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Review of EU and Danube-Carpathian countries' laws, regulations and governance, and finance mechanisms related to the establishment of the Trans-European Nature Network (TEN-N)

Excerpt from Deliverable 2.1 Review and synthesis of best practice examples in governance and land-use policies to implement TEN-N, Appendix 1

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Abbreviations

CAP	Common Agricultural Policy
CBD	Convention on Biological Diversity
CC	Carpathian Convention
CBF	Carpathian Biodiversity Framework
CoP	Conference of the Parties
DCR	Danube-Carpathian region
ERDF	European Regional Development Fund
EAFRD	European Agricultural Fund for Rural Development
EAGF	European Agricultural Guarantee Fund
EC	European Commission
ES	Ecosystem Services
EU	European Union
EUROPARC	The Federation of Nature and National Parks of Europe
EUSDR	European Union Strategy for the Danube River
GAEC	Good Agricultural and Environmental Conditions
GBF	Kunming-Montreal Global Biodiversity Framework
GDP	Gross Domestic Product
GEF	Global Environment Facility
GI/GBI	Green Infrastructure / Green-Blue Infrastructure
ICPDR	International Commission for the Protection of the Danube River
Interreg	Interregional Instruments
IUCN	International Union for Conservation of Nature
LIFE	*L'Instrument Financier pour l'Environnement*
LULUCF	Land Use, Land Use Change and Forestry
n.d.	No date
NRL	Nature Restoration Law
NGO	Non-governmental organisations
OECM	Other effective area-based conservation measures
PA	Protected area
PAF	Prioritised Action Framework
PEA	Political Economy Analysis
PEEN	Pan-European Ecological Network
SAC	Special Areas of Conservation
SCI	Site of Community Importance

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SPA	Special Protection Area
TEN-E	Trans-European Networks for Energy
TEN-T	Trans-European Transport Network
TEN-N	Trans-European Nature Network
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WFD	Water Framework Directive
WFD CIS	Water Framework Directive Common Integration Strategy
WG	Working Group
WP	Work Package

Glossary

Additional conservation area (ACA), Other effective area-based conservation measure (OECM), conserved area	A geographically defined area other than a protected area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the *in-situ* conservation of biodiversity values, with associated ecosystem functions and services and, where applicable cultural, spiritual, socioeconomic, and other locally relevant values (this is the definition of OECM per (CBD, 2018)).
Ecological connectivity	The movement of organisms, nutrients and ecological processes through a landscape (Crooks et al., 2011; Crooks and Sanjayan, 2006; Hilty et al., 2020).
Ecological corridor, connectivity conservation area	A defined geographical space that is governed and managed over the long term to conserve or restore the effective flow of natural processes between species, habitats, ecosystems, or protected areas (Hilty et al., 2020).
Governance	The individuals, groups, and institutions ultimately responsible for decision-making for an area or network of areas. Governance can also include the process of how decisions are influenced and made (Salafsky et al., 2024).
Green and Blue Infrastructure	An interconnected network of natural and semi-natural areas, including green terrestrial features such as green roofs, retention and detention ponds, re-naturalised and de-culverted rivers, swales, and rain gardens, as well as blue marine features, designed and managed to deliver a wide range of services (e.g., improvement in air and water quality, space for recreation, climate mitigation and adaptation) (Abbott et al., 2013) (Ghofrani et al., 2017) ('Green infrastructure - European Commission,' n.d.).
Natura 2000 site	Network of core breeding and resting sites for rare and threatened species, and for some rare natural habitat types, which aims to protect Europe's most valuable and threatened species and habitats, listed

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	under both the EU Birds Directive and the Habitats Directive (EC, 2008).
Protected area	A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. Protected Areas include nationally designated sites and Natura 2000 sites (Dudley, 2013) ('Effective protected areas | IUCN,' n.d.)
Political Economy Analysis (PEA)	Applied political economy analysis (PEA) is a set of concepts, questions and tools that can help diplomats, development professionals and local reformers better understand the contexts in which they operate, and to engage effectively in supporting change. Applied PEA is concerned with the interaction of political, economic, social and cultural processes and how these generate particular outcomes. This can help explain how change processes happen and why they can become blocked (Australian Government - Department of Foreign Affairs and Trade, 2022).
Protected area network	A set of protected areas that are designed or grouped to collectively achieve long-term conservation of biodiversity and other values. Can include ecological networks and jurisdictional networks. Typically, this term refers only to the spatial sites and not the entities governing and managing them. A network can be formally designated, or it can be a grouping of existing areas with or across jurisdictional boundaries. Areas in an ecological network are ideally connected through ecological corridors to meet design criteria. (Salafsky et al., 2024)
Trans-European Nature Network (TEN-N)	The Trans-European Nature Network is a strategically planned network of protected areas and corridors, building on the existing Natura 2000 network and other protected areas, as well as natural and semi-natural areas that build on other Green Infrastructure. (European Commission, 2020)

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Introduction

The purpose of this Appendix is to provide information on the legal, governance, and financial context and frameworks in place at the EU and regional level and in the NaturaConnect case study countries to designate, protect, fund, and manage their parts of the TEN-N network – the rules of the game. It covers only the **terrestrial parts** of the countries, corresponding to the scope of the NaturaConnect project.

This Appendix provides information for all case study countries on: i) their protected area network (including legal framework and designation categories, OECMs, overlaps, governance and management; ii) their ecological connectivity or green infrastructure strategy, legal framework, legal requirements to integrate into spatial planning, and non-legislative tools to integrate ecological connectivity into spatial planning; and iii) any public funding and private financing for protected area designation and management and for planning, safeguarding and restoring ecological corridors.

The countries reviewed in the Danube-Carpathian region:

- Austria
- Bosnia and Herzegovina
- Bulgaria
- Croatia
- Czech Republic
- Germany (Bavaria and Baden-Württemberg)
- Hungary
- Moldova
- Montenegro
- Poland
- Romania
- Serbia
- Slovakia
- Slovenia
- Ukraine

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1. EU WIDE INFORMATION

1.1. PROTECTED AREA NETWORK (TERRESTRIAL) IN EU

1.1.1. TYPES OF DESIGNATED PROTECTED AREAS

Europe's protected areas include:

- Areas designated under international conventions, including:
  - UNESCO World Heritage and Biosphere sites.
  - Ramsar Convention wetlands.
  - Emerald Network areas designated under the Convention on the Conservation of European Wildlife and Natural Habitats; a binding international legal instrument known as the Bern Convention.
- Areas designated under EU law:
  - Natura 2000 areas designated under the EU Birds and Habitats Directives. The Habitats Directive is the legal instrument to fulfil the EU's responsibilities under the Bern Convention.
- Areas designated under nationally, regionally, and locally defined legal designations.

Transboundary protected areas can be created by: a) designating the whole area in all countries under an international designation, as a World Heritage or Biosphere site and/or as a Ramsar area; and/or b) creating a specific intergovernmental agreement that defines a collaboration between the bordering nationally designated protected areas and/or setting up an organisation to manage the transboundary area. The EUROPARC Federation has set up a certificate for transboundary protected area regions.

The protected areas in Europe include many different designations which are managed with different objectives, many of which overlap partially or fully with each other on the same area. Sites designated under international conventions must all be protected through national-level instruments, as the international agreements do not have direct legally binding legislative power at the national level. Natura 2000 sites are directly protected under EU law but are designated and governed according to the national legislation that transposes the EU directives.

To foster the use of a common standard at international level, the IUCN designed a global **IUCN categorization of protected area types** (Table 1).

Table 1. An overview of terrestrial protected area designations in Europe is listed in the table, using the IUCN categories.

Designation	Legal framework and protection purpose	Governance
INTERNATIONAL		
World Heritage Site	Sites designated for their globally significant natural and/or cultural heritage under the World Heritage Convention overseen by UNESCO.	The World Heritage Committee is responsible for deciding if sites nominated by the Party countries should be registered on the World Heritage List. The Committee can also select sites that are under threat and request and publish reports on the state of conservation of the site, propose activities to mitigate threats, define corrective measures and a timeframe for their implementation.
Ramsar Wetland of International Importance	A wetland that meets the Ramsar Convention's Criteria for the Identification of Wetlands of International Importance. All countries	The Ramsar Convention Secretariat registers site Ramsar Information sheets, publish guidelines, and convene the triennial meetings of the Conference

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	that have signed the Ramsar Convention (which includes all EU countries) must make a wetlands inventory according to scientific criteria and designate at least one wetland. The wetland must be designated with a clear statement of purpose and site conservation objectives based on these scientific criteria.	of the Contracting Parties. Countries have to convene a National Ramsar committee or National Wetlands Committee which is responsible for the sites.
UNESCO Biosphere Site	Biosphere reserves are established under UNESCO's Man and the Biosphere (MAB) Programme dedicated to exploring and demonstrating interdisciplinary approaches to sustainable development. Each site should incorporate a highly protected 'core' area for nature conservation, and 'buffer' and 'transition' areas containing human settlements that are managed sustainably.	UNESCO accredits the biosphere sites that are nominated by the countries under the UN convention. The responsibility for monitoring biosphere reserves lies with the national MAB committee on behalf of UNESCO.
EU / EUROPE		
Natura 2000 – Sites of Conservation Interest (SCI) / Special Areas of Conservation (SAC)	Sites of Conservation Interest (SCI) or Special Areas of Conservation (SAC) designated under the EU Habitats Directive for EU priority habitat types (Annex I habitats) and/or EU priority species (other than birds) listed in Annex II. Designated sites must contain representative areas or populations of the priority habitats and species within the relevant biogeographical region(s). The network within the biogeographical region must be sufficient to protect a representative sample of those habitats and species.	Site protection must follow the EU law and can be enforced through Commission infringement proceedings and European Court of Justice cases. The European Commission and the Member States, in the biogeographical seminar process, review the SCI designation and level of sufficiency.
Natura 2000 – Special Protected Areas (SPA)	Special Protected Areas (SPA) designated under the EU Birds Directive for EU priority bird species listed in Annex I, and/or to protect sites with a large share of the population of certain bird species, and/or to protect sites important for migrating birds and important wetlands.	The EU Commission with Birdlife International reviews the sufficiency of SPA designations.

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Emerald Network[1] - Areas of Special Conservation Interest	Areas of Special Conservation Interest designated by European countries signatories to the Bern Convention. The signatories include Bosnia and Herzegovina, Montenegro, Moldova, Serbia, and Ukraine (as well as all EU countries through the Habitats Directive). The legal framework for site designation is similar to the EU Habitats Directive. Before being officially adopted as Emerald Network sites, all sites proposed for the Network are thoroughly assessed at the biogeographical level for their sufficiency to achieve the ultimate objective of the Network. This objective is long-term survival of the species and habitats of the Bern Convention, which requires specific protection measures. The Natura 2000 network is considered to contribute to the Emerald Network. In the EU accession countries, the network is designated according to lists of plant and animal species harmonized between the Appendices of the Convention and the Annexes of the Habitats Directive and the Birds Directives and will become the national Natura 2000 network upon accession.	The Council of Europe provides the secretariat and hosts the Standing Committee to the Bern Convention. The Committee monitors implementation and adopts reference documents and recommendations. Moldova and Ukraine are among the countries who have officially adopted Emerald Sites on their territories. The Committee regularly nominates officially as 'Candidate Emerald sites' sites proposed by countries currently working on the establishment of the Emerald Network).
NATIONAL CATEGORIES (Dudley, 2013)		
IUCN Category Ia – Strict Nature Reserve	Strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring.	
IUCN Category Ib – Wilderness Area	Similar to a strict nature reserve, but generally larger and protected in a slightly less stringent manner. These protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.	
IUCN Category II – National Park	Protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities.	
IUCN Category III – Natural monument or feature	A comparatively smaller area that is specifically allocated to protect a natural monument and its surrounding habitats. Areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.	
IUCN Category IV – Habitat/species management area	Protected areas that aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category	
IUCN Category V – Protected landscape/seascape	A protected area where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other value	

[1] Council of Europe website: https://www.coe.int/en/web/bern-convention/emerald-network

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IUCN Category VI – Protected area with sustainable use of natural resources	Protected areas that conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area

1.1.2. LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

Protected areas may have various national, regional, and local level governance arrangements. The IUCN has identified four broad governance types, nothing that any of these can be associated with any given management objective (Dudley, 2013):

A. Governance by government (at federal/state/sub-national or municipal level). A government body holds the authority, responsibility and accountability for managing the protected area, determines its conservation objectives, develops and enforces its management plan. Usually, the state also owns or holds the rights to the protected areas' land, water and related resources.
B. Shared governance. Shared governance, sometimes referred to as co-management, occurs in many forms. Varied institutional mechanisms and processes are employed to share management authority and responsibility among different formally and informally entitled governmental and non-governmental actors. In 'collaborative' management, one agency has decision-making authority and responsibility but is required – by law or policy – to inform or consult other stakeholders. In 'joint' management, various actors sit on a management body with decision-making authority and responsibility.
C. Private governance. Protected areas under individual, cooperative, NGO or corporate control and/or ownership. The landowner has authority for managing the protected area and determines the conservation objectives, develops and enforces the management plan and remains in charge of decisions, within the legal framework of the land designation.
D. Governance by indigenous peoples and local communities. The indigenous peoples and local communities have management authority and responsibility through customary or legal, formal or informal, institutions and rules.

The protection measures employed for the different protected area designations in Europe also vary widely. The protection regime differs if the land is under public ownership or owned by private individuals or organisations, and if there are stakeholders who own or have the use of private rights on the land such as hunting rights or water extraction rights. Broadly, protection regimes can be distinguished into four types (which may operate in combination or in different zones if the protected area is large):

1. Regulatory exclusion – strict protection that legally excludes most types of human activities.
2. Regulatory protection against development and other activities that cause degradation – established activities are allowed but statutory protection prevents activities that may be damaging or degrade the nature values of the area and control development. Certain activities are strictly prohibited (e.g. mining) whilst others may be permitted if they are assessed as not causing significant impacts. Sometimes developments are permitted because they are judged to be of overriding public interest.
3. Planning restrictions – sites are mapped or listed in planning documents and their biodiversity importance must be considered in planning decisions. This is generally a relatively weak form of protection.

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4. Contractual incentive-based schemes or measures – where landowners and stakeholders are encouraged to maintain or adopt desired management practices through the use of contracts or payments such as agri-environment agreements funded through the EU Common Agricultural Policy, or contracts supported by national or regional funds.

The European Commission has published guidance on how to interpret **strict protection of protected areas in the EU** (European Commission, 2022). In the context of the EU Biodiversity Strategy target for strict protection, strictly protected areas are defined as: '*Strictly protected areas are fully, and legally protected areas designed to conserve and/or restore the integrity of biodiversity-rich natural areas with their underlying ecological structure and supporting natural environmental processes. Natural processes are therefore left essentially undisturbed from human pressures and threats to the area's overall ecological structure and functioning, independently of whether those pressures and threats are located inside or outside the strictly protected area*.' If the protected area is sufficiently large and has more or less intact natural ecosystems and processes, strict protection may mean non-intervention, with only limited and well-controlled activities, though in many cases interventions are necessary to prevent disastrous wildfires and to control invasive alien species. Strictly protected areas may also be areas in which active management sustains or enhances natural processes, such as maintaining semi-natural grasslands in the absence of wild grazers, restoring peatlands and wetlands, or controlling the populations of wild ungulates when natural predation is insufficient, due to the absence of large carnivores. In practice, there are many degrees of strictness of protection, and different interpretations of what strict protection is.

For **Natura 2000 sites**, the EU Nature Directives set the legal requirements. Sites must be designated in a site designation instrument that describes the conservation objectives and conservation measures that apply to the site. The EU legal framework leaves open different approaches to designate the sites and Member States can use regulatory (statutory), contractual and/or administrative instruments to designate and manage sites. Management plans are not obligatory, and the conservation measures may instead be integrated into other development plans and statutory, administrative or contractual measures. The site must have legal protection that prevents significant deterioration of the conservation status of the habitats and species for which the site is designated. In general, however, other land uses that do not cause significant disturbance or deterioration to these habitats or species can continue in Natura 2000 sites, unless another national or regional designation rules them out.

1.1.3. LEGAL AND GOVERNANCE MECHANISMS FOR ECOLOGICAL CONNECTIVITY IN EU POLICY

This section covers pan-European and EU policies and legislation. The Council of Europe initiated ecological network activities in the 1990s under the Bern Convention. In the EU, three laws explicitly include requirements for ecological connectivity on land and freshwater: since the early 1990s, the EU Habitats and Birds Directives (the nature directives), which govern the Natura 2000 network, and since 2000, the EU Water Framework Directive, supported indirectly by the EU Nitrates Directive (1991) and the EU Floods Directive (2007). The EU has also published strategies and initiatives to realise the global targets for ecological connectivity agreed under the Convention on Biological Diversity in 2010 and 2022.

Pan-European initiatives

The Bern Convention on the Conservation of European Wildlife and Natural Habitats (known as the **Bern Convention**) does not explicitly mention ecological connectivity but does require cooperation between national states for nature protection and special attention to the needs of endangered and vulnerable migratory species and their habitats, as well as legislating for

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the Emerald Network of protected sites described above and protection and restoration of species and habitats.

Under the convention, the Council of Europe adopted an action to establish a **Pan-European Ecological Network** in 1995[4]. The PEEN was a key objective of the Pan-European Landscape and Biodiversity Strategy (PEBLDS)[2], published by the IUCN in 1997 and adopted by the Council of Europe, as a way of implementing the Convention on Biological Diversity in Europe. The PEEN was developed in three subprojects: Central and Eastern Europe, completed in 2002; South-eastern Europe, completed in 2006; and Western Europe, also completed in 2006. The methodology of the development of the three maps was broadly comparable but data availability, differences in national databases, technical developments and geographical differences caused variations in the detailed approach[5]. The maps identified the core nature areas of European importance, existing corridors between these areas, and where new corridors could and should be established to meet the connectivity requirements of key species[3]. The PEEN provided the first framework for strategic cooperation in planning for ecological connectivity across Europe, though the maps have no legal standing and there is no enforcement mechanism.

The **Council of Europe Landscape Convention** recognises the important public interest role of landscapes in the ecological field, though it does not explicitly refer to ecological connectivity. It was agreed by the Council of Europe in 2000 and entered into force in 2004[4]. It is ratified by 40 European countries to date. It proposes legal and financial measures at the national and international levels, aimed at shaping 'landscape policies' and promoting interaction between local and central authorities as well as transboundary cooperation in protecting landscapes.

The **European Green Belt Initiative** has ecological connectivity as its goal[6]. It aims to create a chain of protected areas along the former Iron Curtain between Western and Eastern Europe from the Barents Sea at the Russian-Norwegian border, along the Baltic Coast, through Central Europe and the Balkans to the Black and the Adriatic Sea. The European Green Belt Association e.V. is a legal entity with 17 member countries plus NGO members, including 12 of the Danube and Carpathian countries covered in this Appendix.[5]

EU legislation

The **Habitats Directive** (Directive 92/43/EEC) aims to restore and maintain ecological connectivity. The Directive established the Natura 2000 network in Europe. Article 10 of the EU Habitats Directive states that:

'*Member States shall endeavour, where they consider it necessary, in their land-use planning and development policies and, in particular, with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora. Such features are those which, by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems for marking field boundaries) or their function as stepping stones (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species*.'

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[2] Council of Europe Committee of Ministers 1997. https://rm.coe.int/16804cb2d3 (Website accessed 27/5/2024)

[3] European Environment Agency. https://www.eea.europa.eu/data-and-maps/figures/indicative-map-of-the-pan-european-ecological-network-for-central-and-eastern-europe (Website accessed 27/5/2024)

[4] Council of Europe Landscape Convention (ETS No. 176). Details of Treaty No.176. https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatynum=176 (Website accessed 27/5/2024)

[5] The membership includes 12 of the Danube and Carpathian countries covered in this Appendix (Germany, Poland, Czechia, Slovakia, Austria, Hungary, Slovenia, Croatia, Romania, Bulgaria, Montenegro, Serbia), as well as Finland, Estonia, Latvia, Lithuania, Russia, Italy, Greece, Albania, Macedonia, Turkey, Kosovo, and Norway.

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This article explicitly includes ecological connectivity in the form of linear features, stepping stones, migration, dispersal and genetic exchange. The **Birds Directive** (Directive 2009/147/EC), while not explicitly mentioning ecological connectivity, also includes the management of habitats outside protected areas under Article 3, as well as areas along migratory routes under Article 4. The European Commission issued a guidance document on Article 10 of the Habitats Directive and Article 3 of the Birds Directive in 2007 (Kettunen et al, 2007). Member States are asked to plan measures and funding for green infrastructure – including buffer zones and ecological connectivity – in their Prioritized Action Framework (PAF), the document that plans funding for the Natura 2000 network in each multi-year EU budgetary period, including the use of EU funds (European Commission, 2023b).

The **Water Framework Directive** (Directive 2000/60/EC) requires Member States to achieve good ecological status or good ecological potential of water bodies on their territory. Ecological connectivity is a criterion to be used in the assessment of several of the water quality elements of surface water bodies. River continuity, the hydrological regime, and the connection of rivers to groundwaters and riparian zones are direct quality elements providing ecological connectivity, while thermal and oxygenation conditions can, in some cases, also constitute a barrier to migrating fish. Member States are, therefore, expected to take measures to maintain or re-establish continuity. Member States may designate rivers or sections of rivers as river reserves where connectivity must be preserved. Protected areas under the Water Framework Directive can also protect ecological connectivity as they include Natura 2000 areas, drinking water protection areas, and areas designated for the protection of economically significant aquatic species. The Water Framework Directive also provides for cooperation across Member States through international river basin management plans under Article 13.

Restoring upstream and downstream continuity may include removing barriers and dams, or building fish passes or other passes around barriers, and restoring the riverbed and banks to slow or vary the water flow so that the river restores sediments to places where they are missing and removes sediment from other areas. Restoring latitudinal connectivity includes restoring river meanders, removing dams and restoring natural riparian zones to allow access to floodplain areas, and restoring riparian forests and wetlands. Natural water retention measures (NWRM) are natural or nature-based structures that slow down the flow of stormwater, increase infiltration and reduce pollution through natural processes. EU guidance recommends NWRMs as cost-effective measures to achieve the goals of the Water Framework Directive[3].

The **Nitrates Directive** supports ecological connectivity indirectly by requiring measures to reduce water pollution from nitrates, notably riparian buffer zones or strips with a minimum width and permanent vegetative cover along water bodies.

The **Floods Directive** supports ecological connectivity indirectly by requiring measures to reduce flooding, notably by restoring natural river structures that slow water flow and restoring or recreating floodplain habitats and flood spill over areas. The directive does not directly require legal restrictions in areas with high flood hazard risk, but Member States can choose to restrict potential land uses in flood-prone areas. Flood risk management measures must take account of EU environmental objectives and must address the potential effects of flooding on Natura 2000 and protected waters.

The **Trans-European Networks for Energy (TEN-E)** and the **Trans-European Networks for Transport (TEN-T)** are policies to link the energy or respectively transport infrastructure of EU countries by identifying and supporting lists of Projects of Common Interest and Projects of Mutual Interest. The revised regulations in 2022 impose a new obligation for all projects in the EU list. PCIs and PMIs must meet mandatory sustainability criteria and, in compliance with the 'no significant harm' principle as per the EU Taxonomy Regulation, they must be implemented in a way that does not hinder the achievement of the environmental objectives. The TEN-E regulation is amended by the nature restoration regulation which gives renewable

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energy plants, connections, and grid the status of projects of overriding public interest, exempting them from the alternatives' assessment test.

The **EU Nature Restoration Law** entered into force in the EU on 18 August 2024[6]. It contains legally binding targets for the restoration and recreation of habitat types defined in the EU Habitats Directive (Annex I habitat types) and species protected by both Nature Directives, as well as marine habitats and species. It requires Member States to inventory and then remove artificial barriers to the connectivity of surface waters and to take measures to improve the natural functions of the related floodplains. It also includes targets to restore pollinator populations, and to achieve improving trends in farmland bird populations, grassland butterfly populations, forest birds, and other forest indicators. On agricultural land, Member States should put in place measures to increase the share of land with high-diversity landscape features. In their national nature restoration plans, Member States must consider the connectivity needs between habitats for the species populations to thrive, as well as ongoing and projected changes to environmental conditions due to climate change, the competing needs of the habitats and species, and the presence of high nature value farmland. They must identify and map the agricultural and forest areas in need of enhanced connectivity and landscape diversity, as well as restoration needs more widely.

EU policies

The **EU Green Infrastructure Strategy** was launched by the Commission in 2013 as part of its commitments to the global Aichi biodiversity target 11[7] and the EU Biodiversity Strategy 2020 (which had green infrastructure as headline target 2)[7]. The strategy sets objectives for green infrastructure to enhance connectivity between protected areas to allow species to thrive across their entire natural habitat and adapt to the effects of climate change and to contribute to the maintenance of ecosystem services delivery to society, as well as setting broader aims for natural and semi-natural areas and their ecosystem services to be considered in spatial and territorial planning, as well as restoring natural elements, to deliver benefits to people, nature, and the economy. The European Commission has defined green infrastructure as[8]:

> *'A strategically planned network of natural and semi-natural areas with other environmental features, designed and managed to deliver a wide range of ecosystem services, while also enhancing biodiversity.'*

The key principles of green infrastructure are connectivity, spatial planning, and multifunctionality; it goes beyond the aims of ecological networks, promoting the multifunctional nature of space and the benefits that appropriate management approaches can deliver (van der Sluis and Schmidt, 2021). The EU strategy aimed to create an enabling framework for green infrastructure using existing EU legal, policy and financial instruments. In 2019, the Commission provided guidance on how to integrate green infrastructure into key policies, improve information, strengthen the knowledge base and promote innovation, improve access to finance and foster investments in EU-level Green Infrastructure projects and promote good practices (European Commission, 2019). The guidance emphasises that EU level green infrastructure projects should contribute to the goals of the Nature Directives,

[6] Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869 (Text with EEA relevance). Enters into force 20 days after publication on Official Journal on 29 July 2024.

[7] Target 11 of the Aichi Biodiversity Targets, signed at COP 10 of the Convention on Biological Diversity (CBD) in 2010, states that: By 2020, at least 17% of terrestrial and inland water areas and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.

[8] https://environment.ec.europa.eu/topics/nature-and-biodiversity/green-infrastructure_en

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including via implementing Article 10 of the Habitats Directive and connecting Natura 2000 with buffer zones to defragment the landscape.

Many EU Member States and regions have progressively adopted national and/or regional green infrastructure strategies since 2011[8].

The **EU Biodiversity Strategy to 2030** (European Commission, 2020a) introduced the concept of the coherent and resilient Trans-European Nature Network (TEN-N), and set the target to make at least 25 000 km of rivers free-flowing again by 2030, for as well as setting goals to create an EU regulation for nature restoration and promote investments in green and blue infrastructure, amongst other related goals. Under the strategy, the Commission published a guidance on river barrier removal (European Commission Directorate-General for Environment, 2022).

The EU **Forest Strategy for 2030** promotes closer-to-nature forestry in the EU through technical support and the promotion of payments for ecosystem services and voluntary certification schemes (European Commission, 2021). The Commission guidelines on closer-to-nature forest management published in 2023 include a toolbox with several interventions for ecological connectivity, such as setting areas aside for biodiversity networks and corridors and landscape scale planning and management ('mosaic' approaches) (European Commission, 2023a).

The EU **Pollinators Initiative,** revised in 2023, aims to improve the conservation of pollinators and tackle the causes of their decline. To achieve this the initiative promotes strategically planned restoration activities to ensure adequate areas of well-connected, high-quality habitats for pollinators through species conservation plans. By 2027, the Initiative foresees the development of a blueprint of a network of 'Buzz lines' - ecological corridors for pollinators - with an accompanying implementation plan. The initiative calls on Member States to integrate the 'Buzz lines' into spatial planning at national, regional, and local levels.

1.2. FUNDING

The following section describes EU funding sources for protected areas and ecological connectivity. More information on the availability of EU funding for protected areas is provided in the factsheets available at the NaturaConnect website[9].

Information on national, regional, local and non-governmental sources of funding is given in the country sections of this Appendix. Emerging and potential sources of private funding for protected areas and ecological connectivity are provided in the factsheets available at the NaturaConnect website (see previous footnote).

1.2.1. PUBLIC FUNDING SOURCES FOR PROTECTED AREAS AND ECOLOGICAL CONNECTIVITY

The **LIFE programme** administered by the European Commission has nature conservation and ecological connectivity as one of its core objectives. It offers great opportunities to contribute to a coherent TEN-N as it encourages investments in designation of additional Natura 2000 sites, increasing connectivity and cross-border cooperation in green and blue infrastructure projects. It provides opportunities for jointly funded projects with non-EU countries, which is relevant to cross-border green infrastructure projects, for example where a Natura 2000 site lies alongside a nationally protected area in a non-EU state. It also provides funding opportunities for cross-border marine protected areas. An important feature of LIFE funding is that it can be used for land acquisition. The main limitations are the fact that funding

[9] https://naturaconnect.eu/financing-options-for-the-trans-european-nature-network-ten-n/

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is limited and competitive, project based and therefore not suitable for continuous needs such as maintenance, that it requires co-funding, and that application and management of projects is quite demanding.

The **EU cohesion funds** include the European Regional Development Fund (ERDF), the Cohesion Fund targeted at the eastern European Member States, and the European Social Fund Plus (ESF+). Member States may programme these funds together or separately, and in a single programme or several programmes at national or regional levels, and as these funds are targeted at a series of objectives, the programmes do not necessarily provide funding for protected areas. However, some of the programmes do provide scope for funds to flow to protected areas and their governance. In addition, some Member States provided one-off grants or loans to protected areas through their **Recovery and Resilience Facility** funding programmes.

The European Territorial Cohesion (or **Interreg**) fund is funded by the European Regional Development Fund (ERDF). It has the explicit objective to fund transboundary nature conservation initiatives, alongside its other objectives, so mainly the cross-border, regional, and Europe-wide Interreg programmes include protected areas and ecological connectivity as a funding priority. The funding cannot be used for land acquisition or management directly but is meant to support cross-border partnerships e.g. to collaborate on protected area management, to support learning and training and exchanges of experiences, and to set up collective initiatives.

Other EU funds can be used to support land and water management within protected areas.

The most important in terms of volume of funding are the two **Common Agricultural Policy funds EAGF** and **EAFRD** for the management of farmed land. It is the main source of funding for arable land and most types of grazed and/or mown land within protected areas - including meadows and pastures, scrub, heathlands, and wooded meadows and pastures (including the silvo-pastoral agroforestry habitats of the Iberian Peninsula - dehesa[10] and montado[11]). CAP funding can also be used for the management of farmland in ecological corridors.

The main CAP instruments for land management in protected areas and ecological corridors are:

- Eco-schemes (funded by EAGF) – annual payments for relatively simple ecological actions and management and/or for refraining from doing something (such as applying pesticides). Can support conversion of arable land into grassland and its maintenance.
- Agri-environment-climate contracts (funded by EAFRD) – 5-year contracts to fund defined management activities, or alternatively to achieve a certain ecological result.
- Natura 2000 payments (funded by EAFRD) – annual payments for farmland or forest in Natura 2000 sites tied to conforming to the constraints or management requirements defined for that site and/or general management requirements for all sites.
- These support schemes can be accompanied by advice or training for the task.
- Investment support: Farmers can apply for investment support for tree or hedge planting or other small-scale restoration activities on their land, or for afforestation or conversion of arable fields into grassland. Public authorities may have access to investment support for larger restoration actions such as recreating flooded grasslands

[10] A characteristic landscape of the southwestern quadrant of the Iberian peninsula in which crops, pasture land or Mediterranean scrub, in juxtaposition or rotation, are shaded by a fairly closed to very open canopy of native oaks. https://eunis.eea.europa/habitats/393

[11] The *montado* is a unique, endangered landscape in Portugal's Alentejo region, shaped by centuries of human activity. It integrates agriculture, forestry, and grazing, with cork oaks and holm oaks as key species. This ecosystem is a biodiversity sanctuary, home to hundreds of plant and animal species, including the endangered Spanish imperial eagle. The *montado* represents a harmonious blend of natural and human-altered environments. https://biodiversity.com.pt/biogallery/montado

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and removing dams along rivers, rewetting peatlands, or replacing conifer plantations with deciduous woodland.

Cooperation funding is available in most Member States for a group of farmers in an area to collaborate on a joint initiative such as watershed management or climate adaptation or the creation of an ecological network.

The **European Maritime, Fisheries and Aquaculture Fund (EMFAF)** can be used the restoration of water bodies, such as river re-alignments, dam removals, coastal protection with green infrastructure, and so on. It can also fund research, communication, stakeholder engagement, and collaboration activities that can provide important inputs to projects for ecological connectivity along wetlands, rivers and coastlines. It does not provide ongoing maintenance support.

In most countries, the main source of funding for protected area governance is from national and regional public budgets. There is a great variation in the availability of funds and public administrations across protected area types and countries and regions, ranging from some quite well funded and resourced national parks with their own administrative bodies and income sources, to many protected areas with no dedicated funding at all and minimal administrative capacities in the relevant public authorities. National and subnational sources of funding are described in the country sections.

1.2.2. PUBLIC FUNDING FOR ECOLOGICAL CONNECTIVITY

LIFE and Interreg funding are available for EU neighbouring countries and so enables transboundary initiatives.

As explained above, **LIFE** is a key fund for ecological connectivity projects. Land areas which are purchased and managed under LIFE projects are subject to protection requirements and usually become part of protected areas or another land stewardship arrangement to ensure their long-term dedication to nature conservation.

The **Interreg** fund, part of the European Regional Development Fund, is the most important source of transboundary funding for ecological connectivity. Examples of Interreg projects focused on ecological connectivity are:

- SaveGREEN (2020-2022) - Safeguarding the functionality of transnationally important ecological corridors in the Danube basin led by WWF-CEE. Aimed to demonstrate ways of designing appropriate mitigation measures and maintaining or improving the functionality of ecological corridors through integrated planning, building on key results of the previous Interreg projects TRANSGREEN, ConnectGREEN, and HARMON.
- ConnectGREEN (2018-2021) - Restoring and managing ecological corridors in mountains as the green infrastructure in the Danube basin. Led by WWF-DCP Romania and WWF-CEE with partners in Romania, Austria, Czech Republic, Hungary, Slovakia, and Serbia.
- TRANSGREEN (2017-2019) - Integrated Transport and Green Infrastructure Planning in the Danube-Carpathian Region for the Benefit of People and Nature. Led by WWF-CEE and with 9 associated partners in Czech Republic, Slovakia, Hungary, Romania, Ukraine.
- MEASURES (2018-2021) - Managing and restoring aquatic EcologicAl corridors for migratory fiSh species in the danUbe RivEr baSin. Led by BOKU Uni in Vienna with 24 partners in 13 countries.
- MaGICLandscapes (2017-2020) - Managing Green Infrastructure in Central European Landscapes. Led by Universität Wien with partners in Austria, Czechia, Germany, Italy

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and Poland. It introduced the green infrastructure concept and its benefits to the five country governments and in nine case study areas.

- PlanToConnect (ongoing: 2022-2025) - Mainstreaming ecological connectivity in spatial planning systems of the Alpine Space. This project is developing and testing an Alpine spatial planning strategy for ecological connectivity, and a capacity-building package for its implementation. The aim is to identify the key cross-border areas for planning of ecological connectivity and to facilitate the upgrade of spatial planning systems and territorial policies to preserve or re-establish them. It is working with 8 pilot areas, some of which are municipalities and some of which are intermunicipal, including one transboundary area. An overarching study is addressing observed difficulties in coordination across different territorial levels and challenges related to data harmonization in identifying Green Infrastructure components, as each alpine country utilizes different methodologies and tools.

The Interreg **ESPON programme** (European Observation Network for Territorial Development and Cohesion or European Spatial Planning Observation Network): aims at promoting and fostering a European territorial dimension in development and cooperation by providing evidence, knowledge transfer and policy learning to public authorities and other policy actors at all levels. The implementation of green infrastructures was one of the priorities of ESPON in the 2015-2022 programming period (e.g. Project GRETA: GReen infrastructure: Enhancing biodiversity and ecosysTem services for territoriAl development).

Common Agricultural Policy: there are opportunities for using CAP funds to support ecological connectivity, as detailed above.

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2. THE DANUBE-CARPATHIAN REGION

2.1. REGIONAL LEGAL AND GOVERNANCE MECHANISMS FOR ECOLOGICAL CONNECTIVITY

In the Danube-Carpathian region, several international governance structures are in place, and these implement a series of policies and projects that promote protected area networks and ecological connectivity across the region.

Carpathian Convention

The Framework Convention on the Protection and Sustainable Development of the Carpathians (referred to as the Carpathian Convention) is an international agreement between the Czech Republic, Hungary, Poland, Romania, Serbia, Slovakia and Ukraine. According to Article 4.1, the Parties shall pursue policies aiming at conservation, sustainable use and restoration of biological and landscape diversity throughout the Carpathians, and take appropriate measures to ensure a high level of protection and sustainable use of natural and semi-natural habitats, their continuity and connectivity, and species of flora and fauna being characteristic to the Carpathians, in particular the protection of endangered species, endemic species and large carnivores.

The Carpathian Network of Protected Areas was established under the Convention in 2006 to foster cooperation between the protected areas in the Carpathians and connected mountain ranges[12]. The CNPA Coordination Unit is responsible for coordinating activities and preparing reports and recommendations to be submitted to the Carpathian Convention. The Secretariat of the Convention has an Initiative of Mutual Observership Status with the ICPDR.

International Action Plan on Conservation of Large Carnivores and Ensuring Ecological Connectivity (2020)

The International Action Plan was adopted by the parties to the Carpathian Convention in November 2020. It is designed to be a reference for the development of aligned national management plans in each country (it is not a legal act binding the Parties). The plan includes the strategic objective to prevent habitat fragmentation and ensure ecological connectivity in the Carpathians. This requires all parties to identify a) patches of suitable habitats including core areas and steppingstones for large carnivores, within and between protected areas, Natura 2000 and Emerald networks; and b) key ecological corridors including wildlife/movement/migration corridors between them, using the joint methodology. Parties will also work to improve planning processes, tools and practices to better reflect and integrate ecological networks into spatial planning.

Carpathian Convention information system, guidance and methods

The Carpathian Countries Integrated Biodiversity Information System (CCIBIS) is the platform that hosts the ecological network maps and other information and knowledge. Projects under the Convention (particularly the TRANSGREEN, ConnectGREEN, SaveGREEN, and projects) have developed methods and guidance documents on ecological connectivity, some of which are highlighted the Joint Strategic Action Plan 2021 – 2026 for the implementation of the Protocol on Sustainable Transport:

- Guidelines how to minimize the impact of transport infrastructure development on nature in the Carpathian countries (Hlaváč et al, 2019)

[12] http://www.carpathianparks.org/

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- Handbook of Best Practices for Planning and Implementing Mitigation Measures regarding Landscape Connectivity (Borlea et al, 2022)
- State of the Art and Gap Analysis in the field of environmentally friendly transport infrastructure development (Kovács et al, 2021; Papp and Berchi, 2019)
- Methodology for the Identification of Ecological Corridors in the Carpathian Countries by Using Large Carnivores as Umbrella Species (ConnectGREEN, 2020)
- Methodologies for standardised monitoring and assessment of ecological corridors (Sedy et al, 2022)

International Commission for the Protection of the Danube River (ICPDR)

The Danube River Protection Convention forms the overall legal instrument for co-operation on transboundary water management in the Danube River Basin, signed by eleven of the Danube Riparian States – Austria, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Germany, Hungary, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia and Ukraine – plus the European Commission. The International Commission for the Protection of the Danube River is the implementing body of the Convention.

The ICPDR is formally composed of the Delegations of all Contracting Parties to the Danube River Protection Convention and is assisted by a permanent secretariat including technical experts. The technical work is carried out in the Expert Groups composed of national experts from the Contracting Parties and representatives from ICPDR observer organisations. The most relevant Expert Groups related to ecological connectivity are the Hydro-morphology Task Group (HYMO TG) and the River Basin Management Expert Group (RBM EG).

The Danube River Basin Management Plan includes a set of detailed maps on existing barriers and restoration priorities at the macroregional level, with a complete overview on restoration priorities, barriers to longitudinal connectivity and restoration priorities for aquatic connectivity and green/blue infrastructure[13]. The plan sets the goal to remove a considerable number of these obstacles to river continuity in the wider Danube Basin in the 2021-2027 period.

While Observers are not granted decision-making rights, they actively participate in all meetings of the ICPDR experts and task groups, as well as plenary meetings Delegates of Observers have access to information including all technical meeting documents and the right to contribute to all technical discussions.

The Lower Danube Green Corridor Declaration is an international declaration agreed in 2000 between Bulgaria, Moldova, Romania, and Ukraine, overseen by the International Commission for the Protection of the Danube River. Through the Declaration, these four countries established the Corridor and identified specific targets in terms of wetlands protection and natural floodplains restoration[14]. The Flood Protection Expert Group of the International Commission for the Protection of the Danube River also adopted a Flood Action Programme for the Lower Danube Corridor.

EU Strategy for the Danube Region (EUSDR)

The EU Strategy for the Danube Region (EUSDR) is a macro-regional strategy adopted by the European Commission in December 2010 and endorsed by the European Council in

[13] http://www.icpdr.org/main/publications/maps

[14] TransNature map of transboundary protected areas. https://www.transnature.eu/map (accessed 3 January 2024)

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2011.[15] The Strategy seeks to create synergies and coordination between existing policies and initiatives taking place across the Danube Region. The Commission´s Directorate General for Regional Policy helps to implement the Strategy by facilitating and supporting the actions of the participating countries. The High-Level Group (HLG) on macro-regional strategies is made up of official representatives from all countries involved. It assists the Commission in the policy coordination of the Strategy. The National Coordinators (NCs) have a strategic coordination function within their national or regional government. The NCs coordinate and keep an overview of the participation of their country in the implementation of the EUSDR including all Priority Areas.

The Danube Region Strategy addresses a wide range of issues; these are divided into 4 pillars and 12 Priority Areas (PAs). Each Priority Area is managed by at least two countries as Priority Area Coordinators (PACs) and assisted by the Danube Strategy Point. The PACs organise Steering Group meetings in which mainly the representatives of the ministries of foreign affairs of the Danube countries participate along with other stakeholders as observers.

Under the Strategy's priority area 6, two of the five targets are to: *Improve management of Natura 2000 sites and other protected areas through transnational cooperation and capacity building*; and to *maintain and restore Green and Blue Infrastructure elements through integrated spatial development and conservation planning*.[16] According to the action plan (European Commission, 2020b), the priority area 6 action points[17] include:

- *'Strengthen horizontal knowledge transfer and access to environmental data between national authorities responsible for nature conservation (especially those of neighbouring countries). For instance, the use of Strategic Environmental Assessments for decision making, integration of the blue-green infrastructure into planning documents, supporting sustainable use of protected areas in order to increase support and feeling of ownership of local people, etc.*
- *Development of a common approach to define and determine ecological corridors for key target species on land and improve the communication, knowledge and data sharing between environmental, transport and spatial planning sectors on spatial integration of green and blue infrastructure.*
- *Establish the cooperation between the MRS approaches in establishing ecological connectivity and Green Infrastructure.'*

The **Joint Declaration 'Achieving functional biodiversity in the Danube-Carpathian Region by mainstreaming ecological connectivity'** signed in 2022 lays the basis for cooperation between the ICPDR, CC and EUSDR and commits them to strengthen cooperation on the implementation of ecological connectivity at all levels and sectors.[18]

The **Strategy for ecological corridor conservation and restoration in the Danube catchment** developed by an Interreg project expands on these goals and describes the necessary supporting actions, including the continuation of the Local Migratory Fish Networks set up in the Interreg project (Haidvogl, Munteanu and Reinartz, 2021). As this document has no legal weight, the recommendations and actions will only be implemented if taken up by the ICPDR and the Danube countries.

[15] https://danube-region.eu/

[16] https://nature.danube-region.eu/targets-of-the-priority-area-6/

[17] EUSDR Action Plan 2020 (COM(2020) 59 final)

[18] https://www.icpdr.org/about-icpdr/partners/international-cooperation/icpdr-reaffirms-goals-declaration-achieving

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The **Alps-Carpathian Corridor**[19] is the subject of an Austrian-Slovakian Action Plan for the Corridor covering land use, communication, scientific fundamentals, protection and spatial planning (Frey-Roos et al, 2021). The Corridor is being restored to reconnect the eastern reaches of the Alps to the Western Carpathians and to support ecological connectivity and the sustainable development of the whole region. A cross-border platform forum was set up for the managers of these regions to share ideas and develop solutions that can be applied within the entire region. It promoted the construction of green bridges across the motorways.[20] An Interreg project funded the joint development of strategies for transboundary river management, and pilot restoration measures on the Danube tributary rivers Fischa, Schwechat, Rudava, Mociarka and Malina.[21]

DANUBEPARKS Network

The DANUBEPARKS Association is the platform for coordinated and extensive collaboration among the protected area administrations of nearly all the Danube countries[22]. It represents the managing bodies of 20 national and nature parks, biosphere and nature reserves, represented by public authorities, public enterprises, or NGOs.

The DANUBEPARKS network's **Danube-wide Dry Habitat Corridor Initiative**[23] promotes the protection, restoration, conservation, and appropriate management of the Danube dry grasslands. It maintains a cadaster and map, networks pilot studies, and links protected areas (for example, the Donauengtal near Passau in Germany, the Wachau UNESCO site in Austria, the Danube Bend and Duna-Ipoly National Park in Hungary, Djerdap National Park in Serbia, and Iron Gate Nature Park in Romania are working on joint strategies to synergize their biodiversity conservation actions).

The **Danube Riparian Forest Corridor Initiative**[24] aims to restore the ecological network of riparian forests in the region by mapping gaps in the riparian forest corridor and synergising conservation or restoration measures across the countries.

The **Danube Wild Island Habitat Corridor** is a corridor network of 912 islands covering an area of 138 415 ha with important habitats all along the river.[25] It is being restored as an ecological corridor with the help of Interreg and LIFE funded projects.[26]

An interactive WebGis map was developed indicating the habitat suitability and corridors for bear and lynx in the Danube River Basin.[27]

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[19] https://cor.europa.eu/en/news/Pages/Alps-Carpathians-corridor.aspx

[20] The project 'Alps-Carpathians Corridor' has a total eligible budget of EUR 1 852 450, with the EU's European Regional Development Fund contributing EUR 1 427 519.

[21] INTERREG Slovakia-Austria Alpine Carpathian River Corridor (AKK River) (2017-2020) – led by Donau-Auen National Park, with partners in Austria and Slovakia. https://www.viadonau.org/en/company/project-database/aktiv/alpine-carpathian-river-corridor/?backurl=32

[22] https://www.danubeparks.org/association

[23] https://www.danubeparks.org/initiatives/danube-dry-habitat-corridor

[24] https://www.danubeparks.org/initiatives/danube-riparian-forest-corridor

[25] http://wildisland.danubeparks.org/

[26] Interreg Danube Transnational Programme DanubeparksConnected (2017-2019), followed by LIFE WILDIsland (2021-2027)

[27] http://webgis.eurac.edu/bioregio/

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Strategy of ADC (Alps-Danube-Carpathians)

The protected area networks ALPARC, DANUBEPARKS and CNPA signed a memorandum of cooperation in 2016 to work on common goals and objectives regarding the conservation of biodiversity, through activities to create and realize ecological corridors. Common objectives are also to develop a joint voice towards habitat connectivity on a political level and EU policies (e.g. Green Infrastructure) including all concerned countries of the regions; and to raise awareness of the public for the importance of large non-fragmented areas and permeable landscapes.

Transboundary protected areas in the Danube-Carpathian region

The region has adopted more than ten transboundary protected areas, including:

- East Carpathian Biosphere Reserve adopted in 1998 between Bieszczady National Park in Poland, the Poloniny National Park in Slovakia and the Uzhansky National Park in Ukraine.
- Ramsar Site Floodplains of the Morava-Dyje-Danube Confluence established in 2004 in Austria (Donau-March-Thaya-Auen and Untere Lobau), Czech Republic (Mokrady dolního Podyjí) and Slovakia (Moravské Luhy Protected Area Landscape).[28]
- Mura-Drava-Danube Transboundary Biosphere Reserve established by a joint governmental declaration between Austria, Croatia, Hungary, Serbia, and Slovenia in 2021 (after more than 15 years of negotiations).[29]
- Ramsar sites Ibisha Island, Belene Islands Complex, and Srébarna on the Danube between Bulgaria and Romania[30].
- Krkonose/Karkonosze subalpine peatbogs Transboundary Ramsar Site in the Karkonosze Mountains in Czechia and Poland established in 2009.[31]
- Ramsar site designated in 2023 in the Đerdap gorge (Iron Gate) National Park, along the Danube River, on the border between Serbia and Romania.

2.2. FUNDING FOR REGIONAL ECOLOGICAL CONNECTIVITY

The ICPDR Joint Programme of Measures for the third international Danube River Basin Management Plan (2022-2027) is supported by funding for the permanent secretariat, but implementation of the measures relies on each Danube country mobilizing the funding within their borders.

EU funding plays an important role in funding cross-border actions.

[28] https://rsis.ramsar.org/ris/604

[29] https://wwfint.awsassets.panda.org/downloads/danube_drava_mura_factsheet.pdf

[30] https://rsis.ramsar.org/

[31] https://rsis.ramsar.org/ris/637

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3. THE DANUBE-CARPATHIAN REGION – ANALYSIS BY COUNTRY

Figure 1. Nizke Tatry in the Carpathian Mountains, Slovakia. ©Rastislav Staník

Figure 2. Danube Delta, Romania. ©WWF Central and Eastern Europe.

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3.1. AUSTRIA

In Austria, most of the legislation regarding nature and landscape conservation lies within the responsibility of the federal states (Bundesländer). The Bundesländer have legislative and executive powers with regard to spatial planning, nature protection and transport and are also responsible for the administration, implementation and enforcement of certain federal laws at the lower levels of government. The nature conservation authorities of the Bundesländer are responsible for the conservation and restoration of habitats valuable for nature conservation and their re-establishment.

3.1.1. PROTECTED AREA NETWORK (TERRESTRIAL)

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

Table 2. National and regional designation types, protection purpose and governance in Austria.
Sources: (Suske and Horvath, 2023), (VDN, 2017).[32]

Designation type	Protection purpose and governance	In which federal states
Strict Nature Reserve and Wilderness Area (Wildnisgebiet)	Strictly protected primary forest under non-intervention management (corresponding to IUCN category 1b) with all extractive forms of land use completely prohibited.	Two areas have been designated: Niederösterreich · Dürrenstein-Lassingtal (2001, extended 2021) Salzburg · Sulzbachtäler (2018)
National Park (Nationalpark)	Large area protected in full compliance with IUCN category II with strictly protected core area and buffer zones. Protection goal is to protect ecosystems and intact ecosystem functions in a large natural and mostly intact area.	Designated at federal level through a national law. 6 National Parks have been designated.
Nature Park (Naturpark)	Cultural landscapes that have a high value for nature recovery or learning about nature, or that have a historical significance and that are suitable as areas of recreation and knowledge transfer. These are often traditional agricultural landscapes protected for both nature and sustainable development. Designated by the state government.	Designated by every federal state.
Nature Reserve (Naturschutzgebiet)	Strictly protected for the natural habitats and rare or endangered species present, or for rare or scientifically interesting minerals or fossils. The protection must guarantee the natural functions and processes. However,	Designated by every federal state.

[32] https://www.umweltbundesamt.at/umweltthemen/naturschutz/schutzgebiete; https://www.burgenland.at/themen/natur/geschuetzte-gebiete/; https://www.ktn.gv.at/Themen-AZ/Details?thema=11&detail=1035; https://www.noe.gv.at/noe/Naturschutz/Schutzgebiete_Naturdenkmaeler.html; https://www.land-oberoesterreich.gv.at/92726.htm; https://www.salzburg.gv.at/themen/natur/naturschutzrecht-2/naturschutzrecht-salzburg/gebietsschutz; https://www.verwaltung.steiermark.at/cms/ziel/74838061/DE/; https://www.tiroler-schutzgebiete.at/; https://vorarlberg.at/-/schutzgebiete-in-vorarlberg;

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	there is an exemption for 'customary' agricultural and forestry activities.	
Strict Nature Reserve (Sonderschutzgebiet)	Strict prohibition of any intervention in nature. Exceptions can be given for agriculture, forestry. Fishing and hunting activities may be allowed under license. Human access is prohibited in some areas or during the breeding season. The currently designated areas all contain primary riparian forest.	Designated by Tirol.
Landscape Protection Area (Landschaftsschutzgebiet)	Landscapes with high diversity, uniqueness, and aesthetic quality. Designated for their high value for recreation and tourism or their particular historic or archaeological value. Relatively weak protection level.	Designated by every federal state.
Natural Forest Reserve (Naturwaldreservat)	Forest areas set aside for natural development, with no timber extraction, grazing, or other human intervention allowed. Hunting is allowed to control wild ungulates.	192 reserves protect 83.5 km^2 of forest.[33]
Local/regional protected areas	Designated by local/district government (Bezirksverwaltungsbehörde). Certain actions are prohibited or only allowed under licence from the local authority.	
Protected Landscape Section (geschützter Landschaftsteil)	To protect a small area of semi-natural landscape or cultural landscape that is particularly characteristic and defining in a region, that defines the diversity or structure of the landscape or place, or that is an important recreational area for the local population (e.g. urban green space).	Burgenland Oberösterreich Salzburg Steiermark Tirol Vorarlberg Wien
Protected Habitat (Geschützter Lebensraum / geschützter Biotop)	Small site designated to protect habitat(s) and/or species of EU significance, without being designated as a Natura 2000 site.	Burgenland Wien
Nature Monument (Naturdenkmal)	Natural feature that is distinguished by its uniqueness, rarity or special form, that gives the landscape a unique character or that has a special scientific or cultural and historical value. Protection of the natural feature and its immediate surroundings. Niederösterreich: sites protect, in particular, gorges, waterfalls, springs, trees, hedges, vegetated avenues, hedges and groves and rare habitats[34].	Kärnten Niederösterreich Salzburg Steiermark Wien
Protected Natural Feature with Regional Significance (Geschützte Naturgebilde von örtlicher Bedeutung)	To protect a natural feature or small area that gives the place or town a particular character, have a high aesthetic quality, or a local historical or cultural significance.	Salzburg
Protected Cave (geschützte Höhle / Naturhöhle)	To protect a cave.	Niederösterreich Steiermark
Nature Preservation Area and Sanctuary (Ruhegebiet /Ruhezone)	Landscape dedicated to recreation and enjoyment in nature. Most are in the high mountains. Prohibition on constructions (e.g. cable cars, roads).	Tirol Vorarlberg

[33] BMNT (01 2019) Waldinventur des BFW - Daten und Fakten. Wien.

[34] Lower Austrian Nature Conservation Act 2000 - NÖ Naturschutzgesetz 2000 (NÖ NSchG 2000) [LGBl. 5500-0] https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=LrNO&Gesetzesnummer=20000814

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Plant Protection Area	To protect particular plant populations in alpine areas under high pressure from recreation and tourism. Prohibition on picking, digging up or damaging plants.	Vorarlberg
Ecological Development Zone (Ökologische Entwicklungsfläche)	To protect area important for developing and connecting green infrastructure or to support species and habitat protection programmes. Protection may be permanent or limited to a specified time period (according to article 26 of Vienna nature conservation law).	Wien

Natura 2000 network: 15.4% of terrestrial area (total); 11.2% of area as SCIs, 12.3% as SPAs. The network is considered to be complete.

Total terrestrial protected area: 29.2% of land area (Suske and Horvath, 2023), BISE, CDDA[35].

Overlaps and protection levels: In Austria, almost half of the protected areas are designated exclusively under national laws. The other half consists of Natura 2000 sites (38.2%) or areas where Natura 2000 sites overlap with national designations (47.4%) (BISE[36]). The Austrian Natura 2000 sites are all designated individually through their own legal statutes. There are some overlaps between protected area designations, but the national designations provide a substantial additional protected area coverage that complements the Natura network (Suske and Horvath, 2023). However, a large share of this additional area is made up of the Landscape Parks which have a low level of protection for habitats and species – corresponding to IUCN category V.

Transboundary protected areas: Austria's boundaries with the Czech Republic, Slovakia, Hungary, and Slovenia were part of the Iron Curtain and now form part of the trans-European Green Belt initiative. Austria therefore has many transboundary partnerships between bordering protected areas. Austria and Hungary have declared the Neusiedler See-Seewinkel – Fertö-Hanság area as a Transboundary Ramsar Site, a World Heritage Site, and a transboundary National Park. The Austro-Hungarian National Park Commission, representing the Austrian and Hungarian governmental authorities and the Park's management bodies, acts as a steering committee for the further development of the Transboundary Protected Area[37]. See the Danube-Carpathian region, Chapter 2. Descriptions of further transboundary protected areas that include Austria.

OECMs: So far, Austria has not defined any areas as OECMs.

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

The Natura 2000 sites are designated by the nature conservation departments of the federal governments. Austria had problems completing its Natura 2000 network which led to intensive negotiations with the European Commission and two infringement proceedings for insufficient designation. The network is now considered to be complete. Natura 2000 sites are designated through site specific decrees (Europaschutzgebietsverordnung) which specify the site conservation objectives (Suske and Horvath, 2023). The majority of the sites (almost 80%) have management plans elaborated by the regional nature conservation authority or by NGOs[38]. The authorities use contracts with landowners or users to implement management.

[35] European Environment Agency (2022). Nationally designated areas (CDDA) for public access - version 20, Jun. 2022. https://sdi.eea.europa.eu/catalogue/srv/api/records/28a5cf37-95d5-4758-9204-9eada51ebb8a

[36] EEA BISE https://biodiversity.europa.eu/countries/austria

[37] TransNature map of transboundary protected areas, https://www.transnature.eu/map

[38] Some plans have been developed by NGOs, for example WWF.

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National Parks are designated by the federal government through a national law. Most of the other protected areas are designated by the nature conservation departments of the federal governments. Some protected areas are designated by the local government. Some federal states have created additional categories of protected areas – for example, plant protection areas in Vorarlberg, and undisturbed areas in Tirol and Vorarlberg (Suske and Horvath, 2023).

The federal state Vorarlberg has designated a buffer zone around one Natura 2000 site through a local ordinance, which specifies rules for buffer zone I and buffer zone II[39]. This governance instrument has not been used for any other protected area and has not been used in the other regions.

3.1.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

There is no federal legal framework for ecological connectivity. Progress on green infrastructure and ecological networking differs between federal states.[40] In the province of Steiermark (Styria) and the district Pinzgau in the province of Salzburg, green zones and corridors are protected by decree (pers.com., Environment Agency Austria). In several other Austrian federal provinces, the theoretical and technical bases for ecological networks have been established, but they are not legally binding.

Two federal instruments require mitigation measures to maintain connectivity across the road network, and an initiative has been started to use forest management plans to define habitat corridors:

The national Ministry Directive '**Habitat connectivity for wild living animals**'[41] requires the retrofitting of 20 green bridges over the existing motorway network in Austria by 2027. This is intended to secure long-term habitat connectivity for wide ranging wildlife species. The state-owned motorway management company ASFINAG has built four in the provinces of Niederösterreich (Lower Austria) and Burgenland (Göttlesbrunn, Pöttsching, Mühlendorf, and Bergland), and is constructing two more in the province of Oberösterreich (Upper Austria) across the Linz-Passau motorway and the province of Steiermark (Styria) near Graz.

The federal government **Guidelines on Wild Animal Protection[42]** issued in 2007 regulates the construction and management of structural crossing aids in new road projects[43]. These crossing aids may include underpasses, tunnels, overpasses, amphibian tunnels and culverts.

Visualization of habitat corridors in forest development plans: The forest development plans are not legally binding, but the plans are taken into consideration in environmentally relevant procedures such as Environmental Impact Assessment and Strategic Environmental Assessment. The integration of habitat corridors into the plans is being tested at the local level

[39] The ordinance specifies a prohibition on construction and activities. Landesrecht konsolidiert Vorarlberg: Gesamte Rechtsvorschrift für Pufferzonen zum Schutz von Gebietsteilen außerhalb des Natura 2000 Gebietes, Fassung vom 17.10.2023.
https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=LrVbg&Gesetzesnummer=20000509

[40] https://lebensraumvernetzung.at/

[41] Dienstanweisung Lebensraumvernetzung Wildtiere (2006) Dienstanweisung Lebensraumvernetzung Wildtiere based on the WWF implementation concept 'Strategic planning for habitat connectivity in Austria - prioritisation of retrofit proposals for green bridges over motorways and expressways'
https://www.bmk.gv.at/themen/verkehr/strasse/umwelt/wildtiere.html

[42] in Guidelines and Regulations for Planning, Construction and Maintenance of Roads, Richtlinien und Vorschriften für das Straßenwesen, RSV 04.03.12. Not publicly available but can be purchased at www.fsv.at

[43] Richtlinien und Vorschriften für den Straßenbau (RVS) 04.03.14 'Schutz wildlebender Säugetiere (ausgenommen Fledermäuse) an Verkehrswegen'

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in three pilot communities in the provinces of Tirol (Tyrol), Salzburg and Steiermark (Styria). The corridors must be made visible; however, there is no guidance on how to manage these areas. Community representatives are asking for more action at the level of spatial planning and more communication among all stakeholders.

3.1.3. SPATIAL PLANNING

The provinces have legislative and executive powers with regard to spatial planning. The Austrian Conference on Spatial Planning (ÖROK) serves as the coordinating body at federal level and publishes the Austrian Spatial Development Concept, most recently updated in 2021. The federal strategy is specified in more detail and implemented at the regional level in partnership agreements, which can be in the form of recommendations endorsed by all partners, or projects funded and led at the federal level.[44]

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

The **Ecological Network Austria** (Lebensraumvernetzung Österreich) is a standardized Austria-wide evaluation of the most important wildlife corridors for Austria. The map and assessment were first published in 2018.[45] Data were derived from several national projects and sub-strategies[46], and harmonized in 2015 to support the implementation of targets 10 and 11 of the Austrian Biodiversity Strategy 2020+. In these projects, the Austrian Environment Agency (UBA), in cooperation with the federal states, identified the most important habitat axes in Austria (Leitner et al, 2018).

The aim of this standardized evaluation is to protect the remaining open green corridors that serve as migration routes at the national scale from being lost and fragmented through building and soil sealing. The map visualizes the ecological corridors but has no legal basis. Local planning authorities should require mitigation measures to protect the corridor function whenever planning permission is given for building projects that affect corridors. The Austrian Environment Agency (UBA) recommends that the authorities can secure corridors by strategically locating the compensation areas that are required as offsets for biodiversity losses from large projects, or by making nature conservation management agreements with landowners. UBA developed a guideline for farmers on how to manage ecological corridors which has been discussed with the Chamber of Agriculture.

The online platform **Lebensraumvernetzung** (habitat connectivity) provides access to all databases, maps and visualisations. It offers the following tools for spatial planning:

- Integrated dataset of ecological corridors: line maps, nodes, polygons of minimum areas
- Assessment of quality of ecological corridors: connectivity index, index of landscape structure, index of landscape elements
- Application to establish maps of ecological corridors in forest development plan
- Completed ecological corridor maps for forest development plans

Austria-Czechia wild animal corridors action plan: A series of projects have researched and planned the protection and restoration of the ecological corridors for large mammals across the Austria-Czech border. The work has culminated in an action plan jointly agreed

[44] ÖREK-Partnerschaften, https://www.oerok.gv.at/raum/themen/weitere-themen

[45] https://lebensraumvernetzung.at/

[46] 'Habitat Connectivity Austria' ('Lebensraumvernetzung Österreich: Grundlagen – Aktionsfelder – Zusammenarbeit') and 'Habitat Networking for the Protection of Biodiversity' (Lebensraumvernetzung zur Absicherung der Biodiversität)

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between Austria and the Czech Republic (Frey-Roos et al, 2021). The action plan maps wild animal corridors of regional, trans-regional and international significance for red deer, elk, lynx, wolf and bear. It also considers the ecological corridor mapping for wild cats carried out in another project (Interreg MaGIClandscapes). Red deer are used as the umbrella species for the corridors. However, the maps are not publicly available and there is little evidence that spatial planners have used them to make legally binding restrictions on land in the corridors.

3.1.4. FUNDING

FUNDING FOR PROTECTED AREAS

The main funding source for protected area designation and management are the federal state budgets. The Austrian Federal Biodiversity Fund (partly state money, partly money from the EU Recovery and Resilience Facility) supports projects for the restoration and protection of endangered species and habitats with a special focus on habitat connectivity.

The Austrian Conference on Spatial Planning (ÖROK) is responsible for managing EU funding from the European Regional Development Fund and Interreg programmes and coordinating cross-border cooperation programmes. This funding can be used for protected area work or ecological connectivity projects. The EU Common Agricultural Policy (through EAFRD[47]) is the main funder for land management through the Austrian Programme for Environmentally Sound Agriculture (ÖPUL), which provides broad-based agricultural policy support measures for environmental policy and landscape planning, agri-environment schemes and Natura 2000 payments since 1995.

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

The European Regional Development Fund and Interreg programmes have been used for ecological connectivity projects across borders, such as the projects DaRe to Connect and SaveGREEN.

The Austrian Programme for Environmentally Sound Agriculture (ÖPUL) uses the Common Agricultural Policy (EAFRD) to fund measures for the maintenance of elements that provide ecological corridors on farmland (flower strips, trees, hedges, and other landscape elements). Funding is provided through multi-year contracts with individual farmers or resource managers.

In Lower Austria (Niederösterreich), the Lower Austrian Landscape Fund (LAFO) aims to preserve and restore an ecologically intact cultural landscape with a rich variety of native animals and plants, diverse landscape elements and environmentally friendly uses, considering the effects of climate change.

The state-owned road company ASFINAG funds green bridge planning and construction from their budget.

[47] European Agricultural Fund for Rural Development

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3.2. BOSNIA AND HERZEGOVINA

Nature protection is based in the law on nature protection updated in 2013 in the Federation of Bosnia and Herzegovina, the law on nature protection updated in 2014 in the Republic of Srpska, and the law on nature protection of the Brčko district. There is currently no unified state law addressing nature protection. Environmental laws in the regions are generally similar but with some differences related to the different governance systems. The country is in the process of making changes to its nature conservation law and policy on the way to EU integration.

Environmental responsibilities are distributed across central, regional, and local authorities.[48] The Council of Ministers (the main government body) has established the Directorate for European Integration as the main operational partner of the European Commission in the EU integration process. The Directorate facilitates a coordinated approach to integration into the European Union and international policies across the government and regions.

3.2.1. PROTECTED AREA NETWORK (TERRESTRIAL)

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

Table 3. National and regional designation types, protection purpose and governance in Bosnia and Herzegovina.
Sources: Law on Nature Protection. Official Gazette of the Federation of Bosnia and Herzegovina, no. 66/13. (Zakon o zaštiti prirode. Službene novine Federacije Bosne i Hercegovine, broj 66/13). Official Gazette of the Republic of Srpska No. 20/14.

Designation type	Protection purpose and governance
Strict Nature Reserve (Strogi rezervat prirode)	Area strictly protected for regionally, nationally or globally prominent ecosystems, species (individual or grouped) and/or geodiversity features, which are to be maintained mostly or completely without human activities and will be degraded or destroyed even with very low human pressures. Corresponds to IUCN category Ia. Visitation, uses and impacts are strictly controlled and limited in order to ensure the protection of natural values.
Wilderness Area (Područje divljine)	Protected area that is unchanged or very little changed, that has retained its natural character and influences, in which there are no permanent or significant human settlements. The primary purpose is the long-term protection of the ecological integrity of natural areas, which are not disturbed by significant human activities, without modern infrastructure, in which natural forces and processes are dominant. Corresponds to IUCN Category Ib.
National Park (Nacionalni park)	Large natural or almost natural areas, for the protection of ecological processes of a wider scale, and relevant species and ecosystems typical for the area, which represent the basis for spiritual, scientific, educational, recreational and touristic potential, compatible with the protection of cultural and natural inheritance. The primary purpose is the protection of natural diversity together with contained ecological structures and accompanying ecological processes while promoting education and recreation. Protection corresponds to IUCN Category II. There are four national parks: Sutjeska National Park (173 km^2), Kozara National Park (34 km^2), Drina National Park (63 km^2) in the Republic of Srpska and Una National Park (198 km^2) in the Federation of Bosnia and Herzegovina.[49]

[48] https://portal.cor.europa.eu/divisionpowers/Pages/Bosnia-Herzegovina-Environment.aspx

[49] https://en.wikipedia.org/wiki/List_of_protected_areas_of_Bosnia_and_Herzegovina

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Nature Park (Park prirode)	A nature park is a large natural or partially cultivated area of land and/or sea with ecological abundance of international, federal or cantonal importance, with an accentuated landscape, visual, cultural, historical and tourist values. Private and other activities are allowed in the nature park, which do not undermine its intrinsic qualities and role. The way of enjoying private activities and the use of natural goods in the nature park shall be governed by the nature protection regulations. Large natural or partially cultivated area with ecological characteristics of international, federal or regional importance with outstanding landscape, educational, cultural-historical and tourist-recreational values. Economic and other activities and actions that do not endanger its essential characteristics and role are allowed. Protection corresponds to IUCN category IIIa in the Federation and IUCN category V in the Republic of Srpska (Republic Institute for the Protection of Cultural Historical and Natural Heritage, 2023).
Monument to Nature and Natural Wealth (Spomenik prirode i prirodnih obilježja)	Area protected for specific natural features, such as special landforms, geological formations or habitats. Generally, these are smaller protected areas, often with high tourist potential. The primary purpose is to protect the specific natural features and their associated biodiversity and habitats. The protection corresponds to IUCN Category IIIb.
Habitat/Species Management Area (Područje upravljanja staništima/vrstama)	Area protected for individual species or habitats, which are a management priority. The primary objective is to maintain, preserve or recover species populations and/or habitats. Many protected areas of this category need regular interventions in order to fulfil the ecological requirements of certain species or to maintain the habitat. The protection corresponds to IUCN Category IV.
Protected Landscape (Zaštićeni pejzaž)	Area created through the interaction of people and nature over time, characterized by significant ecological, biological, cultural and aesthetic values. The primary objective is to protect and maintain important land, seascapes and nature with values created by the interaction of people and nature through traditional management practices. Preserving the interaction of people and nature is vital for the protection and sustainability of the area. The protection corresponds to IUCN Category Va.
Regional Park (Regionalni park)	Large natural or partially cultivated area with ecological features of international, federal or cantonal importance and landscape values typical for the area and its geographical location. Economic and other activities that do not endanger the essential characteristics and role of the area are permitted. The protection corresponds to IUCN Category Vb.
Protected area with sustainable use of natural resources (Zaštićena područja sa održivim korištenjem prirodnih resursa)	Area protected in order to preserve ecosystems and habitats along with associated cultural values and a system of traditional natural resource management. In general, these are large areas, with most of the land in a natural condition, and parts under sustainable management. Sustainable use of natural non-industrial resources is one of the main goals of management. The protection corresponds to IUCN Category VI.

Emerald Network / Natura 2000: No adopted sites, but 29 sites have been officially nominated as candidates for the Emerald Network covering a total area of 2504.5 km^2.[50] These sites will become Natura 2000 sites upon accession to the EU.

[50] CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE AND NATURAL HABITATS. Standing Committee 43rd meeting Strasbourg, 27 November - 1st December 2022. Updated list of officially nominated candidate Emerald Network sites (December 2023). https://rm.coe.int/draft-list-of-candidate-emerald-network-sites/1680ad54a2

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Total terrestrial protected area: 4.06% of the land area covered, 2082 km² in 65 protected areas[51]. The recent proposal for the Emerald Network / Natura 2000 will increase the protected area to about 18-19% of the territory (Šobot and Lukšič, 2019).

Overlaps and protection levels: In the Republic of Srpska, nearly 60% of the protected area is in protected landscapes, with landscape protection according to IUCN Category V, and 36% of the protected area in national parks (Republic Institute for the Protection of Cultural Historical and Natural Heritage, 2023).

OECM: not yet implemented.

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

In the **Federation of Bosnia and Herzegovina**, the ten regional cantonal governments have established public institutions for the management of protected areas and protected natural resources[52] as part of the EU integration process (Šobot and Lukšič, 2019).

In the **Republic of Srpska**, the Republic Institute for the Protection of Cultural, Historical and Natural Heritage is responsible for protected areas. The Republic has 34 protected areas covering 730 km^2, consisting of two strictly protected nature reserves, three national parks, 17 natural monuments, three protected habitats, six nature parks and three areas with sustainable use of natural resources (Republic Institute for the Protection of Cultural Historical and Natural Heritage, 2023). Designation has progressed from two sites in 2007 to 34 in 2023, with the area more than doubling between 2019 and 2022[53]. In 2023, a new natural monument was submitted to the declaration procedure, and the study for the declaration of a new protected habitat area is being carried out. Initiatives were also launched to establish protected areas in Gacko and Pale Municipalities. The Society for Biodiversity Research carried out research for the protection of locations in the municipality of Modriča, and the Center for the Environment did the same for the forests around the City of Banja Luka. In the municipality of Višegrad, the citizens association 'Ekocentar' launched an initiative to protect the canyon of the Rzav River.

The Directorate for European Integration is in the process of establishing the **Natura 2000 network** (Šobot and Lukšič, 2019). The country has officially nominated 29 sites as candidates to the Emerald Network under the Bern Convention[54]; if these are all adopted, the total protected area coverage will increase from 4% to 18% of the land area (Šobot and Lukšič, 2019).

The law specifies that **management plans** are to be adopted for a period of 10 years (or less if there are justified reasons). In the Republic of Srpska, 18 of the 34 protected areas have management plans or programmes in place, with two adopted in 2023 (Republic Institute for the Protection of Cultural Historical and Natural Heritage, 2023). The national parks are managed by a director and board appointed by the ministry. They are expected to integrate the designation of Emerald Network / Natura 2000 sites into their management plans (Šobot and Lukšič, 2019). The Una National Park (198 km²) designated in 2008 is designed as a Natura 2000 area.

[51] https://www.protectedplanet.net/country/BIH

[52] Law on Nature Protection, 151.

[53] Figure 2 in (Republic Institute for the Protection of Cultural Historical and Natural Heritage, 2023)

[54] CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE AND NATURAL HABITATS. Standing Committee 43rd meeting Strasbourg, 27 November - 1st December 2022. Updated list of officially nominated candidate Emerald Network sites (December 2023). https://rm.coe.int/draft-list-of-candidate-emerald-network-sites/1680ad54a2

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Protected area managers are required to submit an annual report on the content, determination and method of implementation of management measures. Management activities should be documented in the Register of Protected Natural Resources and subjected to an expert opinion. In 2022, 18 of the 31 areas that were required to report in that period in the Republic of Srpska did so, whereas in 2021, 26 of 28 submitted a report. The institute proposed a revised format for annual reporting to get better data on the management of protected areas. In 2022, the protected area managers in the Republic of Srpska reported the lack of financing as the dominant problem in the implementation of management measures, followed by the absence of a security service, and insufficient training of personnel (Republic Institute for the Protection of Cultural Historical and Natural Heritage, 2023). About a quarter of the protected areas had almost no management activities and other activities resulting from the act on protection. The national and nature parks and those in urban areas report most activity. Monitoring of natural resources was carried out in three protected areas (one national park and two nature monuments), but the planned monitoring in one national park was not completed due to a park staff strike.

The Republic of Srpska is updating its Nature Protection Information System Protected Areas module. In future it will be necessary to increase the level of quality and accuracy of the scope boundaries, to fully comply with the law. There is a need for a developed country-wide information and reporting system for protected areas (Šobot and Lukšič, 2019).

3.2.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

There is no legal framework for the protection of ecological connectivity. The Federal Environmental Strategy for 2022-2032[55], which sets priorities and measures to improve the environment, mitigate and adapt to climate change, and ensure compliance with EU regulations, seeks to integrate and protect natural habitats and ecosystems and ecological connectivity. It was developed with participation from a wide range of stakeholders including public sector representatives, academicians, civil society organizations, and the private sector[56].

There are major concerns regarding the rising number of hydroelectric power plants, as more than 300 such plants are planned, which could result in all the country's rivers being used for energy generation[57]. The Aarhus Convention right to access to justice was used for the first time in a court case opposing the construction of mini-hydro-electric plants in the Sutjeska National Park[58].

3.2.3. SPATIAL PLANNING

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

In the Republic of Srpska, protected areas must adopt a zoning plan in accordance with the regulations governing spatial planning and construction. Only one of the four national parks and one national monument have such valid spatial plans; a plan for the Sutjeska National Park was drawn up in the proposal phase, but it did not pass the adoption procedure in the

[55] https://esap.ba/the-fbih-government-adopted-the-federal-environmental-strategy-for-2022-2032/

[56] https://www.sei.org/features/sei-supported-bih-in-developing-environmental-strategy/

[57] https://riverwatch.eu/en/balkanrivers/news/new-report-hydropower-tsunami-balkans

[58] OSCE (2020) Aarhus Centres in Bosnia and Herzegowina. Organization for Security and Cooperation in Europe Mission to Bosnia and Herzegowina. https://www.osce.org/files/f/documents/f/4/445741.pdf

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National Assembly of the Republic of Srpska (Republic Institute for the Protection of Cultural Historical and Natural Heritage, 2023).
No information on spatial planning in the area of the Federation is available.

3.2.4. FUNDING

FUNDING FOR PROTECTED AREAS

Protected area managers report the lack of financing as the dominant problem in the implementation of management measures (Republic Institute for the Protection of Cultural Historical and Natural Heritage, 2023). The main source of funding for both the protected area network and for ecological corridors and connectivity in the past decade has come from the Global Environment Facility (GEF), with a United Nations Environment Programme (UNEP) project from 2016 to 2021 followed by a United Nations Development Programme (UNDP) project from 2022 to 2027:

- **GEF Sustainability of Protected Areas Project** (2022 - 2027)[59]: This UNDP project addresses the need for enhanced protection of biodiversity and ecosystem diversity in the face of increasing environmental threats. It aims to create and update management plans in 10 pilot protected areas with the findings of a comprehensive climate threat assessment. It will also develop an eco-tourism concession model and sustainable tourism products. The SPA project is funded by the GEF with a budget of USD 2.79 million. It has a comprehensive approach involving different stakeholders, including national ministries and environmental funds.
- **Biodiversity Conservation through GEF** (2016 - 2021)[60]: This UNEP project sought to build effective management capacities for biodiversity conservation in protected areas, to support the expansion of the protected area system and to address pressures from construction, deforestation, and urban expansion. The project was executed by the Federal Ministry of Environment and Tourism and the Ministry of Spatial Planning, Construction and Ecology of Republika Srpska. It was funded by GEF and co-financiers including the Federal Ministry of Environment and Tourism. The project has established special training programs for managers of protected areas[61], which provide insights into funding opportunities, project application processes, and the development of sustainable tourism in protected areas. The trainings aim to promote the preservation and enhancement of these areas through improved management and funding strategies.

A series of EU, NGO and internationally funded projects have supported the development of the Natura 2000 network and the nature protection system since 2007, for example, a project to protect the Sava River floodplains, and cross-border cooperation between Bosnia and Herzegovina and Serbia to protect the river Drina, involving the establishment of Natura 2000 areas (Šobot and Lukšič, 2019).

[59] https://www.undp.org/bosnia-herzegovina/projects/spa-project and https://www.undp.org/bosnia-herzegovina/press-releases/beginning-new-undp-project-support-sustainability-protected-areas-bih

[60] https://www.thegef.org/projects-operations/projects/6990 and https://www.unep.org/regions/europe/our-projects/paving-new-paths-biodiversity-conservation

[61] https://www.undp.org/bosnia-herzegovina/press-releases/training-managers-protected-areas-grant-support-nature-protection-and-tourism-development

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FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

There is no government funding available specifically for ecological corridors or connectivity. The Global Environment Facility (GEF) funding promotes some aspects of ecological connectivity.

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NATURA CONNECT

3.3. BULGARIA

3.3.1. PROTECTED AREA NETWORK (TERRESTRIAL)

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

Table 4. National and regional designation types, protection purpose and governance in Bulgaria. Source: (Barov, 2023).

Designation type	Protection purpose and governance
Reserves (IUCN category I)	Representative areas of natural ecosystems, including characteristic and/or remarkable wild plant and animal species, as well as their habitats. They are exclusively state owned and have strict protection regimes that typically only allow access to visitors on designated paths, and fire prevention activities.
National Parks (IUCN category II)	Preserve complexes of self-regulating ecosystems and their inherent species diversity, habitats of rare and endangered species and communities, characteristic and remarkable landscapes and inanimate objects that are of global importance for science and culture. They must be larger than 1 000 ha and have no human settlements; they are exclusively state property. In accordance with their goal of preserving natural processes, forest and water management is limited and tightly regulated.
Natural Phenomena (IUCN category III)	Characteristic or remarkable objects of inanimate and living nature that are small and/or occupy a single site (e.g. caves, canyons and waterfalls are typically designated under this category).
Managed (maintained) Reserves (IUCN category IV)	Preserve ecosystems including rare and/or endangered wild plant and animal species, as well as their habitats, that require some form of regular maintenance, management or restoration activities, e.g. maintenance of the water regime, traditional salt production or forest restoration activities.
Nature Parks (IUCN Category IV or V)	Large areas with diverse ecosystems, plants and animals and their habitats, characteristic remarkable landscapes, and natural and semi-natural areas shaped by traditional human activities. Nature Parks have rather weak protection regimes, seeking a balance between the protection of natural resources and economic development.
Protected Localities (IUCN category IV and/or V)	Localities that contain characteristic or remarkable landscapes and habitats of endangered, rare or vulnerable plant and animal species and communities. They are small, and their management regimes are focussed on the specific needs of the target species or habitats.

Natura 2000 network: With 194 designated SACs by November 2023, Bulgaria is close to completing the designation of its SCIs as SACs, albeit significantly behind schedule[62].

Total terrestrial protected area: Bulgaria legally protects 34.9% of its terrestrial and marine areas including Natura 2000 and other nationally designated protected areas[63]. The designation of the Natura 2000 network has increased the area of land under legal protection in Bulgaria by seven times, as the nationally protected areas covered only 5.1% of the country before Bulgaria started designating its Natura network (Barov, 2023).

[62] COMMISSION STAFF WORKING DOCUMENT Environmental Implementation Review 2022. COM(2022)438. Country Report - BULGARIA https://ec.europa.eu/transparency/documents-register/detail?ref=COM(2022)438&lang=en

[63] personal communication WWF Bulgaria

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Overlaps and protection levels: Domestic protected areas and Natura 2000 sites overlap almost completely with the Natura network, with only a small percentage of national protected areas not designated as Natura (Barov, 2023). This does not include the State Game Husbandries (which are not regarded as protected areas).

OECM: Forests can be designated as State Game Husbandries under the forestry and hunting laws, in which commercial forestry is excluded; but they do not have the status of protected areas (Barov, 2023). In 2016, the Ministry of Agriculture and Food designated 109 000 ha of old growth forests in forests owned by the state, where logging is not allowed except in very specific cases. There is a process of designating municipally owned old-growth forests. Sanitary zones established for the protection of drinking water sources also can potentially contribute to the establishment of OECMs.

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

The Protected Areas Act (SG No. 133/1998[64]) defines six categories of national protected areas based on, but not fully identical to, the six IUCN protected areas management categories, and regulates the ownership of protected areas (Barov, 2023). The Biological Diversity Act of 2002 added a provision for special protected areas, which allows for the designation of Natura 2000 sites (SPA and SCI/SAC). National Parks and Reserves are exclusive state property in accordance with the Constitution and any use of territory within them can only be made through an economic concession. The Protected Area Act regulates the general regimes of designation as protection, management and use and describes the responsibilities to the respective authorities. The ministry of the environment and water (MoEW) has the overall responsibility, and the National Nature Protection Service within the ministry is responsible for the protection and management of biodiversity, protected areas and the Natura 2000 network.

Management plans are obligatory for National Parks, Nature Parks, Managed Reserves and Reserves, and optional for Protected Sites and Natural Monuments since 1998. The management plans are valid for 10 years, while short-term annual activity plans and budgets are approved each year.

Although Bulgaria has designated its Natura 2000 network, it has established site-specific conservation objectives for only some of its Natura 2000 sites. Work on setting conservation objectives started only at the end of 2021 and work on the conservation measures has yet to begin. The European Commission has referred the case to the European Court of Justice (ECJ)[65].

Since 2018, the MoEW has promoted a new approach to Natura 2000 management using a project funded by the EU cohesion funds (Barov, 2023). The ministry aims to establish a new management system, to increase institutional capacity, to decentralise management responsibilities and to increase the involvement of local communities through a two-tier governance model, setting up national and regional network management authorities. Stakeholder involvement is to be promoted through a national Natura 2000 advisory board and stakeholder committees at the regional level. Management planning for Natura 2000 is to become mandatory and a four-level approach to setting conservation objectives developed: at the biogeographical level (for habitats and species under the EU Habitats Directive) or national level (birds), at the network level, at site level and at specific localities. A national document incorporating the Natura 2000 conservation objectives and 28 regional management plans (corresponding to the 28 administrative regions) is also to be developed.

[64] Protected Areas Act (SG 133/1998)

[65] European Commission press release November 2021 Nature: Commission refers BULGARIA to the Court of Justice of the European Union for failing to protect and manage its Natura 2000 sites. https://ec.europa.eu/commission/presscorner/detail/en/ip_21_5351

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The legal framework for this new approach has not yet been agreed. In 2023, the concept changed: the 16 management plans (titled territorial plans in the law) are developed by the Regional Inspectorates of the Environment and Water (REIW); regional management bodies were established within each REIW. This approach was criticised by the nature conservation community because management plans will cover only the parts of Natura 2000 sites falling within the administrative boundaries of the REIWs. The consequence of this is that some sites will be managed with two or more management plans, with the most extreme example being the site Central Balkan Buffer, which will fall within five management plans because parts of it fall within five different REIWs. The exception here is Natura 2000 sites that are within national parks, where the management body is the national park directorate, and the management plan is for the whole Natura 2000 site. The other exception is marine Natura 2000 sites, which will all fall within the Black Sea management plan. These amendments were adopted in September 2023.

3.3.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

There are no officially mapped and approved or recognized ecological corridors in Bulgaria (Borlea et al, 2022). There are no engineering requirements and formal by-law standards for the construction and planning of defragmentation facilities to ensure the passage of wild animals. The Spatial Development Act (Jan 2001, amend. SG. 49/13 Jun 2014) contains some small provisions for the protection of the green system on the territory of municipalities.

National Ecological Network: The Law on Biological Diversity (2002) establishes the concept of a National Ecological Network including all national protected areas and Natura 2000 sites (Borlea et al, 2022). It has a provision to ensure connections between the Natura 2000 sites in the development plans, regional plans for the development of forest territories, forestry plans and programs, national and regional programs. It is intended that these include measures and activities for the protection of landscape features that, by virtue of their linear and continuous structure or connectivity function, are significant for migration, geographic distribution and genetic exchange in plant and animal populations and species. These principal features of the landscape are defined as rivers and riverbanks and water-logged old riverbeds, natural marshes, lakes, wet meadows and other wetlands, caves, rock edges, faces and dunes, valleys and other natural landforms linking separate mountains, field boundary markings, forest shelter belts, dry meadows and pastures, flood plains and riverside vegetation, and forests located at an altitude not exceeding 500 m above sea level.

Some designations of Natura 2000 sites include designation of ecological corridors or parts of them. Some of the Natura 2000 sites are designated because of their role as stepping stones. An example of such a designation is the Verila SCI, BG0000308 which protects most of the Verila Mountain that links Vitosha and Rila Mountains. This legal provision[66], however, is not linked with any control or regulatory mechanism in the law, and therefore is mainly disregarded in practice.[67]

The **National Action Plan for Conservation of Wetlands of High Significance in Bulgaria** (2013–2022) set protection, maintenance and restoration priorities as well as horizontal measures for the conservation and sustainable use of wetlands. The plan defined measures for spatial and functional re-connection of wetland habitats in line with the green infrastructure concept.

[66] Art. 30 of the Biodiversity Act, which transposes Art.10 of the Habitats Directive

[67] Personal communication with WWF-BG

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3.3.3. SPATIAL PLANNING

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

- The Water Act sets out objectives and measures for rivers (which we can consider as one type of ecological corridors).
- The secondary legislation for the Forest Act has a Regulation which bans logging within 15 meters along rivers in forest areas.
- The Bulgarian CAP Plan includes an ecoscheme aimed at preserving landscape elements.

There are no other instruments for integrating green infrastructure into spatial planning.

3.3.4. FUNDING

FUNDING FOR PROTECTED AREAS

The main financial sources for nature conservation in Bulgaria are the state budget, government funds established under the Environmental Protection Act and the Forestry Act, several international and bilateral donor programmes (1990–2000), pre-accession aid in the early 2000s. and EU funds since accession in 2007 (Barov, 2023). EU funding is now by far the biggest contributor.

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

There is no specific direct funding for ecological corridors. The Environment Programme 2021 – 2027, funded by the European Regional Development Fund, has an option to provide funding for the development of Natura 2000 management plans, measures for achieving favourable conservation status of species and habitat types including wetlands restoration, restoration of hydrological regimes etc.

The Bulgarian Strategic CAP plan includes an eco-scheme titled 'Eco scheme for maintaining and improving biodiversity and ecological infrastructure' approved with a budget of EUR 160 million. However, in December 2023, the Ministry of Agriculture and Food initiated a procedure for amending the CAP plan reducing the funding of the eco-scheme by more than EUR 120 million.

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3.4. CROATIA

3.4.1. PROTECTED AREA NETWORK (TERRESTRIAL)

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

The Nature Protection Act of the Republic of Croatia, which entered into force in July 2013, defines nine categories of protection: strict reserve, national park, special reserve, nature park, regional park, natural monument, significant landscape, park-forest and monument of park architecture. The Act distinguishes between protected areas of national significance and protected areas of local significance.

Table 5. National and regional designation types, protection purpose and governance in Croatia. Sources: (Underwood et al, 2014) and (Radović, 2023) and (MINGOR, 2023).

Designation type	Protection purpose and governance
National Park (nacionalni park)	Large, predominantly unchanged areas of land and/or sea, with exceptional and multiple natural values, covering one or more conserved or slightly changed ecosystems. These have scientific, cultural, educational and recreational purposes. While national parks are generally identifiable with IUCN Category II, in reality some may more closely resemble special reserves due to the high percentage of actively managed semi-natural habitats such as species-rich grasslands maintained through grazing. Visitors must keep to certain zones and on marked paths and may have to pay for a permit to visit. Managed by park authority set up and at least partially funded by the state. Has to have management plan that has management objectives, activities necessary to achieve the objectives and the indicators needed to assess progress (Nature Protection Act 2008). Corresponds to IUCN Category II according to (MINGOR, 2023)
Strict nature reserve (strogi rezervat)	Areas of land and/or sea with unmodified or slightly modified nature, dedicated to the conservation of untouched natural areas, scientific research and monitoring of nature and education activities which do not disturb or interrupt the natural processes. Visitors must keep to certain zones and on marked paths. Has to have management plan that has management objectives, activities necessary to achieve the objectives and the indicators needed to assess progress (Nature Protection Act 2008). Designated by the government but managed by the county. Corresponds to IUCN Category Ia.
Special Reserve (posebni rezervat)	Protection of habitats of special importance (e.g. endangered habitats; habitats of endangered species). Visitors must keep to certain zones and on marked paths. Has to have management plan that has management objectives, activities necessary to achieve the objectives and the indicators needed to assess progress (Nature Protection Act 2008). Designated by the government but managed by the county. Corresponds to IUCN Category IV.
Nature Park (park prirode)	Protection of a large natural or semi-natural area with high biodiversity or geo-diversity, and characterised by significant landscape, educational, cultural and historical values. Economic uses are allowed if they do not threaten the key characteristics and roles of the site. Managed by park authority set up and at least partially funded by the state. Corresponds to IUCN Category V.
Regional Park (regionalni park)	Large natural or partly cultivated areas of land and/or sea with ecological characteristics of international, national or local importance, with landscape values characteristic of the region in which it is situated. Has to have management plan that has management objectives, activities necessary to achieve the objectives and the indicators needed to assess progress (Nature Protection Act 2008). Corresponds to IUCN Category V.

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Natural Monument (spomenik prirode)	Small strongly protected areas focussed on a particular natural feature, i.e. an individual unchanged part, or group of parts, of living or not-living nature with ecological, scientific, aesthetic or educational value. Many are smaller than 1 ha in size. Corresponds to IUCN Category III.
Significant Landscape (značajni krajobraz)	Natural or cultivated area of high landscape value and high biological diversity; or with cultural and historic values or landscape with preserved features characteristic for specific region, dedicated to leisure and recreation; or especially valuable landscapes as identified according to the Nature Conservation Law. Has to have management plan that has management objectives, activities necessary to achieve the objectives and the indicators needed to assess progress (Nature Protection Act 2008). Corresponds to IUCN Category V.

Natura 2000 network: There are 745 SCIs covering 23.72% of the total land and sea area and 38 SPAs covering 20.55%. Overall, in 2022 the network covered 36.7% of the land area (Radović, 2023).

Total terrestrial protected area: 38.1% (BISE[68]).

Overlaps and protection levels: Around 26% of Natura 2000 is protected under one of the nine categories of domestic protected areas, while 87% of all domestic protected areas are included in Natura 2000 (those which satisfied scientific criteria according to the Nature Directives) (Radović, 2023).

OECMs: OECMs are being identified and know-how is being built for use in the future, both for terrestrial and marine habitats (see below).

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

The Ministry of Economy and Sustainable Development and the administrative bodies of the regional self-government units (county offices) are responsible for nature protection. Public institutions, founded by the Republic of Croatia, are responsible for the management of national parks and nature parks and for the management of other protected areas and/or parts of nature whose founders are regional and local self-government units.

Legal ordinances for each site prescribe detailed rules for the protection, conservation, improvement and use of National Parks, Nature Parks, Strict Reserves and Special Reserves, enacted by the competent minister. County authorities have the power to pass ordinances with similar rules for other categories of protected area. The State has a right to expropriate, or restrict the use of, private real estate (typically land or sometimes buildings) if it is necessary for the conservation of protected parts of nature (Radović, 2023). Landowners can offer their land for sale to the state or the county or get it exchanged for equally valuable real estate. In a National Park, Strict Reserve or Special Reserve, the land must be offered to the State in the first instance, then to the respective county and finally to the local community.

All nine categories of protected areas are supposed to have adopted management plans, while for National Parks and Nature Parks spatial plans are also obligatory, adopted by the Croatian Parliament. The plans are based on expert studies and define zones according to conservation objectives and levels of use. There is a legal option to confer the care of protected areas, including Natura 2000 sites, or parts thereof, to the landowner or rights holder, or even to another person or organisation (e.g. NGO), by signing a care contract, following a public

[68] https://biodiversity.europa.eu/countries/croatia

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tender. However, the county authorities have not used this mechanism, despite their low capacities (Radović, 2023).

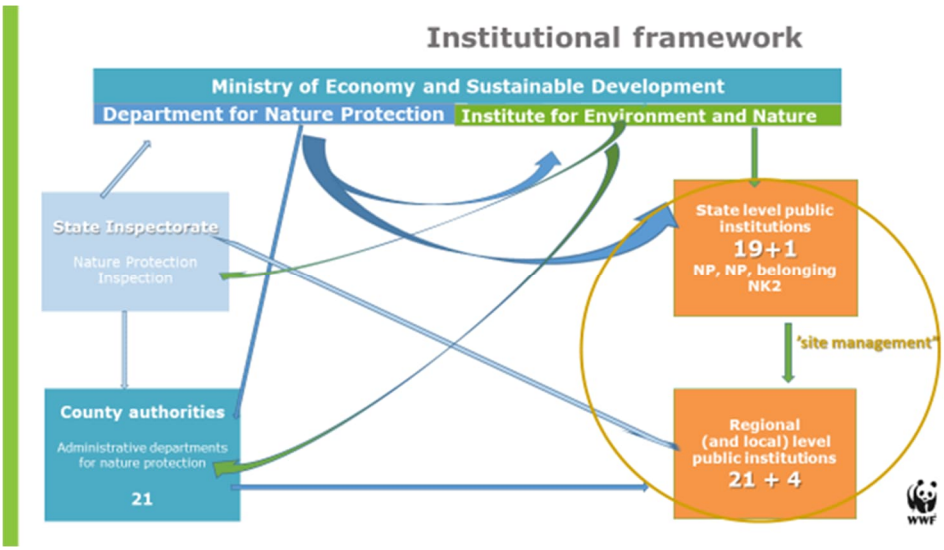

Figure 1. Institutional framework for nature conservation in Croatia, WWF Adria.

The Implementation Programme of the Ministry of Economy and Sustainable Development for the period 2021 – 2024[69] includes a measure for '*Ensuring Preconditions for Establishing a Representative and Functional Network of Areas Significant for Nature Conservation and Their Efficient Management*', which mentions the use of Other Effective Conservation Measures (OECMs). It does not, however, specify what types of areas will be considered as OECMs in Croatia.

The Croatian Agency for Nature and Environment Protection has developed a training module (MINGOR, 2023) in which participants learn to understand the definition of protected areas, categories, and types of management as defined by the IUCN standards, acquire the necessary knowledge to categorize protected areas according to the IUCN system (including areas within the ecological network), understand the difference between protected areas and OECMs, and understand the purpose and possibilities of using the IUCN standard.

3.4.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

The need for ecological connectivity varies across Croatia. Because of the density of the protected area network in Croatia, a recent author (Radović, 2023) concluded that '*overall, national protected areas and Natura 2000 comprise a functionally connected network because Natura sites are large and close to each other, or even border each other, especially in the Alpine and Mediterranean biogeographical regions. In the Continental region, which contains more densely populated and agricultural areas, the network could benefit from additional sites or corridors created through various types of green infrastructure'.*

[69] PROVEDBENI PROGRAM MINISTARSTVA GOSPODARSTVA I ODRŽIVOG RAZVOJA za razdoblje 2021. – 2024. Godine. https://mingor.gov.hr/UserDocsImages/GLAVNO%20TAJNI%C5%A0TVO/Strategija,%20planovi%20i%20ostali%20dokumenti/PROVEDBENI%20PROGRAM%20MINGOR-IZMJENE%20I%20DOPUNE-tekstualni%20dio.pdf

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LEGAL AND GOVERNANCE MECHANISMS

Croatia does not have an ecological network legislation or strategy. Some aspects of the following sectoral policies address ecological connectivity or green infrastructure directly or indirectly:

Water: Croatian Waters is responsible for the management of water bodies, which are public property. The annual maintenance plans of water bodies include nature protection requirements.

Forestry: Croatian Forests is responsible for management of state-owned forests, including forested Natura 2000 sites, which make up 81% of the forest area. It is not clear if the Croatian forest policy promotes ecological connectivity.

Transport: The Ordinance on Wildlife Crossings (based in the NPA) requires the construction of special crossings over highways ('green bridges') that connect fragmented habitats and reduce the number of animals killed by traffic. This is an important legal measure for large carnivores, and some other species that are threatened by the development of transport infrastructure (Radović, 2023). The locations in which they are required are based on EIAs and their maintenance needs are defined in the Ordinance. Regular monitoring indicates that the bridges are effective in enabling animals to cross the roads.[70]

Agriculture: Croatia has a landscape with high nature value in semi-natural grasslands and small-scale cropland mosaics, rich with hedges and tree lines (Radović, 2023). However, they are threatened due to the disappearance of traditional agricultural practices in areas being abandoned, or agricultural improvements and intensification in others. The Common Agricultural Policy Strategic Plan has designated all grasslands in Natura 2000 sites as Environmentally Sensitive Permanent Grasslands (ESPG), meaning that farmers receiving CAP payments cannot plough them and convert them. This is a significant ecological connectivity measure in Croatia as these grasslands make up a large part of the farmland area.

3.4.3. SPATIAL PLANNING

The spatial planning system is currently being changed. The State Spatial Development Plan of Croatia is being prepared, and after its adoption, the counties must create new county plans, followed by municipalities and cities. All the new plans will need to have SEAs that assess potential impacts on the Natura 2000 network. This could result in nature protection requirements being inserted into sectoral management plans and spatial plans.

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

The Nature Protection Information System includes publicly available data through a web GIS-based Bioportal. A new Map of Terrestrial Non-Forest Habitats was produced at the scale 1:25 000 in 2016.

3.4.4. FUNDING

FUNDING FOR PROTECTED AREAS

The main funding mechanisms for protected areas are the state budget, county, city or municipality budgets. The Nature Protection Act also provides for income from the use of protected parts of nature, income from compensatory benefits and other established sources,

[70] OIKON Laboratory for Monitoring and Research of Large Carnivores and Ecology of Vertebrates. https://oikon.hr/our-departments/laboratory-for-research-and-monitoring-of-large-carnivores/

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and Croatian national parks charge an entry fee. The development of tourism in Croatia has increased the number of visitors to national parks and nature parks, and this increase in income enables the allocation of a significant part of these funds for nature protection activities. National and nature parks use these funds for building infrastructure, research, monitoring, etc.

The CAP plan in the previous and current period offers a series of agri-environment measures for maintaining grassland and landscape features, but the uptake by farmers is very low (Radović, 2023). The Natura 2000 payments would reach more farmers but cannot currently be used because of the lack of conservation objectives and measures for the Natura 2000 sites.

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

Apart from projects funded by the EU Funds (ERDF, Interreg cross-border cooperation programmes, LIFE, etc.), there is no national fund earmarked for working on ecological connectivity.

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3.5. CZECH REPUBLIC

3.5.1. PROTECTED AREA NETWORK (TERRESTRIAL)

The Czech protected areas network is made up of the Natura 2000 network and protected areas designated based on national criteria (called specially protected areas, not to be confused with the sites designated based on the Birds Directive) – national parks, protected landscape areas, national nature reserves, nature reserves, national natural monuments, and natural monuments.

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

Table 6. National and regional designation types, protection purpose and governance in the Czech Republic. Sources: (Knižátková and Havel, 2022), (Underwood et al, 2014), CDDA database[71]

Designation type	Protection purpose and governance
National Park	Extensive territories that are considered nationally or internationally unique, a considerable part of which consist of natural ecosystems or ecosystems little affected by human activities, in which plants, animals and inanimate nature are of exceptional scientific and educational significance (Art 15 of the Act on the Conservation of Nature and Landscape). Nature conservation authorities are required to propose and approve a management plan. Zoning is mandatory including a core area under strict protection.
Protected Landscape Area	These areas are defined as extensive territories having a harmoniously formed landscape, with a characteristic relief, a significant proportion of which consist of natural forest or grassland ecosystems, or with preserved monuments of historical settlement (Art 25 of the Act on the Conservation of Nature and Landscape). Although the designation has purposes that go beyond biodiversity conservation, the preservation of 'natural values' is one of the key aims. Nature conservation authorities are required to propose and approve a management plan. Recreational use is admissible, provided it does not damage the natural values of the area.
National Nature Reserve	These protected areas are defined as smaller territories of exceptional natural value, where the natural landscape, together with a typical geological structure, forms ecosystems which are unique and significant on a national or international scale (Art 28 of the Act on the Conservation of Nature and Landscape). Management Plans which detail proposed conservation measures (and which must therefore set out conservation goals) must be prepared for each site and approved by the national nature conservation authority (under Sec. 38 of the Nature Protection Act). Must include a 50m protective zone around the area.
Nature Reserve	Nature Reserve designated by regional authorities for its regional or local significance (Art 33 of the Act on the Conservation of Nature and Landscape). Includes 50m protective zone around area.
National Nature Monument	Smaller 'natural formations' can be designated as National Nature Monuments, in particular geological or geomorphologic formations, mineral deposits, or rare and endangered species in fragments of ecosystems that are of national or international environmental, scientific or aesthetic significance (Art 35). Management Plans which detail proposed conservation measures (and which must therefore set out conservation goals) must be prepared for each site and approved by the national nature conservation authority (under Sec. 38 of the Nature Protection Act). Alteration or damage strictly prohibited. Includes 50 m protective zone around area.
Nature Monument	Designated by regional authorities for their regional or local significance Art 36 of the Act on the Conservation of Nature and Landscape). Includes 50 m protective zone around area.

[71] https://dd.eionet.europa.eu › datasets › latest › CDDA

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Significant Landscape Element (VKP)	Includes certain habitats protected by law (ponds, lakes, water courses, peatlands, valley floodplains, forests) from harm and destruction. They shall only be used in a way that does not disturb their restoration and does not endanger or weaken their stabilizing function. There is no central registration of such elements, and they are not regarded as protected areas.
Contractually protected area	New instrument (introduced in 2006), still used almost exclusively for Natura 2000 sites - but could be applied in the non-protected landscape.

Natura 2000 network: 41 SPAs, 1113 SCIs.

Total terrestrial protected area: 21.9% of land area (BISE[72]).

Overlaps and protection levels: Slightly more than a third of the protected area network is designated exclusively under national laws; 44% consists of Natura 2000 sites; 35.4% is areas where Natura 2000 sites overlap with national designations (35.4%) (BISE[73]). Natura 2000 sites often overlap with the national parks and protected landscape areas. In some cases, the national protected area designations play a vital role in ensuring the protection regime of Natura 2000 sites (both in terms of legal limits as well as management planning and implementation).

OECMs: the concept has not been explored or systematically promoted in Czechia. Two legal tools might be used for OECMs: the significant landscape elements (VKP) and the Territorial System of Ecological Stability (TSES) (see below for description). These are both nature conservation tools that do not involve the designation of specific areas but have potential to ensure the connectivity of protected areas. However, they do not meet the OECM criteria on their own as they do not set specific conservation objectives and measures or ensure effective management and monitoring of the biodiversity in the areas.

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

Designation and management of protected areas: The four national parks have their own administration body. The protected landscape areas (PLA) are managed by the Nature Conservation Agency of the Czech Republic. Regional departments (PLA Administrations) of the Nature Conservation Agency or regional authorities are responsible for the smaller protected areas and Natura 2000 sites which do not overlap with the large, protected area designations. PLA administrations are responsible for those sites that fall within protected landscape areas; and PLA administrations are also often responsible for reserves/monuments in the national category even though they are outside the PLAs, and for some Natura 2000 sites outside the PLAs.

Designation of buffer zones: If a Specially Protected Area is under threat from 'disturbing influences' from its surroundings, a protective zone may be proclaimed for this area, where it is possible to specify actions that require prior approval from nature conservation authorities. National Nature Reserves, National Nature Monuments, Nature Reserves and Nature Monuments automatically have a protective zone which extends 50 m from the border of the protected area (defined in the Nature Protection Act Sec 37).

3.5.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

The Territorial System of Ecological Stability of the Landscape (TSES) constitutes an ecological network in the landscape in the Czech Republic. The legislation defines the TSES as a continuous network of areas with relatively high ecological stability (biocenters and

[72] https://biodiversity.europa.eu/countries/czechia

[73] https://biodiversity.europa.eu/countries/czechia

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biocorridors) for the purpose of preserving or restoring the biological diversity of the landscape and supporting the surrounding less ecologically stable parts of the landscape. The TSES consists of three basic elements – biocentres, bio-corridors and interactive elements. A biocentre is a habitat or a system of habitats which by its state and size enables permanent existence of a natural or modified, but semi-natural ecosystem. Biocentres are divided into existing and planned. A bio-corridor (biotic dispersal & migration corridors) is an area which does not enable permanent long-term existence of the critical part of organisms, but it facilitates their migration and/or dispersal between biocentres: thus, it makes a real interconnected network from isolated biocentres. The third component of TSES are interactive elements, small areas/patches/plots (often spatially isolated) that provide favourable conditions for some plants and animals significantly affecting the functioning of ecosystems in the cultural landscape.

The TSES is defined at three interconnected levels – supra-regional, regional and local. There is a dense network of local corridors (of approx. 1 km) linking local biocentres (1 to 3 hectares). The function of regional biocentres is to preserve the sub-national biodiversity. At the regional level, corridors have a width ranging from 20 to 50 metres, and a length ranging from 300 to 1000 metres. The supra-regional level includes biocentres with an area of more than 1000 hectares (Görner and Kosejk, 2011).

The habitat of specially protected large mammal species (lynx, bear, wolf and elk) was mapped in the ConnectGREEN project, as TSES does not focus on large carnivores which need large territories for migration (ConnectGREEN, 2021). This document has been integrated into the implementing regulation of the Construction Act since 2020.[74] This map level is therefore now a binding basis for all levels of land use plans.[75] A methodology for the protection of the biotope of specially protected species in spatial planning[76] was published in 2021 (Hlaváč et al, 2021). However, there has been no consultation with affected landowners or other stakeholders.

[74] Regulation 500/2006 Coll. on territorial analytical documents, 36B

[75] Action plan for habitat connectivity and linking wildlife corridors between the Czech Republic and Austria, ConnectingNature AT-CZ project. Interreg AT-CZ 2014-2020. https://2014-2020.at-cz.eu/at/ibox/pa-2-umwelt-und-ressourcen/atcz45_connat-at_cz

[76] Ochrana biotopu vybraných zvláště chráněných druhů v územním plánování

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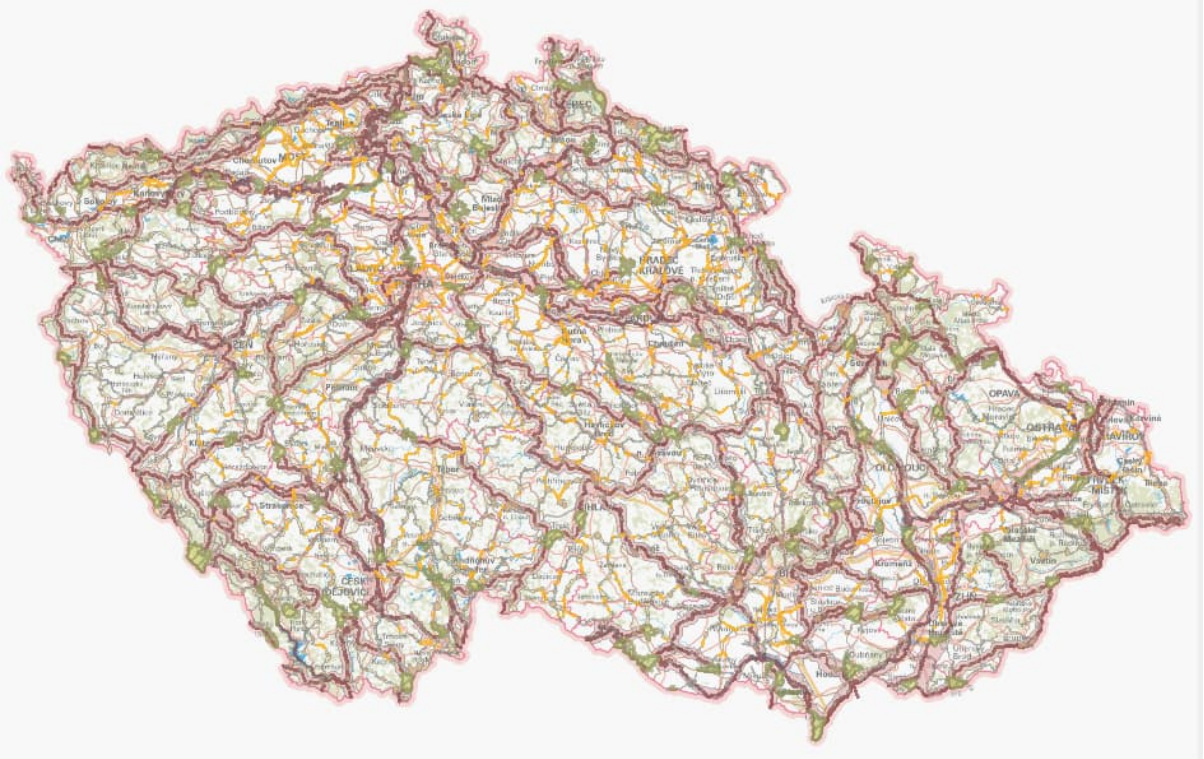

Figure 2. Territorial System of Ecological Stability (TSES) in the Czech Republic.
Source:
https://aopkcr.maps.arcgis.com/apps/webappviewer/index.html?id=399328f6b35646c2910ddbc0995b2bf6 *– the interactive map of TSES is accessible on the website managed by Nature Conservation Agency.*

3.5.3. SPATIAL PLANNING

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

The TSES is integrated in the spatial planning system. The TSES on all levels (local/regional/supra-regional) must be included in land use plans of municipalities, towns, regional districts, PLAs and National Parks. It means that any intervention in the area mapped as TSES is subject to approval by the Authority. However, most parts of the TSES exist just as a plan in land use plans and the physical realization of local and regional bio-corridors and biocentres grows only very slowly.

The Czech Road Directorate is taking ecological connectivity into account in its planning of new roads and is constructing some green bridges (Chenevois, 2023).

Austria-Czechia wild animal corridors action plan: A series of projects have researched and planned the protection and restoration of the ecological corridors for large mammals across the Austria-Czech border. The work has culminated in an action plan jointly agreed between Austria and the Czech Republic in 2021 (Frey-Roos et al, 2021) The action plan maps wild animal corridors of regional, trans-regional and international significance for red deer, elk, lynx, wolf and bear. It also considers the ecological corridor mapping for wild cats carried out in another project (Interreg MaGIClandscapes). Red deer are used as the umbrella species for the corridors.

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Biotope of selected specially protected species of large mammals (lynx, wolf, bear, elk)

This biotope is provided by the Nature Conservation Agency as a GIS layer for spatial planning purposes according to the new Building Act. 283/2021, Annex 1 (methodology described in Hlaváč et al, 2021)[77].

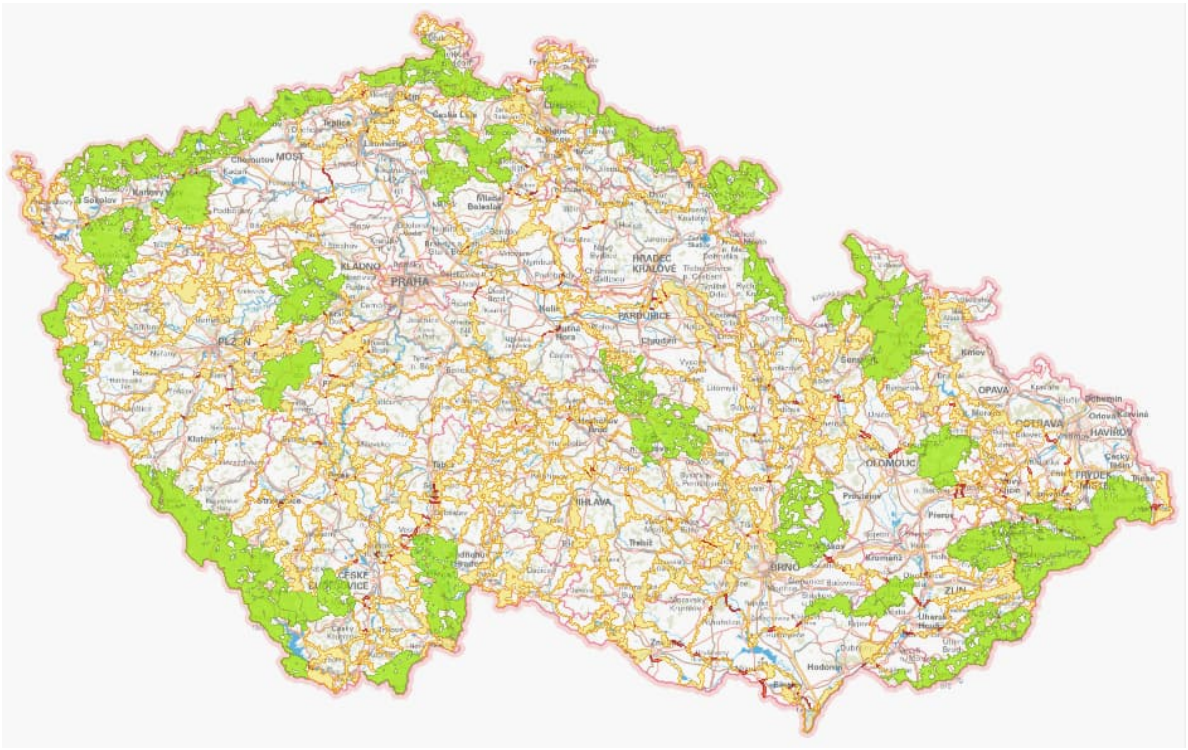

Figure 3. Interactive map of biotopes for the Czech Republic
Source:
https://aopkcr.maps.arcgis.com/apps/webappviewer/index.html?id=e07f48c384534f038cd837f7eb00d569 – *managed by Nature Conservation Agency.*

3.5.4. FUNDING

FUNDING FOR PROTECTED AREAS

Protected areas are directly financed by the Ministry of the Environment budget through the Nature Conservation Agency. There are also other national and EU funds, particularly projects in the Operational Programme Environment (ERDF and Cohesion funds) dedicated to the management of localities and other actions or activities[78].

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

There is no special funding scheme for migration corridors or ecological connectivity. The Nature Conservation Agency of the Czech Republic has an open funding call for applicants

77 https://www.researchgate.net/publication/355809168_Ochrana_biotopu_vybranych_zvlaste_chranenych_druhu_v_uzemnim_planovani#fullTextFileContent

78 https://dotace.nature.cz/

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under the Operational Programme[79] which can be used to fund the restoration or creation of landscape and vegetation elements and structures such as small ponds and can be used for the Territorial System of Ecological Stability.

[79] Measure 1.3.1: Promoting nature-friendly measures in landscapes and settlements for renaturation / creation of small pools / creation of new and restoration of existing vegetation elements and structures (including Territorial System of Ecological Stability). https://dotace.nature.cz/-/aopk-opzp-zmv-4-vyzva

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3.6. GERMANY – national, Bavaria and Baden-Württemberg

This section provides an overview of the national framework and the situation in the two federal states that fall within the Danube River basin – Bavaria and Baden-Württemberg. The region Saxony within which lies the case study area Leipzig-Halle is presented separately in Chapter 5.1.

Germany is a federal state in which the state provides the legislative framework for nature conservation, but the laws are interpreted through the legal acts of the federal states, which may differ in their details. The federal states are responsible for the designation of protected areas and for funding incentives to promote biodiversity management.

3.6.1. PROTECTED AREA NETWORK (TERRESTRIAL)

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

The German nature conservation law (Bundesnaturschutzgesetz, BNatSchG) defines seven categories of protected area to be designated at the federal level for nature and landscape protection. The German federal states can also define and designate other protected area types if they are specified in the regional state's nature conservation law. Germany has also designated 17 UNESCO biosphere reserves. Germany also has designated wilderness areas that are not within the scope of the BNatSchG. The national parks, biosphere reserves, wilderness areas, and nature parks are classed as large, protected areas. These protected areas are jointly organised in the alliance of Nationale Naturlandschaften (in English: National Natural Landscapes).

Table 7. National designation types, protection purpose and governance in Germany. Sources: Bundesamt für Naturschutz[80]

Designation type	Protection purpose and governance
National Park[81]	Large unfragmented areas designated as a complete territory. Most of the area must meet the criteria for a nature reserve, and most of the area must be in a natural condition that is only slightly affected by human influences or have the capacity to develop into a state where natural processes and functions operate according to natural dynamics. National parks should also be designated for scientific observation, learning, and to allow the public to experience nature. (Designated according to § 24 Abs. 1 BNatSchG). Economic uses of the land (including farming, forestry, fishing and hunting) are allowed only under strict conditions. Public access and tourism can be prohibited in sensitive areas.
Nature Reserve (Naturschutzgebiet)[82]	Areas designated for the protection of nature and landscape (including geology or soil aspects) and strictly protected in all or most of their area. (Designated according to § 23 BNatSchG). Each site is protected by a statute which defines the conservation objectives and the site-specific restrictions and permitted land uses and actions. One of the oldest designation types in Germany.
Landscape Protection Area (Landschaftsschutzgebiet)[83]	Designation of landscapes for their natural heritage and/or their cultural heritage and social values and to protect the character and the uniqueness of the landscape. They can include urban areas if these are considered part of the overall landscape in need of

[80] BfN webpage: https://www.bfn.de/schutzgebiete

[81] BfN webpage: https://www.bfn.de/nationalparke

[82] BfN webpage: https://www.bfn.de/naturschutzgebiete

[83] BfN webpage: https://www.bfn.de/landschaftsschutzgebiete

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Designation type	Protection purpose and governance
	protection (e.g. farms and villages). The protection objectives are to: protect, develop or restore the natural functions and the resilience and recovery of the natural resources; to protect the unique character of the landscape; and/or because of their importance for recreation. (Designated according to § 26 Abs. 1 BNatSchG). Designated by the regional nature authority through a statute. The protection level is generally weak, corresponding to IUCN category V, but can be stricter in some cases. One important function is to protect against further development of industry or urban growth, whilst land uses such as forestry, agriculture, and hunting can continue if they do not significantly alter the landscape. They can cover large areas and make up a significant share of Germany's protected area network.
Nature Park (Naturpark)[84]	Large areas designated for the protection and maintenance of cultural landscapes with their habitat and species diversity and for their use for recreation and sustainable tourism, and to ensure a long-term sustainable land use and education for sustainable development. The nature park area should be mostly designated as either nature reserve or landscape protection area and classified for recreation in the spatial plan.
National nature monument (Nationale Naturmonumente)[85]	Area designated for its significant scientific, natural heritage, cultural, or historical value and its rarity, beauty, or uniqueness. Includes areas with geological or archaeological significance provided they also have value for nature. (Designated according to § 24 BNatschG). Added to the German system in 2010. Protection level is the same as for nature reserves. Corresponds to IUCN category III. There is no minimum or maximum size. Most sites have a high visitor pressure. Active site management, site zoning with different levels of restrictions, and site management plans are recommended.
Nature monument (Naturdenkmal)	Small area protected for a particular natural feature, protected for its natural heritage value, and for its aesthetic and scientific interest. There is a maximum size limit of 5 ha. A nature monument can be an individual tree, tree group or tree avenue, geological feature, or feature with natural and cultural heritage value.
Protected landscape element (Geschützter Landschaftsbestandteil)[86]	Small area or feature protected for a biotic or abiotic component of the landscape with a particular significance for their ecological functions (such as erosion control, air quality regulation, noise or other pollution mitigation) and/or for the character, structure or ecological connectivity of the landscape or place. They can be natural or manmade (e.g. cemeteries or parks). Elements can also be designated for their importance as habitat for species. Examples are tree avenues, village ponds, traditional fruit orchards. The designation can also be used for all the occurrences of a particular feature within a restricted area; for example, all the veteran trees in a village or town. The designation provides basic protection against the removal, destruction, damage or alteration of the landscape element, and some obligatory actions, such as replacement plantings, to maintain the ecological functions. Management actions are allowed as long as they are consistent with maintaining the characteristics of the landscape element. For example, in **Bayern** the designation includes a protection (outside the urban area) from destruction or significant damage for all hedges, living fences, tree groups, and patches of scrub, cases

[84] BfN webpage: https://www.bfn.de/naturparke

[85] BfN webpage: https://www.bfn.de/nationale-naturmonumente

[86] BfN webpage: https://www.bfn.de/geschuetzte-landschaftsbestandteile

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Designation type	Protection purpose and governance
	and underground caverns, drystone walls, ponds and other small water bodies[87].
Protected habitat (Gesetzlich geschützter Biotop)[88]	Protects a list of habitat types that are threatened. According to the law, the habitat type is protected from destruction or significant damage wherever it occurs. (Designated according to § 30 BNatSchG). The protections must be registered in a publicly accessible way (according to the legal specifics of each federal state). The list of protected habitats includes: ● Natural or near-natural stretches of free-flowing rivers or standing water and their banks, regularly flooded zones, floodplains, and old meanders with natural or semi-natural vegetation. ● Bogs, fens, marsh, reedbeds, sedge fens, flood meadows, springs, inland salt marshes. ● Inland dunes, open natural scree or rock formations, sedimentary cliffs, heaths, Nardus grassland, dry grasslands, calaminarian grasslands, forests and scrub typical of dry and warm sites. ● Natural forest types typical of alluvial, swamp, gorges, steep slopes, scree, and subalpine larch and pine forests. ● Rock formations, caves or mines with natural features, alpine meadows, snow depressions, dwarf shrubs. ● Coastal cliffs and rocks, coastal dunes and shingle banks, dune slacks, saltmarshes and meadows, intertidal mudflats, seagrass meadows and other marine macrophyte stands, reefs, sublittoral sandbanks, species rich seabeds with gravel, sand or fine sediments. ● Lowland and mountain hay meadows according to EU Habitats Directive Annex I, orchards, stone rows, dry stone walls. The revisions of the national nature conservation law in 2009 and 2022 added more endangered habitat types to the list including orchards with non-dwarf trees. Since March 2022, these orchards are protected in whatever size or configuration, which altered the legal situation in some federal states – including Baden-Württemberg (which previously only protected orchards larger than 1500 m²), in Bayern (previously only larger than 1500 m²), and Rheinland-Pfalz (which previously did not protect the habitat type). Brandenburg and Sachsen already had the legal protection in place[89].
Wilderness area (Wildnisgebiet)[90]	The wilderness areas are also to be integrated into the transnational biotope network.

Natura 2000 network: In Germany, there are a total of over 4,500 Fauna and Flora Habitats and 742 Special Bird Areas, some of which overlap. In total, 15.5 % of Germany's land area is covered by Natura 2000 protected areas.

Total terrestrial protected area: The total coverage of protected areas in Germany is 37.4% of the territory. More than half of the protected areas in the terrestrial environment are designated

[87] Bestimmungsschlüssel für geschützte Flächen nach § 30 BNatSchG / Art. 23 BayNatSchG: https://www.lfu.bayern.de/natur/doc/kartieranleitungen/bestimmungsschluessel_30.pdf

[88] BfN webpage: https://www.bfn.de/gesetzlich-geschuetzte-biotope and BNatSchG Paragraph 30 https://www.gesetze-im-internet.de/bnatschg_2009/__30.html

[89] Naturschutz und Landschaftspflege 06/2022. https://www.nul-online.de/themen/landschaftspflege/article-7157239-201985/gesetzlicher-biotopschutz-nach-30-bnatschg-.html

[90] https://nationale-naturlandschaften.de/gebiete/kategorie/wildnisgebiete

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solely under national laws. Additionally, 15.9% is covered by Natura 2000 sites and 25.4% by those areas where Natura 2000 sites overlap with national designations (BISE).

Overlaps and protection levels: As the German designations are deliberately overlapping, the total protected area is much less than the sum of the protections. Nature parks cover around 28.7% of the land area, within which just over half has another designation: around half the nature park area is Natura 2000; 5% is nature reserve; also, landscape parks. Nature reserves are the only designation that applies strict protection across the whole designated area, though it is important to note that national parks must have their core area designated as nature reserve.

OECMs: Germany has not proposed OECMs. The debate in Germany has focused on the advantages and disadvantages of marine OECM options.[91]

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

The German legal framework was designed for state governance and lacks specific provisions to accommodate private protected areas. Designation is the responsibility of the regional nature conservation authorities, or the local conservation authority, depending on the designation type. Management may be transferred to another public body.

Nature reserves are designated by the federal states through site-specific statutes. Their effectiveness is related to their size: although around 15% of Germany's nature reserves are 200 ha or more in size, over half of them are smaller than 50 ha in size and are not adequately buffered against negative pressures such as drainage, eutrophication, or pollution[92]. Where the nature reserve lies inside a landscape park, this can provide a buffer function.

Nature parks have the mission to contribute to maintaining ecological connectivity and take measures to counter habitat fragmentation. There are large differences in their effectiveness between federal states, due to differences in governance and financing. In some cases, the parks are managed by the state environment ministry, in other cases associations or cooperatives have taken over the management. Management plans are only obligatory in some states. The Federal Nature Agency has published a series of guidance documents for nature park management, including how to develop and implement management planning for nature parks[93] and how to designate wilderness areas in nature parks. This identified a potential for 463 076 ha of designated wilderness in the parks, but to date only a small part of this has been realised. In 2006, the EUROPARC Federation and a national association started a campaign to improve the management of nature parks and established a method and criteria to measure and distinguish management quality.

Nature monuments and **protected landscape elements** are designated by the relevant nature conservation authority at the district or town level. Some federal states have specified that these designations should also be used to contribute to the ecological network or safeguard an ecological corridor.

The national nature heritage (Nationales Naturerbe) is an initiative by the federal government to turn national state-owned areas, such as military sites, into protected areas. The federal government has transferred ownership of areas with high nature conservancy value, and thus the responsibility for protection, to the federal states and to nature conservation foundations and associations. Many of the sites were obtained in the German reunification and include areas of the former inner-German border, former military training grounds, and abandoned pit

[91] NABU 2022 https://www.nabu.de/natur-und-landschaft/meere/meeresschutzgebiete/32078.html

[92] https://www.bfn.de/naturschutzgebiete#anchor-3210

[93] VDN (2008) Leitfaden für die Praxis, developed by the nationally funded project Forschungs- und Entwicklungsvorhaben (F+E) 'Optimierte Umsetzung von Naturparkplänen'.

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mining sites. According to the German Federal Ministry of Environment (BMUV), approximately 164 000 ha were designated as national nature habitat by 2021.[94]

The **European Green Belt** runs through Germany from north to south along the old border between eastern and western Germany. The aim of the German partnership is to protect a 200-ha area on each side of the border, of which 75% should be restored to high value habitats (i.e. habitats on the German red list of habitat types). The Green Belt includes five ecological connectivity areas in Germany: Stecknitz-Delvenau-Niederung (Schleswig-Holstein), Landgraben-Dumme-Niederung (Sachsen-Anhalt), Thüringer Schiefergebirge (Thuringen), Rhön-Grabfeld (Bayern) and Innerer Bayerischer Wald (Bayern & Czech Republic).

The German federal states can also define and designate other protected area types if they are specified in the regional nature conservation law.

Bayern (Bavaria)

Bavaria has not added additional types of protected area in its Bavarian Nature Conservation Act (BayNatSchG). The Bavarian protected area network consists of two national parks, two biosphere reserves, 597 nature reserves, 699 landscape parks, 19 nature parks, 674 SCI/SACs and 74 SPAs, but as there are considerable overlaps in the designations, the actual number of protected areas on the ground is much smaller.[95]

Baden-Württemberg

The protected area network of Baden-Württemberg consists of one national park, two biosphere reserves, 1048 nature reserves, 1452 landscape parks, 7 nature parks, 6058 nature monuments, 212 SCI/SACs and 90 SPAs, but there are considerable overlaps in the designations, so the number of actual sites is much lower.[96]

3.6.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

The Federal Nature Conservation Act (BNatSchG)[97] mandates an ecological network for Germany – the **Biotopverbund** - that must occupy at least 10% of the land area[98]. The biotope network consists of core areas, connecting areas, and connecting elements, which are to be legally protected by suitable measures. Connecting areas and connecting elements are considered together from a technical point of view. The core areas of the network are the nature reserves, national parks, biosphere reserves, Natura 2000 sites (or parts of them), the areas of the national natural heritage and the green belt. The Bundesamt für Naturschutz issues large-scale maps of the biotope network.

The National Natural Heritage (**Nationales Naturerbe NNE**) consists of more than 180 000 ha formerly in government ownership that has been donated to various charitable recipients and dedicated to nature conservation in perpetuity. Only around half of the NNE areas have been protected as nature reserves and that many more have only been partially protected (Ackermann et al 2021).

Bavaria

[94] https://www.bmuv.de/themen/naturschutz/gebietsschutz-und-vernetzung/nationales-naturerbe

[95] https://www.stmuv.bayern.de/themen/naturschutz/schutzgebiete/index.htm

[96] https://www.lubw.baden-wuerttemberg.de/natur-und-landschaft/schutzgebietsstatistik

[97] Bundesnaturschutzgesetz 2002

[98] https://www.biotopverbund.de/

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The new Bavarian Nature Conservation Act (BayNatSchG), which was developed following a citizen's petition and referendum, specifies that the biotope network is to be expanded to at least 15% of Bavaria's open land area by 2030, with intermediate goals of 10% by 2023 and 13% by 2027[99]. The technical approach is laid down in the Bavaria Concept for Expanding the Biotope Network.[100]

Baden-Württemberg

The state has set a legal goal to realise a functional biotope network on 10 % of the state's open land by 2023, 13 % by 2027 and 15 % by 2030, similar to Bavaria.[101]

Contractual tools for land

German nature conservation associations or foundations use various legal means to gain permanent access to land of conservation interest, through leases (Pachtverträge), land swaps (Tauschvertrag), licensing agreements (Lizenzvertrag), and conservation easements (Dienstbarkeit) (Kopsieker and Disselhoff, 2024).

3.6.3. SPATIAL PLANNING

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

The federal spatial planning law (Raumordnungsgesetz ROG) states in its principles of spatial planning the importance of intact ecosystems and the requirement to protect and restore them, the requirement to reduce land use, and to consider the requirements of ecological connectivity. The ROG also specifies when and how environmental assessment and monitoring must be integrated into spatial planning procedures.

The German planning system places emphasis on measures to reduce land take for new building and development and control urban sprawl. German planning therefore clearly distinguishes between the zones defined for human settlement (Innenbereich), which are subject to detailed spatial planning, and the rural zone (Außenbereich) in which developments are strictly limited (except certain priority activities[102]) and where land is not divided into development plan areas (see below). Each local authority area must clearly define the borders between settlement zone and rural zone in its area. Agricultural and forest areas should be included in rural zones. Developments in the rural zone are severely restricted except for a federally defined list of exemptions, such as transport corridors, energy installations (power lines, wind farms, biomass processing plants etc.). however, various arrangements allow municipalities to acquire rights to develop in the rural zone. The federal planning law (ROG) requires an environmental assessment of the spatial plans to assess the impact of the plans.

The highest binding planning level is the federal state level planning programme (landesweiter Raumordnungsplan) and (in some states) the district level regional plan (Regionalplan), sometimes also a state level plan (Landesentwicklungsplan). The community or municipality

[99] Art. 19 Para. 1 BayNatSchG

[100] Bayrisches Landesamt für Umwelt. https://www.lfu.bayern.de/natur/bayaz/biotopverbund/konzept_ausweitung/index.htm

[101] Source: Landesanstalt für Umwelt, Baden-Württemberg. https://www.lubw.baden-wuerttemberg.de/en/natur-und-landschaft/biotopverbund

[102] These are defined in the Building Code section 35 as developments necessary to support agricultural, horticultural or forestry activities, developments associated with ensuring power supplies and telecommunications (powerlines, cables etc), or other public services (waste, heating etc), renewable energy generation, activities associated with nuclear energy, and a clause for other activities that are defined as being unsuitable to be carried out in settlement areas.

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level plan[103] defines land use zones, including desired future uses, and the objectives, areas and measures for nature conservation and landscape. Local development plans - so called 'local construction development plans' or 'binding land use plans' (Bebauungsplan /verbindlicher Bauleitplan) - strictly specify land use in detail at the land parcel level, for example for a cluster of plots of land.

All regional and municipal plans are required to incorporate and illustrate all the sites that are potentially useable for offset measures, and these sites must contribute to the regional ecological network. Offset measures must be coherent with the local landscape plan[104]. However, the ecological network concept and its implementation is vaguely defined in the regulations, and in practice it is difficult to tell whether offsets are contributing to ecological coherence or not (Wende et al, 2018).

Bavaria

The biotope network is not legally secured and is not anchored in any Bavaria-wide supra-regional concept.[105] The Bayerisches Landesamt für Umwelt[106] (Bavarian State Office for the Environment) supports participation in the biotope network advice in advance on the procedures and options for restoring the areas to a good ecological condition. Landowners contribute on a voluntary basis and the land remains entirely the responsibility of the landowner, or the person authorised to use it.

Addressing defragmentation of habitats and corridors through transport infrastructure, the Bayerische Landesamt für Umwelt has drawn up the 'Concept for the conservation and restoration of important wildlife corridors on federal roads in Bavaria' with the involvement of various specialist agencies and experts in 2008. For implementation, a period of 15 years is proposed for the most important measures and 20-25 years for second priority measures. At the same time, the concept offers the opportunity to assess the potential for conflict with regard to the biotope network when planning future roads and to consider mitigation measures.

Baden-Württemberg

The specialist plan for the state-wide biotope network, including the general wildlife route plan (GWP, since 2010 §22NatSchG BW) maps out the sites and wildlife corridors of the ecological network. All public planning authorities must take the biotope network into account in their planning and measures. To implement this, the local authorities must draw up biotope network plans for their area based on the Baden-Württemberg biotope plan and wildlife route plan, or they must adapt their landscape or green space plans. Where necessary and appropriate, the biotope network must be secured under planning law within the framework of regional plans and land use plans.

3.6.4. FUNDING

FUNDING FOR PROTECTED AREAS

Germany in general

The funding structure varies greatly between different categories of protected area. The national parks are funded through annual budgets from the federal states. For nature parks

[103] In the states other than Bavaria and Baden-Württemberg there are two types of local plans: the 'municipal preparatory land use plan' (Flächenutzungsplan /vorbereitender Bauleitplan) defines land use zones, including desired future uses, and the 'landscape plan' (Landschaftsplan) defines the objectives, areas and measures for nature conservation and landscape.

[104] According to article 15 of the national conservation law §15 Absatz 2 BNatSchG 2009

[105] Personal communication NABU

[106] https://www.lfu.bayern.de/natur/index.htm

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and landscape parks, there are large differences in governance and financing, from state run parks to those run by an association. Local authorities within the parks are generally significant sources of support. The association run parks may have access to a dedicated funding programme from the state, or they may rely on project funding from national or EU sources. Nature reserves and Natura 2000 sites are often managed and financed as part of a larger area designation.

Bavaria

For nature parks, the annual management payment from the state covers only a small proportion of the actual staff and maintenance costs, and the rest must be covered through project funding[107]. For example, the nature park Bayerischer Wald is mainly financed through project payments from the Bavarian state budget, complemented by the membership payments from the participating local authorities and towns, private individuals, and associations or NGOs, with a small addition of donations and project funding[108].

Baden-Württemberg

Special programme to strengthen biodiversity.

To guarantee the long-term preservation, protection and development of natural and near-natural landscape elements, habitats and the animal and plant species that need to be protected, representative areas and nature conservation projects are also financially supported. In addition to the state funding programmes - in Baden-Württemberg, PLENUM, the state's project for the conservation and development of nature and the environment, should be mentioned first and foremost. This programme is special in the sense that it also supports green economy such as ecological agriculture and tourism along with conservation and education. There are also funding programmes at federal and EU level. Nationally significant natural and cultural landscapes are supported by the Federal Ministry for the Environment as so-called large-scale nature conservation projects via the federal programmes Chance.Nature and Biological Diversity. The European programmes LIFE-Nature, LIFE+ and LIFE.

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

Germany (federal level)

On the federal level, funding for ecological corridors and stepping stones is available for the areas that fall under federal responsibility. The reconnection of habitats across federal traffic infrastructure, federal roads and federal waterways is funded within the Federal Defragmentation Programme (Bundesprogramm Wiedervernetzung) to reconnect fragmented habitats across federal roads, and the Federal Blue Belt Programme (Bundesprogramm Blaues Band) to restore the federal waterways to near-natural status including ecological permeability. Both programmes are led jointly by the federal ministry of the environment and the federal ministry of traffic. While the funding of connectivity in the Federal Defragmentation Programme mainly consists of retrofitting federal traffic infrastructure, the Federal Blue Belt Programme also includes funding of regional and local projects, for example floodplain restoration.

Bavaria

Bavaria has several state operated funding programmes that can be used to maintain, create and restore the state-wide biotope network. These programmes include funding schemes for conservation along with funding schemes for ecological connectivity:

[107] https://www.bundestag.de/resource/blob/559638/905a09aa298dcd323c5d5358fe341937/WD-8-040-18-pdf-data.pdf

[108] https://www.naturpark-bayer-wald.de/finanzierung.html

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- Contract Nature Conservation Programme (Vertragsnaturschutzprogramm, VNP),
- Contract Nature Conservation in Forests Programme (Vertragsnaturschutzprogramm Wald, VNP-Wald)
- Landscape Conservation and Nature Park Directives (Landschaftspflege- und Naturpark-Richtlinien, LNPR).

The VNPs are mainly directed at farmers and forest owners respectively but may also be nature conservation associations, that maintain the ecological management practices and ecological connectivity. The VPN is co-financed by the EU[109]. The LNPR is directed at nature protection associations to support restoration and maintenance of natural or near-natural landscapes. The LNPR funding is project based and capped to 70 % of the total project cost[110].

More explicitly dedicated to the support of ecological connectivity is the programme BayernNetzNatur. The Programme works to bring together stakeholders from different sectors on a voluntary base. The funding of projects requires at least one lead partner to take over responsibility and 10% of the project costs, the rest is funded from several programmes including the programmes VNP, VNP-Wald, LNPR, the Bavarian Cultural Landscape Programme (Bayerisches Kulturlandschaftsprogramm, KULAP), the Climate Protection Programme Bavaria (Klimaschutzprogramm Bayern, KLIP) and the Bavarian Nature Conservation Funds (Bayerischer Naturschutzfonds, BNF). For larger projects federal funding ('chance.natur – Bundesförderung Naturschutz', Federal Programme for Biodiversity) or EU funding (LIFE-Programme) and funding with donations or funds from other environment foundations is possible depending on the project[111].

Baden-Württemberg

Baden-Württemberg has several funding programmes that can be used to maintain, create and restore the state-wide biotope network:

- Landscape Conservation Directive (Landschaftspflegerichtlinie, LPR)
- CAP funding programme for agri-environment, climate protection and animal welfare (Förderprogramm für Agrarumwelt, Klimaschutz und Tierwohl, FAKT)
- Biodiversity consultancy: Land managers and land users can obtain information on suitable measures for biodiversity on their farm via the biodiversity advisory service. Advice on biodiversity is 100% subsidised.

To achieve the goals of expanding the biotope network, the state government launched a state-wide initiative in 2019 to strengthen the biotope network, which includes both financial and personnel support. As part of the Landscape Conservation Directive (LPR), the funding rate for municipal biotope network planning was increased to 90% and to 70% for measures that serve to implement the biotope network. To support and coordinate biotope network planning and implementation, in all the districts biotope network ambassadors have been employed by the landscape conservation associations (LEV) (or the district administrations in districts without LEV). The Ministry for the Environment, Climate Protection and the Energy Sector is responsible for overall management, with technical support from the LUBW and the State Institute for Agriculture, Food and Rural Areas (LEL). Together with the regional councils, they support local stakeholders with a large amount of specialised information and training courses. This ensures a standardised level of knowledge and a uniform approach throughout the state.

[109] https://www.stmuv.bayern.de/themen/naturschutz/naturschutzfoerderung/vertragsnaturschutzprogramm/index.htm (in German)

[110] https://www.stmuv.bayern.de/themen/naturschutz/naturschutzfoerderung/landschaftspflege_naturparkrichtlinien/index.htm (in German)

[111] https://www.bestellen.bayern.de/application/eshop_app000006?SID=137628979&ACTIONxSESSxSHOWPIC(BILDxKEY:%27stmuv_natur_0016%27,BILDxCLASS:%27Artikel%27,BILDxTYPE:%27PDF%27) (in German)

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3.7. HUNGARY

3.7.1. PROTECTED AREA NETWORK (TERRESTRIAL)

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

Table 8. National and regional designation types, protection purpose and governance in Hungary. Sources: (Sipos, 2023), (MARI et al, 2022)

Designation type	Protection purpose and governance
National Park (nemzeti parkok)	Large unmodified area with multiple natural values and biodiversity; conservation + scientific, cultural, educational, recreational purpose.
Landscape Protection Area (tájvédelmi körzetek)	Designated for heritage, environmental education, ecotourism, local development.
Nature Conservation Area (természetvédelmi területek)	Smaller, unitary and characteristic territory.
Natural Monument (természeti emlékek)	Individual natural formation
Ex lege protected natural values qualified as nature conservation areas	Only mires and alkaline lakes not overlapping with other domestic protected areas
Ex lege protected natural values qualified as natural monuments	Kurgans, earth fortifications, springs and sinkholes
Ex lege protected natural asset	Caves
Protected natural areas of local importance = Nature Conservation Area of local importance Natural Monument of local importance	Areas of local importance can only be designated as Nature Conservation Areas or Natural Monuments.

Natura 2000 network: the network consists of 56 SPAs (13 747 km²), 479 SACs (14 442 km²) that is 525 Natura 2000 sites (19 949 km²), which cover 14.8%, 15.5% and 21.4% of the land[112].

Total terrestrial protected area: 22.2% (BISE[113]).

Overlaps and protection levels: Hungary has a total of 851 protected areas, comprising 326 sites designated under national laws and 525 recognized as Natura 2000 sites (BISE). More than half of the protected areas are designated exclusively as Natura 2000 sites. The rest consists mainly of Natura 2000 sites overlapping with national designations, with a small portion (3.6%) protected solely by national designations.

OECMs: OECMs are not used in Hungary.[114]

Transboundary protected areas: Austria and Hungary have declared the 'Neusiedler See-Seewinkel – Fertö-Hanság' area as a Transboundary Ramsar Site, a World Heritage Site, and a transboundary National Park. The Austro-Hungarian National Park Commission,

[112] https://www.eea.europa.eu/data-and-maps/dashboards/natura-2000-barometer

[113] https://biodiversity.europa.eu/countries/hungary

[114] Verbal communication with a representative of the Ministry of Agriculture, Department for Protected Areas.

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representing the Austrian and Hungarian governmental authorities and the Park's management bodies, acts as a steering committee for the further development of the Transboundary Protected Area[115]. Hungary also has transboundary Ramsar sites with Slovakia (Upper Tisza Valley, Ipoly valley and Poiplie).

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

The Nature Conservation Act (NCA 53/1996) defines three types of designations (Sipos, 2023). **Protected areas of national importance** (National Park, Landscape Protection Area, Nature Conservation Area and Natural Monument) are designated by the minister for nature conservation; their conservation administration lies with the county government offices, and their nature management is the responsibility of the relevant National Park Directorate. **Protected areas of local importance** are designated by a local decree and supervised by the relevant municipality which is also responsible for their management. Areas of local importance can only be designated as Nature Conservation Areas or Natural Monuments.

In all the protected areas designated according to the Nature Conservation Act, the legislation explicitly prohibits certain detrimental land uses such as the planting of invasive species, the clearcutting of forest areas of more than three hectares, and harmful infrastructure development. It also specifies authorisation procedures for potentially harmful land uses such as land transformations, the use of chemicals, collection of biomasses, and research activities (Sipos, 2023). The Act requires zonation within national parks and buffer zones around protected areas, but neither of these requirements have been enforced, except the zonation of the Hortobágy National Park in 2020. In practice, the level of protection provided by the legislation designating the national parks varies. According to MARI et al (2022), five of the ten national parks can be classified as IUCN category II, whereas five are IUCN category V. Hungary also has nature parks, but these are not designated under the act (MARI et al, 2022).

The Nature Conservation Act considers that maintenance of biodiversity and natural heritage also requires measures outside the protected areas, and it therefore introduces legal provisions for the general protection of habitats including protection from invasive alien species and protection of landscapes (Sipos, 2023) as well as provisions for the protection of protected species. **Ex lege protection** applies to the following precisely defined features of particular importance and uniqueness: mires, alkaline lakes, caves, springs, sinkholes, kurgans (burial mounds) and earth fortifications. Wherever these are discovered and meet the definition in the Act, they are given automatic and immediate protection. To register the ex lege protected features, the relevant conservation authority (currently the county government offices) must identify and designate the affected land parcels.

One challenge to management in the national parks is that forest ownership is complex, including forest land owned by the state-owned forest companies or by private persons (as well as the public land), and legal and illegal logging takes place, sometimes in contradiction to the management objectives.

3.7.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

National Ecological Network: The ecological network is a spatial planning instrument with core zones, ecological corridors, and buffer zones. The national ecological network zone includes the core areas, the buffer zones and the ecological corridors as well (ConnectGREEN, 2021). It was mapped in 2000 at a scale of 1:50 000, covering 36% of the country and comprising 55% core zones, 25% corridors and 20% buffer zones (Sipos, 2023).

[115] TransNature map of transboundary protected areas. https://www.transnature.eu/map (accessed 3 January 2024)

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3.7.3. SPATIAL PLANNING

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

The National Land Use Framework Plan, which is renewed every six years, includes a series of thematic maps that indicate the National Ecological Network, the zone of forests and afforestation, the zone of landscape scenery protection, World Heritage Sites and candidates, and water protection areas, besides Natura 2000 sites and other protected areas (Sipos, 2023).

The County Land Use Framework Plan and the municipal land use plans (master plans) must follow the structure of the higher (spatial) level land use plans.

In the zone of core areas and ecological corridors, the rules restrict the designation of areas for development, placement of transport and energy infrastructure and new surface mines and prescribe that utility lines fit into the landscape (ConnectGREEN, 2021).

The Regulation Plans (zoning of regulation packages on a map) of the spatial plans contain the exact zoning of the National Ecological Network. The County Land Use Framework Plans, and Land Use Plans for so called priority regions (e.g. the Lake Balaton Recreational Area and the Budapest Metropolitan Region) contain regional tasks to protect the environment, landscape and nature. The National Development Concept of 2011 formulates guidelines for the development and protection for landscape areas of national importance such as Lake Balaton, the Danube region, or Lake Tisza. Guidelines for special landscape types can also be found within the frames of development plans (ConnectGREEN, 2021).

The zone of the National Ecological Network is entrenched in the municipal planning of settlements (ConnectGREEN, 2021). In the core area and ecological corridor, new areas for building cannot be designated in case the urban area is surrounded by the core area or ecological corridor. New built-up areas can be designated just in the frame of an official land-use regulation procedure.

3.7.4. FUNDING

FUNDING FOR PROTECTED AREAS

The Ministry of Agriculture does not allocate an independent budget to the Department for Nature Conservation or the Department of National Parks and Landscape Protection. Their funding is included in the overall ministry budget, which may risk a loss of resources if priorities shift. Capital, county and district government offices also receive a general budget from the Annual Budget Act, with no specified allocation for nature conservation. It is therefore difficult to assess trends in funding for nature conservation over time. National Park Directorates do, however, receive a separate budget. The budget for the National Park Directorates has increased since 2008, largely as a result of substantial revenues raised by the directorates themselves (around 60%) from environmentally friendly farming as well as ecotourism (OECD, 2018).

Nature conservation funding from the European Union has declined, but the National Park Directorates still significantly benefit from EU LIFE programme funding. The LIFE programme financed 19 projects between 2008 and 2016, providing more than EUR 1 million towards total costs of EUR 2.1 million. However, changes in budgeting in 2012 may have reduced capacity to apply for EU funding (WWF Hungary, Hungarian Birds and Nature Conservation Association and Hungarian Association of Nature Conservationists, 2015). From 2014 to 2020, the Environment and Energy Efficiency Operational Programme and the Central Hungary Operational Programme (EU Regional Development Fund and Cohesion Fund) provided HUF 37.8 billion for direct nature investments. These include ecological restoration projects and

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investments in nature management infrastructure on at least 100 000 ha of protected areas and/or Natura 2000 sites.

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

There is no funding earmarked especially for ecological corridors and stepping stones. However, they can be financed via short-term projects, mainly through the EU funding instruments.

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3.8. MOLDOVA

3.8.1. PROTECTED AREA NETWORK (TERRESTRIAL)

The main legislation (Law 1538/1998) defines seven categories of protected area (scientific reserve, national park, nature monument, nature reserve, landscape reserve, resource reserve, area with multifunctional management) which are designated nationally according to the IUCN classification, and landscape architecture monuments which are applied locally. Biosphere reserves and wetlands of international importance are designated under the respective international conventions.

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

Table 9. National and regional designation types, protection purpose and governance in Moldova. Sources: Republic of Moldova Parliament Law No. 1538 of 25-02-1998[116]

Designation type	Protection purpose and governance
Scientific Reserve	The scientific reserve has as a priority objective the protection of the environment, the carrying out of scientific research, the education and ecological training of the population. The scientific reserve has the status of a scientific research institution and is subordinate to the central authority for the environment. On forest land, a dedicated regulation delimits the management competencies between the central authority for the environment and the central authority for forestry. The central authority for the environment and the Academy of Sciences of Moldova approve the statement of objectives.
National Park	The objective of the national park is to preserve natural complexes of particular ecological, aesthetic and cultural-historical importance in order to harmonize the geographical landscapes and their sustainable use for scientific, cultural, touristic, instructive and educational purposes. The central authority for the environment establishes the statement of objectives of each park. The national park management has the status of a public institution. Its subordination is established at the time of designation.
Nature monument	There are different classes of nature monuments: geological and paleontological, hydrological, zoological, botanical, mixed, and rare plant and animal species. Natural monuments are under the management of central or local public administration authorities. The owner of the land which is declared a natural monument is obliged: a) to ensure compliance with the protection regime of the natural monument; b) to install bollards, warning boards, signs, pedestrian tourist itineraries at the borders of the nature monument and ensure their integrity; c) to fence the protection areas of secular trees and hydrological monuments; d) to improve the living conditions of the animals, applying appropriate biotechnical methods.
Nature reserve	The objective of the nature reserve is to ensure the optimal conditions for the protection and restoration of species, plant and animal communities significant from a national point of view. Nature reserves are under the authority of the central or local public administration.

[116] https://www.legis.md/cautare/getResults?doc_id=141074&lang=ro

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Landscape reserve	The landscape reserve has as its objective the conservation of geographical landscapes of national importance, their regulated use for economic, aesthetic, cultural and recreational purposes. Landscape reserves (of geographical landscapes) are under the authority of the central or local public administration.
Resource reserve	The resource reserve has as its objective the conservation of natural resources to maintain them in their natural state for further exploitation. The resource reservation status has a provisional character, depending on its ecological and economic importance, and is evaluated by the scientific organizations and institutions of the field in agreement with the central authority for the environment. The resource reserves are under the authority of the central or local public administration, and their territories remain with the holders.
Area with multifunctional management	The area with multifunctional management has as its objective the conservation of nature and the regulated management of natural resources. Natural areas with a special protection regime within the area must be demarcated. Areas with multifunctional management are subordinated to central or local public administration authorities.
Landscape architecture monument	The landscape architecture monument aims to preserve and develop landscape architectural compositions and serve as a repository of the plant gene pool. Old parks, forest parks, alleys with historical, cultural, scientific, aesthetic, economic and recreational value are declared monuments of landscape architecture. The land is excluded from economic development, under the authority of the local public administration, but remains at the owner's disposal for allowed uses. Any work of reconstruction and restoration of the monument of landscape architecture is carried out according to a project approved by the central authority for the environment.

Emerald Network: 62 sites have been designated for the continental and the steppic biogeographical regions covering an area of 3 252 km², and the sites are now in the process of being legally established.[117]

OECMs: not applied in Moldova.

Total terrestrial protected area: protected areas in Moldova cover 1 912.7 km², which is 5.66% of the country's territory.[118]

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

The Ministry of the Environment (MoE) is responsible for protected area policy development and implementation. The government and ministry are in the process of reorganising the governance of the whole environmental domain, including a separation of forest management from conservation and protected area management, which means all protected areas will be governed by a single policy and administrative unit. A new Environmental Strategy 2024-2030 has been developed and is now under public consultation. A new national biodiversity strategy is also being prepared by the National Office for Environmental Project Implementation (subordinated to the MoE).

[117] CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE AND NATURAL HABITATS. Standing Committee 43rd meeting Strasbourg, 27 November - 1st December 2022. Updated list of officially adopted Emerald network sites (December 2023). https://rm.coe.int/draft-list-of-adopted-emerald-network-sites/1680ad54a1

[118] pers.com., Dr. Aurel Lozan

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The land ownership in protected areas is diverse, with nearly 40% of the area, mainly forests and wetlands, owned and managed by the public forestry and hunting agency Moldsilva (subordinated to the MoE). The local public authorities and the private sector are the other main landowners, but they have only weak capacities for conservation and management. The most recent protected area established is the Lower Dniester National Park (Law 71/2022), which encompasses practically the entire Ramsar area with the same name.

3.8.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

In Moldova, the Law 'About Ecological Network' (Law 94/ 2007) provides the legal framework for ecological connectivity[119]. It has been amended several times to partially transpose provisions of the EU Habitats Directive and to include a definition of the Emerald network. The law provides the legal basis for creating and developing a national ecological network as a component of the Pan-European ecological network and establishes control and protection mechanisms for the network.

However, although the National Ecological Network is conceptualized in the law, it is almost not implemented as such. Some of its aspects are considered in various incentives, projects or policy documents. However, the network implementation needs a holistic approach and much more robust implementation on the ground[120].

3.8.3. SPATIAL PLANNING

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

No specific tools are available, as the national ecological network law is practically hardly implemented.

3.8.4. FUNDING

FOR PROTECTED AREAS

There is no public budget for protected areas. Some areas generate funding from their internal sources (from logging and harvesting other forest products, hunting etc.), but funding for protected areas owned by local authorities or private organisations or individuals is almost inexistent.

However, authorities are seeking for ways to sustain protected areas and support good incentives. The National Office for Environmental Project Implementation manages the National Environmental Fund, which has objectives for biodiversity conservation and area protection. The fund's focus and administrative structure was significantly changed in 2022, and it now exclusively focuses on environmental protection, climate change, and sustainable resource management, ensuring that more funding is directed toward specific environmental protection projects, including those related to ecological corridors[121]. Previously, almost all of the spending was allocated to water supply and sanitation projects. This shift in scope enables more resources to be dedicated to projects with direct environmental protection aims[122].

[119] https://cis-legislation.com/document.fwx?rgn=18399

[120] pers.com., Dr. Aurel Lozan

[121] amendments to Law 1515/1993 adopted in March 2022

[122] https://www.eu4environment.org/news/legal-reforms-of-the-national-environmental-fund-a-stepping-stone-to-environmental-protection-in-moldova/

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Various international organizations, in cooperation with local entities (NGOs, LPAs) and central authorities (Ministry of Environment, Moldsilva), are promoting initiatives aimed at enhancing biodiversity conservation and improving protected area management on the ground. Examples of cooperation between international institutions and national and local bodies are:

- Project 'Improving governance of protected areas in Moldova through institutional development, capacity development and habitat restoration' funded by the Austrian Development Agency (2023 to 2027) with a budget of €1 653 700[123]. It aims to increase the effectiveness of protected areas in reducing biodiversity loss and achieving conservation outcomes through innovative governance models and sustainable management practices. The target areas include the Codrii nature reserve, Orhei and Lower Dniester National Parks, and the focus is on integrating ecosystem services, enhancing ecological capacity, and strengthening the role of women in protected area governance.
- Global Environment Facility (GEF) funded projects aimed at improving the coverage and management effectiveness of the protected area system in Moldova. One project, which ended in 2014, sought to expand the protected area system to include under-represented ecosystems. It received a GEF Project Grant of $ 950,000 with a co-financing total of $ 1,091,670 and was implemented in partnership with the United Nations Development Programme.[124]

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

There is no dedicated funding for the National Ecological Network.

[123] https://www.entwicklung.at/en/projects/detail-en/improving-governance-of-protected-areas-in-moldova-through-institutional-development-capacity-development-and-habitat-restoration

[124] https://www.thegef.org/projects-operations/projects/3675

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3.9. MONTENEGRO

3.9.1. PROTECTED AREA NETWORK (TERRESTRIAL)

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

Table 10. National and regional designation types, protection purpose and governance in Montenegro. Sources: Protected Planet database (https://www.protectedplanet.net/country/MNE), The Law on the Protection of Nature.

Designation type	Protection purpose and governance
Landscape with special features (Predio Izuzetnih Odlika)	An area of exceptional characteristics on land and/or sea where the mutual influence of people and nature over time has shaped recognizable features of the locality with significant aesthetic, ecological and cultural values, accompanied by high biological diversity. It is forbidden to carry out actions, activities and activities that violate the features for which the area was declared protected.
National Park (Nacionalni Park)	A national park is a natural land and/or sea area which is designated to protect the ecological integrity of one or more ecosystems for current and future generations, in order to prevent the inappropriate use of natural resources or other harmful actions and activities and to provide spiritual, scientific, educational, recreational needs and the needs of visitors that are compatible with the preservation of the environment and culture. In the national park, it is forbidden to carry out activities and activities that threaten the integrity of nature.
Natural Monument (Spomenik Prirode)	An area of land and/or sea in which there is one or more natural or natural-cultural forms which have ecological, scientific, aesthetic, cultural or educational value. A nature monument can be in a natural, semi-natural or anthropogenically altered state. On the natural monument and in its immediate surroundings, which is an integral part of the protected natural property, it is forbidden to carry out actions, activities and activities that threaten the characteristics, values and role of the natural monument.
Nature Park (Park Prirode)	A nature park is a large natural or partially cultivated area of land and/or sea, characterized by a high level of biological diversity and/or geological values with significant regional, cultural and historical values and ecological features of national and international importance. In the nature park, it is forbidden to carry out actions, activities and activities that threaten the features, values and role of the park.
Special Nature Reserve (Posebni Rezervat Prirode)	An area of land and/or sea of particular importance due to its uniqueness, rarity or representativeness of natural values, which includes the habitat of endangered wild species of plants, animals and fungi, in which man lives in harmony with nature and which is protected for preservation of natural conditions and values. A special nature reserve can be in a natural, semi-natural or anthropogenically altered state. In the special nature reserve, it is forbidden to carry out actions and activities and to carry out activities that may damage the properties for which it was declared a protected area, namely: amelioration; drainage or other hydrological modifications which can cause changes in the structure and function of the ecosystem, i.e. irreversibly damage the land surface, change the water regime or change the relief of the terrain; construction of facilities and road infrastructure; extraction of minerals; movement of persons and driving outside marked paths for movement, except guards, forest guards and game guards, military and police personnel, inspection, firefighters, medical personnel in the performance of their duties; intentional introduction and spread of non-indigenous plant and animal species; mountaineering, use of kites, paragliders and parachutes; game breeding; harassment, capture

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	and killing of animals; commercial fishing; mariculture; anchoring of boats; construction of infrastructure in the sea; picking and collecting plants; lighting campfires in places not designated for that purpose; changing the natural values of the area. Certain actions, activities and activities can be carried out on the basis of a permit in accordance with the management plan. Visits can be made for the purposes of monitoring the state of nature, education and tourism based on the approval of the management, provided that the populations of wild species of animals are not disturbed and the habitats of wild species of plants, animals and fungi are not disturbed.
Strict Nature Reserve (Strogi Rezervat Prirode)	An area of land and/or sea with isolated or representative ecosystems, unaltered or insignificantly altered artificial nature. It is intended exclusively for the preservation and restoration of the state of nature and for scientific research, which does not alter the basic abundance and does not endanger the free unfolding of natural phenomena and processes. In a strict nature reserve, it is forbidden to carry out any work or activity, except for activities aimed at the conservation, preservation and restoration of the natural environment.

Emerald Network / Natura 2000 network: No adopted sites, but 31 sites have been officially nominated as candidates for the Emerald Network.[125] These sites will become Natura 2000 sites upon accession to the EU. The proposed sites cover around 2400 km^2.

OECMs: Not yet introduced.[126]

Total terrestrial protected area: coverage of national and local protected areas is 13.9% in 2022 according to the World Database on Protected Areas (WDPA).[127]

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

The management and governance of terrestrial protected areas in Montenegro is under development, including the preparation of the Emerald Network of sites under the Bern Convention, to prepare the country for EU accession and the requirement to establish a Natura 2000 site network under the EU Habitats and Birds Directives[128]. The Ministry of Ecology, Spatial Planning and Urbanism and the Nature and Environment Protection Agency have been supported by EU pre-accession funding in this work.

A Europe-Aid funded project focused on establishing the Natura 2000 network from 2016 to 2019[129]. The project mapped and gathered data to identify key biodiversity areas and facilitated knowledge exchange between local and international experts. The Montenegro Nature and Environment Protection Agency continued the monitoring programme after the project ended. Further funding was provided in the framework of the Instrument for Pre-Accession (IPA), and a new project between 2021 and 2023 continued field work to map

[125] CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE AND NATURAL HABITATS. Standing Committee 43rd meeting Strasbourg, 27 Nov - 1 Dec 2022. Updated list of officially nominated candidate Emerald Network sites (December 2023). https://rm.coe.int/draft-list-of-candidate-emerald-network-sites/1680ad54a2

[126] https://www.protectedplanet.net/country/MNE

[127] https://data.worldbank.org/indicator/ER.LND.PTLD.ZS?locations=ME&type=shaded&view=map

[128] https://www.eeas.europa.eu/node/61066_en

[129] https://www.syke.fi/en-US/Research__development/Research_and_development_projects/Projects/Montenegro__Natura_2000_Establishment_of_Natura_2000_network_ECEuropeAid_20162019/Montenegro__Natura_2000_Establishment_of(53830

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habitat types and species distributions and to map the territorial scope with precise borders (in .shp format) to occupy at least 7.33% of the state territory[130].

However, in 2018 the country reported significant challenges for protected areas arising from a low level of trust between local populations and competent authorities, conflictual situations, and excessive pressures to biodiversity.[131] The national park management authorities have not fully engaged in the Natura 2000 planning process[132]. It was assessed that measures are needed to reconcile the needs for conservation and for development by involving the stakeholders into planning and management processes, so as to achieve socio-economic progress which would have minimal impact on biodiversity.[133]

The CGIS Bioportal[134] maintained by the Nature and Environment Agency is an up-to-date source of information on Montenegro's protected areas. This publicly available online platform, launched in 2017, allows users to discover protected areas, access statistics, and download current data, including details about area, national and IUCN categories, and zoning. This portal improves data availability, national planning, priority setting, and management of protected areas and biodiversity, making the national protected area system more transparent and open to public participation[135].

3.9.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

No policy framework for ecological connectivity is available and used at the moment[136].

3.9.3. SPATIAL PLANNING

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

The formal categorization of ecological corridors both in plans and on the ground remains uncertain and unclear. Montenegro has relevant legal frameworks for land-use/spatial planning, nature conservation, sectorial planning, as well as procedural aspects like strategic environmental assessment (SEA) and environmental impact assessment (EIA) laws. There are also legal mechanisms supporting protection, such as expropriation, and land-use permissions and the definition of public interest[137].

[130] Funded with EUR 299 926 from EuropeAid

[131] Montenegro government 6th national report to the Convention on Biological Diversity (2018). https://www.cbd.int/doc/nr/nr-06/me-nr-06-en.pdf

[132] https://www.eeas.europa.eu/node/61066_en

[133] 6th NR to CBD (see above)

[134] https://cloud.gdi.net/smartPortal/zppCG

[135] https://www.iucn.org/news/eastern-europe-and-central-asia/201706/national-portal-protected-areas-launched-montenegro

[136] personal communication with Birdlife Montenegro

[137] personal communication with Birdlife Montenegro

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3.9.4. FUNDING

FUNDING FOR PROTECTED AREAS

Montenegro receives support for its protected areas through international grants and projects. The development of the Emerald Network (and future Natura 2000 network) is being funded through the EU funds for pre-accession countries. An example:

> The 'Promoting Protected Areas management through integrated marine and coastal ecosystems protection in coastal areas of Montenegro' project is funded by the Global Environment Facility (GEF) Trust Fund and co-financed by the United Nations Environment Programme (UNEP) and Montenegro's Ministry of Ecology, Spatial Planning, and Urbanism[138]. This project aims to enhance the conservation and sustainable use of coastal and marine biodiversity through effective management of coastal and marine protected areas.

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

No dedicated funding is available at the moment[139].

[138] https://www.unep.org/regions/europe/our-projects/coast-adriatic-sea-better-protected-montenegro

[139] personal communication with Birdlife Montenegro

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3.10. POLAND

3.10.1. PROTECTED AREA NETWORK (TERRESTRIAL)

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

The Nature Protection Act[140] defines seven types of protected area designation as well as Natura 2000 sites and international designations.

Table 11. National and regional designation types, protection purpose and governance in Poland. Sources: (Pawlaczyk, 2023)

Designation type	Protection purpose and governance
National Park	Large areas (>1 000 ha) designated for conservation of all elements of nature and the landscape. Nature conservation is their main goal, in most cases overriding all other activities (strict protection). Designation requires a decision by parliament, followed by a governmental decree to establish the park's borders. All local assemblies must agree. Must have a buffer zone. Over 85% of the land within the current parks is state-owned. Each National Park has its own directorate and specialised staff, and generally manages land owned by the state within its boundaries.
Nature Reserve	Smaller areas designated exclusively for nature or landscape conservation, with site-specific conservation objectives. Strict protection similar to national parks. Must have a buffer zone. Land is mostly privately owned. Supervised by Regional Directorates of Environment Protection (RDOŚ or RDEP). Require a management plan, but less than half of the reserves currently have one.
Landscape Park	Area designated by the regional government (Voivodship Assembly) for landscape protection with some elements of biodiversity conservation, integrated with sustainable land use. Land uses such as agriculture and forestry are still continued, and the protection is achieved mainly by land-use planning. Corresponds to IUCN category V. Some parks have a specific management body (directorate), which may supervise compliance, implement its own conservation projects, organise stakeholder collaboration for landscape care, and implement education measures. In other cases, a few parcs from the same voivodships can be summoned in a Complex of parcs, which takes care of them all jointly. Require a management plan, but less than a third of the parks currently have one.
Landscape Protection Area	Large areas designated for general landscape protection, including ecological connectivity. The protection regime is only through some general restrictions on land-use planning, which lack clear biodiversity-related objectives, measures and monitoring. Corresponds to IUCN category V.
Landscape-Nature Complex	Unique landscapes, natural and/or cultural values, designated by the local community. Protection is achieved mainly by land-use planning, usually with no limitations on forestry, farming and hunting. They vary from small areas (several hectares) to a few thousand hectares.
Ecological Area	Smaller fragments of usually unmanaged land important for biodiversity (e.g. swamps, fens, natural ponds, dunes and oxbows), designated by the local community.
Natural Monument	Protected natural features of outstanding importance (e.g. monumental trees, erratic boulders, rocks, caves, waterfalls or springs) that are designated by the local community. 94% of them are trees.

Natura 2000 network: Poland has 864 SCIs and 145 SPAs (terrestrial and marine) (end 2020). The Commission considers that Poland still has to complete its Natura 2000 network to address some insufficiencies in designating SCIs and has taken legal action to address these gaps.

[140] https://leap.unep.org/en/countries/pl/national-legislation/nature-conservation-act-0

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OECMs: OECMs are not implemented in Poland (though they might be adopted in the future[141]).

Total terrestrial protected area: 39.6% of land area (excluding Biosphere Reserves, Natural Monuments, Ecological Areas and Nature Landscape complexes) (EEA BISE[142]).

Overlaps and protection levels: About half of the terrestrial protected areas are designated exclusively as nationally designated areas; 31.0% is covered solely by Natura 2000 sites, and the rest is covered by overlaps between the two (BISE). Most of the nationally designated area consists of Landscape Parks and Protected Landscape Areas.

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

Legal protection: The Nature Conservation Act defines the national protected area system and requires the establishment of management plans and buffer zones for National Parks, Nature Reserves and Landscape Parks (Pawlaczyk, 2023). The National Parks and Nature Reserves have strict protection regimes, but this refers only to the state-owned land within them (Pawlaczyk, 2023). In Landscape Parks, Landscape Protected Areas and Nature-landscape Complexes, the general protection system is based on a list of prohibited activities, but with general derogations for sustainable land uses, including forestry, farming, hunting and fisheries. There is widespread use of these derogations and agriculture and forestry does not differ in intensity inside and outside the protected areas.

Governance: The Ministry of Climate and Environment is in charge of supervising National Parks which have their own directorates and staff. The General Directorate of Environment Protection (GDOŚ) at the national level and the 16 Regional Directorates of Environment Protection (RDOŚ) are responsible for management of Natura 2000 sites and Nature Reserves, as well as species conservation.

Regional government organisations (environmental departments) are responsible for landscape protection, such as through Landscape Parks and Protected Landscape Areas, and general landscape assessment and care. The RDOŚ supervise landscape protection, reconciling all changes in Protected Landscape Area designations as well as land-use decisions within them and their buffer zones. The Landscape Parks' management plans have no legal power to enforce any modifications, although some parks do have dedicated staff (Pawlaczyk, 2023).

Local municipalities are responsible for establishing and managing small, protected areas: Ecological Areas, Nature-landscape Complexes, and Natural Monuments. RDOŚ also supervise local nature protection (Pawlaczyk, 2023).

Natura 2000 designation and management: In the Natura 2000 network, many SCIs have not yet been designated as SAC and have no conservation objectives and measures and no list of prohibited activities. For the Natura 2000 sites that do have defined conservation objectives, the quality of these objectives is considered to be insufficient as they are often not related to the parameters used to determine the conservation condition of the habitat types and species protected on the site (e.g. in relation to area, structure and functions or populations) (Pawlaczyk, 2023).

[141] WWF Poland, written input

[142] EEA BISE, https://www.eea.europa.eu/en/countries/eea-member-countries/poland

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3.10.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

The Polish Nature Conservation Act defines an ecological corridor as 'an area for the migration of animals, plants and fungi' but does not specify any legal mechanisms to designate and protect them (Chenevois, 2023). Landscape protected areas can be designated with the purpose of protecting a corridor (see table above).

The **National Spatial Development Concept 2030**, the national strategic land use planning document, includes the objective to shape spatial structures supporting the achievement and maintenance of high-quality natural environment and landscape values of Poland and emphasises the need to counteract the fragmentation of habitats and the creation of the best possible spatial ecological connections.[143] A plan for a network of ecological corridors was developed and included in the document, but there is no legally binding mechanism to implement it.

In theory, there is potential for the introduction of ecological corridors on forestland and freshwater and wetlands, as most of the Polish forests are managed by State Forests (an independent and self-financing state agency), and the state agency Polish Waters (state agency under the Ministry of Infrastructure) manages all public freshwaters since 2017.

3.10.3. SPATIAL PLANNING

Local municipalities are responsible for most aspects of spatial planning. Land-use planning in Poland has a hierarchical structure, encompassing national, regional (voivodship) and local levels, but only the local plans are legally binding.

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

Several ecological corridor projects have been carried out in Poland.

3.10.4. FUNDING

FUNDING FOR PROTECTED AREAS

The National Parks and landscape parks each get a set budget for each year from public funds overseen by Ministry of Environment. The Regional Directorates of Environment Protection, who manage the nature reserves and Natura 2000 sites, get funding mainly for their everyday work, employees and other activities, and do not or very rarely get money directly from the state budget specifically for the implementation of the management plans. The directorates, National Parks, and landscape parks are legal entities that can apply for EU funds or national funds; therefore, the employees are usually actively searching for project possibilities (mainly EU funded calls for proposals). Other protected areas do not have a set budget either. The main source of national funds is the National Fund for Environmental Protection and Water Management, which mainly is sourced from environmental fees paid by private companies.

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

There is no fund for ecological corridors or stepping stones in Poland. Polish EU funding programmes had several calls for proposals connected directly with ecological corridors in the past[144].

[143] KPZK (2026) NATIONAL SPATIAL DEVELOPMENT CONCEPT 2030. https://www.kooperation-ohne-grenzen.de/wp-content/uploads/2016/05/NSDC-2030.pdf

[144] WWF Poland written input

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3.11. ROMANIA

3.11.1. PROTECTED AREA NETWORK (TERRESTRIAL)

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

Table 12. National and regional designation types, protection purpose and governance in Romania. Sources: (Stanciu et al, 2023).

Designation type	Protection purpose and governance
Scientific Reserve (Rezervatie stiintifica)	Provides strict protection of natural ecosystems (0.07 % of the national protected areas, IUCN Category I
National Parks (Parc national)	National Park, aims to conserve natural ecosystems and maintain natural processes, with limited human interventions in core areas, allowing only for sustainable tourism, education and traditional use of grazing areas for local communities. Core area coverage is less than 75% in most National Parks. IUCN Category II
Natural Monuments (Monument al naturii)	Natural Monument, designated to conserve exceptional natural features (spectacular rocks, gorges, lakes, fossils sites, caves, waterfalls, etc.). IUCN Category III
Nature Reserves (Rezervatie naturala)	Nature Reserve, established for the conservation of natural and semi-natural habitats and valuable species that need active conservation management measures. This type includes marine reserves. IUCN Category IV
Natural Parks (Parc natural)	Natural Park established for the conservation of natural and cultural landscapes and to promote responsible use of natural resources for the sustainable development of local communities. IUCN Category V

Natura 2000 network: Natura 2000 sites make up 87.2 % of the total terrestrial protected area.

Total terrestrial protected area: Protected areas in Romania cover a total of 55,890 km², which is 23.4% of the national territory (BISE[145]). Many of the terrestrial protected areas of national interest overlap with the Natura 2000 sites.

OECM: Romania is implementing a project under the National Resilience and Recovery Plan that aims at developing a concept for and identifying possible OECMs (2020 to 2025)[146].

Overlaps and protection levels: The terrestrial protected area coverage is almost all due to designation as Natura 2000, with 77% of the area only designated as Natura 2000 and 20% as overlapping Natura 2000 and a national designation category (BISE[147]). Only 2.9% of the total protected area is under a national designation only.

[145] EEA BISE at https://biodiversity.europa.eu/countries/romania

[146] pers.com., Ministry of Environment, Forests and Waters

[147] EEA BISE, https://biodiversity.europa.eu/countries/romania

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Transboundary protected areas: Iron Gates Nature Park bordering Serbia's Djerdap National Park on the Danube. Transboundary Ramsar Sites between Romania and Bulgaria: Lake Calarasi (Iezerul Calarasi) (Romania) – Srebarna (Bulgaria); Suhaia (Romania) – Belene Islands Complex (Bulgaria); and Bistret (Romania) – Ibisha Island (Bulgaria).

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

The Ministry of Environment, the Water and Forests Agency and the Protected Area Agency (created within the Ministry in 2016) are formally in charge of all protected areas. Their management is subcontracted mainly to the state-owned forest company RNP Romsilva which manages 22 out of the 29 national parks (Chenevois, 2023). Romsilva is therefore the biggest protected area administrating body. The Protected Area Agency is responsible for the Natura 2000 sites, some of which were managed by NGOs until a legal change in 2018 prevented this. Due to capacity constraints, it is very likely that sub-contracted custodians like NGOs will soon be managing the protected areas again (Chenevois, 2023).

The Danube Delta is a Biosphere Reserve and UNESCO site and since the early 1990s, has its own administration, the Danube Delta Biosphere Reserve Administration (DDBRA, https://ddbra.ro/). It is led by a Governor who is assimilated to a secretary of state. The administration is directly under the Ministry of Environment, Water and Forests. The budget comes from the Ministry.

The Fundatia Conservation Carpathia (https://www.carpathia.org/) is a privately managed protected area, a unique case in Romania. Since its inception in 2009, the foundation has purchased over 26 900 ha of forests and alpine meadows in the south-eastern Carpathians for restoration and full protection. The initiative aims to obtain the highest legal protection level for all acquired land, and already over 8 000 ha of forests have been declared as non-intervention zones in the Făgăraș Mountains Natura 2000 management plan or have been included as core areas of the Piatra Craiului National Park. Almost 1 000 ha of these forests are completely untouched, and part of this area has already been introduced into the National Catalogue of Virgin and Quasi-virgin Forests, in order to protect these areas in perpetuity. The presence of the Fundatia Conservation Carpathia rangers, patrolling an area of over 75 000 ha, has also led to a complete stop of illegal logging in the neighbouring forests.

3.11.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

The spatial planning legislation mentions ecological corridors, but Romania does not yet have a method to officially identify and designate ecological corridors (Chenevois, 2023). Law 350/2001 on Spatial and Urban Planning specifies that territorial management aims, among other targets, to ensure the protection of natural and semi-natural landscapes, biodiversity conservation and the creation of ecological continuity.

In 2014, a working group and discussions were started to create a method and process, but they have not produced any concrete results.

The Romanian National Strategy for the conservation of biodiversity for the period 2013-2020 and Romania's Sustainable Development Strategy 2030 (Goal 14, Goal 15) refer to the need for ecological connectivity (Romania Regional Development Program, 2013).

Romania is a signatory of the **Lower Danube Green Corridor Declaration**[148].

[148] TransNature map of transboundary protected areas. https://www.transnature.eu/map (accessed 3 January 2024)

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3.11.3. SPATIAL PLANNING

The Romanian spatial planning system consists of the National Spatial Plan (Planul de amenajare a teritoriului national - PATN), County Spatial Plans, and Zonal Regional Spatial Plans (ZRSP) (ConnectGREEN, 2021).

According to L350/2001-2011 (art. 41), the National Spatial Plan (NSP) has a directive character, and all its provisions are mandatory for the other spatial planning documents, which should detail its provisions for each specific territory. The national plan is composed of 8 sectoral plans, each of them adopted as laws, including Section III - Protected Areas[149], in which the natural protected areas are integrated in a protected area network. Another law delimits the biosphere reserves, national parks and nature parks and establishes their administrations[150].

The County Spatial Plans, managed by the County Council, detail long, medium and short-term measures to tackle problems and disparities identified in the county. These plans determine the core areas (10-100 km²) and connecting corridors between these areas (e.g. natural river valleys, semi-natural recreation areas for local settlements).

The Zonal Regional Spatial Plan should cover the territory of each region. It has a guiding character, coordinating the implementation of development programs and projects at regional level, in order to tackle specific sectoral problems. According to the law, the Zonal Regional Spatial Plan is initiated and elaborated by the Ministry of Rural Development and Public Administration and should substantiate the Regional Development Plans and ensure vertical coordination between the national and county plans. The Comprehensive Urban Plans determine the function of small habitats, woodlots, wetlands, grassland, patches, ponds (<10 km²) and connecting corridors (stream banks, hedgerows, field verges and ditches).

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

According to the law, protected natural areas and ecological corridors must be highlighted in national, zonal and local urban and spatial plans, in cadastral plans and land books, by the National Agency for Cadastre and Real Estate Advertising as well as by the central public authority for agriculture (ConnectGREEN, 2021). Since there is no official methodology on how to identify ecological corridors and there have been no designations, there is no implementation of this rule. The main spatial planning tool for ecological connectivity is the spatial planning system on different levels: local, regional and national. Another tool is the protected areas' network. One of our protected area forms is Protected Landscape Area, which, according to the Natura Conservation Act, may perform a role of ecological corridor or the obligation of maintaining ecological coherence of the Natura 2000 network according to Natura 2000 network.

The Interreg-funded ConnectGREEN project identified and mapped ecological corridors for large carnivores in the Carpathians that were agreed upon with national experts (ConnectGREEN, 2021). However, this map is a visualization of international and national ecological corridors that are not legally binding.

3.11.4. FUNDING

FUNDING FOR PROTECTED AREAS

The main funding source for protected areas is the state budget and the Romsilva budget. The protected areas managed by Romsilva and the Danube Delta Biosphere Reserve

[149] approved by the Law no. 5 from 6 March 2000
[150] Government Decision no. 230 of 4 March 2003

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generate some income through timber production and tourism. In 2023, Romsilva paid nearly EUR 9 million for the parks they oversee, and the parks generated almost EUR 1 million[151].

Protected areas implemented projects with a total value of EUR 20 million in the 2014-2020 period[152], most of them financed by European funds (notably through the Operational Programme for Large Infrastructure funded by the ERDF and Cohesion Fund). In the 2021-2027 period, the Sustainable Development Operational Program (PODD) continues financial support for the development or updating of management plans for the Natura 2000 network, especially for those areas with infrastructure investment projects.

The National Resilience and Recovery Plan allocated EUR 370 million funding for a reform of the management system of protected natural areas, including EUR 125 million for updating management plans and identifying potential strict protection areas, and EUR 245 million for integrated investments in the restoration and conservation of species rich meadows and wetlands.

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

The National Recovery and Resilience Plan includes a measure (with a funding allocation of EUR 150 million) for removing obstructions from watercourses to facilitate the restoration of the connectivity of habitats and species dependent on water, and the restoration of elements that contribute to lateral connectivity. The funded interventions must be in accordance with the protected area management plans and with the river basin management plan. Other EU funds also finance connectivity projects in Romania. No public funding from the state is available for ecological corridors management and establishment.

[151] personal communication with a Romsilva representative

[152] personal communication with a representative of the Ministry of Environment, Forest and Waters

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3.12. SERBIA

3.12.1. PROTECTED AREA NETWORK (TERRESTRIAL)

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

Table 13. National and regional designation types, protection purpose and governance in Serbia. Sources: Law on Nature Protection issued 2009, last amendments in 2021.[153]

Designation type	Protection purpose and governance
National Park	A national park is an area with a large number of diverse natural ecosystems of national importance, with distinguished landscape characteristics and cultural heritage in which man lives in harmony with the nature, intended for conservation of the existing natural values and resources, with overall landscape, geological and biological diversity, as well as for meeting of scientific, educational, spiritual, aesthetical, cultural, touristic and health and recreational needs and other activities in accordance with the principles of nature protection and sustainable development. The forests within the national park shall be managed by the legal entity that manages the national park.
Nature Park	A Natural Park is an area of well-conserved natural values with mostly conserved natural ecosystems and picturesque landscapes, intended for conservation of the overall geological, biological and landscape diversity, as well as meeting of scientific, educational, spiritual, aesthetic, cultural, touristic, health-recreational needs and other activities harmonized with the traditional way of life and principles of sustainable development.
Strict Nature Reserve	A Strict Nature Reserve is an area of unchanged natural characteristics with representative natural ecosystems, intended exclusively for the conservation of the original nature and processes for scientific research and monitoring.
Special Nature Reserve	A Special Natural Reserve is an area of unchanged or insignificantly changed nature, of particular importance due to its uniqueness, rareness or representativeness, and which includes a habitat of an endangered wild plant, animal and fungi species, without settlements or with scarce settlements in which humans live in harmony with nature, intended for conservation of the existing nature characteristics and processes for scientific research and education, controlled visits and preservation of traditional way of life.
Natural Monument	A Natural Monument is a smaller unchanged or partially changed natural spatial entity, object or phenomenon, physically clearly distinguished, recognizable and/or unique, with representative geomorphological, geological, hydrographical, botanical and/or other characteristics, as well as a botanical value of scientific, aesthetic, cultural or educational significance, created by human labour.
Protected Habitat	A Protected Habitat is an area which includes one or more types of natural habitats that are significant for conservation of one or more populations of wild species and their communities.
Outstanding natural landscape	An outstanding natural landscape is an area of recognizable appearance with significant natural, biological-ecological, aesthetic and cultural-historical values, which developed in time as a result of interaction between the nature, natural potentials of the area and the traditional way of life of the local population.

Emerald Network/Natura 2000: No adopted sites, but 61 sites have been officially nominated as candidates for the Emerald Network.[154] These sites will become Natura 2000 sites upon

[153] Law on Nature Protection 2016. https://www.pregovarackagrupa27.gov.rs/wp-content/uploads/2021/06/LAW-ON-NATURE-PROTECTION-2016.pdf NB this is not the must up to date version of the law, but not much has changed in regards to protected areas.

[154] CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE AND NATURAL HABITATS. Standing Committee 43rd meeting Strasbourg, 27 November - 1st December 2022. Updated list of officially nominated candidate Emerald Network sites (December 2023). https://rm.coe.int/draft-list-of-candidate-emerald-network-sites/1680ad54a2

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accession to the EU. The total area of the proposed Emerald network in Serbia is around 10200 km^2, i.e. 11.54% of the territory of Serbia.[155]

Total terrestrial protected area covers 10.5% of land area according to one analysis[156]; covers approx. 7500 km^2 according to a national expert[157] (not including the proposed Emerald Network sites).

OECM: not in use in Serbia.

Transboundary protected areas: Djerdap National Park bordering Romania's Iron Gates Nature Park on the Danube. Part of the UNESCO Transboundary Biosphere Reserve Mura-Drava-Danube. Drina Transboundary Biosphere Reserve (TBR Drina) between Tara National Park (NP Tara) in the Republic of Serbia and Drina National Park (NP Drina) in the Republic of Srpska/Bosnia and Herzegovina.

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

The Nature Protection Law defines three categories of institutions that designate and govern protected areas in Serbia:

- Protected areas of international, national, i.e. exceptional significance are proclaimed by the National government; the Ministry of Environment is in charge of these areas.
- Protected areas of provincial/regional, i.e. high significance are proclaimed by the Provincial government; each provincial Secretariat for the Environment has responsibility for these areas.
- Protected areas of local significance are proclaimed by the local government, which is also in charge for them.

National parks are established through a legal act passed by the Parliament. For their management, a specific public enterprise is established by the government. A National Park is required to establish a stakeholder council and a scientific board, both of which play an advisory role.

Any other category of protected area can be managed by any legal entity including public company, NGO, public utility company, church, etc. In practice, most of the protected areas in Serbia are managed by public forest companies.

The proposal for 61 Emerald Network sites is waiting for adoption by the Bern Convention. The first list of Emerald Network sites (and at the same time potential SCIs and SPAs for Natura 2000) was prepared by experts in the EU for Natura 2000 in the Serbia project in the period 2019-2021.

The Law of Nature Protection requires ten-year management plans for protected areas in Serbia (with exemptions for small, protected elements)[158]. A tool has been developed to incorporate the Natura 2000 management planning into the national protected area plans.

[155] http://www.natura2000.gov.rs/en/emerald-network/

[156] Mari et al. 2022 cited by (Chenevois, 2023)

[157] Goran Sekulic, personal communication

[158] http://www.natura2000.gov.rs/en/management-plans/

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3.12.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

The Serbian ecological network map was created according to the Law on Nature Conservation Article 38.[159] Currently, it covers mainly larger and smaller watercourses including structural and functional connectivity and ecosystem services. The Institute for Nature Conservation of Vojvodina maintains a digital database containing the vector-displayed boundaries of Ecological Network areas and a map of ecologically important areas. However, the Law on Nature Protection (updated 2009, 2010, and 2016) does not clearly define the protection and management of ecological corridors. The Serbian Regulation on the Ecological Network established in 2010 defines the ecological network as consisting of 1) ecologically significant areas; 2) ecological corridors that connect ecologically important areas present on the national territory, as corridors of national importance and ecological corridors that enable connection with ecological networks of neighbouring countries, in accordance with international regulations and considered as ecological corridors of international importance; 3) protection zones where it is necessary to protect ecologically significant areas and ecological corridors from possible harmful external influences.[160] However, the regulation defines only basic protection measures without specified obligations or restrictions and the provisions have not been fully implemented. According to interviewees, there are not enough resources for an adequate management and functioning of the network (Chenevois, 2023). Conflicting legislation is threatening the protection and management of ecological connectivity, especially in the water sector.

3.12.3. SPATIAL PLANNING

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

Spatial planning practice in Serbia refers to the planning of ecological corridors. The regional spatial plans must outline spatial determinants and protection measures for the special purpose areas. The municipal spatial plans must map all levels of ecological corridors, but without established adequate measures for their protection. In reality, there are very few plans with clear spatial determinants on maps. The exceptions are spatial plans in the territory of the Autonomous Province of Vojvodina where the provincial institute holds relevant data on ecological connectivity and is engaged in spatial plan development.

The planning law provides the opportunity for stakeholders (including those from the environmental sector) to engage in public discussion in several stages of plan development. In practice, these participation processes are not very effective and are usually reduced to minimal legal requirements. They also very much depend on the initiative of the plan developers, who rarely proactively seek involvement from other stakeholders, especially non-institutional actors. There are significant issues with illegal construction in protected areas (Pantić, Zivanovic Miljkovic and Milijic, 2019).

3.12.4. FUNDING

FUNDING FOR PROTECTED AREAS

The following funds for protected areas are available:

- National, regional (provincial) or local budgets make up ca. 10% in average of the funds needed.

[159] http://www.natura2000.gov.rs/en/ecological-network-of-the-republic-of-serbia/

[160] https://www.fao.org/faolex/results/details/en/c/LEX-FAOC196060/

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- Charges for the use of protected areas are an important income source and make up approx. 50% of the total income.
- Own income, which represents mainly the income gained from forestry via state forestry companies. In many protected areas, this is the most significant source of income; in national parks, it provides over 60% of the budget.
- International and national projects that support short-time pilot activities, but not the management itself.

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

There are no specific funds earmarked for ecological corridors.

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3.13. SLOVAKIA

3.13.1. PROTECTED AREA NETWORK (TERRESTRIAL)

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

The national legislation distinguishes five degrees of nature protection, with increasing levels of restrictions defined:

- 5th degree: the least strict level of protection – provides general protection for nature. Applied to the whole territory of Slovakia that is not a protected area.
- 4th degree: Imposes moderate restrictions on activities, allowing sustainable human use. Corresponds to IUCN Category: V (Protected Landscape/Seascape). Applied to Protected Landscape Areas and other larger areas; protects biological diversity, ecological stability, and characteristic landscape features.
- 3rd degree: Applies stricter limitations on activities, focusing on minimal human interference, for the purpose of conservation of largely undisturbed ecosystems or biotopes of significant importance. Corresponds to aspects of multiple IUCN Categories: II (National Park), V (Protected Landscape/Seascape), VI (Protected Area with sustainable use of natural resources). Applied to nature reserves and National Parks, unless specified otherwise in the area's designation statute.
- 2nd degree: More stringent regulations confer high level of protection, limited human activities. Applied to National Parks and other designated areas.
- 1st degree: Highest level of protection, preserving critical habitats and species with minimal human impact. Restrictions are very strict, prohibiting almost all activities that could alter the natural state. Applies to small-scale protected areas referred to as (National) Nature Reserves or Monuments.

Table 14. National and regional designation types, protection purpose and governance in Slovakia. Sources: (Sefferova Stanova and Rybanic, 2023) & enviroportal.sk, Slovak Environmental Agency & data.sopsr.sk/chranene-objekty/ & biomonitoring.sk/

Designation type	Protection purpose and protection level
National Parks (národný park)	A large-scale protected area (VCHÚ), usually with an area of more than 10,000 ha, predominantly with ecosystems substantially unchanged by human activity or in a unique and natural landscape structure, forming the most significant natural heritage, in which nature conservation is superior to other activities. Parks are declared by the government with a regulation. The third degree of protection applies to its territory, unless defined differently in the park regulation. As of 2022, all 9 national park authorities became independent organisations separate from the Slovak National Park Administration. They manage the state forest land within the park.
Protected Landscape Areas (chránená krajinná oblasť)	A large-scale protected area (VCHÚ), usually with an area of more than 1,000 ha, with scattered ecosystems, important for the preservation of biological diversity and ecological stability, with a characteristic appearance of the landscape or with specific forms of historical settlement. Declared by the Government by regulation. The second degree of protection applies, unless otherwise provided by law.
Nature Reserves	A small, protected area (MCHÚ) or location, usually with an area of up to 1 000 ha, which represents original or little-altered by human

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(prírodná rezervácia)	activity biotopes of European or biotopes of national importance or biotopes of European species or biotopes of national importance. Declared by the government by regulation. The third or fifth degree of protection applies to its territory.
National Nature Reserves (národná prírodnú rezerváciu)	Nature reserves that are declared because they represent a supra-regional bio-centre that forms part of the most important natural heritage of the state.
Natural Monuments (prírodná pamiatka)	A small, protected area (MCHÚ), point, linear or other small-scale ecosystem, with components or elements, usually up to 50 ha, which have scientific, cultural, ecological, aesthetic or landscape significance. Declared by the government by regulation. The third or fifth degree of protection applies to its territory.
National Natural Monuments	Natural monuments that are declared because they form part of the most important natural heritage of the state. Declared by the government.
Protected Sites (chránený areál)	A small protected area (MCHÚ) or location, usually with an area of up to 500 ha, on which there are biotopes of European importance or habitats of national importance, or which is the habitat of a species of European importance or the habitat of a species of national importance and where the favourable condition of these habitats depends on human management. Declared by the government by regulation. The second, third, fourth or fifth degree of protection may apply to its territory, depending on the site designation.
Community Protected Areas (obecné chránené územie)	A small, protected area (MCHÚ) or locality, usually with an area of up to 100 ha, with cultural, scientific, ecological, aesthetic or landscape significance. Declared by the municipality by means of a generally binding regulation in which the conditions for its protection are stated.
Protected Landscape Elements (chránený krajinný prvok)	A small, protected area (MCHÚ) of landscape element that fulfils the function of a bio-centre, bio-corridor or interaction element of particular local or regional importance. Declared by the government by regulation. The second, third, fourth or fifth degree of protection applies in its territory.
Private Protected Areas (súkromné chránené územie)	The owner of such land, which meets the conditions established by Act No. 543/2003 Coll. for a protected area, nature reserve or natural monument and has not yet been declared protected, may apply to the district office in the seat of the region for the declaration of a private protected area, private nature reserve or private natural monuments. Can be in IUCN Categories II, IV or VI, depending on the degree of protection provided by the designation.
Natural Parks (prírodný park)	A large-scale protected area (VCHÚ), usually with an area of more than 500 ha, mainly with ecosystems altered by human activity, which form bio-centres of supra-regional importance, or which are important for ensuring the favourable condition of biotopes of European importance, biotopes of national importance, biotopes of species of European importance or biotopes species of national importance. It can be declared by the government. The second or third degree of protection applies to its territory, unless otherwise provided by law.

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	No protected area in this category has been declared as of December 2022.

Natura 2000 network: 29.8% of the land area (Sefferova Stanova and Rybanic, 2023). The protected bird areas (SPA - CHVÚ) represent 26.20% of the area of the Slovak Republic. The territory of European importance sites (SAC - ÚEV) represent 12.56% of the area.

Total terrestrial protected area: 37.4% of land area (EEA BISE[161])

OECMs: As of May 2021, Slovakia has no OECMs reported in the world database, but potential OECMs are under consideration. The new Biodiversa+ project 'PAREUS' has the aim of identifying potential OECMs with the Slovak Academy of Sciences as a partner.

Overlaps and protection levels: Slightly more than a third of the terrestrial protected areas are designated solely as Natura 2000 sites with further 42.4% in areas where Natura 2000 sites overlap with national designations (EEA BISE).

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

The State Nature Protection legislation in the **Act No. 543/2002** on **Nature and Landscape Protection** governs the protection of the country's natural environment, establishes the Terrestrial System of Ecological Stability (TSES) of public interest, the national network of protected areas, and a European network of protected areas. The nature protection legislation has been revised several times to harmonise it with EU and international legislation. It is amended and implemented by two decrees which provide regulations for defining, designating and managing protected areas, the protection of endangered species and habitats, and the implementation of environmental impact assessments[162]. The decrees also establish a system for issuing permits and authorizations for activities that may affect the environment (Izakovičová and Świąder, 2017). The consent of nature protection authorities is required to carry out activities in protected areas (Sefferova Stanova and Rybanic, 2023).

The Slovak Republic has a high density of protected areas, but many areas were not created in accordance with international standards (especially during the communist regime) and were often created without sufficient cooperation with owners and land users.

The Ministry of the Environment has responsibility for the designation of new large-scale protected areas (National Parks, Landscape Protected Areas), except private protected areas or community protected areas. The regional environmental district office deals with new designations of small-scale sites. The State Nature Conservancy[163] usually prepares the proposal and supporting documentation for new protected areas (Sefferova Stanova and Rybanic, 2023).

The State Nature Conservancy manages the Landscape Protected Areas and the Natura 2000 sites in their area of competence, prepares legislation and does inventory work. Each of the nine national parks is managed by its own administration, which are independent of the Slovak National Park Administration since 2022. The Slovak Ministry of Agriculture and Rural Development is responsible for the management and economic use of forests outside and inside all protected areas except National Parks at the 4th and 5th levels of protection. The Institute for Environmental Policy is the state supervisory authority through which the Ministry carries out state supervision on nature protection law compliance and imposes sanctions on natural persons, entrepreneurs and other legal persons pursuant to the Nature Protection

[161] EEA BISE, https://biodiversity.europa.eu/countries/slovakia

[162] Decree No. 24/2003 Coll. and Decree No. 492/2006 Coll.

[163] Štátna ochrana prírody Slovenskej republiky, ŠOP SR

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Act[164]. The institute informs the Ministry about implementation, orders necessary corrective measures to remedy any deficiencies found and fulfils other control duties.

In 2019, the new national environment strategy to 2030 set goals for the protected area system[165]. The strategy sets the goal of reviewing and simplifying the system of protected areas and degrees of protection considering the IUCN international criteria, including goals for expanding strict protection. The re-assessed national parks that are classified under IUCN category II will have a core zone without human intervention reaching 50% of the total area of the national park by 2025 and 75% of this area by 2030. Logging will be prohibited in non-interference zones and environmentally friendly land management will be preferred in areas with active management. The reassessment will compensate landowners whose property rights are affected.

3.13.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

The national ecological network known as the Territorial System of Ecological Stability (TSES or ÚSES) is a non-legally binding system with the goal of restoring and connecting natural elements in the country and maintaining or improving the ecological stability of the territory. and maps the nationally strategic corridors. The TSES as defined in the Nature and Landscape Act is a spatial structure of interconnected ecosystems, to safeguard the diversity of conditions and forms of life in the landscape. It includes bio-centres, bio-TSES corridors, interacting elements and ecostabilising measures of supra-regional (STSES or SUSES), regional (RÚSES) (district) or local importance (LTSES or MÚSES). TSES (Territorial System of Ecological Stability) is a document that defines the current state of the ecological quality of the area and represents the basis for achieving ecological stability. It is prepared at the national (state, the whole country), regional (8 regions in SK currently) and municipality levels (towns, villages). Ecological corridors are part of TSES of all levels.

The TSES, also referred to as the Regional Territorial System of Ecological Stability of the Landscape[166], was first mapped in 1985 and adopted in 1991 and has since gone through several cycles of planning. RÚSES I in the decade 2010 to 2020 established regional plans at a scale of 1:50 000 with the objectives of evaluating the state of the landscape, landscape development plans, and proposing management measures to increase ecological stability. The regional TSES documents were refined during RÚSES II (2020-2023). Funding has come from various EU operational programmes. [167]

Based on the decree of the MoE, regional and municipality TSES forms the basis for:

- the region's spatial plan and the municipality's spatial plan,
- the decision-making of nature protection authorities,
- and the practical care of specially protected parts of nature and landscape.

The Act on Territorial Planning and Construction Order (Building Act)[168] defines that the elements of TSES are obligatory regulative on all level of territorial plans. The Act on Land Arrangement and Land Ownership (No. 331/1991) defines that the TSES is an obligatory basis of each Land Arrangement Project; in which the elements of the TSES and important

[164] https://www.minzp.sk/en/iep/

[165] (2019) Greener Slovakia. Strategy of the Environmental Policy of the Slovak Republic until 2030. https://www.minzp.sk/files/iep/greener_slovakia-strategy_of_the_environmental_policy_of_the_slovak_republic_until_2030.pdf

[166] RÚSES I – Regionálnych Územných Systémov Ekologickej Stability (2010-2020)

[167] https://doi.org/10.1007/978-3-319-94018-2

[168] Act No. 50/1976 Coll. on spatial planning and building regulations (Building Act)

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landscape elements are considered as common arrangement (Izakovičová and Świąder, 2017). The need for improving the TSES function might be accepted as a legal cause for the enactment of the land arrangement procedure. Both laws specify that the TSES should be considered in matters relating to construction activity, but also in management of land by owners and users.

However, there are challenges related to the implementation, lack of compensation due to financial instruments, data accessibility, and the need for regulatory instruments to support the ecological network plans.

3.13.3. SPATIAL PLANNING

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

The Territorial System of Ecological Stability (TSES) requires a top-down approach for achieving ecological continuity, from national to regional/county/local levels. It consists of planning documents (USES) at the supra-regional (STSES or SUSES), regional (RÚSES) (district) or local importance (LTSES or MÚSES) level.

The TSES plan at the national level is at the scale of 1:200 000 – 1:500 000 and maps the nationally strategic corridors. It was created in 1985 and adopted in 1991, together with the ecological network concept.[169]

Landscape Ecological Plans are elaborated at the regional level and the municipal level, with the focus on landscape ecological analysis, assessment and optimisation of functional use in line with landscape ecologic potentials and limitations for development. The plans are prepared by regional and local authorities cooperating with experts (planners, environmental experts). Ecological corridors should be an integral part of the regional and local master plans and the corridors that are outlined there are legally anchored, according to the Centre of Excellence in spatial planning (SPECTRA). Building activities are only allowed under strict conditions.

The local (municipal) level MÚSES documents have a scale of 1:10 000 and form the obligatory basic material for the municipal territorial plan and land consolidation projects (Miklós, Diviaková and Izakovičová, 2019).

Reportedly, there can be a disharmony between the different levels of the USES at the borders of different regions (Izakovičová and Świąder, 2017; Miklós, Diviaková and Izakovičová, 2019).

- Slovakia: Mapping and Assessment of Ecosystems and their Services

A methodology for mapping and assessment of ecosystems and their services was published in 2020[170]. It identifies individual ecosystems and their spatial distribution, status, and selected properties. Ecosystem mapping is not part of spatial planning, but it may be considered in future.

OP KŽP Green municipalities of Slovakia, National project [171] https://www.zeleneobce.sk/

The implementation of the national project will contribute to the expansion of species and the growth of biological diversity even outside protected areas. The implementation of the national project is a measure aimed at the preservation and restoration of biotopes in the territory of the Slovak Republic, which is not directly protected through the Natura 2000 system, which will lead to the improvement of connectivity between existing protected natural areas with the aim of preventing fragmentation and increasing ecological cohesion.

[169] https://dx.doi.org/10.3390/land11071013

[170] http://www.sopsr.sk/files/hodnota-ekosys.pdf

[171] https://pmis.sazp.sk/detail-projektu/120

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- ConnectGREEN https://www.sazp.sk/projekty-eu/connectgreen

Restoration and management of biocorridors in the mountainous regions of the Danube basin.

3.13.4. FUNDING

FUNDING FOR PROTECTED AREAS

Slovakia has a National Environmental Fund. The national state budget is used for compensations to owners and farmers to secure the strictest protection in the existing protected area network (usually protection level 5). Landowners receive this funding in return for restrictions on management, especially in forest ecosystems. A certain part of the budget is also dedicated to the gradual purchase of private land in protected areas, again with priority in the higher protection levels. Once the land has been bought, it is owned and managed by the state.

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

In the context of the TSES, the state budget cannot be used outside protected areas. Insufficient financing is a brake on the implementation of the TSES system (Sefferova Stanova and Rybanic, 2023).

The funding sources for ecological connectivity in Slovakia include the EU funding instruments and national funds from the State Budget, Environmental Fund, and Green Education Fund allocated for ecological connectivity projects.

Examples of EU funded ecological connectivity projects are:

- Alps-Carpathian River Corridor (ERDF funded project 2017-2020)
- ConnectGREEN is funded by European Union funds (ERDF, IPA III, ENI)
- OBWIC – Open Boarders for Wildlife in the Carpathians (HUSKROUA/1702/6.1/0010, 2019-2022)

The LIFE integrated project NATURA 2000 SVK (2021-2030)[172] is funding the implementation of the Prioritized Action Framework for Natura 2000 in Slovakia, including the goal to ensure the coherence of the Natura 2000 network through identifying ecological connectivity elements (ecological corridors, stepping stone habitats…) and applying measures for their protection through relevant policies and instruments.

[172] LIFE19 IPE/SK/000003 at https://www.prirodaprevsetkych.sk/en/home/

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3.14. SLOVENIA

3.14.1. PROTECTED AREA NETWORK (TERRESTRIAL)

The Nature Conservation Act (NCA), known as 'Zakon o ohranjanju narave', provides the legal provisions and guidelines for the establishment and management of protected areas in Slovenia[173]. The Act was adopted in 1999 and has been amended several times.[174].

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

Table 15. National and regional designation types, protection purpose and governance in Slovenia. Source: (Skoberne, 2023)

Designation type	Protection purpose and protection level
Strict Nature Reserve	A Strict Nature Reserve is an area of naturally preserved geotopes, habitats of threatened, rare or representative plant or animal species, or an area important for biodiversity conservation where natural processes occur without human influence. All activities, including access, are prohibited. Currently there is only one very small Strict Nature Reserve in Slovenia.
Nature Reserve	Nature Reserves are areas of geotopes, habitats of threatened, rare or representative plant or animal species, or an area important for biodiversity conservation that is maintained through sustainable human activity. Only activities that maintain the character of the reserve are allowed.
Natural Monument	Natural Monuments are areas containing one or more Valuable Natural Features that have an outstanding form, size, content or location, or that are a rare example of a Valuable Natural Feature. Activities that might adversely affect the state of a Valuable Natural Feature, or reduce its aesthetic value, are prohibited. All other activities, including visits, are allowed.
National Park	A National Park is a large area possessing numerous Valuable Natural Features and high biodiversity. Nature in its near-original state, with intact ecosystems and natural processes, is present in the majority of the park (i.e. wilderness areas). Smaller areas with human influence may occur, but in harmony with nature. At least two protection zones are defined, including a core zone with no economic activities, although recreation and visitors are allowed. There is currently only one in Slovenia (Triglavski narodni park).
Regional Park	Regional Parks are extensive areas of ecosystems and landscapes characteristic of the region, with large areas in a natural state and areas of Valuable Natural Features interwoven with parts of nature where human influence is relatively substantial but in harmony with nature.
Landscape Park	Landscape Parks are areas with an emphasis on the high quality and long-term mutual interaction of people and nature and with high ecological, biotic and landscape value (cultural landscape).

Natura 2000 network: Natura 2000 sites cover about 37% of the country's territory[175].

Total terrestrial protected area covers 40.5% of land area (EEA BISE[176])

OECMs: No OECMs have been defined.

[173] Zakon o ohranjanju narave (Uradni list RS, št. 96/04 – officially consolidated text, 61/06 – ZDru-1, 8/10 – ZSKZ-B, 46/14, 21/18 – ZNOrg, 31/18, 82/20 and 3/22 - ZDeb): www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO1600; English translation: www.pisrs.si/Pis.web/npbDocPdf?idPredpisa=ZAKO6877&idPredpisaChng=ZAKO1600&type=doc&lang=EN (last accessed 28 March 2022)

[174] WWF-Adria personal communication

[175] https://natura2000.gov.si/en/natura-2000/natura-2000-in-slovenia/

[176] https://biodiversity.europa.eu/countries/slovenia

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Overlaps and protection levels: The majority (93.3%) of terrestrial protected areas are designated both as Natura 2000 sites and under national laws, with a small portion designated solely under national laws (BISE).

Transboundary protected areas: Slovenia has two transboundary Biosphere Reserves with Italy and Austria,[177] and three Ramsar sites (8 205 ha[178]). The Triglav National Park in Slovenia and the neighbouring Natural Park of the Prealpi Giulie in Italy are recognised by the EUROPARC federation as the Julian Alps Ecoregion transboundary area and are in the process of becoming an UNESCO MAB Transboundary Biosphere Reserve.[179] In 2014, the Alpine Convention certified the parks as a pilot transborder region for ecological connectivity. Slovenia is part of the European Green Belt.

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

In Slovenia, there are specific policies and strategies that significantly influence the designation of protected areas at the national, regional, and local levels. The Nature Conservation Act regulates the conservation of biodiversity and valuable natural features (e.g. geological phenomena, caves, gorges, waterfalls, lakes and exceptional trees). The act establishes the ecological network and system of protected areas.

The act also lays down the responsibilities of the state and local communities. Landowners must be able to demonstrate that required ecological and social functions (such as in forest plans) are being met on their property, including by allowing free public access.

3.14.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

The Nature Conservation Act defines a general obligation that biodiversity conservation measures and the system for the protection of valuable natural features are integrated into spatial planning and the use and exploitation of natural assets. This legislation serves as the basis for the establishment and management of ecological corridors to facilitate the movement of wildlife and the conservation of natural habitats. The Ministry of Natural Resources and Spatial Planning is the responsible government body.

3.14.3. SPATIAL PLANNING

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

The long-term strategic spatial development document of the Republic of Slovenia is the Spatial Planning Strategy of Slovenia 2050, adopted by the government in June 2023, providing trends and key spatial challenges, objectives, priorities and guidelines for spatial development different topics and sectors to 2050.[180] According to the Spatial Planning Law, all spatial planning documents (regional spatial plan, municipal spatial plan, municipal detailed spatial plan, state detailed spatial plan) and sectoral development programmes must be in line with this strategy. The strategy specifies that one of the four elements of the spatial development

[177] https://en.unesco.org/biosphere

[178] https://www.ramsar.org/country-profile/slovenia

[179] TransNature map of transboundary protected areas. https://www.transnature.eu/map (accessed 3 January 2024)

[180] Resolution on Spatial Development Strategy of Slovenia (Official Gazette, 72/23, 33/): Resolucija o Strategiji prostorskega razvoja Slovenije 2050 (ReSPR50) (pisrs.si)

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concept is green infrastructure and recommendations for its implementation at regional and municipal levels[181].
The ministry published a study with maps and recommendations for spatial planners to address ecological connectivity in spatial planning and management of nature and other resources.

3.14.4. FUNDING

FUNDING FOR PROTECTED AREAS

Funding for protected areas is derived from a mix of national and EU sources. EU funding plays a significant role in supporting conservation efforts and management of protected areas[182]. The state budget of EUR 8 million per year provides the core financing of the Institute for Nature Conservation, public management bodies of protected areas, and co-funding for the Natura 2000–related activities of other public bodies.

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

There is no dedicated funding stream for ecological corridors or stepping stones. Funding can be covered by the funds dedicated to nature conservation activities described above.

[181] https://www.gov.si/en/policies/environment-and-spatial-planning/prostor-2/spatial-planning/

[182] Information from WWF-Adria

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3.15. UKRAINE

3.15.1. PROTECTED AREA NETWORK (TERRESTRIAL)

TYPES OF DESIGNATED PROTECTED AREAS (NOT INCLUDING NATURA 2000 & INTERNATIONAL)

Table 16. National and regional designation types, protection purpose and governance in Ukraine. Sources: Internal WWF Discussion paper on PA reform in Ukraine. Protected Planet database: https://www.protectedplanet.net/country/UKR

Designation type	Protection purpose and governance
Nature Reserves (Природні заповідники)	Nature reserves are declared with the aim of preserving in their natural state typical or unique for a certain landscape zone natural complexes with all their components, studying natural processes and phenomena occurring in them, developing scientific principles of environmental protection, efficient use of natural resources and environmental safety. Land and water areas with all natural resources are completely withdrawn from economic use and are provided to nature reserves in accordance with the procedure established by Art. 15 of the Law of Ukraine 'On Nature Reserved Funds' and other acts of Ukrainian legislation. The composition of nature reserves includes integral areas that are fully represented by natural ecosystems.
Biosphere Reserves (Біосферні заповідники)	Biosphere reserves are established under the UNESCO program 'Man and the Biosphere' within the framework of the Law of Ukraine 'On NRF.' They include various land types based on functional zoning and are subject to a differentiated regime of protection, reproduction, and use. The protected area aims at conserving valuable natural complexes and gene pools, with a regime like that of nature reserves. The buffer zone prevents negative impacts on the protected area from adjacent economic activities, following protection zone requirements. The zone of anthropogenic landscapes allows traditional land use but prohibits hunting. Biosphere reserves serve three functions: biodiversity conservation, sustainable development, and the development of the material and technical base. These functions are realized in three functional zones: natural cores (protected area), buffer zone, and transit zone (zone of human economic activity). The total territory of a biosphere reserve should be large, integrative, and include various land uses. Advisory councils involving stakeholders are established for management, and management plans are developed and implemented.
Regional Landscape Parks (Регіональні ландшафтні парки)	Regional landscape parks are nature conservation and recreational institutions created to preserve in their natural state of typical or unique natural complexes and objects, as well as to provide conditions for organised recreation. Regional landscape parks are organised with or without the withdrawal of land plots, water and other natural objects from their owners or users. Regional landscape parks are analogues of national natural parks, but at the local (regional) level, and are created by decisions of regional councils. The category was first introduced in 1992 by the Law of Ukraine 'On Protected Areas'. Since then, 82 RLPs have been established in different regions.
Local Landscape Reserves (Місцеві ландшафтні заказники)	As a rule, small natural areas are declared as reserves, where individual natural complexes and objects are identified, that require protection. Reserves (except for landscape reserves) often have targeted protection regime aimed at preserving a particular species(s) of flora or fauna, natural complex, geological environment etc. At the same time, the protection regime sometimes does not provide for conservation measures aimed at the rest of the environment. However, the conservation of one component of the landscape is impossible without the others, so the best choice is to create a landscape reserve that covers the entire natural complex. The designation of nature reserves is carried out without the seizure of land plots, water and other natural objects from their owners or users in accordance with Article 25 of the Law of Ukraine 'On NRF' According to the national legislation, reserves are divided into landscape, forest, botanical,

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	general zoological, ornithological, entomological, ichthyological, hydrological, general geological, paleontological and karst and speleological. - Forest reserves include areas of forests that have environmental, scientific, aesthetic and other values and require conservation. These may be fragments of old forests, wetlands or other forests with significant biodiversity. - Botanical reserves are created to protect valuable botanical objects - populations of plant species under state protection, rare plant communities and areas of typical vegetation, preserved in their natural state. Depending on the object of protection 3. Selection of sites for potential nature reserves, they may include forest, meadow, steppe ecosystems and other areas. - Ornithological reserves provide for the protection of areas valuable for birds. These include nesting sites (colonies, individual nests of rare species and buffer zones around such nests, places of seasonal gatherings of birds during migration and wintering). - Entomological reserves include habitats of insects protected by the Red Book of Ukraine and other environmental documents, as well as habitats of natural pollinators. They include can be steppe beams, places of accumulation of old-growth trees, such as old oaks, whose wood is a place for the development of deer beetle larvae. - Ichthyological reserves are created to protect the habitats of rare fish species and integral fish communities, as well as to protect fish spawning grounds. Such areas are usually water bodies, including floodplains of rivers with oxbows, sections of the natural channel of unregulated rivers, upper reaches of rivers, and floodplains of rivers with oxbows. - General zoological reserves are created to protect faunal complexes and areas necessary for the conservation of protected animal species. protected species. The territories for the creation of such reserves can be very diverse and depend on the habitat needs of the of the species to be protected. - Hydrological reserves include water bodies (rivers, streams, lakes, swamps, marshes, floodplains and floodplains) that are of great natural value. When creating such reserves, it is desirable to include the natural complex in its entirety (for example, a river with a floodplain, a stream with a wetland from which it originates, etc.). - General geological reserves are created to protect geological formations that are valuable for science. geological formations (rocks, rock outcrops, gypsum flow formations, etc.). - Paleontological reserves are created in places where layers of earth are exposed as a result of geological processes on the surface expose layers of the earth's surface in which fossilised remains of prehistoric living organisms are found. Examples of such areas are the Druzhkivka Fossil Trees tract in Donetsk Oblast and Maryina Mountain in Luhansk Oblast, with outcrops of prints of prehistoric organisms. - Karst and speleological reserves are created to protect against damage to caves, karst formations, and their unique biodiversity. - Landscape reserves are optimal for protecting all elements of the natural landscape, flora and fauna Local landscape areas occupy 34.7% of the total area of protected areas in Ukraine and 38.5% of their number.

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Natural Monuments (Пам'ятки природи)	Natural monuments are individual unique natural formations that have special environmental protection, scientific, aesthetic, cognitive and cultural significance, with the aim of preserving them in their natural state. This status can be granted to both natural areas with a certain area, as well as individual objects, such as rocks, stones, and individual trees. Natural monuments are divided into complex, botanical, zoological, hydrological and geological. Complex natural monuments, as well as landscape reserves, include all natural, and sometimes also historical and cultural sites within their boundaries. These can include areas of natural ecosystems, ancient settlements, ramparts and mounds that are now covered with natural vegetation. Some historical and archaeological monuments are protected within natural monuments. Geological sites in geological natural monuments can be areas exposed during the development of mineral deposits and rocks that are not actually natural territory, but have an educational, scientific and aesthetic role. For example, such an object is the Basalt Pillars natural monument in Rivne region. Botanical, zoological, hydrological and geological natural monuments are created to protect individual objects: centuries-old and memorial trees, rocks, unusual geological formations, springs, trees with nests rare birds, etc. Accordingly, a natural monument is a category of protected areas that can be located both within natural landscapes and on the territory of settlements. Similarly, to nature reserves, nature monuments are a category of protected areas with so-called subject protection and protect only the main object included in their composition. The best way to preserve small natural areas is to create reserves and natural monuments of local significance under a simplified procedure for their declaration at the local (oblast) level. Because natural monuments may have a small area (or even have no area at all), there are many of them (41.7% of the total number of protected areas in Ukraine and 0.75% of their area).

Protected area network - Nature Reserve Fund (NRF): As of January 2022, the composition of the NRF is:

- Biosphere Reserves: 5 sites, covering 479 110 hectares.
- Nature Reserves (strict protection): 19 sites, encompassing 206 630 hectares.
- National Nature Parks: 53 sites, spanning 1 388 816 hectares.
- Regional Landscape Parks: 87 sites, covering 829 108 hectares.
- Other NRF Sites: A total of 8 632 sites of a lower scale and protection level.
- Botanical Gardens, Zoos, and Dendrological Parks: 28 Botanical Gardens, 13 Zoos, and 62 Dendrological Parks are also part of the NRF.

The World Database of Protected Areas (WDPA) lists a total of 5 622 protected areas registered in Ukraine; these are not aligned with Ukraine's NRF which lists 8 889 sites (MEPNR, 2023; Timmins et al, 2023).

Emerald Network: 377 sites, approximately 8 million hectares, constituting 13.42% of Ukraine's territory.[183]

Total terrestrial protected area: 10.4%.[184] Ukraine's Nature Reserve Fund (NRF; the MEPNR's system of PAs) lists 8 889 protected sites covering 4.6 million ha, including marine protected areas. Protected areas cover around 7% of the land area (MEPNR, 2023). According to 2015

[183] Internal WWF Discussion paper on PA reform in Ukraine

[184] Shared Environmental Information System website cited by Chenevois (2023)

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data, the estimated area of sites that could potentially make up the Environmental Network[185] amounts to approximately 38% of Ukraine's territory.

OECMs: not yet introduced.

LEGAL AND GOVERNANCE MECHANISMS FOR PROTECTED AREAS

The national system of Protected Areas is known as the Nature Reserve Fund (NRF). The Ministry of Environmental Protection and Natural Resources (MEPNR) is responsible for designation.

It should be noted that the NRF only loosely correspond to the International Union for Conservation of Nature (IUCN) management categories. The country's strict nature reserves, for instance, generally align with IUCN Category Ia (Strict Nature Reserve), which is focused on minimal human intervention, but the alignment is not rigid. National Nature Parks and Regional Landscape Parks, on the other hand, bear some resemblance to IUCN Category II (National Park) and V (Protected Landscape/Seascape), yet do not exactly conform to these classifications.[186] Particularly notable are the Biosphere Reserves, most of which adhere to the MaB Programme guidelines, except for the Chernobyl Reserve, which more closely represents an IUCN Category Ib Wilderness Area.

Most of the protected areas are state owned.[187]

Biosphere Reserves, Nature Reserves, and National Nature Parks are managed based on 10-year plans. These management plans require the consensus of the main landowners, land users, and local authorities within the protected area boundaries, along with approval from the Ministry of Environmental Protection and Natural Resources (MEPNR). The involvement of scientific-technical councils offers advisory support. Challenges often arise due to the lack of capacity of staff and the lack of participatory approaches in developing management plans, leading to difficulties in both their approval and effective implementation.[188]

The Russian full-scale invasion to Ukraine in February 2022 has drastically worsened the situation with protected areas regulations and management due to the lack of access to the monitoring systems, centralized power and lifted environmental regulations. As example, until 2023, the creation of new protected areas in forests was difficult due to opposition from foresters, but not impossible. With the creation of the State Enterprise 'Forests of Ukraine', the situation has deteriorated significantly. In nine months - from November to July 2023 - the company agreed to reserve no more than 700 hectares of forests - out of more than 36 thousand hectares proposed for protection during this period. That is, in 9 months, about 0.007% of Ukraine's forests received protected status (Hrynyk, Harbarchuk and Tiestov, 2023).

3.15.2. ECOLOGICAL CONNECTIVITY STRATEGY / LEGAL FRAMEWORK

LEGAL AND GOVERNANCE MECHANISMS

Under the Law on Environmental Network of Ukraine[189], the Nature Reserve Fund (NRF) sites are designated to form the core areas of an environmental network[190]. The law defines the

[185] Law of Ukraine - On the Key Principles (Strategy) of the State Environmental Policy of Ukraine for the Period till 2030 https://zakon.rada.gov.ua/laws/show/en/2697-19#Text

[186] Source: Internal WWF Discussion paper on PA reform in Ukraine

[187] Source: Internal WWF Discussion paper on PA reform in Ukraine

[188] Source: Internal WWF Discussion paper on PA reform in Ukraine

[189] Law of Ukraine - On Environmental Network of Ukraine https://zakon.rada.gov.ua/laws/show/en/1864-15#Text

[190] Source: Internal WWF Discussion paper on PA reform in Ukraine

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formation, conservation, and rational sustainable use of the ecological network. This network is further complemented by other protected areas, including rivers and riparian zones, reservoirs, forests, windbreaks, and grasslands. Integral to this network are the Emerald Network sites and critical parts of major eco-corridors in Ukraine – namely, the Poliskyi, Carpathian, Seashore, and Dniprovskyi corridors. These corridors facilitate the movement and genetic exchange of wildlife across different habitats, enhancing the resilience and adaptability of species. Areas earmarked for restoration with the aim of creating new eco-corridors or core areas in the future are also considered part of the network.

As of January 1, 2024, 18 regional eco-network schemes and 22 operating regional programs of the environmental network formation have been developed, and decisions of the respective level councils have been made to approve them. However, at present, the ecological network is simply a set of sites of the nature reserve fund that do not yet form ecological networks that are truly capable of stabilizing the natural environment. There is currently no monitoring of the network.

The National Environmental Network Formation Program of Ukraine for 2000-2015[191] set the objective of ensuring the integration of the national environmental network with the environmental networks of neighbouring countries that are part of the Pan-European Environmental Network by creating joint transboundary elements within natural regions and natural corridors, coordinating land management projects in border areas.

The **Lower Danube Green Corridor Declaration** is an international declaration agreed in 2000 between Bulgaria, Moldova, Romania, and Ukraine, overseen by the International Commission for the Protection of the Danube River. Through the Declaration, the four countries established the Corridor and identified specific targets in terms of wetlands protection and natural floodplains restoration[192]. The Flood Protection Expert Group of the International Commission for the Protection of the Danube River also adopted a Flood Action Programme for the Lower Danube Corridor.

3.15.3. SPATIAL PLANNING

SPATIAL PLANNING TOOLS FOR ECOLOGICAL CONNECTIVITY

There is a plan to amend the Law of Ukraine 'On Regulation of Urban Planning Activities' regarding the General Plan for the Planning of the Territory of Ukraine, to integrate the formation of the national ecological network into the General Plan for the Planning of the Territory of Ukraine for the period after 2021.[193]

Wildlife migration corridors linking the Bukovina region in Romania and the Bieszczady Mountains in Poland have been designated and formally included in spatial planning documents (Deodatus et al, 2013).

3.15.4. FUNDING

FUNDING FOR PROTECTED AREAS

The current funding system relies primarily on state and regional budgets, which often fall short, particularly in supporting vital scientific research and conservation initiatives. In 2021, only 0.55% of the State Budget of Ukraine was allocated for nature protection, including 0.45%

[191] https://zakon.rada.gov.ua/laws/show/1989-14#Text

[192] TransNature map of transboundary protected areas. https://www.transnature.eu/map (accessed 3 January 2024)

[193] Source: Internal WWF Discussion paper on PA reform in Ukraine

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managed by the MEPNR.[194] This funding level is insufficient to meet the actual needs of park and reserve administrations, typically covering only half of the required amount. Consequently, most protected areas are in constant search for additional financial support through donors, grants, and visitor fees, though such funding is rarely secured.

This situation highlights the critical need to reform the funding model for protected areas in Ukraine. The chronic underfunding of protected areas results in low wages for employees, diminishing the appeal of conservation work to skilled professionals. There is a lack of appropriate equipment and insufficient funds for vital environmental protection measures, leading to reduced effectiveness of conservation efforts. Additionally, this financial shortfall creates opportunities for corruption and weakens law enforcement in protected areas. The ongoing war has further strained financial resources, diverting attention and funds away from nature conservation. Environmental issues and nature conservation receive only a small portion of national and local budgets, with few mechanisms to stimulate financial support for conservation. Innovative approaches, such as those based on payment for ecosystem services, public-private partnerships and ecotourism initiatives, could bridge some of the gaps, but stable state support is still needed.[195]

FUNDING FOR ECOLOGICAL CORRIDORS OR STEPPING STONES

Financial support for the management of ecological corridors is not provided.[196]

[194] Source: Internal WWF Discussion paper on PA reform in Ukraine

[195] Internal WWF Discussion paper on PA reform in Ukraine

[196] Personal communication from PAEW, NGO Ukraine

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NATURA CONNECT

More information about the project:

NaturaConnect has 22 partner institutions: International Institute for Applied System Analysis (project lead; Austria); German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig (project co-lead; Germany); Associação Biopolis (Portugal); BirdLife Europe (Netherlands); Birdlife International (United Kingdom); Centre National De La Recherche Scientifique (France); Doñana Research Station - Agencia Estatal Consejo Superior De Ivestigaciones Cientificas (Spain); EUROPARC Federation (Germany); Finnish Environment Institute (Finland); Humboldt-University of Berlin (Germany); Institute for European Environmental Policy (Belgium); Netherlands Environmental Assessment Agency (Netherlands); Rewilding Europe (Netherlands); University of Evora (Portugal); University of Helsinki (Finland); University of Natural Resources and Life Sciences, Vienna (Austria); University of Rome La Sapienza (Italy); University of Warsaw (Poland); Vrie University of Amsterdam (Netherlands); WWF Central and Eastern Europe (Austria); WWF Romania and WWF Hungary.

NaturaConnect aims to design and develop a blueprint for a truly coherent **Trans-European Nature Network** (TEN-N) of conserved areas that protect at least 30% of land in the European Union, with at least one third of it under strict protection. Our project unites universities and research institutes, government bodies and non-governmental organizations, working together with key stakeholders to create targeted knowledge and tools, and build the capacity needed to support European Union Member States in realizing an ecologically representative, resilient and well-connected network of conserved areas across Europe.

www.naturaconnect.eu

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