



UiT The Arctic University of Norway

UiT – The Arctic University of Norway

Faculty of Law

BRINGING NATURE BACK INTO CITIES

Urban ecosystems restoration in the international and EU legal biodiversity frameworks

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*Look again at that dot.
That's here.
That's home.
That's us.
On it everyone you love,
everyone you know,
everyone you ever heard of,
every human being who ever was,
lived out their lives.
The aggregate of our joy and suffering,
thousands of confident religions,
ideologies, and economic doctrines,
every hunter and forager,
every hero and coward,
every creator and destroyer of civilization,
every king and peasant,
every young couple in love,
every mother and father,
hopeful child,
inventor and explorer,
every teacher of morals,
every corrupt politician,
every "superstar",
every "supreme leader",
every saint and sinner in the history of our species
lived there,
on a mote of dust
suspended in a sunbeam.*

Carl Sagan, *Pale Blue Dot: A Vision of the Human Future in Space*

To my beloved husband, whose constant support, encouragement, and love have been my greatest source of strength.

Your belief in me and our shared dreams have carried me through every challenge over these past two years.

I love you.

Abstract

Biodiversity is declining globally, and traditional conservation methods have proven insufficient. Ecosystems restoration is imperative, also in urban areas. This thesis underscores the existence of an international trend toward establishing frameworks for urban ecosystems restoration. Various initiatives, such as the Sustainable Development Goals and the UN Decade for Ecosystems Restoration, highlight the need for urban biodiversity restoration, though current treaties lack robust restoration obligations. The recent Kunming-Montreal Global Biodiversity Framework, negotiated under the CBD, includes a target on urban green spaces, but it is non-binding and its implementation framework lacks compliance mechanisms. In the EU, the Green Infrastructure Strategy and the 2030 Biodiversity Strategy emphasize urban ecosystems restoration, but the Nature Directives do not address restoration in urban areas. The proposed Nature Restoration Law seeks to address these gaps with binding targets and a strong implementation framework, although its effectiveness has been weakened in negotiations. Despite progress, significant challenges remain.

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List of Abbreviations

CBD	Convention on Biological Diversity
COP	Conference of the Parties
EEA	European Economic Area
EU	European Union
GBF	Kunming-Montreal Global Biodiversity Framework
NBSAP	National Biodiversity Strategy and Action Plan
NRL	Nature Restoration Law
TEU	Treaty on the European Union
TFEU	Treaty on the Functioning of the European Union
UN	United Nations

1 Introduction

1.1 Background

The seminal paper by Rockström *et al.* (2009) developed the concept of *planetary boundaries*, imaginary confines related to nine key Earth System processes. The authors suggest that as long as anthropologic activities allow to remain within these boundaries, humanity may continue to develop and thrive for generations to come. However, exceeding these boundaries could lead to “unacceptable” global environmental change.¹

Biodiversity is one of these key Earth System processes, thus a specific rate of biodiversity loss has been identified as one of the planetary boundaries that should not be exceeded. Nevertheless, research indicates that the state of Nature is bad worldwide, with many habitats deteriorated and species becoming or become extinct, and this situation is rapidly worsening.² With the relevant planetary boundary already breached,³ biodiversity loss is one of the three pillars of the “triple environmental planetary crisis”, along with climate change and pollution.⁴

The failure of the World to reverse the decline of Nature can be attributed to various pressures. Research indicates that biodiversity loss is significantly impacted by intensive agriculture and fishing, unsustainable forestry activities, pollution, climate change, and growing urbanization.⁵ In terms of urbanization trends, over 55% of the global population currently lives in urban areas, a figure projected to rise to 68% by 2050.⁶

Men and urban settlements are commonly seen as “natural” antagonists of Nature. Made up of steel and concrete, polluted, dazzling and noisy, our cities seem the most distant and different thing from Nature, inhospitable to animal and in constant struggle with trees that heroically resist the bulimic hunger of men for cement, buildings, and infrastructures.⁷ Studies showed that in urban areas, flora and fauna is significantly lower compared to non-urban habitats and considerably less diverse.⁸ Urbanization is, thus, a serious concern for biodiversity.⁹

However, this is only one side of the story. Our cities host multiple elements of the natural environment, from urban parks to city lakes, from municipal rivers to green rooftops,

¹ Rockström *et al.* (2009), pp. 2–6.

² According to IPBES (2019), pp. XXVI–XXXI, ecosystems have declined by 47%, 25% of species are threatened with extinction, and the global biomass of wild mammals has fallen by 82% since prehistory, with a rapid decline since 1970.

³ Rockström *et al.* (2009), pp. 14–15 and 20–23.

⁴ UNEP at <<https://www.unep.org/news-and-stories/speech/triple-planetary-crisis-forging-new-relationship-between-people-and-earth>> and UNFCCC at <<https://unfccc.int/blog/what-is-the-triple-planetary-crisis>> (both accessed on 18 May 2024).

⁵ IPBES (2019), pp. XXXII–XXXVII.

⁶ UN (2019).

⁷ Lord *et al.* (2003), pp. 318–319, 329–330.

⁸ Nilon *et al.* (2017), p. 332.

⁹ CEPF (2022), pp. 8–9; Nilon *et al.* (2017), p. 332; Sirakaya *et al.* (2018), p. 2.

from private and community gardens to tree-lined boulevards. These green and blue areas provide shelter for many insects, birds, fishes, small vertebrates, and many other animals.¹⁰ Nature plays a vital role in maximizing the advantages and minimizing the negative effects of urban living and providing numerous benefits for humans, including health and wellbeing/recreation, climate change adaptation by cooling and insulation, pollination, food, flood risk reduction, water and air pollution removal, carbon storage and sequestration, and many more.¹¹

The international community has long recognized the negative impact of urbanization on biodiversity. However, it is only recently that specific attention has been directed towards protecting and restoring biodiversity within urban areas. This focus is evident in several initiatives, soft law instruments, and Conference of Parties (COP) decisions under key biodiversity treaties, including the Ramsar Convention and the Convention on Biological Diversity (CBD). Nevertheless, these soft law instruments and decisions are not strictly binding, making their implementation reliant on political will and voluntary actions by international community members. They also lack a comprehensive accountability or liability regime.

In this context, the EU has an extensive and sophisticated legislative framework in place to protect its habitats and species. Yet, Europe is not immune to the alarming trend of continuous biodiversity loss, with 81% of the 818 EU habitats studied found to be in an unfavourable conservation status.¹² Recognizing that the environment is becoming increasingly “hostile and uninhabitable for biodiversity”, the European Commission has asserted that protection alone is not enough, and restoration efforts are needed.¹³ As a result, it proposed the adoption of a Nature Restoration Law (NRL) incorporating binding and time-bound restoration targets, some of which specifically targeting urban ecosystems. This Regulation would complement the current legislative framework, which lacks specific, measurable and time-bound restoration provisions. However, as of May 2024, its future is at stake, with the Council of the European Union freezing the legislative procedure in March 2024, after its formal adoption by the European Parliament in February 2024.

1.2 Purpose and research questions

Urban ecosystems are among the least studied ecosystem types from an international and EU law perspective. In the databases consulted for this thesis, I did not find any paper or

¹⁰ Van Haaster-de Winter *et al.* (2022), p. 1; Rodrigues *et al.* (2018).

¹¹ Sirakaya *et al.* (2018), pp. 2–4; Russo and Cirella (2021c); Brzoska and Späße (2020); UN-Habitat (2022), pp. 165–169; EC-DGE (2020), pp. 2–5, 9–10, 19–27; and EC-DGE (2022), p. 7.

¹² EC (2022b), pp. 8–9; EC (2022d); and EEA (2020), pp. 41 *et seq.*, which highlights that the situation during the reporting period 2013–2018 had worsened by 6% compared to the previous reporting period (2008–2012).

¹³ EC-DGE (2022), p. 6; EC (2020).

book that specifically and systematically addressed the topic related to the protection and restoration of urban ecosystems from a legal perspective. This absence of legal literature motivated my research. In light of this, the purpose of this thesis is to investigate the biodiversity legal regime at the international and EU level, to identify and systematize the provisions thereunder concerning the protection and restoration of urban ecosystems. Ultimately, it aims at analysing the legal framework to draw a way forward and propose ways to improve the international and EU systems to improve the odds for Nature to be brought back into cities.

At the international level, this thesis aims to examine a selection of soft law instruments and biodiversity treaties, to highlight the provisions and targets applicable to urban biodiversity. With reference to the CBD, the investigation will be extended to the COPs decisions establishing the Aichi Targets and the Kunming-Montreal Global Biodiversity Framework (GBF).

At the EU level, this thesis aims to analyse policies and current legislation to highlight the provisions and targets applicable to urban biodiversity. After discussing the legislative shortcomings of the current framework that prevent the EU from effectively halting biodiversity loss, the thesis will delve into the proposal of NRL, to underscore its added value compared to the current legislative framework. Furthermore, this thesis seeks to verify whether the NRL is coherent with EU biodiversity framework, and whether it satisfies the so-called “SMART” criteria developed by the European Commission to assess the effectiveness of the targets. Finally, this thesis will question whether the “upgraded” EU policy and legislative biodiversity framework is aligned with the GBF and may therefore contribute to the fulfilment by the EU of its international obligations and targets under the CBD.

The main research question would thus be: *“What are the legal duties to protect and restore urban ecosystems under the international and EU legal frameworks on biodiversity? Are the relevant EU targets coherent, effective, and aligned with international targets?”*. This question is broken down into three sub-questions:

- A. How is the restoration of urban ecosystems incorporated into existing international soft law and hard law biodiversity instruments?
- B. How is the restoration of urban ecosystems incorporated into the EU’s policy and legislative framework on biodiversity?
- C. Is the Nature Restoration Law coherent with the EU’s biodiversity policy framework? Do the targets on urban ecosystems restoration meet the “SMART” criteria set by the Commission to assess their effectiveness? Is the EU’s policy and legislative framework on urban ecosystems restoration aligned with the Global Biodiversity Framework?

1.3 Limitations

The primary focus of this thesis is on urban ecosystems. Consequently, the objective is not to analyse and discuss all provisions of all international soft and hard law instruments and EU policy and legal framework impacting on ecosystems restoration. Instead, it will concentrate on those that specifically pertain to urban ecosystems. Their general restoration provisions applicable to all ecosystems, including urban ones, will only be briefly touched upon.¹⁴

This thesis is strictly focused on biodiversity, although other legal regimes may be relevant to the restoration of urban ecosystems and may serve as either catalysts or obstacles.

For instance, climate change regime may accelerate the process of restoring ecosystems, as urban parks and wetlands are important carbon sinks. In 2021, during COP26 under the UN Framework Convention on Climate Change, Parties adopted the Glasgow Climate Pact.¹⁵ This Pact acknowledges the interconnection between climate change and biodiversity loss. It emphasizes the importance of protecting, conserving and restoring ecosystems to achieve the Paris Agreement temperature goal and highlights that by protecting and restoring ecosystems, annual net greenhouse gas emissions may be reduced by more than 7 giga tonnes by 2030.¹⁶

Another example, which on the contrary may hinder urban ecosystems restoration due to competing interests, arises from energy law, specifically renewable energy. For instance, in the EU, the development of renewable energy infrastructures is presumed as being in the overriding public interest when balancing legal interests in permit-granting procedures. As a result, renewable energy projects may be carried out despite a negative assessment on their implication for a protected site, provided that no alternative solution exists and compensatory measures are taken.¹⁷ The strong impulse given to the installation of photovoltaic systems in urban areas (especially on rooftops) leads to a reduction in space available for Nature and green areas.

The mutual influences of these different regimes deserve a separate analysis and are therefore not further developed in this thesis.

1.4 Methodology and materials

The methodology employed in this thesis mostly relies on legal doctrinal research, since it concentrates on the analysis of international legal instruments, both hard law and soft law,

¹⁴ For a comprehensive review: Telesetsky *et al.* (2016), pp. 61–143; Cliquet (2017); Mendes *et al.* (2022); Cliquet *et al.* (2022).

¹⁵ UNFCCC (2021a).

¹⁶ UNFCCC (2021b), p. 11.

¹⁷ Article 16f of Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652 (so-called RED-III), referring to the derogation rules of Habitats Directive (Articles 6(4) and 16(1)(c)), Water Framework Directive (Article 4(7)) and Birds Directive (Article 9(1)(a)).

and EU primary and secondary laws, as well as policy documents, and case law. The objective is to study the relevant documents to delineate a coherent system by extrapolating the principles, rules and concepts that apply to the specific topic of urban ecosystems restoration. This will involve verifying the existence, scope, content, and nature of provisions impacting on urban ecosystems, urban ecosystem services and urban biodiversity in general. Ecological and urban studies will be used in an auxiliary way, mainly to define concepts.

International legal instruments will be described and interpreted to determine how they apply to urban ecosystems, specifically emphasizing where the relevant instrument explicitly consider urban biodiversity. With regard to the three conventions analysed in Section 3.3, emphasis will be given to the subsequent work of COPs or similar governing bodies as this work helps in interpreting the treaty's text and ensures the implementation of the relevant provisions.

Similar to international law, the selected policies and legislative acts of the EU biodiversity framework will be studied and interpreted to outline the framework applicable to the restoration of urban ecosystems. I will refer to some relevant case law by the Court of Justice of the European Union concerning the EU Nature Directives.

The assessment on policy coherence will be carried out by referring to the documentation accompanying the proposal of NRL. However, it is important to note that the European Parliament and the Council of the European Union have negotiated a text that significantly diverges from the Commission's proposal. Therefore, efforts will be made to assess whether the final draft remains coherent with the previously highlighted policy framework.

The assessment on the effectiveness of the NRL and its targets on urban ecosystems will be made by employing the "SMART" methodology developed by the Commission. This means that the Regulation and the specific targets will be tested against seven criteria: specificity, measurability, achievability and realism, time-boundness, coordinated approach, comprehensiveness, and enabling measures. This methodology is better described in Section 5.3. Here it is important to anticipate that many other factors may impact on the *real-world* effectiveness of a certain piece of legislation, as it will be further discussed thereunder.

Finally, the assessment on the alignment of EU law with international law will be made through comparing what the international law aims to achieve, albeit in a non-binding manner, and what the "upgraded" EU legal system actually prescribes. This comparison allows to understand what contribution the biodiversity EU policy and legal system may give to the achievement by the EU of the targets and obligations under the CBD, specifically under the Kunming-Montreal Global Biodiversity Framework.

As previously mentioned in Section 1.2, the legal literature on urban ecosystems is extremely scarce. This might be attributed to the fact that the most significant legislative changes have taken place in the last eighteen months. This contrasts with the abundance of ecological and urban literature on the same subject. As a consequence, in addition to many academic articles and books concerning the broader topic of ecosystems restoration, the materials consulted specifically relating to urban ecosystems are mainly documents having legislative nature, policies, strategies, resolutions, preparatory documents and guidelines.

1.5 Structure of the thesis

The Structure of this thesis is as follows. Chapter 2 provides a theoretical background on ecosystems, focusing on the unique features of urban ecosystems and the importance of Nature within cities. It explores the meaning of ecological restoration and examines the process of restoring urban ecosystems. This Chapter primarily draws from ecological and urban studies.

Chapter 3 focuses on international law, addressing sub-research question A. It examines key soft law instruments and three conventions: the Ramsar Convention, the Bern Convention, and the CBD. It also reviews the instruments developed within these conventions, including COPs decisions, to elucidate the principles, rules, and targets applicable to urban ecosystems.

Chapter 4 discusses the EU's framework, responding to sub-research question B. After a brief introduction on the nature of EU law, it investigates the policy framework, specifically the three Biodiversity Strategies adopted so far and the Green Infrastructure Strategy, to highlight the principles and framework set by the EU for urban nature. It then studies the current EU Nature Directives, highlighting the principles and provisions applicable to urban ecosystems outside Natura 2000 sites, the EU network of protected areas. Subsequently, the NRL is analysed to discuss its potential additions to the existing framework, and whether it fills the gaps identified in the current EU Nature Directives, noting that urban ecosystems have been made a specific target for the first time.

Chapter 5 responds to sub-research question C, and assesses the coherence of the NRL, in its current form, with the policy framework, as well as the compliance of the same and of its targets on urban ecosystems with the SMART criteria used by the Commission to assess effectiveness. Lastly, EU law is put in connection with international law to evaluate whether the “upgraded” EU policy and legislative framework – assuming the final adoption of the NRL in its current version – is aligned with the GBF and, thus, can contribute to the fulfilment of EU's commitments under the CBD.

Chapter 6 provides the conclusion of the study.

2 Restoration of urban ecosystems

2.1 Introduction

This thesis explores the restoration of urban ecosystems. But what is this topic about? This Chapter delves into ecological and urban studies to provide definitions and the understanding necessary to imbue the legislative provisions on urban ecosystems restoration that will be analysed in the following Chapters with substantive content.

2.2 Urban ecosystems and urban ecosystem services

Ecosystems, the dynamic interactions between living organisms and their environment, form the foundation of life on our planet and provide invaluable benefits to humanity.

The Society for Ecological Restoration (SER)¹⁸ defines “ecosystem” as an “assemblage of biotic and abiotic components in water bodies or on land in which the components interact to form complex food webs, nutrient cycles, and energy flows”.¹⁹ While biotic components encompass all living organisms, abiotic components refer to the non-living materials and conditions within a given ecosystem, such as air, water, soil, sunlight, weather and climate, landscape, and nutrients that support the living organisms. The interconnectedness and interdependence of all living organisms within a given area, as well as their interactions with the non-living components of their environment, is emphasized. These interactions may take many forms and play a crucial role in shaping the structure and function of the relevant ecosystem; in fact, one of the key characteristics of ecosystems is their ability to self-regulate and maintain a dynamic balance through various ecological processes.²⁰

Ecosystems are generally divided between aquatic and terrestrial, and can be classified into several main types, each characterized by its unique environmental conditions, species composition, and ecological processes. Sometimes, natural ecosystems are distinguished from artificial or anthropogenic ecosystems, the latter including urban ecosystems.

All ecosystems offer a diverse array of functions crucial to human well-being, which are economically measurable and financially valuable.²¹ The direct and indirect contributions of ecosystems to human well-being are called *ecosystem services*, and are generally grouped in

¹⁸ SER is an influential international non-profit organization, composed of various scientists and practitioners from all over the World, dedicated to promoting ecological restoration as a means of sustaining the planet’s biodiversity.

¹⁹ Gann *et al.* (2019), p. 35.

²⁰ Energy flows in the form of sunlight, which is captured by photosynthetic organisms like plants and algae and converted into chemical energy. This energy is transferred through the food chain as nutrients cycle through ecosystems, moving through soil, water, and living organisms. Decomposers such as bacteria and fungi break down dead organic matter, releasing nutrients back into the environment where they can be taken up by plants and used to support new growth; Chapin *et al.* (2011), pp. 3–22.

²¹ Telesetsky *et al.* (2016), pp. 46–47.

four categories: supporting, regulating, provisioning and cultural services.²² Supporting services are fundamental processes that sustain life, such as soil formation and photosynthesis, which aren't directly used by humans but are vital for our survival. Regulating services refer to the critical role ecosystems play in regulating environmental aspects like climate, floods, diseases, and water quality; for instance, forests help regulate climate by absorbing carbon dioxide and releasing oxygen. Provisioning services are the tangible products that ecosystems provide, directly supporting human needs, such as food, water, timber, and fibre. Cultural services encompass the non-material benefits that people derive from Nature, including recreational opportunities, aesthetic enjoyment, and spiritual enrichment.

Urban ecosystems are a specific ecosystem type shaped by the continuous interactions between human activity and Nature, characterized by high population densities or extensive coverage of built structures, while natural elements exist but are disconnected from the broader landscape.²³ One of the main challenges lies in establishing a shared definition of *urban*, as this implies considering environmental, spatial, social, political, cultural, and economic factors.²⁴

Urban ecosystems might be considered mere geographical areas encompassing other types of ecosystems within urban settings; consequently, restoring an urban ecosystem would entail restoring specific types of ecosystems geographically located in urban settlements. However, in this sense, a separate treatment of urban ecosystems restoration would not be justified.²⁵

From the perspective adopted in this thesis, urban ecosystems differ from a mere geographical occurrence of a multitude of ecosystems within urban settings. Instead, urban ecosystems are characterized by an extreme level of environmental disturbances due to the preponderance of buildings and grey infrastructures and the continuous presence of humans.²⁶ This leads to a high level of habitats fragmentation, species isolation and disruption of ecological processes such as migration, species interactions, and ecological connectivity between habitats. In cities, the hydrological structure is ordinarily substantially altered due to impervious surfaces. In addition to air and water pollution, urban settlements suffer from the so-called “heat island effect”²⁷, primarily caused by the modification of land surfaces, replacement of natural

²² MEA (2005), pp. V-VI; Gann *et al.* (2019), p. 35; Nilon *et al.* (2017), p. 333.

²³ Pickett *et al.* (2001), p. 129; Brzoska and Späße (2020), p. 2; Sirakaya *et al.* (2018), pp. 3–4. The interactions of living organisms, built structures, and the physical environment where people are concentrated is the object of study of urban ecology science: Forman (2016), p. 1655; Forman (2014); Norris *et al.* (2017), pp. 371–372; Lord *et al.* (2003), pp. 321–322.

²⁴ Sirakaya *et al.* (2018), p. 4. MEA (2005), p. 27, considers settlements with more than 5,000 inhabitants whose boundaries are identified through observation of persistent night lights or by inferring the areal extent. Lord (2003), pp. 326–327, refutes the relevance of political boundaries in ecological studies because these boundaries are meaningless for animals and plants.

²⁵ Norris *et al.* (2017), p. 371.

²⁶ Zerbe (2013), pp. 422–427.

²⁷ Urban areas experience higher temperatures than surrounding rural areas due to human activities and built environment.

vegetation with concrete and asphalt, and concentration of heat-generating activities such as industrial processes and transportation. These core characteristics are such as to challenge some of the basic ideas and approaches of non-urban ecological restoration.

Nature in cities plays a crucial role in providing many ecosystem services that go beyond the mere aesthetic value of green areas, ensuring greater sustainability, resiliency, and liveability of urban settlements, and contributing to human health. *Urban ecosystem services* are the set of benefits that urban dwellers obtain from urban ecosystems functions, co-produced by humans and ecosystems, and with a strong anthropogenic impact, and include the following:²⁸

Provisioning services	Regulation and maintenance services	Cultural services
Provision of wild and cultivated plants and animals for nutritional purposes; provision of fibres and other materials from various biological sources for both direct use and processing needs other than nutritional purposes; cultivation of plants for energy production; supply of surface and ground water for drinking and non-drinking purposes.	Carbon storage and sequestration; air and water purification; water flow regulation for storm water management; floods control; coastal protection; noise attenuation; wind and fire protection; pollination; pest control; soil quality maintenance; regulation of chemical status and composition in freshwaters, atmosphere, and oceans; regulation of temperature, humidity, ventilation, transpiration; mitigation of heat hazard; maintenance of nursery population and habitats.	Promotion of physical and mental health; enjoyment through immersive or observational interactions with Nature; support for scientific investigation; development of traditional ecological knowledge; educational and training opportunities; cultural, heritage, and religious values; aesthetic appreciation; recreational purposes.

The concept of urban ecosystem services is strongly correlated with *green infrastructures* and *natural assets*.²⁹ *Green infrastructure* refers to a strategically planned network of natural and semi-natural areas integrated into urban planning, specifically designed and managed to deliver a wide range of ecosystem services such as water purification, air quality improvement, temperature regulation, and recreational spaces.³⁰ *Natural assets* are natural components of the environment, existing independently of human intervention and not necessarily subject to management (including natural forests, wetlands, aquifers, and other ecosystems), that provide services and benefits to people.³¹ Despite this strong correlation, proper knowledge among local urban planners of ecosystem services and the underlying science is still modest.³²

2.3 The meaning of ecological restoration

SER defines ecological restoration as the intentional process of initiating, accelerating, and assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed, with

²⁸ Brzoska and Spāģe (2020); Russo and Cirella (2021c), pp. 1–3; Sirakaya *et al.* (2018), pp. 2–3; MEA (2005), pp. 47, 60. For a thorough study on urban ecosystem services, the reader may refer to Russo and Cirella (2021a) and Russo and Cirella (2021b).
²⁹ Russo and Cirella (2023).
³⁰ Thompson *et al.* (2024), p. 1; Brzoska and Spāģe (2020), pp. 1–2; Nilon *et al.* (2017), p. 332.
³¹ Thompson *et al.* (2024), p. 3.
³² Thompson *et al.* (2024); Brzoska and Spāģe (2020), pp. 1–2; Nilon *et al.* (2017), p. 333.

respect to its health, integrity, and sustainability.³³ This definition is broad and inclusive, allowing for its application across a variety of ecosystems, including urban ones.

Recovery, a key concept of restoration, is the process by which a damaged or disturbed ecosystem regains its natural balance and functionality, including the provision of ecosystem services, and returns to a state where it possesses sufficient living and non-living resources, it is self-sustaining, resilient and capable to recovery from normal level of environmental stress, and able to interact effectively with the surrounding environment, preserving and enhancing the interconnectedness between biotic and abiotic components of ecosystems.³⁴

The aim of ecological restoration is to attempt to return an ecosystem to its *ecological trajectory*, which is understood as the *developmental pathway of an ecosystem through time*.³⁵ Such ecological trajectory includes a wide, yet limited, range of possible ecological manifestations over time, also referred to as *reference points*. Historic (past) conditions that shaped the ecosystem before significant human intervention are the ideal starting point (the so-called *historic trajectory*). In fact, ecological restoration aims at re-establishing key ecological features and functions of an ecosystem that were present in a past time, with the ultimate objective of allowing the ecosystem to return to a status of self-sustainability.³⁶

However, the identification of the historic trajectory is particularly challenging and entails making choices as to *which* past status restoration efforts should aim to, and identifying the inner features of such version of the ecosystem that allow to obtain self-sustainability.³⁷ Additionally, the current level of external disturbances (*e.g.*, global warming, pollution, altered ecological processes) and substantial alterations that many ecosystems have undergone make it impossible for many ecosystems to return to historic, pre-human interference; consequently, they cannot but develop along an alternative trajectory. This is the case, for example, of strongly anthropocentric ecosystem types such as urban ecosystems.

Once ecological trajectory and reference points are identified, the practical implementation of restoration varies significantly depending on its objectives (*e.g.*, what species are desired, what processes are intended to be restored, what level of human influence is contemplated), methodologies used, and stakeholders involved.³⁸ This process may include activities like reforestation, wetland restoration, species reintroduction, and habitat enhancement.

³³ SER (2004), pp. 1, 3.

³⁴ SER (2004), pp. 3–4; Gann *et al.* (2019), p. 35; Telesetsky *et al.* (2016), pp. 50–53, 20–22.

³⁵ SER (2004), p. 1.

³⁶ Norris *et al.* (2017), p. 371.

³⁷ Telesetsky *et al.* (2016), pp. 26–27.

³⁸ Sinclair *et al.* (2017); Telesetsky *et al.* (2016), pp. 2–5.

2.3.1 Restoration of ecosystems versus preservation and conservation

The urgent need to address environmental degradation considering the bad status of biodiversity worldwide has prompted a growing recognition that simply preventing new sources of pollution or managing existing protected areas is insufficient; instead, actively reverse environmental damage is needed.

Restoration, thus, differs from *preservation* and *conservation*.³⁹ *Preservation* focuses on maintaining natural ecosystems in their pristine state, setting aside designated areas where human interference is limited or tightly regulated, to protect biodiversity, ecosystem functions, and natural processes.⁴⁰ *Conservation* aims to sustainably manage and use natural resources while ensuring their long-term viability, with focus on balancing human needs with the maintenance of ecosystem and biodiversity to prevent overexploitation and mitigate human impacts.⁴¹

Both concepts assume that ecosystems can recover by themselves if stressors from human activities cease.⁴² This is the main difference with *restoration* since the latter acknowledges that many ecosystems have undergone changes so drastic that they cannot recover by themselves, but it is necessary to actively aid their recovery. This situation resonates with the claim that many planetary boundaries – *i.e.*, the limits existing on the functioning of the Earth systems – have been breached, thus implying that the anthropogenic pressures have destabilized the Earth systems at a point where these systems cannot recover autonomously.⁴³

2.4 Restoring urban ecosystems

Urban ecosystems are suffering tremendous pressures from a steady significant population growth and climate change impacts (heat-related events and extreme rainfall).⁴⁴ In order to ensure that urban Nature continues to provide ecosystem services at satisfactory quality and in sufficient quantity for the benefits of humans, urban ecosystems need to be restored.

The underlying idea of all approaches that are relevant for urban ecosystems restoration is the actively return of Nature into cities. *Bringing Nature Back into Cities* approach, as properly understood, encompasses actions to reinstate *native* species of animals, plants, or fungi, in urban areas where they are rare or locally extinct, and assumes that species may be reinstated in remnant or designed habitats within private or public spaces, either as individuals,

³⁹ Telesetsky *et al.* (2016), pp. 6, 20–22.

⁴⁰ Telesetsky *et al.* (2016), pp. 20–21, highlights the inadequacy of this concept alone considering the extent of human impact, and that it fails to acknowledge the dynamic character of ecosystems.

⁴¹ Conservation involves sustainable harvesting, habitat management, land-use planning; Telesetsky *et al.* (2016), pp. 20–21.

⁴² Telesetsky *et al.* (2016), pp. 7–8.

⁴³ Rockström *et al.* (2009), pp. 2–6.

⁴⁴ IPCC (2019), p. 14; Brzoska and Späße (2020), pp. 11–12.

populations or ecological communities, with or without human intervention.⁴⁵

In the realm of urban studies, the idea of reintroducing Nature into cities manifests through the adoption of urban sustainability approaches, including public greening, nature-inclusive design and construction, urban forests, bioswales, and other green infrastructures.⁴⁶ These approaches predominantly relate to plants species, often favouring those species that bring most benefits for humans, irrespective of whether they are native, rare, or locally extinct, and that are more suitable to be used as naturally-inspired infrastructures to solve various problems (“nature-based solutions”).⁴⁷ Conversely, *Bringing Nature Back into Cities* targets animals, plants, or fungi without any stated preference, and focuses only on native species.

In ecological studies, *Bringing Nature Back into Cities* idea aligns with the concept of ecological restoration. However, the degree of human-induced alteration in urban ecosystems, along with changes in hydrogeology, microclimate, species composition and connectivity, is so severe that it is nearly impossible to identify a reference system to which restoration projects should aim, without distorting the essence of *urban* ecosystem.⁴⁸ Hence, urban restoration projects are designed to restore essential ecological services rather than returning to a pristine, reference state.

Furthermore, the aim of urban ecological restoration is to improve the ecological health of urban environments and the quality of life for its dwellers, while linking the restoration efforts with economic, social, and cultural values.⁴⁹ As a matter of fact, decisions of what and how restore in urban ecosystems are influenced by a range of factors, including: cultural significance and traditional/indigenous knowledge; social acceptability and physical and mental health risks associated with species; ecological considerations, including conservation significance and ecological feasibility; and economic viability, which considers financial constraints while recognizing the economic value of urban ecosystem services.⁵⁰

In addition to its distinct purpose and criteria for decision-making processes, urban restoration challenges some other ideas and approaches found in non-urban ecological restoration. First, it includes humans as object of study and considers buildings and grey infrastructures as

⁴⁵ Mata *et al.* (2020), p. 351.

⁴⁶ Van Haaster-de Winter *et al.* (2022); Ito (2021); Mata *et al.* (2020), p. 351.

⁴⁷ Norris *et al.* (2017), pp. 372–373; Mata *et al.* (2020), p. 351. For example, a non-native plant species may be favoured over a native species if the former is more climate resilient and provides higher thermal regulation with more benefits for humans.

⁴⁸ Norris *et al.* (2017), pp. 372–373.

⁴⁹ Lord *et al.* (2003), pp. 330–331.

⁵⁰ Mata *et al.* (2020), pp. 356–358.

integral parts of the environment, thereby incorporating them into restoration projects.⁵¹ Second, the elevated level of fragmentation of urban Nature reduces the typical size of the restoration projects, as they are possible also at the level of single private garden or rooftop.⁵²

All these characteristics cast doubt on the suitability of the definition of ecological restoration provided by SER to explain urban ecological restoration, in favour instead of a broader understanding which also includes approaches aimed at reintroducing specific keystone species to rebuild ecological complexities (*rewilding*), or rebuilding the integrity and health of an ecosystem without focusing on returning to past conditions, resulting in the creation of a *novel ecosystem* where certain historical ecosystem features are replaced by more ecologically productive elements to ensure greater resilience in the face of irreversible changes.⁵³

To conclude, SER's definition of ecological restoration is applicable to urban ecosystems since the goal remains to assist the recovery of ecosystems towards improved structure, function, sustainability, resiliency, and self-sufficiency. However, the reference conditions for urban ecological restoration might be impossible to determine and, in any case, differ from those in less disturbed ecosystems. Instead of aiming to return an urban ecosystem to a pre-disturbance state, restoration efforts should aim to establish a healthy, functional ecosystem that accommodates both human use and native species, recognizing the dynamic nature of urban settlements, towards a concept of restoration closer to novel ecosystem approach.⁵⁴

Urban restoration efforts, thus, might focus on creating functional green and blue spaces that support biodiversity, manage storm water, reduce pollution, and provide recreational areas for residents. This can include the restoration of urban wetlands, the creation of green roofs and walls, the planting of native species in urban parks, and the rehabilitation of urban streams.⁵⁵

The following photos are examples of urban ecosystem restoration projects worldwide.

⁵¹ Lord *et al.* (2003), pp. 323, 326–327.

⁵² Norris *et al.* (2017), p. 372.

⁵³ Richardson and Akhtar-Khavari (2019), pp. 121–123; Telesetsky *et al.* (2016), pp. 31–36.

⁵⁴ Klaus and Kiehl (2021) developed a conceptual framework guiding urban ecological restoration and rehabilitation by establishing restoration targets for various levels of ecological novelty.

⁵⁵ Zerbe (2013), pp. 432–436.



High Line, New York City (USA)

The High Line project transformed an abandoned elevated railway into a public park, featuring native plant species and providing habitats for urban wildlife, while also serving as a green corridor for residents and tourists to enjoy.



Bee Highway, Oslo (Norway)

The Bee Highway initiative aims at creating a network of feeding stations for pollinators and engaging residents, businesses and government entities to create flowerbeds and install bee-friendly plants on rooftops, balconies, and public spaces.



Bosco Verticale, Milan (Italy)

These two residential towers incorporate over 900 trees, 15,000 perennials and 5,000 shrubs, equivalent to 30,000 sqm of woodland and undergrowth; designed by Stefano Boeri, they represent a pioneering integration of nature and architecture.



Cheonggyecheon Stream, Seoul (Korea)

Once covered by a highway, the Cheonggyecheon Stream was restored to create a 11-km-long vibrant public space in Seoul, by removing the road, uncovering the stream, and creating a public recreation area along its banks.



Nesting bricks, Amsterdam (The Netherlands)

A private house in Amsterdam incorporating special bricks with cavities designed to accommodate the nesting of various species of birds and bats.



Biohut at Marseille Port, Marseille (France)

Multiple Biohuts were installed at Marseille International Port, as an initiative aimed at enhancing marine biodiversity in coastal cities by creating artificial habitats providing shelter for young fish.



Gardens by the Bay, Singapore (Singapore)

Built on a former industrial land, this 101-ha futuristic park is an example of rewilding; it hosts also 18 supertrees that are home to over 158,000 plants, mimicking the services provided by trees, including shade, water filtering and refrigeration.



Urban Agriculture Initiatives, Nairobi (Kenya)

In response to food security and urbanization challenges, Nairobi passed a law establishing a framework for urban agriculture, promoting the conversion of vacant lots, rooftops, and urban spaces into productive agricultural areas.

3 Urban ecosystems restoration in the international legal framework on biodiversity

3.1 Introduction

The restoration of ecosystems is a crucial challenge in contemporary environmental discourse; nevertheless, the attention to *urban* ecosystems restoration is more recent and is one of the emerging topics within the realm of environmental law. This Chapter 3 transitions to the Law and examines the international legal framework governing urban ecosystems restoration.

The Law is a powerful driver for active engagement in restoration activities not only of States, but also of local governments as well as private entities; it provides a tool for gradually reviving lost or disappearing ecological values and, in general, human connections with the larger natural community, even in the context of cities.⁵⁶ In other words, the Law serves as the backbone of environmental conservation efforts, providing the necessary legal instruments, mechanisms, and frameworks to protect and restore ecosystems. In the context of urban ecosystems, addressing the serious challenges seen in Section 2.2 requires a robust legal framework that not only mandates conservation but also facilitates restoration efforts within urban settlements, to increase the resilience of our cities.⁵⁷

Ecosystems restoration in international environmental law is coeval with the first multilateral environmental agreements. In fact, one of the earliest references to restoration is contained in the 1972 Stockholm Declaration. Nevertheless, the *legal* meaning of restoration is almost never defined, and this impacts not only on the identification of the legal content of international law provisions (*i.e.*, what States should *actually* do to restore ecosystems), but also on the enforceability of obligations, to the detriment of States' accountability.⁵⁸

The legal system of biodiversity protection and restoration is situated on multiple levels, from international and regional to national, down to local level, with many intertwining legal instruments completing each other.⁵⁹ Bearing in mind the limitations of this thesis (Section 1.3), this Chapter analyses the provisions contained in selected soft law and hard law biodiversity instruments specifically referring to urban ecosystems, and will touch upon some general provisions on ecosystems restoration that apply to all ecosystems, including urban ones. Focus will be placed on the Convention on Biological Diversity (1992) (CBD), including the Aichi Targets and its most recent Kunming-Montreal Global Biodiversity Framework (GBF), as the main

⁵⁶ Telesetsky *et al.* (2016), pp. 6–7.

⁵⁷ SCBD (2012), pp. 20 *et seq.*

⁵⁸ Mendes *et al.* (2022), pp. 6–8; Cliquet and Decler (2019), pp. 127–128; Telesetsky *et al.* (2016), pp. 17–18, 22–25.

⁵⁹ Sirakaya *et al.* (2018), pp. 209–210.

international legal instrument dealing with biodiversity.

3.2 Urban ecosystems restoration in soft law instruments

3.2.1 The Stockholm Declaration (1972), the Rio Declaration (1992) and the Rio+20 The Future We Want (2012)

The Stockholm Declaration, adopted by 112 States at the 1972 UN Conference on the Human Environment held in Stockholm (Sweden) is a landmark document in the history of international environmental law. It represents the first global intergovernmental conference focused on addressing, at the highest level, environmental challenges for the whole humanity. The Stockholm Declaration contains 26 principles which, despite not being binding, provide evidence for state practice, and set the stage for subsequent international agreements and initiatives aimed at promoting environmental values.⁶⁰

Principle 3 states that “[t]he capacity of the earth to produce vital renewable resources must be maintained and wherever practicable, restored, or improved”. Restoration appears to be linked to the basic need of resources productivity: this principle encapsulates the recognition that ecosystems provide essential services upon which human societies depend for their survival and well-being. However, the restoration of ecosystems (*rectius*, the Earth’s production capacity) is qualified by its practicability, thus it seems that the drafters were aware of the financial and technical barriers for the restoration of degraded ecosystems.⁶¹

Principle 15 is relevant for urban ecosystems. It states that “[p]lanning must be applied to human settlements and urbanization with a view to avoiding adverse effects on the environment and obtaining maximum social, economic and environmental benefits for all”. This Principle refers to the *planning* process of *future* urban development, requiring that it aims at avoiding *further* environmental degradation; nothing is said, however, in relation to the environmental degradation *already occurred* due to urbanization. Considering that when the Stockholm Declaration was adopted, the world population amounted to 3.87 billion people, and now it counts 8.06 billion, the rapid growth of global population has led to unprecedented levels of urbanization and challenged the capacity of local governments to ensure a sustainable urban planning, attentive to environmental values.⁶²

⁶⁰ The principles are grounded on the idea that non-State actors are to contribute to the protection of the environment (Preamble 7).

⁶¹ Telesetsky *et al.* (2016), pp. 65–66.

⁶² Considering that in 1972 the world population was 3.87 billion, and now it is 8.06 billion according to data from the United States Census Bureau, available here <<https://www.census.gov/programs-surveys/international-programs/about/idb.html>> (accessed on 2 April 2024), the rapid population growth led to unprecedented levels of urbanization and challenged the capacity of local governments to ensure sustainable urban planning, attentive to environmental values.

In 1992, States gathered in Rio de Janeiro (Brazil) for the UN Conference on Environment and Development (*Earth Summit*). This Conference led to the adoption of the Rio Declaration by 175 States, conceived as an extension of the Stockholm Declaration, and two landmark international legal instruments on the environment: the UN Framework Convention on Climate Change and the CBD (the latter, analysed in Section 3.2.3).

Out of the 27 principles of the Rio Declaration, only Principle 7 mentions restoration: “States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth’s ecosystem”. As it can be easily appreciated, in twenty years the concept of restoration has evolved from restoring the provisioning of services, to a holistic approach providing for the restoration of ecosystems in general, specifically caring for the health and integrity of ecosystems and not just the benefits that humans get from them.⁶³

The second part of Principle 7 affirms that States have common but differentiated responsibilities. This principle acknowledges that while all States share a common responsibility to protect the environment, the level of responsibility should be differentiated based on factors such as historical contributions to environmental degradation, economic and technological capacity, and developmental needs. Therefore, developed States, which have historically contributed more to environmental degradation through industrialization and resource consumption, are expected to take the lead in addressing environmental challenges and providing support to developing States. Meanwhile, developing States, while still responsible for environmental protection, may require assistance and support from the international community to overcome the challenges they face. Considering the connection existing between the two parts of Principle 7, it may be inferred that developed States shall not only restore their degraded ecosystems, but also help developing countries to conserve, protect and restore their own degraded ecosystems, through financial contributions, capacity building efforts and transfer of technologies.

Further to some environmental principles of general applicability, no specific mention is given to the relevance of environmental values within urban settlements, unlike Principle 15 Stockholm Declaration.⁶⁴ Nonetheless, alongside the Rio Declaration, States agreed to a comprehensive action plan named “Agenda 21”⁶⁵, aimed at building a global partnership for sustainable development to protect the environment and improve human conditions, which includes objectives, proposals of actions and means of implementation that, albeit non-binding in nature, in many ways refer to restoration activities, also in urban environments. For instance,

⁶³ Telesetsky *et al* (2016), p. 72.

⁶⁴ *E.g.*, Principle 3 on intergenerational equity; Principle 15 on precaution; and Principle 16 on polluter-pays principle.

⁶⁵ UN (1992).

Chapter 7 specifically deals with promoting sustainable human settlement development and encourages States to improve urban management by adopting innovative city planning strategies to address environmental issues (para. 7.16), and to promote the integrated provision of environmental infrastructure (paras. 7.35 *et seq.*). Chapter 15 encourages governments, *with the support of indigenous people and their communities, non-governmental organizations and other groups, including the business and scientific communities*, to promote the restoration of damaged ecosystems and the recovery of threatened and endangered species (para. 15.5).

In 2012 States gathered again in Rio de Janeiro for the UN Conference on Sustainable Development (Rio+20), which produced a document named “The Future We Want”.⁶⁶ This document bears witness of an increased understanding of restoration as a key environmental management strategy targeting ecosystems rather than just services and resources (paras. 4 and 40).⁶⁷ It includes a framework for action and one thematic area specifically related to Sustainable Cities and Human Settlements (paras. 134-137), where States committed to promote sustainable development policies that support the promotion, protection and restoration of safe and green urban spaces.

3.2.2 The Sustainable Development Goals (2015) and the UN Decade on Ecosystem Restoration (2019)

In 2015, the UN Sustainable Development Summit adopted in New York the 2030 Agenda for Sustainable Development, a universal call to action to eradicate poverty and ensure prosperity for all by 2030, while concurrently protecting the world environment, its natural resources and ecosystems.⁶⁸ The Agenda comprises 17 Sustainable Development Goals (SDGs) and 169 non-binding targets providing a comprehensive framework to address the most pressing social, economic and environmental challenges currently faced, and seeks to meet the needs of the present without compromising the ability of future generations to meet their own needs.

SDG15 specifically concerns the protection, restoration, and promotion of sustainable use of terrestrial ecosystems, the reversal of land degradation, and the preservation of biodiversity; its Target 15.1 mentions restoration in relation to terrestrial and inland freshwater ecosystems and their services, implicitly including urban ecosystems.⁶⁹

Additionally, the Agenda *does* consider the role of urban ecosystem services in SDG11

⁶⁶ UNGA Res. A/RES/66/288.

⁶⁷ Telesetsky *et al.* (2016), pp. 75–76.

⁶⁸ UNGA Res. A/RES/70/1.

⁶⁹ Targets 15.2 and 15.3 mention restoration of degraded forests and land and soil. Other Targets mention restoration, including Target 6.6 in connection with sustainable use of water; and Targets 14.2 and 14.4 on marine ecosystems, and fish stock.

on inclusive, safe, resilient, and sustainable cities.⁷⁰ Targets connected to SDG11 purports, by 2030: the enhancement of inclusive and sustainable urbanization (Target 11.3); the strengthening of efforts to protect and safeguard the world’s natural heritage (Target 11.4); the reduction of losses caused by natural disasters (Target 11.5); the reduction of adverse per capital environmental impact of cities (Target 11.6); the provision of universal access to safe, inclusive and accessible green and public spaces (Target 11.7); the substantial increase in the number of cities adopting and implementing integrated policies and plans towards resource efficiency, mitigation and adaptation to climate change, and resilience to natural disasters (Target 11.b).⁷¹

States are encouraged to report their progress on SDGs to increase accountability, transparency, and international cooperation in advancing sustainable development. Based on the various States’ reports, the UN prepare an annual Report. The most recent Sustainable Development Goals Report available, related to 2023, shows little progress in relation to SDGs 15 and 11 as regards restoration of urban ecosystems, *rectius* increase of green areas. In relation to SDG15, the Report calls for urgent action to restore terrestrial ecosystems in light of the alarming trends in land degradation, inviting governments, businesses and communities to collaborate to conserve natural areas and develop green urban areas and infrastructures. Furthermore, it highlights the need to increase open public spaces in cities, encouraging efforts on implementing inclusive, resilient and sustainable urban development policies that prioritize, among other things, access to green spaces for all.⁷²

A few years later, the UN recognized the urgent need to revive damaged ecosystems and launched the global initiative UN Decade on Ecosystem Restoration to mobilize action for the restoration of degraded ecosystems, galvanizing political will, financial support, and technical expertise.⁷³ The Decade spans from 2021 to 2030 and serves as a critical opportunity to scale up efforts to reverse biodiversity loss and combat climate change. Restoration is defined as “assisting in the recovery of ecosystems that have been degraded or destroyed, as well as conserving the ecosystems that are still intact”; there is, more importantly, the recognition that “it is not always possible – or desirable – to return an ecosystem to its original state”.⁷⁴ This is clearly particularly true for urban ecosystems.

⁷⁰ See IPBES (2019), pp. 940–945, for options for sustainable cities; Russo and Cirella (2021c), pp. 1–2.

⁷¹ In order to measure progress towards the achievement of Goals and Targets, States adopted 231 unique indicators (UNGA Res. A/RES/71/313). None of them directly relates to urban ecosystems, but the following are relevant: indicator 11.3.1 measuring the ratio of land consumption rate to population growth rate; indicator 11.4.1 on total *per capita* expenditure on preservation, protection and conservation of cultural and natural heritage; indicator 11.7.1 on share of land allocated to public spaces and total population with access; and indicator 15.3.1 measuring the proportion of land that is degraded over total land area.

⁷² UN (2023), pp. 34–35, 45.

⁷³ UNGA Res. A/RES/73/284; Cliquet *et al.* (2022).

⁷⁴ Source: <<https://www.decadeonrestoration.org/what-ecosystem-restoration>> (accessed on 5 April 2024).

In relation to urban ecosystems, the Resolution launching the UN Decade on Ecosystem Restoration embeds the vision for cities that “protect, conserve, restore, and promote their ecosystems, water, natural habitats and biodiversity, [and] minimize their environmental impact”. This is in line with the New Urban Agenda adopted at the UN Conference on Housing and Sustainable Urban Development (Habitat III) in Quito (Ecuador) in 2016, which committed States to promote safe, inclusive, accessible, and multifunctional green and quality public spaces, providing benefits in terms of social interaction and inclusion, human health and well-being, economic exchange and cultural expression and dialogue.⁷⁵ Additionally, States committed to facilitate the sustainable management of natural resources in cities to protect and improve urban ecosystem and related services, and to reduce greenhouse gas emissions and air pollution, while fostering sustainable economic development and protecting the well-being of all persons through environmentally sound urban and territorial planning.⁷⁶

As a contribution to the UN Decade on Ecosystem Restoration, the UN Environment Programme (UNEP) launched in October 2023 the Generation Restoration Cities Project (2023-2025) which encourages private and public entities to adopt nature-based solutions at urban level, to protect, conserve and restore degraded urban ecosystems.⁷⁷

3.3 International rules and targets to restore urban ecosystems

Soft law instruments and city initiatives provide valuable guidance for promoting urban ecosystem restoration;⁷⁸ however, their effectiveness depends on voluntary compliance, political will, and local implementation. Collaborative efforts between many stakeholders are essential for translating soft law principles and initiatives into tangible actions and outcomes that enhance cities sustainability and liveability, concurrently protecting and restoring urban Nature.

This Section will move to hard law instruments and will analyse how the Ramsar Convention (1971), the Bern Convention (1979) and the Convention on Biological Diversity (1992) incorporate provisions on the protection and restoration of urban ecosystems. Needless to say, priority will be given to the CBD as the main biodiversity binding legal instrument.

⁷⁵ UNGA Res. A/RES/71/256, Section 37.

⁷⁶ UNGA Res. A/RES/71/256, Section 67.

⁷⁷ Information may be found here: <<https://www.decadeonrestoration.org/generation-restoration-cities-urban-nature-restoration>> (accessed on 4 April 2024). In the context of the Project, UNEP selected 8 cities target of support, and 11 Role Model cities to strengthen advocacy and share knowledge as champions of restoration.

⁷⁸ For instance, the Green and Healthy Streets Declaration, launched in 2017 and signed by many cities member of the C40 Cities Climate Leadership Group, which aim to transform cities into greener, healthier and prosperous places to live. C40 (2022); <[c40.org/what-we-do/scaling-up-climate-action/transportation/green-and-healthy-streets/](https://www.c40.org/what-we-do/scaling-up-climate-action/transportation/green-and-healthy-streets/)> (accessed on 4 April 2024). Another example is BiodiverCities by 2030, an initiative of the World Economic Forum (WEF (2022)).

A preliminary consideration is needed. Multilateral environmental treaties serve as crucial binding frameworks for addressing pressing global environmental challenges. Within these treaties, the Conference of the Parties (COP), as the supreme decision-making body, plays a pivotal role in facilitating international cooperation, implementation of environmental objectives and advancement of global efforts. While COP decisions are not legally binding in the same manner as treaty obligations, they often carry significant political weight and serve as key instruments for guiding States' actions and planning future negotiations and agreements.⁷⁹ In fact, these decisions are typically adopted through consensus or by a two-thirds majority vote, demonstrating a collective commitment to addressing environmental challenges.

3.3.1 Ramsar Convention (1971)

The Ramsar Convention on Wetlands of International Importance, adopted in Ramsar (Iran) in 1971 and in force in 172 States, recognizes the ecological, economic, cultural, and scientific importance of wetlands⁸⁰ and emphasizes the need to maintain their ecological character, prevent their degradation, and promote their restoration and sustainable management.

The Convention incorporates the restoration of wetlands as a key component of its mission to promote their conservation and wise use.⁸¹ While the Convention primarily focuses on designating, listing and conserving wetlands of international importance, it recognizes the importance of restoring all degraded wetlands. Indeed, States have the obligation of result to ensure the restoration of wetlands, by creating additional reserves, as a compensation for the loss or de-listing of wetlands.⁸² Additionally, since 1997, all Strategic Plans recognized wetlands restoration as key objective of the Convention, and therefore included specific targets.⁸³

Restoration is understood in broad sense as including both projects aimed at returning to pre-disturbance conditions, and projects that improve wetland functions without returning to pre-disturbance conditions.⁸⁴ This approach aligns with the acknowledgment that achieving a complete return to pre-disturbance conditions is seldom feasible (see Section 3.1.2 above).

The Convention leaves to each State to identify the sites to be managed in accordance

⁷⁹ Ekardt *et al.* (2023), p. 6; Cliquet (2017), p. 398.

⁸⁰ "Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres" (Article 1(1)).

⁸¹ Article 3 indicates restoration among the conservation measures that States must implement. Cliquet (2017), pp. 392–393.

⁸² Telesetsky *et al.* (2016), pp. 95–96; on the distinction between obligations of conduct and of result, Wolfrum (2011).

⁸³ The Strategic Plan 2016-2024 (RAM/COP/RES/XIV/4) contains Goals referring to wetlands restoration, including Target 5 on maintaining or restoring the ecological character of Ramsar sites through effective planning and integrated management; and Target 12 on restoration of degraded wetlands, prioritizing those relevant for biodiversity conservation, disaster risk reduction, livelihoods or climate change mitigation and adaptation. See Cliquet (2017), p. 393; Telesetsky *et al.* (2016), p. 100.

⁸⁴ RAM/COP/RES/VIII/16, Annex, Section 4.

with the Convention and to define its restoration objectives and means of implementation, despite some degree of cooperation and transfer of knowledge, technology and financing is envisaged (Article 5). Each State shall submit national reports, which are reviewed by the COP which may only address States with recommendations that wetlands managers *shall* take into consideration (Articles 6(2)(d) and 6(3)). However, the Convention lacks punitive or specific legal accountability frameworks for States failing to fulfil their duties.⁸⁵

Some authors highlighted that the Convention was originally interpreted as targeting only *rural* wetlands.⁸⁶ Only in 2008, COP10 in Changwon (Korea) started addressing the link between wetlands and urbanization, urging all Parties to take appropriate measures to conserve and protect urban wetlands and, where needed, to put in place mechanisms for their restoration and rehabilitation to ensure that urban wetlands can provide ecosystem services at their fullest extent.⁸⁷ Subsequently, in 2012, COP11 in Bucharest (Romania) adopted certain principles on planning and managing urban wetlands, including the principle whereby wetlands should be restored as elements of urban and water management infrastructure.⁸⁸ In 2018, COP13 in Dubai (UAE) adopted a resolution on the link between sustainable urbanization, climate change and wetlands.⁸⁹ Finally, COP12 in Punta del Este (Uruguay) in 2015 and COP14 in Wuhan (China) and Geneva (Switzerland) in 2022 launched the Wetland City Accreditation, a recognition program aimed at acknowledging cities that demonstrate outstanding commitment to the conservation and sustainable management of urban wetlands.⁹⁰ This voluntary accreditation program raises awareness on the importance of urban wetlands, promote best practices, and encourage local governments to integrate wetlands protection into urban planning and development strategies. However, it does not create any additional right or obligation for accredited cities.

This increased attention to urban wetlands is reflected in the Strategic Plan 2016-2024, whose Target 1 provides that wetlands benefits are featured in urban development policies and plans, and Target 13 calls for enhanced sustainability of urban development.

The restoration system under the Ramsar Convention is praised for providing a clear understanding of how States should set restoration objectives and implement measures for their wetlands.⁹¹ However, as regards urban wetlands, despite the activation of the Wetland City

⁸⁵ Telesetsky *et al.* (2016), p. 101.

⁸⁶ Sirakaya *et al.* (2018), p. 210.

⁸⁷ RAM/COP/RES/X/27, Sections 13 and 14.

⁸⁸ RAM/COP/RES/XI/11, Principle 2. One example of urban wetlands restoration is the London Wetland Centre, a 40-hectare restored urban wetland located on four old water reservoirs of the Thames River in London, hosting over 180 species of birds.

⁸⁹ RAM/COP/RES/XIII/16.

⁹⁰ Respectively, RAM/COP/RES/XII/10 and RAM/COP/RES/XIV/10. The overall number of cities that obtained accreditation is 43: 18 during COP13 in 2018 and 25 during COP14 in 2022.

⁹¹ Telesetsky *et al.* (2016), pp. 95–96, 99.

Accreditation which facilitates implementation, technical guidelines are still missing.⁹²

3.3.2 Bern Convention (1979)

The Bern Convention on the Conservation of European Wildlife and Natural Habitats is a treaty aimed at conserving biodiversity and protecting endangered species and habitats in Europe. Adopted in 1979 in Bern (Switzerland) on the initiative of the Council of Europe, the Convention is a one-of-its-kind regional treaty currently in force in 45 European States, the EU, and 4 African States.⁹³ It served as basis for the EU Nature Directives (Section 4.3).

The Convention's mission is to ensure that wild flora, fauna, and habitats are maintained at, or restored to, a favourable conservation status; thus, restoration is seen as a conservation strategy.⁹⁴ States have strong obligations of result: they shall take measures to maintain the population of wild flora and fauna at a level corresponding to ecological, scientific, and cultural requirements, taking into account economic and recreational requirements (Article 2), and they shall take appropriate measures to ensure the conservation of listed and endangered habitats (Article 4). Other obligations qualify as obligations of conduct, including the reintroduction of native species to contribute to the conservation of endangered species (Article 11(2)(a)).

Along with strong obligations of result, the Bern Convention stands out for its implementation and enforcement framework, which includes a reporting system, a case-file system, and a dispute settlement mechanism to facilitate compliance and address potential violations.⁹⁵

The Bern Convention applies to all natural habitats, also within cities. However, the Convention does not acknowledge the peculiar challenges that wild fauna and flora face in urban settlements. This lack of consideration of urban biodiversity had been object in 2008 of a Recommendation by the Standing Committee of the Congress of Local and Regional Authorities, which encouraged multiple international organisations to integrate urban biodiversity within their activities, policies and instruments on biodiversity, and States to adopt national biodiversity strategies that are aware of urban biodiversity.⁹⁶ In response, the Standing Committee of the Bern Convention noted that urban biodiversity should be fully addressed in all

⁹² Sirakaya *et al.* (2018), p. 211.

⁹³ The European Community acceded to the Bern Convention in 1982 through CEC (1981).

⁹⁴ CoE-SCBC (2021). The Strategic Plan to 2030 (CoE-SCBC (2023)) includes Target 1.1 on restoration or rehabilitation of natural and semi-natural ecosystems.

⁹⁵ The reporting system requires States to submit regular reports on their conservation activities and the status of protected species and habitats, including mandatory biennial reports. The Standing Committee reviews national and independent reports to assess progress towards conservation goals and provides recommendations for further action. The case-file system was established by the Standing Committee to investigate potential violations by a State. This process can be initiated by another State, ENGO, or legal person. If a violation is confirmed, the Committee issues a recommendation, and the State is *expected* to update on progress towards meeting the recommendation (see CoE-SCBC (2022)). The dispute settlement mechanism of Article 18 provides for a preliminary phase of friendly settlement efforts, followed by an arbitration, unless the interested parties agree otherwise. The decisions of the arbitration tribunal are final and binding.

⁹⁶ CoE-SCCLRA (2008).

biological diversity instruments, strategies and action plans.⁹⁷ No follow-up was given to this acknowledgment; instead, after 2008 urban biodiversity does not appear in any further document, not even in Strategic Plans. This is a missed opportunity, as urban biodiversity might have benefited from the strong implementation mechanism set up under the Convention.

3.3.3 Convention on Biological Diversity (1992)

The CBD stands as a cornerstone treaty dedicated to the conservation of biological diversity, the sustainable use of biological resources, and the fair and equitable sharing of benefits derived from genetic resources. Adopted in Rio de Janeiro (Brazil) in 1992 and entered into force in 1993, the CBD is a framework convention representing a collective commitment by the international community to address the alarming biodiversity loss and its associated ecological, economic, and social impacts.⁹⁸ All UN State members are party to the CBD, except the USA; the Convention is also in force in other non-UN members.⁹⁹

3.3.3.1 Restoration obligations under the CBD

The CBD includes substantive provisions implementing its objectives. Article 8 is a core Article which refers to *in-situ* conservation activities, therefore it applies only to the natural habitats of species, including – but not only limited to – protected areas. This Article contains many obligations aimed at conserving species in their natural habitats, including one of the two explicit references to *restoration*. In fact, Article 8(f) requires each party to, “as far as possible and as appropriate”, rehabilitate and restore degraded ecosystems and promote the recovery of threatened species. Additionally, Article 8(h) concerns the control and eradication of invasive alien species, which qualifies as restoration when they hinder the ability of an ecosystem to return to its historical trajectory.¹⁰⁰

Article 9(c) on *ex-situ* conservation, applicable outside species natural habitats, requires parties to, “as far as possible and as appropriate”, adopt measures for the recovery and rehabilitation of threatened species and for their reintroduction into their natural habitats under appropriate conditions, in any case predominantly for the purpose of complementing *in-situ* measures.

These provisions are obligations of conduct as the language “as far as possible and as appropriate” suggests that Parties are expected to make genuine efforts to rehabilitate and restore ecosystems, control and eradicate invasive alien species and recovery threatened species.

⁹⁷ CoE-SCBC (2008).

⁹⁸ On the meaning of “framework convention” and on the binding nature of CBD provisions, Ekardt *et al.* (2023), pp. 5–6.

⁹⁹ State of Palestine, the Cook Islands and Niue, while the Holy See is a non-Party.

¹⁰⁰ Telesetsky *et al.* (2016), p. 115.

The focus is on the development and implementation of plans, strategies, and actions, rather than guaranteeing the successful restoration or rehabilitation of ecosystems or the recovery of species. In other words, “as far as possible” and “as appropriate” are ways to recognize that the success of Contracting Parties’ efforts may be influenced by factors beyond their control.

Finally, Article 14(2) defers to the COP to examine the issue of liability and redress, including restoration and compensation, for damage to biological diversity.

The above are the only references to *restoration*, *rehabilitation*, or *recovery* included in the CBD and no further guidance comes from the text.¹⁰¹ Neither of these terms is defined and the duty to shed light on these provisions has been deferred to subsequent work of the COP.¹⁰²

As already clarified in Section 2.2, *restoration*, *rehabilitation*, and *recovery* have different meanings in ecological studies; more precisely, *ecological restoration* may encompass different activities, including restoration, rehabilitation, recovery, remediation, or reclamation. The circumstance that these terms are used in the Convention apparently indifferently, and oftentimes paired, creates confusion as to the scope and content of the provisions.¹⁰³

By way of example, *restoring* and *rehabilitating* degraded ecosystems, as set forth in Article 8(f), are not the same thing. Rehabilitation focuses more on repairing ecosystem services and less on restoring the ecosystem integrity in terms of species composition and structure, therefore it is considered less optimal than restoration. How can a Party to the Convention fulfil a commitment to rehabilitate *and* restore ecosystems? Acknowledging that restoration *includes* rehabilitation, the provision might be interpreted as an obligation to restore all ecosystems preceded by their rehabilitation, but this would probably create obligations beyond the intention of the drafters due to the connected technical and financial challenges. On the other hand, the wording of the provision might suggest a choice that Parties may make to fulfil their obligations between (the technically challenging and financially demanding) restoration, on one side, and (the easier and more economical) rehabilitation, on the other: a choice with rather predictable results. One interesting reading, though, pivots on the qualification “as far as possible and as appropriate”. According to this reading, which aligns with a good-faith interpretation of the Convention’s provision in line with Article 31(1) of the Vienna Convention on the Law of Treaties (1969), the choice of Parties is to be made considering what is technically possible or financially achievable or on the basis of other *appropriate* considerations: if restoration is technically possible and does not impose disproportionate or unbearable costs, than

¹⁰¹ Cliquet (2017), p. 388.

¹⁰² Ekardt *et al.* (2023), p. 6.

¹⁰³ Mendes *et al.* (2022), pp. 6–8; Telesetsky *et al.* (2016), pp. 112–114.

the relevant Party shall endeavour to restore the damaged ecosystem; contrariwise, the obligation would be fulfilled by trying to rehabilitate the damaged ecosystem.¹⁰⁴

Further understanding of restoration was provided by two COP decisions. COP11 in Hyderabad (India) in 2012 clarified that restoration is not a substitute for conservation, and urged Parties to implement restoration provisions, prevent further degradation, and use best practices, providing full and effective participation of indigenous and local communities and promoting the restoration of critical ecosystem functions to allow provisioning of essential ecosystem services; furthermore, it called for the development of implementation tools for ecosystem restoration.¹⁰⁵ The subsequent COP12 in Pyeongchang (Korea) in 2014 invited Parties and other stakeholders to increase efforts in restoration, taking into account the ecosystem approach, and giving priority to avoiding or reducing ecosystem losses and promoting large-scale ecosystem restoration activities, but noting the cumulative effects of small-scale restoration.¹⁰⁶

3.3.3.2 Urban ecosystems in the CBD

Urban ecosystems are not expressly excluded from the Convention; however, they are not even explicitly contemplated. It is only since 2006 that there has been increasing attention to the role of cities in protecting biodiversity, which most COP meetings have acknowledged.¹⁰⁷

In 2006, COP8 in Curitiba (Brazil) acknowledged the need to implement an indicator for the 2010 Biodiversity Indicators for urban ecosystems, using remote-sensing as a possible data source.¹⁰⁸ The following COP9 in Bonn (Germany) in 2008 adopted a decision on promoting engagement of cities and local authorities in implementing the CBD, encouraging Parties to recognize the role of cities in protecting urban biodiversity and integrate biodiversity considerations in infrastructure development projects for cities.¹⁰⁹

In 2010 COP10 in Nagoya (Japan) moved a step forward as it adopted a Plan of Action on Subnational Governments, Cities and Other Local Authorities for Biodiversity.¹¹⁰ This Plan purports to increase engagement of cities in protecting urban biodiversity and incorporate biodiversity into urban planning and development, including public procurement policies and urban infrastructure investments.¹¹¹ It included a list of possible actions and invited to use self-

¹⁰⁴ Ekardt *et al.* (2023), pp. 7–8; Telesetsky *et al.* (2016), pp. 113–114.

¹⁰⁵ UNEP/CBD/COP/DEC/XI/16, paras. 1, 5(h) and 5(i); see Telesetsky *et al.* (2016), pp. 132–135.

¹⁰⁶ UNEP/CBD/COP/DEC/XII/19; see Cliquet (2017), p. 392.

¹⁰⁷ Sirakaya *et al.* (2018), pp. 210–211.

¹⁰⁸ UNEP/CBD/COP/DEC/VIII/15, para. 4 and Annex V.

¹⁰⁹ UNEP/CBD/COP/DEC/IX/28, paras. 3 and 4.

¹¹⁰ UNEP/CBD/COP/DEC/X/22, paras. 1 and 6; Annex paras. 4(b), 5(e) and 5(o).

¹¹¹ UNEP/CBD/COP/DEC/X/2.

monitoring tools to set goals and measure progresses, like the City Biodiversity Index.¹¹² The same COP10 requested the Secretariat to prepare an assessment of the links and opportunities between urbanization and biodiversity. The key messages of the Cities and Biodiversity Outlook, were acknowledged during COP11 in 2012 in Hyderabad (India), which also renovated the invitation to develop indicators tracking the progress of urban settlements towards the Aichi Targets (Section 3.2.3.3).¹¹³

In 2014, COP12 in Pyeongchang (Korea) adopted the first decision focusing on sustainable urbanization and invited all Parties to work together with local governments to achieve the Aichi Targets, and to incorporate biodiversity considerations into urban, land use, and infrastructure planning, including green infrastructure and nature-based solutions.¹¹⁴ Additionally, it invited Parties to collaborate with Ramsar Convention, UN agencies, international organizations and biodiversity-related conventions, to protect and restore urban biodiversity.

In 2016, COP13 in Cancun (Mexico) adopted various decisions related to urban ecosystems: it encouraged Parties to facilitate the development by cities of urban biodiversity strategies and action plans;¹¹⁵ it encouraged Parties and relevant organizations to promote the wide use of ecosystem-based approach where appropriate, including in urban areas;¹¹⁶ it encouraged research on the contribution of urban biodiversity in promoting mental and physical health and cultural well-being;¹¹⁷ it encouraged Parties and stakeholders, *taking into account national circumstances, as appropriate*, to promote conservation, management and restoration of patches of natural habitats in urban areas and the maintenance of floral resources and nesting sites for pollinators.¹¹⁸ Additionally, COP13 adopted a short-term Action Plan on ecosystem restoration, envisaging – for the first time – even the restoration of urban ecosystems, *as appropriate*.¹¹⁹ This Action Plan clarifies that ecosystem restoration is complementary to conservation and prevention of further degradation by reducing pressures and maintaining ecological integrity and the provisioning of ecosystem services, and shall be inspired by various principles including best available science, traditional knowledge, prior informed consent, full and effective

¹¹² The Singapore Index on Cities' Biodiversity, developed in 2010 and updated in 2020, is a self-assessment tool for cities to monitor progress on biodiversity conservation, based on 28 indicators; <<https://www.nparks.gov.sg/biodiversity/urban-biodiversity/the-singapore-index-on-cities-biodiversity>> (accessed on 8 April 2024); Chan *et al.* (2021).

¹¹³ UNEP/CBD/COP/DEC/XI/8, paras. 2 and 6. The Cities and Biodiversity Outlook is the first global assessment of the effects of urbanization on biodiversity (see SCBD (2012)).

¹¹⁴ UNEP/CBD/COP/DEC/XII/9, paras. 2 and 3.

¹¹⁵ UNEP/CBD/COP/DEC/XIII/1, para. 14.

¹¹⁶ UNEP/CBD/COP/DEC/XIII/4, para. 8(h).

¹¹⁷ UNEP/CBD/COP/DEC/XIII/6, para. 6(e), Annex paras. (d) and (f).

¹¹⁸ UNEP/CBD/COP/DEC/XIII/15, para. 7(c).

¹¹⁹ UNEP/CBD/COP/DEC/XIII/5, para. 5; Annex, paras. 1, 5.

participation of indigenous peoples and local communities, engagement of women, communication, education and public awareness.¹²⁰ The envisaged voluntary activities are grouped in four steps, with an associated indicative 6 years' timeline: assessing opportunities for ecosystem restoration; improving the institutional enabling environment; planning and implementing ecosystem restoration activities; monitoring, assessing, reporting and communication.¹²¹

COP14 in Sharm-El-Sheikh (Egypt) in 2018 mentioned urban biodiversity in its decisions on: mainstreaming biodiversity, which encouraged Parties and stakeholders to integrate biodiversity and ecosystem services in urban planning and development, including approaches for the conservation, improvement, restoration and sustainable use of biodiversity in spatial planning;¹²² climate change, listing some intervention options to reduce climate change impacts, like green aeration corridors, storm water management by green spaces, urban river restoration and green façades for buildings;¹²³ health;¹²⁴ and pollinators, promoting the implementation of pollinator-friendly practices in urban areas and restoration of their urban habitats.¹²⁵

In 2021-2022, COP15 in Kunming (China) and Montreal (Canada), adopted the Kunming-Montreal Global Biodiversity Framework (Section 3.2.3.4), including one target on urban ecosystems restoration. While the focus has certainly been on the adoption of this framework, COP15 also updated the Plan of Action on Subnational Governments, Cities and Other Local Authorities for Biodiversity under the CBD (2023–2030) aimed, *inter alia*, at increasing the engagement of cities to ensure implementation of the Kunming-Montreal Global Biodiversity Framework, improve coordination and exchange of best practices, and integrating biodiversity concerns into urban and territorial planning and development.¹²⁶

3.3.3.3 Implementing the CBD: Aichi Targets (2011-2020)

It is evident that the provisions of the CBD – which outline goals, principles and general obligations – and the decisions of the COPs – which are non-binding, full of acknowledgments, encouragements and invitations – need further refinement in order to be capable of being implemented in a concerted and coordinated way by each Party and other relevant stakeholders; thus, COPs work is paramount for effective implementation and progress in global biodiversity conservation. Through COP meetings, Parties negotiate and set targets serving as benchmark

¹²⁰ UNEP/CBD/COP/DEC/XIII/5, Annex, paras. 8 and 10.

¹²¹ UNEP/CBD/COP/DEC/XIII/5, Annex, paras. 11–16.

¹²² UNEP/CBD/COP/DEC/XIV/3, para. 13(m).

¹²³ UNEP/CBD/COP/DEC/XIV/5.

¹²⁴ UNEP/CBD/COP/DEC/XIV/4.

¹²⁵ UNEP/CBD/COP/DEC/XIV/6.

¹²⁶ UNEP/CBD/COP/DEC/XV/12.

for biodiversity conservation efforts and providing a framework for measuring progress and guiding action at national, local, and international levels.¹²⁷ Furthermore, setting targets is functional to ensure a certain level of international accountability, as it allows transparent assessment of achievements and shortcomings. While there are no explicit legal consequences, failing to meet the negotiated targets may have significant implications like reputational risk associated with falling short of international commitments.¹²⁸ Additionally, States may face domestic legal action or public pressure, particularly if there are associated national laws and policies in place.

In 2010, COP10 in Nagoya (Japan) acknowledged that the previously-agreed targets had not been met and recognized the need for more ambitious and holistic objectives.¹²⁹ Thus, it adopted the Strategic Plan for Biodiversity 2011-2020 – *Living in harmony with nature*, comprising the Aichi Targets.¹³⁰ The Aichi Targets provided a more structured and comprehensive framework for biodiversity conservation, with 20 specific objectives and associated indicators designed to address the underlying drivers of biodiversity loss and promote sustainable use and conservation of biodiversity. These targets are applicable to national governments as well as to cities and subnational governments subject to the Contracting Parties’ national procedures for implementing international law and shall be read along with the Plan of Action on Subnational Governments, Cities and Other Local Authorities for Biodiversity, adopted by the same COP10 (Section 3.2.3.2).¹³¹

The Strategic Plan for Biodiversity 2011-2020 sets five strategic goals. The most relevant for restoration is Strategic Goal D, which comprises Targets 14 and 15. Target 14 anticipates, by 2020, the restoration and protection of all ecosystems providing essential services and contributing to well-being taking into account also the needs of local communities.

Target 15 is the most explicit target on restoration, as it calls for the conservation and restoration of ecosystems, including in particular the restoration of at least 15% of degraded ecosystems, to enhance ecosystem resilience and contribute to climate change mitigation and adaptation.¹³² It showcases the strong link between biodiversity and climate change, as restoring degraded ecosystems helps mitigating climate change by increasing carbon sequestration capacity of natural habitats. It is not limited quantitatively to 15% of degraded ecosystems, which is a starting point, nor is it limited to protected areas. On the contrary, as protected areas

¹²⁷ Ekardt *et al.* (2023), p. 8.

¹²⁸ Ekardt *et al.* (2023), pp. 8–9, challenges the view that the Aichi Targets were to be considered non-binding.

¹²⁹ The 2010 Biodiversity Targets had been adopted through UNEP/CBD/COP/DEC/VI/26.

¹³⁰ UNEP/CBD/COP/DEC/X/2.

¹³¹ See footnote no. 110.

¹³² Cliquet (2017), p. 390.

are already covered by Target 11, Target 15 should be interpreted as constituting an additional target to be achieved outside protected areas, despite no confirmation of this reading was provided by the COP.¹³³

In the CBD Secretariat's guides to Targets 14 and 15, *restoration* is defined as: "the process of actively managing the recovery of an ecosystem that has been degraded, damaged or destroyed as a means of sustaining ecosystem resilience and conserving biodiversity"; these guides acknowledge that the most suitable restoration approach depends on the type of ecosystem that is to be restored.¹³⁴ However, the Aichi Targets on restoration were set in 2010 without an actual understanding of what ecosystem restoration entailed; in fact, COP10 deferred to the following COP11 the task to provide guidance on ecosystem restoration (Section 3.2.3.1).¹³⁵

As it can be appreciated, Targets 14 and 15, unlike the provisions of the CBD, are formulated in a results-oriented way, since they anticipate the expected outcomes that Parties committed to achieve by 2020, despite without legal consequences *stricto sensu*. Additionally, they apply to all ecosystems providing essential services and contributing to health, livelihoods and well-being (Target 14) and to all degraded ecosystems (Target 15), thus to urban ecosystems as well, notwithstanding the lack of specific consideration.¹³⁶ In fact, since the restoration of ecosystems shall be made *taking into account* the wellbeing of local communities, ecosystem services restoration should be carried out in urban areas as well, and urban ecosystems restoration is essential to achieve Target 15 due to the strong contribution of cities to climate change.¹³⁷

Some targets support restoration without mentioning it: Target 5 on reduction of habitats degradation and fragmentation; Target 6 on recovery of depleted fish species; Target 9 on control and eradication of invasive alien species; Target 11 on conservation of protected areas.¹³⁸

Other targets relevant to urban ecosystems are Target 2 on integration of biodiversity into local development strategies and planning processes; and Target 4 on plans for sustainable use of natural resources. In relation to these Targets, COP13 proposed an indicator measuring the number of public urban infrastructure policies and plans that integrate biodiversity considerations, and the development of guidelines for urban-based biodiversity and ecosystems.¹³⁹

¹³³ Cliquet (2017), p. 391.

¹³⁴ SCBD (a); SCBD (b).

¹³⁵ Cliquet (2017), p. 391; Telesetsky (2016), p. 117; UNEP/CBD/COP/DEC/X/9, para. (a)(ix).

¹³⁶ Sirakaya *et al.* (2018), p. 213.

¹³⁷ Despite cities cover a minuscule fraction of the Earth's land, they account for 75% of global greenhouse gas emissions; UNEP (2020).

¹³⁸ Telesetsky *et al.* (2016), p. 117; Cliquet (2017), pp. 389–390.

¹³⁹ UNEP/CBD/COP/DEC/XIII/23.

3.3.3.4 The Aichi Targets in practice: how States have implemented the restoration targets in relation to urban ecosystems

This Section aims at illustrating how a selected number of Contracting Parties to the CBD has implemented the Aichi Targets with regard to restoration of urban ecosystems. This review is based (solely) on the latest available reports submitted by Contracting Parties in 2018, *i.e.*, the Sixth National Reports, which were used by the CBD Secretariat to prepare the Fifth Global Biodiversity Outlook¹⁴⁰ and served as baseline for negotiations leading to the adoption of the Kunming-Montreal Global Biodiversity Framework in 2022 (Section 3.3.3.5).

The selection of the Contracting Parties was made on three criteria. First, I considered the 18 most populated States that together account for two-thirds of the global population. Second, I reviewed the Sixth National Reports from the 10 most urbanized States.¹⁴¹ Third, I examined the Reports submitted by the EU, 27 EU Member States, 3 European Economic Area (EEA) States, and the United Kingdom.¹⁴² In total, I reviewed 56 out of the 189 Sixth National Reports submitted, and I classified the Contracting Parties in five categories: (i) Parties that reported the adoption of quantitative national targets for urban ecosystems; (ii) Parties that reported the adoption of qualitative national targets for urban ecosystems; (iii) Parties that reported the adoption of measures on urban ecosystems without specific targets; (iv) Parties that consider urbanization a problem for biodiversity but did not report specific targets or measures on urban ecosystems; (v) Parties whose Report does not refer to urbanization.¹⁴³

It is worth stressing that, considering the limited number of Reports analysed (*i.e.*, 56 out of 189 Sixth National Reports submitted), and in light of the principle of state equality, this review does not aim to provide conclusions regarding the degree of implementation of the Aichi Targets on urban ecosystems and urban ecosystems services.

The following three tables summarize the results of the investigation carried out.

¹⁴⁰ SCBD (2020).

¹⁴¹ Data on world and national population and urbanism was sourced from World Bank's World Development Indicators and refer to 2022; for *total population*, <<https://data.worldbank.org/indicator/SP.POP.TOTL?view=chart>>; for *urban population*, <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?most_recent_value_desc=true> (accessed on 16 April 2024).

¹⁴² The United Kingdom was still a EU member when its Sixth National Report was submitted.

¹⁴³ The review involved reading all national targets to verify their immediate relevance for urban ecosystems and using the "search" function to find relevant entries (*i.e.*, *urban**, *city/cities*, *town**, *village**, *municipal**, *settlement**, *land use planning*, *green infrastructure*, and *local*, and corresponding words in French and Spanish). Lithuania and Romania, despite meeting the selection criteria, did not submit their Report. Kuwait submitted its Report, but I could not review it due to language barriers.

Table A: Most populated States¹⁴⁴

State	Total Population	Urban Population	Quantitative Target	Qualitative Target	Only Measures	Urbanization as Problem	No Consideration
India	1,417,173,173	35.9%			✓		
China	1,412,175,000	63.6%			✓		
Indonesia	275,501,339	57.9%	✓				
Pakistan	235,824,862	37.7%			✓		
Nigeria	218,541,212	53.5%				✓	
Brazil	215,313,498	87.6%			✓		
Bangladesh	171,186,372	39.7%					✓
Russian Fed. ¹⁴⁵	144,236,933	75.1%				✓	
Mexico	127,504,125	81.3%			✓		
Japan	125,124,989	92.0%		✓			
Ethiopia	123,379,924	22.7%					✓
Philippines	115,559,009	48.0%	✓				
Egypt	110,990,103	43.0%		✓			
DR Congo	99,010,212	46.8%			✓		
Vietnam	98,186,856	38.8%				✓	
Iran	88,550,570	76.8%				✓	
Türkiye	84,979,913	77.0%					✓

Table B: Most urbanized States¹⁴⁶

State	Total Population	Urban Population	Quantitative Target	Qualitative Target	Only Measures	Urbanization as Problem	No Consideration
Singapore	5,637,022	100.0%		✓			
Monaco	36,469	100.0%			✓		
Nauru	12,668	100.0%				✓	
Qatar ¹⁴⁷	2,695,122	99.3%			✓		
San Marino	33,660	97.7%		✓			
Uruguay	3,422,794	95.7%			✓		
Israel	9,557,500	92.8%	✓				
Argentina	46,234,830	92.3%				✓	
Japan	125,124,989	92.0%		✓			
Jordan	11,285,869	91.8%					✓

Table C: EU, EU Member States, EEA Member States, and the UK¹⁴⁸

State	Total Population	Urban Population	Quantitative Target	Qualitative Target	Only Measures	Urbanization as Problem	No Consideration
European Union	447,370,510	75.5%			✓		
EU Member States							
Austria	9,041,851	59.3%		✓			
Belgium	11,685,814	98.2%		✓			
Bulgaria	6,465,097	76.4%				✓	
Croatia	3,855,600	58.2%				✓	
Cyprus	1,251,488	66.9%			✓		
Czech Republic	10,672,118	74.4%		✓			
Denmark	5,903,037	88.4%			✓		
Estonia	1,348,840	69.6%			✓		
Finland	5,556,106	85.7%		✓			
France	67,971,311	81.5%			✓		
Germany	83,797,985	77.6%	✓	✓			
Greece	10,426,919	80.4%			✓		
Hungary	9,643,048	72.6%		✓			
Ireland	5,127,170	64.2%				✓	
Italy	58,940,425	71.7%		✓			
Latvia	1,879,383	68.5%					✓
Luxembourg	653,103	91.9%			✓		
Malta	531,113	94.9%		✓			
Netherlands	17,700,982	92.9%				✓	
Poland	36,821,749	60.1%			✓		
Portugal	10,409,704	67.4%		✓			
Slovakia	5,431,752	53.9%			✓		
Slovenia	2,111,986	55.8%			✓		
Spain	47,778,340	81.3%			✓		
Sweden	10,486,941	88.5%		✓			

¹⁴⁴ This table does not consider the USA despite being third among the most populated states, as they are not a CBD Party.

¹⁴⁵ The Russian Report was submitted in Russian language and was translated through an automatic translator.

¹⁴⁶ This table does not consider Kuwait despite having a 100% urbanization rate, due to language barriers.

¹⁴⁷ The Qatari Report was submitted in Arabic language and was translated through an automatic translator.

¹⁴⁸ This table does not consider Lithuania and Romania as they did not submit their Sixth National Reports.

State	Total Population	Urban Population	Quantitative Target	Qualitative Target	Only Measures	Urbanization as Problem	No Consideration
EEA Member States							
Iceland	382,003	94.0%					✓
Liechtenstein	39,327	14.5%			✓		
Norway	5,457,127	83.7%			✓		
Former EU Member State							
United Kingdom	66,971,395	84.4%			✓		

Quantitative targets appear rarely in the reviewed Reports, as they are adopted only in four States: Indonesia, the Philippines, Israel, and Germany, with Germany and Israel addressing the reduction of land take rather than the increase of green space.

The Philippines' target to achieve a 5% increase in green spaces in the five largest cities by 2028 is significant, despite its limited geographical scope, considering the strong urbanization growth expected in the near future.¹⁴⁹ To implement this target, the Philippines have adopted several measures, including the Green Building Code; ratings for real estate assets; guidelines for integrating biodiversity into local development planning; and financial support.

Indonesia includes an urban biodiversity quantitative objective as part of its target on sustainable management of biodiversity resources. The National Plan on Spatial Planning was revised to ensure the development of green spaces covering at least 30% of the urban area.

Germany aims to limit additional land take to 30 hectares per day by 2030, by favouring brownfield developments over greenfield ones. In 2017, the Government published the "Green Spaces in the City" White Paper outlining measures to support urban green spaces, followed by the Urban Nature Master Plan adopted in 2019. These measures range from integrated planning for urban green space, to making urban green spaces climate resilient, socially compatible, and good for human health, to encourage greenery of buildings and infrastructures, and activate citizens engagement. Each municipality has to report on progress every four years.¹⁵⁰

Israel aims to halve the rate of conversion of natural habitats by 2025 by reducing new low-density housing construction and conversion of agricultural land to constructed areas. However, Israel is moving away from this target due to planned urban expansion to 2030.

15 States have adopted qualitative targets on urban biodiversity. Half of them have a weak target as they encourage biodiversity-inclusive urban planning (Austria, Belgium, Finland, Portugal, Egypt, San Marino, and Singapore). The remaining seven States (Czech Repub-

¹⁴⁹ From current 48% to 67% by 2030 and 84% by 2050; source <<https://unhabitat.org/philippines>> (access on 21 April 2024).

¹⁵⁰ Hamburg, among the largest and most densely populated German cities, is covered for more than half by a Green Network and recently adopted the *Natürlich Hamburg!* project, the first major nature conservation project in a major German city which spreads over 14 nature reserves, 20 urban parks and green spaces and the roadside greenery along four arterial roads. Information about the project may be found here: <<https://www.hamburg.de/natuerlich-hamburg/>> (access on 21 April 2024).

lic, Germany, Hungary, Italy, Malta, Sweden, and Japan) have targets that encourage the increase and improvement of quality of urban nature and provide examples of concrete actions.

Italy has adopted eleven targets on urban biodiversity, aiming to limit land take, preserve urban ecosystems, maintain ecological corridors and ecosystems connectivity, ensure sustainable use of resources, recover disused urban areas, and improve citizens' understanding of the ecological status of urban environments. These targets also advocate for the incorporation of green plans into local urban planning and innovative choices in local building regulations, such as garden roofs and green walls, and aim to recover natural areas within cities.¹⁵¹

Singapore needs a separate treatment since, as a city-state, inherently adopts all biodiversity targets and measures within urban context.¹⁵² Singapore has adopted a robust legislative framework that is the product of a committed policy framework characterized by an innovative blend of urban planning and biodiversity conservation strategies.¹⁵³ The “City in a Garden” vision aims to transform Singapore into a city nestled within an expansive, lush garden, promoting co-existence of urban development and nature. This vision is implemented through multiple initiatives such as the Park Connector Network and the Nature Conservation Masterplan, and a financial incentive mechanism for integrating biodiversity components in urban buildings (the so-called Skyrise Greenery Incentive Scheme). These efforts have protected more than 7,800 hectares of green spaces, all linked through 370 km of park connectors, across the country, equal to more than 10% of the State’s extension.¹⁵⁴ In 2021, the “City in a Garden” vision evolved into the “City in Nature by 2030” vision as part of Singapore’s Green Plan 2030. This plan outlines ambitious targets for expanding green spaces, enhancing connectivity between nature parks, and increasing the naturalisation of gardens and parks. It also sets goals for 2030 in terms of creating 30 new therapeutic gardens, implementing recovery plans for 100 plant and 60 animal species, and restoring 80 hectares of forest, marine, and coastal habitats, along with 50% of all national parks. The Building Control (Environmental Sustainability) Regulations were updated to set new standards for buildings, aiming to have 200 hectares of skyrise greenery by 2030 and plant 170,000 additional trees in industrial areas. The Landscape Replacement Policy ensures no net loss of green spaces due to development.

Generally speaking, in the context of the limited investigation carried out, it appears that

¹⁵¹ Italy’s National Biodiversity Strategy, pp. 101–106, available in Italian here: <https://www.mase.gov.it/sites/default/files/archivio/allegati/biodiversita/Strategia_Nazionale_per_la_Biodiversita.pdf> (access on 21 April 2024).

¹⁵² See, for reference, the Sixth National Report by Singapore, submitted offline and available here: <<https://www.cbd.int/doc/nr/nr-06/sg-nr-06-en.pdf>> (access on 21 April 2024).

¹⁵³ Key laws include Parks and Trees Act, Animals and Birds Act, Wildlife Act, Control of Plants Act and Endangered Species Act.

¹⁵⁴ Source of data: National Parks Board official website, accessible here: <<https://www.nparks.gov.sg/about-us/city-in-nature>> (access on 21 April 2024).

EU/EEA membership leads to a higher consideration of urban nature, as 75% of the States concerned has targets or measures in place. This occurs despite the absence of specific targets on urban ecosystems in the EU, suggesting that the policy and legislative framework in place in 2018 (especially on green infrastructure, as it will be seen in Section 4.2) was in any case capable of exerting some degree of influence on States in integrating urban biodiversity within their national strategies.

One final consideration is needed. The fact that a State reported the adoption of national targets or measures does not provide information about the effectiveness (or impact) of these actions on urban biodiversity. In fact, apart from Israel and San Marino which reported moving away from their targets, most researched States with targets on urban ecosystems reported insufficient progress and partially effective measures. Exceptions were the Philippines, on track to achieve its target, and Singapore, on track to achieve or exceed most of its targets. The Fifth edition of the Global Biodiversity Outlook confirmed this trend, and, despite acknowledging that numerous initiatives have recently emerged to promote the transition towards sustainable urbanization, it highlighted the need to scale up efforts to improve the condition of Nature across urban settlements.¹⁵⁵

3.3.3.5 Implementing the CBD: Kunming-Montreal Global Biodiversity Framework

Despite some progress, IPBES's Global Assessment Report on Biodiversity and Ecosystem Services and the Fifth Global Biodiversity Outlook showed that none of the Aichi Targets was achieved.¹⁵⁶ This outcome was acknowledged by COP15 in Kunming (China) and Montreal (Canada), which adopted in December 2022 the Kunming-Montreal Global Biodiversity Framework (GBF), along with many implementing decisions.¹⁵⁷

The GBF covers the period 2022-2030 and builds on the previous Strategic Plan. It aims at contributing to the achievement of sustainable development goals (para. 8), by enabling and accelerating *urgent and transformative action* by governments and local authorities, with the involvement of the society as a whole (paras. 4 and 7(c)), to reverse biodiversity loss, qualified as a common concern of humankind (para. 7(k)), in accordance with national circumstances, priorities and capabilities (para. 7(d)) and inspired by the principles of the Rio Declaration.

¹⁵⁵ SCBD (2020), pp. 18–19, 142, 168–170.

¹⁵⁶ IPBES (2019); SCBD (2020); Mendes *et al.* (2022), p. 4.

¹⁵⁷ UNEP/CBD/COP/DEC/XV/4 adopting the Global Biodiversity Framework; other relevant resolutions include: UNEP/CBD/COP/DEC/XV/5 on monitoring framework; UNEP/CBD/COP/DEC/XV/6 on mechanisms for planning, monitoring, reporting and review; UNEP/CBD/COP/DEC/XV/7 on resource mobilization; UNEP/CBD/COP/DEC/XV/8 on capacity-building; UNEP/CBD/COP/DEC/XV/12 on engagement of local authorities.

Similar to the Aichi Targets, the GBF is an action- and results-oriented framework which sets a Vision for 2050 of a World living in harmony with Nature where “biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people” (para. 10), accompanied by a corresponding Mission for 2030 “to take urgent action to halt and reverse biodiversity loss to put nature on a path to recovery for the benefit of people and planet” (para. 11).

Two out of four long-term goals for 2050 embedded in the GBF directly refer to restoration. Goal A anticipates the maintenance, enhancement, or *restoration* of integrity, connectivity, and resilience of all ecosystems, substantially increasing natural ecosystems, while Goal B calls for the maintenance, enhancement, and *restoration*, of “nature’s contributions to people”, including ecosystem services, thus supporting *the* sustainable development.

To ensure achievement of its Goals, the GBF has 23 action-oriented global targets for urgent action that, despite non-binding, “need to be initiated immediately and completed by 2030” (para. 13), which overall aim to maintain, enhance, or restore the integrity, connectivity and resilience of all ecosystems, halting human-induced species extinction, and maintain, enhance, and restore ecosystem functions and services, while supporting the achievement of sustainable development. Four targets directly refer to restoration activities.

Target 2 of the GBF is the most relevant and explicit target ever conceived by the COP on restoration of ecosystems and is the successor of Aichi Target 15.¹⁵⁸ Also called “30x30 target”, it calls upon Parties to ensure that by 2030 at least 30% of all degraded ecosystems are under *effective restoration* in order to enhance biodiversity and ecosystem functions and services, ecological integrity and ecosystems connectivity. This general target is accompanied by Target 11, the successor of Aichi Target 14, which provides for the restoration, preservation and improvement of ecosystem functions and services through nature-based solutions and/or ecosystem-based approaches.¹⁵⁹

The guidance notes by the CBD Secretariat for Target 2 of the GBF clarify that restoration refers to a *continuum of actions* aimed at enhancing biodiversity and ecosystem functions and services, ecological integrity and connectivity, and *may* include ecological restoration and ecosystem rehabilitation.¹⁶⁰ Additionally, considering that restoration is a long-term process,

¹⁵⁸ Target 2 contributes, *inter alia*, to SDG6 (Target 6.6 on protection and restoration of water-related ecosystems), SDG14 (Target 14.2 on restoration of marine and coastal ecosystems) and SDG15 (Targets 15.1 and 15.3, respectively on restoration of terrestrial and inland freshwater ecosystems and their services, and degraded land and soil); and RAM/COP/RES/VII/17.

¹⁵⁹ Target 11 contributes, *inter alia*, to SDG1 (Target 1.5 on building resilience of poor and vulnerable people against environmental shocks and disasters), and SDG15 (Target 15.4 on reducing the degradation of natural habitats).

¹⁶⁰ Mendes *et al.* (2022), p. 8.

the target does not require that ecosystems are restored by 2030, rather that *effective restoration activities*, appropriately resources and monitored over time, are commenced by that date in relation to at least 30% of degraded ecosystems, *i.e.*, ecosystems experiencing a persistent reduction in the capacity to provide ecosystem services.¹⁶¹

On Target 11, the relevant guidance emphasizes the role of nature-based solutions (which include restoration) and ecosystem-based approaches in reaching the objective.¹⁶²

Targets 4 and 10 are the other targets explicitly referring to restoration; they envisage, respectively, the preservation and restoration of the genetic diversity within and between populations of native, wild, and domesticated species to maintain their adaptive potential; and the conservation and restoration of biodiversity in areas under agriculture, aquaculture, fisheries, and forestry, which are to be managed sustainably. Other targets implicitly refer to restoration: Target 6 provides for the elimination and control of invasive alien species; and Target 8 aims at minimizing the impact of climate change and ocean acidification on biodiversity and increase its resilience through nature-based solutions, implying restoration activities.

For the first time ever, the importance of urban ecosystems has been specifically recognized and made object of Target 12, which calls Parties to:

“[s]ignificantly increase the area and quality and connectivity of, access to, and benefits from green and blue spaces in urban and densely populated areas sustainably, by mainstreaming the conservation and sustainable use of biodiversity, and ensure biodiversity-inclusive urban planning, enhancing native biodiversity, ecological connectivity and integrity, and improving human health and well-being and connection to nature and contributing to inclusive and sustainable urbanization and the provision of ecosystem functions and services”.¹⁶³

This formulation is rather chaotic and needs to be decomposed to be fully appreciated.

The first part targets green and blue spaces within urban areas. These are patches of vegetation within or near human settlements, as well as inland and coastal waters (urban rivers

¹⁶¹ SCBD (c). The monitoring of the level of implementation of this Target will need to be further elaborated as for now there is no baseline level; Ekardt *et al.* (2023), p.10.

¹⁶² Nature-based solutions are “*actions to protect, conserve, restore, sustainably use and manage natural or modified ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits*”; ecosystem-based approach refer to “*the use of biodiversity and ecosystem services as part of an overall strategy to help mitigate and adapt to adverse effects of climate change*”; SCBD (d).

¹⁶³ Target 12 contributes to SDG11 (Target 11.7 on access to safe, inclusive and accessible green and public spaces; and Target 11.b on number of cities adopting biodiversity-inclusive urban planning).

and streams, lakes, ponds, wetlands, artificial urban water bodies including canals, marine waters for coastal cities). Target 12 aims at significantly increasing not only the number or area covered by urban green and blue spaces, but also their quality, their connectivity, their accessibility for humans, and the benefits deriving from them. It is clear that to fulfil this target, Parties may not rely *only* on planting young, non-native, trees in areas at the border of urban settlements, but there must be a rigorous planning process aimed at identifying both the most suitable species *and* the most suitable locations, potentially restoring degraded urban ecosystems (*rec-tius*, creating new urban ecosystems, in line with the novel ecosystems approach (Section 2.3)).

The second part aims at ensuring that urban planning – *i.e.*, the process that regulates the uses, physical form, and economic functions of the spaces within urban settlements – becomes increasingly biodiversity-inclusive, meaning that it integrates biodiversity concerns in any conceivable way. This means, for instance, restoring brownfields, creating green infrastructures, converting building plots in unbuildable land, or setting building standards requiring that a certain share of surface be covered by vegetation or the installation of facilities for the nesting of birds, the resting of bats, or the fruition by pollinators.

Both activities covered by Target 12 shall be carried out *sustainably* and in a way as to *mainstream* biodiversity. This means that biodiversity shall become a constant consideration in policies and practices that might have an impact on it, so that biodiversity is appropriately included, but cannot prevaricate all other considerations, since sustainability is a concept that goes beyond the limits of environmental values to factor in economic and social values as well.

Finally, these activities shall aim to pursue different objectives: the improvement of native biodiversity; the increase of ecological connectivity and integrity; the improvement of human health and well-being as well as of a (more spiritual) connection with Nature; the contribution to inclusive and sustainable urban development; the continued provisioning of urban ecosystem services; and, in general, the reduction of the environmental footprint of cities.

On the negative side, it is possible to note that Target 12 is not measurable in full and, in any case, does not have a specific timeline, although it shall be completed by 2030. The GBF monitoring framework identifies as indicator for this target the average share of the built-up area of cities that is green/blue space for public use for all (indicator 12.1). Clearly, many of the terms used in the indicators need further refinement for the sake of measuring progress and comparability of results: what can be considered built-up area? What are the characteristics that an urban settlement must have to be considered city or does the indicator apply to any urban settlement? How are cities (or urban areas) spatially delimited? How large does an area of vegetation have to be for its computation as a green space? Given the connection with SDG11,

particularly Target 11.7 and its indicator 11.7.1, the GBF might benefit from the work on methodology already done in that context, noting however that the indicator under the SDG does not distinguish between green, blue, and artificial public spaces. Another indicator is currently in development, *i.e.*, the number of countries with biodiversity-inclusive urban planning referring to green or blue urban spaces, but in this case the work is still at its early stage.

Along with the GBF, the COP adopted an *enhanced* planning, monitoring, reporting, and review mechanism, designed to be cyclical and to facilitate tracking progress in implementing the various targets. It encompasses various components, including the invitation to revise or update National Biodiversity Strategies and Action Plans (NBSAPs) to align them with the GBF; the submission of national reports using the agreed indicators; the global analysis of NBSAPs; the consideration of collective progress through global reviews; voluntary peer reviews; the ongoing development and testing of an open-ended forum for voluntary country reviews; and the inclusion of information on non-state actors' commitments towards the GBF. Unfortunately, the Contracting Parties did not establish a compliance mechanism with the responsibility of reviewing each Party's commitments.

This approach set in motion a *voluntary* "ambition cycle" as the intention of the drafters of the GBF is to promote progressively stronger commitments, since Parties *may* (but are not obliged to) take the outcomes of the global review into account in future revisions and implementation of their NBSAPs, but only *with a view to improve* actions and efforts, as appropriate (para. 17).¹⁶⁴ To underline the non-bindingness of targets, GBF clarifies that the implementing, monitoring, and review mechanisms shall be carried out in a facilitative, non-punitive way (para. 19). However, the targets may, to some extent, be enforceable, under domestic law.¹⁶⁵

Some scholars claim that, despite the GBF is not legally binding and does not contain legally binding obligations, it may still qualify as a subsequent interpretative agreement of the legally binding obligations contained in the CBD, particularly Article 1 from which an obligation to halt and reverse biodiversity loss may be inferred, for the purposes of Article 31(3)(a) of the Vienna Convention on the Law of Treaties.¹⁶⁶ According to this interpretation, a failure to achieve the goals and targets of the GBF and/or the adoption of policies undermining the objectives of the GBF would constitute a violation of the CBD, triggering international liability.

¹⁶⁴ Ekardt *et al.* (2023), pp. 12–13.

¹⁶⁵ Ekardt *et al.* (2023), p. 13.

¹⁶⁶ This claim is supported by the acknowledgment that the GBF satisfies the three conditions set forth in ILC (2018) for being considered as an authentic means of interpretation: it was unanimously adopted by all CBD Parties; it was adopted after the CBD's adoption; and it is related to the interpretation of the CBD and the application of its provisions as it specifies obligations and clarifies legal terms, thus limiting the discretion of the Parties in implementing the CBD; see Ekardt *et al.* (2023), p. 15.

3.3.3.6 Concluding remarks

The CBD serves as a critical international instrument for the preservation of biological diversity and the sustainable utilization of biological resources. Since its adoption at the Rio Conference in 1992, the CBD has provided a framework for global cooperation and action to address the escalating challenges posed by biodiversity loss.

One of the fundamental aspects addressed by the CBD is the restoration of degraded ecosystems and the recovery of threatened species. While the Convention explicitly mentions restoration in certain (binding) provisions, such as Articles 8(f), 8(h) and 9(c), it lacks comprehensive guidance on the scope and implementation of restoration efforts.¹⁶⁷ This ambiguity has led to varying interpretations and challenges in fulfilling restoration obligations among Contracting Parties. States, through COPs, have translated these general obligations into quantitative targets which, however, are not binding.¹⁶⁸ If they were binding, they would qualify obligations of result.¹⁶⁹ These non-legally binding targets, however, helps determine what qualifies as “appropriate” in the abovementioned provisions (Section 3.2.3.1).¹⁷⁰

Moreover, the recognition and treatment of urban ecosystems within the CBD framework has evolved over time. Initially overlooked, urban ecosystems have gained increasing attention in recent COP meetings, reflecting a growing awareness of the role of cities in biodiversity conservation and the importance of urban nature. Decisions and actions adopted by COP meetings, particularly those related to sustainable urbanization, highlight the importance of integrating biodiversity considerations into urban planning and development. Finally, the GBF contains Target 12 specifically concerning urban biodiversity.

States are expected to implement the targets negotiated under the CBD at national and subnational level, through NBSAPs comprising national targets. These NBSAPs play a crucial role in “nationalizing” international law, *i.e.*, translating States’ international legal obligations, such as those outlined CBD and COP decisions, into domestic policies, laws, and practices. This process is significant because it reflects the practice and priorities of individual States in addressing the global environmental challenge of biodiversity loss. Moreover, the NBSAPs may influence the development of customary international law, which evolves from the consistent practice of States coupled with a belief in legal obligation to act in a certain manner.¹⁷¹

The means for implementing the international provisions on restoration may vary from

¹⁶⁷ Cliquet *et al.* (2022), pp. 2–3.

¹⁶⁸ Cliquet *et al.* (2022), pp. 1–2; Ekardt *et al.* (2023), p. 14.

¹⁶⁹ Telesetsky *et al.* (2016), p. 110.

¹⁷⁰ Telesetsky *et al.* (2016), p. 129.

¹⁷¹ Article 38(1)(b) of the Statute of the International Court of Justice. See Fitzmaurice (2017), pp. 183–185.

country to country, according to national needs and circumstances. However, there seems to be an emerging principle of international law according to which States are bound to incorporate restoration efforts into their NBSAPs and, possibly, that States shall actively participate in the restoration of essential supporting ecosystem services such as soil fertility.¹⁷² Interestingly, some scholars support the development of an international legal principle on ecological restoration which would oblige States to conduct restoration aimed at obtaining the highest level of ecosystem recovery possible; this principle would also be coupled with the prevention principle: States shall use their best efforts to avoid harm to ecosystems, but if such harm is nevertheless caused, ecosystems should be ecologically restored at their highest level possible.¹⁷³

On another level, the absence of a mechanism to establish standards on ecological restoration makes it extremely difficult to determine what practices tantamount to ecological restoration, in a globally accepted way. Hence, some scholars claim that a protocol on ecological restoration under the CBD is needed to create such possibility.¹⁷⁴

Under Article 26 CBD, each Party shall submit periodical reports on implementing measures taken.¹⁷⁵ Parties are expected to inform the COPs of the national targets or commitments and policy instruments they adopt to implement the targets agreed and report on progress towards them. While the previous Strategic Plan did not obligate Parties to report on progress in achieving the Aichi Target, the GBF provides for enhanced reporting and monitoring mechanisms.¹⁷⁶ The CBD Secretariat coordinates global monitoring efforts by compiling and synthesizing information from national reports submitted by the Parties. This allows for the assessment of progress at the global level and the identification of trends and patterns in biodiversity conservation, including areas where additional action is needed, which is made object of recommendations.

¹⁷² Telesetsky *et al.* (2016), p. 129.

¹⁷³ Cliquet *et al.* (2022), pp. 3–4; it is worth noting that current international practice is far from reflecting this principle.

¹⁷⁴ Cliquet *et al.* (2022), pp. 4–5.

¹⁷⁵ Article 26 CBD is the only provision of the CBD not restricted by qualifiers; Ekardt *et al.* (2023), p. 7.

¹⁷⁶ Ekardt *et al.* (2023), p. 13.

4 Restoration of urban ecosystems in the EU

4.1 Introduction

Chapter 4 discusses the EU's approach to urban ecosystems restoration. EU law stands as a unique legal system, distinct from the broader framework of international law. Its characteristics not only reflect the complex integration process within the EU but signify a departure from traditional principles governing interactions among sovereign States.

In fact, EU law operates within a supranational framework grounded on the Treaty on European Union (TEU), the Treaty on the Functioning of the European Union (TFEU) and the Charter of Fundamental Rights of the European Union (EUCFR). Unlike international law, which relies heavily on the consent and cooperation of sovereign States, EU law possesses a binding force directly applicable to Member States (Member States) and their people;¹⁷⁷ it has supremacy over conflicting national laws;¹⁷⁸ additionally, it may have direct effect (*i.e.*, it may be invoked by individuals and applied by national courts without prior transposition into national law).¹⁷⁹ The European Economic Area (EEA) Treaty extends most EU law concerning the single market, including environmental law, to Norway, Iceland, and Liechtenstein.¹⁸⁰

EU's supranational nature is reinforced by its institutional framework. The European Commission, as main executive body and guardian of the Treaties, holds the power to enforce EU law and has the right of legislative initiative as per Article 17 TEU, while the EU Parliament and the Council of the EU jointly exercise legislative functions pursuant to Articles 14 and 16 TEU. The Court of Justice has the authority to interpret EU law uniformly across Member States, as set by Article 19 TEU; financial penalties may be imposed against a Member State which fails to observe a judgment by the Court of Justice, pursuant to Article 260(2) TFEU.

The EU's legislative power is based on the principle of conferred competences, meaning the EU only has powers expressly granted by Member States through the EU Treaties. Therefore, every legislative act must have a legal basis in the TFEU. EU competences are either exclusive or shared with Member States, but most areas, including the internal market and environment, fall within the latter category, as indicated by Article 4 TFEU. Once the EU legislates in these areas, Member States cannot anymore, but an exception exists for environmental

¹⁷⁷ Langlet and Mahmoudi (2016), pp. 6–7.

¹⁷⁸ *Costa v ENEL* (1964), *Simmenthal* (1978).

¹⁷⁹ *Van Gend & Loos* (1963).

¹⁸⁰ EU environmental legislation adopted before 1994 was incorporated into the EEA Agreement, while EU legislation adopted after the entry into force of the EEA Agreement becomes EEA law after unanimous decision of the Committee of the EEA.

rules: Article 192 TFEU sets out the EU decision-making procedure to achieve EU’s environmental objectives mentioned in Article 191 TFEU, but Article 193 TFEU allows Member State to continue legislating in areas where EU law exists, provided the national law is consistent with other EU law and aims for a higher level of environmental protection, and on condition that the Commission is notified.

Article 191 TFEU lays out the EU’s environmental objectives, serving as guiding principles for development and implementation of EU environmental policy and legislation. It states that EU environmental policy shall aim for a “high level of protection” and contribute to several objectives, including “preserving, protecting and improving the quality of the environment”. Article 37 EUCFR also emphasizes the integration of a high level of environmental protection and quality improvement into EU policies, in line with sustainable development principles. While the term *restoration* is not explicitly mentioned, it is clear that improving the quality of the environment refers to situations where the environment has been degraded or negatively impacted by human activity, and improvement can be interpreted as restoration.¹⁸¹ Thus, Article 191 TFEU empowers the EU to adopt policy and legislation aimed at conserving and restoring ecosystems across the EU. The following Sections explore EU policy and current legislation related to ecosystems restoration, particularly in urban environments.

4.2 EU policy framework on urban ecosystems restoration

4.2.1 EU Biodiversity Strategy (1998)

In 1998, the European Community adopted its first Biodiversity Strategy in response to the CBD. This Strategy mentioned ecosystems restoration as part of conservation and sustainable use of biological diversity but did not provide definitions and urban ecosystems were not specifically considered.¹⁸² The first explicit consideration of urban ecosystems came in 2005, when the Commission adopted the first Thematic Strategy on the Urban Environment.¹⁸³

4.2.2 EU Biodiversity Strategy to 2020 (2011)

In 2011, the Aichi Targets were incorporated into the EU Biodiversity Strategy to 2020, whose vision for 2050 and 2020 headline target referred to restoration of biodiversity and ecosystem services.¹⁸⁴ Target 1 aimed at ensuring the full implementation of the Birds and Habitats Directives (Section 4.3), by *improving* the conservation status of certain habitats and species in

¹⁸¹ Langlet and Mahmoudi (2016), pp. 34–35; Telesetsky *et al.* (2016), pp. 143–144.

¹⁸² EC (1998), Section II, paras. 2 and 3.

¹⁸³ EC (2006).

¹⁸⁴ EC (2011). See Telesetsky *et al.* (2016), pp. 161–171.

Natura 2000 sites by 2020, essentially requiring restoration efforts.¹⁸⁵

Target 2, reflecting Aichi Targets 14 and 15, aimed to maintain and enhance ecosystems and their services by 2020, by incorporating green infrastructures into spatial planning and restoring at least 15% of degraded ecosystems.¹⁸⁶ The Commission planned to propose an initiative to ensure no net-loss of ecosystems and their services, particularly relevant for the restoration of ecosystems outside the Natura 2000 network, but this was not followed through.¹⁸⁷

In 2013, the Commission published a study to aid Member States in prioritizing ecosystems restoration.¹⁸⁸ This study introduced a four-level model dividing the continuum of ecosystems status from poor to excellent, and restoration was intended as moving from a lower level to a higher level.¹⁸⁹ However, this model was contested and never gained influence.¹⁹⁰

Despite various national initiatives, scepticism grew about EU's ability to meet Target 2. In 2015, the Commission called for intensified efforts as it acknowledged that progress was lagging, and many habitats were in an unfavourable status, urgently requiring restoration.¹⁹¹

4.2.3 Green Infrastructure Strategy (2013)

As part of the efforts to reverse biodiversity loss and ensure the provision of ecosystem services, in 2013 the Commission adopted the Green Infrastructure Strategy to preserve, enhance and restore green infrastructure across the EU.¹⁹²

Green infrastructure is defined as “a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services”.¹⁹³ While the Natura 2000 network established under the Habitats Directive (Section 4.3) is the backbone of EU's green infrastructure, the Strategy notes that green infrastructures exist also outside Natura 2000 sites and in urban settings. Examples include biodiversity-rich urban parks and green spaces, fresh air corridors, and green roofs. These are not only ecologically significant for urban ecosystems restoration, but they also offer health and social benefits, they help in mitigating and adapting to climate change, they reduce flood risks, and support the green economy by creating job opportunities.¹⁹⁴

¹⁸⁵ Telesetsky *et al.* (2016), pp. 162–163; EC (2011), para. 3.1, and Action 1(c).

¹⁸⁶ For a more in-depth analysis of this Target 2, see Telesetsky *et al.* (2016), pp. 165–170.

¹⁸⁷ Telesetsky *et al.* (2016), pp. 166–167.

¹⁸⁸ Lammerant *et al.* (2013). See on prioritization, Egoh *et al.* (2014).

¹⁸⁹ Telesetsky *et al.* (2016), pp. 169–170.

¹⁹⁰ Schoukens (2017b), pp. 127–129.

¹⁹¹ EEA (2015), p. 51; IPBES (2019), pp. 12–13; EC (2015), pp. 7–8.

¹⁹² EC (2013).

¹⁹³ EC (2013), p. 3.

¹⁹⁴ Sirakaya *et al.* (2018), p. 214, EC (2013), pp. 3–4, 8–9.

In 2019, the Commission acknowledged that, despite some progress, challenges remained in implementing the Strategy.¹⁹⁵ The Commission highlighted various initiatives and policies promoting urban green infrastructure, including the Urban Agenda for the EU, and the European Green Capital and European Green Leaf Awards.¹⁹⁶ These Awards recognize cities leading in environmental-friendly urban living. Winning or being shortlisted for these Awards grants cities visibility and opportunities, including participation in the exclusive Networks.¹⁹⁷

To assist in considering the economic, social, and environmental benefits provided by green infrastructure, the Commission developed guidance on integrating ecosystems and their services into decision-making, specifically referring to urban green infrastructure projects.¹⁹⁸

4.2.4 EU Biodiversity Strategy to 2030 (2020)

Despite the EU's advanced legislative framework for ecosystem protection, progress on ecological restoration has been slow and insufficient.¹⁹⁹ The European Green Deal launched in 2019 anticipated the adoption of a new Biodiversity Strategy focused on restoration and included proposals to green European cities and increase urban biodiversity.²⁰⁰

Titled “Bringing Nature Back into Our Lives”, the Biodiversity Strategy to 2030 puts restoration in its core.²⁰¹ Its headline ambition for 2050 is to ensure all world's ecosystems are restored, resilient, and adequately protected. To contribute to this ambition, the EU aims to put biodiversity on the path to recovery by 2030, by developing an EU Nature Restoration Plan.²⁰²

The EU Nature Restoration Plan comprises two main actions. The first encourages Member State to enhance the implementation of existing EU Nature Directives and ensure no deterioration in conservation status of all protected habitats and species by 2030. The second involves developing a proposal for legally binding EU restoration targets applicable to all degraded ecosystems, including urban ones. This legislative proposal is discussed in Section 4.4.

Apropos urban ecosystems, the Strategy aims to halt the loss of green urban space and ensure the systematic integration of green infrastructure and nature-based solutions into urban planning, both in public and private spaces, as well as in building and infrastructure design.²⁰³ The Commission urged EU cities with populations of at least 20,000 to create ambitious Urban

¹⁹⁵ EC (2019a), pp. 10–11.

¹⁹⁶ EC (2019a), p. 6; for more detail, see EC (2019b), pp. 22–36, 39; Information may be found here: <<https://www.urbanagenda.urban-initiative.eu/>> (access on 30 April 2024).

¹⁹⁷ Further information may be found here: <https://environment.ec.europa.eu/topics/urban-environment/european-green-capital-award_en> (access on 29 April 2024).

¹⁹⁸ EC (2019c), pp. 14–16.

¹⁹⁹ Cortina-Segarra *et al.* (2021), pp. 1–3, 12–14; Telesetsky *et al.* (2016), p. 171–172.

²⁰⁰ EC (2019d), para. 2.1.7, pp. 13–14.

²⁰¹ EC (2020).

²⁰² EC (2020), pp. 3, 6–15.

²⁰³ EC (2020), pp. 12–13.

Nature Plans by 2021, detailing measures to establish biodiverse, accessible, and interconnected urban green spaces. To support this process, the Commission set an Urban Nature Platform to provide guidance and knowledge to EU cities in enhancing and restoring their urban nature.²⁰⁴

Another initiative under the Biodiversity Strategy to 2030 is the *Green City Accord*.²⁰⁵ By signing this Accord, cities commit to make cities greener, cleaner, and healthier, and to take stronger actions in five priority areas, including nature and biodiversity; in exchange, they access a network of like-minded cities, they gain visibility and credibility, and increase in transparency and accountability. In each priority area, within two years of signing, cities must set baselines and adopt targets more ambitious than the minimum EU requirements. They must implement policies and measures to reach their targets by 2030 and report progress every three years. For example, in the nature and biodiversity area, cities commit to increasing extent and quality of green areas and halting the loss of urban ecosystems and restoring the same.

4.3 Ecosystems restoration in the current EU Nature Directives

The EU has enacted several legislative acts to safeguard nature, covering various aspects of environmental management and conservation, ranging from protecting specific species and habitats to managing water resources and preventing environmental damage. Most of EU secondary legislation include ecosystems restoration provisions, although there is no specific reference to urban ecosystems. This Section focuses on the Birds Directive (BD)²⁰⁶ and the Habitats Directive (HD)²⁰⁷ as the core EU legislation on nature conservation, but some restoration provisions relevant to urban areas are contained in other instruments not addressed here.²⁰⁸

Enacted in 1979 and amended in 2009, the BD establishes a general system of protection of all wild birds in the European territory of the EU (Article 5 BD), and a strengthened regime for specific species implying the creation of Special Protection Areas (SPAs) for their survival, in which birds shall be protected from pollution, habitats deterioration, and other significant disturbances (Article 4 BD). Since the designation criteria of SPAs have only scientific, ornithological and/or ecological nature, SPAs may be located within cities.

The HD was adopted in 1992 and complements the BD by focusing on the conservation of natural habitats and habitats of species (Articles 3-11 HD) and the protection of wild fauna and flora (Articles 12-16 HD). Additionally, the HD establishes the Natura 2000 network of

²⁰⁴ For Information: <environment.ec.europa.eu/topics/urban-environment/urban-nature-platform_en> (access on 29 April 2024).

²⁰⁵ Information here: <environment.ec.europa.eu/topics/urban-environment/green-city-accord_en> (access on 29 April 2024).

²⁰⁶ Directive 2009/147/EC of European Parliament and the Council of 30 November 2009 on the conservation of wild birds.

²⁰⁷ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

²⁰⁸ Article 4 Water Framework Directive, Article 1 Marine Strategy Framework Directive, Article 20 Invasive Alien Species Regulation.

protected areas, consisting of Special Areas of Conservation (SACs) hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, and SPAs designated under the BD. These sites are subject of the special protection regime detailed in Article 6 HD.²⁰⁹

Since Member States shall designate Natura 2000 sites based on objective and scientific criteria, irrespective of economic, social, and cultural requirements (Article 4 HD), these sites may be located within urban boundaries. Indeed, there are 11,000 Natura 2000 sites within EU cities, including 25 EU capitals, representing 15% of the overall network.²¹⁰ When a Natura 2000 site is located within a city, the special protection regime applies. However, the rules on restoring Natura 2000 sites, even when located within cities, will not be developed here.²¹¹

Both Nature Directives contain provisions on restoration, which is considered a core conservation strategy, despite the absence of definitions.²¹²

The BD recognizes that *the restoration of a sufficient diversity and area of habitats is essential to the conservation of all species of birds*. Article 3 BD requires Member States to adopt measures to preserve, maintain or *re-establish* a sufficient diversity and area of habitats for all species of wild birds, to keep populations at a level corresponding to ecological, scientific, and cultural requirements, while considering economic and recreational requirements (Article 2 BD). The requisite measures include the creation of SPAs for species mentioned in Annex I, the re-establishment or creation of biotopes, and the conservation and management of habitats inside *and outside* SPAs (Article 3(2) BD), including habitats located within cities. However, restoration provisions outside SPAs are more general than those applicable inside.²¹³

The HD aims to maintain or restore specific habitats and species to a *favourable conservation status* (Article 2(2) HD).²¹⁴ The focus of the HD is on *listed* habitats, which shall enter the Natura 2000 network, and *listed* species, unlike the BD which establishes a general protection system applicable to all wild birds.

The Natura 2000 network is the primary, but not the only, way of achieving HD's aim

²⁰⁹ Member States are required to establish conservation measures for Natura 2000 sites, focusing on maintaining, restoring, and enhancing habitats and species populations at favourable conservation status. Preventive measures must be taken to prevent deterioration and disturbance of species, extending beyond protected areas. Projects or plans with potential impacts on Natura 2000 sites must undergo appropriate assessment to ensure no harm to site integrity, potentially considering mitigation measures. If a project is deemed necessary despite negative assessment, as there are no alternatives and for imperative reasons of overriding public interest, compensatory measures must be implemented. See: Telesetsky *et al.* (2016), pp. 240–247, 252–262; Schoukens (2017a); Schoukens (2017b), Squintani (2020), Schoukens and Cliquet (2016), and EC (2018).

²¹⁰ The two capitals not hosting a Natura 2000 site are Bucharest and Nicosia. EC (2020), p. 13; EC-DGE (2020), pp. 13–18.

²¹¹ The reader may refer to Telesetsky *et al.* (2016), pp. 240–247, 252–262.

²¹² Schoukens (2017b), pp. 2–3; Telesetsky *et al.* (2016), p. 147.

²¹³ EC (2022c), p. 218.

²¹⁴ Habitats have favourable conservation status when their natural range and areas are stable or increasing, the vital structure and functions are likely to exist for the foreseeable future, and the conservation status of its typical species is favourable (Article 1(e)); species have favourable conservation status when the population is maintaining itself on a long-term basis, its natural range is stable, and there is a sufficiently large habitat to maintain its populations on a long-term basis (Article 1(i)).

to contribute towards ensuring biodiversity through conservation of natural habitats and wild fauna and flora in EU. Consequently, HD's restoration obligations are not confined to Natura 2000 sites, but restoration in the wider landscape, including urban areas, is functional to achieving the HD's objective and may be *implicitly* required by at least two provisions of the HD.²¹⁵

Firstly, restoration in the wider landscape may be necessary to avoid external disturbances that may cause deterioration of habitats and species within Natura 2000 sites (Article 6(2) HD).²¹⁶ For instance, a Member State may need to restore an urban river or pond if its waters flow into a Natura 2000 site and cause such disturbance as to risk its deterioration.

Secondly, restoration activities may be required under Article 10 HD on connectivity. Member States should encourage the management of landscape features of major importance for the migration, dispersal, and genetic exchange of wild fauna and flora (*e.g.*, urban parks) within their land-use planning and development policies, aiming to improve the ecological coherence of Natura 2000 network. However, this is a weak, non-binding, provision.²¹⁷

Unlike the habitats provisions, the species protection system based on a species-approach applies to the listed species across their natural range, regardless of their presence within or outside Natura 2000 sites. Therefore, it is prohibited to deliberately kill, capture, or disturb a protected species present within a city, or deliberately destroy their eggs or breeding or resting sites (Article 12 HD).²¹⁸ The Commission clarified that Article 12 does not cover proactive habitat management measures such as restoration of habitats/population.²¹⁹ Nonetheless, if breeding or resting sites are destroyed, the EU Court of Justice seems inclined to recognize a requirement to restore a species that is in an unfavourable conservation status due to a State's failure to ensure an adequate protective framework, even in the absence of an express restoration obligation in the HD.²²⁰ Article 12 has not (yet) been interpreted to include an obligation to restore species beyond the maintenance or improvement of actual sites of protected species.

Lastly, Article 22(a) HD invites States to "study the desirability" of re-introducing protected native species if this contributes to their conservation, based on investigation and after public consultation. This provision implements Article 11(2) of the Bern Convention (Section 3.3.2), but it is weaker since the latter *encourages* the reintroduction of protected native species.

²¹⁵ Schoukens (2017b), pp. 4, 21–22; Telesetsky *et al.* (2016), p. 148; Verschuuren (2010), pp. 435–436; EC (2022c), p. 218.

²¹⁶ EC (2018), p. 26; Schoukens (2017b), p. 21.

²¹⁷ Verschuuren (2010), p. 436.

²¹⁸ Derogations to this strict protection regime are permitted, subject to satisfaction of the conditions of Article 16 HD.

²¹⁹ EC (2021), pp. 15, 30.

²²⁰ *European Hamster* (2011); Schoukens (2017a), pp. 53–54; Telesetsky *et al.* (2016), pp. 151–153.

4.3.1 Fitness check of the EU Nature Directives

The EU has in place an advanced legislative framework for ecosystems protection which partially mandates restoration efforts from Member States, yet significant implementation and regulatory gaps hinder and slow down progress.²²¹

Most EU habitats remain in unfavourable status due to many pressures; with reference to urban ecosystems, habitat changes, pollution, and nutrient enrichment have a high impact on urban biodiversity, followed by invasive species, climate change and exploitation.²²²

A recent study highlighted a large number of barriers to ecological restoration; interestingly, the most important ones are not related to environmental issues.²²³ These are: insufficient funding (economic barrier), low political priority (political barrier), conflicting interests of different stakeholders (social-cultural barrier), lack of integrated land use planning and difficulty in obtaining property rights over the area to be restored (legal barriers). The first environmental barrier identified (high level of degradation) appears in the second tertile of barriers identified.

Other studies connected the limited success of restoration in Europe to many additional interacting factors, including lack of shared definitions, knowledge gaps, uncertain legislative requirements, insufficient stakeholder engagement, negative impacts of subsidies, weak enforcement, limited human capacity and resources, challenges in defining restoration goals and measures, lack of baseline data and scenario, inconsistent long-term monitoring across the EU, and an incomplete understanding of the socio-economic benefits of restoration.²²⁴ The complexity of ecosystems restoration in Europe is further compounded by the diverse range of participants and the varying ecological, governance, and socio-economic contexts within the EU.

The Commission has recently identified the key *legal* reasons for the inability to halt biodiversity loss.²²⁵ These include: reliance on voluntary targets; absence of specific restoration norms; fragmented rules; absence of deadlines to maintain or restore habitats and species to their favourable conservation status; lack of requirement to restore ecosystems outside Natura 2000 sites; absence of requirement for Member States to prepare restoration plans; absence of definition and common restoration criteria; absence of agreed methodology to map, assess, monitor and report on ecosystems condition. These factors, along with low political priority and insufficient funding for restoration activities, are the most significant contributors to the

²²¹ Cortina-Segarra *et al.* (2021), pp. 1–3, 12–14.

²²² EEA (2015), p. 51; EC (2015), p. 7.

²²³ Cortina-Segarra *et al.* (2021), pp. 7–14.

²²⁴ Milieu *et al.* (2016), p. 15; Schoukens (2017b), pp. 4.

²²⁵ EC (2022b), pp. 7–8, 30–36; EC (2022d).

ongoing crisis.²²⁶ Recognizing these problems, the Commission proposed a dual strategy: setting legally binding restoration targets for degraded ecosystems, and improving implementation of existing legislation, to prevent any further decline in the conservation status of protected habitats and species.

4.4 Urban ecosystem restoration in the Nature Restoration Law

4.4.1 The context of the proposal and its timeline

In June 2022, the Commission proposed the adoption of a regulation on nature restoration, the Nature Restoration Law (NRL), based on Article 192(1) TFEU.²²⁷ Remarkable is the choice of legal instrument, since a regulation allows the system to operate immediately throughout the EU, ensuring promptness, consistency and coherence across the Union.²²⁸

This proposal underwent negotiations between EU Parliament and EU Council. By November 2023, a provisional agreement was reached, welcomed by the Commission.²²⁹

The EU Parliament formally adopted the NRL in February 2024. However, in March 2024, the Belgian Presidency of the EU Council decided to delay the vote on the NRL, due to concerns about insufficient support. As of May 2024, the legislative process is on hold, and it is unclear whether the NRL will be passed in its current form, if changes will be negotiated, or if it will be adopted at all. Nonetheless, its contents will be analysed to discuss what it could add to the current legislative framework, its alignment with the EU Biodiversity Strategy to 2030, and its potential contribution to achieving the EU's global commitments under the CBD.

4.4.2 Structure of the Nature Restoration Law

The NRL combines an overarching, non-enforceable, objective to contribute to the continuous, long-term, and sustained recovery of biodiversity, to climate mitigation and adaptation objectives, and to land degradation neutrality (Article 1 NRL), with various binding restoration targets for specific ecosystems, particularly those with the greatest potential to capture and store carbon and to prevent and reduce the impact of natural disasters, including terrestrial, coastal, and freshwater, marine, urban, agricultural and forest ecosystems, and for pollinators (Articles

²²⁶ Schoukens and Cliquet (2016), pp. 2–3; Schoukens (2017b), pp. 4–6; and Hoek (2022), pp. 320–321.

²²⁷ EC (2022a). The Impact Assessment accompanying the proposal studied four different policy options. The baseline option consisted in the implementation of the Green Deal and the Biodiversity Strategy to 2030 without binding restoration targets; the second option foresaw only an EU-wide binding restoration target; the third option provided for many binding ecosystem-specific restoration targets directly applicable to Member States; the fourth option combined an overarching objective with several specific-ecosystems restoration targets. The EC chose the fourth policy option as it resulted the best in terms of effectiveness, efficiency, policy coherence, subsidiarity and proportionality. EC (2022b), pp. 52 *et seq.*, 112–113.

²²⁸ Regulations are binding and directly applicable in Member States without the need of incorporation, unlike directives (Article 288(2) TFEU).

²²⁹ CEU (2023).

4 to 12 NRL). In addition, the NRL includes an enhanced implementation framework discussed in Section 4.4.3. Overall, restoration measures should cover at least 20% of EU land and 20% of EU sea by 2030, and all degraded ecosystems by 2050 (Article 1(2) NRL). Similar to the BD and HD, the NRL applies only to the European territory of Member States (Article 2 NRL).²³⁰

The NRL sets targets for ecosystems with readily available data and monitoring mechanisms (*e.g.*, habitat types listed in Annex I HD, and habitats for species protected under the BD and HD), and for ecosystems that lack comprehensive data and monitoring, Member States are expected to show a positive trend in key biodiversity indicators. At the same time, a process to develop an EU-wide methodology for assessing the condition of these ecosystems will be launched, to facilitate the establishment of specific, additional restoration targets in the future.

Article 3(3) contains the first EU legislative 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, through improving an area of a habitat type to good condition, re-establishing favourable reference area, and improving a habitat of a species to sufficient quality and quantity [...], and meeting the targets and fulfilling the obligations under Articles 8 to 12, including reaching satisfactory levels for the indicators referred to in Articles 8 to 12”.

This definition introduces new concepts not derived from the Nature Directives.²³¹ Active restoration measures are particularly effective when ecosystems have been profoundly degraded or require regular management, and include replanting mixed native woodland, reconnecting a river with its floodplain, greening cities and buildings. Passive restoration measures allow for natural recovery by protecting an area from human pressures (*e.g.*, setting caps of pollutant emissions). Both types of measures aim to aid the recovery of an ecosystem to improve its structure and functions, without referring to any kind of historical trajectory, and this clearly deviates from the ecological definition of restoration discussed in Section 2.3.

The goal of restoration of habitats should be to enhance them to a state of *good condition*. This is defined as a state in which the key characteristics of the habitat type, especially its structure, functions, and typical species or species composition, reflect a high degree of ecological integrity, stability, and resilience, which are crucial for its long-term preservation.²³²

²³⁰ The Commission’s proposal had a wider geographical scope as it applied to the entire Member States’ territory.

²³¹ Hoek (2022), p. 325.

²³² Cliquet *et al.* (2023) claims that the definition lacks a reference to “absence of threats” to be consistent with SER principles.

The NRL sets specific binding targets for listed terrestrial, coastal, and freshwater ecosystems, even when located within city boundaries (Article 4). Member States shall adopt restoration measures to improve the conditions of habitats not in good condition, prioritizing Natura 2000 sites, and to re-establish the listed habitat types with the aim of reaching *favourable reference area*²³³.²³⁴ Certain thresholds are indicated for such purpose, while derogations are possible for very common and widespread habitat types.²³⁵

Article 4(11) to (13) introduces a non-deterioration principle which has been diluted compared to the Commission's proposal. Initially, the non-deterioration clause was an unqualified obligation of result. The current NRL has made it an obligation of conduct, qualified in terms of significance: Member States shall adopt measures *aimed to* ensure that restored areas do not *significantly* deteriorate. Moreover, Member States shall *endeavour* to adopt measures to prevent *significant* deterioration of areas hosting listed habitats in good condition or needed to meet Article 4(17) targets. Failure to achieve these outcomes does not imply a failure to comply with the obligation to implement measures suitable for reaching these outcomes. In areas outside Natura 2000 sites, the non-deterioration clause may be applied at a biogeographical regional level, provided compensatory measures are taken for each significant deterioration (Article 15(3)(g)). Exemptions are provided for plans or projects of overriding public interest for which no less damaging alternative solutions are available (Article 4(14) and (15)).²³⁶ It is clear that, given the novelty of restoration obligations for habitats outside Natura 2000 sites, guidance from the Commission would be more than welcome.²³⁷

4.4.3 Implementation of the Nature Restoration Law

The NRL includes an implementation framework, based on National Restoration Plans to be prepared by each Member State considering the best and latest scientific evidence available (Article 14 NRL). These Plans shall cover the period up to 2050, with interim deadlines aligned with the specific targets, and must contain certain information, including the areas to be restored, justification of any derogations, description of the measures planned to meet the targets, timeline for implementation, financial needs, and synergies with climate change, energy and disaster prevention (Article 15 NRL).

²³³ *I.e.*, minimum area necessary to ensure the long-term viability of the habitat type and its typical species (Article 3(8) NRL).

²³⁴ Cliquet *et al.* (2023) suggest that compensation measures adopted in the context of projects under Article 6(4) HD should not be considered under the NRL restoration targets, in line with CJEU case law (*Nitrogen Deposition* (2018)).

²³⁵ Measures shall regard 30% of degraded habitats by 2030; 60% by 2040 and 90% by 2050; Member States shall adopt measures to re-establish lost habitat types on 30% of the area needed to reach favourable reference area by 2030; 60% by 2040 and 100% by 2050.

²³⁶ Renewable energy and national defence projects are presumed as being of overriding public interest (Articles 6 and 7 NRL).

²³⁷ Cliquet *et al.* (2023), pp.8–9.

The Commission assesses the compliance of the drafts National Restoration Plans with the formal requirements set and its adequacy for meeting the targets and fulfilling the obligations under the NRL (Article 17 NRL). Member States must consider the Commission’s observations, finalise and publish the final Plan within specific timelines. The Plans shall be revised every ten years (Article 19 NRL) and if Commission deems progress insufficient to meet the targets and fulfil NRL obligations, it may request the Member State concerned to submit a revised draft of National Restoration Plan with additional measures (Article 19(3) NRL).

Member States shall comply with monitoring and reporting obligations set out in Articles 20 and 21 NRL, which would enable regular assessment of progress towards achieving the specific targets, and the timely implementation of corrective measures. With particular regard to reporting, Member States shall report every three years, *inter alia*, on the area subject to restoration measures and their contribution to the EU commitment of planting 3 billion additional trees, and every six years on the progress in implementing their National Restoration Plans and in meeting the restoration targets.

4.4.4 Urban ecosystems restoration

The NRL pays attention to urban ecosystems, which are the least protected by existing Nature Directives.²³⁸ According to the NRL, restoring urban ecosystems means increasing *urban green spaces* and *urban tree canopy cover* in those local administrative units classified as cities, and towns and suburbs.²³⁹ Article 8 NRL includes the following three targets, complementing the general provision of Article 4 on terrestrial ecosystems:

Target U1 no net loss (Article 8(1) NRL)	Target U2 urban green space increase (Article 8(2) NRL)	Target U3 urban tree canopy cover increase (Article 8(3) NRL)
<i>By 31 December 2030, Member States shall ensure that there is no net loss in the total national area of urban green space and of urban tree canopy cover in urban ecosystem areas [...], compared to [year of entry into force of this Regulation]. For the purposes of this paragraph, Member States may exclude from those total national areas the urban ecosystem areas in which the share of urban green space in the urban centres and urban clusters exceeds 45 % and the share of urban tree canopy cover exceeds 10 %.</i>	<i>From 1 January 2031, Member States shall achieve an increasing trend in the total national area of urban green space, including through the integration of urban green space into buildings and infrastructure, in urban ecosystem areas, [...] measured every six years from 1 January 2031, until a satisfactory level as set in accordance with Article 14(5) is reached.</i>	<i>Member States shall achieve, in each urban ecosystem area, determined in accordance with Article 14(4), an increasing trend of urban tree canopy cover, measured every six years from 1 January 2031, until the satisfactory level identified as set in accordance with Article 14(5) is reached.</i>

²³⁸ Only 3% of urban ecosystems is protected as Natura 2000 site; Maes *et al.* (2021), p. 26; EC (2022b), pp. 14–15.

²³⁹ Urban green space includes trees, bushes, shrubs, permanent herbaceous vegetation, lichens and mosses, ponds and watercourses found within cities or towns and suburbs as defined in Article 2(17) and (18); urban tree canopy cover refers to the urban area covered by the overhead layer of branches and leaves of trees, when viewed from above.

During the legislative process, the Commission’s proposal has been significantly weakened. The following table includes the four targets originally proposed by the Commission:

Target <i>ex-U1</i> no net loss (<i>ex-Article 6(1) NRL</i>)	Target <i>ex-U2</i> urban green space (<i>ex-Article 6(2) NRL</i>)	Target <i>ex-U3</i> urban tree canopy cover (<i>ex-Article 6(2)(a) NRL</i>)	Target <i>ex-U4</i> green buildings (<i>ex-Article 6(2)(b) NRL</i>)
<i>Member States shall ensure that there is no net loss of urban green space, and of urban tree canopy cover by 2030, compared to 2021, in all cities and in towns and suburbs.</i>	<i>Member States shall ensure that there is an increase in the total national area of urban green space in cities and in towns and suburbs of at least 3 % of the total area of cities and of towns and suburbs in 2021, by 2040, and at least 5 % by 2050.</i>	<i>Member States shall ensure a minimum of 10 % urban tree canopy cover in all cities and in towns and suburbs by 2050.</i>	<i>Member States shall ensure a net gain of urban green space that is integrated into existing and new buildings and infrastructure developments, including through renovations and renewals, in all cities and in towns and suburbs.</i>

The Commission’s proposal required Member States to ensure no net loss of urban green spaces and urban tree canopy cover by 2030, compared to 2021, in all cities and towns and suburbs (Target *ex-U1*). Article 8(1) of the agreed text of NRL postpones the baseline date to the year of entry into force of the NRL (Target U1). More importantly, it states that the no net loss criterion shall be calculated at national level and not at the individual city level, and Member States may exclude those areas where the share of urban green space exceeds 45% and the share of urban tree canopy cover exceeds 10%. While this amendment has not deprived the target of its measurability character, it significantly increased Member States flexibility. Switching from a city-level to a nation-level scope for the no net loss rule means that one city may suffer loss of green spaces provided such loss is recovered elsewhere, but this overlooks the fact that urban ecosystem services are inherently local and impact on health, air quality, water drainage, local temperature control, and more. Furthermore, “greener” cities may be excluded from the relevant area, meaning they may suffer loss of green spaces or tree canopy cover without the need to recover such loss elsewhere.

From 1 January 2031, Member States are required to *achieve an increasing trend* in the total national area of urban green space, and an *increasing trend* of urban tree canopy cover in each urban ecosystem area, until a satisfactory level is reached (Targets U2 and U3). This provision has been significantly weakened compared to the Commission’s proposal, which set minimum thresholds with defined deadlines (Targets *ex-U2* and *ex-U3*).²⁴⁰

The agreed text of NRL also struck the specific target proposed for ensuring a net gain of urban green space integrated into existing and new buildings and infrastructures developments in all cities, towns and suburbs (Target *ex-U4*). This integration is now contemplated as

²⁴⁰ Target *ex-U3* was particularly criticized due to fears that it might freeze urban development. See Hoek (2023), p. 978, who strongly contest this view.

one of the means to reach the increasing trend in the total national area of urban green space.

Member States shall map urban ecosystem areas, which may include the entire city or town and suburb, or parts thereof (Article 14(4) NRL). By 2030 Member States shall set the satisfactory levels for urban green space and urban tree canopy cover (Article 14(5) NRL) based on the guiding framework to be prepared by the Commission by 2028 (Article 20(10) NRL). Member States are required to monitor urban green space and urban tree canopy cover every six years (Article 20(1)(b) and (6)).²⁴¹

While the NRL does not generally refer to quality or connectivity of urban green spaces, nor it prioritizes native species, these elements are mentioned in two instances. First, Member States shall aim to contribute to the commitment of planting 3 billion trees by 2030 at EU level when implementing urban restoration measures (Article 13), and this contribution shall respect ecological principles, including ensuring species diversity and age-structure diversity, prioritizing native tree species, and increasing ecological connectivity. Second, Annex VII mentions increasing urban green spaces with ecological features, considering species diversity, native species, local conditions, and climate change resilience, as an example of restoration measures.

²⁴¹ Monitoring will be made through data collected by Copernicus Land Monitoring Service (<https://land.copernicus.eu/>).

5 Analysis of the Nature Restoration Law

5.1 Introduction

This Chapter focuses on the Nature Restoration Law (NRL). Recognizing that the text which emerged from the negotiations between the EU Parliament and the EU Council, and which has been adopted by the Parliament but remains stalled at the Council, is substantially different from the Commission’s proposal, it verifies the impact of these changes on the overall coherency of the NRL with the biodiversity policy framework. Similarly, it verifies the NRL’s compliance with the SMART criteria used by the Commission to assess effectiveness, both in general and with specific reference to urban ecosystems restoration targets, although it is worth anticipating that many more factors impact on the effectiveness of legislation.

Finally, this Chapter discusses whether the “upgraded” EU’s policy and legislative framework is aligned with Target 12 of the Global Biodiversity Framework (GBF).

5.2 Policy coherence of the Nature Restoration Law

According to Article 7 TFEU, the EU shall ensure consistency between its policies and activities. *Policy coherence* refers to the systematic promotion of mutually reinforcing policy actions across different areas within the EU’s system. This means ensuring that the objectives and actions of one policy or piece of legislation do not contradict or undermine those of another.

This section discusses how the current text of the NRL relates to the EU Green Deal, the EU Biodiversity Strategy to 2030, and the current EU Nature Directives. However, among the various restoration targets, only those on urban ecosystems will be specifically considered.

The documentation accompanying the Commission’s proposal of the NRL clarifies that the NRL has a general objective, a specific objective, and many operational objectives.

The NRL’s general objective – that the EU’s biodiversity should be on the path to recovery and that all EU ecosystems should be restored – relates to the headline ambition of the EU Biodiversity Strategy to 2030: to ensure that by 2050 all of the world’s ecosystems are restored, resilient, and adequately protected. This is consistent with Articles 192(1) and 191 TFEU.²⁴² In fact, the NRL aims at preserving, protecting, and improving the quality of the environment, as the more ecosystems are restored, the greater their ability to halt and revert biodiversity loss. Ecosystems restoration supports climate change mitigation, especially for those ecosystems acting as major carbon sinks, and adaptation efforts, thus the NRL is coherent with

²⁴² EC (2022b), pp. 42–43.

EU climate legislation. The NRL also supports the EU's objective of mainstreaming biodiversity into all policy areas and decision-making.

The NRL's specific objective is to restore degraded ecosystems across the EU, in particular those that have the most potential to remove and store carbon and prevent and reduce the impact of natural disasters, and to restore the broad range of ecosystems in the EU, with restoration measures in place by 2050 and ecosystems on the path to recovery by 2030. This objective has an ecological nature as it aims to improve the ecosystems' status, but simultaneously assists the continuous provisioning and improvement of ecosystem services.²⁴³ In cities, this is particularly true for those services linked to climate change mitigation and adaptation, and disaster risk prevention.

The EU Biodiversity Strategy to 2030 called for biodiversity to be on the path to recovery by 2030 and *all* ecosystems to be restored by 2050. However, this last objective is hardly realistic; thus, by referring to *broad range* of ecosystems, the NRL ensures achievability while maintaining ambitiousness.²⁴⁴ Furthermore, the dates indicated in the Biodiversity Strategy set the timeline and milestone for restoration efforts, and the NRL is aligned with this timeline; the fact that each ecosystem type has its own temporal target should prevent States from cherry-picking which ecosystems to restore first, based on a convenience/ease criterion.

The NRL's operational objectives cover both the substantive and the procedural provisions.²⁴⁵ In fact, the NRL aims to restore and maintain ecosystems to good conditions by establishing legally binding restoration targets which complement the current legislation and fills most gaps identified, including the restoration of ecosystems not covered by the existing legislation and those outside Natura 2000 sites, like urban ecosystems.

These binding targets are in line with the Biodiversity Strategy to 2030, which acknowledges that protection alone, even in the case of better implementation of existing legislation, would not suffice, but binding restoration targets are needed.

The NRL defines what restoration is and towards what condition ecosystems need to be restored. Furthermore, it ensures comparability and, ultimately, the achievability of targets through an EU-wide methodology that will be developed by the Commission. Additionally, the NRL aims to ensure the proper implementation of targets through an effective implementation

²⁴³ EC (2022b), p. 43.

²⁴⁴ EC (2022a), pp. 3–4.

²⁴⁵ EC (2022b), pp. 46–47.

framework requiring mapping, monitoring, assessment, planning, reporting, enforcement, financing, capacity building, and remedial or corrective action.²⁴⁶ This framework partly builds upon the existing monitoring system provided for by the EU Nature Directives, allowing for immediate actions and quick implementation of restoration targets, and is capable of ensuring an increased implementation of the EU Nature Directives as well, as it sets clear deadline for achieving favourable conservation status for species and habitats covered by these Directives.

The specific targets on urban ecosystems contribute to policies on climate adaptation, for instance by increasing the cooling capability of the natural environment within cities in contrast with the heat island effect; and disaster risk reduction by increasing the permeability of the land and consequent capacity for storm water absorption and reducing the risks of flooding. They align with and complement the Green Infrastructure Strategy by providing a legal framework of action and setting concrete, binding results to be achieved by 2030.

The overarching objective set by Article 1 of the NRL, to contribute to the continuous, long-term, and sustained recovery of biodiversity, to climate mitigation and adaptation objectives, and to land degradation neutrality, elevates the overall level of ambition of the Regulation. This aligns with the EU Green Deal, which calls for the EU to address the main causes of biodiversity loss through measurable objectives.

5.3 Effectiveness or compliance with SMART criteria

In the Impact Assessment accompanying the NRL proposal, the Commission defines *effectiveness* as “the extent to which the option would achieve the specific objectives”.²⁴⁷ In fact, the Commission studied four different structural options for its proposal, choosing the structure delineated in Section 4.4.2 above – grounded on an overarching, non-binding, objective, along with ecosystem-specific binding restoration targets – as this option received a higher score in all dimensions concerned, including effectiveness.²⁴⁸

The Commission has assessed the *effectiveness* of each policy option along dimensions building on the definitions of “SMART”, which refer to the following criteria:

- (i) **Specificity:** the target needs to be clearly articulated in terms of anticipated results, leaving no room for misinterpretation, and avoiding broad outcomes;
- (ii) **Measurability:** the method for reaching the targets and their methods of evaluation, whether quantitative or qualitative, must be described;

²⁴⁶ Hering *et al.* (2023), pp. 6–7, 9–10.

²⁴⁷ EC (2022b), pp. 72–73.

²⁴⁸ EC (2022b), pp. 108–117.

- (iii) **Achievability & Realism:** the targets should be ambitious yet achievable within the set timeframe, considering all constraints in terms of scientific knowledge, human capacity and financial resources;
- (iv) **Time-boundness:** the targets should have a clear timeframe or deadline for their achievement;
- (v) **Coordinated approach:** the law should deliver results across the EU in a harmonised manner thanks to common approaches and methodology;
- (vi) **Comprehensiveness:** the law should address a broad range of ecosystem types;
- (vii) **Enabling measures:** the law should include measures that facilitate implementation and achievement of the targets set.²⁴⁹

Requirements (i)–(iv) refer to the targets contained in the NRL, while requirements (v)–(vii) are more general and refer to the NRL as a whole.

While the Commission’s understanding of *effectiveness* briefly described above is an *ex ante*, theoretical, assessment of the capability of a law to achieve its objective, the real-world impact of the NRL will depend on many other factors.²⁵⁰ These include the degree of implementation of required measures, scientific uncertainties, adverse effects of climate change, pollution, invasive species, conflicts, and more. Other factors such as local variations, unforeseen costs or funding shortages, delays in implementation, scarcity of human resources, failures in enforcement mechanisms, complexity of the administrative structure, and domestic litigation against planned measures also come into play. These variables cannot be evaluated in advance, but can only be assessed after the performance of any policy, program, or action undertaken by the EU and its Member States to implement the NRL’s targets has been evaluated..

The assessment in the following Sections 5.3.1 and 5.3.2 aims at verifying the compliance of the NRL as a whole and urban ecosystems restoration targets with the SMART requirements and, consequently, whether they may be considered effective in the meaning used by the Commission. On the contrary, it does not aim to draw conclusions on their actual real-world impact, *i.e.*, whether the measures envisaged in the NRL will be successful and the intended outcomes (reversing biodiversity loss, restoring urban ecosystems) will be achieved. This clarification is extremely important to qualify the use of “effectiveness” made within this thesis.

5.3.1 Effectiveness of the Nature Restoration Law as a whole

The effectiveness of the NRL as a whole, in the meaning used by the Commission, is

²⁴⁹ EC (2022b), pp. 46, 64–73.

²⁵⁰ EC (2022b), p. 97.

tested in this Section against the requirements (v)–(vii).

With regard to the requirement on *coordinated approach*, the NRL overcomes the fragmentation of the current system as it represents a unique legal instrument exclusively dedicated to the restoration of several types of ecosystems, supplementing the existing legislation. Furthermore, a higher degree of coordination is ensured thanks to the type of legal instrument chosen (*i.e.*, a regulation), which does not need transposition into national law. The EU-wide methodology that will be developed by the Commission to assess the conditions of ecosystems for which there is not yet a methodology in place, set indicators and baselines, and assess progress towards achieving the binding targets, ensures that Member States take actions in a coordinated manner. Furthermore, by requiring Member States to prepare National Restoration Plans, the NRL ensures a coordinated implementation of the planned measures, thus allowing synergies.²⁵¹ Overall, this requirement of *coordinated approach* may be considered met.

With regard to the requirement on *comprehensiveness*, the NRL addresses restoration in numerous ecosystem types. It contains restoration measures for listed terrestrial, coastal, and freshwater ecosystems, including all protected habitats under the Habitats Directive, wetlands, grasslands, river, lake, alluvial and riparian habitats, forests, steppe, and rocky and dune habitats; marine ecosystems; urban ecosystems, rivers connectivity; pollinators; agricultural ecosystems; and forest ecosystems. Therefore, the comprehensiveness requirement is clearly met.

With regard to the requirement on *enabling measures*, the NRL provides many crucial elements that contribute to ensure a greater effectiveness of the law, starting from the choice of legal instrument, which may be considered *per se* an enabling measure, since it allows immediate operativity of the system throughout the EU, ensuring consistency at EU level.

National Restoration Plans are a powerful enabling measure as they force States to map their ecosystems and relevant conditions, plan effective measures, prioritise restoration activities, and set up monitoring systems, while at the same time ensuring adequate financial resources.²⁵² The Plans are subject to periodic review at least every 10 years or when needed. Both the initial Plan and the revised Plans shall need to be submitted to the Commission, who carries out an assessment on formal compliance and adequacy, and may request the submission of a revised Plan with additional measures if progress is deemed insufficient.

The mandatory reporting mechanism is another enabling measure as it allows for regular assessment of progress. Along with the periodical review of the Restoration Plans, these

²⁵¹ For instance, by requiring the restoration of urban ecosystems, it ensures the improvement of quality of water ecosystems, which are strongly affected by catchment land use; Hering *et al.* (2023), pp. 7–8.

²⁵² EC (2022b), pp. 64–66.

measures facilitate engagement, accountability, enforcement, and implementation of the NRL.

Other essential enabling instruments are the Commission's guidelines, and the EU-wide methodology to be developed for evaluating the conditions of ecosystems, establishing indicators and baselines, and assessing progress towards the targets. This will ensure legal clarity as it will allow to rely on clear and common definitions and thresholds, further contributing to the comparability of monitoring and reporting by Member States.²⁵³

Another element impacting positively on the effectiveness of the NRL as a whole, as understood by the Commission, is the introduction of an overarching objective, associated with the ecosystems-specific restoration targets. In fact, despite being non-binding, this overarching objective increases the degree of achievability of the specific targets, as it bears notable relevance for communication and mainstreaming purposes. Furthermore, it links the NRL directly with the Biodiversity Strategy to 2030, and by carving this objective into the regulation text, instead of letting it at policy level, it commits Member States to strive towards its achievement.

Contrariwise, the dilution of the non-deterioration principle risks impacting negatively on the capability of the NRL to ensure a long-term result. In accordance with the non-deterioration principle, restored ecosystems should receive a degree of protection capable of ensuring their full recovery and long-term viability. The Commission qualified this principle as an obligation of result, as Member States were to *ensure* that listed habitats do not deteriorate, except in case of *force majeure*, unavoidable habitat transformation caused by climate change, or a project of overriding public interest for which no less damaging alternative solutions are available. The current formulation of the principle contained in the NRL qualifies it as obligation of conduct whereby Member States shall adopt measures aimed at ensuring that the listed habitats do not *significantly* deteriorate; furthermore, outside Natura 2000 sites, the non-deterioration principle may be applied on the level of each biogeographical region, and do not apply to deterioration caused by the circumstances already listed by the Commission, as well as by natural disasters and action or inaction by third countries. The change in the nature of the non-deterioration obligation, coupled with the introduction of a significance qualification, its applicability at a wider geographical level, and the expansion of the exclusions list, may have detrimental impacts on the long-term effects of the restoration activities carried out.

5.3.2 Effectiveness of urban ecosystems restoration targets

Section 4.4.4 discussed the three targets on urban ecosystems restoration currently incorporated into the NRL. These are Target U1 on no net loss of urban green space and urban

²⁵³ EC (2022b), p. 68.

tree canopy cover by 2030; Target U2 on increasing trend of urban green space from 2031; and Target U3 on increasing trend of urban tree canopy cover from 2031. This Section verifies whether these three targets meet the SMART criteria and, consequently, may be considered effective in the meaning provided by the Commission.

5.3.2.1 Target U1: no net loss by 2030

Starting with the *specificity* requirement, Target U1 sets a clear goal of no net loss in the total national area of urban green space and urban tree canopy cover in urban ecosystem areas. The NRL precisely defines what *urban green space* and *urban tree canopy cover* means; it further delineates the method to draw the boundaries of *urban ecosystem areas*, thus excluding any ambiguity. It clearly articulates its anticipated result, which is unequivocal, therefore it satisfies the requirement at issue.

Moving to the *measurability* requirement, the assessment on progress will be based on data provided by the Copernicus Land Monitoring Service and other available supplementary data provided by the Member State concerned. This makes Target U1 measurable.

With regard to the requirements of *achievability* and *realism*, Target U1 aims to ensure no net loss compared to the present situation (*i.e.*, the date of entry into force of the NRL), within a reasonable timeframe, considering the overall national territory and with the possibility to exclude “greener” cities. This allows for compensation among cities and provides a certain degree of flexibility. Yet, Target U1 remains ambitious enough in light of the growing urbanization in the EU. Furthermore, Target 1 is also realistic considering the current restraint, as the anticipated result requires Member State to avoid that urban green space and urban tree canopy cover suffer net losses, instead of a net increase, and this should not be excessively burdensome. Consequently, Target U1 satisfies also the requirements of *achievability* and *realism*.

Finally, the requirement of *time-boundness* is clearly met, since Target U1 sets a clear deadline to achieve the intended result of no net loss (*i.e.*, 31 December 2030).

In light of the above, Target U1 complies with all SMART requirements; therefore, it may be considered effective in the meaning given by the Commission. As already anticipated, many factors may impact the real-world effectiveness of this target, but this analysis is out of the scope of this thesis.

5.3.2.2 Targets U2 and U3: increasing trend from 2031

Contrary to Target U1, Targets U2 and U3 – which are addressed jointly as they are formulated in an analogous way – do not comply with the SMART criteria.

Firstly, neither of the targets is *specific*. The anticipated results – *i.e.*, an *increasing trend*

in the total national area of urban green space and urban tree canopy cover, measured every six years, until a *satisfactory level* is reached – is formulated in a broad way. It does not set the pace of the *increasing trend*, nor does it clarify what constitutes a *satisfactory level* of total national area of urban green space and urban tree canopy cover, respectively. The decision of what constitute this level will be made by each Member State by the end of 2030, based on the latest scientific evidence, as well as on future guidelines that the Commission is called to adopt by the end of 2028. However, the NRL does not clarify the consequences of setting a *satisfactory level* disregarding the Commission’s guidelines.

Targets U2 and U3 should not raise issues on the *measurability* requirement as the data source for measuring the *increasing trend* would be the same as those of Target U1. However, it remains to be clarified to what extent the integration of urban green space into buildings and infrastructure will be considered for the computation of Target U2 and how this extension to green and blue components incorporated into buildings and infrastructure may be measured.

The *achievability* and *realism* requirements cannot be presently verified since their assessment depends on what the *satisfactory level* to be reached will be, as well as the pace of the *increasing trend*. It also remains to be clarified whether the flexibility consisting in the exclusion of “greener” cities from the calculation is confirmed for Targets U2 and U3.

Finally, with regard to the *time-boundness* requirement, Targets U2 and U3 are both projected into the future, after 1 January 2031, and assume the achievement of Target U1. They do not set a final deadline for reaching the intended result of *satisfactory level*. The only temporal reference contained in the text is the periodicity of the assessment, falling on a six-years’ basis, but this does not constitute, in its current formulation, intermediate deadlines.

In light of the above, acknowledging that Targets U2 and U3, in their current formulation, do not meet the SMART requirements, much of their effectiveness depends on how the Commission will formulate its guiding framework, particularly in relation to the scope and content of guidance (*i.e.*, whether the Commission will only establish the methodology to define the *satisfactory level*, or also intermediate deadlines, quantitative thresholds, or the increase rate that may be considered “satisfactory”), and the degree of discretion left to Member States.

5.3.2.3 Assessment on the targets contained in the Commission’s proposal

Comparing the result of the analysis on the current targets on urban ecosystems restoration incorporated in the NRL with the Commission’s proposal highlights how the overall effectiveness of these targets has been diminished. The Commission worked hard to ensure all targets met the SMART criteria. In fact, Targets *ex-U1*, *ex-U2*, and *ex-U3* were all specific,

measurable, achievable and realistic, and time-bound. Issues might have been raised on the overall level of ambition, particularly of Target *ex*-U3 on tree canopy cover given the current average tree cover.²⁵⁴ However, the Commission stressed the importance to set relatively low targets to stimulate better urban planning instead of restricting urban development.

The only exception was Target *ex*-U4 on the integration of biodiversity in buildings and infrastructures, which did not fully meet the SMART criteria. This target, indeed, was not time-bound, and remained to be discussed how it would be possible to measure progress.

5.4 Alignment with Global Biodiversity Framework

This final Section seeks to connect the international and EU legal systems to assess whether the “upgraded” EU framework on urban ecosystems restoration – *i.e.*, the policy framework comprising the Biodiversity Strategy to 2030 and the Green Infrastructure Strategy, along with the EU Nature Directives and the NRL, assuming its final adoption by the EU Council – is aligned with Target 12 of the GBF, and thus contributes to the achievement of EU’s global commitments under the CBD and the GBF (Section 3.3.3.5).

The GBF’s mission for 2030 is to take urgent action to halt and reverse biodiversity loss, to put Nature on a path to recovery. Its Target 12 on urban ecosystems aims to achieve by 2030 a *significant* increase in the area, quality, connectivity of, access to, and benefits from green and blue urban spaces. It supports efforts to integrate biodiversity into urban planning and to mainstream biodiversity, and pursues objectives such as enhancing native biodiversity, improving human well-being, ensuring inclusive sustainable development, and reducing cities’ environmental footprint. The EU framework will be assessed against this background.

The Green Infrastructure Strategy, the EU Biodiversity Strategy to 2030 and other voluntary initiatives promote a more biodiversity-inclusive urban living that partially contribute to achieving Target 12 of the GBF. The first Strategy promotes the development of green infrastructure as a means to enhance biodiversity in urban areas, mitigate climate change, and increase the resilience of urban areas to climate change impacts. It recognizes the positive impact of green spaces on human health and well-being, and encourages the multifunctional use of green infrastructure. It advocates for the integration of green infrastructure into urban planning and development processes, and emphasizes the importance of connectivity, both within urban areas and between urban and rural areas, to create a coherent and resilient ecological network.

²⁵⁴ The average urban tree cover in 1,000 European cities in 2018 was 28.5%, with Finland having the highest average tree cover (58%) and only Iceland, Cyprus and Malta being on average below the threshold (respectively, 5%, 5.9% and 6.6%). Source: <<https://www.eea.europa.eu/data-and-maps/dashboards/urban-tree-cover>> (accessed on 12 May 2024).

The Biodiversity Strategy to 2030 aims to halt the loss of green urban space and ensure the integration of green infrastructure and nature-based solutions into urban planning, and in building and infrastructure design. It also urges EU cities with more than 20,000 inhabitants to adopt Urban Nature Plans to establish biodiverse, accessible, and interconnected urban green spaces. Under the voluntary initiative *Green City Accord*, signatory cities commit to take stronger actions in the biodiversity area.

The European Green Deal includes the ambitious target of planting over 3 billion additional trees in the EU by 2030 (also in cities) in a manner that respects ecological principles.

All these strategies and initiatives are voluntary, and failure to achieve their objectives does not lead to legal consequences. This voluntary nature of restoration provisions was flagged as one of the reasons preventing the EU from achieving its goal to reverse biodiversity loss.

Moving to the current Nature Directives, their contribution towards achieving Target 12 of the GBF is minimal. There exists no restoration target specific for urban ecosystems. Restoration efforts in urban areas may be required to achieve the objectives of the Habitats Directive and to ensure that Natura 2000 sites do not suffer external disturbances that may cause deterioration, but the focus is more on Natura 2000 sites than on the outer *habitats* to be restored. Urban green spaces might find protection under the provisions on connectivity, as these spaces may be considered landscape features of major importance for the migration, dispersal, and genetic exchange of wild flora and fauna. Again, this provision, not specifically referring to urban ecosystems, is weak as its content is merely the management of these features.

In this context, the NRL represents a significant improvement, due to the binding nature of its targets and its implementation framework. However, it is evident that the targets on urban ecosystems restoration are not fully aligned with Target 12 of the GBF. Considering that Targets U2 and U3 refer to a temporal period beyond the GBF reference period, only Target U1 is relevant for the analysis. This EU target for 2030 aims to ensure no net loss of urban green space (including blue space) at the national level, thus contemplating the potential loss of some urban ecosystems on condition that compensatory measures are taken elsewhere; furthermore, “greener” cities may experience substantial loss of urban green space without needing to compensate elsewhere. As evident, the level of ambition is overall not aligned with the GBF as the letter calls Contracting Parties to ensure a significant increase in urban green areas by the same deadline. At the EU level, an *increasing trend*, not even qualified by significance thresholds, is only contemplated from 2031 onwards, until a *satisfactory level* is reached (Target U2).

While connectivity and prioritization of native biodiversity are central to Target 12 of the GBF, in the NRL they are only partially and indirectly considered in the context of Member

States' collective efforts to plant 3 billion additional trees in urban and rural areas, a target which, already contained in the European Green Deal, has now been translated into law.

Efforts towards ensuring biodiversity-inclusive urban planning, at least in terms of integrating urban green space into buildings and infrastructure, is promoted as one of the strategies to ensure the *increasing trend* in urban green space from 2031. In the Commission's proposal, this was object of a specific target, which was eventually struck. Finally, nothing is said in the NRL on the *quality* of green elements within cities and access to urban green space.²⁵⁵

In conclusion, the analysis of the “upgraded” EU policy and legislative framework carried out in this Section shows that the NRL increases the alignment of the EU framework with Target 12 of the GBF. However, the general level of ambition of the EU in substantive terms (*i.e.*, what it intends to achieve) is lower than the ambition required by the GBF, and the NRL appears to be doomed to fall short of ensuring the achievement of this international target.

One last consideration, though, is worth highlighting. While it is true that Target 12 GBF is more ambitious than the corresponding EU target, the latter should be able to ensure achievement of greater results in light of the very nature of EU law. In fact, the NRL would be binding and directly applicable on EU Member States without the need of prior transposition into national law, ensuring uniform and immediate applicability throughout the entire European territory of the EU. Failures to fulfil the NRL obligations will lead to legal consequences in terms of judicial proceedings before the EU Court of Justice and, ultimately, financial penalties in case of non-fulfilment of judicial decisions. This will also ultimately pave the way for domestic litigation. On the contrary, despite the existence of an enhanced implementing framework, the international targets negotiated under the GBF are not binding as they originate from a COP decision, and there is no international mechanism capable of enforcing the GBF; its implementation is, therefore, dependent on Contracting Parties' will.

²⁵⁵ City parks and green spaces with short-cut grass and non-native short-lived flowers and shrubs, lacking tall and dense vegetation, do not provide ecosystem services of the same quality as natural green spaces; EC-DGE (2020), pp. 9–10.

6 Conclusions

Biodiversity is suffering an escalating and continuous decline everywhere, leading to breach one of the planetary boundaries that are crucial for humans' prosperity. The traditional ecological strategies of protection and conservation, endorsed by the key international and EU legal instruments, are no longer adequate. To ensure Earth's liveability, restoration is now needed more than ever. It is imperative for humans to return to live in harmony with Nature, and this requires significant efforts to aid biodiversity and ecosystems along their recovery path.

Cities are increasingly recognizing the vital importance of incorporating Nature into their environments, given the multitude of ecosystem services it provides, which are essential for ensuring their liveability, sustainability, and resilience, as well as health and well-being of their dwellers. Many initiatives have been launched worldwide, aimed at creating urban parks, de-paving, greening buildings, and installing facilities for hosting birds, pollinators, and other animals. However, the status, trends, and threats to urban biodiversity remain largely unknown and misunderstood. Unlike other ecosystems, urban areas appear only sporadically in biodiversity literature and do not feature prominently in conservation discussions.

This thesis underscores the existence of an increasing international trend in establishing a framework for bringing Nature back into cities. All soft law instruments discussed in this thesis are crucial to ensure engagement and direction of the international community towards the common goal of reversing biodiversity loss also in urban areas, further pursuing the achievement of the sustainable development goals. The momentum provided by the UN Decade on Ecosystem Restoration should be exploited as much as possible to promote the adoption of initiatives aimed at ensuring a better relationship between cities and Nature. The Generation Restoration Cities project by UNEP is a good example which may serve as catalyst towards a nature-based transformation in cities, but its scope – currently involving 19 cities worldwide – should be extended, at least in relation to the number of cities where pilot projects are to be carried out. Furthermore, synergies may arise between the UNEP's project and the initiatives by C40 Cities Climate Leadership Group, which might extend the exchange of best practices in managing and restoring urban nature to as much as 96 leading world cities.

Moving to hard law instruments, the CBD is clearly the main instrument to look at for a comprehensive approach towards managing and restoring ecosystems. Nonetheless, for urban ecosystems, the Ramsar Convention may play an important role in restoring urban wetlands, vital for the overall functioning of urban ecosystems. The Cheonggyecheon stream restoration in Seoul (Korea), the Ballona Wetlands Restoration Project in Los Angeles (USA), and the

creation of the London Wetland Centre (United Kingdom) shed light on the crucial importance of urban wetlands as well as on the services they provide. Under the Ramsar Convention, the Wetland City Accreditation was established as a voluntary accreditation program directed towards promoting best practices in urban wetlands restoration. However, the Convention still lacks official guidelines on how to restore wetlands within urban settlements, therefore their adoption might bring important benefits for the overall implementation of the Ramsar Convention, especially in wetlands not listed as wetlands of international importance.

At the European level, the Bern Convention is a core legal instrument with a strong implementation and enforcement framework which allows for a remarkable level of protection and conservation of wild flora and fauna. However, it does not specifically address urban biodiversity, despite the Standing Committee's acknowledgement in 2008. This body should strive to follow up to its anticipation to integrate urban biodiversity into the Convention's framework and to address the issues relevant to flora and fauna present within urban boundaries. This fortunate development would ensure that urban nature in 45 European States and 4 African States is increasingly protected and benefits from the Convention's strong implementation and enforcement framework. It might ultimately lead to legislative evolutions in the EU as well, given the current absence of consideration of urban ecosystems within the Nature Directives.

Parties to the CBD have finally acknowledged the importance of urban ecosystems for biodiversity. After recognizing the failure of the system previously established and, in particular, that none of the Aichi Targets had been met by 2020, the COPs adopted the Kunming-Montreal Global Biodiversity Framework (GBF). From a substantive point of view, it contains Target 12 on urban green spaces which is dense of elements that Member States should consider when striving towards restoring urban ecosystems, including ecosystems integrity, connectivity, accessibility, and care for native species. This target, along with all other targets under the GBF, is not strictly binding. Notwithstanding the development of an enhanced implementing framework grounded on monitoring, reporting, and voluntary peer-review, CBD's Parties did not establish a specific compliance mechanism with the responsibility of reviewing Parties' commitment to facilitate the achievement of the agreed targets. Such compliance mechanism might provide impetus to international efforts in restoring ecosystems, even with non-binding targets. Clearly, the possibility to negotiate a protocol to the CBD including binding restoration obligations for various ecosystems, including binding provisions on urban green spaces, should be explored; however, at the dawn of the GBF's adoption, and pending the term for submitting the Seventh National Report (*i.e.*, 28 February 2026), this option is remote even in the mind of

the most optimistic individual. It remains to be seen whether the GBF will advance the protection and restoration of urban ecosystems by increasing the number of Contracting Parties adopting targets and measures addressing urban biodiversity. Meanwhile, efforts should be concentrated on developing guidelines, shared definitions, common methodologies, and indicators to ensure full measurability of progress towards Target 12.

In the EU, the way forward to advance the protection and restoration of urban ecosystems is by completing the legislative process for the adoption of the Nature Restoration Law (NRL), stalled at the EU Council. The NRL would fill gaps currently present in the Nature Directives, which do not provide for clear restoration requirements for areas outside Natura 2000 network. At this point, it is unlikely that the text goes back to the negotiation phase with the Parliament to return stronger than it was, therefore for the period up to 2030 States should adopt all requisite measures to ensure no net loss in urban green space and tree canopy cover.

The Commission should start working, in *liaison* with all relevant stakeholders, on the guiding framework for setting the criteria to define the “final” *satisfactory level* to be reached after 2031, which shall be set at a level ambitious enough to allow for a transformative change in EU cities, yet achievable and careful not to unjustifiably hinder urban and infrastructure development. Furthermore, the Commission should explore the possibility to interpret broadly its mandate under the NRL, and therefore to include in the guiding framework references to what pace of *increasing trend* may be considered satisfactory, what results may be considered satisfactory by certain intermediate deadlines, and how connectivity and prioritization for native species shall be incorporated into Member States’ efforts. Finally, the Commission shall clarify how the derogations and flexibility mechanisms provided in the NRL in relation to urban ecosystems restoration should be used – for instance, at what conditions Member States may exclude “greener” cities from the area relevant to the computation of the no net-loss criterion, and how the principle of non-deterioration may be applied to urban ecosystems. The overall aim should be to ensure that the targets for the period after 2031 meet the SMART criteria, safeguarding their effectiveness.

Beyond legislation, the EU should continue to support initiatives aimed at contributing to achieve its policy objectives. For instance, the Green City Accord may be a powerful instrument to mainstream the protection of urban biodiversity, thus implementing the objectives of the Biodiversity Strategy to 2030. However, its current geographical reach is quite limited, as in almost three years only 113 European cities have signed the Accord. The EU could make other initiatives, like the European Green Capital and European Green Leaf, or special funding or other benefits, conditional upon signing the Accord. All policy instruments shall be used to

try and exceed the modest target set for 2030 under the NRL, with a view to align more with Target 12 of the GBF.

In conclusion, the protection and restoration of urban biodiversity is a pressing issue that requires concerted international and regional efforts. The integration of urban ecosystems into the frameworks of international conventions, the adoption of comprehensive urban biodiversity strategies, and the establishment of robust monitoring and reporting mechanisms are all crucial steps towards this goal. At the same time, the role of cities themselves cannot be underestimated. Urban areas have the potential to be catalysts for biodiversity conservation, providing habitats for a wide range of species and contributing to the overall health and well-being of their inhabitants. By embracing nature-based solutions, prioritizing green infrastructure, and actively engaging their citizens in conservation efforts, cities can become key players in the global effort to halt and reverse biodiversity loss. As we move forward, it is essential that we continue to explore and implement innovative strategies for urban biodiversity conservation, drawing on the lessons learned from past initiatives and adapting to the unique challenges and opportunities presented by the urban environment.

Works cited

Academic articles

Brzoska and Spāge (2020)	Brzoska, Patrycja & Spāge, Aiga, “From city-to site-dimension: Assessing the urban ecosystem services of different types of green infrastructure”, <i>Land (Basel)</i> 9:5 (2020), pp. 150-, doi:10.3390/LAND9050150.
Cliquet (2017)	Cliquet, An, “International Law and Policy on Restoration”, in Allison, Stuart K. & Murphy, Stephen D. (eds), “Routledge handbook of ecological and environmental restoration”, Routledge (London) (2017).
Cliquet <i>et al.</i> (2022)	Cliquet, An, Telesetsky, Anastasia, Akhtar-Khavari, Afshin & Decler, Kris, “Upscaling ecological restoration: toward a new legal principle and protocol on ecological restoration in international law”, <i>Restoration ecology</i> 30:4 (2022), doi:10.1111/rec.13560.
Cliquet <i>et al.</i> (2023)	Cliquet, An et al., “Legal assessment of the Proposal for an EU Nature Restoration Law: Report by the Legal Working Group of the Society for Ecological Restoration Europe”, Society for Ecological Restoration Europe – Legal Working Group (2023).
Cliquet and Decler (2019)	Cliquet, An, Decler, Kris, “Linking restoration science and law”, in Richardson, Benjamin & Akhtar-Khavari, Afshin, “Ecological restoration law: concepts and case studies” (Abingdon, Oxon, Routledge, 2019)
Cortina-Segarra <i>et al.</i> (2021)	Cortina-Segarra, Jordi, García-Sánchez, Ismael, Grace, Miriam, Andrés, Pilar, Baker, Susan, Bullock, Craig, Decler, Kris, Dicks, Lynn V., Fisher, Judith L., Frouz, Jan, Klimkowska, Agata, Kyriazopoulos, Apostolos P., Moreno-Mateos, David, Rodríguez-González, Patricia M., Sarkki, Simo & Ventocilla, Jorge L., “Barriers to ecological restoration in Europe: expert perspectives”, <i>Restoration ecology</i> 29:4 (2021), doi:10.1111/rec.13346.
Egoh <i>et al.</i> (2014)	Egoh, Benis N, Paracchini, Maria L, Zulian, Grazia, Schägner, Jan Philipp, Bidoglio, Giovanni & Jones, Julia, “Exploring restoration options for habitats, species and ecosystem services in the European Union”, <i>The Journal of applied ecology</i> 51:4 (2014), pp. 899–908, doi:10.1111/1365-2664.12251.
Ekardt <i>et al.</i> (2023)	Ekardt, Felix, Günther, Philipp, Hagemann, Katharina, Garske, Beatrice, Heyl, Katharine, and Weyland, Raphael, “Legally binding and ambitious biodiversity protection under the CBD, the global biodiversity framework, and human rights law”, <i>Environ Sci Eur</i> 35:80 (2023), https://doi.org/10.1186/s12302-023-00786-5
Fitzmaurice (2017)	Fitzmaurice, Malgosia, “The History of Article 38 of the Statute of the International Court of Justice: The Journey from the Past to the Present”, in Besson, Samantha, and d’Aspremont, Jean (eds), “The Oxford Handbook of the Sources of International Law”, (2017), Oxford Handbooks
Forman (2016)	Forman, Richard T. T., “Urban ecology principles: are urban ecology and natural area ecology really different?”, <i>Landscape ecology</i> 31:8 (2016), pp. 1653–1662, doi:10.1007/s10980-016-0424-4.
Gann <i>et al.</i> (2019)	Gann, George D., McDonald, Tein, Walder, Bethanie, Aronson, James, Nelson, Cara R., Jonson, Justin, Hallett, James G., Eisenberg, Cristina, Guariguata, Manuel R., Liu, Junguo, Hua, Fangyuan, Echeverría, Cristian, Gonzales, Emily, Shaw, Nancy, Decler, Kris & Dixon, Kingsley W., “International principles and standards for the practice of ecological restoration. Second edition”, <i>Restoration ecology</i> 27:S1 (2019), pp. S1–S46, doi:10.1111/rec.13035.
Hering <i>et al.</i> (2023)	Hering, Daniel, Schürings, Christian, Wenskus, Franziska, Blackstock, Kirsty, Borja, Angel, Birk, Sebastian, Bullock, Craig, Carvalho, Laurence, Dagher-Kharrat, Magda Bou, Lakner, Sebastian, Lovrić, Nataša, McGuinness, Shane, Nabuurs, Gert-Jan, Sánchez-Arcilla, Agustín, Settele, Josef & Pe’er, Guy, “Securing success for the Nature Restoration Law”, <i>Science (American Association for the Advancement of Science)</i> 382:6676 (2023), pp. 1248–1250, doi:10.1126/science.adk1658.
Hoek (2022)	Hoek, Niels, “A Critical Analysis of the Proposed EU Regulation on Nature Restoration: Have the Problems Been Resolved?”, <i>European Energy and Environmental Law Review</i> 31:Issue 5 (2022), pp. 320–333, doi:10.54648/EELR2022021.
Hoek (2023)	Hoek, Niels, “Addressing Legal Myths about the Proposed EU Nature Restoration Law”, <i>Verfassungsblog</i> no. 2366–7044 (2023).

Klaus and Kiehl (2021)	Klaus, Valentin H. & Kiehl, Kathrin, "A conceptual framework for urban ecological restoration and rehabilitation", <i>Basic and applied ecology</i> vol. 52 (2021), pp. 82–94, doi:10.1016/j.baae.2021.02.010.
Lord <i>et al.</i> (2003)	Lord, Charles P, Strauss, Eric & Toffler, Aaron, "Natural cities: urban ecology and the restoration of urban ecosystems", <i>Virginia environmental law journal</i> 21:3 (2002), pp. 317-.
Mata <i>et al.</i> (2020)	Mata, Luis, Ramalho, Cristina E., Kennedy, Jade, Parris, Kirsten M., Valentine, Leonie, Miller, Maddison, Bekessy, Sarah, Hurley, Sarrah, Cumpston, Zena & Geneletti, Davide, "Bringing nature back into cities", <i>People and nature</i> (Hoboken, N.J.) 2:2 (2020), pp. 350–368, doi:10.1002/pan3.10088.
Mendes <i>et al.</i> (2023)	Mendes, Ana, Martínez Hernández, Lorena, Badoz, Léa, Slobodian, Lydia & Rabaça, João E., "Towards a legal definition of ecological restoration: Reviewing international, European and Member States' case law", <i>Review of European Community & international environmental law</i> 32:1 (2023), pp. 3–17, doi:10.1111/reel.12476.
Nilon <i>et al.</i> (2017)	Nilon, Charles H., Aronson, Myla F. J., Cilliers, Sarel S., Dobbs, Cynnamon, Frazee, Lauren J., Goddard, Mark A., O'neill, Karen M., Roberts, Debra, Stander, Emilie K., Werner, Peter, Winter, Marten & Yocom, Ken P., "Planning for the Future of Urban Biodiversity: A Global Review of City-Scale Initiatives", <i>Bioscience</i> 67:4 (2017), pp. 332–342, doi:10.1093/biosci/bix012.
Norris <i>et al.</i> (2017)	Norris, Jessica H., Bowers, Keith & Murphy, Stephen D., "Ecological Restoration in an Urban Context", in Allison, Stuart K. & Murphy, Stephen D. (eds), "Routledge handbook of ecological and environmental restoration", Routledge (London) (2017).
Pickett <i>et al.</i> (2001)	Pickett, S. T. A., Cadenasso, M. L., Grove, J. M., Nilon, C. H., Pouyat, R. V., Zipperer, W. C. & Costanza, R., "Urban Ecological Systems: Linking Terrestrial Ecological, Physical, and Socioeconomic Components of Metropolitan Areas", <i>Annual review of ecology and systematics</i> 32:1 (2001), pp. 127–157, doi:10.1146/annurev.ecolsys.32.081501.114012.
Rockström <i>et al.</i> (2009)	Rockström, Johan et al., "Planetary Boundaries: Exploring the Safe Operating Space for Humanity", <i>Ecology and society</i> 14:2 (2009), pp. 32-, doi:10.5751/ES-03180-140232.
Rodrigues <i>et al.</i> (2018)	Rodrigues, Aline Goulart, Borges-Martins, Márcio & Zilio, Felipe, "Bird diversity in an urban ecosystem: the role of local habitats in understanding the effects of urbanization", <i>Iheringia. Série Zoologia</i> vol. 108 (2018), doi:10.1590/1678-4766e2018017.
Russo and Cirella (2021c)	Russo, Alessio & Cirella, Giuseppe T., "Urban Ecosystem Services: New Findings for Landscape Architects, Urban Planners, and Policymakers", <i>Land</i> 10:1 (2021), pp. 88-, doi:10.3390/land10010088.
Russo and Cirella (2023)	Russo, Alessio & Cirella, Giuseppe T., "Urban Ecosystem Services: Advancements in Urban Green Development", <i>Land</i> (Basel) 12:3 (2023), pp. 522-, doi:10.3390/land12030522
Schoukens (2017a)	Schoukens, Hendrik, "Habitat Restoration Measures as Facilitators for Economic Development within the Context of the EU Habitats Directive: Balancing No Net Loss with the Preventive Approach?", <i>Journal of environmental law</i> 29:1 (2017), pp. 47–73, doi:10.1093/jel/eqw028.
Schoukens (2017b)	Schoukens, Hendrik, "Non-Regression Clauses in Times of Ecological Restoration Law: Article 6(2) of the EU Habitats Directive as an unusual ally to restore Natura 2000?", <i>Utrecht law review</i> 13:1 (2017), pp. 124–154, doi:10.18352/ulr.382.
Schoukens and Cliquet (2016)	Schoukens, Hendrik & Cliquet, An, "Biodiversity offsetting and restoration under the European Union Habitats Directive: balancing between no net loss and deathbed conservation?", <i>Ecology and society</i> 21:4 (2016), pp. 10-, doi:10.5751/ES-08456-210410
Sinclair <i>et al.</i> (2017)	Sinclair, A.R.E., Pech, Roger P., Fryxell, John M., McCann, Kevin, Byrom, Andrea E., Savory, C. John, Brashares, Justin, Arthur, Anthony D., Catling, Peter C., Triska, Maggie D., Craig, Michael D., Sinclair, Tim J.E., McLaren, Jennie R., Turkington, Roy, Beyers, Rene L. & Harrower, William L., "Predicting and Assessing Progress in the Restoration of Ecosystems", <i>Conservation letters</i> 11:2 (2018), doi:10.1111/conl.12390
Sirakaya <i>et al.</i> (2018)	Sirakaya, Aysegül, Cliquet, An & Harris, Jim, "Ecosystem services in cities: Towards the international legal protection of ecosystem services in urban environments", <i>Ecosystem services</i> vol. 29 (2018), pp. 205–212, doi:10.1016/j.ecoser.2017.01.001.

Squintani (2020)	Squintani, Lorenzo, “Balancing nature and economic interests in the European Union: On the concept of mitigation under the Habitats Directive”, <i>Review of European Community & international environmental law</i> 29:1 (2020), pp. 129–137, doi:10.1111/reel.12292.
Thompson <i>et al.</i> (2024)	Thompson, Kate, Sherren, Kate, Duinker, Peter N., Terashima, Mikiko & Hayden, Anders, “Building the case for protecting urban nature: How urban planners use the ideas, rhetoric, and tools of ecosystem services science”, <i>Ecosystem services</i> vol. 65 (2024), pp. 101579-, doi:10.1016/j.ecoser.2023.101579.
Van Haaster-de Winter <i>et al.</i> (2022)	van Haaster-de Winter, Mariët A., Dijkshoorn-Dekker, Marijke W. C., Mattijssen, Thomas J. M. & Polman, Nico B. P., “Enhancing Urban Biodiversity: A Theory of Planned Behavior Study of the Factors Influencing Real Estate Actors’ Intention to Use Nature-Inclusive Design and Construction Concepts”, <i>Land (Basel)</i> 11:2 (2022), pp. 199-, doi:10.3390/land11020199.
Verschuuren (2010)	Verschuuren, Jonathan, “Climate Change: Rethinking Restoration in the European Union’s Birds and Habitats Directives”, <i>Ecological Restoration</i> 28:4 (2010), pp. 431–439, doi:10.3368/er.28.4.431.
Wolfrum (2011)	Wolfrum, Rüdiger, “Obligation of Result Versus Obligation of Conduct: Some Thoughts About the Implementation of International Obligations” (2011), Leiden, The Netherlands: Brill Nijhoff, https://doi.org/10.1163/9789047427070_021

Books

Chapin <i>et al.</i> (2011)	Chapin III, F Stuart., Matson, Pamela A. & Vitousek, Peter., <i>Principles of Terrestrial Ecosystem Ecology</i> , 2nd ed. 2011. ed. (New York, NY: Springer New York, 2011).
Forman (2014)	Forman, Richard T. T., “Urban ecology: science of cities” (2014), Cambridge University Press.
Ito (2021)	Ito, Keitaro, “Urban Biodiversity and Ecological Design for Sustainable Cities”, 1st Edition 2021 ed. (Tokyo: Springer Japan, 2021).
Langlet and Mahmoudi (2016)	Langlet, David & Mahmoudi, Said, <i>EU environmental law and policy</i> , 1st ed. (New York: Oxford University Press, 2016).
Richardson and Akhtar-Khavari (2019)	Richardson, Benjamin & Akhtar-Khavari, Afshin, “Ecological restoration law: concepts and case studies” (Abingdon, Oxon, Routledge, 2019).
Russo and Cirella (2021a)	Russo, Alessio & Cirella, Giuseppe T., “Urban Ecosystem Services”, (Basel, Switzerland: MDPI - Multidisciplinary Digital Publishing Institute, 2021).
Russo and Cirella (2021b)	Russo, Alessio & Cirella, Giuseppe T., “Urban Ecosystem Services II: Toward a Sustainable Future” (Basel, Switzerland: MDPI - Multidisciplinary Digital Publishing Institute, 2021).
Telesetsky <i>et al.</i> (2016)	Telesetsky, Anastasia, Cliquet, An & Akhtar-Khavari, Afshin, “Ecological restoration in international environmental law” (London, Routledge, 2017).
Zerbe (2023)	Zerbe, Stefan, “Restoration of ecosystems - bridging nature and humans: a transdisciplinary approach”, 1st ed. 2023. ed. (Berlin, Germany: Springer Spektrum, 2023).

Reports

C40 (2022)	C40, “C40 Green and Healthy Streets Declaration” (2022).
CEPF (2022)	Critical Ecosystem Partnership Fund, “Impact Report 2001-2020” (2022)
Chan <i>et al.</i> (2021)	Chan, L., Hillel, O., Werner, P., Holman, N., Coetzee, I., Galt, R., and Elmqvist, T., “Handbook on the Singapore Index on Cities’ Biodiversity (also known as the City Biodiversity Index)” (2021). Montreal: Secretariat of the Convention on Biological Diversity and Singapore: National Parks Board, Singapore
EC-DGE (2020)	European Commission, Directorate-General for Environment, “Natura 2000 in cities”, Publications Office of the European Union (2020).

EC-DGE (2022)	European Commission, Directorate-General for Environment, “Restoring nature – For the benefit of people, nature and the climate”, Publications Office of the European Union (2022).
EEA (2015)	European Environmental Agency, “State of nature in the EU – Results from reporting under the nature directives 2007-2012”, Technical Report no. 2/2015, Copenhagen (2015).
EEA (2020)	European Environmental Agency, “EEA Report No 10/2020 - State of nature in the EU – Results from reporting under the nature directives 2013-2018”, Luxembourg, Publications Office of the European Union (2020).
IPBES (2019)	Inter-governmental Science-Policy Platform on Biodiversity and Ecosystem Services, “Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services” (2019).
IPCC (2019)	IPCC, “Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems – Summary for Policymakers” (2019), https://doi.org/10.1017/9781009157988.001 .
Lammerant <i>et al.</i> (2013).	Lammerant, J, Peters, R., Snethlage, M., Delbaere, B., Dichie, I., and Whiteley, G., “Implementation of 2020 EU Biodiversity Strategy: Priorities for the restoration of ecosystems and their services in the EU. Report to the European Commission” (2013).
Maes <i>et al.</i> (2021)	Maes, J., Teller, A., Erhard, M., Conde, S., Vallecillo Rodriguez, S., Barredo Cano, J.I., Paracchini, M., Malak, D.A., Trombetti, M., Vigiak, O., Zulian, G., Addamo, A., Grizzetti, B., Somma, F., Hagyo, A., Vogt, P., Polce, C., Jones, A., Carré, A. and Hauser, R., “EU Ecosystem Assessment”, Publications Office of the European Union, Luxembourg (2021), doi:10.2760/846428.
MEA (2005)	Millennium Ecosystem Assessment, “Ecosystems and Human Well-being: Synthesis” (2005), Island Press, Washington, DC.
Milieu <i>et al.</i> (2016)	Milieu, IEEP & ICF, “Evaluation Study to support the Fitness Check of the Birds and Habitats Directives” (2016).
SCBD (2012)	Secretariat of the Convention on Biological Diversity, “Cities and Biodiversity Outlook” (2012)
SCBD (2020)	Secretariat of the Convention on Biological Diversity, “Global Biodiversity Outlook 5” (2020).
SCBD (a)	Secretariat of the Convention on Biological Diversity, “Quick guide to the Aichi Biodiversity Targets – Target 14: Ecosystems and essential services safeguarded”, available here: < https://www.cbd.int/doc/strategic-plan/targets/T14-quick-guide-en.pdf > (last accessed on 9 April 2024)
SCBD (b)	Secretariat of the Convention on Biological Diversity, “Quick guide to the Aichi Biodiversity Targets – Target 15: Ecosystems restored and resilience enhanced”, available here: < https://www.cbd.int/doc/strategic-plan/targets/T15-quick-guide-en.pdf > (last accessed on 9 April 2024)
SCBD (c)	Secretariat of the Convention on Biological Diversity, “Guidance Note to the Kunming-Montreal Global Biodiversity Framework – Target 2: Restore 30% of all Degraded Ecosystems”, available here: < https://www.cbd.int/gbf/targets/2 > (last accessed on 10 April 2024)
SCBD (d)	Secretariat of the Convention on Biological Diversity, “Guidance Note to the Kunming-Montreal Global Biodiversity Framework – Target 11: Restore, Maintain and Enhance Nature’s Contributions to People”, available here: < https://www.cbd.int/gbf/targets/11 > (last accessed on 10 April 2024)
SER (2004)	Society for Ecological Restoration International Science & Policy Working Group, “The SER International Primer on Ecological Restoration” (2004), www.ser.org & Tucson: Society for Ecological Restoration International.
UN (1992)	United Nations Agenda 21 (1992), available at < https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf > (accessed on 2 April 2024).
UN (2018)	United Nations, “The World’s Cities in 2018: Data booklet”, New York (NY, United States of America), United Nations (2018).

UN (2019)	United Nations, Department of Economic and Social Affairs, Population Division, “World Urbanization Prospects: The 2018 Revision” (ST/ESA/SER.A/420), New York (NY, United States of America), United Nations (2019).
UN (2023)	United Nations, “The Sustainable Development Goals Report 2023: Special edition – Towards a Rescue Plan for People and Planet” (2023).
UNEP (2020)	United Nations Environment Programme, “Cities and Climate Change” (2020), available at < https://www.unenvironment.org/explore-topics/resource-efficiency/what-we-do/cities/cities-and-climate-change > (accessed on 11 April 2024).
UN-Habitat (2022)	United Nations Human Settlements Programme (UN-Habitat) (2022), “World Cities Report 2022 – Envisaging the Future of Cities”, Nairobi (Kenya), United Nations Human Settlements Programme (2022).
WEF (2022)	World Economic Forum, “BiodiverCities by 2030: Transforming Cities’ Relationship with Nature – Insight Report”, Cologny/Geneva (Switzerland), World Economic Forum (2022).

EU Law

Legislation and official documentation

CEC (1981)	Council of the European Communities, “Council Decision of 3 December 1981 concerning the conclusion of the Convention on the conservation of European wildlife and natural habitats”, 82/72/EEC, 3 December 1981.
CEU (2020)	Council of the European Union, “Council Conclusions on Biodiversity - the need for urgent action”, 12210/20, 23 October 2020.
CEU (2023)	Council of the European Union, “Proposal for a Regulation of the European Parliament and of the Council on nature restoration - Letter to the Chair of the European Parliament Committee on the Environment, Public Health and Food Safety (ENVI)”, 15907/23, 22 November 2023.
EC (1998)	European Commission, “Communication from the Commission to the Council and the European Parliament on a European Community biodiversity strategy”, COM/98/0042 final, 4 February 1998.
EC (2006)	European Commission, “Communication from the Commission to the Council and the European Parliament on Thematic Strategy on the Urban Environment”, COM/2005/0718 final, 11 January 2006.
EC (2011)	European Commission, “Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions – Our life insurance, our natural capital: an EU biodiversity strategy to 2020”, COM/2011/244 final, 3 May 2011.
EC (2013)	European Commission, “Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions – Green Infrastructure (GI) – Enhancing Europe’s Natural Capital”, COM/2013/249 final, 6 May 2013.
EC (2015)	European Commission, “Report from the Commission to the European Parliament and the Council - The Mid-Term Review of the EU Biodiversity Strategy to 2020”, COM/2015/0478 final, 2 October 2015.
EC (2018)	European Commission, “Managing Natura 2000 sites – The provisions of Article 6 of the ‘Habitats’ Directive 92/43/EEC”, COM/2018/7621 final, 21 November 2018.
EC (2019a)	European Commission, “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Review of progress on implementation of the EU green infrastructure strategy”, COM/2019/236 final, 24 May 2019.
EC (2019b)	European Commission, “Commission Staff Working Document – Additional information on the review of implementation of the green infrastructure strategy - Accompanying the document ‘Report from the Commission to the European Parliament, the Council, the

	European Economic and Social Committee and the Committee of the Regions – Review of progress on implementation of the EU green infrastructure strategy”, SWD/2019/184 final, 24 May 2019.
EC (2019c)	European Commission, “Commission Staff Working Document – Guidance on a strategic framework for further supporting the deployment of EU-level green and blue infrastructure”, SWD/2019/193 final, 24 May 2019.
EC (2019d)	European Commission, “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – The European Green Deal”, COM/2019/640 final, 11 December 2019.
EC (2020)	European Commission, “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 to 2030 – Bringing nature back into our lives”, COM/2020/380 final, 20 May 2020.
EC (2021)	European Commission, “Guidance document on the strict protection of animal species of Community interest under the Habitats Directive”, COM/2021/7301 final, 12 October 2021.
EC (2022a)	European Commission, “Commission Proposal for a Regulation of the European Parliament and of the Council on nature restoration”, COM/2022/304 final, 22 June 2022.
EC (2022b)	European Commission, “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 – Part 1/12, 22 June 2022.
EC (2022c)	European Commission, “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 – Part 2/12, 22 June 2022.
EC (2022d)	European Commission, “Commission Staff Working Document – Evaluation of the EU Biodiversity Strategy to 2020”, SWD(2022) 284 final, 6 September 2022
EP (2021)	European Parliament, “European Parliament resolution of 9 June 2021 on the EU Biodiversity Strategy to 2030: Bringing nature back into our lives”, 2020/2273(INI), 9 June 2021.

Case law – Court of Justice of the European Union

<i>Costa v Enel</i> (1964)	C-6/64 <i>Costa v ENEL</i> (1964) ECLI:EU:C:1964:66.
<i>European Hamster</i> (2011)	C-383/09 <i>Commission v France</i> (2011) ECLI:EU:C:2011:369.
<i>Nitrogen Deposition</i> (2018)	C-293/17 and C-294/17 <i>Coöperatie Mobilisation for the Environment UA and Vereniging Leefmilieu v College van gedeputeerde staten van Limburg and College van gedeputeerde staten van Gelderland</i> (2018) ECLI:EU:C:2018:622.
<i>Simmenthal</i> (1978)	C-106/77 <i>Amministrazione delle Finanze v Simmenthal SpA</i> (1978) ECLI:EU:C:1978:49.
<i>Van Gend & Loos</i> (1963)	C-26/62 <i>van Gend en Loos v Ned Belastingen</i> (1963) ECLI:EU:C:1963:1.
<i>Weser</i> (2015)	C-461/13 <i>Bund für Umwelt und Naturschutz Deutschland v Bundesrepublik Deutschland</i> (2015) ECLI:EU:C:2015:433

International Law

Convention on Biological Diversity

UNEP/CBD/COP/DEC/VI/26	UNEP/CBD/COP/DEC/VI/26, <i>Strategic Plan for the Convention on Biological Diversity</i> , 19 April 2002.
UNEP/CBD/COP/DEC/VIII/15	UNEP/CBD/COP/DEC/VIII/15, <i>Framework for monitoring implementation of the achievement of the 2010 target and integration of targets into the thematic programmes of work</i> , 15 June 2006.

UNEP/CBD/COP/DEC/IX/28	UNEP/CBD/COP/DEC/IX/28, <i>Promoting engagement of cities and local authorities</i> , 9 October 2008.
UNEP/CBD/COP/DEC/X/2	UNEP/CBD/COP/DEC/X/2, <i>The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets</i> , 29 October 2010.
UNEP/CBD/COP/DEC/X/9	UNEP/CBD/COP/DEC/X/9, <i>The multi-year programme of work for the Conference of the Parties for the period 2011-2020 and periodicity of meeting</i> , 29 October 2010.
UNEP/CBD/COP/DEC/X/22	UNEP/CBD/COP/DEC/X/22, <i>Plan of Action on Subnational Governments, Cities and Other Local Authorities for Biodiversity</i> , 29 October 2010.
UNEP/CBD/COP/DEC/XI/8	UNEP/CBD/COP/DEC/XI/8, <i>Engagement of other stakeholders, major groups and subnational authorities</i> , 5 December 2012.
UNEP/CBD/COP/DEC/XI/16	UNEP/CBD/COP/DEC/XI/16, <i>Ecosystem restoration</i> , 5 December 2012.
UNEP/CBD/COP/DEC/XII/9	UNEP/CBD/COP/DEC/XII/9, <i>Engagement with subnational and local governments</i> , 17 October 2014.
UNEP/CBD/COP/DEC/XII/19	UNEP/CBD/COP/DEC/XII/19, <i>Ecosystem conservation and restoration</i> , 17 October 2014.
UNEP/CBD/COP/DEC/XIII/1	UNEP/CBD/COP/DEC/XIII/1, <i>Progress in the implementation of the Convention and the Strategic Plan for Biodiversity 2011-2020 and towards the achievement of the Aichi Biodiversity Targets</i> , 12 December 2016.
UNEP/CBD/COP/DEC/XIII/4	UNEP/CBD/COP/DEC/XIII/4, <i>Biodiversity and climate change</i> , 10 December 2016.
UNEP/CBD/COP/DEC/XIII/5	UNEP/CBD/COP/DEC/XIII/5, <i>Ecosystem restoration: short-term action plan</i> , 10 December 2016.
UNEP/CBD/COP/DEC/XIII/6	UNEP/CBD/COP/DEC/XIII/6, <i>Biodiversity and human health</i> , 14 December 2016.
UNEP/CBD/COP/DEC/XIII/15	UNEP/CBD/COP/DEC/XIII/15, <i>Implications of the IPBES assessment on pollinators, pollination and food production for the work of the Convention</i> , 9 December 2016.
UNEP/CBD/COP/DEC/XIII/23	UNEP/CBD/COP/DEC/XIII/23, <i>Capacity-building, technical and scientific cooperation, technology transfer and the clearing-house mechanism</i> , 16 December 2016.
UNEP/CBD/COP/DEC/XIV/3	UNEP/CBD/COP/DEC/XIV/3, <i>Mainstreaming of biodiversity in the energy and mining, infrastructure, manufacturing and processing sectors</i> , 30 November 2018.
UNEP/CBD/COP/DEC/XIV/4	UNEP/CBD/COP/DEC/XIV/4, <i>Health and biodiversity</i> , 30 November 2018.
UNEP/CBD/COP/DEC/XIV/5	UNEP/CBD/COP/DEC/XIV/5, <i>Biodiversity and climate change</i> , 30 November 2018.
UNEP/CBD/COP/DEC/XIV/6	UNEP/CBD/COP/DEC/XIV/6, <i>Conservation and sustainable use of pollinators</i> , 30 November 2018.
UNEP/CBD/COP/DEC/XV/3	UNEP/CBD/COP/DEC/XV/3, <i>Review of progress in the implementation of the Convention and the Strategic Plan for Biodiversity 2011-2020 and the achievement of the Aichi Biodiversity Targets</i> , 19 December 2022.
UNEP/CBD/COP/DEC/XV/4	UNEP/CBD/COP/DEC/XV/4, <i>Kunming-Montreal Global Biodiversity Framework</i> , 19 December 2022.
UNEP/CBD/COP/DEC/XV/5	UNEP/CBD/COP/DEC/XV/5, <i>Monitoring framework for the Kunming-Montreal Global Biodiversity Framework</i> , 19 December 2022.
UNEP/CBD/COP/DEC/XV/6	UNEP/CBD/COP/DEC/XV/6, <i>Mechanisms for planning, monitoring, reporting and review</i> , 19 December 2022.
UNEP/CBD/COP/DEC/XV/7	UNEP/CBD/COP/DEC/XV/7, <i>Resource mobilization</i> , 19 December 2022.
UNEP/CBD/COP/DEC/XV/8	UNEP/CBD/COP/DEC/XV/8, <i>Capacity-building and development and technical and scientific cooperation</i> , 19 December 2022.
UNEP/CBD/COP/DEC/XV/9	UNEP/CBD/COP/DEC/XV/9, <i>Digital sequence information on genetic resources</i> , 19 December 2022.
UNEP/CBD/COP/DEC/XV/10	UNEP/CBD/COP/DEC/XV/10, <i>Development of a new programme of work and institutional arrangements on Article 8(j) and other provisions of the Convention related to indigenous peoples and local communities</i> , 19 December 2022.
UNEP/CBD/COP/DEC/XV/11	UNEP/CBD/COP/DEC/XV/11, <i>Kunming-Montreal Global Biodiversity Framework</i> , 19 December 2022.

UNEP/CBD/COP/DEC/XV/12	UNEP/CBD/COP/DEC/XV/12, <i>Engagement with subnational governments, cities and other local authorities to enhance implementation of the Kunming-Montreal Global Biodiversity Framework</i> , 19 December 2022.
UNEP/CBD/COP/DEC/XV/13	UNEP/CBD/COP/DEC/XV/13, <i>Cooperation with other conventions and international organizations</i> , 19 December 2022.

Council of Europe

CoE-SCBC (2008)	Council of Europe, Standing Committee of the Bern Convention, T-PVS (2008) 5, <i>Comments of the Bureau of the Standing Committee on Recommendation 232 (2008) of the Congress of Local and Regional Authorities of the Council of Europe on "Biodiversity policies for urban areas"</i> , 2 June 2008.
CoE-SCBC (2021)	Council of Europe, Standing Committee of the Bern Convention, T-PVS (2021) 14, <i>Vision for the Bern Convention for the period to 2030</i> , 3 December 2021.
CoE-SCBC (2022)	Council of Europe, Standing Committee of the Bern Convention, T-PVS/Inf(2022)27, <i>Case-fyle system: Summary of general procedures for the processing of complaints – a resource for the Bern Convention stakeholders</i> , 2 December 2022.
CoE-SCBC (2023)	Council of Europe, Standing Committee of the Bern Convention, T-PVS (2023) 18, <i>Strategic Plan for the Bern Convention for the period to 2030</i> , 1 December 2023.
CoE-SCCLRA (2008)	Council of Europe, Standing Committee of the Congress of Local and Regional Authorities, Recommendation 232 (2008), <i>Biodiversity policies for urban areas</i> , 14 March 2008.

International Law Commission

ILC (2018)	International Law Commission, <i>Draft conclusions on subsequent agreements and subsequent practice in relation to the interpretation of treaties</i> , 2018.
------------	---

Ramsar Convention

RAM/COP/RES/VII/17	COP7 Resolution VII.17 <i>Restoration as an element of national planning for wetland conservation and wise use</i> , 10 May 1999.
RAM/COP/RES/VIII/16	COP8 Resolution VIII.16, <i>Principles and guidelines for wetland restoration</i> , 26 November 2002.
RAM/COP/RES/X/27	COP10 Resolution X.27, <i>Wetlands and urbanization</i> , 4 November 2008.
RAM/COP/RES/XI/11	COP11 Resolution XI.11, <i>Principles for the planning and management of urban and peri-urban wetlands</i> , 1 January 2012.
RAM/COP/RES/XII/10	COP12 Resolution XII.10, <i>Wetland City Accreditation of the Ramsar Convention</i> , 3 July 2015.
RAM/COP/RES/XIII/16	COP13 Resolution XIII.16, <i>Sustainable urbanization, climate change and wetlands</i> , 29 October 2018.
RAM/COP/RES/XIV/4	COP14 Resolution XIV.4, <i>Review of the fourth Strategic Plan of the Convention on Wetlands, additions for the period COP14-COP15 and framework for the fifth Strategic Plan, amending COP12 Resolution XII.2 on The Fourth Strategic Plan 2016-2024</i> , 13 November 2022.
RAM/COP/RES/XIV/10	COP14 Resolution XIV.10, <i>Updating the Wetland City Accreditation of the Convention</i> , 13 November 2022.

UN Framework Convention on Climate Change

UNFCCC (2021a)	UNFCCC, UN FCCC/PA/CMA/2021/10/Add.1, Decision 1/CMA.3 "Glasgow Climate Pact", 8 March 2022.
----------------	--

UNFCCC (2021b)	UNFCCC, “COP26 Glasgow Climate Pact – Presidency Outcomes”.
----------------	---

UN General Assembly

UNGA Res. A/RES/70/1	UNGA Res. A/RES/70/1, <i>Transforming our world: the 2030 Agenda for Sustainable Development</i> , 25 September 2015.
UNGA Res. A/RES/71/256	UNGA Res. A/RES/71/256, <i>New Urban Agenda</i> , 25 January 2017.
UNGA Res. A/RES/73/284	UNGA Res. A/RES/73/284, <i>United Nations Decade on Ecosystem Restoration (2021–2030)</i> , 6 March 2019.
UNGA Res. A/RES/66/288	UNGA Res. A/RES/66/288, <i>The Future We Want</i> , 20 June 2012.
UNGA Res. A/RES/71/313	UNGA Res. A/RES/71/313 (Annex), <i>Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development</i> , 6 July 2017.

