# Rewilding and the EU Nature Restoration Law

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**Abstract**

'Rewilding' is a form of nature restoration that prioritizes natural processes and the autonomous functioning of ecosystems over specific outcomes in terms of species composition and abundance. The relationship between rewilding and legal instruments for biodiversity conservation is a variable one. This article focuses on the EU Nature Restoration Law (Regulation 2024/1991) adopted in 2024. It asks to what extent the Regulation changes the legal landscape for rewilding in Europe, in which the Birds and Habitats Directive have been, and continue to be, dominant features. The article explores the Nature Restoration Law's objectives, general obligations, and specific provisions concerning forests, rivers, and oceans, while also addressing the Regulation's relevance for the restoration of missing species in ecosystems. The analysis shows that the Nature Restoration Law has notably increased the opportunities for rewilding, both in Natura 2000 sites and beyond.

## 1 Introduction

Without ambitious nature restoration efforts, there is no way out of the current biodiversity and climate crises. There is a clear consensus on this count in science and in policy at global, regional, and national levels. Against this background, a particular form of nature restoration known as 'rewilding' has been gaining in significance and popularity, also in Europe.[1] Rewilding emphasizes natural processes and the functioning of ecosystems rather than specific outcomes in terms of species composition and abundance.[2]

Its relationship with classical, more controlled, restoration policies, and with wildlife law[3] (and other legislation), has in part been uneasy.[4] By and large, however, international and European policy and law appear to have been developing in a way that creates more rather than less space for rewilding.[5] By way of illustration, the United Nations (UN) declared 2021-2030 to be the UN Decade on *Ecosystem* Restoration[6] – not the Decade on *Species* Restoration. An associated guidance document indicates that ecosystem restoration

[1] P. Jepson & C. Blythe, Rewilding: The Radical New Science of Ecological Recovery, Icon Books 2020; S. Hawkins et al. (eds.), Routledge Handbook of Rewilding, Earthscan 2022.
[2] See section 2 below.
[3] 'Wildlife law' is used here as a rough synonym of 'nature conservation law' or 'biodiversity law'.
[4] E.g., Jepson & Blythe, *supra* note 1; N. Pettorelli et al., Making Rewilding Fit for Policy, Journal of Applied Ecology 2018 (55), p. 1114; A. Trouwborst, Megafauna Rewilding: Addressing Amnesia and Myopia in Biodiversity Law and Policy, JEL 2021 (33), p. 639; A. Trouwborst, 'Rewilding: Juridische Verplichtingen en Hindernissen – de Verschillende Gedaantes van het Recht op Weg naar Gezonde Ecosystemen', in: K. Arts, L. Bakker & A. Buys (eds.), Rewilding in Nederland: Essays over een Offensieve Natuurstrategie, KNNV Uitgeverij 2022, p. 165; A. Eagle et al., Rewilding: A Legal Perspective, in: Hawkins et al., *supra* note 1, p. 134.
[5] Id.; see Section 3 below.
[6] UN General Assembly Resolution 73/284 (2019).

involves activities which contribute to "recovering an ecosystem to the trajectory it would be on if degradation had not occurred, accounting for environmental change."[7] Likewise, the current EU Biodiversity Strategy supports the vision that by 2050 "all of the world's ecosystems are restored, resilient and adequately protected."[8]

A recent milestone in European wildlife law has been the adoption of the EU Nature Restoration Law,[9] which entered into force on 18 August 2024.[10] This Regulation aims for member states to put in place restoration measures in at least 20% of the EU's land and sea areas by 2030 and in "all ecosystems in need of restoration" by 2050.[11] It sets out general requirements for member states to take measures to improve, and even re-establish, a range of terrestrial and marine habitat types and habitats of species.[12] In addition, it contains specific obligations regarding the restoration of biodiversity in forest,[13] riverine,[14] agricultural, and urban[15] ecosystems, and of pollinator populations.[16] All of these obligations are furnished with particular targets and deadlines. Member states must draw up and implement national restoration plans, in which they identify concrete restoration needs and the measures needed to fulfill their obligations and achieve the Regulation's objectives.[17]

This article asks to what extent the Nature Restoration Law changes the legal landscape for rewilding in Europe. After exploring the basic features of rewilding and its place in the pre-existing legal landscape, it will proceed to identify and analyze the features of the Nature Restoration Law which are most relevant from a rewilding perspective, focusing consecutively on the Law's objectives, general obligations, and specific provisions concerning forests, rivers, and oceans, and dwelling finally on the matter of restoring missing species. It ends with some concluding observations and an answer to the central question.

## 2 Rewilding: *natura naturans*

Although a universally accepted definition of rewilding does not yet exist, the following appears to be a rather representative one:

> "Rewilding is the process of rebuilding, following major human disturbance, a natural ecosystem by restoring natural processes and the complete or near complete food web at all trophic levels as a self-sustaining and resilient ecosystem with biota that would have been present had the disturbance not occurred. This will involve a paradigm shift in the relationship between humans and nature. The ultimate goal of rewilding is the restoration of functioning native ecosystems containing the full range of species at all trophic levels while reducing human control and pressures. Rewilded ecosystems should – where possible – be self-sustaining. That is, they require no or minimal

[7] FAO, IUCN CEM & SER, Principles for Ecosystem Restoration to Guide the United Nations Decade 2021-2030, FAO 2021.
[8] EU Biodiversity Strategy for 2030: Bringing Nature Back Into Our Lives, COM (2020) 380, 20 May 2020, p. 5.
[9] Regulation 2024/1991 on nature restoration and amending Regulation 2022/869 (Nature Restoration Law).
[10] See, e.g., N. Hoek, A Critical Analysis of the Proposed EU Regulation on Nature Restoration: Have the Problems Been Solved?, EEELR 2022 (19), p. 320; 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?, Restoration Ecology 2024 (32), e14158.
[11] Nature Restoration Law, Art. 1(2).
[12] Id., Art. 4 and 5.
[13] Id., Art. 11.
[14] Id., Art. 9.
[15] Id., Art. 8.
[16] Id., Art. 10.
[17] Id., Art. 14 and 15.

management (i.e., *natura naturans* [nature doing what nature does][18]), and it is recognized that ecosystems are dynamic."[19]

Rewilding aims for 'self-willed' nature.[20] It puts natural processes and ecosystem dynamics center stage, expressing the conviction that, ultimately, nature itself is in the best position to maintain and, when damaged, to restore itself. Complete, functional, dynamic ecosystems also tend to be robust and biodiverse ecosystems. At the end of the day, as Svenning points out, "rewilding reinstates the only proven effective long-term mechanisms for generating and maintaining biodiversity."[21]

Rewilding differs from 'traditional' restoration in several ways, including by aiming for "minimal to no ongoing management in the long term" and by focusing on "present and future ecosystem functioning and resilience, allowing the ecosystem to continually adapt and self-organise in response to environmental change."[22] It also prioritizes the filling of gaps left in ecosystems by extinct species, even if this is done by non-native substitutes, over concerns over species nativeness.[23] To simplify, traditional restoration can be captured as 'human-led, nature enabled' – *natura naturata*, one might say[24] – and rewilding as 'nature-led, human enabled'.[25]

This is far from saying that under a rewilding philosophy, a human helping hand may not be welcome or necessary in order to set – and sometimes keep – an ecosystem on the right trajectory.[26] Depending on the circumstances, this helping hand can take many forms. First and foremost, giving nature more space is crucial (also) from a rewilding perspective. The larger and better connected an area is, the greater the chances for rich, autonomous ecosystems to develop and thrive. To (re)create favourable physical conditions, it may also be necessary to remove or reduce human stressors, such as harmful forms of water extraction, logging, fishing, recreation, nitrogen deposition, and contamination, for instance with pesticides.

Active interventions in the landscape are another important category, such as creating ecological corridors, (partial) removal of monotonous and biodiversity-poor planted forests, excavating river side channels in floodplains, re-meandering previously canalized streams, rebuilding lost structures (such as artificial reefs), creating new islands, and removing barriers (such as dams in rivers or fences). Sometimes rewilding starts from 'scratch', for instance on prior farmland (as has happened in many Dutch floodplains), in abandoned mining sites, or literally on new land (as in the Oostvaardersplassen and the Markerwadden islands in, again, the Netherlands).

In addition, an essential element of rewilding is ensuring, as far as possible, the return of species of flora and fauna that have disappeared in the past due to human action, especially those that play important roles in ecosystems, also known as 'keystone species'. Many large

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[18] This seems to be a play on philosophical ideas of Baruch Spinoza, who actually viewed *natura naturans* ('naturing nature') to be essentially identical to God. See, e.g., Stanford Encyclopedia of Philosophy: Baruch Spinoza, 2024 ed., https://plato.stanford.edu/entries/spinoza/; or, more elaborately, C. Merchant, Autonomous Nature: Problems of Prediction and Control from Ancient Times to the Scientific Revolution, Routledge 2016.
[19] S. Carver et al., Guiding Principles for Rewilding, Conservation Biology 2021 (35), p. 1882, 1888.
[20] E.g., Jepson & Blythe, *supra* note 1, p. 5-6.
[21] J.-C. Svenning, Rewilding Should Be Central to Global Restoration Efforts, One Earth 2020 (6), p. 657.
[22] N. Pettorelli & J.M. Bullock, Restore or Rewild? Implementing Complementary Approaches to Bend the Curve on Biodiversity Loss, Ecological Solutions and Evidence 2023 (4), e12244, p. 2.
[23] Id.
[24] Nature as controllable or controlled; see Merchant, *supra* note 18.
[25] Hawkins et al., *supra* note 1.
[26] The following considerations are based, *inter alia*, on Hawkins et al., id.; Jepson & Blythe, *supra* note 1; and Carver et al., *supra* note 19.

herbivores and predators fall in this category, but also smaller species like beavers and dung beatles.[27] Some species can return by themselves when given the chance, as exemplified by the autonomous re-establishment of reproducing populations of common cranes, white-tailed eagles, eagle owls, and wolves to various western European countries. Due to varying circumstances, other species are unable to do so. Various parts of Europe have therefore seen active reintroductions of, among other species, European bison, ibex, lynx, beavers, otters, ravens, and butterflies such as the scarce large blue. Then there are species, particularly wild horses and aurochs, that have disappeared in their wild forms but live on, in a way, in their domesticated descendants. In ecosystems, these species can be replaced rather well by primitive or back-bred breeds such as Konik horses, Exmoor ponies, Sayaguesa cattle, and 'tauros'. Finally, several species have gone extinct all the way, and can only be replaced by related or comparable species. For example, in the Danube delta and several Dutch wetlands, the extinct European water buffalo is being replaced by (de)domesticated Asian water buffaloes.

Be that as it may, most European ecosystems continue to be mere ghosts of their former selves, and are much more incomplete than most people realize.[28] Ecologically speaking, moon bears, leopards, spotted and striped hyenas, lions, and hippopotamuses are all perfectly compelling reintroduction candidates. Likewise, without the return of grey whales and the introduction of substitutes for the continent's lost elephants and rhinoceroses, it will remain problematic to speak of restored European ecosystems.[29]

However, whether the creation of more space for nature or the return of missing species is concerned, rewilding is not an all-or-nothing affair, and takes place on a sliding scale. Every step towards complete, autonomously functioning ecosystems counts, so the thinking goes.[30] Whichever way, once the conditions for self-sufficient ecosystems have been (re)created as well as possible, rewilding reverts for the better part to 'folding chair management', with interventions limited to a minimum. Management is then delegated primarily to natural processes involving floods, storms, fires, succession,[31] herbivory, predation, insect and disease outbreaks, and migration. Mowing and pruning, for instance, is then entrusted to large herbivores instead of machines.

Besides to biodiversity, recovering and restored ecosystems also tend to contribute significantly to carbon sequestration and buffering against droughts and floods. Rewilding can thus provide 'nature-based solutions' in the realm of climate mitigation and adaptation, in a rather cost-effective way – nature does the job itself, and for free.[32] In addition, rewilding can offer economic opportunities, such as ecotourism, in parts of the European countryside where other ways to make a living are disappearing.[33]

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[27] See, e.g., B. Macdonald, *Cornerstones: Wild Forces that Can Change Our World*, Bloomsbury 2022.
[28] G. Monbiot, Feral: Rewilding the Land, Sea and Human Life, Penguin Books 2013, p. 244: "Ours is a dwarf and remnant fauna, and as its size and abundance decline, so do our expectations, imperceptibly eroding to match the limitations of the present."
[29] For a complete list of missing large terrestrial mammal species, see A. Trouwborst & J.-C. Svenning, Megafauna Restoration as a Legal Obligation – International Biodiversity Law and the Rehabilitation of Large Mammals in Europe, RECIEL 2022 (31), p. 182.
[30] E.g., Carver et al., *supra* note 19.
[31] Process whereby ecological communities succeed each other in a given order, for instance from bare sand all the way to forest, until another disturbance disrupts the situation once more.
[32] E.g., Jepson & Blythe, *supra* note 1, p. 130-133.
[33] Id.

## 3 Rewilding and EU wildlife law

Whereas rewilding, when things go according to plan, leads to biodiverse outcomes, the precise results are somewhat unpredictable and changeable by definition. Evidently, autonomous ecosystems cannot be expected to provide very specific and permanent habitat types, species, and numbers. Rewilding may thus be considered the antithesis of the hands-on micromanagement that is currently typical of many (small) European protected areas, and which is characterized by mechanical mowing, clipping, logging, dredging, and so on, driven by lists of desired habitat types and species.[34] That is to say, when the conservation or restoration of specific rare species or ecological communities in specific locations is the objective – and there may be good reasons for this[35] – then rewilding may not be the method of choice.

This brings the analysis to the law. Depending on the circumstances, current international, European, and national wildlife legislation can require, facilitate, hamper, or preclude rewilding.[36] To illustrate, obligations to rewild may flow from various international treaties, such as the Biodiversity Convention.[37] The influential obligations from the Birds[38] and Habitats[39] Directives, however, are linked to lists of species and habitat types, delimiting the options for rewilding.[40] In spite of this, the Directives do provide some scope for rewilding, as determined by the species and habitats concerned, and among other things also by the way in which member state authorities formulate the conservation objectives for corresponding Natura 2000 sites.[41] In fact, it would appear that the important Article 6 of the Habitats Directive, on the measures to be taken with regard to designated Natura 2000 sites, can in principle require or proscribe most if not all of the aforementioned forms of rewilding, depending on the circumstances.[42]

Subsequently adopted EU legal instruments in the field of nature conservation have adopted ecosystems rather than habitat types and species as the overriding units of interest. The Water Framework Directive of 2000 aims to prevent deterioration, protect, and enhance the status of "aquatic *ecosystems* and, with regard to their water needs, terrestrial *ecosystems* and wetlands directly depending on the aquatic ecosystems."[43] It requires member states to adopt measures to achieve and maintain a good "ecological status" of water bodies,[44] in terms of the "quality of the *structure* and *functioning* of aquatic ecosystems."[45] Likewise, the 2008 Marine Strategy Framework Directive intends for member states to "restore marine

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[34] As Monbiot, *supra* note 28, p. 8, reflects on this from a British perspective: "In countries such as my own, the conservation movement, while well intentioned, has sought to freeze living systems in time. … It seeks to manage nature as if tending a garden."
[35] E.g., Pettorelli & Bullock, *supra* note 22.
[36] See, *inter alia*, the sources mentioned in *supra* note 4.
[37] Convention on Biological Diversity, 1992; see, e.g., Trouwborst & Svenning, *supra* note 29.
[38] Directive 2009/147 on the conservation of wild birds, OJ 2010, L 20, p. 7 (Birds Directive).
[39] Directive 92/43 on the conservation of natural habitats and of wild fauna and flora, OJ 1992, L 206, p. 7 (Habitats Directive).
[40] See the sources in *supra* note 4; and also C.J. Bastmeijer, 'Natura 2000 and the Protection of Wilderness in Europe', in: C.J. Bastmeijer (red.) *Wilderness Protection in Europe: The Role of International, European and National Law*, Cambridge University Press 2016, p. 177.
[41] Id.
[42] Trouwborst (2022), *supra* note 4.
[43] Directive 2000/60/EC establishing a framework for Community action in the field of water policy, OJ 2000, L 327, p. 1 (Water Framework Directive), Art. 1(a) (emphasis added).
[44] Id., Art. 4(1)(a)(ii) and 2(18), (21) and (22).
[45] Id., Art. 2(21) (emphasis added).

*ecosystems* in areas where they have been adversely affected."[46] Member states must take measures designed to achieve or maintain a "good environmental status"[47] whereby:

> "the *structure*, *functions* and *processes* of the constituent marine ecosystems, together with the associated physiographic, geographic, geological and climate factors, allow those ecosystems to *function fully* and to maintain their *resilience* to human-induced environmental change."[48]

All of this is central to rewilding.

The question addressed in the remainder of this article is how the Nature Restoration Law relates to this bigger picture, and how it influences the legal landscape for rewilding.

## 4 The Nature Restoration Law: reinforced focus on ecosystems

The Nature Restoration Law builds on, and closely aligns with, the Birds and Habitats Directives, as well as with the Water Framework Directive and the Marine Strategy Framework Directive. The Regulation's main obligations continue to target listed habitat types and habitats of listed species.[49] However, compared to the Birds and Habitats Directives, the Nature Restoration Law has a much stronger focus on ecosystems and ecological dynamics. And even if the term 'rewilding' itself is lacking from the Regulation, the description of one of the restoration measures highlighted in its Annex VII comes rather close: "Allow ecosystems to develop their own natural dynamics" by "promoting naturalness and wilderness."[50]

The Regulation's "overarching objective"[51] is the "long-term and sustained recovery of biodiverse and resilient *ecosystems* across the Member States' land and sea areas through the restoration of degraded *ecosystems*."[52] Biodiverse and resilient ecosystems are precisely what rewilding aims for. The term "ecosystem" is understood to mean the following:

> "a *dynamic complex* of plant, animal, fungi and microorganism communities and their non-living environment, interacting as a *functional unit*, and *includes* habitat types, habitats of species and species populations."[53]

In sum, the Nature Restoration Law ultimately seeks the proper *functioning* of *dynamic* ecosystems, which happens by means of natural *processes*. In line with the definition, habitat types and species should emphatically be viewed within this larger and changeable ecological context. Member states must bear this in mind when implementing the Regulation's various concrete obligations.

Moreover, the Nature Restoration Law ought to be understood and applied in accordance with the objectives of the EU Biodiversity Strategy, including the intention to designate 10% of the EU's land and sea areas as *strictly* protected areas by 2030.[54] This status

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[46] Directive 2008/56/EC establishing a framework for Community action in the field of marine environmental policy (Marine Strategy Framework Directive), Art. 1(2)(a) (emphasis added).
[47] Id., Art. 5(2)(b) and 13.
[48] Id., Art. 3(5)(a) (emphasis added).
[49] Nature Restoration Law, Annexes I, II, III and V, and various references to the annexes of the Habitats Directive.
[50] Id., Annex VII, par. 23.
[51] Id., Preamble, par. 65.
[52] Id., Art. 1(1)(a) (emphasis added).
[53] Id. Art. 3(1) (emphasis added).
[54] EU Biodiversity Strategy, p. 4; Nature Restoration Law, Preamble, par. 10 and 46.

is envisaged in particular for areas of "very high biodiversity value or *potential*."[55] In such areas, human activities ought to be kept to a minimum, while natural processes are given free rein and 'hands-off' management is adopted as standard:

> "Strict protection does not necessarily mean the area is not accessible to humans, but leaves natural processes essentially undisturbed to respect the areas' ecological requirements."[56]

As noted in the Nature Restoration Law's preamble, some areas will be able to "recover naturally by stopping or limiting some of the pressures from human activities," and placing such areas under strict protection "will, in some cases, be sufficient to lead to the recovery of the natural values they host."[57]

## 5 Obligations to restore structure, functions, and resilience

The central Articles 4 and 5 of the Nature Restoration Law contain general obligations to restore terrestrial, coastal, freshwater, and marine ecosystems, whereby particular percentages of degraded ecosystems are to be under restoration by particular years. Member states shall take "the restoration measures that are necessary" to improve areas of habitat types listed in the Regulation's annexes to "good condition".[58] That is the "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,"[59] which in turn contributes to achieving or maintaining a "favourable conservation status" in terms of the Habitats Directive or, as the case may be, "good environmental status" in terms of the Marine Strategy Framework Directive.[60]

Also these obligations, then, are not (just) about specific species or numbers, but (also) about the overall structure and the proper functioning of ecosystems. The sounder its structure, and the more space an ecosystem is given to function autonomously, the greater its diversity and its ability to cope with stressors tend to be. This also comes to the fore in the Regulation's definition of "restoration":

> "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*"[61]

The Nature Restoration Law also expressly aims for the development of *new* nature, in addition to existing Natura 2000 and other protected sites, and Articles 4 and 5 set out concrete obligations to "re-establish" habitats.[62] As Hoek puts it, "ecosystems are to be built and rebuilt."[63] Small-scale examples are restoration measures to convert "brownfield sites, former industrial areas and quarries into natural areas."[64] According to the Regulation,

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[55] EU Biodiversity Strategy, id. (emphasis added).
[56] Id.
[57] Nature Restoration Law, Preamble, par. 10.
[58] Id., Art. 4(1) and 5(1).
[59] Id., Art. 3(4) (emphasis added).
[60] Id.
[61] Id., Art. 3(3) (emphasis added).
[62] Id., Art. 4(4) and 4(7), and 5(2) and (5).
[63] Hoek, *supra* note 10, p. 325.
[64] Nature Restoration Law, Annex VII, par. 33.

restoration may also entail the conversion of one habitat type into another (whereby this then does not count as deterioration).[65] Further obligations in the Nature Restoration Law concern the (re)connection of habitats, and thereby effectively the enlargement of ecosystems.[66]

## 6 Forest ecosystems

Also of interest from a rewilding perspective is the obligation of member states under Article 12 of the Regulation to put in place "the restoration measures necessary to enhance biodiversity of forest ecosystems," in addition to forest restoration measures under Article 4.[67] The pursuit of more natural forests, where ecological processes are given greater opportunities to run their course, is directly promoted by the choice of the seven indicators, for six of which the member states must ensure an increasing trend:

> "(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."[68]

Standing and lying deadwood, and a diversity of ages and (native) tree species, are typical features of natural forests.[69] The additional obligation to realize an upward trend for common forest birds also seems to be in line with rewilding.[70] The Regulation's requirement to consider the risk of forest fires when taking restoration measures for forest ecosystems[71] can play into rewilding's hand as well, as the presence of natural numbers of large herbivores appears to significantly reduce the risk of extreme forest fires.[72]

Several forest restoration measures from Annex VII also clearly tie in with the rewilding philosophy, for instance increasing "ecological features" in forests, such as "large, old and dying trees" and (again) amounts of "lying and standing deadwood;"[73] enabling the ecological process of "natural regeneration and succession of tree species," which is likely to result in a more "diversified forest structure;"[74] and promoting the development of "old-growth native forests" by "abandonment of harvesting or by active management which favours development of autoregulatory functions and appropriate resilience."[75] Of special significance is the enhancement of "forest diversity" by "restoring mosaics of non-forest habitats such as open patches of grassland or heathland, ponds or rocky areas."[76] Research shows that such mosaics – that is, half-open landscapes rather than closed forests – are the

[65] Id., Preamble, par. 37.
[66] Id., Art. 4(7) and 5(5).
[67] Id., Art. 12(1).
[68] Id., Art. 12(3).
[69] Id.; see also Annex VI.
[70] Id., Art. 12(2).
[71] Id., Art. 12(1) and Preamble, par. 63.
[72] E.g., J. Rouet-Leduc et al., Effects of Large Herbivores on Fire Regimes and Wildfire Mitigation, Journal of Applied Ecology 2021 (58), p. 2690.
[73] Nature Restoration Law, Annex VII, par. 10.
[74] Id., par. 11.
[75] Id., par. 15.
[76] Id., par. 13.

default natural state of many ecosystems on the European continent.[77] A corresponding restoration measure is the removal of plantations on "former dynamic inland dune systems" in order to "re-enable natural wind dynamics in favour of open habitats.[78]

## 7 Rivers and floodplains

Another set of obligations of importance for present purposes concerns measures to "restore freshwater ecosystems and the natural functions of rivers," in particular by improving the "natural connectivity of rivers as well as their riparian areas and floodplains," including through "removal of artificial barriers."[79] A concrete objective in this area is to turn at least 25,000 kilometers of rivers in the EU into "free-flowing rivers" again by 2030[80] – that is to say into (stretches of) rivers "the *longitudinal, lateral and vertical connectivity* of which is not hindered by artificial structures forming a barrier and the *natural functions* of which are largely unaffected."[81] The Regulation thus not only envisages the unobstructed passage for migratory fish and other aquatic fauna in such areas, but also the restored ecological functions of the floodplains. The latter are areas where rewilding has been particularly successful in the Netherlands, with co-benefits for biodiversity and reduced flooding risks for people, and restored hydrological dynamics and natural grazing by large herbivores as key features.[82]

Article 9 of the Nature Restoration Law firstly obliges member states to inventory artificial barriers and to map those barriers that need to be removed in order to attain the restoration targets for freshwater ecosystems set out in Article 4 and the free-flowing river objective.[83] Subsequently, member states "shall remove" the barriers in question.[84] Furthermore, they shall carry out the "measures necessary to improve the natural functions of the related floodplains."[85] Once riverine connectivity and natural floodplain functions have been thus restored, the member states involved "shall ensure" that they are maintained.[86] Article 9 does not provide for derogations from these obligations – although member states do appear to have some discretion in determining which barriers to select for removal, and what measures are required to improve the ecological functions of floodplains.[87]

Relevant restoration measures mentioned in Annex VII are to generally improve the "dynamics of surface waters;"[88] to "re-establish the meandering of rivers and reconnect artificially cut meanders or oxbow lakes;"[89] to "remove longitudinal and lateral barriers, such as dikes and dams;"[90] and to "give more space to river dynamics and restore free-flowing river stretches."[91] Key roles in ensuring the natural functions of floodplains appear to be reserved for beavers and large grazers.

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[77] E.g., E.A. Pearce et al., Substantial Light Woodland and Open Vegetation Characterized the Temperate Forest Biome Before *Homo sapiens*, Science Advances 2023 (9), eadi9135.
[78] Nature Restoration Law, Annex VII, par. 21.
[79] Id., Preamble, par. 50.
[80] Id., Art. 9(1).
[81] Id., Art. 3(22) (emphasis added).
[82] E.g., M.W. Straatsma et al., Biodiversity Recovery Following Delta-Wide Measures for Flood Risk Reduction, Science Advances 2017 (3), e1602762; also Jepson & Blythe, *supra* note 1, p. 128-130.
[83] Nature Restoration Law, Art. 9(1).
[84] Id., Art. 9(2).
[85] Id., Art. 9(3).
[86] Id., Art. 9(4).
[87] Id., Art. 9(1) and (3).
[88] Id., Annex VII, par. 2.
[89] Id., par. 5.
[90] Id., par. 6.
[91] Id.

Grazing is also mentioned in the Regulation's Preamble as a means of restoring or maintaining areas such as "grasslands, heath or wetland habitat types."[92] Other obligations regarding terrestrial ecosystems in the Nature Restoration Law that could, depending on the circumstances, promote rewilding, concern the rewetting of drained peatlands[93] – for instance, the Preamble mentions the grazing of rewetted peatland by water buffaloes[94] – and the recovery of pollinator populations.[95]

## 8 Oceans

The general obligation in Article 5 to restore and, where necessary, re-establish marine habitat types was already mentioned above. When given the chance, marine ecosystems tend to demonstrate a considerable autonomous recovery potential. The removal or reduction of stressors, and 'passive' rewilding, therefore often go a long way. The most important stressor for many ecosystems is fisheries. To "minimise negative impacts of fishing activities on the marine ecosystem" is accordingly one of the restoration measures included in Annex VII,[96] as is the restoration of "important fish spawning and nursery areas."[97] To a significant extent, such measures will need to be pursued within the framework of the EU Common Fisheries Policy, and due attention is paid to this in the Nature Restoration Law.[98] Another example mentioned in Annex VII is the reduction of marine pollution, "such as nutrient loading, noise pollution and plastic waste."[99]

Sometimes, however, active measures are also required at sea, for instance the provision of "structures or substrates" so as to "encourage the return of marine life in support of the restoration of coral, oyster or boulder reefs."[100] As the case may be, a combination of passive and active approaches may be called for. To illustrate, the Regulation notes that the restoration of seagrass meadows and kelp forests can be achieved "by actively stabilising the sea bottom, reducing and, where possible, eliminating pressures or by active propagation and planting."[101] A final, and important, restoration measure featured in Annex VII is to ensure the return of missing (keystone) species:

> "Restore or improve the state of characteristic native species population vital to the ecology of marine habitats by conducting passive or active restoration measures, for example, introducing juveniles."[102]

## 9 Restoring missing species

It is striking that a comparable measure for terrestrial, coastal, and freshwater ecosystems is missing from Annex VII. After all, compared to marine areas, the return of missing species on land is less likely to happen spontaneously.[103] Indeed, it would have been logical to include a

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[92] Id., Preamble, par. 31.
[93] Id., Art. 11(4) and Preamble, par. 59-60.
[94] Id., Preamble, par. 60; this reference is made, however, in the context of agricultural activities on rewetted peatland.
[95] Id., Art. 10(1).
[96] Id., Annex VII, par. 25.
[97] Id., par. 26.
[98] Id., Preamble, par. 42, and Art. 14(19), 15(4), and 18.
[99] Id., Annex VII, par. 30.
[100] Id., par. 27.
[101] Id., par. 28.
[102] Id., par. 29.
[103] See also M.J. Gaywood et al., Conservation Translocations, Cambridge University Press 2022.

provision on this issue in the text of the Regulation itself. Obligations concerning reintroductions are a staple feature of international legal instruments on wildlife conservation,[104] and would certainly be an expected ingredient in a legal instrument dedicated entirely to restoration. As far as Annex VII is concerned, this missed opportunity can still be salvaged, as the Regulation enables the Annex's amendment where appropriate.[105] The text of a candidate paragraph could be as follows:

> "Restoring missing species to ecosystems, by promoting autonomous range expansions where possible, by reintroducing native species, or by introducing suitable ecological substitutes for native species that have gone extinct (entirely or in their wild form)."

At any rate, Annex VII is suggestive only, and (re)introductions can already be mandatory under by Article 4 of the Regulation, in particular when they are necessary to restore the structure, functions, and/or typical species (composition) of habitat types.[106] For instance, it does not seem difficult to argue, on the basis of a textual and teleological interpretation in light of relevant scientific information, that restoration of certain wetland habitat types in western Europe requires not just the presence of otters and beavers, but also Dalmatian pelicans and moose.[107] Naturally, parallel considerations apply with regard to Article 5 and marine ecosystems.

There may even be reasons to (re)introduce species aside from their own typical roles in native ecosystems. To illustrate, a restoration measure that is probably required in many habitats is to "remove and control invasive alien species."[108] Notorious examples of invasive alien plants are black cherry, Himalayan blackberry, and giant hogweed. Having all three, and other invasives, on the menu is a rare feature of the European bison,[109] so that its reintroduction can for certain areas be construed as part of the implementation of Article 4 of the Nature Restoration Law also for that reason.[110]

## 10 National restoration plans

The various rewilding measures that could thus be considered mandatory or at least appropriate in light of the Nature Restoration Law are to be recorded and elaborated by the member states in the national restoration plans the Regulation requires them to draw up and

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[104] E.g., Convention on the Conservation of Migratory Species of Wild Animals, 1979 (Bonn Convention), Art. V(5)(g); Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), 11(2)(a); Habitats Directive, Art. 22(a).
[105] Id., Art. 22(7) and Preamble, par. 86.
[106] Id., Art. 4(1) and 3(4). Under certain circumstances it could also be argued that reintroductions are necessary in order to comply with Art. 4(4) and 4(7).
[107] See, e.g., G. Kurstjens et al., Een Verkenning van de Kansen voor de Kroeskoppelikaan in Nederland en Vlaanderen, 2021, https://arkrewilding.nl/sites/default/files/2023-12/Kroeskoppelikaan_rapport_1.pdf; B. Macdonald, Rebirding: Restoring Britain's Wildlife, Pelagic Publishing 2019, p. 200-205.
[108] Nature Restoration Law, Annex VII, par. 24.
[109] ARK Natuurontwikkeling, Wisent Helpt bij Terugdringen Exoten, Nature Today, 27 September 2020, http://www.naturetoday.com/intl/nl/nature-reports/message/?msg=26721; E. Klein Lebbink et al., Wisent op de Veluwe: Evaluatie 2016-2020, ARK Natuurontwikkeling/Staatsbosbeheer/Stichting Wisent op de Veluwe 2021.
[110] European bison reintroduction could also be required by Art. 8(f) of the Biodiversity Convention; Art. 11(a) of the Bern Convention; Art. 6(1), 6(2) and/or 22(a) of the Habitats Directive; and/or Art. 19(1) of EU Regulation 1143/2014 on the prevention and management of the introduction and spread of invasive alien species.

implement.[111] That is where the details are to be fleshed out as to how each member state intends to plot the trajectory of ecological restoration in its land and ocean areas until 2050.[112]

Member states have until September 2026 to compose their draft plans and submit them to the European Commission.[113] The Commission then has the opportunity to comment on each draft plan, within six months after reception.[114] Subsequently, each member state has another six months to submit its final plan,[115] in which it "shall take account of any observations from the Commission."[116] Although each national restoration plan is to be reviewed and revized by 2032, 2042, and "every ten years thereafter,"[117] the first plan can be expected to set the tone, and radical changes of course seem unlikely.

Whereas the Regulation sets out various concrete targets, terms, and obligations, it leaves the member states quite some discretion as to *how* to meet these. As the above analysis shows, some rewilding measures are mandatory, but for many habitat types and species habitats the degrees to which their restoration will be pursued through approaches consistent with a rewilding philosophy or through more hands-on approaches remains at least in part a matter of choice.

It thus seems fair to say that the extent to which rewilding will actually take place in the EU in the next few decades will be determined to a significant extent in the next few years.

## 11 Conclusion

To answer the overarching question asked at the outset of this article, the EU Nature Restoration Law turns out to have a distinctly 'wilder' and more holistic character than the Birds and Habitats Directives. Alongside more traditional restoration approaches,[118] the Regulation appears to offer rather many opportunities for the particular mode of nature restoration called rewilding, both in Natura 2000 sites and beyond. In 2020, the authors of a popular book on rewilding predicted that:

> "decision-makers will realise that rewilded land systems offer the potential to simultaneously address a suite of concerns – climate change, biodiversity loss, flood management, soil health, ethical food production and rural depopulation – and will gradually put in place the policies and incentives to support wider adoption."[119]

It would seem that the Nature Restoration Law fits this predicted trend, and its adoption can be considered a landmark development in the present context. Indeed, the first few years of the Regulation's implementation are likely to significantly influence the scale at which rewilding will take place in Europe for decades to come.

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[111] Id., Art. 14 and 15.
[112] Id., Art. 15(1).
[113] Id., Art. 16.
[114] Id., Art. 17(1)-(4).
[115] Id., Art. 17(6).
[116] Id., Art. 17(5).
[117] Id., Art. 19(1).
[118] On the complementarity of rewilding and other restoration approaches see, e.g., Pettorelli & Bullock, *supra* note 22.
[119] Jepson & Blythe, *supra* note 1, p. 154.