher-level planning and coordination in cooperation with key stakeholders, as well as initiating projects itself (see Figure 31).

The currently existing responsibilities of the nature conservation and water authorities, including water management, remain independent of this in both federal states. Likewise, the responsibilities of the maintenance associations, especially in flood protection, remain unaffected. The Biosphere Reserve Administration is responsible for the implementation of management planning and, after successful UNESCO recognition, also for the preparation of the trans-regional framework concept (see Chapter 17.4).

This is done in close cooperation with the competent and local authorities, bodies and land users. Congruent networking with the levels of the districts is a declared goal of the biosphere reserve, especially against the background of the establishment of the regional brands and the umbrella brand of the National Natural Landscapes (NNL e. V.) as well as the tourism region (Job et al., 2019).

In the future, the relevant agendas will be further bundled for efficient area management. For this purpose, the tourism region is to be anchored at the Biosphere Reserve Administration and thus a destination management organisation is to be established. The planning of this will be written down in the course of the preparation of the framework concept (see Chapter 17.4).

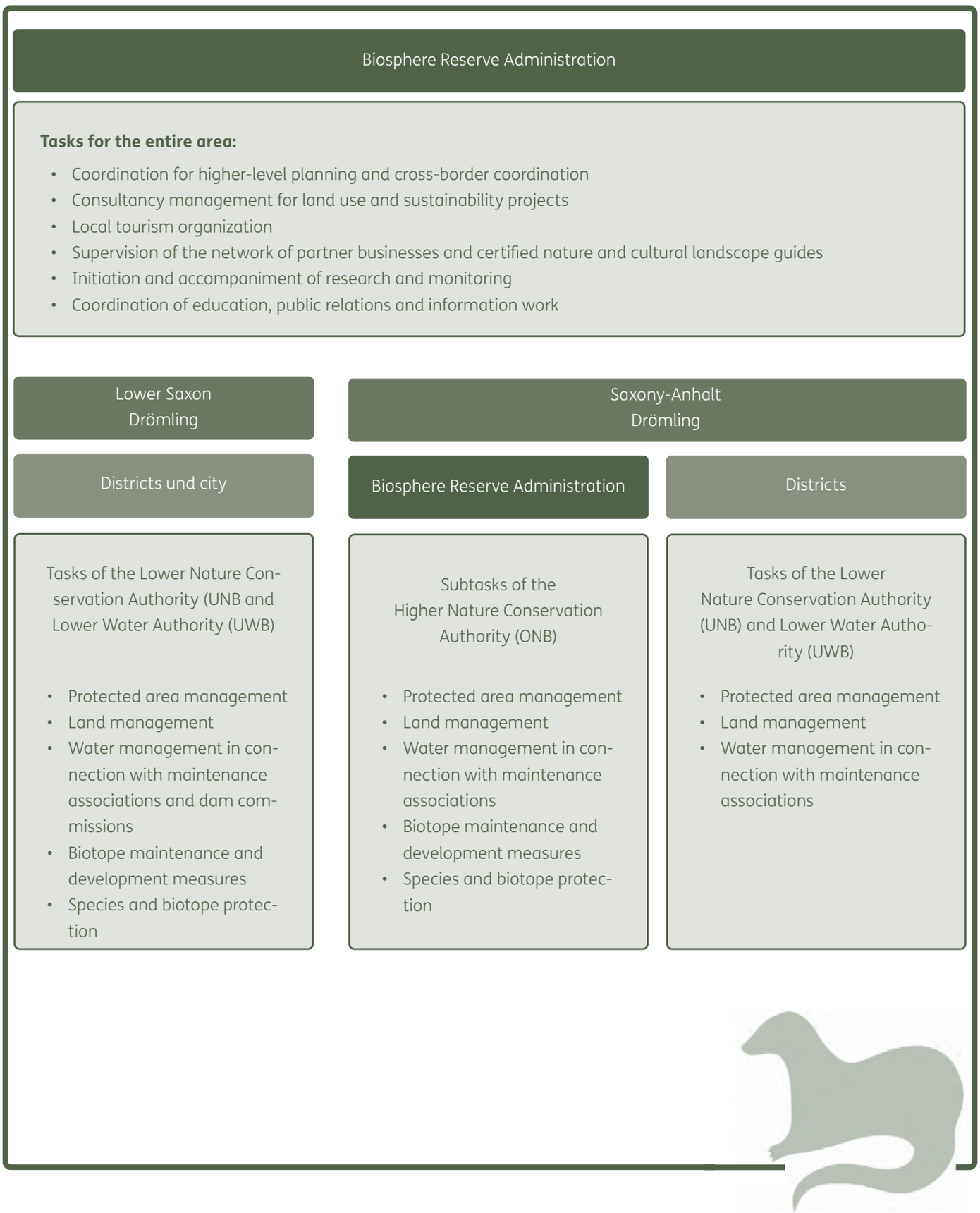

Figure 31: Overview of the organisational structure and distribution of tasks of the administrative units of the planned UNESCO Biosphere Reserve.

17.1.5 Main land tenure for each zone

In the **core areas**, 99.7% of the land is in public ownership. Approximately 54% of the **buffer zone** is in public ownership. Other owners include foundations and the Association for the Nature and Cultural Landscape of the Drömling.

In the Saxony-Anhalt **transition area**, the share of publicly owned land is about 12%.

For Lower Saxony, it was not possible to break down the ownership structure for each zone. This analysis is to be carried out in the context of the development of the framework concept. Of the total area of the core and buffer zones in Lower Saxony, approx. 43% is in public ownership (Kaiser et al., 2001).

17.1.6 Head of the Biosphere Reserve Administration

The Head of Service for the Drömling Biosphere Reserve Saxony-Anhalt is Fred Braumann, his deputy is Ulf Stautmeister. The employer of the head of the biosphere reserve is the State of Saxony-Anhalt represented by the Ministry of Science, Energy, Climate Protection and the Environment of Saxony-Anhalt (MWU).

17.1.7 Consultative advisory or decision-making bodies

The **cross-border working group** set up for the biosphere reserve consists of representatives of the Ministry of Science, Energy, Climate Protection and the Environment of Saxony-Anhalt (MWU), the Lower Saxony Ministry for the Environment, Energy, Construction and Climate Protection (MU), the Drömling Biosphere Administration of Saxony-Anhalt and the district of Gifhorn, which also represents the district of Helmstedt and the city of Wolfsburg. The extended circle of this working group includes representatives of the municipalities and interest groups involved in the biosphere reserve (see Chapter 13.3).

The **Drömling Conferences** should continue to be held as an open event format in order to ensure that a broad public has opportunities to participate in the development of the biosphere reserve and to inform them about the work of the Biosphere Reserve Administration.

In the **Local Action Group ‚Around the Drömling‘**, citizens as well as partners from different public and socio-economic sectors can participate in shaping the LEADER region. The Biosphere Reserve Administration is an important contact for the Local Action Group and works on the board.

As an independent advisory body for the development of the planned UNESCO Biosphere Reserve, the members of the Advisory Board are nominated and appointed. The **Advisory Board** has already met and thus started its tasks.

17.1.8 Coordination structure

In the joint cabinet meetings in 2014 and 2019, the state governments of Lower Saxony and Saxony-Anhalt decided, and the decisions of both state governments in 2022 were repeatedly confirmed, to set up a **cross-state working group** and to permanently establish it for the cross-state coordination and management of the proposed UNESCO Biosphere Reserve.

The working group is composed of representatives of the Ministry of Science, Energy, Climate Protection and the Environment of Saxony-Anhalt (MWU), Lower Saxony Ministry for the Environment, Energy, Construction and Climate Protection (MU), the Drömling Biosphere Reserve Administration of Saxony-Anhalt and the district of Gifhorn, which also represents the district of Helmstedt and the city of Wolfsburg. The task of the working group is to explore the possibilities for the development of a trans-regional UNESCO Biosphere Reserve and a unified territorial development in the Drömling with the involvement of regional actors. This cross-state working group is to remain in existence after the successful development of the cross-state biosphere reserve.

17.1.9 Adaptation of management and coordination to the local situation

In order to view the Drömling as a natural unit with its socio-economic and economic structure that spans two federal states, the region has jointly decided to develop and strive for a cross-state UNESCO Biosphere Reserve. This means that responsibility at the state level lies with two ministries in two federal states. The trans-regional working group was formed to coordinate these responsibilities.

17.1.10 Evaluation and monitoring of the effectiveness of the management

An evaluation of the Biosphere Reserve Administration has not yet taken place. However, after recognition as a UNESCO Biosphere Reserve, it would be subject to evaluation by the MAB National Committee and UNESCO in Paris at ten-year intervals. This is also enshrined in the agreement for the joint management of the UNESCO Biosphere Reserve (Annex 10). The criteria and indicators for internal quality management of the Biosphere Reserve Administration are to be reflected and laid down in the framework concept (see Chapter 17.4).

This should be based on the one hand on the BfN Guidelines for Framework Concepts (Falter, Küstner, Nichlas, & Scherfose, 2018) and on the other hand on the template of the UNESCO Evaluation Document (2013).

The planned Integrative Monitoring Programme for Large Protected Areas in the Drömling will provide information on the status, management and measures of the biosphere reserve based on specified indicators (Kowatsch, A., Hampicke, U., Kruse-Graumann, L. and Plachter, H., 2011).

17.2 Conflicts within the biosphere reserve

17.2.1 Conflicts regarding the access or the use of natural resources in the area

The conflicts in access to natural resources play out in two thematic areas.

On the one hand, there is a fundamental conflict between the goals of nature and landscape conservation, peatland and climate protection as well as species and biotope protection on the one hand, and so-called good agricultural practice, which does not take these goals into account at all or only insufficiently, on the other. This fundamental conflict became particularly apparent in the 1990s, when large parts of the Drömling were to be placed under nature conservation and rewetted. This conflict was solved by the purchase of land on about 800 ha, mainly in the context of large-scale nature conservation projects, and by land consolidation in land consolidation procedures. In addition, the Biosphere Reserve Administration has not only offered voluntary nature conservation measures to farmers, but has also jointly coordinated and implemented them, which generates additional income, especially for livestock farms. These aspects are also taken into account in the design of public sector leases.

In the field of water, the fundamental conflict is the insufficient supply of water, and this need is exacerbated by climate change. Furthermore, the status reports of the Magdeburg drinking water supplier indicate that the demand for drinking water will also increase in the future for the water supply of the greater Magdeburg area, which would then have to be withdrawn from the Ohre primarily in spring and autumn. As explained in section 15.4, the potential for conflict is to be reduced by updating the water management model and examining variants, including the water transfer.

A further conflict exists in the maintenance of the ditch system in the Drömling. In its work, the Obere Ohre Maintenance Association has to take into account the concerns and requirements of its members on the one hand and the nature conservation objectives for the water bodies on the other. This conflict arises, among other things, in the impoundment by beaver dams, in the setting of impoundment targets, in the retention of water in the landscape and in the intensity of watercourse maintenance. In particular, the temporal availability of the anthropogenically influenced water supply is the main problem for the fen in the Drömling Biosphere Reserve. For reasons of bog protection, but also of biotope and species protection, it is necessary to reduce the regularly occurring summer water deficit. In this context, there is a fundamental conflict of objectives between the hydrological requirement of the longest and highest possible water retention in the winter half-year and the guarantee of agricultural usability in the area of the nature reserve ‘Ohre-Drömling’, which is to be preserved as an area predominantly used as a cultivated landscape (TRIOPS / LPR, 2007).

17.2.2 Conflicts in competence among the different administrative authorities in the management of the biosphere reserve

There are currently no conflicts with the administrative bodies involved in the management of the area beyond the Biosphere Reserve Administration.

One conflict with the agricultural administration has been resolved in recent years. The responsible offices (ÄLFF) often doubted the eligibility of wet grassland and wet grassland for subsidies, or refused to grant them to the farmers, because in their view they were no longer agricultural land eligible for subsidies. With the help of the Saxony-Anhalt Ministry responsible for nature conservation, the Biosphere Reserve Administration was able to resolve this conflict and resolve it in a way that was comprehensible to all parties involved, by classifying the above-mentioned grassland as a typical local expression within the meaning of the protected area objectives.

The basic conflict with agriculture described in Chapter 17.2.1 and the associated form of watercourse maintenance remain.

17.2.3 Solutions to these conflicts, and their effectiveness

The show commissions of the Maintenance Association have proven to be an effective means of identifying conflicts with land users at an early stage, addressing them and clarifying them to a bilateral agreement.

In other conflicts, too, it has been shown that a sustainable solution can only be found through early information and

participation of all interested parties. In particular, during the moderation process in the course of designating the 'Ohre-Drömling' Nature Conservation Area, coordination and thematic participation with farmers and their representatives led to a consensus that was supported by all stakeholders.

This procedure was used again for the designation of the biosphere reserve. Very intensive cooperation also takes place at the direct bilateral level between the area administration and the municipalities and users. Above all, there are consultations on land use once or several times a year with the 150 farms operating here, as a result of which jointly supported solutions are usually found to safeguard the conservation objectives.

17.3 Representation, participation and consultation of local communities

17.3.1 Involvement of the local people

The coordination structure and the bodies involved in the biosphere reserve have already been discussed in detail in Chapters 17.1.7 and 17.1.8. Through these bodies, the local population was already able to get involved and participate before and during the designation of the biosphere reserve.

Depending on the respective projects and measures to be carried out, the Biosphere Reserve Administration's work consists of coordinating with the elected representatives of the local population and also involving the local administration. This work also includes applications and suggestions from users, which are dealt with by telephone or e-mail if possible or lead directly to on-site meetings.

In the course of the discussion process with local authorities in the Drömling, extensions to the former nature park took place, especially in the northeast and southeast, for the designation as a biosphere reserve. In the north-east, in order to fully integrate the bird sanctuary ‚Feldflur bei Kusey' into the biosphere reserve, and in the southeast, in order to include the NSG ‚Klüdener Pax-Wanneweh' as well as further parts of the municipality of Calvörde into the biosphere reserve.

Concrete examples of the participation opportunities described above are currently the establishment and development of the partner programme, which in the next step should lead to the development of a regional brand. In this way, local businesses in particular are given the opportunity to participate in a biosphere reserve regional development project from the very beginning.

17.3.2 Representation of local people

Such a body does not yet exist in the biosphere reserve. Therefore, no breakdown by gender or indigenous origin is possible. The bodies mentioned so far that participate in the management of the biosphere reserve are accessible to women and men in the same way.

17.3.3 Youth in the Drömling

A specific survey on the situation of young people within the proposed UNESCO Biosphere Reserve has not been conducted so far. An assessment of the situation of young people can therefore only be made qualitatively. The offers of Education for Sustainable Development (ESD), which are offered to young people in the biosphere reserve, have already been dealt with intensively in Chapter 16.2.1.

As a peripheral rural region in Eastern Germany, the Altmark has been particularly hard hit by the effects of demographic change and the consequences of economic structural change since the 1990s. The overlapping of these complex problems led to an enormous population decline. This can be estimated at approx. 23% for the period from 1990 to 2013. Overall, population loss due to selective migration is not a problem specific to the Altmark, but affects most rural areas in Saxony-Anhalt. Young people in particular, especially women, are leaving the region due to the availability of training or university places and higher income opportunities in the growth regions (Regionalverein Altmark e.V., 2015).

The following projects are carried out or offered for young people in the Drömling:

A project specifically designed for young people is **'Youth films biodiversity'**. It is a project of Gespa e. V., funded in the Federal Programme on Biological Diversity by the Federal Agency for Nature Conservation with funds from the BMU and the Lower Saxony Bingo Environmental Foundation. Through the use of modern video technology and learning by doing, young people came closer to nature, acquired knowledge about the topic of biodiversity and empowered themselves to become multipliers for sustainability. In the implementation of the project, excursions, animal observations and the acquisition of species knowledge and factual information are important stations that were passed through. In the media production and documentation phase, scripts were written and film teams formed. Subsequently, film material and information research were evaluated, and a film was created that addresses many aspects of the biosphere reserve.

Climate camp: In the summer of 2020, young people were taught about nature conservation and environmental protection, culture, history, old crafts and healthy food as part of a climate camp, as well as getting to know their surroundings.

Trainee exchange: Many businesses in various sectors in rural areas have great problems finding junior staff or temporary workers. It is planned to offer a junior staff exchange. Together with the employment agency, the chamber of crafts and commerce, the investment bank and other actors, a programme for the search for junior staff is to be set up.

Farm as a place of learning: Workshops and excursions on nearby farms/agricultural enterprises for extracurricular educational activities. Through an experience farm, the function of a farm is to be explained to children and young people.

Urban Gardening goes to the countryside: There are plans to set up school gardens for school classes at partner companies. Together with health insurance companies, a concept is being developed to teach schoolchildren about healthy eating.

Return Centre: The aim of the future project is to bring young families back to the rural region. The project aims to offer potential returnees and their families a comprehensive welcome network. Local contact persons are active in supporting families, for example, in finding accommodation and day-care places. Returnees‘ regular tables and regional network meetings are also part of the project portfolio. Furthermore, the project has set itself the task of bundling all information for returnees and making it available (finding a day care place, jobs, finding housing, infrastructure, recreational opportunities and more).

17.3.4 Representation of companies, associations, environmental associations, trade unions

At this point, reference is made to the committees described in detail in Chapter 17.1.7.

17.3.5 Procedures for integrating the representative body of local communities

The Advisory Board has the task of providing scientific and technical advice and support to the Administration of the Drömling Biosphere Reserve, which spans several federal states, in the implementation of its tasks. The Advisory Board is intended to ensure the participation of many interest groups in decision-making in the Drömling, including the protection and conservation of the cultural and natural landscape and biological diversity, the establishment of sustainable regional development, the performance of scientific tasks and in the field of education for sustainable development. The appointment is made for a period of five years.

17.3.6 How long-lived are consultation mechanisms?

See Chapter 17.3.5.

17.3.7 Consultation mechanisms

The Advisory Board has the task of providing scientific and technical advice and support to the Administration of the trans-regional Biosphere Reserve Drömling in the implementation of its tasks. Recommendations can be made in the form of a resolution. The Advisory Board includes representatives of associations, societies and special-purpose associations, the regional economy and local authorities.

17.3.8 Women participation in community organizations and decision-making processes

The bodies mentioned so far that participate in the management of the biosphere reserve are accessible to women and men in the same way. Special incentives or programmes to promote women‘s representation and participation are not in place. Gender-specific impact assessments of planning and strategies are not carried out.

17.4 The management plan and framework concept

17.4.1 Present and future management concepts in the Drömling

A comprehensive management plan or a uniform framework concept for the entire Drömling Biosphere Reserve does not yet exist. The Biosphere Reserve Administration will develop this or a framework concept in accordance with the MAB criteria within three years of successful recognition by UNESCO. The ‚Key issue paper – Towards a Biosphere Reserve’ (Annex 37) created a basis for the further development of the biosphere reserve, which, however, needs to be updated and implemented to a greater extent.

For a large part of the biosphere reserve area in Saxony-Anhalt, there is already a planning document aimed at natural area management, which was agreed upon as the **‚Maintenance and Development Plan for the Drömling Nature Park’** (LPR, 1996) in the then project-accompanying working group.

For the Lower Saxony large-scale nature conservation project in the Drömling area, a maintenance and development plan was also drawn up (Kaiser et al., 2001), which essentially covers the core areas and buffer zones in Lower Saxony.

Currently, based on this maintenance and development plan, a management plan is being developed for the nature conservation areas of the protected area system of the Drömling in Lower Saxony after they have been secured.

In December 2007, a management plan for the 'Ohre-Drömling' nature reserve was completed as an update of the Drömling Management and Development Plan for Saxony-Anhalt and as a basis for the preparation of **FFH and bird sanctuary management plans**. It covers the core area and almost the entire buffer zone. In addition, there is also a separate management and development plan for the 'Klüdener Pax-Wanneweh' Nature Conservation Area. The management plans are to be merged and harmonised with regard to the framework concept to be developed.

17.4.2 Involved actors in preparing the framework concept

A broad, public participatory process is designed for the elaboration of the framework concept. In addition to a comprehensive analysis of the status quo, the framework concept will set out the medium- and long-term objectives and the measures (projects) required to fulfil the biosphere reserve's functions (Falter, Küstner, Nichlas, & Scherfose, 2018).

It is planned to form thematic working groups on the functions and priority topics of the Drömling Biosphere Reserve, which will participate in the elaboration and updating process. The process will be preceded by a detailed stakeholder analysis based on existing cooperations, partner models and groups of actors. The working groups should be composed of representatives of the municipalities, land users, authorities, institutions, associations and federations from the fields of nature conservation, agriculture, water management, forestry, regional development, tourism, education and culture as well as other owners.

17.4.3 Formal adaptation of the framework concept

After its completion, the framework concept is published on the internet via the biosphere reserve's website and serves as a basis for the authorities' actions. Accordingly, the framework concept is not formally adopted by the regional authorities concerned (administrative districts, municipalities). The municipalities are recommended to adopt suitable contents in their municipal land use and landscape planning.

Nevertheless, the framework concept is to be used and implemented by the Biosphere Reserve Administration and the competent authorities as a basis for action for the uniform development of the proposed UNESCO Biosphere Reserve Drömling. Due to the official function of the Biosphere Reserve Administration for Saxony-Anhalt, this is of particular importance.

17.4.4 Duration of the framework concept

The framework concept shall be valid for ten years and shall be evaluated by UNESCO at the latest in the course of the 10-year evaluation.

17.4.5 Contents of the framework concept

The framework concept is to be drawn up after UNESCO recognition and refer to the texts and documents mentioned in Chapter 17.4.1. Accordingly, it should consist of three parts: Part I – Inventory analysis (description); Part II – Guiding principles, objectives and fields of action (principles); Part III – Measures and projects (implementation). The main objectives are derived from the regulation on the biosphere reserve. In addition, the contents, themes and tasks contained in the key issues paper of the Drömling cross-state working group will be used as a basis for the framework concept (Länderübergreifende Arbeitsgruppe Drömling, 2016).

The future framework concept of the biosphere reserve should include at least the following focal points:

- Sustainable land use and nature conservation management;
- Sustainable use of water resources, improvement of the water balance as well as peatland and water protection;
- Protection and conservation of the historical cultural landscape and elements of cultural and historical value as well as regional identity;
- Promotion of regional development and tourism;
- Education for sustainable development, research and monitoring;
- Transport and energy infrastructure.

The focal points are divided into fields of action and coordinated with the respective groups of actors in the course of a participatory process. An important frame of reference for the framework concept are the basic functions of a biosphere reserve and the active sustainable design of the Drömling Biosphere Reserve. For the implementation part of the concept

(measures and projects), the main focus is on introducing model approaches and aspects of sustainable development. This forms the basis for a subsequent public relations concept.

17.4.6 Objectives of the framework concept

The objectives set out in the framework concept will be based on the existing maintenance and development plans with regard to nature conservation measures and guidelines. Further documents used for the development of the objectives of the framework concept are listed in Chapter 17.4.1.

17.4.7 Binding nature of the framework concept

See also Chapter 17.4.3.

17.4.8 Authorities are in charge of the implementation of the framework concept

The Biosphere Reserve Administration in Oebisfelde will continue to be responsible for coordinating the proposed biosphere reserve across all federal states. The transfer of further tasks for the implementation of the framework concept to the Biosphere Reserve Administration is or will be regulated in the administrative agreement for the period from UNESCO recognition between the two Länder and is based on the *‚Agreement in preparation for the joint administration of the planned, cross-state UNESCO Biosphere Reserve in the Drömling‘* of 12 June 2019, on the basis of the key points paper prepared in 2016. This will be worked out in detail in the course of the process of developing the framework concept (see Chapters 17.4.2 and 17.4.3). In accordance with the existing administrative structures, described in Chapters 17.1.3 and 17.1.4, the responsibilities for nature conservation law enforcement in Saxony-Anhalt and Lower Saxony are regulated differently.

17.4.9 Obstructing and supporting factors of the implementation of the framework concept

The implementation of the framework plan is favoured by the fact that a protected area administration, today‘s Drömling Biosphere Reserve Administration, has already existed for many years for a large part of the Drömling, which implements and organises nature conservation measures and is in constant consultation with land users, local residents and municipal administrations. In this way, a form of coordination has been established in recent years, as a result of which jointly supported solutions have generally been found to secure the conservation objectives (see Chapter 17.4.3). In keeping with the tradition of large-scale nature conservation projects in both federal states, information and involvement of regional actors and stakeholders, such as coordination in the dam commissions and cooperation in the Local Action Group ‘Rund um den Drömling’, should be continued.

In addition, the Drömling has been a focal area for extensive nature conservation measures and large-scale nature conservation projects for many years. Large-scale nature conservation projects have been implemented both in Saxony-Anhalt and in Lower Saxony‘s Drömling. As a result, the demands of nature conservation have a high priority in the region and are taken into account by all parties involved in most issues. In order to safeguard the results of the large-scale nature conservation project, large areas of the Drömling Biosphere Reserve are already protected under nature conservation law (see Chapter 17.1.1).

The implementation of the framework concept could be made more difficult by the fact that there are still some fears, especially among the agricultural sector and its interest groups, regarding future restrictive regulations on land use. Furthermore, there are doubts among a few actors that a biosphere reserve could generate positive effects for regional development.

Another factor in the implementation of the framework concept is the limited financial capacity to act of both the Biosphere Reserve Administration and the participating towns and municipalities. The expansion of the financial framework and project initiation at European level will be included in the implementation part of the concept and are an important task of the Drömling Biosphere Reserve Administration.

17.4.10 Integration of the regional and local strategies

More than 90% of the proposed biosphere reserve area is designated as priority or reserved areas for nature and landscape, flood protection and water extraction in the Saxony-Anhalt State Development Programme (2010) and in the regional development plans. In Lower Saxony, the biosphere reserve‘s backdrop is anchored in the regional planning programme of Lower Saxony. The municipalities‘ urban land use planning, which primarily affects the transition area, was intensively coordinated for each individual locality in the run-up to the designation of the Drömling landscape conservation area. In this respect, the boundaries of the protected area according to nature conservation law and the land use plans of the municipalities currently coincide.

The development of the Drömling Biosphere Reserve is also part of the Biodiversity Strategy of Saxony-Anhalt (2010), which in turn is based on the National Strategy on Biological Diversity (NBS). The Lower Saxony Nature Conservation Strategy (2017) also includes the intensive cooperation and

recognition of the Drömling as a UNESCO Biosphere Reserve as a goal.

17.4.11 Main source of the funding and the estimated yearly budget

See Chapter 13.6.

17.5 Conclusions

Protection

The Drömling is a diverse, peatland-rich and grassland-dominated lowland area of international importance for nature conservation. Important milestones for the protective function of the biosphere reserve have already been achieved and are in constant development. The different spatial qualities in the Drömling area have been met by a technically sound division into three zones with different objectives. The zones have been legally secured in the best possible way through differentiated target definitions and protected area categories. Numerous management concepts, maintenance and development plans have been implemented for many decades and are regularly updated. Particularly in bilateral coordination with the land users in the region, an approach has been established over the last 30 years that has generated a high degree of acceptance among all parties involved, so that jointly supported solutions for managing the areas and securing the conservation objectives could be found. To this end, legal and incentive-based mechanisms for regulating land use are in constant development. The conservation and renaturation of the peatland body and its associated habitats, species and sustainable management practices will be of supra-regional importance in maintaining ecosystem services.

The restoration of a water balance characterised by water retention forms the basis for the most important protection and development functions in the Drömling and is to be further developed in the future. In addition to the conservation of peatlands for climate protection reasons, this also applies to the protection of organic soils as a production basis for agriculture, the protection of wet forests and wet meadows as biotopes and species protection (for example for the highly endangered snipe), the storage of water in the area as flood protection for towns below the Drömling, as well as the experiential value of a large water-dominated lowland peatland landscape for experiencing nature and education for sustainable development.

The wealth of experience and the competence built up in the implementation of nature conservation projects and measures will also benefit future, further implementations in this area.

Development

The potential of sustainable development for the region results from the unique use of the area in terms of cultural landscape in combination with the excellent cultural-historical, socio-cultural, spatial-structural and administrative basic conditions. The Drömling is a historically unique land use model, which makes it particularly suitable for exemplary implementation of the MAB programme in terms of ecological, economic and socio-cultural compatibility.

The region is characterised by a high degree of existing social capital, regional competence and a sense of identity based on a rich historical foundation. The area already offers excellent opportunities for a gentle environmental experience and sustainable tourism use, a high potential for further development and strong networking with the neighbouring metropolitan region of Wolfsburg. The uniqueness and variety of management forms, in combination with the high level of social capital and the spatial-structural conditions, make the development of sustainable economic practices possible in a special way.

Regional development will certainly receive further impetus from the partner programmes currently being developed and the regional brand. The Local Action Group for the LEADER region ‘Around the Drömling’ has initiated and completed several projects in recent years that have improved the situation in the region in many areas. In this context, the elaboration of a Local Development Strategy (Annex 39) and a tourism and marketing concept (Annex 38) are important milestones and at the same time guidelines for the further development of the biosphere reserve based on broad consensus.

Logistic support

The mission for scientific research, permanent observation and environmental education lies at the interface of high nature conservation importance and sustainable regional development, whereby the area brings with it the best prerequisites for fulfilling the logistics function. As a former nature park, the Drömling in Saxony-Anhalt is already established as a model region for applied research in the field of human-environment relations. More than 300 studies and papers testify to the high and available knowledge capital that can be built upon in the future. Existing long-term monitoring activities, such as the Drömling monitoring concept, are being continuously improved and expanded. In the future, this concept is to be merged across the federal states, extended to the enlarged protected area and expanded to include socio-economic factors.

The Biosphere Reserve Administration already coordinates and supports third-party research projects related to the protected area and works closely with research institutions. The attractiveness of the area has led to long-standing partnerships and cooperation with the universities of Magdeburg-Stendal and Anhalt, with the University of Halle-Wittenberg and the Technical University of Braunschweig, which are being continuously expanded.

The Biosphere Reserve Administration maintains its own facilities for education and information work and contributes to education for sustainable development (ESD) through its own offers. It involves suitable persons and institutions in this and cooperates with local authorities, associations and organisations. The educational work of the area administration, which already addresses many different population groups, leads to identification with the region, its uniqueness and beauty. In particular, the local population is made aware of the biosphere reserve‘s protection and development goals, which is crucial for successful implementation.

In Saxony-Anhalt, the Drömling has had a full-time protected area administration for 30 years, which enjoys the trust of the population and local communities. The original nature park, which was smaller in area, was transferred to a biosphere reserve (Saxony-Anhalt) in summer 2019. The Drömling Saxony-Anhalt Biosphere Reserve Administration was equipped with all the legal-administrative, resource-technical and technical foundations required. The Administration assumes all tasks that are crucial to the success of the biosphere reserve‘s functions.

As the official nature conservation authority, the Drömling Biosphere Reserve Administration in Saxony-Anhalt also exerts a great deal of steering influence on regional developments, explicitly in Lower Saxony as well. An excellent example of this is the partner network of largely private-sector actors that supports the Administration in implementation and thus increases the influence on regional development in Saxony-Anhalt and Lower Saxony. With the joint commitment of the two states of Saxony-Anhalt and Lower Saxony to the joint designation as a UNESCO Biosphere Reserve Drömling, the cross-state biosphere reserve is on a good footing. The financial resources for the future are also secured. The management can act against the background of numerous valuable guiding principles and sectoral plans, which will be adapted even more thoroughly to the biosphere reserve philosophy in the future. With the so-called framework concept, a participatory ‚master plan‘ will further concretise the existing objectives and provide a clear framework for action within 3 years after recognition. The broad and intensive participation process for the designation of the biosphere reserve will benefit a continuous integration of the biosphere reserve agendas into both higher-level and cross-sectoral planning and structures.

18. SPECIAL DESIGNATIONS

UNESCO World Heritage Site: not relevant

RAMSAR Wetland Convention Site: not relevant

Other international/regional conservation conventions/ directives:

There are ten Natura 2000 sites in the Drömling area. These include the three EU bird sanctuaries ‘Drömling’ (DE 3431-401), ‘Bird Sanctuary Drömling’ (DE 3532-401) and ‘Feldflur bei Kusey’ (DE 3432-401) and the seven FFH areas ‘Drömling’ (DE 3431-331), ‘Klüdener Pax-Wanneweh east of Calvörde’ (DE 3634-301), ‘Grabensystem Drömling’ (DE3532-301), ‘Jeggauer Moor’ (DE3433-301), ‘Stauberg north of Oebisfelde’ (DE 3531-301), ‘Obere Ohre’ (DE 3431-302) and ‘Drömling’ (DE3533-301). These areas partially overlap, so that a net area of approx. 25,680 ha (57%) is protected under European law.

Long term monitoring site: -

Long Term Ecological Research (LTER site): -

19. SUPPORTING DOCUMENTS

19.1 Location and zonation map with coordinates

- Annex 1 Location in Germany
- Annex 2 Zonation map

19.2 Vegetation map or land cover map

- Annex 3 Land use (CORINE 2018)
- Annex 7 Habitat types

19.3 List of legal documents

- Annex 9 Agreement in the Preparation for the Joint Administration of the UNESCO Biosphere Reserve
- Annex 10 Agreement on the Joint Administration of the UNESCO Biosphere Reserve Drömling
- Annex 11 Draft version of the announcement in the ministerial gazettes
- Annex 12 Rules of procedure for the Biosphere Reserve Advisory Board
- Annex 13 Extract from the Lower Saxony Regional Planning Programme

Protection of the core area

- Annex 14 Regulation on the Drömling Biosphere Reserve Saxony-Anhalt (also buffer zone and transition area)
- Anhang 15 Regulation on the Ohre-Drömling Nature Conservation Area (also buffer zone
- Annex 16 Regulation on the Giebelmoor Nature Conservation Area
- Annex 17 Regulation on the Politz and Hegholz Nature Conservation Areas (also buffer zone)
- Annex 18 Regulation on the Southern Drömling Nature Conservation Area (also buffer zone)

Protection of the buffer zone

- Annex 19 Regulation on the Klüdener Pax-Wanneweh Nature Conservation Area
- Annex 20 Regulation on the Kaiserwinkel Nature Conservation Area
- Annex 21 Regulation on the Northern Drömling Nature Conservation Area
- Annex 22 Regulation on the Schulenburgscher Drömling Nature Conservation Area
- Anhang 23 Regulation on the Wendschotter und Vorsfelder Drömling with Kötherwiesen Nature Conservation Area

Protection of the transition area

- Annex 24 Regulation on the Ohreaue bei Altendorf and Brome Nature Conservation Areas
- Annex 25 Regulation on the Mittlere Ohreaue Nature Conservation Area
- Annex 26 Regulation on the Drömling (Saxony-Anhalt) Landscape Conservation Area
- Annex 27 Regulation on the Kaiserwinkel Landscape Conservation Area
- Annex 28 Regulation on the Lütjes Moor Landscape Conservation Area
- Annex 29 Regulation on the Drömling Landscape Conservation Area (Lower Saxony)
- Annex 30 Regulation on the Ohretal bei Altendorf Landscape Conservation Area

19.4 Species list

- Annex 32 Species list

19.5 List of main bibliographic references

- Annex 33 Selected publications, expert opinions and studies

19.6 Original Endorsement letters according to paragraph 5

See chapter 5

19.7 Further supporting documents

Further maps

- Annex 4 Hydrology
- Annex 5 Soils
- Annex 6 National Protected Areas
- Annex 8 Number and structure of visitors

Further relevant documents

- Annex 31 Monitoring Concept Drömling (Saxony-Anhalt)
- Annex 34 Drömling Courier 01
- Annex 35 Drömling Courier 02
- Annex 36 Drömling Courier 03
- Annex 37 Key issues paper – Towards a Drömling Biosphere Reserve
- Annex 38 Tourism and Marketing Concept for the Drömling
- Annex 39 Local Development Strategy – Around the Drömling
- Annex 40 Decree on Natural Forest Development on 10% of Lower Saxony's State Forest Areas (NWE10) as a Contribution to the National Strategy on Biological Diversity

20. ADDRESSES

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22. ANNEX I

Annex I to the Biosphere Reserve Nomination Form, January 2013
MABnet Directory of Biosphere Reserves
Biosphere Reserve Description

Administrative details

Country:	Federal Republic of Germany
Name of BR:	Drömling Biosphere Reserve
Year designated:	
Administrative authorities: (17.1.3)	The Drömling Biosphere Reserve Administration in Oebisfelde is a specialised authority under the Ministry of Science, Energy, Climate Protection and the Environment.
Name of contact: (20.1)	Fred Braumann
Contact address: (20.1)	Biosphere Reserve Administration Drömling D-39646 Oebisfelde-Weferlingen Bahnhofstraße 32 Germany Telephone: +49 39002 8500 E-mail: poststelle@droemling.mule.sachsen-anhalt.de
Related links: (Websites)	www.biosphaerenreservat-droemling.de

Description

General description: (Site characteristics in 11.1; human population in 10)

The UNESCO Biosphere Reserve Drömling consists of a former lowland moorland that was reclaimed in several stages over the last 250 years. The result is a highly structured cultural landscape of grassland, arable land and forest, criss-crossed by countless ditches and canals. This is where the name 'Land of 1000 Ditches' comes from. This network-like water system is the reason for its great importance for biodiversity. The Drömling provides a habitat and breeding ground for numerous endangered and threatened animal and plant species. With its location on the European Green Belt, the Drömling also contributes to the biotope network in Europe.

Major ecosystem type: (14.1)	Peatland and grassland ecosystems.
Major habitats & land cover types: (11.6)	Peatlands and water bodies, grasslands and wet woodlands
Bioclimatic zone: (11.5)	Semiarid to subhumid bioclimatic zone
Location (latitude & longitude): (6.1)	Midpoint 52° 29' 46" N, 11° 4' 36" E
Total Area (ha): (7)	45,220 ha
Core area(s): (7)	1,650 ha
Buffer zone(s): (7)	14,140 ha
Transition area(s): (7)	29,430 ha
Different existing zonation: (7.4)	-
Altitudinal range (metres a.s.l.): (11.2)	51 to 108 metres above sea level
Zonation map(s): (6.2)	Annex 2

Main objectives of the biosphere reserve

Brief description (13.1)

A model region is to be created in the Drömling in which the interplay between historically unique land use and water management with the current challenges of moorland protection and climate change is researched, communicated and implemented in an exemplary manner. In addition, the development and preservation of the unique character of the Drömling as

a landscape of remembrance, which was shaped by the former inner-German border situation, is to be promoted in order to initiate a careful transformation in the sense of an inner and common regional identity.

Research
Brief description (16.1.1)

Future research will focus on the preservation and restoration of water-bound ecosystems in connection with climate change and sustainable use, including energy use. In particular, there is still a need for further research on the establishment of sustainable land use systems on rewetted peatlands.

Monitoring
Brief description (16.1.1)

The monitoring of species and habitats is to be coordinated and merged between the two federal states and extended to the entire area of the UNESCO Biosphere Reserve in the future. Furthermore, the monitoring is to be supplemented by socio-economic parameters.

Specific variables (fill in the table below and tick the relevant parameters)

Abiotic		**Biodiversity**	
Abiotic factors	x	Afforestation/Reforestation	
Acidic deposition/Atmospheric factors		Algae	
Air quality	x	Alien and/or invasive species	x
Air temperature	x	Amphibians	x
Climate, climatology	x	Arid and semi-arid systems	
Contaminants	x	Autoecology	
Drought	x	Beach/soft bottom systems	
Erosion		Benthos	x
Geology		Biodiversity aspects	x
Geomorphology		Biogeography	x
Geophysics		Biology	x
Glaciology		Biotechnology	
Global change	x	Birds	x
Groundwater	x	Boreal forest systems	
Habitat issues	x	Breeding	
Heavy metals		Coastal/marine systems	
Hydrology	x	Community studies	
Indicators	x	Conservation	x
Meteorology	x	Coral reefs	
Modeling	x	Degraded areas	
Monitoring/methodologies	x	Desertification	
Nutrients	x	Dune systems	
Physical oceanography		Ecology	x
Pollution, pollutants	x	Ecosystem assessment	x
Siltation&sedimentation	x	Ecosystem functioning/structure	x
Soil	x	Ecosystem services	x
Speleology		Ecotones	
Topography		Endemic species	
Toxicology		Ethology	
UV radiation		Evapotranspiration	x
		Evolutionary studies/Palaeoecology	
		Fauna	x

Abiotic		Biodiversity	
		Fires/fire ecology	
		Fish	x
		Flora	x
		Forest systems	x
		Freshwater systems	x
		Fungi	x
		Genetic resources	x
		Genetically modified organisms	
		Home gardens	
		Indicators	
		Invertebrates	x
		Island systems/studies	
		Lagoon systems	
		Lichens	x
		Mammals	x
		Mangrove systems	
		Mediterranean type systems	
		Microorganisms	x
		Migration populations	x
		Modeling	x
		Monitoring/methodologies	x
		Mountain and highland systems	
		Natural and other resources	x
		Natural medicinal products	
		Perturbations and resilience	
		Pests/Diseases	x
		Phenology	
		Phytosociology/Succession	
		Plankton	
		Plants	x
		Polar Systems	
		Pollination	
		Populatin genetics/dynamics	
		Productivity	
		Rare/Endangered species	x
		Reptiles	x
		Restoration/Rehabilitation	x
		Species (re) introduction	x
		Species inventorying	x
		Sub-tropical and temperate rainforest	
		Taxonomy	
		Temperate forest systems	x
		Temperate grassland systems	x
		Tropical dry forest systems	
		Tropical grassland and savannah systems	
		Tropical humid forest systems	
		Tundra systems	
		Vegetations studies	x
		Volcanic/Geothermal systems	
		Wetland systems	x
		Wildlife	x

Socio-economic		Integrated monitoring	
Agriculture/Other production systems	x	Biogeochemical studies	
Agroforestry		Carrying capacity	x
Anthropological studies		Climate change	x
Aquaculture		Conflict analysis/resolution	
Archaeology		Ecosystem approach	x
Bioprospecting		Education and public awareness	x
Capacity building	x	Environmental changes	x
Cottage (home-based) industry	x	Geographic Information System (GIS)	x
Cultural aspects	x	Impact and risk studies	
Demography	x	Indicators	
Economic studies	x	Indicators of environmental quality	x
Economically important species	x	Infrastructure development	
Enery production systmes	x	Institutional and legal aspects	
Ethnology/traditional practices/knowledge		Integrated species	
Firewood cutting		Interdisciplinary studies	x
Fishery	x	Land tenure	x
Forestry	x	Land use/Land cover	x
Human health		Landscape inventorying/monitoring	x
Human migration		Management issues	x
Hunting	x	Mapping	x
Indicators		Modelling	x
Indicators of sustainability	x	Monitoring/methodologies	x
Indigenous people‘s issues		Planning and zoning measures	x
Industry	x	Policy issues	x
Livelihood measures	x	Remote sensing	x
Livestock and related impacts	x	Rural systems	x
Local participation	x	Sustainable development/use	x
Micro-credits		Transboundary issues/measures	
Mining		Urban systems	
Modelling		Watershed studies/monitoring	x
Monitoring/methodologies	x		
Natural hazards	x		
Non-timber forest products	x		
Pastoralism	x		
People-Nature relations	x		
Poverty			
Quality economics/marketing			
Recreations	x		
Resource of use	x		
Role of women			
Sacred sites			
Small business initiatives			
Social/Socio-economic aspects	x		
Stakeholders‘ interests	x		
Tourism	x		
Transport	x		

23. ANNEX II

Promotional and communication materials for the proposed biosphere reserve

Flyer:

- From Nature Park to Biosphere Reserve (2019).
- News, projects and ideas (2020)
- Drunter und drüber – A biotope network for the otter in the Drömling (2021)
- Theme villages in the Drömling Biosphere Reserve (2021)
- Dates in the Biosphere Reserve (2022)
- Annual calendar with holidays and event dates (2022)

Fotos:

Format	Caption/File name	Year	Photographer	Contact details of the rights holder	non-exclusive transfer of the rights
Photo	Examination of aquatic organisms Foto1.jpg	2015	Antje Keitel	Biosphere Reserve Administration, Bahnhofsstraße 32, D-39646 Oebeisfelde	Yes
Photo	Staggered mowing in grassland Foto2.jpg	2016	Archiv BR Drömling	Biosphere Reserve Administration, Bahnhofsstraße 32, D-39646 Oebeisfelde	Yes
Photo	Dam in the Ohre Foto3jpg	2020	Matthias Dumjahn	Biosphere Reserve Administration, Bahnhofsstraße 32, D-39646 Oebeisfelde	Yes
Photo	Ranger on a thematic tour Foto4.jpg	2021	Matthias Dumjahn	Biosphere Reserve Administration, Bahnhofsstraße 32, D-39646 Oebeisfelde	Yes
Photo	Core area with peatland dam cultures Foto5.jpg	2021	Archiv BR Drömling	Biosphere Reserve Administration, Bahnhofsstraße 32, D-39646 Oebeisfelde	Yes

Videos:

- Image film UNESCO Biosphere Reserve Drömling (2021)
- Nature knows no borders: how the Drömling was reunited (2020)

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