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IMPLEMENTING THE NATURE RESTORATION REGULATION REPORT

PART I: THE LEGAL CONTEXT

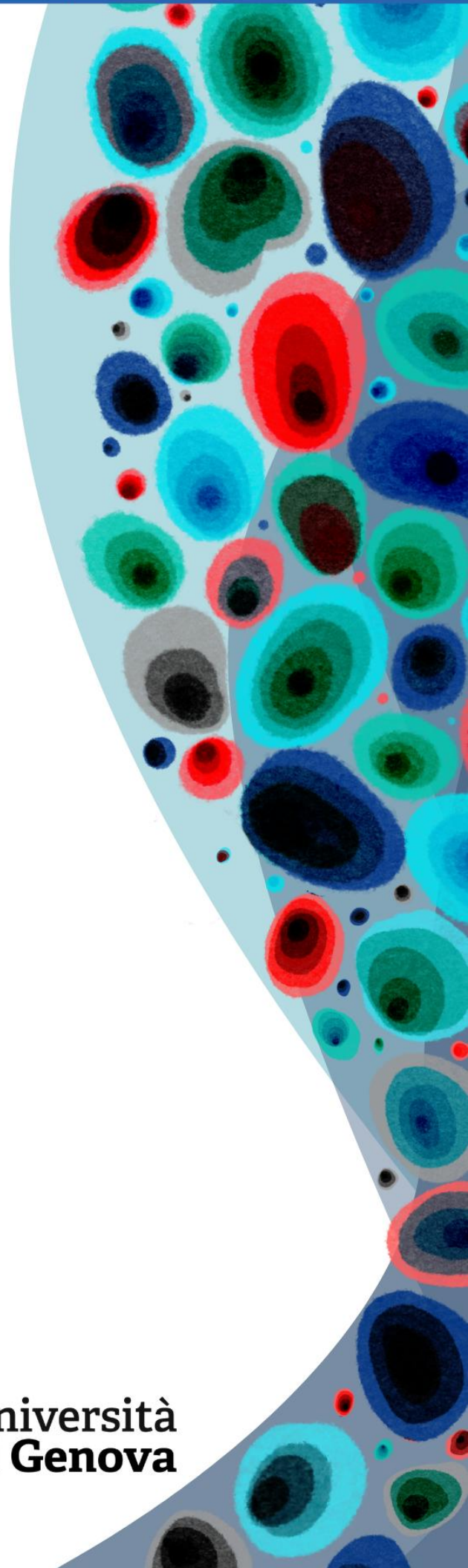
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CHAPTER I – THE NATURE RESTORATION REGULATION: THE EU’S RESPONSE TO THE BIODIVERSITY CRISIS

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I.1 The biodiversity crisis in Italy and the Nature Restoration Regulation. – I.2 An overview of the NRR. – A. Obligations to restore habitats. – B. Obligations relating to specific biodiversity indicators. – C. Obligations to identify condition of habitats whose condition is currently unknown. – D. Non-deterioration obligations. – E. Procedural obligations. – I.3 Legal and governance issues for implementing the Nature Restoration Regulation. – Further reading.

I.1 The biodiversity crisis in Italy and the Nature Restoration Regulation

Italy has a wealth of biodiversity that is unrivalled in Europe. Of the 233 habitat types listed in Annex I to the Habitats directive, over half are present in Italy, more than any other European state.¹ Many of these are found nowhere else: 18% of all plant species and 10% of all fauna in Italy are endemic. In part, the richness of Italian biodiversity is a result of its position in the heart of the Mediterranean Sea. However, Italy’s biodiversity has also been shaped by thousands of years of human habitation. Here, as elsewhere in the world, nature and society have developed together and now depend on each other for their continued survival.

Italy’s biodiversity, like that of the rest of Europe, is in decline. According to a 2022 study, almost one-third of vertebrate species in Italy are classified as vulnerable, endangered or critically endangered.² The creation of the Natura 2000 network has not been enough to halt this decline. Among the protected areas in Italy, only about 10% are in favourable conservation status.³ However, the true status of many species and habitats is simply unknown.

The loss of biodiversity is not just a problem for nature: it can also lead to social and economic harm. Biodiversity provides ecosystem services like pollination, flood mitigation, air pollution reduction, temperature regulation, and recreation.

International and European institutions have been concerned with improving the condition of European nature since the 1970s. Recently, protecting and restoring biodiversity became a central objective of the 2019 European Green Deal, which affirms that “All EU policies should contribute to preserving and restoring Europe's natural capital.” The Biodiversity Strategy for 2030, part of the European Green Deal, set out the ambition of upscaling the

¹ ISPRA, *Rapporti Direttive Natura (2013-2018). Sintesi dello stato di conservazione delle specie e degli habitat di interesse comunitario e delle azioni di contrasto alle specie esotiche di rilevanza unionale in Italia*. ISPRA, Serie Rapporti 349/2021, Roma, 2021.

² C. RONDININI et al. (eds.), *Lista Rossa IUCN dei vertebrati italiani 2022*, Roma, 2022.

³ European Environmental Agency, *Biodiversity System for Europe: Italy*, available at <https://biodiversity.europa.eu/countries/italy>.

Union's efforts with binding nature restoration commitments.⁴ This resulted in the publication, in 2022, of a proposal for a regulation establishing clear, binding obligations for Member States to take action to halt biodiversity loss and to reverse its decline. The proposal—the Nature Restoration Regulation (NRR)—built upon the pre-existing legal and policy framework in this area. It was adopted in June 2024 after intense public debate,⁵ and entered into force in August 2024. As a regulation, it is directly applicable under EU law.

The objective of this report is to describe the legal framework applicable to biodiversity restoration efforts across the numerous areas covered by the NRR. It aims to offer a tool for practitioners, public authorities and the wider public to understand what EU biodiversity law requires at a national and a local level, what areas of conflict or uncertainty remain and what governance issues may arise in its implementation. More broadly, it seeks to offer support to authorities and restoration practitioners in applying EU law in the legal, geographical, and cultural context of Italy.

1.2 An overview of the NRR

The commitments contained in the Nature Restoration Regulation can be broadly grouped into several categories:

- a. Obligations to restore habitats;
- b. Obligations to identify the status of habitats whose condition is currently unknown;
- c. Obligations relating to specific biodiversity indicators;
- d. Non-deterioration obligations;
- e. Procedural obligations.

A. *Obligations to restore habitats*

The overarching objective of the Nature Restoration Regulation is for restoration to be in progress on 20% of land and sea areas across the European Union by 2030, and on all ecosystems in need of restoration by 2050. This does not mean that it aims for all European territory to be restored: it applies only to areas and ecosystems falling within the scope of the NRR, which concerns specific habitats and ecosystems only. The Commission has specified that this objective serves as a guide for policy and for communicating the value of nature restoration, but it is not directly binding upon them in the same way as the ecosystem-specific targets.⁶

⁴ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU Biodiversity Strategy for 2030 Bringing nature back into our lives, COM(2020) 380 final of 20 May 2020.

⁵ A. CLIQUET et al., “The negotiation process of the EU Nature Restoration Law Proposal: bringing nature back in Europe against the backdrop of political turmoil?”, in *Restoration Ecology*, 5/2024, p. e14158 ff., DOI 10.1111/rec.14158.

⁶ Commission Staff Working Document Impact Assessment Accompanying the proposal for a Regulation of the European Parliament and of the Council on nature restoration, SWD(2022) 167 final of 22 June 2022, p. 61-62, 99, 109.

In order to achieve this objective, the NRR sets binding targets for the restoration of certain terrestrial, aquatic and marine areas by 2030, 2040 and 2050. As mentioned, the Regulation requires that Member States begin restoration on certain habitat types only. The habitat types targeted by restoration are listed in Annex I and Annex II of the Regulation. In addition, Member States must take measures to improve the quality and quantity of habitats for protected species whose survival is threatened by habitat degradation. The NRR does not set a timeline for when Member States should begin restoration of the habitats of protected species; indeed, as Member States are already under a duty to do this under the existing EU law,⁷ they should begin these efforts as soon as the need arises.

At a glance, the habitat restoration obligations are summarised in *Table 1* below.

TABLE 1 – OVERVIEW OF HABITAT RESTORATION OBLIGATIONS IN THE NRR

Overview of habitat restoration obligations in the NRR			
	2030	2040	2050
<i>Terrestrial, coastal and freshwater habitats (Article 4)</i>			
Annex I habitat types not in good condition	30%	60%	90%
Very common and widespread Annex I habitat types not in good condition	24-30%	48-60%	80-90%
Re-establishment of habitats needed to guarantee a favourable reference area for Annex I habitats	27-30%	54-60%	90-100%
Restoration of other areas needed to provide sufficient quantity and quality of habitat for protected species		not specified	
<i>Marine habitats (Article 5)</i>			
Annex II (group 1 – 6) habitat types not in good condition	30%	60%	90%
Annex II group 7 habitat types (soft sediments) not in good condition		2/3 of 2050 target set by Member State	target set by the Member State

⁷ See Chapter 3 below.

Re-establishment of habitats needed to guarantee a favourable reference area for Annex II habitats (groups 1 – 6)	27-30%	54-60%	90-100%
Other areas needed to provide sufficient quantity and quality of habitat for protected species		not specified	
<i>Agricultural ecosystems (Article 11)</i>			
Soils of drained peatlands under cultivation	30%	40%	50%
Rewetting of drained peatlands under cultivation	7.50%	12%	15%

It is crucial to understand that restoration is a process, not an outcome. Restoration is defined in the NRR as “the process of actively or passively assisting the recovery of an ecosystem in order to improve its structure and functions with the aim of conserving or enhancing biodiversity and ecosystem resilience.”⁸ This is a crucial definition, as it means that restoration is understood as a *process of recovery*, one that ideally works with natural dynamics. The legal definition of *restoration* in the NRR must be kept distinct from how this term is used in other contexts. It also differs from other concepts applied in this area, such as *ecological restoration*,⁹ *rewilding*,¹⁰ and *environmental remediation*.¹¹

This process can be *passive* when it is sufficient to reduce or eliminate human disturbances to ecosystems, such as overfishing, overgrazing or pollution to reach the desired results. However, when ecosystems are too degraded, *active* restoration may be needed. This can include measures such as eradicating invasive species, raising water tables, or reintroducing plants or animals.

⁸ Article 3 para. 3 NRR.

⁹ G. D. GANN et al., “International principles and standards for the practice of ecological restoration. Second edition”, in *Restoration Ecology*, 2019, p. S1 ff., DOI 10.1111/rec.13035.

¹⁰ J. T. DU TOIT et al., “The differences between rewilding and restoring an ecologically degraded landscape”, in *Journal of Applied Ecology*, 11/2019, p. 2467 ff., DOI 10.1111/1365-2664.13487; S. CARVER et al., “Guiding principles for rewilding”, in *Conservation Biology*, 6/2021, p. 1882 ff., DOI 10.1111/cobi.13730.

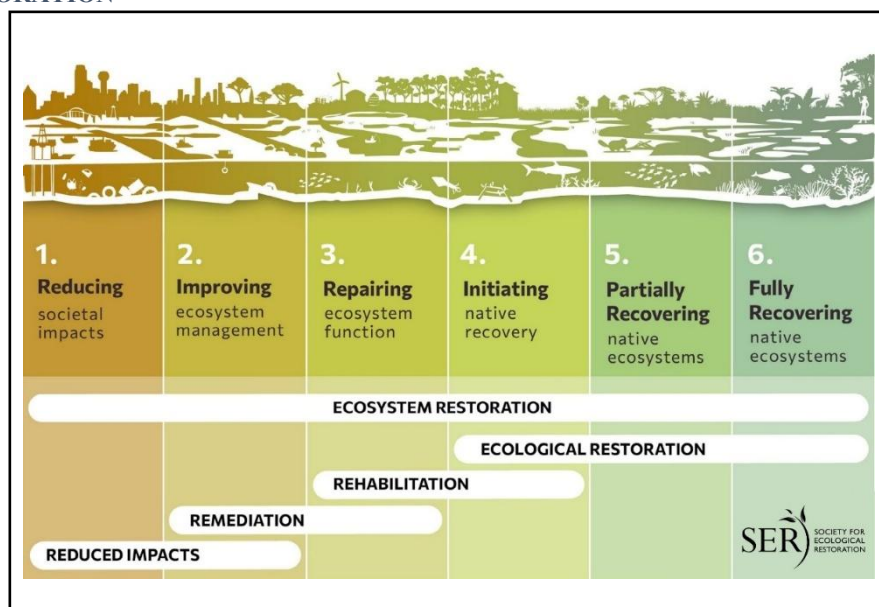
¹¹ Remediation refers to the process of recovering a habitat following environmental damage, and it aims merely to return a damaged area to the *status quo ante*. In the EU, the Environmental Liability Directive (Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage, OJ L 143/56 of 30 April 2004) provides specific rules on when environmental remediation is required and what form it must take. On the preventive function of environmental liability in EU law, V. FOGLEMAN, “The duty to prevent environmental damage in the environmental liability directive; a catalyst for halting the deterioration of water and wildlife”, in *ERA Forum*, 4/2019, p. 707 ff., DOI 10.1007/s12027-019-00586-6.

The goal of restoration is to ensure that the target habitat is in *good condition*. The NRR defines good condition as:

a state where the key characteristics of the habitat type, in particular its structure, functions and typical species or typical species composition reflect the high level of ecological integrity, stability and resilience necessary to ensure its long-term maintenance and thus contribute to reaching or maintaining favourable conservation status for a habitat, where the habitat type concerned is listed in Annex I to Directive 92/43/EEC, and, in marine ecosystems, contribute to achieving or maintaining good environmental status.

The notion of “good condition” as presented in the NRR, is new and unique. It differs from similar existing targets under EU Nature law, such as that of ‘favourable conservation status’ under the Habitats Directive, raising legal issues which will be explored below. It also differs from some of the scientific representations of this process, such as the ‘restoration continuum’ proposed by the Society for Ecological Restoration (*Figure 1*), in that good condition means that a habitat is resilient enough to be self-sufficient, such that if left alone, it will continue to recover and eventually reach a favourable conservation status. Good condition might be attainable at various stages of the Restoration Continuum, depending on the pressures facing a site and its capacity for autonomous recovery. Additionally, restoration, as described in the Regulation, is not a matter of recreating a historic native landscape, but of re-starting the dynamic processes by which an ecosystem thrives in the face of disturbances and evolves over time.

FIGURE 1 – THE RESTORATION CONTINUUM OF THE SOCIETY FOR ECOLOGICAL RESTORATION



Source: G. D. GANN et al., “International principles and standards for the practice of ecological restoration. Second edition”, in *Restoration Ecology*, 2019, DOI 10.1111/rec.13035.

It is notable that good condition is not just about the current state of a habitat, but its projected evolution. Climate change must therefore be taken into account when assessing the condition of a habitat for the NRR. Climate change is already affecting ecosystems on the European continent, especially Arctic and Alpine areas.¹² It is not only altering ecosystem conditions, but also introducing new species and increasing the frequency of extreme events, such as fires, floods and droughts. Restoration does not, therefore, mean attempting to hold on to an ecosystem that climate change will prevent from being self-sufficient in the long term.

One cause of the degradation of habitats and species is habitat fragmentation, which occurs when the extension of habitats is reduced beyond the minimum area needed to guarantee sufficient genetic exchange and resilience to external pressures and shocks. In such cases, it can be necessary to enlarge habitats or reconnect habitat islands by creating ecological corridors. The NRR requires Member States to identify areas where habitat fragmentation is a problem and then to restore what is needed to reach a *favourable reference area* for the habitat or species concerned. The favourable reference area is defined as:

the total area of a habitat type in a given biogeographical or marine region at national level that is considered the minimum necessary to ensure the long-term viability of the habitat type and its typical species or typical species composition, and all the significant ecological variations of that habitat type in its natural range.

In general, re-establishing habitats can be technically complex and controversial, especially when it affects private property.¹³

While many habitats are harmed by human activities, there are some types of habitats that have evolved together with the human communities and where it is no longer possible to think of them as separate. Traditional practices, such as extensive agriculture, are thus needed to ensure their health. Thus, restoring ecosystems does not necessarily mean that they need to be returned to nature: sometimes human intervention, of the right kind, is what is needed.

In addition to restoration targets for Annex I and II habitats, those needed for protected species and to re-establish favourable reference areas, the NRR also contains special targets for drained peatlands under cultivation. These were some of the most contested provisions of the NRR. They will be analysed in greater detail in Chapter 5.

B. Obligations relating to specific biodiversity indicators

In addition to the restoration of certain terrestrial and marine habitats, the NRR also contains a series of obligations for Member States relating to specific indicators of ecosystem health (*Table 2*). Here, the NRR leaves Member States an ample margin of discretion to decide where it is opportune to intervene in order to meet their targets. Some

¹² IPCC, *The Ocean and Cryosphere in a Changing Climate*, Cambridge, 2022.

¹³ N. M. HOEK, “Nature Restoration Put to EU Law: Tensions and Synergies between Private Property Rights and Environmental Protection”, in N. M. HOEK, et al. (eds.), *Spanningen tussen duurzaamheid en Europees recht*, Nijmegen, 2024, p. 129 ff.

of these duties reinforce restoration obligations found in Article 4 and 5, while others are self-standing.

Notably, these ecosystem restoration duties extend beyond protected habitats, including to urban and agricultural areas, and comprise duties to remove obsolete barriers on rivers and other waterways. However, these duties are not without limit, as Member States must show improvement until a ‘satisfactory level’ is reached.

Once reached, Member States will only need to maintain the values above this level.

TABLE 2 – OVERVIEW OF TARGETS RELATED TO SPECIFIC BIODIVERSITY INDICATORS IN THE NRR

Overview of targets related to specific biodiversity indicators in the NRR			
	2030	2040	2050
<i>Urban ecosystems</i>			
Urban green space and tree canopy cover	no net loss	increasing trend until satisfactory level is reached	
<i>Rivers and floodplains</i>			
Removal of barriers identified as obsolete	25000 km of rivers restored to free-flowing state in the Union by 2030		
<i>Pollinator populations</i>			
Pollinator diversity and population numbers	no further decline	increasing trend until satisfactory level is reached	
<i>Agricultural ecosystems</i>			
Common farmland bird index	increasing trend until satisfactory level is reached		
Selected indicators of agricultural ecosystem health	increasing trend until satisfactory level is reached		
<i>Forest ecosystems</i>			
Common forest bird index	increasing trend until satisfactory level is reached		
Selected indicators of forest ecosystem health	increasing trend until satisfactory level is reached		

C. Obligations to identify condition of habitats whose condition is currently unknown

Member States are only required to restore habitats that are known to be degraded; however, what is problematic is that the current condition of many species and habitats has not been studied. To prevent Member States from using this as an excuse for inaction, the NRR sets obligations for them to assess the condition of species and habitats whose present status is unknown (*Table 3*).

Marine environments are particularly difficult and costly to study. For this reason, less stringent targets are set for these areas, with priority given to marine habitats that are of greater value for marine biodiversity, distinguishing between them (groups 1-6) and the more extensive soft sediment habitats (group 7).

TABLE 3 – OVERVIEW OF TARGETS FOR IDENTIFYING THE CURRENT STATUS OF HABITATS IN THE NRR

Overview of targets for identifying the current status of habitats in the NRR			
	2030	2040	2050
<i>Terrestrial, coastal and freshwater habitats</i>			
Annex I habitats	90%	100%	
<i>Marine habitats</i>			
Annex II (groups 1-6) habitats	50%	100%	
Annex II (group 7) habitats	--	50%	100%
<i>Rivers and floodplains</i>			
Inventory of barriers and identification of obsolete barriers for removal		not specified	

In addition, in order to reach their river connectivity targets, Member States must first prepare an inventory of all barriers that impede the connectivity of surface waters and identify any that are suitable for removal.

D. Non-deterioration obligations

It goes without saying that restoration efforts will require significant investments. The NRR therefore seeks to ensure that Member States do not undermine their efforts by backtracking once a project has begun, or by allowing sites that are already in good condition to degrade needlessly. To this end, it contains continuous-improvement and non-deterioration obligations: Member States must make efforts to ensure that sites where restoration has

begun show continuous improvement overall. They must also seek to prevent deterioration of habitats in good condition or those which must be subject to restoration at a future date.

These non-deterioration duties are not absolute. For one, they are generally understood to be obligations of efforts, not results, meaning that Member States are not responsible for deterioration when they have acted diligently and in good faith.¹⁴ Additionally, exceptions to these duties are provided for certain unavoidable events and for projects that serve an overriding public interest, when specific conditions are met. While there is some uncertainty over what kind of efforts must be undertaken to prevent degradation, it is clear that these duties can have a significant impact on Member States' territory beyond restoration sites.

E. Procedural obligations

In order to achieve ambitious targets described above, the NRR sets out a series of procedural and practical obligations incumbent both upon Member States and the Commission.

Above all, Member States must prepare a National Restoration Plan (NRP), setting out in detail how they intend to achieve their restoration targets under the NRR and how they will coordinate nature restoration with other policy areas, such as agriculture and climate change.¹⁵ The draft NRP must be sent to the Commission by 1 September 2026. The Commission will have six months to present its observations on the NRP, following which the Member State has a further six months to adopt the final version of the plan.

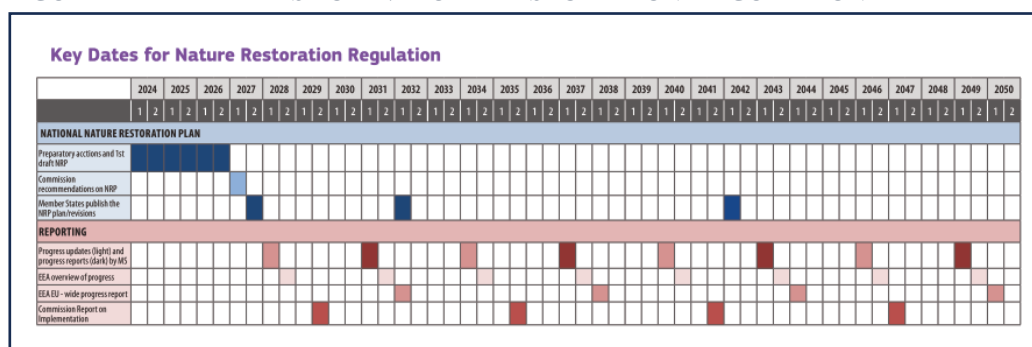
Subsequently, Member States must comply with monitoring and reporting requirements, which serve to assess their progress and ensure they are on track to reaching their targets. Member States must present a progress update to the Commission by June 2028, followed by a progress report by June 2031 and a revised NRP by 2032 (*Figure 2*). However, if the Commission finds that the Member State's efforts are insufficient, it may request it to revise its NRP at any time.¹⁶

¹⁴ B. J. DE LEEUW, C. W. BACKES, "The Non-Deterioration Obligation in the Nature Restoration Regulation – a Necessary and Proportionate Addition to the Habitats Directive or a Monstrosity with Disastrous Consequences for Society?", in *Journal for European Environmental & Planning Law*, 1/2024, p. 22 ff., DOI 10.1163/18760104-21010004.

¹⁵ Articles 14 and 15 NRR. See I. PERISSI, "Assessing the EU27 Potential to Meet the Nature Restoration Law Targets", in *Environmental Management*, 2025, p. 711 ff., DOI 10.1007/s00267-024-02107-9.

¹⁶ Article 19(3) NRR.

FIGURE 2 – KEY DATES FOR NATURE RESTORATION REGULATION



Source: EUROPEAN COMMISSION: DIRECTORATE-GENERAL FOR ENVIRONMENT and K. SUNDSETH, *The Nature Restoration Regulation: Overview and Objectives*, Brussels, 2025, p. 10, available at <https://data.europa.eu/doi/10.2779/5842922>.

1.3 Legal and governance issues for implementing the Nature Restoration Regulation

There are numerous legal issues that may arise in the implementation of the NRR.

For one, efforts to restore biodiversity are connected to constitutional values at the heart of the European and national legal orders. These will shape the degree of effort by Member States and will be further explored in Chapter 2 of this report.

Many legal issues arise from the fact that the NRR has been added to a complex pre-existing legal framework, including conservation and restoration duties, set out in both European and domestic law. It is therefore crucial to understand how this new regulation interacts with other important European directives, including in terrestrial habitats (Chapter 3) and freshwater and marine habitats (Chapter 4).

Second, the success of the NRR will depend on its ability to catalyse change in many policy areas. This report will examine potential synergies and conflicts between these areas and nature restoration targets. For one, the NRR sets specific ecosystem restoration targets for agricultural areas, which will need to be coordinated with EU agriculture policy (Chapter 5). Additionally, it contains specific targets related to urban areas (Chapter 6).

Another major issue concerns the governance of nature restoration and the role of public participation. Many public authorities may be potentially involved in proposing, authorizing and assessing nature restoration plans and projects. At the same time, certain groups of the public—farmers, landowners and recreational land users—may be directly affected by nature restoration efforts. They enjoy rights to participate in decision-making on matters that affect them; even more so as the NRR calls for a “fair and cross-society approach” to restoration.¹⁷ These are examined in Chapter 7.

¹⁷ Preamble para. 83 NRR.

While implementing the NRR will require significant investments, there are many potential benefits to restoring degraded habitats and ecosystems. In its impact assessment accompanying the proposal for the NRR, the Commission estimated that every euro invested in restoration would bring between 8 and 38 Euros of benefits, including in the form of ecosystem services and damage avoided.¹⁸ Potential instruments for financing restoration by public institutions and private parties are analysed in detail in Part II of this Report.

Overall, the NRR challenges Member States, and society more broadly, to take action to confront the biodiversity crisis in Europe. It demands a new approach to our relationship with nature, offering an opportunity to make the EU greener and more resilient, for the benefit of both present and future generations.

Further reading

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¹⁸ Commission Staff Working Document Impact Assessment Accompanying the proposal for a Regulation of the European Parliament and of the Council on nature restoration, SWD(2022) 167 final of 22 June 2022.

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CHAPTER II – NATURE RESTORATION AND CONSTITUTIONAL PRINCIPLES

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II.1 The Environment and the Italian Constitution: A slow but essential evolution. – II.2 The 2022 Constitutional reform and the new Article 9: protecting the environment, biodiversity, and ecosystems for future generations. – II.3 The Italian Constitution: A crucial support for restoring Italy's biodiversity. – Further reading.

II.1 The Environment and the Italian Constitution: A slow but essential evolution

Nature restoration is closely linked to the Italian Constitution framework and its values, a relationship that reflects the complexity of environmental law within a multilevel legal framework. Grounding biodiversity restoration in constitutional principles is a crucial starting point for assessing the impact of the NRR on the Italian legal system.

As is widely acknowledged, approaches to environmental protection have evolved over time, also within the Italian constitutional order. In the first half of the twentieth century, environmental issues were not a central concern of the law, which is hardly surprising, given the historical context of the time. However, when the Italian Constitution was adopted in 1948, it already showed a certain awareness of environmental matters. Its approach was shaped by a strongly anthropocentric view of nature, understood mainly for its aesthetic and cultural value, expressed in the notion of 'landscape.' It stated that, "The Republic promotes the development of culture and scientific and technical research. It protects the landscape and the historical and artistic heritage of the Nation." Although Article 9, as originally conceived, was only indirectly related to environmental protection, its inclusion sparked significant debate, revealing that Italian legal culture at the time was still far from embracing a holistic concept of the environment.

Over the following decades, constitutional and legislative developments gradually reinforced environmental protection. Attention to environmental issues was largely expressed through ordinary legislation at both national and regional levels,¹ and especially through the rulings of the Constitutional Court, which gradually helped build a legal framework increasingly oriented toward environmental protection.²

The term 'environment' entered the Italian Constitution for the first time only in 2001, not as a standalone element, but within the context of a constitutional reform aimed at

¹ See, among others, law 6 December 1991, n. 394, *Legge quadro sulle aree protette*.

² Although the original text of the Constitution did not include the term 'environment' nor provisions explicitly aimed at protecting ecosystems, Constitutional Court case law had already recognized the 'preeminent importance accorded by the Constitution to safeguarding human health (Art. 32) and the protection of the environment in which people live (Art. 9, second paragraph)' as primary constitutional goods (Corte Costituzionale, judgment no. 247 of 23 July 1974; Corte Costituzionale, judgment no. 210 of 28 May 1987).

redefining the distribution of powers between the State and the Regions.³ The reform established that the “*tutela dell'ambiente, dell'ecosistema e dei beni culturali*” (protection of the environment, ecosystems and cultural goods) falls within the State’s exclusive legislative competence, while the “*valorizzazione*” (enhancement) of these assets is within the Regions’ concurrent powers. This reform therefore established a division of powers in environmental matters, outlining a multilevel system in which regional and territorial authorities play an important role and coordinate with national policies.

With regard to the distinction between “protection” and “enhancement”, the Constitutional Court (judgment no. 407 of 2002) stated that it is not possible to identify an ‘object’ in the technical sense that can be classified as ‘environmental protection’, since it does not appear to be a strictly defined and delimited sphere of state competence, but rather one that is inextricably intertwined with other interests and competences. It is therefore better to refer to the environment as a constitutionally protected ‘value’, which, as such, outlines a sort of ‘cross-cutting’ matter, in relation to which different competences are manifested. These competences may well be regional, while the State remains responsible for decisions necessary to ensure the uniform regulation of environmental goods throughout the national territory. Indeed, numerous spheres of competence of the State and Regions may affect biodiversity, further complicating efforts to establish coherent strategies for attain the objectives set out in the Nature Restoration Regulation (*Table 4*)

Despite this complex picture, with regard to its competence over environmental protection, the State may establish national standards of protection even where these affect the legislative competences of the Regions pursuant to Article 117 of the Constitution. Moreover, state legislation on environmental protection operates as a limit on the regulatory powers exercised by the Regions, meaning that they may in no way derogate from or lower the level of environmental protection established by the State law. The issue of legislative powers intersects with administrative and territorial governance powers.

A useful reference could be the Italian Environmental Code.⁴ In the Code, the State lays down uniform standards of environmental protection applicable throughout the national territory, including minimum quality thresholds and binding regulatory limits concerning air, water, soil, waste management, remediation, emissions, and environmental liability.

Overall, while the State sets uniform environmental protection standards, the Regions are primarily responsible for planning, authorizing, organizing, and promoting environmental management within their territories. Overall, it is therefore difficult to identify a clear-cut division of competences. Environmental protection produces wide-ranging implications at the administrative and governance levels, which vary depending on the specific dimension of environmental protection concerned and the other areas of competences in play, such as agriculture or transport.

³ See full text of the 2001 Reform, available at: <https://www.governo.it/it/costituzione-italiana/parte-seconda-ordinamento-della-repubblica/titolo-v-le-regioni-le-province-e-i>

⁴ See D.lgs. 3 April 2006, n. 152.

The distinction between state and regional competences is critical for understanding the division of authority over biodiversity in the Italian constitutional system. Unfortunately, it is not always clear which institution and at what territorial level action should be taken. Moreover, the acknowledged “cross-cutting” nature of environmental protection engages the entire Republic, requiring coordinated action across all levels of government rather than a rigid separation of power

This division will affect the implementation of the NRR. For this reason, a proper drafting and planning of measures through National Restoration Plans require strong synergy among all institutional actors involved. This approach reflects the constitutional environmental mandate, which necessarily entails a collective and shared responsibility across all territorial levels of government.

II.2 The 2022 Constitutional reform and the new Article 9: protecting the environment, biodiversity, and ecosystems for future generations

As mentioned, the 2022 constitutional reform introduced a new paragraph to Article 9 of the Constitution,⁵ expressly enshrining “*the protection of the environment, biodiversity, and ecosystems, including in the interest of future generations*” in the constitutional order.⁶ In other words, the reform established, among the fundamental principles of the Italian constitutional charter, an autonomous principle of environmental protection, giving distinct importance to the concepts of ‘biodiversity’ and ‘ecosystem.’⁷ At the same time, Article 41 of the Constitution was amended to clarify that the protection of health and the environment constitutes a limit to the freedom of economic initiative, highlighting the inseparable link between economic activity, social objectives, and environmental preservation.⁸ This addition supplements the previously established limits of safety, freedom, and human dignity. Article 41 thus explicitly recognizes the inseparable connection between economic activity, health, and the environment, establishing that public and private economic activity must be directed toward or coordinated with social and environmental objectives.

⁵ The constitutional bill A.C. 3156-B concerning environmental protection was approved by the Chamber of Deputies in its second reading on 8 February 2022, with a two-thirds majority of its members. The vote was 468 in favour, 1 against, and 6 abstentions. For more details see <https://www.riformeistituzionali.gov.it/la-legge-costituzionale-in-materia-di-tutela-dell-ambiente>.

⁶ Specifically, it states that “The Republic promotes the development of culture as well as scientific and technical research. It protects the landscape and the historical and artistic heritage of the Nation. It safeguards the environment, biodiversity, and ecosystems, including in the interest of future generations. State law regulates the methods and forms of animal protection”. See Art. 9 of Italian Constitution.

⁷ A safeguard clause was added regarding animal protection for the regions with special statutes and the Autonomous Provinces of Trento and Bolzano.

⁸ “Private economic initiative is free. It may not be carried out in conflict with social utility, nor in a way that causes harm to health, the environment, safety, freedom, or human dignity. The law establishes appropriate programs and controls so that both public and private economic activity can be directed and coordinated for social and environmental purposes”. See Art. 41 of the Italian Constitution.

Together, these developments show how environmental protection has gradually become an integral part of both the regulatory framework and the guiding principles of economic and social policy, reflecting an evolution from an anthropocentric vision of constitutional principles to a more comprehensive and systemic approach. By specifically referring to *environment, biodiversity, and ecosystems*, the reform also established a distinction among these concepts. Moreover, in the reform, environmental protection is conceived as extending to the interests of future generations: indeed, it requires that the environment be preserved in an integral state so as to ensure that future generations may enjoy it under conditions of equality with present generations.⁹

Together, these amendments reflect a constitutional framework that increasingly integrates the guiding principle of environmental protection across regulatory competencies and economic and social policy.

In this regard, it is appropriate to recall one of the first and most significant decisions of the Italian Constitutional Court that engaged with the amended Article 9 Cost.¹⁰ In its decision, the Court emphasized that the 2022 constitutional reform directly enshrined a mandate for environmental protection within the text of the Constitution. Moreover, the judgment further underscored the temporal perspective within which environmental protection must be pursued, namely one that extends to the interests of future generations. These include individuals not yet in existence, towards whom present generations bear a specific duty to preserve the conditions necessary for them likewise to enjoy an environmental heritage that is as intact as possible.¹¹

The reform therefore expressly binds all public authorities to take action to ensure the effective protection of the environment. Nonetheless, environmental protection in the Italian system, while having strongly evolved toward a systemic approach, remains rooted in its deeply anthropocentric origins.

The most important innovation, starting from 2022, is that the duty to protect the environment can now be directly derived from the Constitution itself, rather than only through systematic interpretation. This is especially significant because the protection of biodiversity, ecosystems, and animals calls for the adoption of a legal approach capable of understanding and interpreting the complexity of a normative and jurisprudential

⁹ On the protection of future generations in the Italian legal order, see among others L. BARTOLUCCI, “Il più recente cammino delle generazioni future nel diritto costituzionale”, in *Osservatorio costituzionale*, 4/2021, pp. 1-19; but also G. AMOROSO, “L’«interesse delle future generazioni» come nuovo parametro costituzionale”, in *Rivista del Diritto della Sicurezza Sociale*, 3/2022, pp. 431-439.

¹⁰ Corte Costituzionale, Judgment 13 June 2024, n. 105.

¹¹ On the notion of duties towards future generations in relation to environmental protection, see Bifulco E. BROWN WEISS, “Implementing Intergenerational equity”, in *Research Handbook on International Environmental Law*, M. FITZMAURICE, et al. (eds.), Cheltenham, 2014, p. 100 ff. and F. CIARAMELLI, F.G. MENGA, “L’interrogazione filosofico-giuridica sugli obblighi verso le generazioni future”, in *Rivista di filosofia del diritto*, 2/2021.

framework in the context of international and European legal frameworks dedicated to nature, like that of the NRR.

II.3 The Italian Constitution: A crucial support for restoring Italy's biodiversity

While the Italian approach is also evolving towards a systemic conception of nature¹², it is still far from embracing a more eco-centric approach favoured by other legal traditions.¹³ Nonetheless, the recently-amended Italian constitutional framework offers a critical constitutional foundation for the implementation of the Nature Restoration Regulation in Italy. Indeed, environmental protection is no longer merely a programmatic objective, but an operative constitutional principle capable of directing administrative action, shaping legislative choices, and informing judicial interpretation. As Article 9 is enshrined among the fundamental principles of the Constitution, it also serves as a standard for assessing the constitutionality of legislation. This means, practically, that these interests serve as a parameter for assessing the validity of laws, regulations, and private agreements, and judges can raise questions about the conformity of such instruments with the constitutional charter.

As noted, the Constitution also establishes a framework for coordination regarding environmental interests, whereby the central authority – the Republic – acts in conjunction with the Regions. This complex multilevel governance structure makes coordination essential to achieve the objectives of nature restoration in a way that is effective while fully respecting the division of powers enshrined in the Constitution.

The increasing importance given to nature, biodiversity, and ecosystems affects how constitutional interests are balanced when conflicts arise, as evidenced by the new wording of Article 41 of the Constitution. The challenge for the future will be to reconcile different values and interests in a context like Italy's, where biodiversity and ecosystems are both threatened and deeply cherished.

In conclusion, the obligations and goals at the heart of the NRR are not only reinforced by the broader constitutional and regulatory context in Italy but are also firmly embedded within it, enjoying solid constitutional legitimacy. Environmental protection, nature restoration, and related responsibilities are increasingly at the core of Italy's constitutional framework, reflecting both a legal and a value-driven commitment to safeguarding our natural heritage for present and future generations.

Further reading

¹² See R. BIFULCO, “Ambiente e cambiamento climatico nella costituzione italiana” in *Rivista AIC*, 3/2023, p. 3 ff.

¹³ See among others the recent work of D. AMIRANTE and S. BAGNI, *Environmental Constitutionalism in the Anthropocene*, London - New York, 2022; and also M. CARDUCCI, “Le premesse di una “ecologia costituzionale”, in *Veredas do Direito – Direito ambiental e Desenvolvimento Sustentável*, 17 (37) 2020, p. 94 ff.

- D. AMIRANTE, “La “reformette” dell’ambiente in Italia e le ambizioni del costituzionalismo ambientale”, in *Diritto pubblico comparato ed europeo*, n. 2, 2022, p. 5 ff., DOI: 10.17394/104434.
- D. AMIRANTE, *Costituzionalismo ambientale. Atlante giuridico per l’Antropocene*, Il Mulino, Bologna, 2022.
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- D.R. BOYD, *The Environmental Rights Revolution: A Global Study of Constitutions, Human Rights and the Environment*, Vancouver, 2012.
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- F. GALLARATI, “L’ambiente sì, ma dove? Il problema della collocazione delle disposizioni ambientali nelle costituzioni europee” in *DPCE Online*, Sp2/58, p. 683 ff.
- R. MONTALDO, “La tutela costituzionale dell’ambiente nella modifica degli artt. 9 e 41 Cost.: una riforma opportuna e necessaria?”, in *Federalismi.it*, 13/2022.
- M. MONTEDURO, “Riflessioni sulla ‘primazia ecologica’ nel moto del diritto europeo (anche alla luce della riforma costituzionale italiana in materia ambientale)” in *AIDAMBIENTE - Atti di Convegno*, Napoli, 2022, p. 221 ff.
- E. PADOA-SCHIOPPA, “L’Epoca dell’Antropocene: scenari dell’ecologia”, in *DPCE Online*, Sp-2/2023, p. 7 ff.

CHAPTER III – RESTORATION OF TERRESTRIAL HABITATS

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III.1 The scientific context. – III.2 The Nature Restoration Regulation and Natura 2000 sites. – III.3 Terrestrial areas outside Natura 2000 sites. – III.4 Protected species. – III.5 Forested areas. – III.6 Nature restoration and renewable energy. – Further reading.

III.1 The scientific context

Biodiversity restoration duties draw upon a series of notions that have been developed in the ecological sciences. Therefore, it is impossible to understand the legal framework without becoming familiar with key ecological concepts and categories.

The first key notion is that of **habitats**. Biodiversity obligations in EU law focus on both habitats and species. A habitat is defined as, “a place where plants or animals normally live, characterised primarily by its physical features (topography, plant or animal physiognomy, soil characteristics, climate, water quality etc.) and secondarily by the species of plants and animals that live there.”¹ Habitats have been targeted for special protection in Europe since the 1979 Bern convention, the first international instrument in Europe to set duties to protect both species and their habitats.² Habitat types are characterised using a system of parameters, for example soil type, typically flora and fauna, humidity and temperature, depth (for aquatic ecosystems), and human activities and impacts. The Habitats Directive, in Annex I, sets out a classification of natural habitat types that are the basis for the legal obligations it enshrines. The Commission has adopted an Interpretation Manual to aid Member States in identifying these Annex I habitats in a uniform manner.³

The second key notion is that of **ecosystems**. This term refers instead to the habitat and the community of organisms that inhabit it, as well as the inputs of energy and matter it receives. Ecosystems are characterized by their resources, structure and functions. Resources are the inputs that enable the living components of an ecosystem to grow and thrive, like water, sunlight, and nutrients. The structure describes its sedentary life—that is, its vegetation and fungal life, which is also key to determining its habitat classification. Functions of an ecosystem including the processes like nutrient cycling and energy flow that enable it to be self-sustaining over time.

¹ European Environment Agency — European Topic Centre on Nature Protection and Biodiversity, *EUNIS habitat classification revised 2004*, available at http://eunis.eea.europa.eu/upload/EUNIS_2004_report.pdf.

² Convention on the Conservation of European Wildlife and Natural Habitats (adopted 19 September 1979, entered into force 1 June 1982) UNTS 1284 p. 209

³ EUROPEAN COMMISSION, *The Interpretation Manual of European Union Habitats - EUR28*, Brussels, April 2013

Ecosystems can also provide services that are valuable for human communities.⁴ These are typically divided into four groups: supporting, provisioning, regulating, and cultural services.⁵

The European Union has extensive maps of habitat types based on the EUNIS classification system. The EUNIS system encompasses the entire territory of the EU, both the Habitats Directive Annex I habitats and other territory types, such as those formed through human activities. Similarly, in Italy, efforts have been made to map where habitat types are found or are likely to be found throughout the territory.⁶ Although criticism have been raised that habitat categories are too broad and thus miss critical sub-habitat types, and that EUNIS maps are still not sufficiently precise, this data provides a basis for beginning to implement restoration duties.

The Nature Restoration Regulation contains separate duties targeting biodiversity in territories and in specific ecosystems. Its habitats restoration targets relate to determined territories, while other duties target ecosystem structures and functions directly, as measured by indicators. While habitats have been the subject of protection and restoration obligations prior to the adoption of the NRR, the Regulation adds new duties to improve specific indicators of ecosystem health.

As for the former, Member States are bound by the targets set out in *Table 4* below.

TABLE 4 – RESTORATION TARGETS FOR TERRESTRIAL, COASTAL AND FRESHWATER HABITATS – ARTICLE 4 NRR

Restoration targets for terrestrial, coastal and freshwater habitats - Article 4 NRR			
	2030	2040	2050
Annex I habitat types not in good condition	30%	60%	90%
Very common and widespread Annex I habitat types not in good condition	24-30%	48-60%	80-90%
Other areas where restoration is needed for Annex I habitats to reach a favourable reference area	27-30%	54-60%	90-100%

⁴ On the economic valuation of ecosystem services in nature credits, see Part II, Chapter III of this Report.

⁵ R. HASSAN et al. (eds.), *Millenium Ecosystem Assessment. Ecosystems and Human Well-being: Current State and Trends, Volume 1*, Washington - Covelo - London, 2005.

⁶ G. CAPOTORTI et al., “Ecosystems of Italy. Updated mapping and typology for the implementation of national and international biodiversity-related policies”, in *Plant Biosystems - An International Journal Dealing with all Aspects of Plant Biology*, 2023, p. 1 ff., DOI 10.1080/11263504.2023.2284135.

Other areas needed to provide sufficient quantity and quality of habitat for protected species	not specified
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In accordance with Article 4, Member States must begin restoration on specific percentages of areas where Annex I habitats are found by 2030. This does not mean that these areas must have already reached good condition, only that efforts must be underway to achieve this in the long term. Once restoration has begun, however, Member States must show continuous improvement until good condition is reached (Article 4 para. 11).

Until 2030, Member States must prioritize restoration measures in areas that are located in Natura 2000 sites.⁷ This complex sets of obligations, however, raises questions about the relationship between the obligations under the NRR and those that are already provided by the Habitats and Birds Directives.

III.2 The Nature Restoration Regulation and Natura 2000 sites

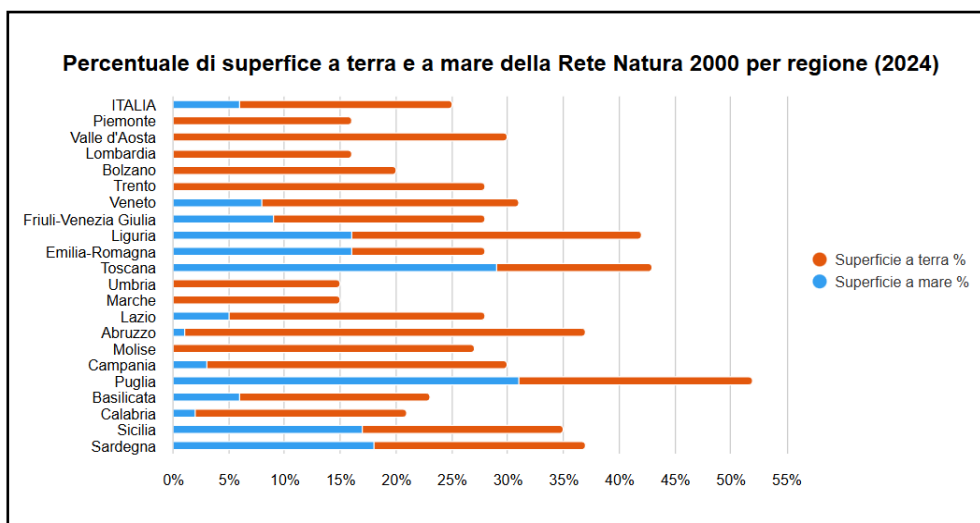
As Natura 2000 sites are prioritized by the Nature Restoration Regulation, it is critical to understand how these new restoration efforts fit into the pre-existing legal and governance framework for these areas.

Natura 2000 sites were created under the Habitats Directive, which sets out specific rules as to conservation and restoration efforts within them. Each Natura 2000 site was designated through a collaborative process involving the Commission and the Member State, which had an obligation to legally designate and approve a management plan for each site. In Italy, there are 2694 Natura 2000 Sites covering 19.4% of the national territory.⁸ However, their distribution is uneven, as regionally, there is a significant variation in how much territory is covered by protected areas (*Figure 3*).

⁷ Article 4(1) NRR.

⁸ S. ERCOLE, B. BRECCAROLI, *Rete Natura 2000*, 2025, available at <https://indicatoriambientali.isprambiente.it/it/aree-tutela/rete-natura-2000>.

FIGURE 3 – PERCENTAGE OF TERRITORY COVERED BY NATURA 2000 SITES



Source: S. ERCOLE, B. BRECCIAROLI, *Rete Natura 2000*, 2025, available at <https://indicatoriambientali.isprambiente.it/it/aree-tutelate/rete-natura-2000>.

Within Natura 2000 sites, public authorities are under a duty to comply with substantive and procedural duties under both the Habitats and Birds Directive.

In particular, Article 4 provides that they must maintain or, where appropriate, restore both habitats and protected species to a ‘favourable conservation status’. The conservation status of a habitat considers the influences acting on it and its typical species that may affect its long-term distribution, structure and functions. A conservation status of a habitat is ‘favourable’ when its extent is stable or increasing, the elements necessary for its long-term survival are present and likely to continue to be present, and its typical species are also in a favourable conservation status.

Member States have been under a duty to ensure that habitats located within Natura 2000 sites and protected species are in a favourable conservation status since the creation of the Natura 2000 network.⁹ However, this has not always taken place, in part due to the lack of clear deadlines and dedicated resources for doing so.¹⁰ The NRR now requires them to begin efforts to restore sites to good condition. Given that good condition for the NRR is defined as a state that contributes to reaching or maintaining favourable conservation status,¹¹ if Member States fulfil their duties under the NRR, they will be on track to also meeting their obligations under Habitats Directive and Birds Directives as well.

⁹ H. SCHOUKENS, “Towards a Legally Enforceable Duty to Restore Endangered Species under EU Nature Conservation Law – On Wild Hamsters, the Rule of Law and Species Extinction”, in *Procedural Environmental Rights: Principle X in Theory and Practice*, J. JENDROSKA, M. BAR (eds.), Cambridge - Antwerp - Portland, 2018, p. 287 ff.

¹⁰ A. CLIQUET, “EU Nature Conservation Law: Fit for Purpose”, in *Research Handbook on EU Environmental Law*, M. PEETERS, M. ELIANTONIO (eds.), Cheltenham ; Northampton, 2020, p. 265 ff.

¹¹ Article 3(4) NRR.

Indeed, it is an easier target to achieve, as Member States will have satisfied their duties under the NRR once effective restoration measures are in place, even if good condition has not yet been achieved. The NRR's continuous improvement and non-deterioration obligations then ensure that Member States maintain biodiversity gains and continue to progress towards good condition. Specifically, Member States must show continuous improvement in sites where restoration has been initiated¹² and to prevent significant deterioration of sites where good condition has been reached¹³ or other sites that must be subject to restoration in order to meet the overall target of restoring 90% of Annex I habitats to good condition by 2050.¹⁴

In the NRR, these duties can be qualified as duties of best efforts.¹⁵ In other words, Member States must act diligently, including by assessing the potential impact of plans and projects, putting in place adequate monitoring mechanisms, and intervening when data shows that a site is at risk of deterioration. However, if the site deteriorates despite the Member State's best efforts, they are not responsible for failing to achieve the desired result. In addition, the NRR provides exceptions for deterioration that is caused by force majeure, including natural disasters, unavoidable habitat transformations caused by climate change, actions or inactions by third countries, and plans of projects of overriding public interest for which no less damaging alternatives are available.¹⁶ In the case that the plan or project affects a Natura 2000 site, then this plan or project must be approved in accordance with Article 6(4). Thus, for projects located within Natura 2000 sites, the stricter procedural and substantive requirements provided by the Habitats Directive continue to be applicable.

As for procedural duties, Article 6(2) of the Habitats Directive requires that public authorities conduct an assessment of any plan or project that may have a significant impact on protected habitats or species, and prohibits them from approving any that may affect the integrity of a Natura 2000 site in a manner that is contrary to the conservation objectives of the same, unless specific conditions are met. These conditions are set out in Article 6(4), namely that the plan or project serves an overriding public interest, compensatory measures are taken, and the Commission is duly informed. In the case that the project affects a priority site or species, the Commission must give prior approval.

The substantive and procedural duties set out in the Habitats Directive are not abrogated by the Nature Restoration Regulation. On the contrary, numerous provisions of the NRR are worded to make it clear that the rules governing Natura 2000 sites continue to be applicable. Indeed, in many respects, they are more stringent than those of the NRR, including the duty to conduct an appropriate assessment.

¹² Article 4(11) NRR.

¹³ *Ibid.*

¹⁴ Article 4(12) NRR.

¹⁵ B. J. DE LEEUW, C. W. BACKES, "The Non-Deterioration Obligation in the Nature Restoration Regulation – a Necessary and Proportionate Addition to the Habitats Directive or a Monstrosity with Disastrous Consequences for Society?" *op. cit.*.

¹⁶ Article 4(14-16) NRR.

In essence, within Natura 2000 sites, the NRR simply adds deadlines for Member States to start efforts that they should anyways be taking comply with the Habitats and Birds Directives.

III.3 Terrestrial areas outside Natura 2000 sites

Many Annex I habitats are found outside Natura 2000 sites. In fact, the Natura 2000 network was the fruit of negotiation between the Member State and the Commission, a political compromise which does not fully capture the ecological value of European habitats. However, one of the reasons that Natura 2000 sites are not in favourable conservation status is their relative isolation. Reconnecting these sites to other habitats located outside the borders of protected areas is one way to improve their condition and ensure they can be resilient over time.

The restoration obligations found in Article 4 of the NRR apply wherever Annex I habitats are found, both inside and outside of protected areas. It does not distinguish between areas based on whether they are publicly or privately owned. Thus, the restoration of Annex I habitats that are currently private property—such as hunting reserves, pastures, or private reserves—may contribute to achieving the Member States’ targets under the NRR.

The NRR does not directly require Member States to extend or re-negotiate the borders of their Natura 2000 sites, even though they remain free to evaluate whether extending protected areas would be opportune. It is true that Europe set out the goal of increasing the portion of European territory falling within protected areas to 30% by 2030, including 10% under a strict protection regime,¹⁷ reflecting commitments undertaken in the 2022 Kunming-Montreal Declaration.¹⁸ However, these targets are non-binding and are not included in the NRR.

The NRR recognizes that Member States need flexibility to balance restoration duties with societal needs when it comes to Annex I habitats outside protected areas. To this end, it allows them to invoke certain derogations. For one, they can apply the duty to show continuous improvement in areas subject to restoration at a biogeographical level instead of a site level, which should permit them to compensate losses in one area with gains in another for the purposes of this target. Thus, greater gains within protected areas could compensate less ambitious efforts in territories outside of the same. Moreover, Member States can invoke a derogation from their non-deterioration obligations for projects of overriding public interest. Although the NRR does not specifically require environmental impact assessment in such cases, this does not exclude that some compensation may be needed.

¹⁷ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU Biodiversity Strategy for 2030 Bringing nature back into our lives, COM(2020) 380 final of 20 May 2020 p. 4.

¹⁸ Conference of the Parties to the Convention on Biological Diversity, *Kunming-Montreal Global Biodiversity Framework*, CBD/COP/DEC/15/4, 19 December 2022.

One of the most significant challenges that will face Member States is re-establishing habitats outside of protected areas necessary to re-establish favourable reference areas for Annex I habitats. This involves transforming land, such as to create ecological corridors. For one, identifying where habitats need to be re-established is no simple task. Moreover, Member States will need to establish priorities for how to do so, and how to collaborate with private landowners where necessary.

III.4 Protected species

Besides habitats listed in Annex I, Member States must also restore or re-establish habitats necessary for protected species listed in the Habitats and Birds Directive.¹⁹ The NRR does not establish specific targets for doing so: instead, it provides that Member States should restore habitats needed for protected species to reach or maintain a favourable conservation status. The fact that the NRR does not establish timelines for restoring the habitats of protected species does not mean that Member States can postpone action. In the past, the Court of Justice has found Member States in infringement of their duties to establish protection regimes for Habitats Directive species when they fail to take measures to prevent the destruction of habitats and to re-establish those that have been lost.²⁰ The urgency of such measures will depend on the needs of the protected species concerned.

III.5 Forested areas

In addition to these habitat restoration obligations, Article 12 requires Member States to take measures necessary to enhance ecosystems in forested areas. This concerns forests inside protected areas and outside, including plantation forests or those designated for harvesting. The duties set out in Article 12 NRR also recognize the importance of these areas for carbon sequestration and achieving the Union's climate objectives. Although its aim is to improve ecosystems, achieving the NRR's targets will also contribute to efforts to improve carbon sinks, as required under the LULUCF Regulation.²¹ Data shows that the quality of European forests as carbon sinks is decreasing. This trend is certainly worsened by recent droughts and forest fires caused by climate change.

The Nature Restoration Regulation sets out specific indicators of forest ecosystem health. Member States must show an increasing trend in these indicators, measured every six years, until a satisfactory level is reached. Each Member State must establish what the satisfactory level will be within its territory, based on guidelines that the Commission will adopt.²²

¹⁹ Article 4(7) NRR.

²⁰ CJEU, Judgment of 9 June 2011, case C-383/09, *Commission v France*, ECLI:EU:C:2011:369.

²¹ Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU, OJ L 156/1 of 19 June 2018.

²² Article 14(5) NRR.

Specifically, all Member States must show an increasing trend in the common forest bird index, an indicator derived from the PanEuropean Common Bird Monitoring Scheme.²³ In general, populations of forest birds have been increasing over the last years (*Figure 5*), although trends differ among Member States. In addition, they must choose six of the following seven indicators:

- a. standing deadwood;
- b. lying deadwood;
- c. share of forests with uneven-aged structure;
- d. forest connectivity;
- e. stock of organic carbon;
- f. share of forests dominated by native tree species;
- g. tree species diversity.

The failure of Member States to show improvement in their targets can be justified only when their failure is caused by large-scale *force majeure*, including wildfires, or unavoidable habitat transformations caused by climate change. This is an important exception. It should be kept in mind that a state cannot invoke *force majeure* unless the event is unforeseeable and uncontrollable, and it must render the performance of the obligation materially impossible. It is reasonable to argue that Member States may not be able to invoke *force majeure* when their failure to properly manage wildfires risk, or to adequately respond to the same, increases the damage they cause.

III.6 Nature restoration and renewable energy

While nature restoration can contribute to carbon sequestration, it can also come into conflict with the need to expand the production of renewable energy in rural areas. In order to help reconcile these two EU objectives and combat climate change, the NRR provides that Member States must coordinate their national restoration plans with the development of renewable energy and the related infrastructure. Under the Renewable Energy Directive (EU) 2018/2001, Member States must designate areas which are particularly suited to solar and wind energy production as “renewable acceleration areas.”²⁴ While they may not locate these areas within Natura 2000 sites or areas where they may have a significant environmental impact, including on migratory species, they are not precluded from including within them habitats in need of restoration under the NRR.

In such areas, the NRR recognizes that renewable production may be prioritized. When preparing their national restoration plans, Member States must account for the existing renewable acceleration areas and must ensure that the special regime applicable to them is maintained. They are also required to organize restoration efforts in such a manner as to

²³ See the PECMBS, *European common bird indicators, 2023 update*, available at see <https://pecbms.info/european-common-bird-indicators-2023-update/>.

²⁴ Article 15 of Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources, OJ L 328/82 of 21 December 2018.

leave the functioning of renewable areas unchanged, including any infrastructure necessary to integrate renewable energy into the national grid.²⁵

Article 6 of the NRR goes one step further, setting out an exception to the prohibition of deterioration of Annex I habitats in good condition or need of restoration. It specifically provides that the “planning, construction and operation of plants for the production of energy from renewable sources, their connection to the grid and the related grid itself, and storage assets shall be presumed to be in the overriding public interest.” Moreover, if a strategic environmental assessment or environmental impact assessment has been carried out prior to the approval of the project, then the Member State does not need to demonstrate that no less damaging alternative solutions were available. The result is that the restoration duties under the NRR should not be an obstacle to the development of renewable energy, in accordance with the Renewable Energy Directive, either on land or in marine areas.

It is not always the case that renewable energy projects are incompatible with ecosystem restoration. Studies have shown that the land under solar panels and surrounding wind turbines or grid infrastructure can be managed in a way that benefits native flora, insects, and small mammals. Similarly, the prohibition of fishing around offshore wind turbines, as well as the anchors of turbines themselves, can have net benefits for marine life.²⁶ Although controversial, maximising biodiversity benefits around renewable energy can be an efficient way for Member States to achieve both their climate and nature objectives.

Further reading

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A. CLIQUET, K. DECLER, “Halting and restoring species loss: incorporating the concepts of extinction debt, ecological trap and dark diversity into conservation and restoration law”, in *Griffith Law Review*, 2/2017, p. 178 ff., DOI 10.1080/10383441.2017.1355873.

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V. MAUERHOFER, “Complement the directed: the EU's nature restoration regulations' relation to the habitats, birds, and environmental liability directives”, in *Restoration Ecology*, 2025, DOI 10.1111/rec.70227.

²⁵ Article 14(13) NRR.

²⁶ EEA Briefing no. 14/2024, *Harnessing offshore wind while preserving the seas*, 2024, available at <https://www.eea.europa.eu/en/analysis/publications/harnessing-offshore-wind-while-preserving-the-seas>.

H. SCHOUKENS, “Towards a Legally Enforceable Duty to Restore Endangered Species under EU Nature Conservation Law – On Wild Hamsters, the Rule of Law and Species Extinction”, in *Procedural Environmental Rights: Principle X in Theory and Practice*, J. JENDROSKA and M. BAR (eds.), Cambridge ; Antwerp ; Portland, 2018, p. 287 ff.

H. SCHOUKENS, A. CLIQUET, “Biodiversity offsetting and restoration under the European Union Habitats Directive: balancing between no net loss and deathbed conservation?”, in *Ecology and Society*, 4/2016, p. 10 ff., DOI 10.5751/es-08456-210410.

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CHAPTER IV – RESTORATION OF FRESHWATER AND MARINE AREAS

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IV.1 The complex scientific and legal context. – IV.2 Restoration of freshwater, transitional waters and coastal areas. – IV.3 Non-deterioration duties in freshwater areas. – IV.4 Restoration of free-flowing rivers and barrier removal. – IV.5 Restoration of marine areas and ecosystems. – Further reading.

IV.1 The complex scientific and legal context

Water has many uses: producing food, enabling sanitation services, cooling power generators and data centres, transporting goods, and producing energy, among others. Some of these functions of water are linked to fundamental rights, such as the right to food and to sanitation. Yet water is also a critical environmental resource, an essential component of all forms of life and the host of aquatic ecosystems.

Given these many competing demands, it is no surprise that freshwater ecosystems are some of the most degraded in Europe.¹ This is so despite decades of efforts to protect and restore the ecology of European rivers, wetlands, lakes, transitional and coastal waters. Within the EU, numerous regulations and directives have been developed to improve the quality of bodies of water, including the Water Framework Directive (WFD),² Marine Strategy Framework Directive,³ Floods Directive,⁴ Drinking Water Directive (DWD),⁵ and Groundwater Directive,⁶ along with rules to prevent and control pollution by economic activities.⁷

¹ Report from the Commission to the European Parliament, the Council and the European Economic and Social Committee. The state of nature in the European Union: Report on the status and trends in 2013 - 2018 of species and habitat types protected by the Birds and Habitats Directives, COM(2020) 635 final of 15 October 2020.

² Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for the Community action in the field of water policy, OJ L 327 1 of 22 December 2000.

³ Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy, OJ L 164 19 of 25 June 2008.

⁴ Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, OJ L 288/27 of 6 November 2007.

⁵ Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption (recast), OJ L 435/1 of 23 December 2020.

⁶ Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration, OJ L 372/1 of 27 December 2006.

⁷ Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast), OJ L 334/17 of 17 December 2010.

In addition, certain particularly critical aquatic habitats are also protected by the Habitats Directive⁸ the Birds Directive.⁹

Into this complex set of rules, the new Nature Restoration Regulation has added new duties for Member States to restore freshwater and marine habitats. These include a target to remove obsolete barriers like dams and levees currently found on European rivers, with a goal of restoring 25,000 km of European rivers to ‘free-flowing’ status. One of the first challenges in implementing the NRR is therefore to understand how the NRR fits into the pre-existing legal framework governing freshwater and marine ecosystems.

IV.2 Restoration of freshwater, transitional waters and coastal areas

The Water Framework Directive 2000/60/EC (WFD)¹⁰ is the overarching legal instrument governing the quality of surface waters, groundwaters and coastal waters within the European Union. It set ambitious targets for improving the ecological and chemical status of surface waters and it promotes an integrated approach to water management, one that unites all the different regulatory questions related to water, from upstream land management to end users.¹¹

Its specific objectives are framed in terms of environmental quality, including preventing further deterioration, protecting and improving the status of the aquatic environment and promoting the sustainable use of surface and groundwaters.¹² In addition to ecological objectives, it also includes aims more directly concerned with human interests, such as mitigating the impact of floods and droughts and ensuring the provision of water sufficient for “sustainable, balanced and equitable” use.¹³

⁸ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, OJ L 206 7 of 22 July 1992.

⁹ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds, OJ L 20/7 of 26 January 2010.

¹⁰ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for the Community action in the field of water policy, OJ L 327 1 of 22 December 2000 (hereinafter ‘WFD’).

¹¹ M. LEE, “Law and Governance of Water Protection Policy”, in *Environmental Protection: European Law and Governance*, J. SCOTT (ed.) Oxford, 2009, p. 27 ff.; M. VAN RIJSWICK, A. KEESSEN, “The EU approach for integrated water resource management: Transposing the EU Water Framework Directive within a national context - key insights from experience”, in *Routledge Handbook of Water Law and Policy*, Florence, 2017, p. 51 ff.; M. VLACHOPOULOU et al., “The potential of using the Ecosystem Approach in the implementation of the EU Water Framework Directive”, in *Science of the Total Environment*, 2014, p. 684 ff., DOI 10.1016/j.scitotenv.2013.09.072; N. VOULVOULIS et al., “The EU Water Framework Directive: From great expectations to problems with implementation”, in *Science of the Total Environment*, 2017, p. 358 ff., DOI 10.1016/j.scitotenv.2016.09.228.

¹² Article 1 WFD.

¹³ Article 1(e) WFD.

Under the WFD, Member States are bound to “protect, enhance and restore” the quality of surface waters;¹⁴ specifically, they must assess the ecological and chemical status of surface water bodies and ensure that both are, at a minimum, classified as *good* by 2027. Ecological status is defined based on several parameters relating to biological, hydrological and physio-chemical quality elements. *Excellent* status is given when conditions are equivalent to those of a “totally or nearly totally undisturbed” state, which is assessed in relation to a reference model selected by the river basin management authority (RBMA). *Good* status corresponds to conditions “slightly” varied compared to excellent status, and *moderate* describes a “moderately” disturbed state. Under the WFD, it does not matter whether the disturbance is caused by anthropogenic or natural factors.¹⁵ This remains the case after the adoption of the NRR, which has not replaced the ecological quality objectives set out in the WFD. Instead, Member States must meet both the WFD and NRR targets when managing their surface water bodies.

Significant criticism has been raised about the WFD, especially its methodology for selecting the reference model against which *good ecological status* is assessed.¹⁶ Some argue that this target status may not be realistic, as European waterways have been impacted by human activities for centuries.¹⁷ At the same time, the WFD includes flexibility mechanisms designed to take account of these altered conditions. For example, Member States may designate a water body as “artificial or heavily modified” when it has been created by human activity (i.e. artificial lakes, canals) or when “as a result of physical alterations by human activity [it] is substantially changed in character.”¹⁸ In this case, they must only achieve “good ecological potential,” defined as slightly variation from a state where its qualities reflect those associated with a comparable natural waterbody, given the modifications it has undergone. It thus takes into account what is realistically achievable without re-naturalization. The recent report of the Commission on the third river basin management plans 2021-2027 reveals that 12.4% of surface water bodies have been designated as heavily modified and 4.4% as artificial in the territory of the EU.¹⁹

¹⁴ Article 1(1.a.2) WFD.

¹⁵ CJEU, Judgment of 21 March 2024, case C-671/22, *Bezirkshauptmannschaft Spittal an der Drau*, ECLI:EU:C:2024:256, para. 37. Exceptions are possible in accordance with Article 4(7) WFD, discussed below.

¹⁶ S. VALINIA et al., “Problems with the reconciliation of good ecological status and public participation in the Water Framework Directive”, in *Science of the Total Environment*, 2012, p. 482 ff., DOI 10.1016/j.scitotenv.2012.06.087, at p. 489; K. BISHOP et al., “Nature as the “natural” goal for water management: a conversation”, in *Ambio*, 4/2009, p. 209 ff., DOI 10.1579/0044-7447-38.4.209.

¹⁷ B. MOSS, “The Water Framework Directive: total environment or political compromise?”, in *Science of the Total Environment*, 1-3/2008, p. 32 ff., DOI 10.1016/j.scitotenv.2008.04.029.

¹⁸ Article 2(9) WFD.

¹⁹ Report from the Commission to the Council and the European Parliament on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC), COM(2025) 2 final of 4 February 2025 p. 20.

The WFD also introduced a new system of governance for managing surface, coastal and groundwaters. At the centre of this framework are river basin management authorities (RBMAs), tasked with adopting river basin management plans in six-year cycles. Preparing these plans is a lengthy process, involving extensive public input and strategic assessment. The fourth river basin management plans must be submitted by December 2027.

Despite these efforts, a 2025 report on the third river basin management cycle reveals that Member States have fallen short in achieving either good ecological status or good ecological potential in their surface water bodies. The report shows only limited progress towards this goal over a quarter century after the adoption of the WFD, with only 39.5% of surface waters in good ecological status or good ecological potential.²⁰ Given these considerations, Member States will certainly fall short from meeting the WFD's 2027 deadline of achieving this target.

In practice, the WFD may support the implementation of the NRR's ecological objectives, and vice-versa. The greatest benefits are likely to come from projects that advance several environmental objectives simultaneously, as shown by experience with surface water restoration in Natura 2000 areas.²¹ From this perspective, prioritizing projects that contribute to reaching both WFD and NRR objectives could maximize ecosystem benefits, since projects aimed solely at short-term improvements in water quality may be less effective than those designed to enhance ecosystem diversity and function more broadly.²² Therefore, synergies between the WFD and NRR objectives could extend restoration efforts to areas such as floodplains, temporary streams and ephemeral waters that fall outside the scope of the WFD, leading to improvements in both water quality and ecosystems downstream.

However, there may also be a degree of mismatch between the two instruments. The NRR does not address how its requirement to reach 'good condition' relates to 'good ecological status' or 'good ecological potential' in the WFD. This is remarkable. The definition of good condition in the NRR specifically states that it contributes to reaching favourable conservation status under the HD and good ecological condition under the MSFD, but it contains no similar mention of the WFD. This may reflect the fact that the two targets do not necessarily coincide and may, in some cases, even pull in different directions. Indeed, RBMAs may use a historic model as their reference for assessing the *ecological status* of

²⁰ Ibid.

²¹ M. VAN RIJSWICK, A. KEESSEN, "The EU approach for integrated water resource management: Transposing the EU Water Framework Directive within a national context - key insights from experience", *op. cit.*; M. BLICHARSKA, P. RÖNNBÄCK, "What factors enable or hinder engagement of civil society in ecosystem management? The case of 'pike factories' and wetland restoration in Sweden", in *Journal of Environmental Planning and Management*, 5-6/2018, p. 950 ff., DOI 10.1080/09640568.2017.1350145.

²² For example, regarding peatlands, R. J. M. TEMMINK et al., "Wetscapes: Restoring and maintaining peatland landscapes for sustainable futures", in *Ambio*, 9/2023, p. 1519 ff., DOI 10.1007/s13280-023-01875-8.

a waterbody; instead, *good condition* for the NRR considers the long-term resilience of a habitat, including in the face of climate change.

This divergence may be even more pronounced in relation to waterways designated as artificial or heavily modified. For the NRR, restoration is necessary whenever a habitat designated in Annex I or a protected species is not in good condition, or when necessary to reach the favourable reference area for a designated species or habitat. This applies regardless of whether the areas to be restored are designated as artificial or heavily modified under the WFD. In this respect, the NRR may help to counterbalance the excessive use of this flexibility by some Member States to lower their ambitions under the WFD. It may also encourage the restoration of ecosystems in ‘heavily modified’ waterbodies, such as canals and channelized bodies of water, which can have significant ecological benefits. In this way, the NRR’s targets can support more ambitious, but also more realistic, action to restore freshwater bodies, including heavily modified or artificial waterways that might not otherwise be targeted for restoration.

River basin management authorities will therefore have the task of integrating the new targets under the NRR. The fact that these institutions are already in place and have a mandate to adopt an integrated approach to water management, is a significant advantage. They will, however, need to take ownership of NRR targets. and find synergies between the two regimes.

IV.3 Non-deterioration duties in freshwater areas

Both the NRR and the WFD contain non-deterioration obligations, which aim to preserve gains made and to prevent degradation that would aggravate future restoration needs. Although these obligations differ significantly in scope and legal effect, they may also operate in a mutually reinforcing way.

As the Court of Justice of the European Union (CJEU) first stated in the *Weser* case, under the WFD Member States must not allow any deterioration in the qualitative status of water bodies, even on a temporary basis.²³ The strictness of this non-deterioration obligation is tempered by the exception provided in Article 4(7) WFD. Under that provision, a failure to reach good status or to prevent deterioration is not a violation of the WFD when certain conditions are met: the poor condition is due to modifications to the physical characteristics of the water body (excluding chemical or ecological changes); all practicable steps are taken to mitigate the adverse impact of the changes; the modifications must be provided in the river basin management plan; the intervention must be of “overriding public interest” or otherwise in the interest of human health, human safety or sustainable development, to an extent that outweighs the benefits to the environment and society of achieving good

²³ CJEU, Judgment of 1 July 2015, case C-461/13, *Bund für Umwelt und Naturschutz Deutschland eV*, ECLI:EU:C:2015:433 para. 70; CJEU, Judgment of 5 May 2022, case C-525/20, *Association France Nature Environnement (Impacts temporaires sur les eaux de surface)*, ECLI:EU:C:2022:350 para. 45.

status in the waterbody concerned; and the benefits of the modification cannot for reasons of technical feasibility or disproportionate cost be achieved by other, less-damaging means. Both the Commission and the CJEU have indicated that they intend to interpret these requirements strictly and expect Member States to do as well.²⁴ Indeed, the CJEU has held that, “Member States are required – unless a derogation is granted – to refuse to grant consent for an individual project where it may cause a deterioration of the status of a body of surface water or where it jeopardises the attainment of good surface water status or of good ecological potential and good surface water chemical status by the date laid down by the directive.”²⁵ This deadline is currently the end of the third river basin management cycle, in December 2027.

The flexibility mechanism provided in the NRR differs in both its scope and contents from that in the WFD. For one, while the CJEU has made clear that non-deterioration in the WFD is an obligation of result, such that Member States are responsible whenever deterioration occurs, in the NRR it is an obligation of best efforts.²⁶ Moreover, while both instruments allow deterioration for projects necessary to protect an overriding public interest, the conditions governing such derogations are not the same. Under the WFD, derogation is permitted only for modifications to the physical characteristics of the waterway. The NRR contains no equivalent limitation and instead allows derogation for the negative effects of plans and projects more broadly. Moreover, efforts to mitigate adverse impacts are required under the WFD, while this does not appear to be required by the NRR. The main exception concerns projects affecting protected areas, for which compensatory measures will be required in accordance with Article 6(4) of the Habitats Directive.

What follows from this is that the WFD’s more stringent non-deterioration requirements will continue to be applicable, even for projects whose harmful effects may be allowed under the NRR. In practice, this means that restoration projects in aquatic areas, particularly barrier removal, will need to fulfil the non-deterioration requirements under the WFD; at the same time, any water quality gains such projects achieve will be protected by the same.

IV.4 Restoration of free-flowing rivers and barrier removal

While the WFD aims to maintain and improve the aquatic environment, it has not placed the same emphasis on removing barriers that impede the natural flow of rivers. Such

²⁴ Report from the Commission to the Council and the European Parliament on the Commission's assessment of the Member States' programmes of measures as updated under Article 17 of the Marine Strategy Framework Directive (2008/56/EC), COM/2025/3 final of 4 February 2025.

²⁵ CJEU, Judgment of 20 December 2017, case C-664/15, *Protect Natur-, Arten- und Landschaftsschutz Umweltorganisation*, ECLI:EU:C:2017:987 para. 31.

²⁶ B. J. DE LEEUW, C. W. BACKES, “The Non-Deterioration Obligation in the Nature Restoration Regulation – a Necessary and Proportionate Addition to the Habitats Directive or a Monstrosity with Disastrous Consequences for Society?” *op. cit.*; E. LEES, O. W. PEDERSEN, “Restoring the Regulated: The EU’s Nature Restoration Law”, in *Journal of Environmental Law*, 2025, p. 1 ff., DOI 10.1093/jel/eqae032.

barriers can impede the flow of water downstream, as in the case of dams, weirs and culverts, or can prevent the water from moving laterally, as with embankments, channels and levees. Indeed, although the WFD requires Member States to assess the hydromorphological quality of surface waters, they do not need to remove barriers to river connectivity if other means are available to reach good ecological status or good ecological potential, such as the installation of fish ladders. Moreover, waterways with barriers are more likely to be designated as *heavily modified*, with the result that Member States are required to achieve only good ecological potential, assessed in light of the existing modifications to a waterway. As long as the barriers continue to provide benefits that cannot be achieved by other, more environmentally-friendly means, including due to their cost,²⁷ then the waterways can continue to be classified as heavily modified, with consequent lowering of the level of ecological ambition.

Studies show that Member States currently employ very different approaches to barrier removal.²⁸ In recent years, the Commission has attempted to encourage Member States to step up efforts to identify river segments that may be restored to free-flowing status, understood as a state in which the river is not impaired by artificial barriers and is not disconnected from its floodplain, thus allowing the free movement of water, sediment, fish and other organisms.²⁹ To qualify as free-flowing, a segment of river must have unimpeded flow of sediments from upstream and provide sufficient connection so as to allow the passage of fish from downstream areas.³⁰ Thus, no free-flowing segment is considered in isolation, but always in relation to the broader landscape.

The NRR does not provide specific guidance on how to select the barriers to remove, aside from prioritising ones that are obsolete. Of the estimated 1.2 million barriers currently found on European waterways,³¹ around 10 to 15% are no longer needed.³² According to this estimate, removing obsolete barriers alone would create 50,000km of free-flowing rivers. The NRR, instead, sets the target of restoring only half of this—25,000km—by 2030.

Barrier removal may nonetheless give rise to legal and technical issues. Occasionally, infrastructure removal may itself require environmental impact assessment, as it can

²⁷ Article 4(3)(b) WFD.

²⁸ H. KUJALA et al., “Not all data are equal: Influence of data type and amount in spatial conservation prioritisation”, in *Methods in Ecology and Evolution*, 11/2018, p. 2249 ff., DOI 10.1111/2041-210x.13084; P. S. KEMP, J. R. O'HANLEY, “Procedures for evaluating and prioritising the removal of fish passage barriers: a synthesis”, in *Fisheries Management and Ecology*, 4/2010, p. 297 ff., DOI 10.1111/j.1365-2400.2010.00751.x.

²⁹ EUROPEAN COMMISSION, *Biodiversity Strategy 2030 Barrier Removal for River Restoration*, p. 15-18; W. VAN DE BUND et al., *Criteria for identifying free-flowing river stretches for the EU Biodiversity Strategy for 2030*, Luxembourg, 2024

³⁰ W. VAN DE BUND, et al., *Criteria for identifying free-flowing river stretches for the EU Biodiversity Strategy for 2030*, cit.

³¹ B. BELLETTI et al., “More than one million barriers fragment Europe’s rivers”, in *Nature*, 7838/2020, p. ff., DOI 10.1038/s41586-020-3005-2.

³² WWF, *The Potential of Barrier Removal to Reconnect Europe’s Rivers*, Vienna, April 2021.

generate negative environmental impacts and worsen water quality, albeit on a temporary basis. The assessment of barrier removal projects can be problematic, as the removal of one dam or culvert may have only limited benefits for river ecology when other barriers upstream or downstream continue to impact sediment transfers or fish migration. Instead, the real ecological benefits may depend on more ambitious efforts at a landscape scale.³³ This, naturally, is more difficult to achieve, as efforts to create extended stretches of free-flowing rivers are more likely to require the removal of barriers that are not wholly obsolete.

The NRR also contains a special non-deterioration duty applicable to river segments that have been restored to a free-flowing state. Indeed, Article 9(4) states that Member States “shall ensure that the natural connectivity of rivers and natural functions of the related floodplains restored[...]are maintained.”³⁴ No exceptions in the text of the NRR are provided. Interpreted strictly, this would go beyond both the non-deterioration duties in the WFD and the NRR more generally. At the same time, it is difficult to foresee how hydrological flows will be affected by climate change over the upcoming decades, and it may be reasonable to permit Member States to carry out new infrastructure projects if necessary to safeguard imperative public interests, like public safety or water security, compatibly with Article 4(7) WFD. It remains to be seen how this provision will be interpreted by the courts of Member States and, ultimately, the CJEU.

IV.5 Restoration of marine areas and ecosystems

While many freshwater and coastal habitats are included within Annex I of the NRR and are thus subject to the same duties and derogations as terrestrial areas, marine habitats present special challenges. For this reason, the Commission determined that it was necessary to dedicate a separate Article 5 to marine restoration duties, distinguishing them from those set out in Article 4. These legal duties are shaped by the scientific state of the art on restoration at sea.

The legal framework applicable to marine areas in the EU is already particularly complex.³⁵ The provisions in the NRR must be coordinated with numerous other duties provided by EU environmental law, the Common Fisheries Policy (CFP) and regional seas arrangements, such as the UNEP Mediterranean Action Programme (UNEP/MAP) created by the 1992 Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, also known as the Barcelona Convention.³⁶ Even before the

³³ N. SOININEN et al., “Ecological restoration hierarchy as a lens to reveal the foundational economic and legal structures impeding restoration”, in *Restoration Ecology*, 2025, p. e70216 ff., DOI 10.1111/rec.70216.

³⁴ Article 9(4) NRR.

³⁵ S. J. BOYES, M. ELLIOTT, “Marine legislation--the ultimate 'horrendogram': international law, European directives & national implementation”, in *Mar Pollut Bull*, 1-2/2014, p. ff., DOI 10.1016/j.marpolbul.2014.06.055.

³⁶ Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (adopted 16 February 1976, entered into force 12 February 1978) UNTS 1102 27-

NRR, the resulting legal and governance framework was already considerably more complex than that applicable to terrestrial areas.

Within marine areas, the NRR is applicable to Annex II habitats that are not in good condition and to other habitats that must be restored to maintain or achieve a favourable conservation status for protected species. (*Table 5*)

TABLE 5 – RESTORATION TARGETS FOR MARINE HABITATS – ARTICLE 5 NRR

Restoration targets for marine habitats – Article 5 NRR			
	2030	2040	2050
Annex II (group 1 – 6) habitat types not in good condition	30%	60%	90%
Annex II group 7 habitat types (soft sediments) not in good condition		2/3 of 2050 target set by Member State	target set by the Member State
Re-establishment of habitats needed to guarantee a favourable reference area for Annex II habitats (groups 1 – 6)	27-30%	54-60%	90-100%
Other areas needed to provide sufficient quantity and quality of habitat for protected species	not specified		

When drafting the Regulation, the Commission considered it necessary to soften restoration requirements for certain marine habitat types. These habitats—listed in Group 7—comprise seabed habitats with a soft sediment substrate, which are the most widespread of marine habitat types. They are also studied less frequently than other, more biodiversity-rich habitats like reefs, vents and seagrass beds. Delaying restoration obligations of these habitats allows Member States additional time to map them and assess their current status. Member States also enjoys the freedom to set the target for what percentage of these areas they will restore by 2050, which must be included in their National Restoration Plan.³⁷

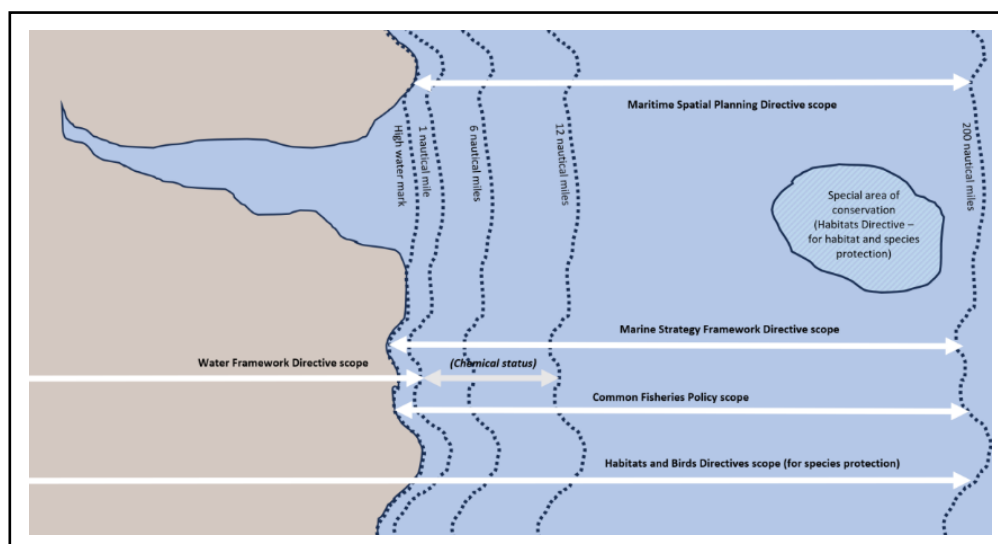
Notably, the Regulation differs in some respects from the Habitats and Birds Directives. For one, the habitat classification adopted in Annex II is not the same as that attached to the Habitats Directive: instead, it reflects how marine habitats are classified in the EUNIS system, which is more precise with regard to certain pelagic (open water) and benthic

³⁷ Article 14(3) NRR.

(seabed) ecosystems.³⁸ For another, when it comes to efforts to restore the habitats of protected species, the NRR adds several new species to those already protected under the Habitats and Birds Directives. Found in Annex III, this includes several types of sharks and rays. While the NRR does not set in place the same strict protections found in Article 12 of the Habitats Directive, it does require Member States to take measures to restore their habitats so as to contribute to the recovery of these critical species.

The many EU rules applicable to marine areas frequently overlap in both their territorial scope and regulatory reach (*Figure 4*). The NRR will add a further layer of rules to this framework. Particularly critical is understanding the level of ambition they must enact. Within marine protected areas (MPA) falling under the Habitats Directive, Member States are under a duty to achieve favourable conservation status for habitats falling within their borders and for protected species, both within and outside MPAs. In coastal waters, the WFD requires them to achieve good ecological status within an area extending one nautical mile from the baseline.

FIGURE 4 – GEOGRAPHICAL SCOPE OF EU POLICY AND LEGISLATION APPLICABLE TO THE MARINE ENVIRONMENT



Source: Report from the Commission to the Council and the European Parliament on the Commission's assessment of the Member States' programmes of measures as updated under Article 17 of the Marine Strategy Framework Directive (2008/56/EC), COM/2025/3 final of 4 February 2025, p. 56.

³⁸ Preamble para. 41 NRR.

However, for marine areas, the 2008 Marine Strategy Framework Directive (MSFD)³⁹ sets out an overarching framework of duties for state to improve marine ecosystems, both within their territorial waters and their exclusive economic zone.

The MSFD was adopted to set in place a regulatory regime aimed at improving marine ecosystems. It requires Member States to adopt strategies to achieve ‘good environmental status’ in all their marine areas by 2020. The measures provided under the MSFD should be integrated into a maritime spatial planning instrument, as foreseen by the 2014 Maritime Spatial Planning Directive.⁴⁰

Unlike *favourable conservation status* under the HD, *good environmental status* is defined by each Member State, albeit on the basis of guidance provided by the Commission⁴¹ and in coordination with other Member States at a regional sea level. To this end, Member State set quantifiable targets, then adopt programmes of measures to achieve them, monitoring the impact on a recurring cycle. When marine areas also fall under the scope of the WFD or the Habitats Directive, then good environmental status should be interpreted coherently with the standards of good ecological status or favourable conservation status under these, with additional parameters to address issues like marine litter and underwater noise, which are not covered by the WFD.⁴²

The second MSFD cycle, which concluded in 2024, revealed that while states have improved their definitions of good environmental status and monitoring programmes, there have been only limited improvements in the condition of marine ecosystems. While marine litter has decreased and the population of some marine mammals has recovered, the 2025 Commission’s REFIT evaluation found that, “The Directive has only been partially effective. Overall, it has been oriented more towards process than outcome.”⁴³

As with the Water Framework Directive, the lack of coherence of the MSFD with other Union policy, including the Common Fisheries Policy and the Common Agricultural Policy, has undermined the achievement of its objectives.⁴⁴ Indeed, many of the sources of disturbance of marine environments have their origins on land, such as pollution runoff and

³⁹ Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy, OJ L 164 19 of 25 June 2008.

⁴⁰ Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning, OJ L 257/135 of 28 August 2014.

⁴¹ Commission Decision (EU) 2017/848 of 17 May 2017 laying down criteria and methodological standards on good environmental status of marine waters and specifications and standardised methods for monitoring and assessment, and repealing Decision 2010/477/EU, OJ L 125/43 of 18 May 2017. To aid Member States, the Commission and Member States have created a Common Implementation Strategy – the Marine Strategy Coordination Group – which includes a working group on good environmental status.

⁴² Commission Staff Working Document Evaluation of Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), SWD(2025) 50 final of 6 March 2025 p 53-56.

⁴³ Ibid p 25.

⁴⁴ Ibid.

litter. Improving marine ecosystems therefore requires a ‘source to sea’ approach, which is politically and technically difficult to achieve. For one, marine pollution may have its source outside the national territory, making regional cooperation essential.⁴⁵ Additionally, there can be a significant delay between when measures to reduce pollution are taken and when the monitoring data shows improvements. This delay can make it difficult to assess whether measures, like restrictions on fishing methods or reductions in pollutant runoff, are sufficient to permit the recovery of marine ecosystems.

The Nature Restoration Regulation may face the same difficulties that have so far limited the effectiveness of the MSFD. Nonetheless, it also provides an opportunity to strengthen it; indeed, the NRR defines good condition in marine areas as a state that contributes to the maintenance or achievement of good environmental status. Thus, if restoration measures are put in place with the aim of reaching good status under the NRR, they will by definition also be functional to reaching the MSFD’s targets. Second, the NRR establishes mechanisms for Member States to raise issues affecting its marine areas that extend beyond its competence, including those related to the common fisheries policy (CFP).⁴⁶ To this end, it states that Member States must make use of mechanisms under the Common Fisheries Policy to adopt joint recommendations on conservation measures when such measures are provided in their NRPs.⁴⁷ To date, Member States have rarely made use of the joint recommendation process, so the fact that the NRR now requires them to do so may be helpful.⁴⁸

One of the challenges of improving the marine environment is the lack of data about the status of many marine ecosystems and species. The 2020 Special Report of the EU Court of Auditors revealed that such data gaps are still significant, making it difficult to assess the impact of the MSFD or what further measures may be needed.⁴⁹ The NRR seeks to address this issue by setting specific deadlines for Member States to identify the condition of marine habitats. (*Table 6*) However, it is worth noticing that the deadline for identifying

⁴⁵ C. S. DE OLIVEIRA et al., “The source-to-sea nexus between water and ocean law: An international and EU perspective”, in *Review of European, Comparative & International Environmental Law*, 1-15/2025, p. ff., DOI 10.1111/reel.70031.

⁴⁶ Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC, OJ L 354 22 of 28 December 2013. In fact, the European Union has exclusive competence in matters relating to common fisheries. This means that Member States are precluded from adopting any rules that in this area.

⁴⁷ Article 18 NRR. Such measures are adopted by the Commission after consultations with the Member States, in accordance with Article 18 Regulation (EU) No 1280/2013.

⁴⁸ Commission Staff Working Document Evaluation of Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), SWD(2025) 50 final of 6 March 2025 p. 65.

⁴⁹ EUROPEAN COURT OF AUDITORS, *Special Report. Marine environment: EU protection is wide but not deep*, Luxembourg, 2020, p. 34.

the condition of Group 7 habitats is delayed, as these are the least studied yet most widespread of marine habitat types.

TABLE 6 – TARGETS FOR IDENTIFYING CURRENT STATUS OF MARINE HABITATS – ARTICLE 5 NRR

Targets for identifying current status of marine habitats – Article 5 NRR			
	2030	2040	2050
Annex II (groups 1-6) habitats	50%	100%	
Annex II (group 7) habitats	--	50%	100%

Although restoration of European seas is technically complex, it also offers significant potential for both revitalizing marine ecosystems and creating a sustainable Blue Economy.⁵⁰ The Commission estimates that achieving good environmental status in EU marine areas would generate € 15.8 billion per year in benefits, including in the form of ecosystem services like climate regulation, tourism and recreation, and fishery products.⁵¹ The EU's efforts to preserve and enhance its marine biodiversity can thus offer economic opportunities. Italy, with its 7900 km of coastline and 100.000 km² of territorial seas, has a particularly crucial role to play in advancing both the science and practice of restoration at sea, and is also well-placed to benefit from these efforts.

Further reading

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⁵⁰ EUROPEAN COMMISSION, *The EU Blue Economy Report 2025*, Luxembourg, 2025.

⁵¹ Commission Staff Working Document Evaluation of Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), SWD(2025) 50 final of 6 March 2025, p. 45-47.

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CHAPTER V – RESTORATION OF AGRICULTURAL ECOSYSTEMS

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V.1 Agriculture and nature in Europe. – V.2 Agricultural habitats in the Nature Restoration Regulation. – V.3 Duties to protect and restore pollinators. – V.4 Duties to improve indicators of agricultural ecosystem health. – A. Common Farmland Bird Index. – B. Grassland butterfly index. – C. Stock of organic carbon in cropland mineral soils. – D. Share of agricultural land with high-diversity landscape features. – V.5 Temporary suspension in case of food security crisis. – Further reading.

V.1 Agriculture and nature in Europe

Farmers in Europe depend on the benefits provided by biodiversity, and the loss of pollinators, soil erosion, pollution, invasive species, floods and droughts are increasingly affecting agricultural production in Europe. Efforts to achieve the objectives of the NRR in agricultural territories can contribute to the resilience of agricultural production in the face of new challenges, including the biodiversity crisis and climate change.

Just as agricultural production depends on healthy ecosystems, so do some ecosystems depend on agricultural activities. The EEA estimates that 23 habitat types are fully dependent on agricultural management, with another 40 are partially dependant on the same.¹ In these habitats, activities like grazing, mowing or harvesting maintain ecosystems over time, such as by preventing grasslands from being transformed into forests through natural succession dynamics. Some protected species, including insects, small mammals and plants, live in these habitats and thus depend on agriculture for their continued existence. The Common Agricultural Policy (CAP) framework refers to these areas as High Nature Value (HNV) farmlands, providing measures to incentivise extensive agriculture in these areas.

The objectives of the NRR are not limited to reversing biodiversity losses in agricultural areas, but extend also to contributing to climate change mitigation and adaptation, preventing land degradation and improving the Union's food security.² Although it directly mentions food production among these objectives, the NRR is careful not to interfere with the existing CAP framework, expressly stating that it does not require the re-allocation of programmed CAP funding.³ Nonetheless, it holds Member States to show specific improvements in their agricultural biodiversity, which may in turn require adjustments to their agricultural and rural development policy framework.

V.2 Agricultural habitats in the Nature Restoration Regulation

As mentioned, some protected habitats are shaped by agricultural activities. Where these habitats are found, or where they need to be re-constructed to reach a favourable reference

¹ L. HALADA et al., “Which habitats of European importance depend on agricultural practices?”, in *Biodiversity and Conservation*, 11/2011, p. 2365 ff., DOI 10.1007/s10531-011-9989-z.

² Article 1 NRR.

³ Article 14(11) NRR.

area, then certain agricultural activities can be a key component of restoration efforts to meet a Member State's targets under Article 4 of the Nature Restoration Regulation. These activities—like mowing for fodder, low-intensity grazing, extensive orchards or vineyards—may have been abandoned due to unprofitability. The NRR can give Member States a reason to create incentive programmes so that these activities may be restarted, recognising their valuable contribution to producing ecosystem services and safeguarding biodiversity. Aiding farmers in creating an economically viable activity that also contributes to achieving the Member State's goals could help not just to restore nature, but to revitalize rural communities, both within and outside of Natura 2000 sites.

Besides supporting HNV agriculture, the restoration duties set out in the NRR may affect agricultural activities more directly. In particular, re-establishing favourable reference areas for Annex I habitats, as required by Article 4 NRR, may require the conversion of some farmland into natural areas or biodiversity corridors. Appropriate sources of financing will need to be found,⁴ as well as means of collaborating with farmers instead of imposing land transformation through compulsory purchase or land use restrictions, which would likely give rise to opposition. The restoration of protected habitats may also require changes to agricultural production methods in surrounding areas.

Moreover, Article 11 of the NRR specifically includes obligations applicable to agricultural lands consisting in drained organic soils (*Table 7*). This was one of the more contested provisions within the proposed Regulation, and it was notably softened compared to the Commission's initial proposal. Indeed, across the EU, there are over 17.8 million hectares of drained organic soils under cultivation, primarily in Northern and Eastern Europe, amounting to 4.9% of European land.⁵ (It should be noted that in Italy, only about 0.2% of croplands consist in drained organic soils,⁶ mainly found in Alpine and Apennine areas.⁷)

⁴ See Part II of this Report.

⁵ C. ARIAS-NAVARRO et al. (eds.), *The state of soils in Europe*, Ispra, 2024.

⁶ EEA, *Briefing no. 14/2022. Soil carbon, 2022* available at <https://www.eea.europa.eu/en/analysis/publications/soil-carbon>.

⁷ CONSIGLIO PER RICERCA E LA SPERIMENTAZIONE IN AGRICOLTURA, MINISTERO DELLE POLITICHE AGRICOLE ALIMENTARI E FORESTALI, *Carta dei suoli d'Italia - Soil Map of Italy*, Rome, 2012.

TABLE 7 – RESTORATION TARGETS FOR AGRICULTURAL HABITATS – ARTICLE 11 NRR

Restoration targets for agricultural habitats – Article 11 NRR			
	2030	2040	2050
Restoration of soils of drained peatlands under cultivation	30%	40%	50%
Rewetting of drained peatlands under cultivation	7.50%	12%	15%

Restoring these areas would have both biodiversity and climate benefits.⁸ Drained organic soils are a major source of greenhouse gas emissions. It is estimated that the total GHG emissions from drained organic soils amount to between 119Mt and 288 Mt of CO₂ equivalent annually,⁹ which represents a significant share of agricultural emissions in the EU. Because of their potential as a carbon sink, efforts to restore drained organic soils will help a Member State to reach their climate change targets under the Land Use, Land Use Change and Forestry (LULUCF) Regulation.¹⁰ Rewetting can be done by gradually raising the water table and reseeded peatland vegetation, especially mosses. Full rewetting includes raising water levels to create standing pools of water, which may require ceasing traditional agriculture, either to fully restore natural habitat or to conduct alternative forms of agriculture, especially paludiculture.¹¹ However, the NRR specifies that any rewetting must take place on a strictly voluntary basis.

V.3 Duties to protect and restore pollinators

Pollinators are essential for agriculture and thus play a critical role in the EU's food security. It is estimated that the value of pollination services in the EU is between 5 and 15

⁸ The 2021 EU Soil Strategy for 2030 set out a priority of restoring peatlands that had been drained and converted into agricultural use. Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions, EU Soil Strategy for 2030, Reaping the benefits of healthy soils for people, food, nature and climate, COM(2021) 699 final of 17 November 2021.

⁹ Q. V. GIERSBERGEN et al., “Identifying hotspots of greenhouse gas emissions from drained peatlands in the European Union”, in *Nature Communications*, 1/2025, p. 10825 ff., DOI 10.1038/s41467-025-65841-6.

¹⁰ Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU, OJ L 156/1 of 19 June 2018.

¹¹ R. J. M. TEMMINK, et al., “Wetscapes: Restoring and maintaining peatland landscapes for sustainable futures” *op. cit.*.

billion euros annually.¹² Pollinators include the domesticated honeybee (*apis mellifera*) as well as wild bees, hoverflies, butterflies and moths.

Only a few pollinator species are directly protected under the Habitats Directive. However, starting with the first pollinator initiative in 2018,¹³ the EU has taken action to protect all insect pollinators, increasingly recognising their key role on agriculture. This initiative was revised in 2023, setting for the first time the goal of reversing the decline in insect pollinator populations by 2030.¹⁴ This objective was later enshrined in Article 10 of the NRR, which requires that Member States put in place measures to improve pollinator diversity and reverse the decline of pollinator populations by 2030. After 2030, they must demonstrate an increasing trend until a satisfactory level is reached. Each state must determine what “satisfactory level” will be applied within their territory, through an “open and effective” process and following guidelines that will be prepared by the Commission.¹⁵

At the time the NRR was proposed, there was no single EU-wide methodology for measuring pollinator populations, differently from other indicators that are the subject of ecosystem-restoration duties in the NRR, like the common bird indices and the grassland butterfly index. For this reason, the Commission was delegated the task of establishing, through an implementing act, a common methodology to be adopted in all EU Member States. This methodology, adopted at the end of 2025¹⁶ and based on the EU Pollinator Monitoring Scheme which has been under development since 2021,¹⁷ provides a common tool for assessing the abundance and diversity of bees (excluding domesticated honeybees), hoverflies, butterflies and moths. Unlike the common bird indices or the grassland butterfly index, it counts both common and rare species. It specifies the number of monitoring sites that must be selected based on random sampling, which are divided between agricultural, forest and other areas, with the aim of gathering data representing the entire national territory. Data must be collected monthly in each observation site during the active period of the pollinators. In addition, special data collection on red-listed species of pollinators must be undertaken. This data will be used to calculate a common pollinator indicator and a pollinator species richness indicator for agricultural, forest and other areas.

¹²EEA, *Protecting and restoring Europe’s wild pollinators and their habitats. EEA Briefing 06/2025*, 2025 available at <https://www.eea.europa.eu/en/analysis/publications/protecting-and-restoring-europes-wild-pollinators-and-their-habitats>.

¹³ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions EU Pollinators Initiative, COM(2018) 395 final of 1 June 2018.

¹⁴ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Revision of the EU Pollinators Initiative A new deal for pollinators, COM(2023) 35 final of 24 January 2023.

¹⁵ Article 14(5) NRR.

¹⁶ Commission Delegated Regulation (EU) 2025/2188 of 19 September 2025 supplementing Regulation (EU) 2024/1991 of the European Parliament and of the Council by establishing a science-based method for monitoring pollinator diversity and pollinator populations, OJ L 2025/2188 of 26 November 2025.

¹⁷ S. G. POTTS et al., *Refined proposal for an EU pollinator monitoring scheme*, Luxembourg, 2024.

In order to meet their targets under the NRR, Member States will need to adopt targeted measures that address the drivers of pollinator decline. Within the CAP 2023-2027, some conditionality requirements may already offer benefits for pollinators in agricultural area,¹⁸ although they have been criticised as insufficient overall.¹⁹ More innovative types of eco-schemes, such as results-based payments systems, may provide a more effective way of engaging farmers in efforts to reverse pollinator losses.²⁰

In Europe, another major driver of pollinator loss is agricultural intensification, in particular the removal of high-diversity landscape features, deep tillage and indiscriminate use of plant protection products.²¹ Pesticides and fungicides can have an impact far beyond the fields where they are applied, leading to loss of both pest and beneficial insects in the broader vicinity.²² A more targeted approach to chemical use would have broader benefits, as would the use of integrated pest management strategies instead of pesticide use. This is up to Member States to promote.

Agricultural abandonment is also a cause of pollinator declines, especially the loss of grasslands that depend on extensive agricultural practices to be maintained, such as periodic mowing or grazing. For example, a critically endangered butterfly species endemic to the Pontine islands—the farfalle di Ponza (*hipparchia sbordonii*)—is threatened with local extinction due to the abandonment of traditional vineyards, in which the flowers needed by the butterfly used to grow.²³ Here, restarting traditional agriculture may itself become a solution to biodiversity loss.

Another driver of pollinator declines is the presence of invasive species. For this reason, the pollinator index specifically excludes domesticated honeybees and invasive species, as they can monopolize resources needed by wild pollinator populations and lead to their decline.

¹⁸ In particular, GAEC 1 (maintain a certain share of permanent grassland of the total agricultural area), GAEC 4 (protect water from pollution through the establishment of buffer strips along water courses), GAEC 6 (protect soil by defining rules for minimum soil cover), GAEC 8 (maintain non-productive areas and landscape features).

¹⁹ L. J. COLE et al., “A critical analysis of the potential for EU Common Agricultural Policy measures to support wild pollinators on farmland”, in *Journal of Applied Ecology*, 4/2020, p. 681 ff., DOI 10.1111/1365-2664.13572.

²⁰ See Chapter 3, Part II of this Report. See also Institute for European Environmental Policy, *Results-based Payments for Biodiversity Guidance Handbook: Designing and implementing results-based agri-environment schemes 2014-20*, London, 2014.

²¹ IPBES, *The assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production*, Bonn, 2016.

²² S. S. ALBASEER et al., “Beyond the field: How pesticide drift endangers biodiversity”, in *Environmental Pollution*, 2025, p. 125526 ff., DOI 10.1016/j.envpol.2024.125526.

²³ Agricultural land abandonment, followed by natural reforestation, is identified as one of the key pressures on populations of threatened and endangered butterflies in Italy in S. BONELLI et al., “The first red list of Italian butterflies”, in *Insect Conservation and Diversity*, 5/2018, p. 506 ff., DOI 10.1111/icad.12293.

Beyond agricultural areas, urbanization and light pollution can be another cause of pollinator loss.²⁴ At the same time, urban areas can also favour pollinators, when well-managed urban gardens and parks offer sources of food and breeding sites that favour pollinator recovery. To this end, establishing habitat connectivity is key for species that depend on different sources of food at different times of the year: for this reason, the Commission’s New Deal for Pollinators proposes creating an EU-wide network of pollinator-friendly sites.²⁵

The target of reversing the decline in pollinator loss is perhaps one of the most ambitious elements of the Nature Restoration Regulation, given the transformations that must occur in order to achieve it. However, in light of the importance of pollinators for agriculture, reaching this objective is critical to safeguarding the long-term vitality of the Union’s agricultural sector.

V.4 Duties to improve indicators of agricultural ecosystem health

The Nature Restoration Regulation requires Member States to show improvements in certain indicators of agricultural ecosystem health. These obligations apply to the entire territory of the state, both inside and outside of protected areas, in natural and artificial habitats. One indicator, the Common Farmland Bird Index, is mandatory. In addition, Member States may then select two out of three further indicators, namely the **stock of organic carbon in mineral soils under cultivation**, the **farmland butterfly index**, and the **percentage of croplands with high-diversity landscape features**. For the optional indicators, Member states must demonstrate improvement until a satisfactory level is reached. (Table 8)

TABLE 8 – RESTORATION TARGETS FOR AGRICULTURAL ECOSYSTEMS – ARTICLE 11 NRR

Restoration targets for agricultural ecosystems – Article 11 NRR			
	2030	2040	2050
Common Farmland Bird Index (1 September 2025 = 100)			
<i>Member States with historically depleted bird populations</i>	110	120	130
<i>Other Member States</i>	105	110	115

²⁴ T. M. STRAKA et al., “Light pollution impairs urban nocturnal pollinators but less so in areas with high tree cover”, in *Science of the Total Environment*, 2021, p. 146244 ff., DOI 10.1016/j.scitotenv.2021.146244.

²⁵ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Revision of the EU Pollinators Initiative A new deal for pollinators, COM(2023) 35 final of 24 January 2023.

Grassland butterfly index	increasing trend until satisfactory level is reached
Stock of organic carbon in cropland mineral soils	increasing trend until satisfactory level is reached
Share of agricultural land with high diversity features	increasing trend until satisfactory level is reached

A. Common Farmland Bird Index

Many species of birds live in and around agricultural areas. Some are harmed by intensive farming, especially the use of pesticides, rodenticides and fertilizers, which reduce the availability of food.²⁶ Others may be affected by land management practices that negatively impact their ability to successfully breed, especially those that are ground nesting, such as *Alauda arvensis* (Skylark) and *motacilla flava* (Yellow wagtail). European ground-nesting species are 17 times more likely to be in decline compared to tree-nesting species.²⁷

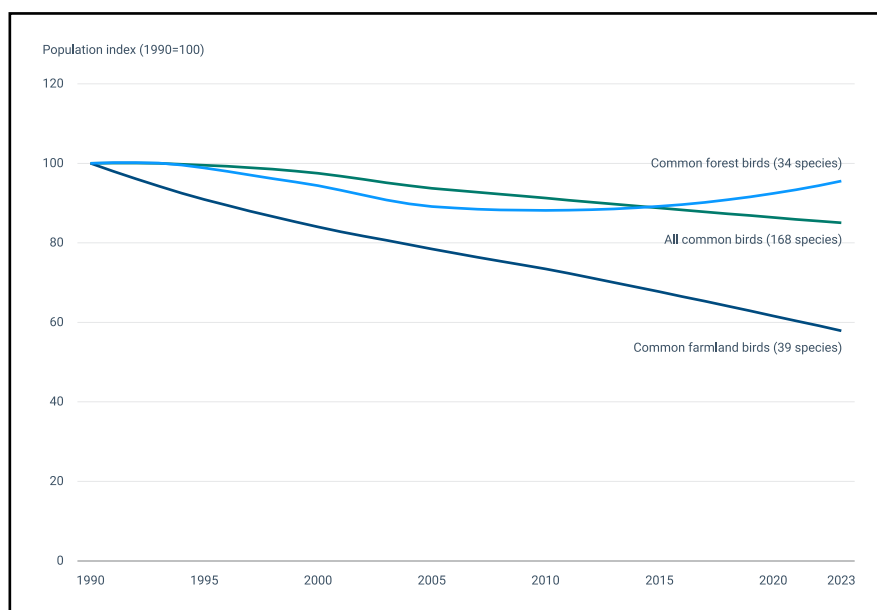
The NRR requires Member States to show improvements in the Common Farmland Bird Index (FBI). In particular, it sets more demanding targets for those Member States whose farmland bird populations have been historically depleted, defined as countries in which half or more of the species contributing to the national common farmland bird index have a negative long-term population trend. Italy is included in this group; indeed, data shows that the Italian FBI has declined by 33,5% since 2000, with two-thirds of FBI species showing a negative population trend in 2025.²⁸

The common farmland bird index is based on data gathered under the Pan-European Common Bird Monitoring Scheme (PECBMS). While its composition varies between Member States, it consistently includes species that rely on agricultural ecosystems for feeding or nesting. For the purposes of the NRR, Annex V identifies the species to be included in each national index, using a simpler list than the one employed under the PECBMS farmland bird index. The two indices may therefore not fully coincide. Nevertheless, the PECBMS data that has been collected since 2000 provides a robust basis for assessing long-term trends. It points to a clear overall decline in farmland bird populations (*Figure 5*).

²⁶ S. RIGAL et al., “Farmland practices are driving bird population decline across Europe”, in *Proceedings of the National Academy of Sciences*, 21/2023, e2216573120, DOI 10.1073/pnas.2216573120.

²⁷ B. J. MCMAHON et al., “The decline of ground nesting birds in Europe: Do we need to manage predation in addition to habitat?”, in *Global Ecology and Conservation*, 2024, e03213, DOI 10.1016/j.gecco.2024.e03213.

²⁸ RETE NAZIONALE DELLA PAC & LIPU, *Uccelli comuni delle zone agricole in Italia. Aggiornamento degli andamenti di popolazione e del Farmland Bird Index per la Rete Nazionale della PAC*, Roma.

FIGURE 5 – COMMON BIRD INDICES IN THE EU, 1990 - 2023

Source: EEA, *Common bird index in Europe 2025*, 2025, available at <https://www.eea.europa.eu/en/analysis/indicators/common-bird-index-in-europe>.

Reversing this trend will require serious effort. At the same time, there are clear synergies with other measures required under the NRR, in particular the duties of Member States related to pollinators. A more careful use of plant protection products, restoring semi-natural grasslands, and the creation of diverse landscape features are all actions that would have co-benefits for bird populations. However, more targeted interventions may also be necessary, such as measures to target invasive predator species²⁹ or, for migratory species, improving habitats used along migratory routes.

B. Grassland butterfly index

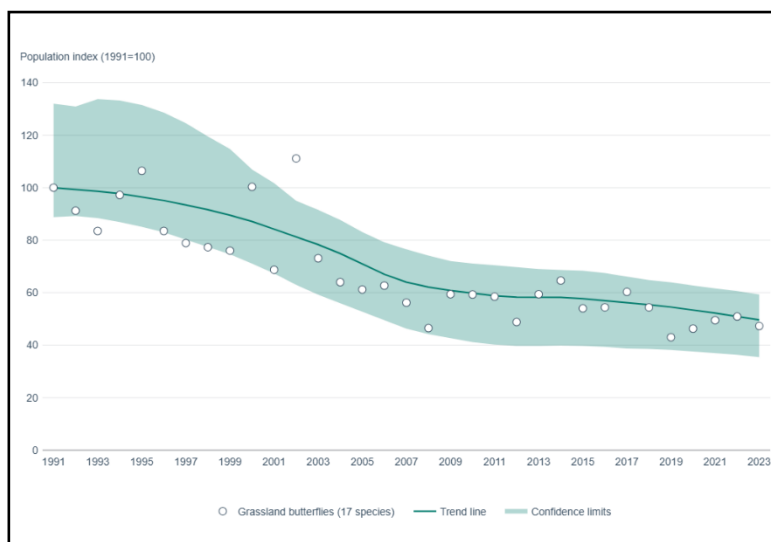
The Grassland Butterfly Index (GBI) is designed to capture the trends in the populations of 17 common butterfly species characteristic of European grasslands. The index is based on data collected under the European Butterfly Monitoring Scheme, an umbrella scheme for gathering and sharing data about butterfly populations across all EU Member States. It involves both scientists and citizens in data collection and, for some countries, provides data dating back to 1991. Thus, the GBI can reveal long-term trends in butterfly populations. Italy has participated in the eBMS since 2019.

The species included in the grassland butterfly index are not rare, although some are vulnerable in certain areas. Instead, they are easily-identifiable for non-specialists and relatively common, making them useful indicator species. Broader trends in butterfly

²⁹ B. J. MCMAHON, et al., “The decline of ground nesting birds in Europe: Do we need to manage predation in addition to habitat?” *op. cit.*

populations can be inferred from trends in the GBI. Data shows that grassland butterfly populations have declined significantly since 1991. (Figure 6)

FIGURE 6 – GRASSLAND BUTTERFLY INDEX IN THE EU, 1991 - 2023



Source: EEA, *Grassland butterfly index in Europe*, 2023 available at <https://www.eea.europa.eu/en/analysis/indicators/grassland-butterfly-index-in-europe-1>

Although the GBI is assessed at a national scale, and not solely in agricultural areas, it includes species that are particularly sensitive to changes in land management and agricultural practices. Some of the species included in the GBI travel only short distances from where they hatch and are thus very sensitive to local conditions, while others, like the Red Admiral (*Vanessa Atalanta*) and Painted Lady (*Vanessa cardui*), migrate across Europe or even to sub-Saharan Africa in the course of a year, and thus are affected by conditions across large areas. Because butterflies have a short lifespan, their populations fluctuate in response to changes on a short-term basis.

Member States may have good reason to choose the GBI as an indicator of agricultural biodiversity, given its potential overlap with other measures they must take under the NRR. For one, restoration of Annex I grassland habitats can have significant benefits for butterfly populations. Similarly, efforts to reverse the decline of pollinator populations through more careful use of plant protection products and creation of wildflower field margins are also likely to have a positive effect on GBI butterfly populations.

The GBI also offers a tool for involving the public in efforts to restore nature. Data is gathered by citizen volunteers, who count butterflies following specific procedures and record their findings in an app. As a result, the indicator may be relatively inexpensive for a Member State to implement compared to other indicators. It also can be a way to raise awareness about pollinators and how citizens can foster biodiversity in urban and peri-urban areas.

C. Stock of organic carbon in cropland mineral soils

This indicator measures the amount of organic carbon contained in non-organic topsoils based on data collected under the Land Use/Cover Area frame Survey (LUCAS). All soils are classified as either mineral or organic, according to their composition and how they were formed. Mineral soils are by far most common throughout the European Union. If Member States select this indicator of agricultural biodiversity, they must show an increase in this measure in 2030 and every six years thereafter until a satisfactory level is reached.

LUCAS will publish an updated dataset in 2026, which will permit Member States to assess future progress in view. The recently adopted Soil Monitoring Directive³⁰ will further increase the availability of data on soil quality, thereby enabling targeted interventions to improve the carbon sequestration in mineral soils.

Even though mineral soils contain less carbon than organic soils, they can be an important carbon sink. Soil organic carbon also supports the productivity of soils, by improving their structural condition, water holding capacity and nutrient supply, rendering them more resilient to disturbances related to land use and climate conditions. For this reason, the EU has long encouraged better soil management through the CAP. Practices that can increase organic carbon in agricultural soils include use of cover crops, better crop residue management, reduced or no tillage, and crop rotation.³¹ In the CAP 2023-2027, several good agricultural and environmental conditions (GAEC) have the potential to contribute to carbon sequestration in cropland soil, in particular GAEC 5 (Tillage management), GAEC 6 (Minimum soil cover to avoid bare soil in periods that are most sensitive), and GAEC 7 (Crop rotation).³²

The 2024 Carbon Removals and Carbon Farming Regulation (EU) 2024/3012 can also help incentivise practices that increase soil carbon.³³ The Regulation aims to create a voluntary, EU-recognized certification scheme for carbon removals in soils. Carbon farming schemes will issue certificates for verified carbon removals that go beyond statutory requirements, which farmers may then be able to sell as carbon credits.

The same practices that improve the quality of agricultural soils and sequester carbon can also benefit agricultural biodiversity, as organic carbon in soils both increases their water-

³⁰ Directive (EU) 2025/2360 of the European Parliament and of the Council of 12 November 2025 on soil monitoring and resilience, OJ L 2025/2360 of 26 November 2025.

³¹ EEA, *Enhancing Europe's land carbon sink: status and prospects*. EEA Report 17/2024, Copenhagen, 2025 p. 76-80.

³² EUROPEAN COMMISSION - DG AGRI, *Rough estimate of the soil protection potential of the CAP Strategic Plans over the 2023-2027 period*, Bruxelles, November 2025.

³³ Regulation (EU) 2024/3012 of the European Parliament and of the Council of 27 November 2024 establishing a Union certification framework for permanent carbon removals, carbon farming and carbon storage in products, OJ L 2024/3012 of 6 December 2024.

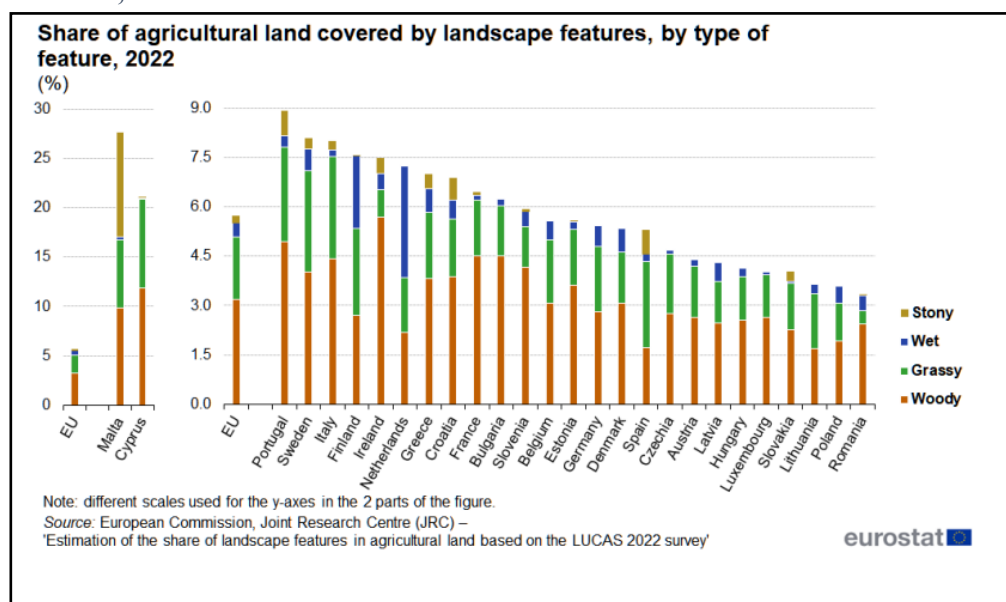
retention capacity and feeds ecosystems below ground. Thus, efforts to increase agricultural soil carbon can have broader environmental benefits.³⁴

D. Share of agricultural land with high-diversity landscape features

The last indicator that Member States may select relates to certain features of agricultural landscapes. These features—like stone walls, hedges, ponds, wooded areas, wildflower field margins and ditches—support agricultural biodiversity, including birds and pollinators. If Member States select this indicator, they must show an increasing trend in the distribution of these features until a satisfactory level is reached. As with the other indicators of agricultural biodiversity, the satisfactory level of high-diversity landscape features will be determined by each Member State, having regard to guidance provided by the Commission and following an open and inclusive process.

The EU has long recognised the importance of preserving and increasing high diversity landscape features in agricultural areas. This is reflected in the Performance and Monitoring Evaluation Framework (PMEF) of the Common Agricultural Policy, which already includes an indicator related to these features. It uses the Land Use/Cover Area frame Survey (LUCAS) to estimate the percentage of these features based on high resolution areal photographs of agricultural areas. Moreover, the EU Biodiversity Strategy 2030 aims for a minimum of 10% of agricultural area to be covered by high-diversity landscape features. 2022 data shows that some Member States have already surpassed this target, while others, including Italy at 8%, are relatively close. (Figure 7)

FIGURE 7 – SHARE OF AGRICULTURAL LAND WITH HIGH DIVERSITY LANDSCAPE FEATURES, 2022



³⁴ Commission Staff Working Document Impact Assessment Accompanying the proposal for a Regulation of the European Parliament and of the Council on nature restoration, SWD(2022) 167 final of 22 June 2022

Source: EUROSTAT, *Landscape features in agricultural land*, 2024, based on EUROPEAN COMMISSION, JOINT RESEARCH CENTRE (JRC), *Estimation of the share of landscape features in agricultural land based on the LUCAS 2022 survey*, 2024, available at <https://publications.jrc.ec.europa.eu/repository/handle/JRC135966>.

Maintaining high diversity landscape features is one of the objectives of the CAP. Under the CAP 2023-2027, direct payments to farmers are conditioned on the conservation and maintenance of certain landscape features and on leaving land fallow on 4% of their land (GAEC 8), while an eco-scheme offered additional payments to farmers willing to dedicate up to 7% of their land for this purpose. However, farmers were not permitted to carry out any productive activities on the land set aside under GAEC 8, nor did they receive any compensation for lost income. Following the farmer's protests in the Spring of 2024, the Commission partially relaxed the GAEC 8 in the Simplification Regulation (EU) 2024/1468. As a result, while farmers must still maintain existing landscape features, they no longer need to set aside a certain percentage of their land to this end.

The creation of new landscape features may nevertheless be compensated under national eco-schemes. The Commission's proposed CAP 2028–2034 appears to maintain this same approach to high-diversity landscape features, requiring conservation of existing features rather than their expansion. If Member States select this indicator for the purposes of Article 11 NRR, it would be up to them to enact eco-schemes or other programmes of incentives to increase the share of agricultural landscape with high diversity features in order to reach a satisfactory level. Again, this target will be set by the Member State in accordance with Article 14(5) NRR.

V.5 Temporary suspension in case of food security crisis

During negotiations, a safeguard clause was added to the NRR in order to address the concerns of some Member States about food security. Article 27 NRR provides that the Commission may adopt implementing acts suspending their obligations under Article 11 on agricultural areas in the case of an “unforeseeable, exceptional and unprovoked event[...]with severe Union-wide consequences for the availability of land required to secure sufficient agricultural production for Union food consumption.” The suspension may last up to 12 months and may be renewed. This clause thus permits the Union to prioritize food security over biodiversity restoration, but only in grave circumstances and only to the extent that is strictly necessary. While this safeguard clause is certainly important, it must be recalled that the loss of agricultural ecosystems is itself a threat to the Union's food security. Efforts to reach the targets set under Article 11 NRR are thus critical not just for the EU's biodiversity, but for its security and well-being in the long term.

Further reading

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CHAPTER VI – NATURE RESTORATION AND URBAN AREAS

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VI.1 Urban nature: a vital resource. – VI.2 Restoration of urban nature in the Nature Restoration Regulation. – VI.3 The EU's target of planting three billion trees by 2030. – VI.4 The benefits of urban nature restoration. – A. Biodiversity. – B. Urban heat. – C. Flooding. – D. Pollution. – E. Health and well-being. – VI.5 The need for an equitable and participatory approach to urban nature. – Further reading.

VI.1 Urban nature: a vital resource

The importance of cities for both human and planetary health cannot be overstated. Although they occupy only around 2% of the Earth's land area, cities are home to over 50% of the global population.¹ However, as urban populations increase, the availability of natural spaces in urbanized contexts is declining.

At the same time, urban ecosystems are increasingly under pressure from climate change impacts, including prolonged droughts, rising temperatures, air pollution, and water scarcity, all of which could further reduce urban livability. Reintegrating nature into urban environments is therefore necessary for enhancing cities' resilience and, ultimately, improving social and ecological well-being for urban populations.

The European Green Deal² and the Biodiversity Strategy for 2030 recognize the need to safeguard urban nature and green space for their benefits for biodiversity, climate resilience and human well-being.³ At a policy level, the EU Green City Accord creates a framework for cities to voluntarily commit to improving urban sustainability, specifically in the areas of air quality, water management, circular economy and waste management, noise reduction, and nature and biodiversity.⁴ The NRR builds on this base, providing specific duties relating to urban areas. These provisions will be examined in detail here, as well as their potential benefits for improving other provisions of EU law and its sustainability objectives.

VI.2 Restoration of urban nature in the Nature Restoration Regulation

¹ S. PINCETL, "Cities in the age of the Anthropocene: Climate change agents and the potential for mitigation", in *Anthropocene*, 2017, p. 74 ff., DOI 10.1016/j.ancene.2017.08.001 74.

² Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM(2019) 640 final of 11 December 2019.

³ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU Biodiversity Strategy for 2030 Bringing nature back into our lives, COM(2020) 380 final of 20 May 2020, p. 12-13.

⁴ See the 2021 Green City Accord political commitment at <https://environment.ec.europa.eu/topics/urban-environment/green-city-accord/>.

In its impact assessment, the Commission defined urban ecosystems as “the ecological system located within an area of high to moderate population density that is composed of physical and biological components that interact with each other”.⁵ The concern for urban ecosystems in the NRR stems from their potential contribution to the Union’s goals to recover biodiversity and to mitigate and adapt to climate change. Specifically, Article 8 of the NRR sets out two main obligations for Member States. (*Table 9*) They must ensure there is no net loss of either urban green space or urban tree canopy cover between the entry into force of the NRR and 31 December 2030, and that both show an increasing trend thereafter until a satisfactory level is reached.

TABLE 9 – RESTORATION TARGETS FOR UBRAN ECOSYSTEMS – ARTICLE 8 NRR

Restoration targets for urban ecosystems – Article 8 NRR			
	2030	2040	2050
Urban green space	no net loss	increasing trend until satisfactory level is reached	
Urban tree canopy cover	no net loss	increasing trend until satisfactory level is reached	

Green space includes not only wooded areas, but also bushes, shrubs, permanent herbaceous vegetation, lichens and mosses, ponds, and watercourses.⁶ The requirement that herbaceous vegetation, like grasslands, be permanent, should exclude cultivated croplands from the calculation of green space for the purposes of Article 8 NRR. In fact, urban and peri-urban agricultural areas provide only limited benefits, such as opportunities for recreation, to urban residents.⁷ Both green space and tree cover are primarily identified in the Corine Land Cover inventory, which is based on remote sensing through the Copernicus Land Monitoring Service. Data on urban growth, soil sealing, tree cover density, and various layers of urban green space are available starting from 2000, update every three years, and have a resolution down to the 10m² level.⁸

⁵ Commission Staff Working Document Impact Assessment Accompanying the proposal for a Regulation of the European Parliament and of the Council on nature restoration, SWD(2022) 167 final of 22 June 2022, para. 435.

⁶ Article 3(20) NRR.

⁷ H. ZEPP et al., “And the winner is? Comparing urban green space provision and accessibility in eight European metropolitan areas using a spatially explicit approach”, in *Urban Forestry & Urban Greening*, 2020, p. 126603 ff., DOI 10.1016/j.ufug.2020.126603.

⁸ Commission Staff Working Document Impact Assessment Accompanying the proposal for a Regulation of the European Parliament and of the Council on nature restoration, SWD(2022) 167 final of 22 June 2022, p. 445.

What constitutes a satisfactory level of greenspace and tree cover will be set by Member States based on guidance provided by the Commission, as with the other ecosystem indicators.⁹ These levels can thus be set in a manner that responds to national conditions. The Commission's initial proposal instead set fixed targets: 3% greenspace in urban areas by 2040 and 5% by 2050, and tree canopy cover of at least 10% in all urban areas by 2050. During the negotiations, however, these targets were replaced by the more flexible approach adopted in the final Regulation.

Urban greenspace and tree cover are assessed at a national, not local, level. This means that the loss of greenspace in one city may be compensated by gains in another area, so long as there is a net increase. Moreover, Article 8 NRR allows Member States to exclude cities that are already sufficiently green from the 'no net loss' obligation, thereby permitting further development in those areas. This exception is permitted for urban centres or clusters with more than 45% greenspace and with urban tree canopy cover over 10%.

Article 8 NRR does not detail how to expand urban green areas. Instead, it suggests that one way may be integrating green space into buildings and infrastructure. The Preamble of the Regulation offers clearer guidance, recommending green infrastructure and nature-based solutions (NBS)¹⁰. These include a wide range of actions, such as creating parks, planting trees, improving water retention areas, and creating green roofs and walls. These measures support natural processes while delivering environmental, social, and economic benefits.

One of the difficulties in implementing the urban greenspace and tree cover targets is the lack of a clear definition of what urban areas include. For this reason, Article 14(4) provides that Member States must map urban ecosystem areas for all 'local administrative units' which are low-level administrative divisions including cities, urban centres, towns and suburbs and peri-urban areas.¹¹ They may also group together several areas into a single urban ecosystem areas.¹² This possibility allows Member States to consider urban and peri-urban agglomerations as a whole, thus increasing the percentage of greenspace and tree cover associated with an area, potentially passing the threshold of 45% of greenspace and 10% of tree canopy cover that would exclude it from the no net loss requirement. In short, the manner in which Member States map the boundaries of their urban areas for the purposes of the NRR will affect the way the obligations set by Article 8 apply to them.

VI.3 The EU's target of planting three billion trees by 2030

Article 13 NRR sets a further target, which applies to both urban and rural areas, of planting three billion trees by 2030. The aim of increasing the EU's tree cover was first set

⁹ Article 14(5) NRR.

¹⁰ Preamble para. 48 NRR.

¹¹ As defined by Article 2 paras 16-19 NRR.

¹² Article 14(4) NRR.

out in the Biodiversity Strategy for 2030.¹³ The NRR translates this target at a Union level, with each Member State under a duty to specify its intended contribution in its Nature Restoration Plan.

The target, while ambitious, is consistent with what studies have shown to be possible. Indeed, a 2021 study estimated that 46 billion trees could be grown in the Union outside of Natura 2000 sites, without impacting agricultural production.¹⁴

Both planted and spontaneously generated trees count towards this pledge; in the latter case, however, seed establishment and growth should be a consequence of human facilitation, such as fencing to keep grazing animals away from seedlings. Trees that are planted in compliance with legal requirements, e.g. reforestation after harvesting, should not count towards the three-billion-tree goal, in accordance with the principle of additionality.¹⁵

Each Member State is free to determine what its contribution will be; nevertheless, the principle of sincere cooperation, one of the foundational principles of Union law with its basis in Article 4(3) of the Treaty on European Union, requires them to act in good faith. Thus, they must make an appropriate contribution to the Union's overall goal.

Concerns have been raised about the three-billion-trees by 2030 target. For one, Member States must only plant trees: whether or not the saplings survive is not taken into account. This may encourage dense planting of trees in inappropriate sites or insufficient care post-planting, leading to high rates of mortality and, ultimately, a waste of resources.¹⁶ Second, it does not necessarily require Member States to plant native trees; indeed, Article 13 specifies that even if native trees should be prioritized, non-native species may also be used where they are better suited to the soil and climactic conditions of a site. This is frequently the case in urban areas, where non-native species may be selected for their hardiness and growth patterns. As a result, efforts to increase urban tree canopy cover can thus include planning of trees that are better suited to the harsher conditions of urban streets and parks, even if they offer more limited biodiversity benefits.

Reaching the target of planting three billion trees cannot be done through urban afforestation alone. Instead, Member States will need to make widescale efforts to plant trees or encourage natural afforestation, including along infrastructure corridors and in rural areas. In 2021, the Commission issued an assessment of the priorities and potential

¹³ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU Biodiversity Strategy for 2030 Bringing nature back into our lives, COM(2020) 380 final of 20 May 2020.

¹⁴ J.F. BASTIN et al., *Tree restoration potential in the European Union*, 2021, DOI:10.13140/RG.2.2.24811.67368/1.

¹⁵ Commission Staff Working Document The 3 Billion Tree Planting Pledge For 2030 Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. New EU Forest Strategy for 2030, SWD(2021) 651 final of 16 July 2021, p. 8-10.

¹⁶ Ibid p. 36-38.

costs of reaching the three billion tree goal.¹⁷ In this document, it specified that tree monocultures for commercial purposes, such as Christmas trees or trees for energy production, should not count towards the pledge,¹⁸ and that invasive alien species should never be used. Similarly, it stated that trees should not be planted in biodiversity-rich areas, including high nature value farmlands, wetlands, or grasslands. Instead, besides urban areas, trees can be planted alongside cultivated croplands, forming new high-diversity landscape features, and in marginal or abandoned agricultural lands. Member States and citizens can account for their contribution to the three-billion tree goal on a web platform provided by the Forest Systems Information for Europe (FISE).¹⁹

VI.4 The benefits of urban nature restoration

Efforts to plant trees, improve urban greenspace and extend urban tree canopy cover can have numerous benefits, both in relation to well-being and the EU's climate mitigation and adaptation goals. These benefits include:

A. Biodiversity

Studies underscore the necessity of protecting and expanding urban greenery as a fundamental strategy for promoting biodiversity density, increasing habitat availability and creating wildlife corridors that facilitate species movement between different green areas. These spaces also provide critical habitats for pollinators, including bees, butterflies, and hoverflies. Well-designed urban greenspace can thus contribute to the objective of reversing the decline of pollinator populations.

B. Urban heat

Green areas and urban trees can play an important role in mitigating the impacts of climate change, helping cities adapt to extreme climate conditions. A 2022 study analysed microclimate regulation in 601 EU cities, modelling temperature differences with and without vegetation.²⁰ The results show that green spaces can significantly reduce temperatures in the surrounding areas.²¹ Additionally, green roofs and walls can make buildings significantly warmer in winter (up to 4.5C), and cooler in summer, which represents significant energy savings for heating and cooling.²² This can help to combat the phenomenon known as the 'urban heat islands', where built structures within cities retain

¹⁷ Ibid.

¹⁸ Ibid p. 8.

¹⁹ Available at <https://forest.eea.europa.eu/policy-and-reporting/3-billion-trees>.

²⁰ F. MARANDO et al., "Urban heat island mitigation by green infrastructure in European Functional Urban Areas", in *Sustainable Cities and Society*, 2022, p. 103564 ff., DOI 10.1016/j.scs.2021.103564.

²¹ E. J. GAGO et al., "The city and urban heat islands: A review of strategies to mitigate adverse effects", in *Renewable and Sustainable Energy Reviews*, 2013, p. 749 ff., DOI 10.1016/j.rser.2013.05.057.

²² L. CIRRINCIONE et al., "Assessing the effectiveness of green roofs in enhancing the energy and indoor comfort resilience of urban buildings to climate change: Methodology proposal and application", in *Building and Environment*, 2021, p. 108198 ff., DOI 10.1016/j.buildenv.2021.108198.

heat during the day, raising temperatures especially at night.²³ Urban heat intensifies health risks for vulnerable groups, e.g. children, older adults, and outdoor workers, while also increasing energy demand, which in return further warms urban environments.

C. Flooding

Expanding tree cover and urban green spaces may also reduce the risk of floods by intercepting rainfall and slowing runoff. Studies show that an increase in green space and urban trees lower runoff, as do the installation of green roofs.²⁴ In addition to their hydrological benefits, sustainable nature-based urban drainage systems offer significant economic advantages.²⁵ For this reason, some cities – known as ‘sponge cities’ – use green space to deliberately hold excess runoff in times of heavy rain, preventing it from reaching runoff channels and allowing it instead to be absorbed into the water table.²⁶

D. Pollution

Urban green space and trees can improve air and water quality by reducing pollution. Studies show that trees can significantly enhance air quality in surrounding areas, especially by removing fine particulate pollution and ozone.²⁷ The effects vary by species, with some studies suggesting that broad-leafed evergreens (e.g. oaks) provide the greatest potential benefits on air quality.²⁸ In addition to trees, green infrastructure and green roofs can also have benefits on air quality.²⁹ Beyond air and water purification, green spaces also contribute to noise reduction. Grass surfaces lower noise levels by up to 3 decibels compared to concrete, while a 10-meter-wide vegetation belt can reduce traffic and environmental noise by 3–8 decibels, often proving more effective than artificial barriers.³⁰

²³ E. J. GAGO, et al., “The city and urban heat islands: A review of strategies to mitigate adverse effects” *op. cit.*.

²⁴ T. ZOLCH et al., “Regulating urban surface runoff through nature-based solutions - An assessment at the micro-scale”, in *Environmental Research*, 2017, p. 135 ff., DOI 10.1016/j.envres.2017.05.023.

²⁵ Commission Staff Working Document Impact Assessment Accompanying the proposal for a Regulation of the European Parliament and of the Council on nature restoration, SWD(2022) 167 final of 22 June 2022, 461. See also M. DAVIS, S. NAUMANN, “Making the Case for Sustainable Urban Drainage Systems as a Nature-Based Solution to Urban Flooding”, in *Nature-Based Solutions to Climate Change Adaptation in Urban Areas: Linkages between Science, Policy and Practice*, N. KABISCH, et al. (eds.), Cham, 2017, p. 123 ff.

²⁶ E. GIES, *Water Always Wins: Thriving in an age of drought and deluge*, Chicago, 2022.

²⁷ The Nature Conservancy, *Planting Healthy Air: A global analysis of the role of urban trees in addressing particulate matter pollution and extreme heat*, Arlington, 2016.

²⁸ M. GAGLIO et al., “Species-specific efficiency in PM(2.5) removal by urban trees: From leaf measurements to improved modeling estimates”, in *Science of the Total Environment*, 2022, p. 157131 ff., DOI 10.1016/j.scitotenv.2022.157131.

²⁹ Some studies show PM10 removal at rates between 0.42 and 9.1 g/m² per year: see L. F. M. FRANCIS, M. B. JENSEN, “Benefits of green roofs: A systematic review of the evidence for three ecosystem services”, in *Urban Forestry & Urban Greening*, 2017, p. 167 ff., DOI 10.1016/j.ufug.2017.10.015.

³⁰ Commission Staff Working Document Impact Assessment Accompanying the proposal for a Regulation of the European Parliament and of the Council on nature restoration, SWD(2022) 167 final of 22 June 2022, p. 465.

E. Health and well-being

Urban trees and green space provide numerous benefits for human health and well-being, including the reduction of air and noise pollution and offering opportunities for recreation.³¹ Exposure to natural environments is associated with improved mental health and cognitive function, reduced cardiovascular morbidity, reduced prevalence of type 2 diabetes, reduced adverse pregnancy outcomes and reduced all-cause and cardiovascular disease mortality.³² For this reason, it is important that green space is easily accessible in all urban areas.³³

VI.5 The need for an equitable and participatory approach to urban nature

To guarantee these benefits, it is essential to ensure that urban nature projects put equity at their core. It has long been recognized that the distribution of public green space often reflects social, ethnic or class divisions within a city, with marginalized groups often enjoying more limited access to quality green spaces compared to the rest of the population.³⁴ The Nature Restoration Regulation does not require Member States to increase greenspace and tree canopy cover in disadvantaged areas; however, it does state that Member States should adopt a “fair and cross-society approach” in implementing their National Restoration Plans.³⁵ This would support a more inclusive and equitable approach to achieving their green space and urban tree canopy cover targets. Member States should also be aware of the social issues raised by ‘green gentrification’, where increasing green space can raise property values and thus amplify inequality, displacing vulnerable residents. Appropriate policy interventions, particularly opportunities for equal and effective public participation in decisions regarding urban greening, can help ensure that efforts to improve urban nature are equitable and respond to local needs.³⁶

³¹ EEA, *Healthy environment, healthy lives: how the environment influences health and well-being in Europe*, Copenhagen, 2020.

³² WHO, *Urban Green Space Interventions and Health: A review of impacts and effectiveness*, Copenhagen, 2017; F. MANES et al., “Regulating Ecosystem Services of forests in ten Italian Metropolitan Cities: Air quality improvement by PM 10 and O₃ removal”, in *Ecological Indicators*, 2016, p. 425 ff., DOI 10.1016/j.ecolind.2016.03.009.

³³ For some authors, low accessibility to urban green areas poses a problem of environmental justice: see H. E. CAMPBELL et al., *Green Gentrification and Environmental Injustice: A Complexity Approach to Policy*, Cham, 2024.

³⁴ E. HOFFMANN et al., “Socioeconomic Inequalities in Green Space Quality and Accessibility-Evidence from a Southern European City”, in *International Journal of Environmental Research and Public Health*, 8/2017, p. 916 ff., DOI 10.3390/ijerph14080916; H. WÜSTEMANN and D. KALISCH, “Towards a National Indicator for Urban Green Space Provision and Environmental Inequalities in Germany: Method and Findings”, SFB 649 Discussion Papers, 2016, available at <https://ideas.repec.org/p/zbw/sfb649/sfb649dp2016-022.html>; S. DE VRIES et al., “Environmental Justice in The Netherlands: Presence and Quality of Greenspace Differ by Socioeconomic Status of Neighbourhoods”, in *Sustainability*, 15/2020, p. 5889 ff., DOI 10.3390/su12155889.

³⁵ Preamble para. 83 NRR.

³⁶ European Commission: Directorate-General for Environment, *Urban nature plans – Guidance*

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CHAPTER VII – PUBLIC PARTICIPATION FOR FAIR AND CROSS-SOCIETY NATURE RESTORATION

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VII.1 The value of public participation in nature restoration actions. – VII.2 Public participation and the Nature Restoration Plans. – VII.3 Public participation in matters related to specific restoration projects. – VII.4 Access to justice and nature restoration. – Further reading.

VII.1 The value of public participation in nature restoration actions

Involving stakeholders and the public in biodiversity restoration can have numerous benefits. For one, public participation can serve as a means for raising awareness and fostering public support. Restoration efforts may require changes to how certain economic activities take place, especially recreation, agriculture, fishery and forestry. Such restrictions are more likely to be perceived as fair, and thus complied with, when affected stakeholders are involved in the decision-making process.¹ Participation can also be a means of gathering information, enabling public authorities to make better decisions.² More generally, the Union is committed to guaranteeing the right to public participation in environmental matters under the 1998 Aarhus Convention, which is implemented in numerous instruments of secondary law. The Nature Restoration Regulation likewise provides that Member States should adopt “a fair and cross-society approach” in implementing the Regulation’s requirements,³ starting with the preparation of the National Restoration Plan.

The principle of public participation comprises three separate rights: access to environmental information, participation in the preparation of projects, plans and programmes affecting the environment, and access to justice in environmental matters. First, Member States must provide the public with access to environmental information, in accordance with Article 4 of the Aarhus Convention and the provisions of Directive 2003/4/EC. This includes all such information held by public authorities, unless specific exceptions apply.⁴ In this respect, the general rules apply without difficulty. Instead, special considerations may arise when it comes to participation in public decisions regarding nature restoration and access to justice, which merit closer examination.

¹ D. MARZO et al., “Drivers of Small-Scale Fishers’ Acceptability across Mediterranean Marine Protected Areas at Different Stages of Establishment”, in *Sustainability*, 11/2023, p. 9138 ff., DOI 10.3390/su15119138; L. LIU et al., “Public participation in decision making, perceived procedural fairness and public acceptability of renewable energy projects”, in *Energy and Climate Change*, 2020, p. 100013 ff., DOI 10.1016/j.egycc.2020.100013.

² C. REGA, G. BALDIZZONE, “Public participation in Strategic Environmental Assessment: A practitioners' perspective”, in *Environmental Impact Assessment Review*, 2015, p. 105 ff., DOI 10.1016/j.eiar.2014.09.007.

³ Preamble para. 83 NRR.

⁴ Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/311/EEC, OJ L 41/26 of 14 February 2003

VII.2 Public participation and the Nature Restoration Plans

As mentioned, Member States must prepare their National Restoration Plan (NRP) in accordance with Article 14 and 15 NRR, with the final plan due before September 2027. The preamble of the NRR states that the process of preparation of the NRPs must be “open, transparent, inclusive and effective”.⁵ In particular, the public must be given “early and effective” opportunities to contribute to its preparation. Article 15 specifically provides that public authorities must account for public contributions to the NRP, requiring them to also include “information on public participation and of how the needs of local communities and stakeholders have been considered.”⁶

Even if these provisions were not included in the NRR, Member States would anyways be under a duty to guarantee that the public has opportunities to contribute to the NRP. Article 7 of the 1998 Aarhus Convention, indeed, provides that all parties must permit the public to participate during the preparation of plans and programmes relating to the environment, which certainly includes the NRP. Public authorities may limit the categories of persons entitled to participate in these consultations; however, they must do so taking into account the objective of guaranteeing broad participation. In practice, they may involve targeted efforts to engage specific communities or stakeholders directly, while still ensuring that other potentially interested persons are also offered an opportunity to have a say.

Public authorities enjoy some discretion in deciding what practical provisions for such participation are appropriate. However, in accordance with the Aarhus Convention and EU law, they must: 1) guarantee that consultations take place in a “transparent and fair” framework;⁷ 2) ensure that the public is given the opportunity to participate when all options are open, that is, prior to any definitive commitments being made;⁸ 3) provide information prior to consultations in a timely manner;⁹ 4) set reasonable time frames for public contributions, taking into account the complexity of the matters under consideration;¹⁰ 5) account for how public input was taken into consideration in the final decision, which is essential for the public to eventually challenge the outcome in court.¹¹

Besides recalling the Union’s commitments under the Aarhus Convention, the NRR specifically states that “consultations shall comply with the requirements set out in Directive 2001/42/EC.”¹² This Directive establishes specific requirements for public consultations carried out during the preparation of plans and projects subject to strategic

⁵ Preamble para. 65 NRR.

⁶ Article 15(3) lett. w NRR.

⁷ As is also required by Article 3(1) of the Aarhus Convention.

⁸ UNECE, *Aarhus Convention Implementation Guide (2nd edn.)*, ECE/CEP/72/Rev.1, 2014, p. 144.

⁹ *Ibid.*, p. 119; similarly, see CJEU, Judgment of 7 November 2019, case C-280/18, *Flausch and Others*, ECLI:EU:C:2019:928, para. 35.

¹⁰ ACCC, Compliance by Lithuania with its obligations under the Convention (Communication ACCC/C/2006/16), ECE/MP.PP/2008/5/Add.6 of 4 April 2008, para. 69.

¹¹ CJEU, Judgment of 30 April 2009, case C-75/08, *Mellor*, ECLI:EU:C:2009:279, para 66.

¹² Article 14(20) NRR.

environmental assessment (SEA). Crucially, the NRR does not specifically state that the NRP must be subject to SEA, only that public consultations should be held in conformity with the modalities set out in the SEA Directive.¹³ Nonetheless, many Member States have decided to subject their NRPs to SEA. When this is done, they may hold the required public consultations within the SEA process, so long as the requirements of EU law are respected, in particular that consultations are “early and effective.”

Member States that decide that SEA for their NRP is not necessary must nonetheless ensure that adequate arrangements for public participation are in place. Failure to do so in accordance with the Member State’s commitments under EU law and the Aarhus Convention may give the public grounds to challenge the final NRP in court. In similar cases, the Court of Justice has ordered Member States to re-do strategic plans, ensuring that the public is given adequate and effective opportunities for participation.¹⁴

Public consultations are therefore not only an obligation; they also provide an opportunity to raise awareness of why the Member State is making efforts to restore biodiversity and the benefits this may bring, at a national and a local scale.

VII.3 Public participation in matters related to specific restoration projects

Besides opportunities for participation in the drafting of the NRP, Member States will also need to provide for public participation in relation to some projects that are carried out in implementation of the Plan. This is particularly the case for projects subject to environmental impact assessment (EIA) or an ‘appropriate assessment’ under Article 6(3) of the Habitats Directive.

Restoration projects subject to EIA include those involving the construction or the removal of certain types of infrastructure, including some dams for water storage or energy production.¹⁵ The removal of such barriers may therefore itself trigger EIA requirements, even where the barrier concerned is obsolete or disused.

In addition, the Habitats Directive requires public authorities to conduct an ‘appropriate assessment’ for plans and projects that may have a significant impact on Natura 2000 sites or species protected under the Habitats and Birds Directives. This assessment is more limited than an EIA, as it relates exclusively to the potential impact of the project on the

¹³ Specifically, these modalities are set out in Article 6 of Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment, OJ L 197 30 of 21 July 2001.

¹⁴ CJEU, Judgment [GC] of 28 February 2012, case C-41/11, *Inter-environnement Wallonie*, ECLI:EU:C:2012:103.

¹⁵ Under Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, OJ L 26/1 of 28 January 2012 (the ‘EIA Directive’), EIA is mandatory for dams with capacity over 10 million cubic meters (Annex I para. 15). Instead, for smaller water storage facilities and hydroelectric projects, Member States must conduct an EIA only if the project could have a significant impact on the environment (Annex II para. 3 lett. h, para. 10 lett. f and g).

protected sites and species in view of the conservation objectives at stake. Active restoration projects within protected areas may therefore be subject to screening to verify whether they may have a potentially significant impact, and if so, they will be subject to assessment. Plans and projects with a negative impact may be approved if the conditions stated in Article 6(4) HD are satisfied, that is, they must serve imperative reasons of overriding public interest, compensatory measures must be taken, and the Commission must be informed. If the proposed development impacts a priority habitat or species, the Commission must give its prior approval.

Biodiversity restoration projects may sometimes have negative environmental impacts in the short term in order to secure gains in the medium or long-term. For example, habitat re-establishment can consist in the conversion of forested areas into Annex I grasslands, and river barrier removal can lead to heavy sediment flows until a new sediment balance is achieved. Nonetheless, it is likely that biodiversity restoration would be considered an overriding public interest such as to justify negative impacts on protected sites or species, especially if they are limited in time and compensatory measures are taken.

The public must be given opportunities to participate in any decision subject to EIA or appropriate assessment, in accordance with Article 6 of the Aarhus Convention and, where applicable, Article 6 of Directive 2011/92/EU. Again, instead of a formality, this should be approached as an opportunity to improve the outcomes of a project and ensure that the views and needs of the local community are taken into account. In particular, special care should be taken to ensure that vulnerable or historically disengaged groups affected by projects are given equal opportunities to contribute.¹⁶

VII.4 Access to justice and nature restoration

The Commission's 2022 proposal for the Regulation included a specific provision dedicated to access to justice. This was deleted during negotiations; however, it was likely unnecessary, as Union law anyways requires Member States to guarantee access to effective judicial remedies. This obligation derives from Article 9 of the Aarhus Convention as well as primary law of the Union, specifically the principle of sincere cooperation, Article 47 of the Charter for Fundamental Rights and Article 19 of the Treaty on the Functioning of the European Union.¹⁷

Article 9 of the Aarhus Convention requires states to provide access to justice in environmental matters. This includes the right to challenge denials of access to information,¹⁸ acts and omissions connected to public decision-making in matters subject to EIA,¹⁹ and acts and omissions by public or private parties that are alleged to infringe

¹⁶ UNECE, *Maastricht Recommendations on Promoting Effective Public Participation in Decision-making in Environmental Matters prepared under the Aarhus Convention*, Geneva, 2015

¹⁷ Preamble para. 82 NRR.

¹⁸ Article 9 para. 1 Aarhus Convention.

¹⁹ Article 9 para. 2 Aarhus Convention.

environmental law.²⁰ States may restrict standing to persons with specific legal interests at stake and qualified environmental associations. However, any such limitations must be compatible with the Aarhus Convention's objective of guaranteeing broad access to justice.²¹

The Court of Justice of the European Union aims to interpret Union law consistently with the requirements of the Aarhus Convention. In particular, it reads the right to effective judicial protection, set out in Article 47 CFR, as comprising the right of access to justice in environmental matters.²² Accordingly, under EU law, judges of Member States are empowered to hear cases brought by the public concerned and qualified environmental associations regarding potential violations of the EU environmental law, including the NRR. It remains unclear, however, which provisions in the NRR are formulated in sufficiently precise terms to be relied upon directly before a court.

A first set of potential cases could arise regarding the National Restoration Plan. Challenges could be brought regarding the compliance of a Member State's NRP with EU law, including the NRR. For example, a lawsuit could argue that an NRP is insufficient to meet the Member State's targets or that the public authorities have misinterpreted key requirements under the NRR. At the same time, the Commission will have a chance to review Member State's NRPs before they are finalized and should flag any substantive issues at this time. If the Commission approves an NRP, it may be difficult to later argue that it is substantially flawed before a national judge. Additionally, the NRP could be challenged before national courts for procedural flaws, such as inadequate provisions for public participation during its preparation. The outcome of such challenges may depend on the seriousness of the procedural flaws and the degree to which they affected the substantive content of the plan.²³

Second, other acts and omissions could be challenged for violating the requirements of the NRR. The NRR's non-deterioration duties, in particular, may give grounds for challenging developments and projects that negatively impact areas under restoration or included for restoration in the NRP. While the non-deterioration duty is generally interpreted as a duty of best efforts,²⁴ any exceptions need to be justified and shown to be compatible with the Member State's targets under the NRR. Moreover, plans, projects or authorizations that

²⁰ Article 9 para. 3 Aarhus Convention.

²¹ UNECE, *The Aarhus Convention: An Implementation Guide*, Geneva, 2014, p. 194-195, 198.

²² Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on Improving access to justice in environmental matters in the EU and its Member States, COM(2020) 643 final of 14 October 2020.

²³ CJEU, Judgment of 7 November 2013, case C-72/12, *Gemeinde Altrip and Others*, ECLI:EU:C:2013:712; CJEU, Judgment of 28 May 2020, case C-535/18, *Land Nordrhein-Westfalen*, ECLI:EU:C:2020:391 para 61-62.

²⁴ E. LEES, O. W. PEDERSEN, "Restoring the Regulated: The EU's Nature Restoration Law" *op. cit.*; B. J. DE LEEUW, C. W. BACKES, "The Non-Deterioration Obligation in the Nature Restoration Regulation – a Necessary and Proportionate Addition to the Habitats Directive or a Monstrosity with Disastrous Consequences for Society?" *op. cit.*

compromise the Member States's ecosystem restoration obligations, like its duty to halt the decline of pollinator populations by 2030, may also be subject to challenge in court. Thus, Member States may need to carefully assess the impact of policy and programmes and ensure that any harm to ecosystems is compensated in order to stay on track to reaching their targets under the NRR. National judges can play a critical role to this end.

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ABSTRACT

This report provides a comprehensive analysis of the European Union's Nature Restoration Regulation (EU) 2024/1991 (NRR), focusing particularly on legal issues raised by the implementation of this innovative, ambitious legal regime.

Part I builds upon the state of the art of restoration in Europe to underscore the interdependence of nature and society, as well as the risks posed by biodiversity loss. Against this backdrop, it connects the NRR to principles of constitutional law and to the evolution of European biodiversity law policy. The NRR's obligations are systematically presented and analysed in relation to in relation to terrestrial, aquatic, agricultural and urban habitats. The report aims to clarify the legal framework governing restoration, equipping practitioners, public authorities, and the public with a better understanding of EU biodiversity law as applied at both national and local levels. It also addresses potential areas of legal ambiguity, governance challenges, and the practicalities of realizing EU mandates in a complex, evolving scientific context.

Part II focuses in particular on sources of public and private financing for biodiversity restoration. It describes in detail the regime applicable to public support for efforts to implement the NRR, then examines recent practice in relation to nature credits and other forms of private financing.

Ultimately, the report serves as a guide for the application of EU law in support of biodiversity restoration, offering insights relevant to both the Italian context and to broader European efforts to reverse ecological decline.

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