

White paper

Safeguarding Europe's Biodiversity Legislation

Scientific Evidence in Support of the EU Birds and Habitats Directives under the 2026 Stress Test

22 June 2026

This white paper is a Biodiversa+ self-initiated, independent and science-based contribution to the European Commission's 2026 stress test of the EU Birds and Habitats Directives. It draws on collective expertise from Biodiversa+ knowledge and advisory structures, including the views of the [BiodivRestore Knowledge Hub](#), the [Advisory Board](#), the [Enlarged Stakeholder Board](#) and relevant [BiodivProtect-funded projects](#). It delivers accessible, evidence-based insights to support an informed policy discussion and strengthen the long-term impact of the EU's environmental framework.

The paper highlights scientific evidence on the effectiveness of the Nature Directives, the key challenges hindering their implementation, and possible ways to improve delivery without weakening existing biodiversity safeguards. While rooted in rigorous analysis, it does not reflect the views of the European Commission or necessarily those of all Biodiversa+ partners.

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| Executive Summary

The 2026 stress test of the EU Birds Directive and EU Habitats Directive takes place in a context shaped by the European Commission's broader agenda on regulatory simplification and competitiveness, as well as ongoing geopolitical tensions. The stated objective is to assess efficiency and proportionality. Concerns have been raised, however, that opening the door to potential amendments to core elements of the EU's legal biodiversity framework may be counterproductive, rather than contributing to simplification and effectiveness, weakening their paramount importance to nature restoration, economy and society in Europe.

A comprehensive review of scientific and policy evidence demonstrates that the EU Nature Directives remain fundamentally **fit for purpose**. Where properly implemented, they have reduced pressures on biodiversity, slowed declines in species and habitat loss, contributed to measurable recovery trends, and provided substantial socio-economic benefits. The **Natura 2000 network**, established under these Directives, constitutes the largest coordinated system of protected areas globally, generating ecosystem service benefits estimated at €200-300 billion annually, which clearly outweigh the estimated annual costs of about €10.2 billion. However, the same body of evidence consistently shows that the Directives' effectiveness is constrained by **implementation gaps**, rather than by deficiencies in the legislation itself. These include insufficient funding and human resources, insufficient translation into operational actions on the ground, weak policy coherence with key economic sectors, stakeholder tensions, persistent gaps in monitoring and data systems, and a lack of well-aligned cross-boundary coordination of the protection of species and habitats.

This white paper presents evidence supporting that the stress test should be reframed as an opportunity not to weaken the Nature Directives, but to **strengthen their implementation and cross-sectoral support**. Simplification should not be understood as lowering legal safeguards, but as making implementation clearer, more predictable, sufficiently funded and better coordinated across policy sectors, ecosystems and member states, without reducing the existing level of protection. Enhancing data quality, improving cross-sectoral policy coherence, reforming harmful subsidies and mobilising biodiversity friendly funding, taking cumulative impacts into account, ensuring ecological connectivity, reinforcing stakeholder participation under biodiversity prioritisation, capitalising on past projects, relying on joint fact-finding, and modernising governance and monitoring systems would significantly increase both legal certainty, environmental effectiveness and economic efficiency of the Nature Directives. Such an approach would align biodiversity protection with the EU's broader goals of a healthy environment for all European citizens, climate change adaptation and mitigation, and long-term sustainable food production and economic

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competitiveness.

1. Introduction and Policy Context

The **EU Birds and Habitats Directives** form the cornerstone of European biodiversity policy, providing a legally binding framework for the conservation of species and habitats across Member States (Tucker et al. 2019; EEA 2026a). Their implementation has led to the creation and management of the EU-wide **Natura 2000 network** of protected areas, which now covers approximately 18% of EU land and a growing share of marine areas (Natura 2000 2024; EEA 2026a).

The current stress test, announced as part of the Commission's simplification agenda, focuses on three main issue areas: (i.) the application of **appropriate assessment** for Natura 2000 sites (Article 6) of the Habitats Directive, (ii.) **policy coherence, stakeholder participation, funding support and governance** including **monitoring and reporting**, and (iii.) **species protection and derogations**, and procedures for **adapting the annexes to scientific and technical progress** (EC 2026a). While this exercise is framed as a technical evaluation, it carries broader political implications, particularly amid growing pressure to roll back EU environmental regulation in times of geopolitical tensions and economic decline in Europe (Winkel et al. 2026). The EU REFIT process, done in 2015-2017, already concluded that the Nature Directives were fit for purpose (EC 2017; Sotirov et al. 2021). If the current stress test now changes that conclusion, it could decrease the credibility of EU policymaking and increase the legal uncertainty around current EU policies.

At the same time, the EU is pursuing ambitious biodiversity and climate objectives, aiming also to meet international commitments such as under the **Kunming-Montreal Global Biodiversity Framework** and the **Paris Agreement** (BfN 2025), including the **EU Biodiversity Strategy for 2030** (EC-DGE 2021) and the implementation of restoration targets under the **EU Nature Restoration Regulation** with legally binding deadlines by 2030, 2040 and 2050 (Cliquet et al. 2024; Fleckenstein et al. 2025; Orliac et al. 2025). In this context, weakening the Nature Directives would risk undermining the very foundations needed to achieve these goals. Further, it would send an ambiguous signal to Member States, currently finalising their draft National Restoration Plans, thus significantly weakening the EU's

coherence and credibility regarding its biodiversity objectives. Conversely, strengthening the implementation of the Nature Directives offers a pathway to deliver multiple policy objectives simultaneously. The Birds and Habitats Directives provide the legal, ecological and spatial baseline on which restoration planning depends, including habitat definitions, conservation objectives, species status assessments, Natura 2000 site data and monitoring obligations. Weakening the Directives risks undermining the implementation architecture needed for credible and ambitious National Restoration Plans.

2. Scientific Foundations and Demonstrated Effectiveness

The Birds and Habitats Directives are grounded in well-established conservation science and ecological sustainability principles, including the protection of critical habitats, the maintenance of ecological connectivity, and a precautionary approach to environmental management (Winkel et al. 2015; Cliquet and Decler 2019). These principles are widely recognised as essential for conserving biodiversity and offering win-win opportunities for sustainable development in fragmented and human-dominated landscapes (Sotirov 2017; Cliquet and Decler 2019; Erdozain et al. 2026).

Comprehensive scientific and practical empirical evidence confirms that the Directives are effective when implemented properly (Donald et al. 2007; Sotirov 2017; BirdLife et al. 2018; Cliquet and Decler 2019; Menéndez-Miguélez et al. 2025; Orliac et al. 2025). The European Commission's Fitness Check, based on an unprecedented review of scientific and practical knowledge, concluded that they have contributed to reducing biodiversity loss and enabling recovery when properly implemented (Donald et al. 2007; EC 2017). The European Environment Agency's State of Europe's Nature assessments similarly show that improvements in species trends are in many cases linked to targeted conservation measures and habitat protection (EEA 2020).

A Network with Socio-Economic Benefits

The Bird and Habitat Directives, including the Natura 2000 network, play central roles in this success (Tucker et al. 2019; Orliac et al. 2025). By protecting a wide range of ecosystems, key habitats and species across biogeographical regions, it provides a coherent framework for conservation at the continental scale and is one of the most ambitious networks for biodiversity conservation globally (Borrass et al. 2015; Sotirov et al. 2015; Winkel et al. 2015; BirdLife et al. 2018; Tucker et al. 2019). Importantly, the network delivers substantial socio-economic benefits, including drinking water, flood protection, climate regulation, food and nutrition, fisheries, timber and pulp/paper, bio-energy, tourism and recreation, as well as spiritual and cultural values (Tucker et al. 2019; Sotirov 2025). These benefits far exceed the costs of implementation, including in full-time jobs created, so that investment needs and prioritised action frameworks across the EU are already considered for the 2021-2027 period (Gantioler et al. 2014; EC, 2020; EC 2023, Sotirov 2025, EC 2026a). More importantly, there are estimations of the significant economic value lost by failing to fully implement the EU Habitats and Birds Directives, with studies indicating that inaction costs the EU billions annually in lost ecosystem services, health impacts, and environmental damage.

It was estimated that biodiversity loss in Europe, largely driven by poor

implementation of nature legislation, costs the EU roughly **3% of its GDP per year**. Weak or lacking implementation of environmental laws, including nature directives, is estimated to cost Europe about **€180 billion per year** in health impacts and environmental damage (EC 2025a; EC 2025b). As of 2026, 81% of habitats covered by the EU's Birds and Habitats Directives are in poor or bad conservation status, and 36% are deteriorating, limiting their ability to provide essential socio-economic benefits (EEA 2023). The Natura 2000 network can provide ecosystem services like carbon storage, water purification, food, biomass and tourism valued at an estimated **€200-300 billion per year**, but this is significantly reduced by improper management (EC 2026c). There is a significant funding gap between the projected annual funding needs for biodiversity restoration within and outside Natura 2000, as aimed under the EU Nature Restoration Regulation, of around €54 billion (adjusted for 2024) and the projected available funding of around €30-33 billion on average (EEA 2025). These costs should, however, be seen as an investment, with each €1 spent estimated to return €4 to €38 in ecosystem benefits (Friends of Europe 2015; EC et al. 2019; Ecologic 2022; Bas 2015; EEB 2025; EEA 2026). This underlines the clear economic rationale for maintaining and strengthening the legal foundations and implementation of the Nature Directives.

3. Article 6 and Appropriate Assessment: A Tool for Sustainable Development

Article 6 of the Habitats Directive establishes the foundation for management planning and a preventive mechanism to ensure that plans and projects do not adversely affect Natura 2000 sites, in particular that economic development does not come at the expense of ecological integrity (Borrass et al. 2015; Sotirov et al. 2015; Möckel 2017; Cliquet and Decler 2019; Orliac et al. 2025). This mechanism is often perceived as administratively burdensome, yet the evidence suggests that it functions as a **risk management tool**, as well as a driver for **sustainable planning**, **socio-ecological innovation**, and the **protection of biodiversity** rather than a barrier to development (Möckel 2017; Cliquet and Decler 2019; Orliac et al. 2025).

By requiring early assessment and mitigation of environmental impacts, Article 6 reduces the likelihood of costly conflicts, delays, and environmental damage. Projects that comply with its provisions can proceed, often with modifications that enhance sustainability and reduce long-term risks. In this sense, the procedure contributes to legal certainty and supports informed decision-making (Möckel 2017; Cliquet and Decler 2019; Orliac et al. 2025).

Implementation Challenges and Long-Term Benefits of Natura 2000

Implementation challenges do exist, particularly in relation to data availability, data quality and administrative capacity. In many cases, site-level information remains inadequate, such as habitat maps and species inventories, with outdated or incomplete data, limiting the effectiveness of assessments. In other cases, complex and lengthy authorisation pathways make it difficult to achieve conservation and restoration objectives. Addressing these gaps through improved biodiversity mapping and monitoring, and data systems and guidance, would significantly enhance implementation efficiency without altering the legal framework (Cliquet and Decler 2019; Orliac et al. 2025). By avoiding environmental damage, the

Natura 2000 network provides not only substantial, often “free” services such as flood control, buffering against extreme weather events, water purification, carbon storage, pollination, food security, biomass and tourism and recreation.

Avoiding environmental damage and maintaining functional ecosystems **reduce administrative costs for maintenance** (reduced or eliminated water treatment plants, artificial flood barriers) whereas the strong legal protection of Natura 2000 provides **long-term security for investments, reducing the administrative need** for constant, ad-hoc legal and emergency action to repair damage. While the initial setup is costly (approx. 33–43% of total costs are one-off), the long-term, continuous management costs are lower, and the benefits accrue over time (Gantioler et al. 2014; Ecologic 2022; EEA 2026). In case of adjacent Natura 2000 sites, impacts should be evaluated at **a transboundary level** to both ensure the ecological coherence of decisions and facilitate the attainment of a favourable conservation status. Transboundary impact assessment would require the identification of similar thresholds to evaluate significant impacts and an attention to small cumulative impacts, as well as a joint process to interpret data or joint fact-finding procedures (Cittadino et al. 2025).

Strengthening Transboundary Cooperation

Recent national case law highlights that the absence of uniform standards under Article 6(3) of the Habitats Directive makes the assessment of transboundary impacts particularly complex and litigation-prone (Schoukens 2025). This provision intersects with other instruments addressing cross-border environmental effects, such as the EIA (Environmental Impact Assessment) and SEA (Strategic Environmental Assessment) Directives and the Espoo Convention (Convention on Environmental Impact Assessment in a Transboundary Context). The latter frameworks provide clearer procedural obligations, including notification, consultation, information exchange, and public participation, which are not explicitly regulated under Article 6(3). Such participatory guarantees are further strengthened by the Aarhus Convention and the Maastricht Recommendations (UNECE 2016), which require equal treatment of affected foreign and domestic publics. More recently, the EU Nature Restoration Regulation adopted in August 2024 has reinforced the importance of cross-border cooperation by mandating coordination in the preparation of National Restoration Plans where ecosystems extend across national boundaries (Cittadino et al. 2025).

4. Policy Coherence, Governance, and Funding

One of the most consistent findings across scientific and policy analyses is that biodiversity outcomes depend heavily on the **coherence of policies across sectors** (Kyrönviita et al. 2024; BfN 2025; Platjouw et al. 2025; Sotirov et al. 2025). This is due to the fact that the origins of the main drivers of biodiversity loss are outside the scope of the Directives themselves, and that these drivers differ across ecosystem types. In terrestrial and freshwater ecosystems, land-use change has had the largest relative negative impact on nature since 1970, followed by the direct exploitation of animals, plants and other organisms, mainly through harvesting, logging, hunting and fishing. In marine ecosystems, direct exploitation, mainly fishing, has had the largest relative impact, followed by land- and sea-use change (EC 2017; Sotirov 2017; EEA 2020; IPBES 2019; Kyrönviita et al. 2024; Niederman et al. 2025). These pressures are further intensified by progressing climate change, cumulative stressors and sectoral activities, namely agricultural

intensification, overfishing, timber logging, intensive bioenergy extraction and infrastructure development in terrestrial ecosystems, or freshwater salinisation, e-commerce and non-native species, infectious diseases, harmful algal blooms, expanding hydropower, emerging contaminants, engineered nanomaterials, microplastic pollution, light and noise, and declining calcium in aquatic ecosystems (Stendera et al. 2012; IPBES 2019; Reid et al. 2019; Niederman et al. 2025).

While biodiversity objectives are increasingly recognised in other sectoral EU policies (e.g., agriculture, forestry, fisheries, transport, energy, industry), their integration into these sectoral frameworks remains uneven and weak (Sotirov 2017; Tucker et al. 2019). For example, forest policy illustrates how competing objectives related to bioeconomy, climate mitigation, and biodiversity can lead to fragmentation, conflict and reduced effectiveness (Winkel and Sotirov 2016; Lindahl et al. 2023; Sotirov et al. 2025). Similar challenges exist in agriculture (Adamescu et al. 2022, Candel et al. 2023), water management (Haapasaari et al. 2024; Kyrönviita et al. 2024), and energy policy (Hajdukovic & Jessel 2026). Improved policy coherence across sectors will directly address the drivers of biodiversity loss, improve planning, and reduce conflict. Hence, instead of reforming the Nature Directives, **policy attention should be further directed to reform major economic sectors and policies at EU and national level**, including agriculture, forestry, fisheries, transport, energy, production industries, housing etc. to **include biodiversity requirements**.

Governance Challenges and Administrative Capacity

Governance complexity, due to different political systems and governmental choices in the EU member states, further complicates cross-sectoral (horizontal) and multilevel (vertical) policy coherence and implementation of the Nature Directives. Responsibilities are distributed across multiple levels and sectors, often leading to coordination challenges (Winkel et al. 2015; Winkel and Sotirov 2016; Sotirov et al. 2025). This is not an inherent flaw to the Habitats and Birds regulatory design at the EU level itself, as both directives offer a great leeway and discretion to Member States on how to implement them (Borrass et al. 2015; Sotirov 2017); instead, these governance issues could be addressed by national decisions. Strengthening institutional cooperation and clarifying roles **at national and subnational level** will improve effectiveness and reduce administrative costs and inefficiencies.

Under the evolving climate, land and sea use changes and cumulative stressors scenario, the **capacity of public administrations** requires continuous update and capacity building for achieving EU nature conservation objectives. Knowledge of high nature value areas, how they contribute to increasing climate resilience and provide nature's benefits to people, has increased in a way beneficial to the entire society (Winkel et al. 2014, Cliquet and Decler 2019). Successful implementation, thus, relies on ever-improved technical capacity within public administrations, and qualification to avoid uneven interpretation of conservation rules, and insufficient coordination among competent authorities. Over the past three decades, the Natura 2000 framework has provided tangible opportunities for EU Member States to invest in training and develop dedicated biodiversity and restoration expertise. Maintaining the ambitions of the Nature Directives means continuing to strengthen the process of developing shared technical guidance, which in turn reduces administrative burdens while improving environmental outcomes (Orliac et al. 2025).

Funding Gaps and Economic Alignment

Funding plays a critical role in EU Nature Directives and Nature Restoration Regulation implementation contexts. Although EU funding instruments such as LIFE and agri-environment and forestry schemes under the Common Agriculture Policy (CAP) contribute to biodiversity conservation, overall funding remains fragmented, insufficient (in both amount and duration) and unevenly distributed across habitats and taxa (Geitzenauer et al. 2017; Sotirov 2017; Mammola et al., 2020; Adamo et al., 2022; Sotirov 2025). Regarding the Nature Restoration Regulation, it is still unclear how much its implementation will cost, since it depends on national contexts and priorities, as well as how these costs should be covered, despite the availability of some EU funds and existing domestic and private financing in some Member States (Aubert et al. 2022). At the same time, harmful subsidies at the EU and national levels for intensified agriculture, fisheries, forestry and bioenergy continue to incentivise land, freshwater, and sea use practices deteriorating ecosystems (Pe'er et al. 2019; Gonon et al. 2025; Reyes-García et al. 2025; Sotirov 2025). Reforming these subsidies and aligning financial flows with biodiversity objectives is therefore essential (Pe'er et al. 2022; Guénard et al., 2025; Sotirov 2025). Under the post 2020 Global Biodiversity Framework there is a scientific consensus and broader policy agreement among EU Institutions and Member States and their global partners about the urgent need to remove biodiversity harmful subsidies (CBD 2022; IPBES 2024)

The implementation of conservation and restoration targets will also depend on practical supply chains for native plant, animal, and fungal materials, including regionally appropriate genetic resources (e.g. Crosier et al. 2025; Crawford et al. 2026). Seed banks, culture collections, botanic gardens, zoos, nurseries, breeding programs, and conservation networks can play strategic roles in supporting restoration delivery, especially for habitats and species of key ecological importance and community interest. Likewise, mobilising sufficient public and private funding for EU Nature Directives and the Nature Restoration Regulation is important to support annual investments and to fairly address the costs and opportunity costs borne by individual landowners and land users. While the Natura 2000 network generates ecosystem service benefits for the general society and economy in Europe estimated at **€200-300 billion annually, equivalent to 2%–3% of EU GDP (EC 2026a)**, these benefits and costs are not distributed equally. The estimated annual cost of operating the network, including management, restoration and protection, is around **€10.2 billion** and has to be covered by public agencies operating under constrained budgets, while also supporting or compensating landowners where conservation measures limit certain land-use options or require changes in management practices (EC 2026a). At the same time, subsidies harmful to biodiversity amount to around € 5 billion annually **in the forestry sector alone**, would already cover ca. 50% of Natura 2000 annual investments, if phased out and redirected (Sotirov 2025). The remaining funding gap could be easily closed if biodiversity harmful public subsidies in the agriculture, aquaculture, energy, and transport sectors, amounting to **34-48 billion € annually**, are also phased out and, ideally, redirected to support biodiversity-friendly measures (WWF 2024; Sotirov 2025).

Stakeholder Participation and Conflicts

Stakeholder participation in implementing EU Nature Directives and Nature Restoration Regulation is critical to their success or failure but remains a complex undertaking. Natura 2000 implementation has evolved from a policy process driven by conservation science and public administration to a more participatory style of conservation management, aiming to inform and engage concerned stakeholders and resolve conflicts, especially with landowners and land users who felt excluded (Borrass et al. 2015; Sotirov

et al. 2015). Stakeholder participation in Natura 2000 enhances trust in conservation goals, improves the legitimacy of management measures, and helps resolve conflicts by incorporating local, social, and economic perspectives. While crucial for effective implementation, it requires significant continuous effort in communication, addressing, and mitigating conflicts between biodiversity conservation and socio-economic activities like agriculture or forestry (Winkel et al. 2015; Blondet et al. 2017; Brescancin et al. 2018; Maczka et al. 2021).

Although the integration of local stakeholders' and land users' demands into conservation planning and management of Natura 2000 is now often a political and legal imperative, it can still compromise policy effectiveness, especially where the primary interests of local stakeholders (e.g. farmers, foresters, fishers, energy, transport and building industries) clash with the achievement of conservation objectives (Winkel et al. 2015; Blondet et al. 2017; Maczka et al. 2021; Konczal et al. 2025). At the same time, the general public in Europe remains highly supportive of biodiversity conservation, climate mitigation and adaptation and the continued provision of ecosystem services. Where trade-offs arise, these benefits are often prioritised over more narrowly defined economic interests, such as timber extraction, firewood provision, hunting space or other material forest benefits (Arato et al. 2024; Kazungu et al. 2025; Konczal et al. 2025; Kilgus & Shrum 2026). It is, therefore, recommended to support wider stakeholder participation, while still clearly prioritising the biodiversity goals of the Nature Directives. Proactively engaging with stakeholders that may not, initially, support biodiversity restoration efforts can help avoid or minimise societal conflicts (Floyd et al. 2024; Satyal et al. 2025). Disagreements can be seen as opportunities to learn about different interests and values, and use societal deliberation to learn to change attitudes and behaviour that can build stronger relationships.

5. Monitoring, Data, and Knowledge Systems

The EU Member States have developed one of the world's most advanced biodiversity monitoring systems, primarily through the reporting obligations set out in Articles 12 and 17 of the Directives. These systems provide valuable information on the status and trends of species, their habitats and prospects (Sotirov 2017; Orliac et al. 2025; EEA 2026b). At the same time, significant gaps remain, both in taxonomic gaps in existing monitoring and species distribution mapping processes. These gaps are particularly relevant for less visible or technically difficult groups, such as invertebrates, pollinators, soil biodiversity, bryophytes, lichens, fungi, freshwater organisms and many marine taxa. This requires both increased capacity at the level of training experts, but also for integrating with the modern approaches discussed below. At the same time, assessment reports for the period 2019-2024 show improvements of the conservation status for sites and species for which actions have been undertaken (EEA 2026). Data quality and coverage vary across Member States, geographic locations, and taxa (García-Roselló et al. 2025), and monitoring outside Natura 2000 sites is frequently inadequate. In many cases, assessments rely on incomplete surveys or on the best available knowledge, which highlights the need for expanded taxonomic coverage, improved implementation, and more robust and harmonised monitoring and data systems (EC 2017; Orliac et al. 2025).

Modernisation and Integration of Knowledge Systems

Modernising and harmonising monitoring through automated sensor

systems and data pipelines (Besson et al., 2022), remote sensing (Reddy, 2021), and integrated databases that combine standard biodiversity data with community-based data (e.g. internet- and citizen science-derived data) (Jaric et al., 2020; Johnston et al., 2023) would enhance both efficiency and accuracy for some taxa and locations. Community-based data provides a critical bridge for integrating indigenous/traditional local knowledge with scientific frameworks. It provides granular, on-the-ground context that complements scientific analysis, particularly in areas like biodiversity monitoring, ecosystem service management, and agricultural practices (Yanou et al. 2023; ARA-TLS 2024; UNFCCC 2024; Ijatuyi et al. 2025). Further, it empowers communities to document their own observations (e.g. biodiversity changes or climate impacts), translating oral traditions and practical skills into actionable data that influences policy, research, and resilience strategies (ARA-TLS 2024; UNFCCC 2024). Local communities transition from subjects of research to owners of their knowledge, allowing them to lead in conservation and climate adaptation planning (Yanou et al. 2023; Ijatuyi et al. 2025). It can also address knowledge gaps regarding local ecology, climate risks, and historical trends often overlooked by conventional scientific surveys, providing essential data for climate change adaptation and better-informed environmental policies and land-management practices. Overall, improved data quality and availability, together with more comprehensive taxonomic and geographic coverage, and hybrid scientific and community-based data systems will additionally support better decision-making, reduce uncertainty for stakeholders, and strengthen the credibility of the policy framework overall (Besson et al. 2022; Yanou et al. 2023; Ijatuyi et al. 2025; Orliac et al. 2025). Clarity should be ensured concerning various aspects: the methodology used for monitoring; data and methodologies to interpret them should be made openly available with continuous access; and national and local authorities should give clear directives and economic incentives to encourage this sharing. This would improve the implementation of the Nature Directives in transboundary contexts where Natura 2000 sites are close to the borders or species straddle across borders.

From Monitoring to Adaptive Management

The above mentioned gaps cannot be fixed directly through the modernisation approaches but require increased capacity in terms of scientists and professional experts for integration into monitoring, better understanding of outcomes, and better information to interpret the results.

Monitoring is the foundation for adaptive management and should not be treated as a reporting obligation only. Site-level management, conservation and restoration measures require indicators, thresholds, feedback mechanisms and documented management adjustments. This would make implementation more transparent, improve accountability and ensure that management actions can be adjusted when ecological responses differ from expectations (Hermoso et al. 2016; Månsson et al. 2023; Smits et al. 2025; EEA 2026b).

6. Climate Change and the Role of EU Nature Directives

A recurring argument in policy debates is that climate change undermines the relevance of site-based conservation approaches such as protected areas by altering species distributions and ecosystem dynamics (de Koning et al. 2014; Dobrowski et al., 2021). This argument is often based

on predictions and extrapolations of biodiversity shifts in space and time associated with large uncertainties and does not hold up under scientific scrutiny (Keppel et al. 2024; Prima et al. 2025; Anderson & Chapple 2026). Climate change does not reduce the importance of protected areas, it increases it, especially when considering a large and climate-diverse network of largely interconnected protected areas, such as Natura 2000. Ecosystems act as carbon sinks, buffer extreme weather events, and provide refugia for species. Connectivity and an EU-wide network between protected areas are essential for enabling species to adapt to and persist under changing climatic conditions (de Koning et al. 2014; Åkesson et al. 2021; Struebig et al. 2024; Prima et al. 2025). Climate change is expected to cause geographic shifts of suitable sites, and a network of protected areas allows natural dispersal across areas with different climatic conditions and can also be the basis for programs of nature-friendly assisted colonisation (Lawlor et al. 2024). Furthermore, the latest Copernicus Report on the state of climate (ECMWF, 2026) confirms that Europe is the fastest-warming continent on Earth, a finding consistent with the assessment of the European Environment Agency (EEA, 2024), which warned that Europe is warming at twice the global average rate. As illustrated by the European Commission's recent guidance on the Natura 2000 and climate change (EC 2026b), the Natura 2000 network offers strong potential to support Europe's overall climate response, while making use of the flexibilities in the Birds and Habitats Directives to adapt conservation objectives and measures to climate change.

Natura 2000: a Tool for Climate Adaptation and Mitigation

The Natura 2000 network is sometimes perceived as a static conservation approach, but this does not reflect its full potential. Its legal and management framework (i.e., the Nature Directives) already allows for adaptive management, periodic updating of conservation objectives and the integration of new scientific knowledge (de Koning et al. 2014, Sotirov 2017; Åkesson et al. 2021; Struebig et al. 2024; Prima et al. 2025). The real limitation lies not in the EU biodiversity legal framework, but in the lack of availability of up-to-date data and the lack of capacity to implement adaptive measures (de Koning et al. 2014; Hermoso et al. 2016; Månsson et al. 2023; Smits et al. 2025; EEA 2026b). Weakening protection and allowing too much human-centric flexibility in response to climate change would be counterproductive. It would reduce species persistence and ecosystem resilience, increase ecosystem risks from non-native species and unsustainable intensification of land use, accelerate biodiversity loss, and increase long-term economic costs. Expanding the protected areas by diversifying the range of climatic zones and conditions to cover altered distribution patterns, and to facilitate species dispersal and migration, improving connectivity to ease species dispersal, nurturing natural processes and Nature-based Solutions to climate adaptation, and integrating climate mitigation and adaptation into conservation management and nature friendly land use are more effective responses (de Koning et al. 2014; Pettorelli 2021; Keppel et al. 2024; Prima et al. 2025; Anderson & Chapple 2026).

| 7. Species Protection and Derogations

Even though some aspects of conservation biology are globally shifting from species to habitat level conservation (Riva et al., 2024; Belitz et al.,

2025), strict species protection remains a key pillar of the Directives (EEA 2026). Nature Directives aim to reduce species loss with a red listing-like approach (as specified in the Annexes). This is a key and powerful conservation activity as these species-focussed protections have contributed to stabilising and, in some cases, reversing declines in species populations when the Directives were properly implemented (Sotirov 2017; Cliquet and Decler 2019; EEA 2026). However, implementation remains uneven and needs to be improved across Member States (Sotirov 2017; EEA 2026), the list of species in the annexes of the habitat directive requires revision to allow for the inclusion of species that are increasingly threatened due to climate and land use changes (Cardoso, 2012; Pallarés et al., 2026), and the use of derogations should be reconsidered as is not always consistent or transparent (EEA 2020b).

Improving the application of species protection measures requires better monitoring, clearer guidance, and stronger enforcement. At the same time, the aforementioned flexibility provided by the Directives allows for adaptive management, ensuring that conservation objectives can be balanced with socio-economic considerations (Winkel et al 2015; Sotirov 2017; Cliquet and Decler 2019; Åkesson et al. 2021; Struebig et al. 2024; Prima et al. 2025).

Derogations and Case Law: A Case Study

The jurisprudence and case law of the European Court of Justice (ECJ) should also be taken into account. The obligation of strict protection of Annex IV species under Article 12(1) is very much species-centred, especially for highly mobile species. For example, the ECJ case law consistently affirms that the conservation status of wolf populations under the Habitats Directive must be assessed at the level of their natural range, rather than strictly within national borders (Case C-674/17, *Tapiola*), while simultaneously requiring that any derogations do not undermine favourable conservation status both nationally and at the population level. Subsequent rulings have clarified and reinforced this approach: in the Austrian wolf case (Case C-601/22), the Court held that a favourable transboundary status alone cannot justify derogations, which must first be grounded in a favourable national or local conservation status; in the Spanish wolf case (Case C-436/22), it emphasised the relevance of cross-border dynamics—such as the movement of individuals—in assessing the sustainability of exploitation under Annex V; and in the Estonian wolf case (Case C-629/23), it reiterated that national conservation status cannot be “artificially” deemed favourable by reference to wider populations, even though exchanges with neighbouring populations remain a relevant consideration. Although the Court has not prescribed specific cooperation mechanisms, its reasoning implicitly underscores the need for robust scientific data, coordinated monitoring, and cross-border management, suggesting that effective transboundary coordination is essential both for legally sound decision-making under the Directive and for enhancing the long-term sustainability and societal acceptance of wolf conservation policies in the EU (Cittadino et al 2025).

8. From Stress Test to Strategic Opportunity

The evidence presented in this paper leads to a clear conclusion: the EU Nature Directives, and the related EU Nature Restoration Regulation, provide the foundations for a coherent, needs-oriented and cost-efficient European biodiversity and restoration agenda. However, their full potential has yet

to be realised after addressing the aforementioned issues with regards to practical conservation management, EU-coherent implementation, cross-sectoral policy coherence, stakeholder involvement, funding and administrative capacity (Orliac et al. 2025).

The 2015-2016 REFIT [Fitness Check](#) has already highlighted these points: *“Within the framework of broader biodiversity policy the Nature Directives are fit for purpose, but fully achieving their objectives and realising their full potential will depend on substantial improvement in their implementation in relation to both effectiveness and efficiency, working in partnership with different stakeholder communities in the Member States and across the EU, to deliver practical results on the ground.”* (SWD(2016) 472 final: 8).

Strengthening Implementation

This stress test should therefore be seen as a timely opportunity to address progress on these gaps and strengthen the conditions for successful implementation. Improving data management and availability, aligning policies and funding, enhancing administrative capacity, and reinforcing governance and monitoring systems within the adaptive management cycle would make the EU biodiversity framework more effective, more efficient and more useful for Member States, practitioners and stakeholders benefitting biodiversity, climate resilience, economic stability, and social well-being is the motto.

In this perspective, the Bird and Habitat Directives (including conservation management inside and outside the Natura 2000) should be recognised not only as the rationale for protected area networks, but also as Europe's strongest existing platform for guiding habitat and species restoration on the continent and elsewhere. Over the past decades, the conservation management of the Natura 2000 network and the species protection regime have generated extensive experience in habitat and species mapping, conservation objectives, management planning, stakeholder engagement, monitoring and restoration practice. These tools and lessons can support restoration actions both inside and outside the network, as expressly required by the Nature Restoration Regulation (Orliac et al. 2025).

From Review to Strategic Transformation

Knowledge hubs, national restoration networks and transboundary organisations can play a key role in this process. By translating scientific evidence into operational support, fostering knowledge exchange, identifying barriers and needs, leveraging good practices and standards, and bridging science, policy and practice. All affected parties, scientists, implementing agencies, conservation managers, landowners, businesses and environmental NGOs, should collaborate to help close the gap between legal ambition and implementation on the ground, by providing evidence and solutions to improve effectiveness and credibility. This way, the stress test can be used as much more than an administrative review and roll back of an already well-established EU policy and legal framework. It is an opportunity to bring to the centre of the discussion the modernisation of the implementation structure, reduce unnecessary legal uncertainty, strengthen trust among institutions, stakeholders, and people, and accelerate worldwide recognised progress towards Europe's biodiversity, restoration and climate-resilience objectives. The strategic choice is therefore not between nature protection and regulatory efficiency, but between weak implementation and a stronger, better-equipped framework capable of delivering results.

The EU Birds Directive and EU Habitats Directive remain fit for purpose, by

their regulatory design, and if fully and properly implemented, as essential instruments to incentivise the achievement of EU's environmental and socio-economic objectives. They provide a scientifically robust and economically justified framework for conserving biodiversity and supporting sustainable development.

As reviewed above, the available evidence suggests that the main challenges facing the Birds and Habitats Directives lie not in their objectives or legal architecture, but in their implementation. The literature highlights the need for targeted improvements in national and local implementation, greater policy coherence across sectors, increased mobilisation of biodiversity-friendly funding, the phase-out of harmful incentives, and stronger knowledge and monitoring systems. The evidence further suggests that the most effective simplification pathway is not to reduce environmental safeguards, but to improve implementation through better data, stronger administrative capacity, clearer guidance and enhanced policy coherence.

Strengthening implementation - not weakening legislation - is the most effective and efficient pathway to safeguarding Europe's natural capital in a changing world.

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