EC
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Research, Assessment, and Development of Documents on Biodiversity, the Impact of Climate Change on Biodiversity, Habitat Restoration, and Long-Term Habitat Management

Assessment of Vulnerable Biodiversity Areas

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The content and views presented herein do not represent the official position of the donors.

2025

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EXECUTIVE SUMMARY

This project “Research, assessment, and development of documents on biodiversity, the impact of climate change on biodiversity, habitat restoration, and long-term habitat management” offers an interdisciplinary approach by integrating spatial planning, legal frameworks, and ecological expertise alongside qualitative, scientific analysis. By combining knowledge from various fields, the aim is to create a comprehensive understanding of biodiversity challenges. The project emphasizes the importance of collaboration among environmental science, policy, and spatial design, creating a foundation for adaptive management strategies informed by both ecological data and spatial dynamics. This ensures that future actions are grounded in a well-informed, comprehensive perspective.
The project aims to identify and map key biodiversity areas at risk, focusing on Prizren, Suharekë, and the Sharr Mountains. Through field assessments, GIS data, spatial maps, spatial ecology analyses, and existing management plan reviews, critical habitats will be identified. These will be compared with historical and current climate patterns to predict future ecological changes and assess the impact of climate variability on biodiversity. Additionally, the project will evaluate the need for habitat restoration, documenting both the ecological and social benefits of restoration efforts.

This report, Assessment of Vulnerable Biodiversity Areas, examines international and European biodiversity frameworks and their relationship to Kosovo’s national policy landscape, with the aim of translating high-level commitments into spatially explicit and actionable priorities for conservation and climate resilience. It emphasizes the need to bridge the gap between policy frameworks and ecological realities by integrating governance instruments with a habitat-centred mapping approach. In doing so, the report highlights how legal commitments, scientific indicators, and spatial analysis can converge to identify vulnerable ecosystems, guide restoration, and support long-term biodiversity management.

BACKGROUND

Kosovo's ecosystems lie at the intersection of multiple pressures—rising temperatures, altered hydrology, land conversion, and fragmented governance—yet they also hold exceptional conservation value, ranging from alpine landscapes to rich riverine habitats. While existing strategies and laws acknowledge this importance, biodiversity monitoring remains incomplete and restoration efforts under-resourced. As climate variability intensifies, sensitive zones face compounding risks, even as community livelihoods and cultural landscapes continue to depend on the services these ecosystems provide.

In this context, a shift is needed from a species-based checklist toward a habitat-centred, spatial, and situated assessment that aligns international ambitions with practical local action. Accordingly, this report:

1. Situates Kosovo's efforts within the CBD/GBF and EU 2030 agendas;
2. Inventories national instruments (laws, administrative instructions, spatial and protected-area plans); and
3. Lays the groundwork for restoration planning, ecological connectivity, and no-regret implementation.

INTRODUCTION

Biodiversity worldwide is in rapid decline, with species loss, ecosystem degradation, and fragmentation accelerating under the combined pressures of climate change, land-use conversion, and unsustainable practices. Because ecological systems and species ranges do not respect administrative borders, the challenge of biodiversity conservation has long been addressed through international agreements and regional strategies. Global frameworks such as the Convention on Biological Diversity (CBD) and its Kunming-Montreal Global Biodiversity Framework (GBF), alongside the European Union's Biodiversity Strategy 2030, have placed biodiversity protection and restoration at the center of environmental and climate agendas. These frameworks emphasize integration of ecological priorities into spatial planning, agriculture, forestry, and other sectors that directly shape landscapes.

Kosovo, while not a signatory to all global treaties, aligns itself with many of these agendas as part of its European integration path and through national strategies on nature protection, climate change, and sustainable development. A comprehensive legal and policy framework exists, ranging from the Law on Nature Protection to sectoral instruments such as forestry and spatial planning legislation. Yet gaps remain in implementation, monitoring, and cross-sectoral coordination. The translation of high-level commitments into spatially explicit, locally relevant action is still uneven, with sensitive habitats facing mounting pressures despite formal recognition of their value.

This report responds to that challenge by assessing the vulnerable biodiversity areas of Kosovo through a multi-scalar lens. It reviews international and European frameworks, situates Kosovo's national policies within these broader agendas, and highlights where alignment is strong and where divergences persist. By connecting governance instruments with a habitat-centered mapping approach, the report aims to prepare the ground for restoration, ecological connectivity, and climate-resilient planning. In doing so, it not only contributes to ongoing efforts to safeguard biodiversity but also underscores the importance of embedding ecological priorities into the future development pathways of Kosovo.

THE CONCEPT OF BIODIVERSITY: HISTORICAL PERSPECTIVES AND INTERNATIONAL INSTRUMENTS

3

BIODIVERSITY, THE VARIETY OF LIFE ACROSS GENES, SPECIES, AND ECOSYSTEMS, BECAME A GLOBAL PRIORITY IN THE LATE 20TH CENTURY THROUGH EFFORTS LIKE THE 1992 CONVENTION ON BIOLOGICAL DIVERSITY. ONCE ROOTED IN EARLY CONSERVATION, IT IS NOW CENTRAL TO SUSTAINABLE DEVELOPMENT, WITH URGENT ACTION NEEDED TO ADDRESS HUMAN-DRIVEN LOSSES AND PROTECT ECOSYSTEMS WORLDWIDE, INCLUDING LOCALLY IN PLACES LIKE KOSOVO.

3. The Concept of Biodiversity: Historical Perspectives and International Instruments

3.1 Foundations and Evolution of the International Biodiversity Discourse

Biodiversity, derived from the combination of “biological” and “diversity,” refers to the variety of life forms across ecosystems and the complex interrelationships among species, their genetic variations, and their habitats. This concept, though vital to the functioning of Earth’s ecosystems, only gained widespread recognition in the late 20th century. It is now understood as a cornerstone of human survival, providing ecosystem services such as pollination, climate regulation, and natural resources. However, biodiversity’s significance as a scientific, societal, and policy concern has evolved significantly over time, reflecting the growing recognition of its importance to human well-being and the natural world.

3.1.1 Origins and Evolution of the Biodiversity Concept

The term “biodiversity” was first coined by Walter G. Rosen in 1985, but its origins can be traced to earlier conservation movements dating back to the late 19th and early 20th centuries. Early conservationists, inspired by the rapid decline of species due to human activities such as habitat destruction and hunting, advocated for the protection of species and landscapes. These early conservation efforts, such as the establishment of national parks and reserves, laid the foundation for the understanding of nature as a delicate, interconnected system.

The true conceptualization of biodiversity, however, began to take shape in the post-World War II era, with the advent of ecology and conservation biology. These disciplines demonstrated how the loss of a single species could disrupt entire ecosystems, revealing the complex interdependencies that define life on Earth. In 1971, the Man and the Biosphere (MAB) Programme, launched by UNESCO, established a global network of biosphere reserves that promoted sustainable development and ecosystem preservation. This initiative was one of the first to recognize that conservation efforts must balance human development with the protection of natural environments [1].

The term “biodiversity” gained prominence in 1986 during the National Forum on Biodiversity in Washington, D.C., where leading scientists and conservationists called for a global understanding of biodiversity as more than just species preservation. It was during this forum that biodiversity was framed as a broader concept, encompassing species diversity, genetic variation, and ecosystem diversity. This moment marked the beginning of a shift toward integrated, ecosystem-based conservation approaches [2].

Fig. 1 : Penland, Dane A. Teleconference on BioDiversity, 1986. 1986. Photograph. Historic Images of the Smithsonian. Smithsonian Institution Archives, Record Unit 371, Box 5. Featured in TORCH, November 1986. Panelists and moderator for the BioDiversity teleconference seated at a table, preparing to go on the air September 24, 1986. From left: Thomas Lovejoy (World Wildlife Federation), Joan Martin-Brown (United Nations Environment Programme), Edward O. Wilson (Museum of Comparative Zoology, Harvard), Maureen Bunyan (moderator, WUSA-TV), Paul Ehrlich (Stanford University), Michael Robinson (NZP) and Peter Raven (Missouri Botanical Garden).

1. *UNESCO. (1971). Man and the Biosphere Programme (MAB).*
2. *Wilson, E. O. (1988). Biodiversity. National Academy Press.*

3.1.2 Biodiversity in the Global Policy Context

As the concept of biodiversity gained traction in the scientific community, it soon became a focal point for international policy. The 1992 Earth Summit in Rio de Janeiro was a key event in this shift, as it resulted in the adoption of the Convention on Biological Diversity (CBD). This legally binding agreement recognized the intrinsic value of biodiversity and set out clear targets for its conservation, sustainable use, and equitable sharing of benefits derived from biodiversity. The CBD marked the first international acknowledgment that biodiversity loss is a global crisis with far-reaching social, economic, and environmental implications [3].

In the years that followed, biodiversity was increasingly framed within the context of sustainable development, and policy frameworks such as the Sustainable Development Goals (SDGs)—particularly Goal 15, which focuses on life on land—emphasized the importance of biodiversity for achieving long-term global sustainability. International conventions, agreements, and scientific assessments have continuously underscored the interconnectedness between biodiversity and human health, economic stability, and environmental well-being [4].

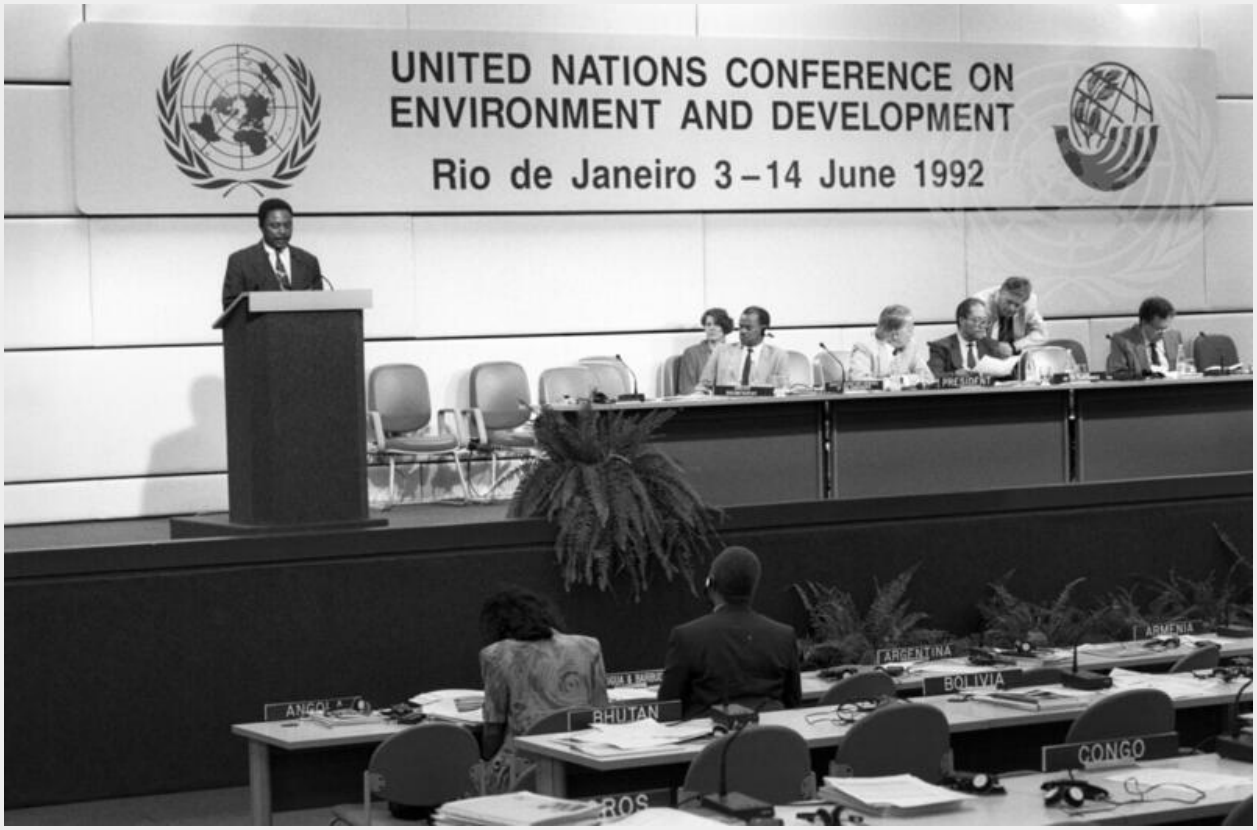


Fig 2. United Nations Photo. Pepin Mongockodji, Minister for Environment and Tourism of Gabon, Addresses the United Nations Conference on Environment and Development (UNCED). Photograph by Michos Tzovaras. June 3, 1992. Rio de Janeiro, Brazil. UN Photo, Unique Identifier: UN7565760. https://media.un.org/photo/en/asset/oun7/oun7565760.

3. *United Nations. Convention on Biological Diversity: Text and Annexes. United Nations, 1992. https://www.cbd.int/doc/legal/cbd-en.pdf.*
4. *United Nations. "Sustainable Development Goals." United Nations, 2015. Accessed February 5, 2025. https://www.un.org/sustainabledevelopment/biodiversity/.*

3.1.3 The Urgency of Biodiversity Today

In the present day, the urgency of addressing biodiversity loss has never been clearer. The rates of species extinction are now estimated to be 1,000 to 10,000 times higher than natural background levels due to human-driven factors such as deforestation, climate change, pollution, and habitat destruction. These alarming statistics highlight the fragility of Earth's ecosystems and the fundamental services they provide, such as water purification, soil fertility, and climate regulation. Loss of biodiversity not only affects the stability of ecosystems but also threatens global food security and human health.

The IPBES Global Assessment Report on Biodiversity and Ecosystem Services (2019) revealed that nearly one million species are at risk of extinction within decades unless urgent action is taken [5]. The report emphasizes the need for transformative changes to reverse biodiversity loss, including the restoration of ecosystems, the reduction of resource exploitation, and the

mainstreaming of biodiversity into all sectors of society.
Efforts to raise awareness about the biodiversity crisis have included major global initiatives such as the United Nations Decade on Ecosystem Restoration (2021–2030), which aims to restore degraded ecosystems and halt biodiversity loss. While this initiative itself is not legally binding, it is supported by legally binding global frameworks such as the Global Biodiversity Framework (Kunming-Montreal Framework, COP15, 2022). Adopted under the legally binding Convention on Biological Diversity (CBD), the framework includes specific and measurable commitments, such as the “30x30 target” to protect 30% of land and sea areas globally by 2030 and mandates to restore degraded ecosystems. These commitments emphasize the importance of integrating biodiversity conservation into policy and development strategies at all levels—from local to global.

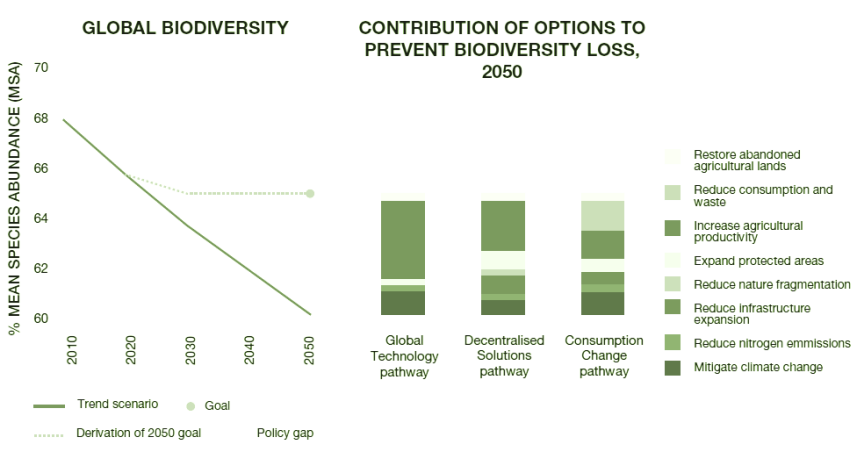


Figure 5 1 B Measures in the alternative pathways that contribute to biodiversity goals.

The Rio+20 scenarios have also been used to explore the impact of alternative pathways on extinction risk and abundance of large mammals, revealing that both bottom-up behavioural change (Consumption Change) and top-down technology and policy changes (Global Technology) can reverse global biodiversity decline in the short term, but the onset of delayed climate change impact may require further mitigation strategies.

This study was also one of first to discuss synergies and trade-offs among food, biodiversity, energy, health and climate targets (see Table SM 5.3.3), some of which were explicit in the models. However, some potential trade-offs remain unquantified, such as the use of pesticides and their impacts on health and biodiversity. Source: PBL (2012).

Fig.3 : Measures in the Alternative Pathways That Contribute to Biodiversity Goals.” In Global Assessment Report on Biodiversity and Ecosystem Services, p 790. 2019. https://www.ipbes.net/global-assessment.

5. *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Global Assessment Report on Biodiversity and Ecosystem Services. 2019. https://ipbes.net/global-assessment. “The rate of species extinction is currently at least tens to hundreds of times higher than it has averaged over the past 10 million years, and the rate of global biodiversity loss is accelerating. It is estimated that the current extinction rate is 1,000 to 10,000 times higher than the natural background rate, primarily due to human activities such as land-use change, direct exploitation of organisms, climate change, pollution, and the spread of invasive species.” (IPBES, 2019)*

3.1.4 Biodiversity in Kosovo: A Local Context within a Global Framework

In Kosovo, biodiversity faces a complex array of pressures that mirror broader global environmental trends while also reflecting region-specific challenges. Key threats include the fragmentation of habitats due to urbanization and infrastructure development, unsustainable agricultural practices that degrade soil and water quality, and the inadequate enforcement of environmental regulations, which hampers conservation efforts [6]. Additionally, illegal logging,

pollution, and the impacts of climate change further exacerbate the vulnerability of Kosovo's ecosystems.

Despite these challenges, Kosovo possesses significant conservation potential, characterized by its rich mosaic of diverse habitats, endemic species, and unique landscapes that span from alpine environments to riverine ecosystems. These natural assets not only harbor biodiversity of national and regional importance but also offer valuable opportunities for sustainable management, eco-tourism, and ecosystem services that support local livelihoods.

Kosovo's Biodiversity Strategy and Action Plan (2015) outlines national priorities for the conservation and sustainable use of biodiversity. However, the effective implementation of these plans is hindered by limited institutional capacity, insufficient financial resources, and gaps in environmental monitoring and data collection. To overcome these barriers, it is crucial to strengthen governance frameworks, enhance cross-sectoral collaboration, and invest in capacity-building initiatives.

Aligning Kosovo's biodiversity conservation efforts with international frameworks such as the Convention on Biological Diversity (CBD) and the European Union's biodiversity policy is essential for improving the efficacy of national strategies [7]. Recent initiatives, such as the EU4Green project, aim to advance Kosovo's environmental strategy for the next decade, focusing on climate resilience, sustainable resource management, and biodiversity protection. By integrating international best practices with local realities, Kosovo can contribute meaningfully to global biodiversity goals while safeguarding its natural heritage for future generations [8,9].

Fig. 4 : EU4Green. Collaboration Advances Kosovo's Environmental Strategy for the Next Decade. Accessed February 5, 2025. https://eu4green.eu/collaboration-advances-kosovos-environmental-strategy-for-the-next-decade/

On November 9, 2023, a workshop in Kosovo marked the start of collaboration between the EU4Green project and Kosovo's government to align the country's environmental strategy (2022–2031) with the Green Agenda and the European Green Deal. This collaboration underscores Kosovo's commitment to integrating international best practices into its national environmental policies. By aligning with European directives and the Green Agenda, Kosovo aims to enhance its biodiversity conservation efforts, promote sustainable development, and contribute to global environmental goals. The workshop facilitated discussions on the draft strategy's initial findings, addressing identified compliance gaps with EU Strategies, the Western Balkan Green Agenda, and Kosovo's own national strategies, thereby ensuring a comprehensive approach to environmental protection and sustainable development.

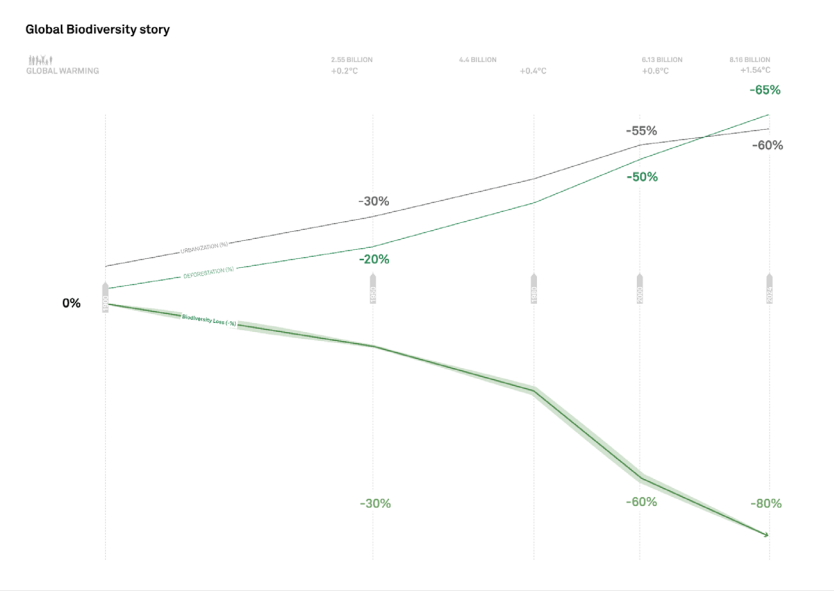
6. Kosovo Ministry of Environment and Spatial Planning. Biodiversity Strategy and Action Plan of Kosovo. Pristina: Ministry of Environment and Spatial Planning, 2015 https://www.ammk-rks.net/assets/cms/uploads/files/Publikime-raporte/Anglisht-final.pdf.
7. European Commission. "EU Biodiversity Strategy for 2030: Bringing Nature Back into Our Lives." European Commission, May 20, 2020. https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/eu-biodiversity-strategy-2030_en.
8. Kosovo Environmental Protection Agency (KEPA). "About Us." Accessed February 5, 2025. https://www.ammk-rks.net/en/per-ne.
9. EU4Green. "Collaboration Advances Kosovo's Environmental Strategy for the Next Decade." Accessed February 5, 2025. https://eu4green.eu/collaboration-advances-kosovos-environmental-strategy-for-the-next-decade/.

3.1.5 Objectives of the Study

This report aims to assess the vulnerabilities of Kosovo's biodiversity by:

- Analyzing existing biodiversity strategies and action plans at International levels.
- Situating Kosovo's biodiversity challenges within the global context, considering both historical trends and future trajectories.
- Providing evidence-based recommendations to support the development of more effective conservation policies and practices that align with global objectives.

As the Anthropocene progresses, the urgency of protecting biodiversity becomes ever more critical. This research underscores the need for global collaboration, scientific innovation, and policy integration to halt biodiversity loss and ensure the long-term health of ecosystems for future generations [10,11].



10. United Nations Environment Programme (UNEP). Global Environment Outlook (GEO-6): Healthy Planet, Healthy People. Nairobi: United Nations Environment Programme, 2019, https://www.unep.org/resources/global-environment-outlook-6.
11. Mace, Georgina M., et al. "Biodiversity Targets and Indicators: An Overview of the Current Frameworks and Their Policy Implications." Philosophical Transactions of the Royal Society B: Biological Sciences 373, no. 1752 (2018): 20170432. https://doi.org/10.1098/rstb.2017.0432.

3.2 Global Biodiversity Frameworks and Milestones

The global conversation on biodiversity, much like the ecosystems it seeks to protect, has evolved over decades through the interconnected work of treaties, protocols, strategies, and landmark events. These milestones reflect humanity's growing awareness of biodiversity's critical role and the urgent need for collective action.

3.2.1 Historical Narrative: The Evolution of Global Biodiversity Frameworks

3.2.1.1 Early Efforts : Foundational Institutional Establishments and growing awareness 1945 - 1970

The period spanning the mid-20th century marked an era of significant environmental change, both in terms of ecological degradation and the rise of international efforts to address these challenges. By 1950, the world was experiencing a 15% loss in biodiversity, fueled by rapid urbanization, deforestation, and the growing impact of industrialization. The global temperature had already risen by approximately 0.2°C, signaling the early stages of climate change. These factors, combined with the burgeoning global population of 2.55 billion, set the stage for an increasingly interconnected environmental crisis. This period also saw the development of high-yield crop varieties and the widespread use of chemical fertilizers, pesticides like DDT, and other practices that further intensified land use changes, deforestation, and overhunting [1][2].
Amid these environmental pressures, foundational institutional structures began to emerge, aiming to address the growing awareness of biodiversity loss. In 1945, the creation of UNESCO marked a crucial step in integrating environmental concerns into the broader framework of international cooperation. UNESCO's mission, which combined education, science, and culture, laid the groundwork for future efforts in biodiversity conservation, recognizing the need for global collaboration to protect the planet's natural resources [3].
In 1948, the International Union for Conservation of Nature (IUCN) was established, further strengthening the institutional framework for global biodiversity governance. The IUCN played a vital role by providing scientific knowledge, policy advice, and advocacy to tackle environmental challenges. It became instrumental in shaping the direction of global biodiversity efforts by providing a platform for collaboration among scientists, governments, and conservationists [4].
By 1960, the establishment of the World Commission on Protected Areas (WCPA) reinforced these early efforts by focusing on the preservation of protected areas. The WCPA provided the necessary scientific and technical expertise to manage parks, reserves, and natural sites effectively, directly contributing to the global effort to halt biodiversity loss. These early initiatives were not isolated but part of a growing recognition of the need for coordinated global action to protect biodiversity against the backdrop of urbanization, climate change, and unsustainable human practices [5][6].

1. *Barnosky, A. D., et al. (2011). "Has the Earth's sixth mass extinction already arrived?" Nature, 471(7336), 51-57. https://doi.org/10.1038/nature09678*
2. *Lenton, T. M., et al. (2008). "Tipping elements in the Earth's climate system." Proceedings of the National Academy of Sciences, 105(6), 1786-1793. https://doi.org/10.1073/pnas.0705414105*
3. *UNESCO. (2021). "History of UNESCO." United Nations Educational, Scientific and Cultural Organization. https://www.unesco.org/en/history*
4. *IUCN. (2021). "IUCN History." International Union for Conservation of Nature. https://iucn.org/about-iucn/history*
5. *Dudley, N., et al. (2013). "Protected Areas: A Framework for Biodiversity Conservation." Science, 341(6141), 1315-1317.*
6. *Noss, R. F., & Cooperider, A. Y. (1994). "Saving nature's legacy: Protecting and restoring biodiversity." Island Press.*

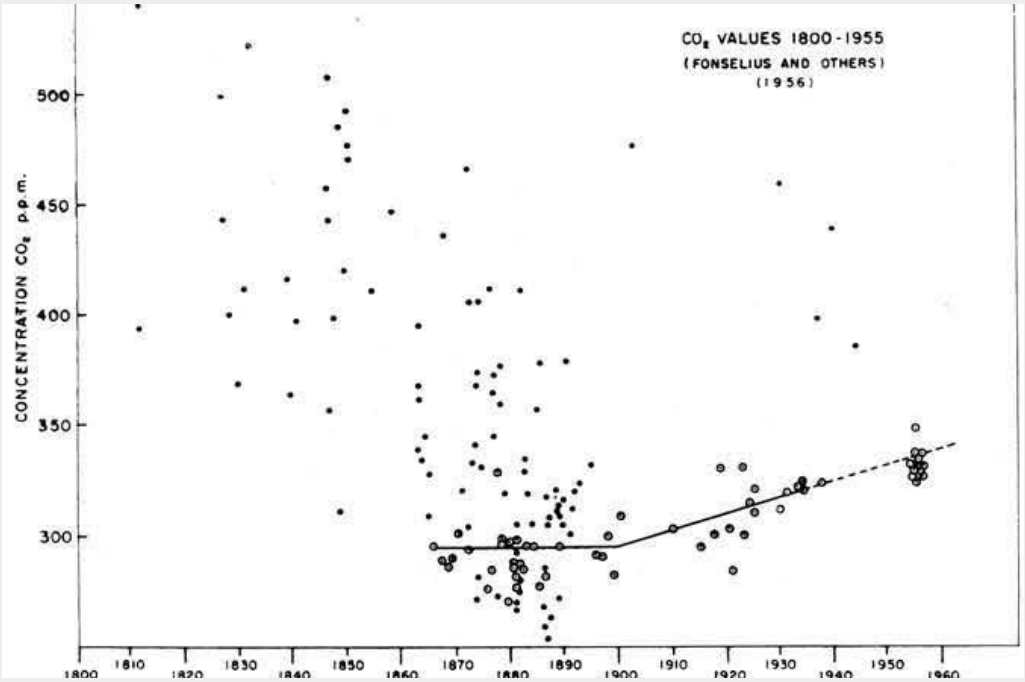


Fig. 5. Miller, L. E. “The International Geophysical Year 1957–58 and Chemistry.” Journal of Chemical Education 34, no. 9 (1957): 424. Reprinted with permission, using data from Fonselius, S., Koroleff, F., and Warme, K. “Carbon Dioxide Concentrations in the Atmosphere.” Tellus 8, no. 2 (1956): 176. Accessed February 5, 2025. https://www.acs.org/education/whatischemistry/landmarks/keeling-curve.html.

The Keeling Curve

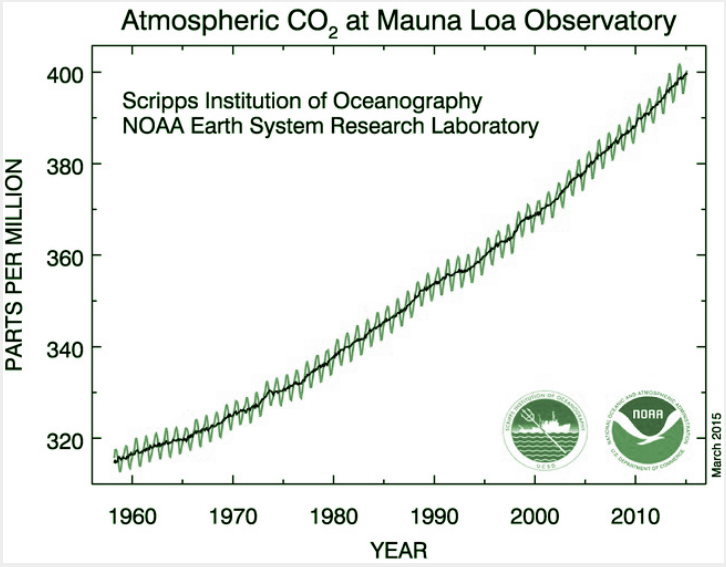


Fig. 6 : National Oceanic and Atmospheric Administration. Keeling Curve. Accessed February 5, 2025. https://www.noaa.gov/keeling-curve.

Keeling's methods of measuring atmospheric carbon dioxide revealed clear natural and man-made trends. The jagged red line shows natural oscillations caused by plant growth cycles, while the increase over time is caused by human activities, especially the burning of fossil fuels. The graph of Keeling's data from Mauna Loa is known as the Keeling Curve. National Oceanic and Atmospheric Administration.

'Silent Spring' Is Now Noisy Summer

Pesticides Industry Up in Arms Over a New Book

By JOHN M. LEE

The $300,000,000 pesticides industry has been highly irritated by a quiet woman author whose previous works on science have been praised for the beauty and precision of the writing.

The author is Rachel Carson, whose "The Sea Around Us" and "The Edge of the Sea" were best sellers in 1951 and 1955. Miss Carson, trained as a marine biologist, wrote gracefully of sea and shore life.

In her latest work, however, Miss Carson is not so gentle,

Rachel Carson Stirs Conflict—Producers Are Crying 'Foul'

fending the use of their products. Meetings have been held in Washington and New York. Statements are being drafted and counter-attacks plotted.

A drowsy midsummer has suddenly been enlivened by the greatest uproar in the pesticides industry since the cranberry scare of 1959.

Miss Carson's new book is entitled "Silent Spring." The title is derived from an idealized situation in which Miss Carson envisions an imaginary town where chemical pollution has silenced "the voices of spring."

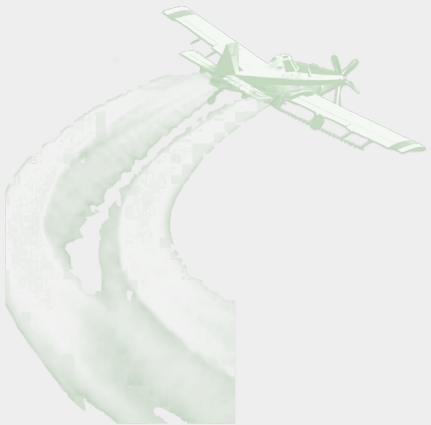


Fig. 6 : John M. Lee, "'Silent Spring' Is Now Noisy Summer," New York Times, 22 July 1962, p. 86.

3.2.1.2 First Global environmental laws and frameworks 1970 - 1980

1970 : + 0,3°C GLOBAL WARMING
4.4 BILLION INHABITANTS

"All the News That's Fit to Print"

The New York Times

LATE CITY EDITION

Weather: Cloudy, rain likely today and tonight. Partly sunny tomorrow. Temp. range: today 64-50; Wed. 67-46. Full U.S. report on Page 73.

VOL. CXIX ... No. 40,997 © 1970 The New York Times Company. NEW YORK, THURSDAY, APRIL 23, 1970 10 CENTS

PRICES CLIMB 0.4% BUT RATE OF RISE APPEARS TO SLOW

Gain in the Consumer Index for March Lags Behind the 4 Previous Months

INCREASE IS STEEP HERE

Medical Care and Mortgage Interest Are the Major Elements in Changes

By EDWIN L. DALE Jr.
Special to The New York Times

WASHINGTON, April 22—Consumer prices rose strongly again in March but there were signs that the pace of inflation was slowing, the Labor Department reported today.

After adjustment of the data to reflect normal seasonal changes, the Consumer Price Index rose four-tenths of 1 per cent in March, less than the five-tenths rise in February and the six-tenths rate of the three months before that.

What is more, one-quarter of the entire March increase in the index was accounted for by a somewhat artificial recording of an increase in Veterans Administration mortgage interest rates. The ceiling on these rates was recently raised by the Government, but the cost to the borrower was not increased by as much as the face amount of the interest.

Finds Easing of Rate

Joel Popkin, Assistant Com-

Millions Join Earth Day Observances Across the Nation

The New York Times (by Patrick A. Burns)

Throngs jamming Fifth Avenue yesterday in response to a call for the regeneration of a polluted environment. View is north from 42d Street, with Central Park in background.

CAMBODIAN CRISIS GROWS AS TROOPS SEEM TO FALTER

With Reds Near, Pnompenh Is Gloomy Over Limited Response to Aid Pleas

CIVIL AVIATION CURBED

Aide Declines to State How Long Army Can Hold Out With the Arms It Has

By HENRY KAMM
Special to The New York Times

PNOMPENH, Cambodia, April 22—An atmosphere of heightening national emergency is overtaking Cambodia.

It is due to evidence that the Cambodian Army is unable to turn back the Vietnamese Communist forces, which at one point are within 15 miles of the capital, and to the limited response to Premier Lon Nol's appeal to all nations for arms aid.

The military authorities closed the Pnompenh airport this evening to all civilian traffic. According to military sources, it is to remain closed until tomorrow in connection with an important military operation. The operation is presumably intended to dislodge the North Vietnamese and Vietcong forces from the district capital of Saang, about 15 miles south of here.

An Appeal to Newsmen

The discouragement over the

U.S. CONCERN SUED WITH 2 IN JAPAN

Westinghouse and Mitsubishi Companies Are Accused in

Mood Is Joyful as City Gives Its Support

By JOSEPH LELYVELD

Huge, light-hearted throngs ambled down auto-less streets

Activity Ranges From Oratory to Legislation

By GLADWIN HILL

Earth Day, the first mass consideration of the globe's en-

BACKERS OF ROJAS THREATEN REVOLT

But Colombian Government Appears in Full Control—

U.S. Plane Flies In Arms As Trinidad Fights Mutiny

By TAD SZULC
Special to The New York Times

WASHINGTON, April 22—The United States flew a planeload of weapons, including mortars and machine guns

failure of such countries as the

Fig 7. **"Millions Join Earth Day Observances Across the Nation."** The New York Times, April 23, 1970. Earth Day 1970 mobilized millions of people, highlighting the importance of protecting the environment and leading to key laws like the Clean Air Act and Endangered Species Act. These measures have safeguarded ecosystems, species, and public health. The movement also sparked global environmental organizations, amplifying the fight for biodiversity conservation.

The early 1970s marked a pivotal period in the evolution of global environmental laws and frameworks, as the growing biodiversity crisis became an urgent global concern. In 1970, the first Earth Day was celebrated, mobilizing millions of people worldwide to raise awareness about environmental degradation, including deforestation, land use changes, and overhunting. These activities were increasingly understood to be directly linked to the rapid loss of biodiversity, highlighting the need for coordinated global action. The environmental issues of the time—such as habitat destruction and species extinction—were recognized as crises that transcended national boundaries and required a collective response from the international community [7][8]. In 1971, UNESCO launched the Man and the Biosphere (MAB) Programme, an innovative initiative designed to balance the conservation of ecosystems with sustainable development practices. The MAB Programme established a network of Biosphere Reserves across the world, which served as models for how conservation efforts could be integrated with local community needs. By blending ecological science with community engagement, the MAB Programme sought to demonstrate that development and conservation could go hand in hand, providing a holistic approach to biodiversity protection. It was one of the first large-scale efforts to integrate human activity into conservation strategies while preserving natural ecosystems for future

generations [9].
The same year saw the adoption of the Ramsar Convention on Wetlands, the first global treaty dedicated specifically to biodiversity conservation. This legally binding agreement focused on the protection of wetlands, which provide essential services such as water filtration, flood regulation, and habitat for countless species. The Ramsar Convention marked a significant milestone in the development of international environmental law, establishing a framework for the conservation of vital ecosystems that play a central role in maintaining biodiversity [10].

Fig. 8"The Convention on Wetlands of International Importance Especially as Waterfowl Habitat is Agreed by Representatives of 18 Nations, 2 February 1971,", Ramsar Convention, 1971, https://www.ramsar.org.

In 1972, the World Heritage Convention (WHC) was adopted, further advancing global efforts to protect both cultural and natural heritage. The WHC sought to preserve sites of outstanding universal value, including ecosystems and landscapes crucial for biodiversity conservation. As a legally binding treaty, it promoted international cooperation and provided technical assistance to support conservation efforts, helping safeguard the world's most valuable natural and cultural sites for future generations [11].

7. *Carson, R. (1962). Silent Spring. Houghton Mifflin.*
8. *Earth Day Organization. (2021). "History of Earth Day." Earth Day Network. https://www.earthday.org/history/*
9. *UNESCO. (2021). "Man and the Biosphere Programme." United Nations Educational, Scientific and Cultural Organization. https://en.unesco.org/programme/mab*
10. *Ramsar Convention. (2021). "Ramsar Convention on Wetlands." Convention on Wetlands. https://www.ramsar.org*
11. *UNESCO. (2021). "World Heritage Convention." United Nations Educational, Scientific and Cultural Organization. https://whc.unesco.org/en/conventiontext/*

3.2.1.3 Biodiversity become a global issue 1980 - 1990

1980: + 0,4°C GLOBAL WARMING
 -30% Biodiversity Lost (-%)

The 1980s were a critical decade in the global evolution of biodiversity conservation frameworks, marked by key initiatives aimed at integrating biodiversity protection with human development and expanding global discourse on environmental issues. In 1980, the World Conservation Strategy (WCS) was released, a non-binding protocol developed by the International Union for Conservation of Nature (IUCN), the United Nations Environment Programme (UNEP), and the World Wildlife Fund (WWF). The strategy emphasized the need to conserve biodiversity while promoting sustainable development. It was one of the first global efforts to link conservation goals with socioeconomic needs, proposing that human development and biodiversity preservation could coexist through thoughtful planning and resource management. The WCS advocated for a balance between conserving nature and addressing human needs for resources, marking a shift in how biodiversity conservation was viewed in relation to economic and social development [12].
In 1986, the National Forum on Biodiversity, held in Washington, D.C., helped shape the global discourse on biodiversity conservation by formally introducing and popularizing the term “biodiversity.” The forum brought together scientists, policymakers, and conservationists to address the rapid loss of biodiversity and to emphasize the urgent need for action. The event highlighted the interconnectedness of species, ecosystems, and human well-being, emphasizing that biodiversity is a critical component of global environmental health. This forum catalyzed international conversations that would later inform key conservation policies and frameworks [13].

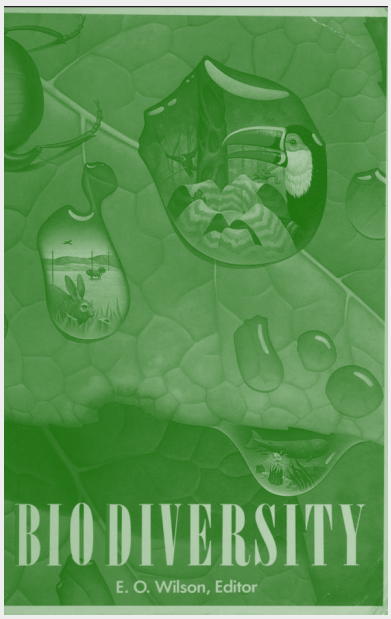


Fig. 9 E.O. Wilson. Biodiversity. Washington, D.C.: National Academy Press, 1988.

By this time, the global biodiversity crisis had deepened, with estimates suggesting that 30% of global biodiversity had been lost due to habitat destruction, overhunting, and pollution. At the same time, the Chernobyl disaster in 1986 highlighted the catastrophic potential of human-made environmental crises. The Chernobyl event raised awareness about

12. *International Union for Conservation of Nature (IUCN), United Nations Environment Programme (UNEP), and World Wildlife Fund (WWF). World Conservation Strategy: Living Resource Conservation for Sustainable Development. Gland, Switzerland: IUCN, UNEP, and WWF, 1980. https://portals.iucn.org/library/efiles/documents/wcs-004.pdf*
13. *National Academy of Sciences. Biodiversity. Washington, D.C.: National Academy Press, 1988. https://archive.org/details/biodiversity0000nati.*

The interconnectedness of environmental disasters, climate change, and biodiversity loss, underscoring the importance of addressing these challenges together. Global warming, which had risen by approximately 0.4°C by the mid-1980s, was increasingly linked to both the greenhouse effect and biodiversity degradation, further solidifying the need for comprehensive environmental policies that addressed these interconnected issues [14,15].

3.2.1.4 Formalization of global biodiversity law 1990 - 2000

In 1990, the formalization of global biodiversity law marked a pivotal moment in the global recognition of biodiversity's importance and the need for international cooperation to protect it. This laid the groundwork for subsequent legal frameworks and treaties. It was a significant step toward acknowledging biodiversity loss as a global crisis, which would require coordinated international efforts. The 1992 United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro, introduced the Convention on Biological Diversity (CBD). This treaty became a binding agreement with the overarching goals of conserving biodiversity, promoting its sustainable use, and ensuring the equitable sharing of benefits derived from genetic resources [16].

A key outcome of the CBD was the requirement for signatory countries to develop National Biodiversity Strategies and Action Plans (NBSAPs). These plans serve as roadmaps for countries to align their policies and strategies with the global biodiversity conservation agenda. NBSAPs, therefore, play a crucial role in operationalizing the CBD at the national level, providing countries with a framework to safeguard their unique ecosystems and species. Kosovo, while not initially a signatory to the CBD, aligned its biodiversity strategies indirectly, showing how even countries outside the formal agreements took steps to conserve their natural resources in line with global efforts [17,18].

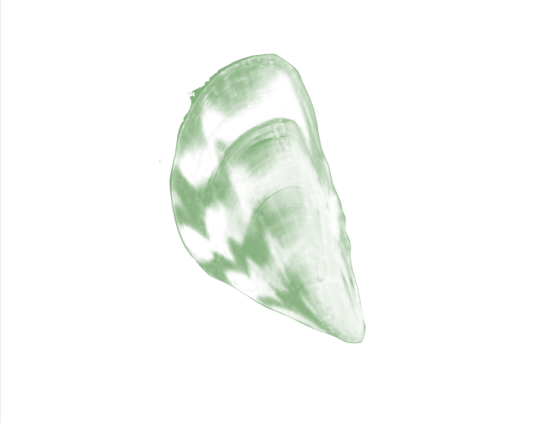


Fig 10 : The invasive zebra mussel (Dreissena polymorpha), native to Eurasia, was first discovered in North America in 1988 in Lake St. Clair, likely introduced through ballast water from transoceanic ships. Its rapid spread disrupted freshwater ecosystems by outcompeting native species, altering food webs, and causing significant economic damage by clogging water intake systems. Zebra mussels highlighted the global threat of invasive species, leading to stricter biosecurity measures and influencing biodiversity management policies under frameworks like the Convention on Biological Diversity (CBD). Their invasion underscored the ecological and economic risks of global trade and environmental neglect.

14. *Chernobyl Forum. Chernobyl's Legacy: Health, Environmental and Socio-Economic Impacts. Vienna: International Atomic Energy Agency, 2005.*
15. *Wilson, Edward O. The Diversity of Life. Cambridge, MA: Belknap Press of Harvard University Press, 1992.*
16. *Heywood, V. H., and R. T. Watson. Global Biodiversity Assessment. Cambridge: Cambridge University Press, 1995.*
17. *United Nations. Convention on Biological Diversity: Text and Annexes. Montreal: Secretariat of the Convention on Biological Diversity, 2000.*
18. *Secretariat of the Convention on Biological Diversity. Global Biodiversity Outlook 4. Montreal: CBD Secretariat, 2014.*

Simultaneously, the spread of invasive species was increasingly recognized as a growing threat to biodiversity. Invasive species, often introduced through human activity, pose a significant challenge to native ecosystems by outcompeting local species for resources, altering habitats, and introducing diseases. This threat gained prominence in the early 1990s, emphasizing the need for not only protecting native species but also preventing the introduction and spread of invasive species [19].
The connection between these events is clear: the formalization of biodiversity law in the 1990s and the establishment of the CBD created a global framework for coordinated action, addressing issues like invasive species as part of a broader biodiversity conservation effort. These developments highlighted the interconnectedness of ecological threats and the necessity for international cooperation to safeguard the planet's biodiversity.

3.2.1.5 Operationalizing biodiversity protection 2000 - 2010

2000 : + 0,6°C GLOBAL WARMING
-60% Biodiversity Lost (-%)

By the year 2000, the urgency to operationalize biodiversity protection had intensified due to alarming global environmental trends. The global population had surged to 6.13 billion, accompanied by a 0.6°C rise in global temperatures compared to pre-industrial levels. These

shifts contributed to the loss of nearly 60% of global biodiversity, driven by habitat destruction, climate change, pollution, and overexploitation of natural resources. The need for robust international frameworks to address these interconnected issues became increasingly clear [20].
A critical development during this period was the adoption of the **Cartagena Protocol on Biosafety** in 2000, under the Convention on Biological Diversity (CBD). This binding agreement aimed to regulate the safe transfer, handling, and use of genetically modified organisms (GMOs), particularly across borders. It was designed to protect biodiversity from potential risks posed by biotechnology while ensuring that technological advances could proceed without compromising ecological integrity. The Cartagena Protocol represented a significant step in operationalizing biodiversity protection, as it established clear guidelines and legal obligations for member states [21].
In 2002, the **World Summit on Sustainable Development (WSSD)** in Johannesburg introduced voluntary biodiversity reduction targets. While not legally binding, these targets were part of the **Johannesburg Plan of Implementation**, which set ambitious goals to reverse the trend of global biodiversity loss by 2010. Although these targets lacked the enforcement mechanisms of binding agreements, they reflected a growing global consensus on the importance of biodiversity and the need for coordinated action. Kosovo, though not directly involved in these agreements, indirectly incorporated aspects of these biodiversity strategies into its national policies, aligning with global efforts to conserve ecosystems [22,23].

The devastating impact of **Hurricane Katrina** in 2005 further underscored the critical role of biodiversity in ecosystem resilience. The loss of coastal biodiversity, including wetlands and mangroves, had significantly weakened natural flood defenses, exacerbating the damage caused by the hurricane. This disaster highlighted the tangible, real-world consequences of biodiversity loss, demonstrating how degraded ecosystems can increase vulnerability to climate-related disasters.

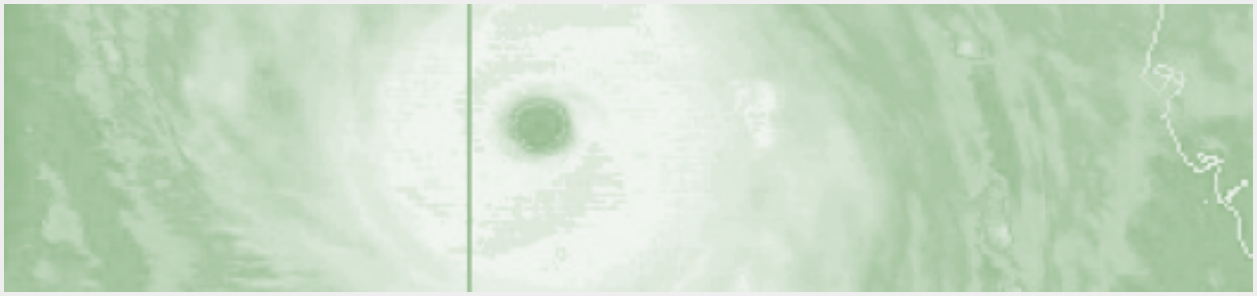


Fig. 11 : Hurricane Katrina, 29 august 2005

19. *Mack, Richard N., et al. "Biotic Invasions: Causes, Epidemiology, Global Consequences, and Control." Ecological Applications 10, no. 3 (2000): 689–710.*
20. ***Millennium Ecosystem Assessment.** Ecosystems and Human Well-being: Biodiversity Synthesis. Washington, DC: World Resources Institute, 2005.*
21. ***Secretariat of the Convention on Biological Diversity.** Cartagena Protocol on Biosafety to the Convention on Biological Diversity: Text and Annexes. Montreal: CBD Secretariat, 2000. **United Nations**. Johannesburg Plan of Implementation.*
22. *World Summit on Sustainable Development (Johannesburg, 2002). Accessed February 5, 2025. https://www.un.org/esa/*

sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf.
23. ***Government of Kosovo***. *National Biodiversity Strategy and Action Plan (NBSAP) 2011-2020. Accessed February 5, 2025. https://kryeministri.rks-gov.net/wp-content/uploads/2022/08/Eng-SAPB-2016-2020.pdf.*

Together, these events illustrate a shift from broad commitments to more operational, targeted strategies for biodiversity protection, emphasizing the interconnectedness of environmental health, climate resilience, and human well-being.

3.2.1.6 Biodiversity and climate frameworks converge 2010 - 2020

The evolution of global biodiversity frameworks has been marked by significant milestones that reflect an increasing recognition of the interconnectedness between biodiversity, climate, and sustainable development. In 2010, biodiversity and climate change frameworks notably began to converge, recognizing that addressing both crises together would be crucial for global environmental sustainability. This shift was reinforced by the adoption of the Nagoya Protocol at the Convention on Biological Diversity (CBD), which became legally binding for ratifying countries. The Protocol focused on access to genetic resources and fair benefit-sharing, providing a stronger mechanism for conservation and sustainable use of biodiversity, while also advancing the objectives of the CBD [24].

Following this, the Strategic Plan for Biodiversity 2011-2020, established at COP 10, set a non-binding framework aimed at halting biodiversity loss by 2020. This plan included 20 global biodiversity targets, known as the Aichi Targets, which were designed to guide countries in their conservation efforts. The targets emphasized key areas such as habitat preservation, sustainable use of resources, and mainstreaming biodiversity across sectors. However, despite ambitious goals, many of these targets fell short, highlighting the need for more robust action [25].

In 2012, the establishment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) further strengthened the global biodiversity framework. IPBES became a crucial platform for synthesizing scientific knowledge and providing policy advice on biodiversity issues, linking science with action to foster better decision-making and governance [26].

Fig. 12 : Coral reefs globally suffered massive bleaching events due to rising ocean temperatures, with 50% of coral cover lost in some regions. In 2014-2015, global coral reefs suffered massive bleaching due to rising ocean temperatures, with some regions losing up to 50% of coral cover. This event highlighted the urgent need for integrated climate and biodiversity action, contributing to the adoption of SDGs in 2015, particularly those addressing climate action (SDG 13) and life below water (SDG 14).

24. *Secretariat of the Convention on Biological Diversity, The Nagoya Protocol on Access and Benefit-sharing: An Overview (Montreal: Convention on Biological Diversity, 2011), https://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf.*
25. *Secretariat of the Convention on Biological Diversity, Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets (Montreal: Convention on Biological Diversity, 2010), https://www.cbd.int/sp/targets/.*
26. *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), IPBES: About Us, accessed February 5, 2025, https://ipbes.net/about.*

In 2015, the adoption of the United Nations Sustainable Development Goals (SDGs), particularly SDG 15, which focuses on life on land, sustainable forest management, and biodiversity loss reduction, represented a major non-binding commitment. Countries, like Kosovo, have incorporated SDG 15 into their environmental strategies, although challenges remain in institutional strengthening and public awareness [27].
By 2019, a new wave of youth activism and global awareness emerged, with younger generations demanding more aggressive action on biodiversity and climate crises, further pushing the agenda for global biodiversity conservation into the spotlight. This shift demonstrates how global frameworks are becoming increasingly interconnected, evolving from binding international protocols to broader, more inclusive sustainability goals [28].

Fig. 13 : Lorie Shaull. Participants of March for Science in Saint Paul, Minnesota. April 22, 2017. Kids Want Climate Justice. Photograph. New waves of awareness and youth activism.

27. *United Nations, Transforming Our World: The 2030 Agenda for Sustainable Development (New York: United Nations, 2015), https://sdgs.un.org/2030agenda.*
28. *Greta Thunberg, Greta Thunberg's Full Speech at the UN Climate Action Summit 2019, filmed September 23, 2019, at the United Nations, New York, NY, YouTube video, 4:53, posted by "Guardian News," September 23, 2019, https://www.youtube.com/watch?v=eZq6F5RkSno.*

3.2.1.7 Acceleration of legal and policy action 2020 - 2024

2020 : + 1,54°C GLOBAL WARMING
8.16 BILLION INHABITANTS
-80% Biodiversity Lost (-%)

The period from 2020 onward marks an era of accelerated legal and policy action in global biodiversity frameworks, driven by growing recognition of biodiversity's critical role in sustaining planetary health. In 2020, the Post-2020 Global Biodiversity Framework (GBF) was introduced, setting binding guidelines aimed at addressing biodiversity threats with ambitious targets extending to 2050. The framework emphasizes strengthened implementation mechanisms to ensure measurable progress. Countries like Kosovo have aligned with EU biodiversity frameworks, focusing on ecosystem restoration, monitoring biodiversity indicators, and integrating conservation priorities into national policy [29,30].

1 M

SPECIES AT RISK OF EXTINCTION (IPBES)

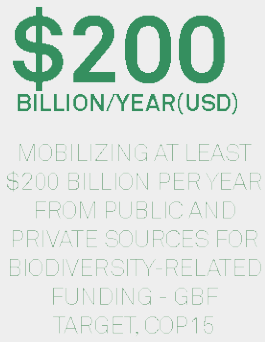
The urgency of biodiversity conservation was underscored by the IPBES report revealing that nearly one million species are at risk of extinction due to human activities. The same year, the COVID-19 pandemic highlighted the direct link between habitat destruction and the emergence of zoonotic diseases, emphasizing how biodiversity loss can have profound impacts on global health. While lockdowns temporarily reduced human activity, they also presented new conservation challenges, including funding shortfalls and increased illegal exploitation of natural resources [31,32].

In 2021, the joint IPBES-IPCC assessment report provided critical insights into the interconnection between biodiversity and climate change. Though non-binding, this report offered valuable data for policymakers, including in Kosovo, informing strategies that address both climate resilience and biodiversity conservation. The announcement of the extinction of the slender-billed curlew, the first bird species from mainland Europe, North Africa, and West Asia to be declared extinct, served as a stark reminder of the irreversible consequences of inadequate conservation efforts [33,34].

EXTINCTION OF SLENDER-BILLED CURLEW IS THE FIRST FROM THE MAINLANDS OF EUROPE, NORTH AFRICA AND WEST ASIA TO BE DECLARED WIPED OUT

29. *Secretariat of the Convention on Biological Diversity. First Draft of the Post-2020 Global Biodiversity Framework. Montreal: Convention on Biological Diversity, 2021. https://www.cbd.int/doc/c/abb5/591f/2e46096d3f0330b08ce87a45/wg2020-03-03-en.pdf*
30. *European Environment Agency. Biodiversity Strategy for 2030: Bringing Nature Back into Our Lives. Luxembourg: Publications Office of the European Union, 2020. https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030_en.*
31. *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Global Assessment Report on Biodiversity and Ecosystem Services: Summary for Policymakers. Bonn: IPBES Secretariat, 2019. https://ipbes.net/global-assessment.*
32. *United Nations Environment Programme (UNEP). Preventing the Next Pandemic: Zoonotic Diseases and How to Break the Chain of Transmission. Nairobi: UNEP, 2020. https://www.unep.org/resources/report/preventing-future-zoonotic-disease-outbreaks.*
33. *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and Intergovernmental Panel on Climate Change (IPCC). Biodiversity and Climate Change: Scientific Outcome of the IPBES-IPCC Co-Sponsored Workshop. Bonn: IPBES and IPCC, 2021. https://ipbes.net/events/ipbes-ipcc-co-sponsored-workshop-biodiversity-and-climate-change.*
34. *BirdLife International. Slender-billed Curlew (Numenius tenuirostris): Species Factsheet. Cambridge: BirdLife International, 2021. https://www.birdlife.org/ (adjust link if citing a specific report or factsheet).*

The momentum continued with the adoption of the Post-2020 GBF at COP 15 in 2022, which, although non-binding, set ambitious goals for 2021–2030, including the 30x30 target—aiming to protect 30% of the planet's land and oceans by 2030. Kosovo, while not a direct signatory, indirectly aligns through EU environmental policies. Financial commitments reached $200 billion annually from public and private sources to support biodiversity-related initiatives [35].



By 2024, at COP 16, the world faces an escalating biodiversity loss amid rising global temperatures, now at 1.54°C above pre-industrial levels, and a human population surpassing 8.16 billion. The increasing frequency of wildfires, deforestation, and species extinctions—contributing to an estimated 80% loss in global biodiversity—underscores the urgent need for transformative action to halt and reverse biodiversity decline [36,37].

3.2.1.8 Future outlook

Looking toward the future, the outlook for global biodiversity presents both critical challenges and opportunities for transformative change. By 2030, projections suggest that up to 85% of biodiversity could be at risk if current trends in habitat destruction, climate change, pollution, and overexploitation continue unchecked. This alarming trajectory underscores the urgent need to fully implement the targets set in the Post-2020 Global Biodiversity Framework (GBF), particularly the ambitious 30x30 target, which aims to protect 30% of the planet's land and oceans by 2030. Achieving this goal requires not only the expansion of protected areas but also the integration of biodiversity conservation into all sectors, from agriculture and urban planning to finance and infrastructure development [38].

The connection between biodiversity loss and climate change will become even more pronounced as global temperatures continue to rise, potentially surpassing the 1.5°C threshold established in the Paris Agreement. The increasing frequency of extreme weather events, wildfires, droughts, and floods will further degrade ecosystems, pushing vulnerable species toward extinction. Without significant policy shifts, coordinated international efforts, and substantial financial investments, biodiversity loss is predicted to reach catastrophic levels by 2050, with estimates suggesting up to 90% of species could face extinction risks. This scenario would not only threaten ecological balance but also undermine human well-being, as biodiversity is integral to food security, clean water, health, and economic stability .

However, the future's not set in stone. The coming decades offer a critical window of opportunity to reverse biodiversity loss. Innovations in conservation science, restoration ecology, and

sustainable development practices can help build resilience in both natural and human systems. The integration of indigenous knowledge, coupled with advanced technologies such as remote sensing and genetic research, can enhance monitoring and adaptive management strategies. Additionally, fostering global environmental governance through stronger multilateral agreements and inclusive participation—from governments to local communities and youth movements—can drive the systemic changes needed [39].

35. *United Nations Environment Programme (UNEP). State of Finance for Nature: Time to Act—Doubling Investment by 2025 and Eliminating Nature-Negative Flows. Nairobi: UNEP, 2022. https://www.unep.org/resources/state-finance-nature-2021.*
36. *Intergovernmental Panel on Climate Change (IPCC). Sixth Assessment Report: Climate Change 2023—Synthesis Report. Geneva: IPCC, 2023. https://www.ipcc.ch/report/ar6/syr/.*
37. *Secretariat of the Convention on Biological Diversity. Global Biodiversity Outlook 5. Montreal: Convention on Biological Diversity, 2020. https://www.cbd.int/gbo5.*
38. *Secretariat of the Convention on Biological Diversity. Kunming-Montreal Global Biodiversity Framework: COP 15 Decision. Montreal: Convention on Biological Diversity, 2022. https://www.cbd.int/gbf/.*
39. *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Global Assessment Report on Biodiversity and Ecosystem Services: Summary for Policymakers. Bonn: IPBES Secretariat, 2019. https://ipbes.net/global-assessment.*

Ultimately, the path we choose today will determine the state of our planet's biodiversity in 2030, 2050, and beyond. Urgent, coordinated action remains our best hope to halt and reverse the decline, ensuring a thriving, biodiverse world for future generations.
As we move forward into a new era of environmental governance, several emerging trends and key drivers are shaping the future of global biodiversity frameworks.

Emerging Trends Shaping Future Frameworks:

1. **Recognition of Ecocide:** A growing international movement is pushing for ecocide—the large-scale destruction of ecosystems—to be recognized as a crime under the Rome Statute of the International Criminal Court (ICC). This would elevate the legal status of biodiversity destruction, allowing for international legal actions against individuals and entities responsible for major environmental harm. If this movement succeeds, it could significantly shift how governments and corporations approach environmental protection and enforcement [40].
2. **Global Plastic Pollution Treaty:** Negotiations are currently underway for a global treaty aimed at reducing plastic pollution, one of the most pervasive threats to biodiversity worldwide. Plastics pollute oceans, harm wildlife, and disrupt ecosystems. The treaty in progress reflects a shift towards addressing the life cycle of plastics, from production to disposal, while promoting circular economies. Its implementation would be a significant step in mitigating the widespread effects of plastic on global ecosystems [41].
3. **Biodiversity Credits:** In response to the financial challenges of biodiversity conservation, innovative financial mechanisms like biodiversity credits are being developed. These credits allow businesses to offset their environmental impact by investing in biodiversity protection and restoration projects. By linking financial incentives to biodiversity conservation, this emerging system could unlock new streams of funding for environmental initiatives, driving widespread participation from private sectors [42].
4. **Nature-Based Solutions (NbS) and Global Frameworks:** Nature-based solutions (NbS) are increasingly central to global biodiversity frameworks, such as the Paris Agreement and the Convention on Biological Diversity (CBD). NbS leverage natural ecosystems to address challenges like climate change and disaster risk, while simultaneously conserving

biodiversity. Examples like wetland restoration and forest planting align with global goals to mitigate biodiversity loss and promote ecosystem resilience. These solutions support long-term environmental and economic benefits, making them a key strategy in achieving both climate and biodiversity targets within global frameworks [43].

5. **Sustainable Development Goals (SDGs) and Biodiversity Integration:** Biodiversity is critical to achieving several SDGs, especially SDG 14 (Life Below Water) and SDG 15 (Life on Land). Global biodiversity frameworks are integrating biodiversity conservation into sectors like agriculture, fisheries, and urban planning, creating synergies with broader development goals like poverty reduction and food security. Aligning biodiversity with SDGs ensures that conservation efforts drive sustainable, inclusive development, making it a fundamental aspect of global progress toward a nature-positive future [44].
6. **Digital Innovation, Monitoring Tools, and Global Biodiversity Frameworks:** Technological innovations such as satellite imaging, AI, and blockchain are revolutionizing biodiversity monitoring and governance. These tools support global frameworks like the CBD's post-2020 targets by enhancing real-time tracking, ensuring transparency in conservation funding, and enabling public participation through citizen science. As digital technologies become more integrated, they provide essential support for data-driven decision-making and more effective biodiversity protection within international frameworks [45].

40. *Stop Ecocide International. 2020. Ecocide: A new crime for the International Criminal Court. Accessed February 6, 2025. https://www.stopecocide.earth/ .*
41. *United Nations Environment Programme (UNEP). 2022. Plastic Pollution. Accessed February 6, 2025. https://www.unep.org/resources/report/making-peace-plastics.*
42. *World Bank. 2020. Biodiversity and Ecosystem Services: An Introduction to the Market Mechanisms for Ecosystem Service Payments. Accessed February 6, 2025. https://www.worldbank.org/en/topic/environment .*
43. *Convention on Biological Diversity (CBD). 2020. Nature-based Solutions for Climate Change and Biodiversity. Accessed February 6, 2025. https://www.cbd.int/nbsap/nbs.*

Key Reasons for Framework Acceleration:

1. **Scientific Evidence:** The urgency of biodiversity protection is underscored by scientific reports such as the 2019 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) report, which warned that nearly 1 million species are at risk of extinction. This unprecedented loss of species and ecosystems poses a threat not only to biodiversity but also to the essential services that ecosystems provide, including food, water, and air purification. Such alarming data is pushing policymakers to accelerate efforts to create robust biodiversity frameworks [46].
2. **Economic Risks:** A 2020 report by the World Economic Forum estimated that $44 trillion, or 44% of global GDP, is at risk due to the degradation of nature and ecosystems. The report highlighted the critical dependency of economies on healthy ecosystems for resources, raw materials, and services. With the economic stakes so high, the push to create and implement biodiversity frameworks has gained significant momentum, as businesses and governments recognize that the loss of biodiversity is not just an environmental issue, but an economic one as well [47].
3. **Public Pressure:** The rise of environmental activism, spearheaded by movements such as Fridays for Future and Extinction Rebellion, has brought public attention to the interconnectedness of the climate and biodiversity crises. This surge in awareness, fueled by the youth and indigenous communities who are directly impacted by biodiversity loss, has

put increasing pressure on governments to act. Public demand for stronger frameworks and more aggressive measures is a driving force in accelerating the pace of biodiversity-related negotiations and policy development [48].

4. **Cross-Border Challenges:** Biodiversity is not confined to national borders; species migrate across countries, oceans are shared by all nations, and ecosystems are interconnected. Global challenges such as migratory species protection, marine biodiversity conservation, and the management of invasive species require collective action. The recognition that biodiversity loss transcends national borders is pushing for more cooperative, multilateral agreements that ensure effective protection and sustainable management of ecosystems at the global scale [49,50].

Looking Forward: Integrated, Holistic Approaches

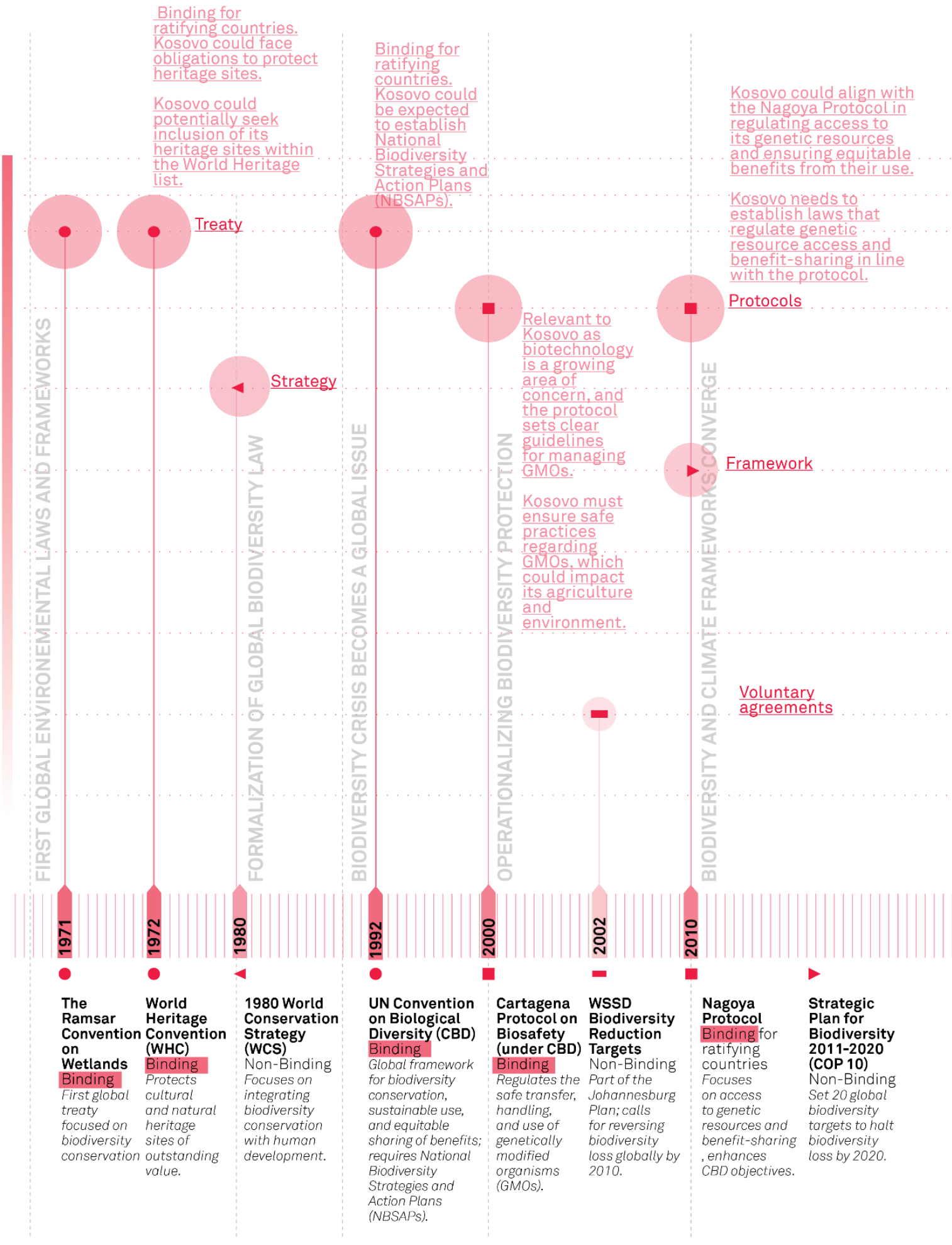
As these emerging trends and key drivers continue to shape the global biodiversity landscape, it is clear that future frameworks will require integrated and holistic approaches. These approaches should not only address the threats to biodiversity but also the underlying drivers of ecosystem degradation, such as unsustainable production and consumption, deforestation, and climate change.

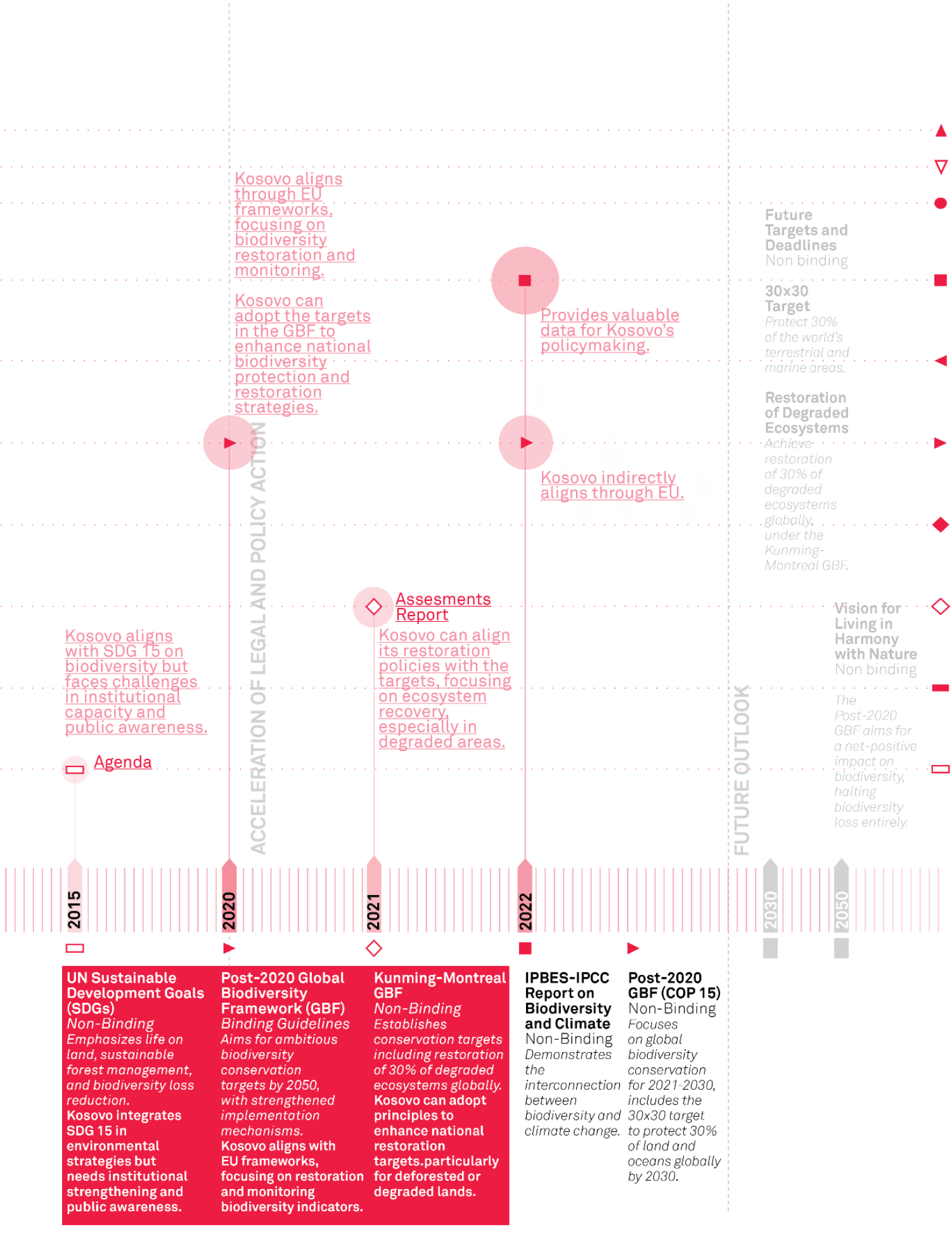
In the coming years, it will be essential to ensure that biodiversity conservation becomes firmly integrated into all sectors of governance, from finance to agriculture to urban planning. For frameworks to be truly effective, they must recognize the intrinsic value of biodiversity and the fundamental role it plays in the well-being of both people and the planet. Through continued collaboration, innovation, and public engagement, global biodiversity frameworks will hopefully usher in a future where humanity and nature can thrive together.

44. *United Nations. 2020. Sustainable Development Goals: A Shared Blueprint for Peace and Prosperity for People and the Planet. Accessed February 6, 2025. https://sdgs.un.org/goals .*
45. *Convention on Biological Diversity (CBD). 2020. Digital Innovations and Data-driven Tools for Biodiversity Monitoring. Accessed February 6, 2025. https://www.cbd.int/ .*
46. *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). 2019. Global Assessment Report on Biodiversity and Ecosystem Services. Accessed February 6, 2025. https://ipbes.net/global-assessment.*
47. *World Economic Forum (WEF). 2020. The Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy. Accessed February 6, 2025. https://www.weforum.org/reports/the-nature-risk-rising-why-the-crisis-engulfing-nature-matters-for-business-and-the-economy.*
48. *Fridays for Future. 2020. "Fridays for Future Movement." Accessed February 6, 2025. https://fridaysforfuture.org.*
49. *Extinction Rebellion. 2020. "About Extinction Rebellion." Accessed February 6, 2025. https://extinctionrebellion.uk/about.*
50. *United Nations. 2020. Biodiversity Beyond National Borders: Migratory Species and Cross-Border Ecosystems. Accessed February 6, 2025. https://www.un.org/en/chronicle/article/biodiversity-beyond-national-borders.*

3.2.2 Global Biodiversity Frameworks and Documents Organized by Legal Status

Global Biodiversity Frameworks & Protocols




Kosovo aligns through EU frameworks, focusing on biodiversity restoration and monitoring.
Kosovo can adopt the targets in the GBF to enhance national biodiversity protection and restoration strategies.
Provides valuable data for Kosovo's policymaking.
Kosovo indirectly aligns through EU.
Assesments Report
Kosovo can align its restoration policies with the targets, focusing on ecosystem recovery, especially in degraded areas.
Kosovo aligns with SDG 15 on biodiversity but faces challenges in institutional capacity and public awareness.
Agenda
ACCELERATION OF LEGAL AND POLICY ACTION
FUTURE OUTLOOK
Future Targets and Deadlines
Non binding
30x30 Target
Protect 30% of the world's terrestrial and marine areas.
Restoration of Degraded Ecosystems
Achieve restoration of 30% of degraded ecosystems globally, under the Kunming-Montreal GBF.
Vision for Living in Harmony with Nature
Non binding
The Post-2020 GBF aims for a net-positive impact on biodiversity, halting biodiversity loss entirely.
2015
2020
2021
2022
2030
2050
UN Sustainable Development Goals (SDGs)
Non-Binding
Emphasizes life on land, sustainable forest management, and biodiversity loss reduction.
Kosovo integrates SDG 15 in environmental strategies but needs institutional strengthening and public awareness.
Post-2020 Global Biodiversity Framework (GBF)
Binding Guidelines
Aims for ambitious biodiversity conservation targets by 2050, with strengthened implementation mechanisms.
Kosovo aligns with EU frameworks, focusing on restoration and monitoring biodiversity indicators.
Kunming-Montreal GBF
Non-Binding
Establishes conservation targets including restoration of 30% of degraded ecosystems globally.
Kosovo can adopt principles to enhance national restoration targets.particularly for deforested or degraded lands.
IPBES-IPCC Report on Biodiversity and Climate
Non-Binding
Demonstrates the interconnection between biodiversity and climate change.
Post-2020 GBF (COP 15)
Non-Binding
Focuses on global biodiversity conservation for 2021-2030, includes the 30x30 target to protect 30% of land and oceans globally by 2030.

For each document, we evaluate its significance and relevance to Kosovo under the following structure:

3.2.2.1 Binding Treaties and Conventions

These agreements impose legal obligations on the signatory countries.

1. **The Ramsar Convention on Wetlands**
   Date: 1971
   Legal Status: Binding (Convention)
   Function: Framework for Action
   Topics Covered: Conservation (Wetlands)
   Brief Description: The first global treaty focused on biodiversity conservation. It aims to conserve wetlands of international importance.
   Relevance to Kosovo: Kosovo has several wetland areas; the convention could guide Kosovo in managing and conserving these ecosystems.
   Legal/Strategic Implications: Direct legal obligations for ratifying countries. Kosovo could align with this treaty through its wetland conservation policies.
   Key Takeaways: Kosovo could use this framework to enhance wetland protection and conservation planning.

2. **World Heritage Convention (WHC)**
   Date: 1972
   Legal Status: Binding (Convention)
   Function: Framework for Action
   Topics Covered: Conservation (Cultural and Natural Heritage)
   Brief Description: Protects cultural and natural heritage sites of outstanding universal value.
   Relevance to Kosovo: Kosovo could potentially seek inclusion of its heritage sites within the World Heritage list.
   Legal/Strategic Implications: Binding for ratifying countries. Kosovo could face obligations to protect heritage sites.
   Key Takeaways: Kosovo can apply for the protection of its natural sites under this convention, contributing to international biodiversity efforts.

3. **UN Convention on Biological Diversity (CBD)**
   Date: 1992
   Legal Status: Binding (Convention)
   Function: Framework for Action, Strategic Goals and Targets
   Topics Covered: Conservation, Sustainable Use, and Fair Benefit Sharing
   Brief Description: A comprehensive global treaty focused on conserving biodiversity, ensuring sustainable use of its components, and fair sharing of benefits from biodiversity.
   Relevance to Kosovo: Kosovo indirectly aligns by integrating elements of the CBD into national biodiversity policies.
   Legal/Strategic Implications: Binding for ratifying countries. Kosovo could be expected to

establish National Biodiversity Strategies and Action Plans (NBSAPs).
Key Takeaways: Kosovo can align its biodiversity planning with the CBD goals and obligations.

4. **Cartagena Protocol on Biosafety (under CBD)**
   Date: 2000
   Legal Status: Binding (Protocol)
   Function: Framework for Action
   Topics Covered: Conservation, Biotechnology
   Brief Description: Regulates the safe transfer, handling, and use of genetically modified organisms (GMOs).
   Relevance to Kosovo: Relevant to Kosovo as biotechnology is a growing area of concern, and the protocol sets clear guidelines for managing GMOs.
   Legal/Strategic Implications: Binding for countries that have ratified it. Kosovo may need to align with biosafety measures.
   Key Takeaways: Kosovo must ensure safe practices regarding GMOs, which could impact its agriculture and environment.

5. **Nagoya Protocol**
   Date: 2010
   Legal Status: Binding for Ratifying Countries (Protocol)
   Function: Framework for Action
   Topics Covered: Sustainable Use and Trade
   Brief Description: Focuses on access to genetic resources and fair benefit-sharing, enhancing the objectives of the CBD.
   Relevance to Kosovo: Kosovo could align with the Nagoya Protocol in regulating access to its genetic resources and ensuring equitable benefits from their use.
   Legal/Strategic Implications: Binding for countries that ratify it. Kosovo could implement policies related to the fair sharing of benefits from its genetic resources.
   Key Takeaways: Kosovo needs to establish laws that regulate genetic resource access and benefit-sharing in line with the protocol.

3.2.2.2 Non-Binding Frameworks, Strategies, and Plans

These documents provide guidelines and goals, but do not impose legal obligations on signatories.

1. **World Conservation Strategy (WCS)**
   Date: 1980
   Legal Status: Non-Binding (Strategy)
   Function: Strategic Goals and Targets
   Topics Covered: Conservation
   Brief Description: A global strategy that integrates biodiversity conservation with human development.

Relevance to Kosovo: Relevant as Kosovo's biodiversity and development policies can align with the objectives of integrating both elements.
Legal/Strategic Implications: No binding obligations, but could influence policy direction.
Key Takeaways: A useful reference for Kosovo to balance biodiversity conservation with sustainable human development.

2. **WSSD Biodiversity Reduction Targets**
   Date: 2002
   Legal Status: Non-Binding (Action Plan)
   Function: Strategic Goals and Targets
   Topics Covered: Conservation
   Brief Description: Part of the Johannesburg Plan, calling for reversing biodiversity loss globally by 2010.
   Relevance to Kosovo: Kosovo can use this target as a reference to reverse biodiversity loss and integrate these goals into national policies.
   Legal/Strategic Implications: Not legally binding but influential for national policy and funding.
   Key Takeaways: Kosovo should use this to guide actions in halting biodiversity loss, even though the deadline has passed.

3. **Strategic Plan for Biodiversity 2011-2020 (COP 10)**
   Date: 2010
   Legal Status: Non-Binding (Action Plan)
   Function: Strategic Goals and Targets
   Topics Covered: Conservation
   Brief Description: Set 20 global biodiversity targets to halt biodiversity loss by 2020.
   Relevance to Kosovo: Kosovo could align its biodiversity policies with the Aichi Targets, which include specific conservation actions.
   Legal/Strategic Implications: Not binding, but widely influential for shaping global biodiversity policies.
   Key Takeaways: Kosovo should aim to meet the Aichi Targets for biodiversity conservation in future national plans.

4. **UN Sustainable Development Goals (SDGs)**
   Date: 2015
   Legal Status: Non-Binding (Agenda)
   Function: Strategic Goals and Targets
   Topics Covered: Conservation, Climate Change, Sustainable Use
   Brief Description: Emphasizes life on land, sustainable forest management, and reducing biodiversity loss.
   Relevance to Kosovo: Kosovo aligns with SDG 15 on biodiversity but faces challenges in institutional capacity and public awareness.
   Legal/Strategic Implications: Non-binding, but influential for national policy and funding.

Key Takeaways: Kosovo's national strategies should integrate SDG 15 to enhance its biodiversity efforts and governance.

5. **Post-2020 Global Biodiversity Framework (GBF)**
   Date: 2021
   Legal Status: Non-Binding Guidelines
   Function: Strategic Goals and Targets
   Topics Covered: Conservation
   Brief Description: Establishes ambitious biodiversity targets through 2050 with strengthened implementation mechanisms.
   Relevance to Kosovo: Kosovo aligns through EU frameworks, focusing on biodiversity restoration and monitoring.
   Legal/Strategic Implications: Not directly binding, but Kosovo should align with the EU's adoption of these goals.
   Key Takeaways: Kosovo can adopt the targets in the GBF to enhance national biodiversity protection and restoration strategies.

6. **Kunming-Montreal GBF**
   Date: 2022
   Legal Status: Non-Binding (Framework)
   Function: Strategic Goals and Targets
   Topics Covered: Conservation, Ecosystem Restoration
   Brief Description: Establishes global targets for biodiversity, including the restoration of 30% of degraded ecosystems by 2030.
   Relevance to Kosovo: Kosovo could adopt these principles to enhance national restoration targets, particularly for deforested or degraded areas.
   Legal/Strategic Implications: Non-binding, but influential in guiding national policies on ecosystem restoration.
   Key Takeaways: Kosovo can align its restoration policies with the targets, focusing on ecosystem recovery, especially in degraded areas.

7. **Post-2020 GBF (COP 15)**
   Date: 2022
   Legal Status: Non-Binding (Framework)
   Function: Strategic Goals and Targets
   C. Topics Covered: Conservation, Climate-Biodiversity Nexus
   Brief Description: Focuses on global biodiversity conservation through 2030, including the 30x30 target to protect 30% of land and oceans globally.
   Relevance to Kosovo: Kosovo aligns indirectly with the EU's adoption of these goals.
   Legal/Strategic Implications: Non-binding, but influential for national biodiversity strategies through EU frameworks.
   Key Takeaways: Kosovo should integrate these global goals into its biodiversity strategy, ensuring national commitments to land and ocean protection.

3.2.2.3 Non-Binding Assessment Reports

These reports assess the state of biodiversity and provide guidance but do not create legal obligations.

1. **IPBES-IPCC Report on Biodiversity and Climate**
   Date: 2019
   A. Legal Status: Non-Binding (Report)
   B. Function: Assessment Report
   C. Topics Covered: Climate-Biodiversity Nexus
   Brief Description: Explores the interconnections between biodiversity and climate change. Provides crucial data for policy-making.
   Relevance to Kosovo: Relevant for informing Kosovo's climate and biodiversity strategies, especially in managing climate impacts on ecosystems.
   Legal/Strategic Implications: Not binding, but essential for influencing policies and funding decisions.
   Key Takeaways: Kosovo should incorporate the findings into climate adaptation strategies, considering biodiversity's role in resilience.

EARLY FOUNDATIONS AND GROWING AWARENESS | FIRST GLOBAL ENVIRONMENTAL LAWS AND FRAMEWORKS | FORMALIZATION OF GLOBAL BIODIVERSITY LAW | BIODIVERSITY CRISIS BECOMES A GLOBAL ISSUE | OPERATIONALIZING BIODIVERSITY PROTECTION | BIODIVERSITY AND CLIMATE FRAMEWORKS CONVERGE

2.55 BILLION
+0.2°C

4.4 BILLION
+0.4°C

6.13 BILLION
+0.6°C

The Ramsar Convention on Wetlands
Binding
First global treaty focused on biodiversity conservation

World Heritage Convention (WHC)
Binding
Protects cultural and natural heritage sites of outstanding value.

UN Convention on Biological Diversity (CBD)
Binding
Global framework for biodiversity conservation, sustainable use, and equitable sharing of benefits; requires National Biodiversity Strategies and Action Plans (NBSAPs). Kosovo aligns indirectly.

Cartagena Protocol on Biosafety (under CBD)
Binding
Regulates the safe transfer, handling, and use of genetically modified organisms (GMOs).

Nagoya Protocol
Binding for ratifying countries
Focuses on access to genetic resources and benefit-sharing, enhances CBD objectives.

1980 World Conservation Strategy (WCS)
Non-Binding
Focuses on integrating biodiversity conservation with human development.

Strategic Plan for Biodiversity 2011-2020 (COP 10)
Non-Binding
Set 20 global biodiversity targets to halt biodiversity loss by 2020.

-15%
Biodiversity Loss (-%)
-30%
-60%

1945
1948
1960
1971
1972
1980
1992
2000
2002
2010
2012

UNESCO
International Union for Conservation of Nature (IUCN)
World Commission on Protected Areas (WCPA)
Man and the Biosphere (MAB)
1971
1986

National Forum on Biodiversity, Washington, D.C., A landmark event that shaped global discourse on biodiversity conservation. **Coining of the Term "Biodiversity".**

WSSD Biodiversity Reduction Targets
Non-Binding
Part of the Johannesburg Plan; calls for reversing biodiversity loss globally by 2010. Kosovo incorporates this indirectly.

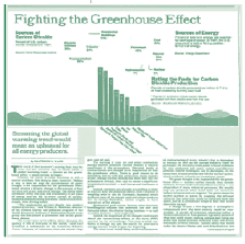
URBANIZATION (%)
DEFORESTATION (%)

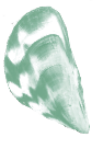
First Earth Day

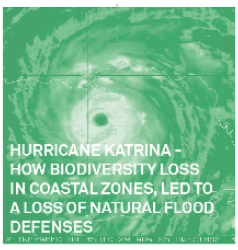
Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)


HIGH-YIELD CROP VARIETIES & CHEMICAL FERTILIZERS AND PESTICIDES (D.D.T.).


DEFORESTATION, LAND-USE CHANGE, AND OVERHUNTING.




THE SPREAD OF INVASIVE SPECIES RECOGNIZED AS A GROWING THREAT TO NATIVE BIODIVERSITY.


HURRICANE KATRINA - HOW BIODIVERSITY LOSS IN COASTAL ZONES, LED TO A LOSS OF NATURAL FLOOD DEFENSES


CORAL REEFS GLOBALLY SUFFERED MASSIVE BLEACHING EVENTS DUE TO RISING OCEAN TEMPERATURES, WITH 50% OF CORAL COVER LOST IN SOME REGIONS.

ACCELERATION OF LEGAL AND POLICY ACTION

FUTURE OUTLOOK

8.16 BILLION

+1.54°C

GLOBAL WARMING

Kunming-Montreal GBF
Non-Binding
Establishes conservation targets including restoration of 30% of degraded ecosystems globally.
Kosovo can adopt principles to enhance national restoration targets.particularly for deforested or degraded lands.

Post-2020 Global Biodiversity Framework (GBF)
Binding Guidelines
Aims for ambitious biodiversity conservation targets by 2050, with strengthened implementation mechanisms.
Kosovo aligns with EU frameworks, focusing on restoration and monitoring biodiversity indicators.

Post-2020 GBF (COP 15)
Non-Binding
Focuses on global biodiversity conservation for 2021-2030, includes the 30x30 target to protect 30% of land and oceans globally by 2030. Kosovo indirectly aligns through EU.

IPBES-IPCC Report on Biodiversity and Climate
Non-Binding
Demonstrates the interconnection between biodiversity and climate change; provides valuable data for Kosovo's policymaking.

UN Sustainable Development Goals (SDGs)
Non-Binding
Emphasizes life on land, sustainable forest management, and biodiversity loss reduction.
Kosovo integrates SDG 15 in environmental strategies but needs institutional strengthening and public awareness.

2015

2020

2021

2022

2024

COP 16

2030

2050

$200
BILLION/YEAR(USD)

MOBILIZING AT LEAST $200 BILLION PER YEAR FROM PUBLIC AND PRIVATE SOURCES FOR BIODIVERSITY-RELATED FUNDING - GBF TARGET, COP15

1 M

SPECIES AT RISK OF EXTINCTION (IPBES)

EXTINCTION OF SLENDER-BILLED CURLEW, IS THE FIRST FROM THE MAINLANDS OF EUROPE, NORTH AFRICA AND WEST ASIA TO BE DECLARED WIPED OUT

COVID-19 PANDEMIC
HIGHLIGHTS THE LINK BETWEEN HABITAT DESTRUCTION AND ZOONOTIC DISEASES, TEMPORARILY REDUCING HUMAN ACTIVITY BUT EXACERBATING CONSERVATION CHALLENGES.

-80%

-85%

-90%

Future Targets and Deadlines
Non binding

30x30 Target
Protect 30% of the world's terrestrial and marine areas.

Restoration of Degraded Ecosystems
Achieve restoration of 30% of degraded ecosystems globally, under the Kunming-Montreal GBF.

Vision for Living in Harmony with Nature
Non binding

The Post-2020 GBF aims for a net-positive impact on biodiversity, halting biodiversity loss entirely.

Conclusion

Kosovo's biodiversity is both rich and unique, characterized by a variety of endemic species and diverse ecosystems, from its pristine forests and rivers to its mountainous terrains. However, like many regions globally, Kosovo faces a range of environmental pressures that threaten its natural heritage. These challenges include habitat fragmentation, unsustainable agricultural practices, weak enforcement of environmental laws, and the growing impacts of climate change. While Kosovo's commitment to biodiversity conservation is evident in efforts such as the establishment of protected areas and local conservation initiatives, significant gaps remain in both legal and conceptual frameworks. Although Kosovo has made progress in aligning its biodiversity policies with EU regulations and standards, it is not yet a formal signatory to key international agreements, such as the UN Convention on Biological Diversity (CBD) and the World Heritage Convention (WHC). This lack of formal participation in global frameworks limits Kosovo's access to international funding, technical expertise, and collaboration opportunities, all of which are crucial to enhancing biodiversity conservation efforts. Kosovo's legal status as a non-signatory also hampers its ability to fully integrate with the global biodiversity community, particularly in accessing international resources that could aid its efforts in protecting its unique biodiversity.

One of Kosovo's strengths lies in its local conservation efforts, exemplified by the protection of areas like the Sharr Mountains and Bjeshkët e Nemuna National Park. These initiatives demonstrate the country's potential to contribute meaningfully to biodiversity preservation. However, these efforts remain fragmented and insufficient without a comprehensive, national strategy. The integration of biodiversity conservation into broader sectors such as agriculture, energy, and urban planning is still lacking, and institutional capacity for biodiversity monitoring and enforcement remains limited.

There are also substantial opportunities for Kosovo to improve its biodiversity management. By strengthening its legal frameworks and aligning with global biodiversity treaties, Kosovo could open the door to increased international cooperation and support. The country's rich natural resources provide opportunities for eco-tourism, sustainable agriculture, and community-based conservation, all of which could foster greater engagement with biodiversity protection while improving the livelihoods of local communities.

The main challenges Kosovo faces are legal and institutional gaps, as well as the need to balance economic development with the preservation of natural ecosystems. Economic pressures from infrastructure, agriculture, and mining sectors often conflict with the need to conserve habitats and species. To address these challenges, key recommendations for Kosovo include:

1. **Legal Alignment:** Kosovo should seek to become a full signatory of international biodiversity agreements, such as the CBD, to strengthen its biodiversity policy and international cooperation.
2. **Policy Integration:** Biodiversity must be integrated into national policies across energy, agriculture, urban development, and climate change.
3. **Institutional Capacity:** Strengthening institutional frameworks for biodiversity management, monitoring, and enforcement is essential for successful implementation of biodiversity strategies.
4. **Public Engagement:** Raising awareness through education campaigns can foster a

stronger conservation culture and empower local communities to play an active role in biodiversity preservation.

5. **Monitoring and Data Collection:** Improved systems for biodiversity monitoring and data collection will help Kosovo track progress and meet international targets, such as the 30x30 target for the protection of land and marine areas.

In conclusion, Kosovo is at a crossroads in its approach to biodiversity conservation. While it has made strides toward aligning its policies with global standards, significant gaps remain in terms of legal integration, sectoral coordination, and institutional capacity. By prioritizing the integration of biodiversity into its national development policies, enhancing its participation in international biodiversity frameworks, and strengthening local conservation efforts, Kosovo can play a crucial role in the global biodiversity restoration movement. The country's unique biodiversity is both a critical asset and an urgent responsibility; the time to act is now to safeguard it for future generations and contribute to the broader global efforts to halt biodiversity loss.

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EUROPEAN BIODIVERSITY OBJECTIVES

4

EUROPEAN BIODIVERSITY POLICY, SHAPED BY GLOBAL AGREEMENTS AND REGIONAL DIRECTIVES, HAS CREATED MAJOR FRAMEWORKS LIKE THE HABITATS AND BIRDS DIRECTIVES AND THE NATURA 2000 NETWORK, PROTECTING VAST LAND AND MARINE AREAS. WHILE PROGRESS HAS BEEN MADE THROUGH RESTORATION AND COOPERATION, BIODIVERSITY LOSS CONTINUES, WITH CHALLENGES IN IMPLEMENTATION AND BALANCING CONSERVATION WITH DEVELOPMENT, ESPECIALLY IN REGIONS LIKE THE BALKANS AND KOSOVO.

4. European Biodiversity Objectives

4.1 Foundations and Evolution of the European Biodiversity Discourse

Biodiversity is not just a scientific or environmental concern; it is a fundamental aspect of Europe's ecological and political landscape. Shaped by centuries of land use, industrialization, and policy interventions, Europe's approach to biodiversity has been defined by a continuous effort to balance conservation with economic and social development. Legal frameworks, treaties, and strategies have been put in place to address biodiversity loss, but challenges remain as ecosystems continue to degrade. In the Balkans, a region rich in biodiversity and home to many endemic species, the stakes are particularly high. Environmental policies must navigate complex political and economic transitions, making conservation efforts more difficult to implement. At the European level, ambitious policies like the EU Biodiversity Strategy for 2030 and the Habitats and Birds Directives aim to halt biodiversity loss, while regional agreements attempt to address specific local challenges. However, despite these initiatives, biodiversity continues to decline, raising critical questions about the effectiveness of existing frameworks and the tensions between policy goals and real-world implementation [1].
Understanding how biodiversity became a European policy priority, the key milestones in its legal and institutional development, and the successes and limitations of conservation efforts provides insight into the broader challenges of environmental governance. The intersection of legal frameworks, regional initiatives, and on-the-ground realities highlights the complexity of protecting biodiversity in a rapidly changing world.

4.1.1 The emergence of biodiversity as a european concern

Biodiversity as a concept did not emerge in isolation; it is the product of shifting scientific perspectives, global environmental movements, and political negotiations. While the diversity of life has long been observed and classified, it was only in the late 20th century that biodiversity became a central concern in policy and governance. The increasing awareness of species extinction, ecosystem degradation, and the consequences of human activity on natural environments led to a fundamental rethinking of how nature should be managed and protected [2].The post-war period saw the rise of ecological sciences, recognizing the intricate interdependence of species and ecosystems. By the 1970s, reports such as the Club of Rome's "Limits to Growth" (1972) and the UN Stockholm Conference on the Human Environment (1972) signaled that environmental degradation was no longer a local issue but a global challenge requiring coordinated action.
In Europe, the first policy discussions around biodiversity protection emerged alongside broader environmental concerns such as air and water pollution. However, the turning point came with the Rio Earth Summit (1992), where the international community adopted the Convention on Biological Diversity (CBD)—a landmark agreement that for the first time formally recognized biodiversity as a shared global responsibility. The CBD set out three core objectives: The conservation of biological diversity, The sustainable use of its components, and The fair and equitable sharing of benefits arising from genetic resources. The European Union played a key role in integrating the CBD's principles into regional policies. In response to the convention, the EU adopted the Habitat Directive (1992), establishing the Natura 2000 network, the largest coordinated system of protected areas in the world. This marked a shift from reactive conservation—protecting individual species—to a more holistic approach focusing

on ecosystems and habitats [3].

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3. *Evans, David. "Building the European Union's Natura 2000 network." Nature Conservation 1 (2012): 11-26. https://natureconservation.pensoft.net/article/1329/*

4.1.2 Europe's Intermediary Role in Biodiversity Conservation

Europe's role in biodiversity conservation can be seen as that of an intermediary between global frameworks and national policies. While international agreements, such as the Convention on Biological Diversity (CBD), set the global stage for biodiversity protection, Europe has provided essential regional coordination to adapt these broad objectives to its unique ecological and political landscape.

In this intermediary role, Europe does not operate completely independently from the global frameworks but rather serves as a connector that translates global goals into more localized, actionable policies. This is done through regional treaties like the Bern Convention (1979) and directives such as the EU Birds and Habitats Directives (1979 and 1992), which were designed to ensure that biodiversity protection in Europe is aligned with the larger global targets set by the CBD and other international agreements. These treaties provide legally binding commitments for European countries to protect endangered species and their habitats, fostering cross-border cooperation for biodiversity conservation [4,5].

Thus, Europe is positioned as a crucial actor in bridging the global and national levels of biodiversity conservation. By creating regional frameworks and protected areas, such as the Natura 2000 network, Europe ensures that global biodiversity goals are reflected in more specific, localized actions that can be enforced and monitored across member states.

4.1.3 The Importance of European Biodiversity and Its Benefits

Recognizing the ecological and economic significance of biodiversity, European policies have prioritized conservation through extensive protected area networks. As of recent estimates, Natura 2000 covers over 18% of the EU's land area and nearly 10% of its marine territory, making it the largest coordinated network of protected areas in the world. Additionally, initiatives like the Emerald Network, which extends conservation efforts to non-EU countries, reinforce biodiversity protection across the broader European region [6].

Restoration efforts have also expanded significantly, aligning with the EU Biodiversity Strategy for 2030, which aims to restore at least 30% of degraded ecosystems by enhancing habitat connectivity and reversing biodiversity loss. Programs targeting rewilding, afforestation, and wetland restoration have demonstrated measurable success in increasing species populations and stabilizing ecosystems [7].

Beyond ecological benefits, biodiversity plays a key role in public health and well-being. Green spaces in urban areas contribute to improved air quality, mental health, and resilience against climate change. By preserving biodiversity, Europe not only safeguards its natural heritage but also ensures a sustainable future for its people and economies.

1. *Morgera, Elisa. "The Bern Convention and the EU Birds and Habitats Directives." In The Legal Aspects of the Conservation of Species: The Bern Convention Thirty Years On, edited by Michael Bowman and Alan Boyle, 1st ed., 19-42. London: Routledge, 2010*
2. *Caddell, Richard. "The Habitats Directive and Bern Convention: Synergy and Dysfunction in Public International and EU Law." Journal of Environmental Law 25, no. 3 (2013): 495-527. https://doi.org/10.1093/jel/eqt022.*
3. *Tóth, Gergely, et al. "Forest-Cover Changes in European Natura 2000 Sites in the Period 2000–2020." Forests 15, no. 2 (2023): 232. https://www.mdpi.com/1999-4907/15/2/232*
4. *European Commission. "Biodiversity Strategy for 2030." Accessed February 7, 2025. https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en*

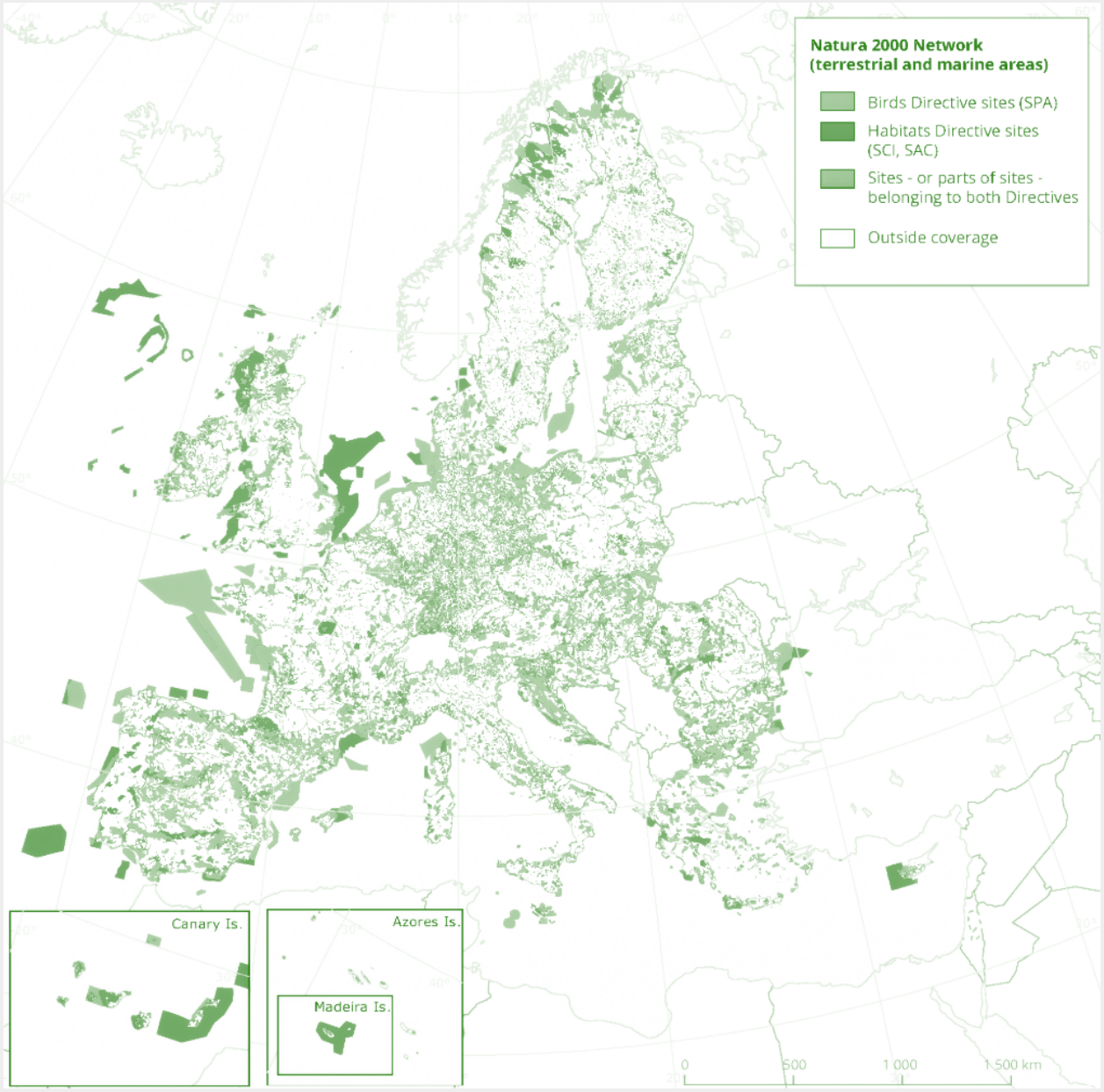


Fig. 1 : Wetlands International, “Figure 1: Natura 2000 Network Map,” Wetlands International (2022), accessed February 7, 2025, https://europe.wetlands.org/europe-is-celebrating-30-years-of-the-natura-2000-network/. The image (2022) highlights the Natura 2000 Network, which encompasses nearly 27,000 terrestrial and marine sites across the 27 Member States of the EU, covering over 18% of Europe’s land area and 9% of its marine territories. This network plays a pivotal role in wetland conservation and sustainable management, with about 41% of all terrestrial and coastal waters in the EU being designated as part of the Natura 2000 sites. Certain wetland types, such as peatlands and coastal habitats, are relatively well represented within the network. However, the coverage of small wetlands remains limited, underscoring a gap in the protection of these vital ecosystems. This image visually captures the scale and significance of Natura 2000 in safeguarding Europe’s biodiversity and promoting long-term environmental sustainability. The Natura 2000 Network was created in 1992, following the adoption of the EU Habitats Directive and the Birds Directive, aiming to safeguard Europe’s most endangered species and habitats by establishing a coherent network of protected areas across the European Union. This network was designed to ensure the long-term conservation of biodiversity by promoting sustainable land use and habitat management practices.

4.1.4 Biodiversity in Kosovo: A Local Context Within a European Framework

Kosovo, situated in the heart of the Balkans, is recognized as a biodiversity hotspot, harboring a wide variety of endemic and endangered species. Its diverse landscapes, ranging from mountainous terrains to freshwater ecosystems, contribute to a rich ecological heritage that is both valuable and vulnerable. Kosovo boasts significant biodiversity, with national parks such as Sharri and Bjeshkët e Nemuna, which serve as critical habitats for species like the Balkan lynx, brown bear, and golden eagle.

While Kosovo is not an EU member state, its environmental policies are increasingly influenced by European biodiversity frameworks. The country has aligned its conservation efforts with regional initiatives such as the Bern Convention and the Emerald Network, working to establish protected areas and sustainable management strategies. However, challenges remain, particularly in balancing economic development with conservation priorities. Issues such as habitat fragmentation, pollution, and insufficient funding for environmental protection pose significant hurdles [8,9].

By examining Kosovo's approach to biodiversity within the broader European context, this study seeks to explore how global and regional conservation frameworks can be effectively implemented at the local level. Understanding Kosovo's biodiversity policies provides insight into the challenges and opportunities of conservation in transitional economies.

4.1.5 Objectives of the Study

This study aims to analyze the evolution of European biodiversity policies and their influence on regional conservation efforts, with a specific focus on Kosovo. The key objectives include:

Researching the Development of European Biodiversity Frameworks:

- Examining the historical progression of biodiversity protection policies in Europe, from early environmental movements to contemporary legal frameworks.
- Assessing the impact of major agreements.
- Evaluating Biodiversity Conservation in Kosovo:
- Analyzing how European conservation policies influence national biodiversity strategies and the extent to which Kosovo aligns with EU environmental standards.
- Collection and Analysis of European Policy Documents
- Reviewing legal documents, strategic plans, and environmental reports from European institutions.
- Identifying best practices and policy recommendations for strengthening biodiversity conservation in Kosovo.

By addressing these objectives, this study will contribute to a deeper understanding of how European biodiversity policies shape conservation efforts at multiple levels and how countries like Kosovo can integrate these frameworks to enhance their environmental governance.

5. *World Bank. Kosovo: A Comprehensive Environmental Assessment. Washington, DC: World Bank, 2015. https://documents1.worldbank.org/curated/en/282361468047686579/pdf/750290ESW0P1310LIC00Kosovo0CEA0Rprt.pdf*
6. *Balkans Green Foundation. Sustainable Development in Kosovo: Key Environmental Issues and Policy Challenges. Accessed February 7, 2025. https://www.balkangreenfoundation.org/uploads/files/2020/December/02/Final_Evidence_Based_Report_EEBO_eng1606913648.pdf.*

4.2 European and Regional Biodiversity Frameworks and Milestones

Biodiversity policy in Europe has evolved through a series of legal, institutional, and strategic developments, shaped by both international agreements and regional priorities. Several key milestones define this trajectory.

4.2.1 Historical Narrative: The Evolution of European Biodiversity Frameworks

4.2.1.1 Early Legal Frameworks and Awareness (1970s–1980s)

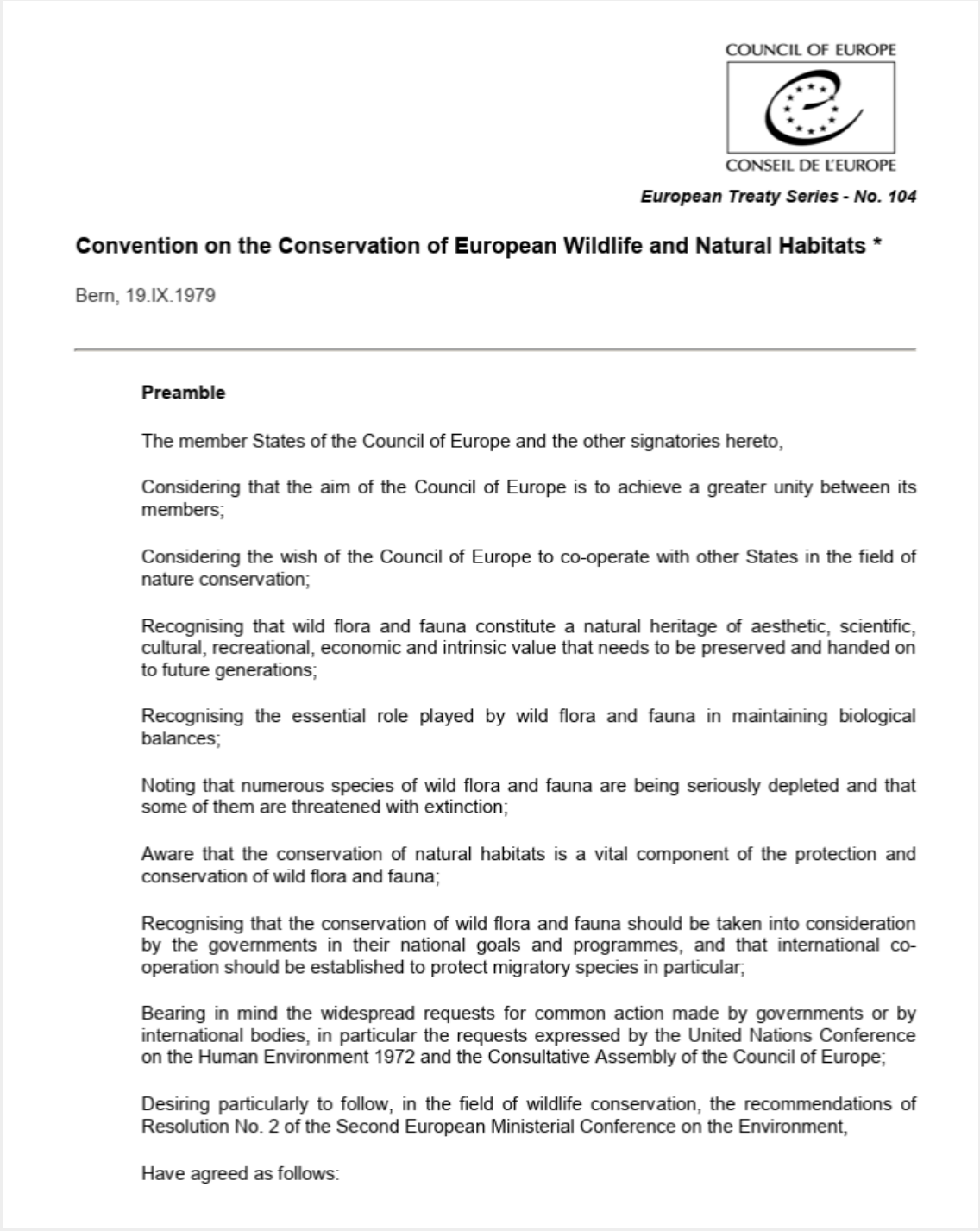
By the 1970s, global temperatures had risen by 0.3°C, and the world population reached 4.4 billion. Scientific research on ecosystems and climate change was expanding, highlighting the critical role of biodiversity in maintaining ecological balance. The establishment of conservation organizations such as BirdLife International and WWF Europe marked a turning point in biodiversity awareness, emphasizing the importance of species protection and habitat conservation [10,11].

During this period, ecological studies deepened the understanding of how biodiversity supports ecosystem stability. Scientists examined the relationships between species, habitat integrity, and environmental resilience, reinforcing the need for international cooperation in conservation. This growing body of research contributed to the adoption of the 1979 Bern Convention on the Conservation of European Wildlife and Natural Habitats, the first legally binding treaty dedicated to protecting species and ecosystems across national borders. The convention played a foundational role in shaping future conservation policies and later influenced the 1992 EU Habitats Directive, which led to the creation of the Natura 2000 network—a key protected area system in Europe [12,13].

By 1980, global warming had increased by 0.4°C, and studies on biodiversity indicators—such as habitat loss, species population trends, and water quality—provided new ways to assess environmental health. This period saw increasing recognition that habitat conservation was essential for sustaining biodiversity and ecosystem services, including climate regulation and natural resource stability [14].

Recognizing the importance of marine and coastal environments, Europe launched the Blue Flag Programme in 1985 to promote high environmental standards for beaches and marinas. Initially focused on water quality and pollution control, the program later evolved to include marine biodiversity conservation and sustainable coastal tourism, integrating science-based criteria into environmental management. The scientific advancements of the 1970s and 1980s laid the groundwork for modern biodiversity policies. Research-driven approaches emphasized habitat protection, ecological monitoring, and international cooperation. These early frameworks set the stage for the stronger conservation laws and protected area networks that emerged in the following decades, ensuring that biodiversity remained a central pillar of European environmental governance [15].

1. *BirdLife International. "Our History." Accessed February 7, 2025. https://www.birdlife.org/about/about-us/our-history.*
2. *World Wildlife Fund (WWF). "WWF's History." Accessed February 7, 2025. https://www.worldwildlife.org/about/history.*
3. *Council of Europe. "Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)." Accessed February 7, 2025. https://www.coe.int/en/web/bern-convention.*
4. *European Commission. "The Habitats Directive." Accessed Feb 7, 2025 https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm.*
5. *Sala, O. E., et al. "Global biodiversity scenarios for the year 2100." Science 287, no. 5459 (2000): 1770-1774. https://doi.org/10.1126/science.287.5459.1770.*
6. *Secretariat of the Convention on Biological Diversity. "Global Biodiversity Outlook 2." Montreal: Secretariat of the Convention on Biological Diversity, 2006. https://www.cbd.int/gbo2/.*



COUNCIL OF EUROPE

CONSEIL DE L'EUROPE

European Treaty Series - No. 104

Convention on the Conservation of European Wildlife and Natural Habitats *

Bern, 19.IX.1979

Preamble

The member States of the Council of Europe and the other signatories hereto,

Considering that the aim of the Council of Europe is to achieve a greater unity between its members;

Considering the wish of the Council of Europe to co-operate with other States in the field of nature conservation;

Recognising that wild flora and fauna constitute a natural heritage of aesthetic, scientific, cultural, recreational, economic and intrinsic value that needs to be preserved and handed on to future generations;

Recognising the essential role played by wild flora and fauna in maintaining biological balances;

Noting that numerous species of wild flora and fauna are being seriously depleted and that some of them are threatened with extinction;

Aware that the conservation of natural habitats is a vital component of the protection and conservation of wild flora and fauna;

Recognising that the conservation of wild flora and fauna should be taken into consideration by the governments in their national goals and programmes, and that international co-operation should be established to protect migratory species in particular;

Bearing in mind the widespread requests for common action made by governments or by international bodies, in particular the requests expressed by the United Nations Conference on the Human Environment 1972 and the Consultative Assembly of the Council of Europe;

Desiring particularly to follow, in the field of wildlife conservation, the recommendations of Resolution No. 2 of the Second European Ministerial Conference on the Environment,

Have agreed as follows:

Fig. 2: Council of Europe. Convention on the Conservation of European Wildlife and Natural Habitats. Bern, 19 September 1979. Accessed February 7, 2025. https://rm.coe.int/1680078aff. The preamble of the Bern Convention (1979) emphasizes the need for international cooperation to protect Europe's wildlife and natural habitats, acknowledging their aesthetic, scientific, and ecological value. It highlights the threat of species extinction and the importance of conserving natural habitats. The Convention calls for integrating biodiversity protection into national policies and emphasizes the need for cross-border action, particularly for migratory species. It reflects global concerns, including those raised by the United Nations, for collective environmental efforts.

4.2.1.2 Establishment of Protected Areas and Global Commitments (1990s)

The 1990s marked a pivotal decade for biodiversity conservation in Europe, driven by both regional and global commitments. In 1992, the European Union introduced the EU Habitats Directive and established the Natura 2000 Network, Europe's largest network of protected areas. This network aimed to safeguard Europe's most valuable species and habitats, covering over 18% of the EU's land area and extending to key marine regions. It was an important extension of earlier agreements, such as the Bern Convention, which had laid the groundwork for regional conservation strategies. The Natura 2000 network not only provided strong protection for diverse ecosystems but also acted as a model for other regions to follow [16].
Simultaneously, 1992 saw the adoption of the UN Convention on Biological Diversity (CBD) during the Rio Earth Summit. The CBD set a global framework for biodiversity conservation, and Europe integrated its goals into regional policies. This international commitment to biodiversity led to enhanced cooperation between European nations and the global community, fostering a shared responsibility for preserving ecosystems worldwide. The CBD's principles influenced the EU's policies, ensuring that Europe's conservation strategies aligned with broader global objectives, thereby strengthening both regional and global biodiversity frameworks [17].
In 1995, the EU launched the LIFE Programme, providing crucial funding for environmental conservation projects across Europe. The LIFE Programme became instrumental in supporting practical conservation actions, funding initiatives aimed at protecting habitats, restoring ecosystems, and addressing climate change. This initiative significantly contributed to species recovery efforts and the implementation of biodiversity strategies, particularly in the context of the Natura 2000 Network [18].
However, the 1990s also saw environmental disasters such as the Erika (1999), which raised alarm about marine biodiversity risks. These tragedies highlighted the urgent need for stricter regulations and restoration efforts for marine ecosystems, further emphasizing the connection between global and regional biodiversity protection [19].
By the end of the 1990s, Europe's focus on protected areas, funded projects, and global collaboration had led to tangible biodiversity gains, including the successful reintroduction of species like the European bison. This decade set the stage for continued biodiversity conservation, aligning local actions with global priorities [20].

1. *European Commission. Natura 2000: The European Network of Protected Sites. Brussels: European Commission, 2000. https://ec.europa.eu/environment/nature/natura2000/index_en.htm.*
2. *United Nations. Convention on Biological Diversity. Adopted June 5, 1992, Rio de Janeiro. Accessed February 7, 2025. https://www.cbd.int/convention/text/.*
3. *European Commission. "LIFE Programme." CINEA – European Climate, Infrastructure and Environment Executive Agency. Accessed February 7, 2025. https://cinea.ec.europa.eu/programmes/life_en.*
4. *European Commission. The Erika Oil Spill: A Case Study in Marine Biodiversity Protection. Brussels: European Commission, 2000. https://ec.europa.eu/environment/marine/oil-spills/erika_en.htm.*
5. *Nechita, Iuliana, Elena Ion, and Sorin G. Toma. "Reintroduction of the European Bison in Romania: Current Status and Future Perspectives." Forests 13, no. 6 (2022): 920. https://doi.org/10.3390/f13060920.*

4.2.1.3 Growing Public Awareness and Scientific Assessments (2000s)

The 2000s marked a period of heightened awareness and significant policy developments regarding biodiversity in Europe. The growing urgency surrounding biodiversity loss was highlighted by a 0.6°C rise in global temperatures and an estimated 60% loss of biodiversity by the turn of the century, setting the stage for crucial actions both regionally and globally [21].
In 2000, the European Union began intensifying its efforts to conserve biodiversity by further

implementing the Habitats Directive. This legal framework provided robust protection for species and habitats under the Natura 2000 Network, ensuring that European countries adhered to legally binding conservation measures. By embedding biodiversity conservation within EU law, the directive set the foundation for coordinated regional action .

The EU took another major step in 2001 with the adoption of the EU Biodiversity Strategy to 2010. This strategy outlined concrete conservation goals, such as halting biodiversity loss by 2010, and set measurable objectives to guide EU member states' efforts. It represented the EU's first comprehensive approach to biodiversity, underscoring the importance of tackling the biodiversity crisis in a structured and committed way.

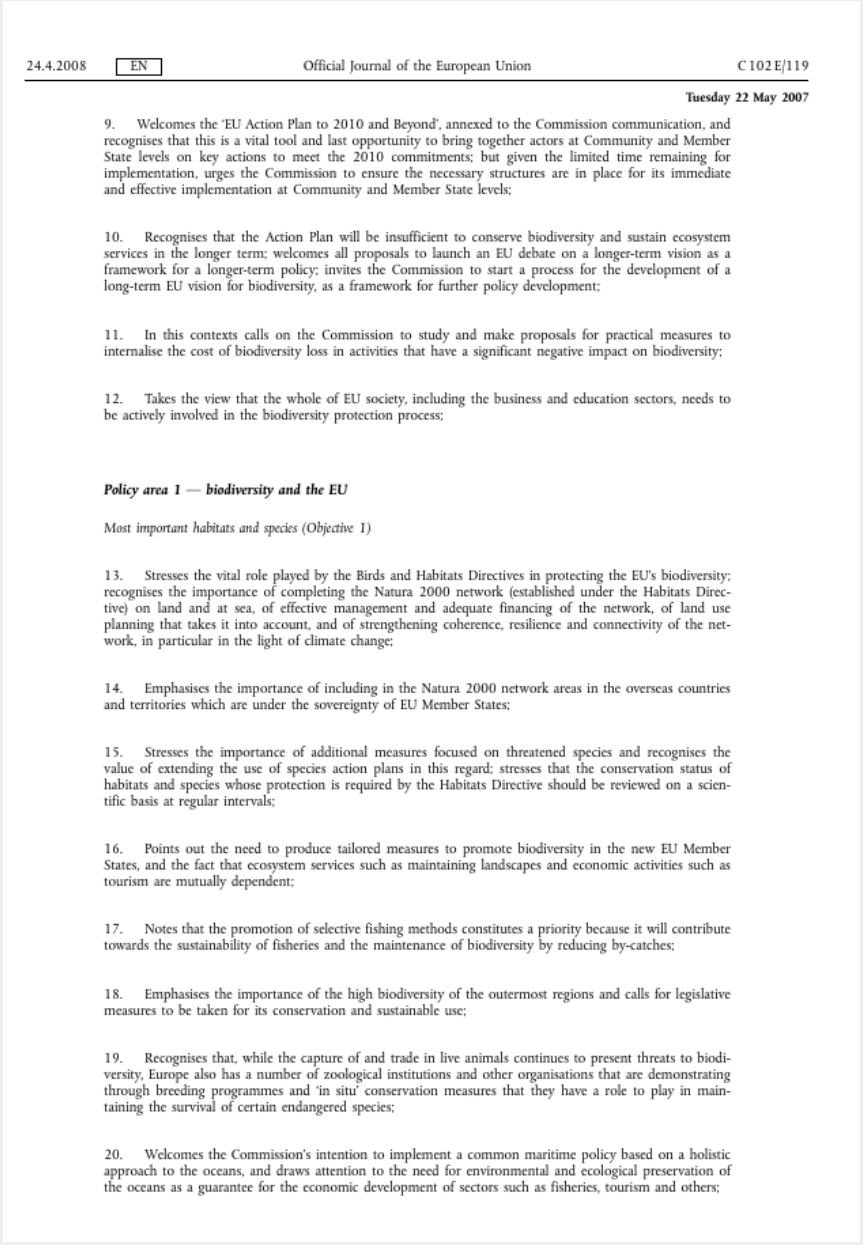
Meanwhile, the Prestige Oil Spill in 2002 served as a devastating wake-up call for Europe, as one of the worst marine environmental disasters triggered public outcry and political pressure for stronger protections for marine biodiversity. The disaster underscored the fragility of marine ecosystems and accelerated the EU's focus on enhancing environmental safeguards.

Amid these events, scientific assessments like the Millennium Ecosystem Assessment (MEA) in 2005 played a critical role in shaping European policy. The MEA revealed the dire state of global ecosystems and the severity of biodiversity loss, prompting European leaders to commit to more aggressive restoration and protection targets. This comprehensive evaluation provided crucial data that influenced both EU and national policies, encouraging a shift toward more sustainable management of natural resources.

In 2007, the Countdown 2010 Movement was launched, uniting stakeholders across Europe in a collective effort to halt biodiversity decline. This initiative highlighted the importance of collaborative action between governments, NGOs, and businesses to reverse biodiversity loss, building on the momentum generated by the EU's earlier policies and global assessments [22].

The 2000s were marked by a growing recognition of the need for urgent action, with increased public engagement and scientific assessments shaping stronger, more targeted conservation policies across Europe. These developments set the foundation for future efforts to protect biodiversity in an increasingly threatened world [23].

1. *European Commission. "Biodiversity Loss: Facts and Figures." European Union, February 2004. https://ec.europa.eu/commission/presscorner/detail/en/memo_04_27*
2. *Millennium Ecosystem Assessment. "Ecosystems and Human Well-being: Biodiversity Synthesis." World Resources Institute, 2005.*
3. *European Commission. "EU Biodiversity Strategy to 2010." European Commission, May 2001. https://www.eea.europa.eu/highlights/biodiversity-beyond-2010-deciding-the*



Tuesday 22 May 2007

9. Welcomes the 'EU Action Plan to 2010 and Beyond', annexed to the Commission communication, and recognises that this is a vital tool and last opportunity to bring together actors at Community and Member State levels on key actions to meet the 2010 commitments; but given the limited time remaining for implementation, urges the Commission to ensure the necessary structures are in place for its immediate and effective implementation at Community and Member State levels;

10. Recognises that the Action Plan will be insufficient to conserve biodiversity and sustain ecosystem services in the longer term; welcomes all proposals to launch an EU debate on a longer-term vision as a framework for a longer-term policy; invites the Commission to start a process for the development of a long-term EU vision for biodiversity, as a framework for further policy development;

11. In this contexts calls on the Commission to study and make proposals for practical measures to internalise the cost of biodiversity loss in activities that have a significant negative impact on biodiversity;

12. Takes the view that the whole of EU society, including the business and education sectors, needs to be actively involved in the biodiversity protection process;

Policy area 1 — biodiversity and the EU

Most important habitats and species (Objective 1)

13. Stresses the vital role played by the Birds and Habitats Directives in protecting the EU's biodiversity; recognises the importance of completing the Natura 2000 network (established under the Habitats Directive) on land and at sea, of effective management and adequate financing of the network, of land use planning that takes it into account, and of strengthening coherence, resilience and connectivity of the network, in particular in the light of climate change;

14. Emphasises the importance of including in the Natura 2000 network areas in the overseas countries and territories which are under the sovereignty of EU Member States;

15. Stresses the importance of additional measures focused on threatened species and recognises the value of extending the use of species action plans in this regard; stresses that the conservation status of habitats and species whose protection is required by the Habitats Directive should be reviewed on a scientific basis at regular intervals;

16. Points out the need to produce tailored measures to promote biodiversity in the new EU Member States, and the fact that ecosystem services such as maintaining landscapes and economic activities such as tourism are mutually dependent;

17. Notes that the promotion of selective fishing methods constitutes a priority because it will contribute towards the sustainability of fisheries and the maintenance of biodiversity by reducing by-catches;

18. Emphasises the importance of the high biodiversity of the outermost regions and calls for legislative measures to be taken for its conservation and sustainable use;

19. Recognises that, while the capture of and trade in live animals continues to present threats to biodiversity, Europe also has a number of zoological institutions and other organisations that are demonstrating through breeding programmes and 'in situ' conservation measures that they have a role to play in maintaining the survival of certain endangered species;

20. Welcomes the Commission's intention to implement a common maritime policy based on a holistic approach to the oceans, and draws attention to the need for environmental and ecological preservation of the oceans as a guarantee for the economic development of sectors such as fisheries, tourism and others;

Fig. 3 : European Union. “Official Journal of the European Union C102E/119.” EU Action Plan to 2010 and Beyond, 4 April 2008. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2008:102E:0117:0127:EN:PDF p. 3. The 2008 EU action plan and related discussions underscore the growing urgency for biodiversity conservation in Europe, particularly in the context of the European Union’s legal and policy frameworks. The Action Plan, which was seen as a crucial tool for meeting the 2010 biodiversity commitments, emphasized the need for immediate and effective implementation at both the EU and Member State levels. However, there was recognition that short-term measures alone would be insufficient to protect biodiversity in the long term. Consequently, the EU proposed the development of a long-term vision for biodiversity that would guide future policy efforts. Additionally, the plan highlighted the importance of economic sectors such as business, education, and tourism in the conservation process, advocating for the integration of biodiversity considerations into all levels of EU society. Specific actions included strengthening the Natura 2000 network, particularly through improved management, adequate funding, and better resilience in the face of climate change. Moreover, there was an emphasis on monitoring species and habitats regularly and promoting selective fishing methods to protect marine biodiversity. The initiative also called for increased involvement of overseas territories and recognition of their high biodiversity value. This period reflects a significant moment in the EU’s evolving commitment to biodiversity, with greater recognition of the role of both policy frameworks like the Birds and Habitats Directives and the need for broader societal engagement in conservation efforts.

4.2.1.4 Strengthening Policy and Regional Cooperation (2010–2020)

From 2010 to 2020, the European framework for biodiversity conservation strengthened, with increased attention from both global and regional actors, as well as a growing emphasis on policy and scientific collaboration.

The International Year of Biodiversity in 2010, declared by the UN, spurred heightened public and policy attention to the alarming loss of biodiversity. The year marked a global push to reverse biodiversity decline, encouraging European nations to reinforce their national commitments. This momentum was further built upon by the EU Biodiversity Strategy to 2020, which introduced ambitious and measurable targets for ecosystem restoration, the reduction of biodiversity loss, and the degradation of ecosystems. The strategy emphasized the importance of green infrastructure and ecosystem services, promoting a holistic approach that considered the benefits of biodiversity for human well-being and the environment. It represented a more integrated effort to tackle biodiversity loss within the broader scope of climate change and sustainable development [24].

In 2011, the European Biodiversity Observation Network (EBONE) was established to improve the monitoring and collection of biodiversity data across Europe. This initiative enhanced scientific collaboration, enabling better tracking of biodiversity trends and helping to inform future conservation strategies. By improving data quality, EBONE played a critical role in evaluating the effectiveness of the EU's biodiversity policies, such as the Natura 2000 network [25].

The Dinaric Arc Biodiversity Resolutions of 2014 further showcased Europe's commitment to regional cooperation. This agreement focused on strengthening transboundary conservation efforts in the Balkans, fostering cross-border collaboration among nations to protect key habitats and species in Southeast Europe. This initiative highlighted the importance of regional cooperation for biodiversity conservation, particularly in areas with shared ecosystems.

The IPBES Regional Assessment for Europe and Central Asia in 2018 provided scientific recommendations for improving biodiversity governance in the region, reinforcing the urgency of preserving ecosystems and species. This report, combined with the ongoing success of the EU Biodiversity Strategy, led to the inclusion of biodiversity conservation in the European Green Deal in 2019, integrating biodiversity into climate action and setting the stage for a green transition across Europe [26].

Through these efforts, Europe saw positive impacts such as the successful recovery of species like the European bison, which was reintroduced in various regions. Additionally, improved monitoring systems allowed for better tracking of biodiversity trends, ensuring that conservation measures could be more effectively tailored to address specific challenges. The 2010–2020 period was pivotal in strengthening Europe's commitment to protecting biodiversity, underscoring the critical need for regional and international cooperation, scientific collaboration, and policy integration [27].

1. *European Commission. Our Life Insurance, Our Natural Capital: An EU Biodiversity Strategy to 2020. COM(2011) 244 final, 2011. https://www.eea.europa.eu/policy-documents/eu-2020-biodiversity-strategy*
2. *Bunce, R.G.H., et al. "The European Biodiversity Observation Network – EBONE." The Nature of the Netherlands: Inventory of the Natural Environment in the Netherlands, edited by R.G.H. Bunce, et al., Wageningen Environmental Research, 2011, pp. 21–32. https://climate-adapt.eea.europa.eu/en/metadata/portals/european-biodiversity-observation-network-ebone*
3. *Schmeller, Dirk S., et al. "Towards a Modern and Efficient European Biodiversity Observation Network." Research Ideas and Outcomes 7 (2021): e7993. https://riojournal.com/topical_collection/145/*
4. *"Dinaric Arc Initiative: Five-Year Plan (2014–2019)." Dinaric Arc Initiative, 2014.*
5. *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). The IPBES Regional Assessment Report on Biodiversity and Ecosystem Services for Europe and Central Asia. Edited by M. Rounsevell, et al., Secretariat of IPBES, 2018. Available at: https://ipbes.net/assessment-reports/eca.*

Fig.4 : "II Konferencija Parkova Dinarida, Budva, Crna Gora, Decembar 2013." Parks Dinarides. Accessed [date]. https://parksdinarides.org/en/big-win-en/. As part of regional biodiversity efforts, the Big Win for Dinaric Arc agreement, first established in 2008, was renewed in 2013 with the inclusion of North Macedonia and Kosovo. Adopted in Budva on December 2, 2013, the initiative, developed by WWF, IUCN, and the Montenegro Ministry of Sustainable Development and Tourism, committed Albania, Bosnia and Herzegovina, Croatia, Montenegro, Slovenia, and Serbia to strengthen protected area management. Over the following five years, participating countries worked to integrate biodiversity conservation into economic development sectors, including fisheries, forestry, and tourism. A key objective was securing sustainable financing mechanisms for conservation efforts, ensuring long-term regional cooperation.

4.2.1.5 Ambitious Restoration Goals and New Challenges (2020–Present)

The period from 2020 to the present marks a critical juncture in Europe's efforts to combat biodiversity loss and ecosystem degradation, with ambitious restoration goals and new challenges on the horizon. By 2020, global warming had reached +1.54°C, with the world's population at 8.16 billion and an estimated 80% of biodiversity lost. In response to these alarming statistics, the European Union introduced its Biodiversity Strategy for 2030, aiming to protect 30% of Europe's land and sea areas and restore degraded ecosystems. This strategy highlighted the urgent need to reverse biodiversity loss, emphasizing not only conservation but also ecosystem restoration as a central goal [29.30].

1. *European Commission. EU Biodiversity Strategy for 2030: Bringing Nature Back into Our Lives. Brussels, 2020. Available at: https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en.*
2. *European Commission. Proposal for a Regulation of the European Parliament and of the Council on Nature Restoration. Brussels, 2022. Available at: https://environment.ec.europa.eu/topics/nature-and-biodiversity/nature-restoration-law_en.*

In tandem with this, the EU Nature Restoration Law was adopted in 2020, creating a legally binding framework for the restoration of ecosystems throughout the EU. This law outlined measures for the recovery of biodiversity hotspots and endangered species, ensuring that restoration efforts are both ambitious and enforceable. These twin initiatives, the Biodiversity Strategy and the Nature Restoration Law, set the stage for a comprehensive, long-term approach to biodiversity restoration across Europe [31,32].

The COP 15 Kunming-Montreal Global Biodiversity Framework in 2021 aligned international and European biodiversity goals, reinforcing Europe's commitment to global biodiversity targets. By ensuring that European efforts were in sync with international strategies, the framework provided a foundation for cooperative global conservation efforts [33].

Citizen involvement in biodiversity conservation also saw a significant increase, with citizen-science projects on freshwater biodiversity emerging in 2022. These initiatives, which engage citizens across Europe in monitoring and recording biodiversity in rivers, lakes, and wetlands, have boosted public participation in conservation efforts and helped gather valuable data for scientific research [34].

In 2023, the proposal for a Soil Health Law addressed one of Europe's most pressing environmental concerns: soil degradation. By focusing on soil biodiversity and resilience, this law aimed to restore vital ecosystems that play a critical role in supporting biodiversity and mitigating climate change [35].

Looking forward, the Nature Restoration Regulation in 2024 continues Europe's ambitious restoration agenda by requiring EU Member States to restore at least 20% of land and sea by 2030. Additionally, the establishment of EU-led Biodiversity Knowledge Hubs fosters cross-border research and collaboration, incorporating indigenous knowledge and conservation strategies to protect Europe's biodiversity more effectively [36].

These efforts, from ambitious legal frameworks to public involvement and cross-border cooperation, reflect Europe's heightened commitment to biodiversity restoration, addressing both current and emerging challenges in preserving ecosystems for future generations.

1. *European Environment Agency. EU Biodiversity Strategy for 2030. Copenhagen, 2020. Available at: https://www.eea.europa.eu/policy-documents/eu-biodiversity-strategy-for-2030-1.*
2. *International Union for Conservation of Nature (IUCN). "The EU Nature Restoration Law Came into Force Yesterday." IUCN News, August 2024. Available at: https://iucn.org/news/202408/eu-nature-restoration-law-came-force-yesterday.*
3. *Secretariat of the Convention on Biological Diversity. The Kunming-Montreal Global Biodiversity Framework. Montreal: United Nations, 2022. https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf*
4. *European Commission. "EU Biodiversity Strategy for 2030: Bringing Nature Back into Our Lives." European Commission, May 20, 2020. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0381*
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Fig. 5: European Union/Philippe Stirnweiss. “European Parliament voting session for the EU Nature Restoration Law, with German MEP Terry Reintke wearing a ‘Restore Nature’ shirt in support of the legislation.” The Brussels Times, February 9, 2023. https://www.brusselstimes.com/984203/completely-incomprehensible-eu-shelves-the-landmark-nature-restoration-law. The EU Nature Restoration Law, part of the 2030 Biodiversity Strategy, mandates restoring 30% of degraded habitats by 2030, with further goals for 2040 and 2050. It targets peatlands, rivers, urban green spaces, and tree planting, aiming to rewet 25% of peatlands and restore 25,000 km of rivers. Despite support, opposition arose from sectors like agriculture, fearing land use restrictions. This law, essential for biodiversity and climate goals, aligns with the Kunming-Montreal Global Biodiversity Framework.

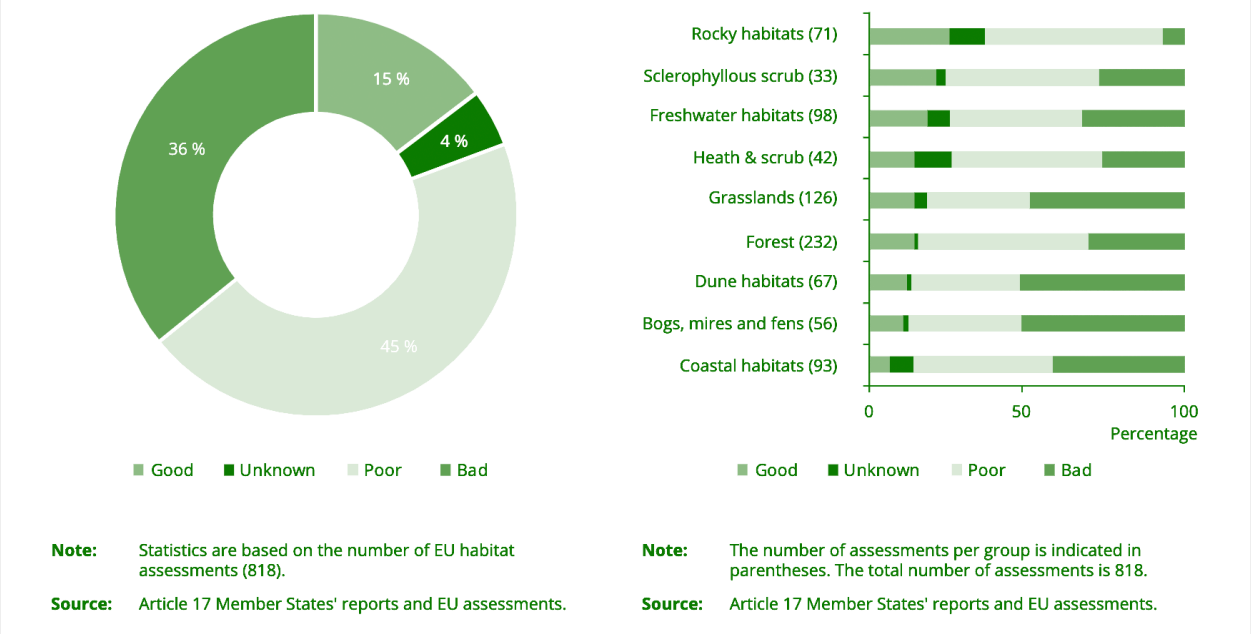

Fig.6 : European Environment Agency (EEA). Conservation Status of Habitats at EU Level and Conservation Status per Habitat Group at the EU Level. EEA, 2020. https://www.eea.europa.eu/data-and-maps/figures/conservation-status-of-habitats-at.

4.2.1.6 Future Targets for European Biodiversity (2030 and Beyond)

Looking ahead, the European Union has set ambitious biodiversity targets for 2030 and beyond, marking a clear commitment to restoring and protecting ecosystems in the face of ongoing environmental challenges. A key goal is the 30x30 Target, which aims to protect 30% of EU land and sea areas by 2030. This target aligns with global biodiversity goals, particularly the UN Convention on Biological Diversity's 30x30 initiative, adopted during the Kunming-Montreal Global Biodiversity Framework in 2021. By setting this target, Europe emphasizes the protection and restoration of critical ecosystems, ensuring that biodiversity is safeguarded for future generations while also enhancing the benefits these ecosystems provide to society, such as clean air, water, and climate regulation [37].

Complementing this target, the EU is working towards Biodiversity Monitoring Networks, which will provide real-time tracking of biodiversity trends across Europe. Fully operational by 2030, these monitoring systems will allow for adaptive management of conservation efforts, enabling authorities to make informed decisions based on up-to-date data. This initiative is critical not only for measuring progress towards the 30x30 target but also for ensuring that restoration and protection strategies are responsive to emerging threats or changes in biodiversity [38].

By 2035, Europe plans to implement Large-Scale Ecological Corridors, which will create cross-border connections between protected areas. These corridors will enhance habitat connectivity, facilitating species migration and improving ecosystem resilience. Such efforts are in direct alignment with global biodiversity initiatives, like the Convention on Biological Diversity's target to halt habitat fragmentation. These corridors will help species adapt to climate change and safeguard biodiversity hotspots [39].

Looking further into the future, from 2040 to 2050, the EU envisions the complete restoration of degraded ecosystems. Large-scale rewilding and ecosystem recovery initiatives will aim to restore Europe's landscapes, contributing to biodiversity resilience and reversing the damage

caused by decades of habitat destruction. This long-term goal ties into the global ambition to restore 350 million hectares of degraded ecosystems by 2030, as proposed during the UN Decade on Ecosystem Restoration [40].
In addition to these ambitious goals, Europe's efforts will likely lead to significant positive impacts. Restoring and protecting ecosystems will enhance ecosystem services, including pollination, water purification, and climate regulation. Healthy ecosystems also play a vital role in climate change mitigation by sequestering carbon, helping Europe meet its climate goals while preserving biodiversity. The 30x30 target, ecological corridors, and ecosystem restoration initiatives are integral parts of a broader, interconnected global effort to halt biodiversity loss and address climate change [41].

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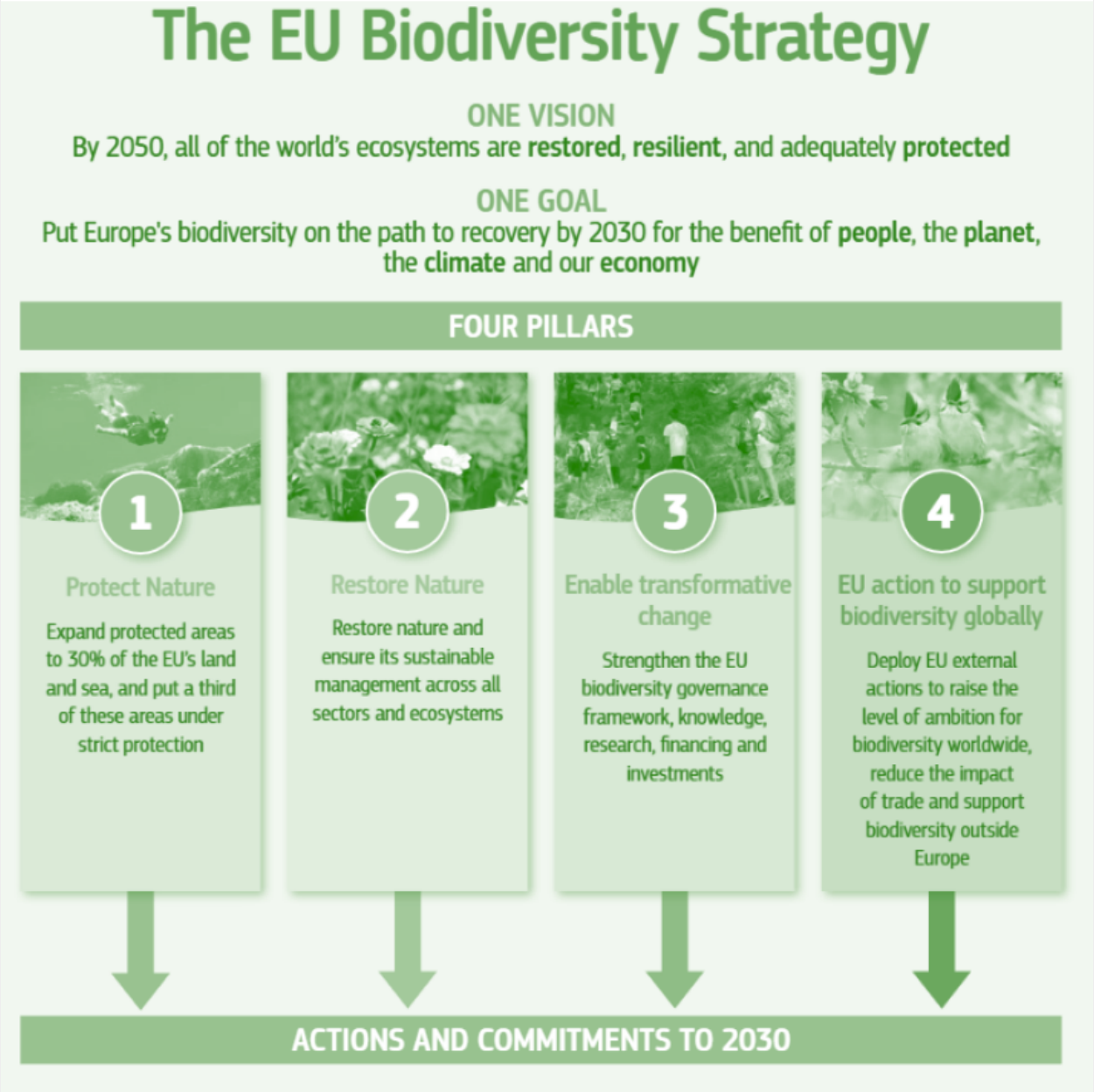
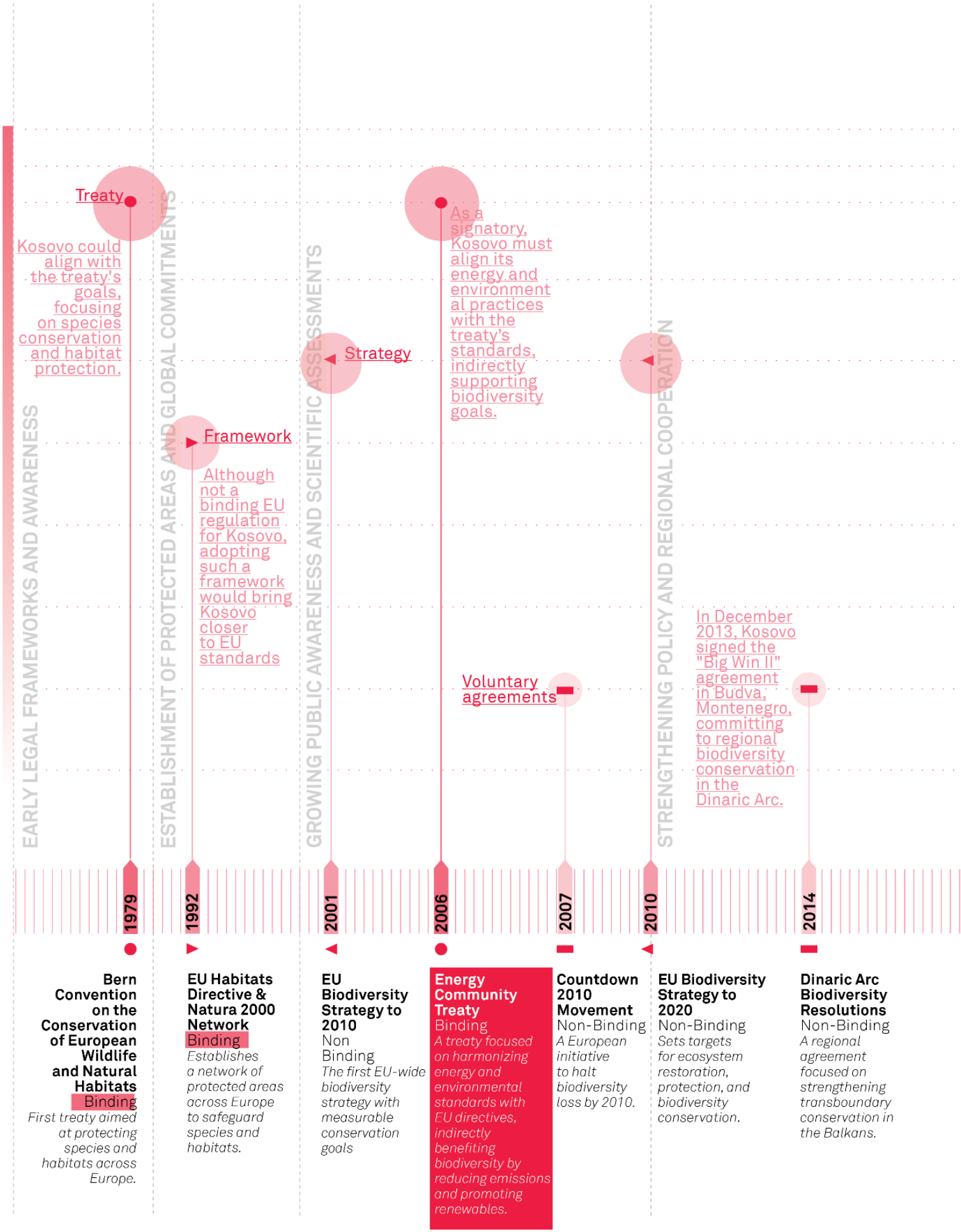
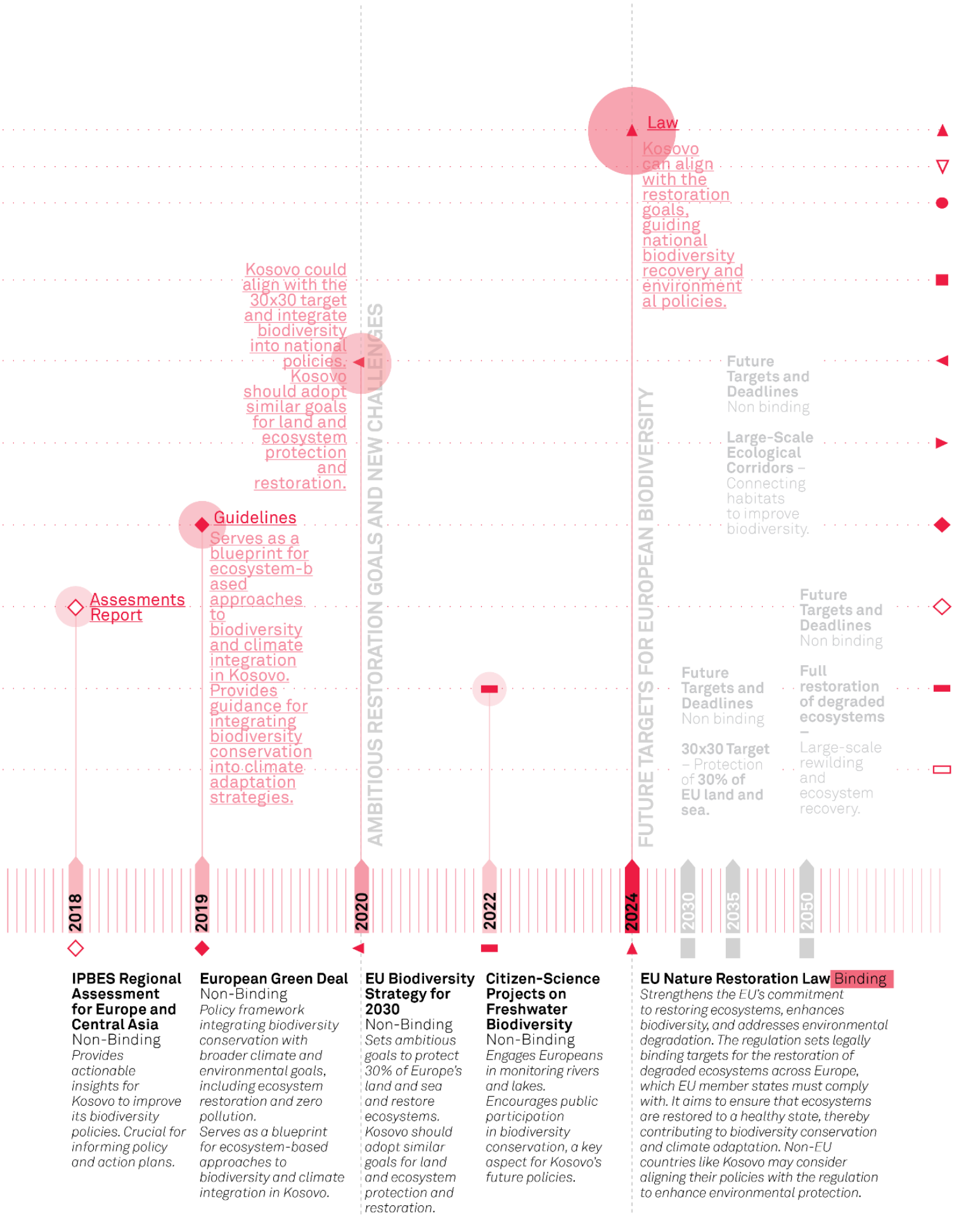


Fig. 7: The EU Biodiversity Strategy for 2030: Bringing Nature Back into Our Lives. Publication No. 2021/4209, European Commission, 2021. https://op.europa.eu/en/publication-detail/-/publication/31e4609f-b91e-11eb-8aca-01aa75ed71a1

European & Regional Biodiversity Frameworks & Protocols





IPBES Regional Assessment for Europe and Central Asia
Non-Binding
Provides actionable insights for Kosovo to improve its biodiversity policies. Crucial for informing policy and action plans.

European Green Deal
Non-Binding
Policy framework integrating biodiversity conservation with broader climate and environmental goals, including ecosystem restoration and zero pollution.
Serves as a blueprint for ecosystem-based approaches to biodiversity and climate integration in Kosovo.

EU Biodiversity Strategy for 2030
Non-Binding
Sets ambitious goals to protect 30% of Europe's land and sea and restore ecosystems. Kosovo should adopt similar goals for land and ecosystem protection and restoration.

Citizen-Science Projects on Freshwater Biodiversity
Non-Binding
Engages Europeans in monitoring rivers and lakes. Encourages public participation in biodiversity conservation, a key aspect for Kosovo's future policies.

EU Nature Restoration Law Binding
Strengthens the EU's commitment to restoring ecosystems, enhances biodiversity, and addresses environmental degradation. The regulation sets legally binding targets for the restoration of degraded ecosystems across Europe, which EU member states must comply with. It aims to ensure that ecosystems are restored to a healthy state, thereby contributing to biodiversity conservation and climate adaptation. Non-EU countries like Kosovo may consider aligning their policies with the regulation to enhance environmental protection.

For each document, we evaluate its significance and relevance to Kosovo under the following structure:

4.2.2.1 Binding Documents (Treaties, Regulations, Protocols)

1. **1979 - Bern Convention on the Conservation of European Wildlife and Natural Habitats (Treaty)**
   Brief Description: The Bern Convention is the first binding treaty aimed at protecting species and habitats across Europe.
   Relevance to Kosovo: Kosovo could align with the treaty's goals, focusing on species conservation and habitat protection.
   Legal/Strategic Implications: As a binding treaty, Kosovo would need to adhere to species protection and habitat preservation guidelines if it signs or aligns with this agreement.
   Key Takeaways: Kosovo could utilize this treaty to strengthen its legal framework for biodiversity protection.

2. **1992 - EU Habitats Directive & Natura 2000 Network (Framework)**
   Brief Description: Establishes a network of protected areas across Europe to safeguard species and habitats.
   Relevance to Kosovo: While not directly part of the EU, Kosovo could adopt a similar system.
   Legal/Strategic Implications: Although not a binding EU regulation for Kosovo, adopting such a framework would bring Kosovo closer to EU standards for environmental protection.
   Key Takeaways: Kosovo could develop a Natura 2000-like system, strengthening its conservation efforts and integrating into broader European frameworks.

3. **2006 - Energy Community Treaty (Treaty)**
   Brief Description: A treaty focused on harmonizing energy and environmental standards with EU directives, indirectly benefiting biodiversity by reducing emissions and promoting renewables.
   Relevance to Kosovo: As a signatory, Kosovo must align its energy and environmental practices with the treaty's standards, indirectly supporting biodiversity goals.
   Legal/Strategic Implications: Binding; requires Kosovo to prioritize renewable energy and biodiversity-friendly reforms.
   Key Takeaways: Aligning energy policies with treaty obligations offers indirect biodiversity benefits.

4. **2020 - EU Nature Restoration Law (Regulation)**
   Brief Description: A legally binding framework for restoring degraded ecosystems across the EU.
   Relevance to Kosovo: Kosovo could adopt similar restoration laws for its ecosystems.
   Legal/Strategic Implications: While the regulation binds EU member states, Kosovo may seek to align with its principles to guide national biodiversity restoration policies.
   Key Takeaways: Kosovo could benefit from adopting the spirit of this law for national restoration initiatives.

5. **2024 - EU Nature Restoration Law (Regulation)**
   Brief Description: Strengthens the EU's commitment to restoring ecosystems, enhances biodiversity, and addresses environmental degradation.
   Relevance to Kosovo: Kosovo can align with the restoration goals, guiding national biodiversity recovery and environmental policies.
   Legal/Strategic Implications: The regulation sets legally binding targets for the restoration of degraded ecosystems across Europe, which EU member states must comply with. It aims to ensure that ecosystems are restored to a healthy state, thereby contributing to biodiversity conservation and climate adaptation. Non-EU countries like Kosovo may consider aligning their policies with the regulation to enhance environmental protection.
   Key Takeaways: Kosovo can adopt similar restoration goals and integrate the principles of the EU regulation into its national biodiversity and climate strategies. It offers a roadmap for ecosystem restoration and securing EU integration.

4.2.2.2 Non-Binding Documents (Agendas, Strategies, Guidelines, Assessment Reports, Voluntary Agreements)

1. **2001 - EU Biodiversity Strategy to 2010 (Strategy)**
   Brief Description: *The first EU-wide biodiversity strategy with measurable conservation goals.*
   Relevance to Kosovo: *Kosovo can develop its own strategy based on this framework.*
   Legal/Strategic Implications: *As a non-binding strategy, it offers guidance for aligning national biodiversity strategies with EU goals.*
   Key Takeaways: *Kosovo's biodiversity strategy could draw from this document to set clear, actionable targets.*

2. **2007 - Countdown 2010 Movement (Voluntary Agreement)**
   Brief Description: *A European initiative to halt biodiversity loss by 2010.*
   Relevance to Kosovo: *Kosovo can join this movement and implement measures to protect its biodiversity.*
   Legal/Strategic Implications: *The initiative is non-binding but offers a framework for countries to engage in biodiversity conservation efforts.*
   Key Takeaways: *The movement's goals could align with Kosovo's national biodiversity targets, fostering collaboration.*

3. **2010 - EU Biodiversity Strategy to 2020 (Strategy)**
   Brief Description: *Sets targets for ecosystem restoration, protection, and biodiversity conservation.*
   Relevance to Kosovo: *Kosovo could align its biodiversity strategy with the EU's to meet similar conservation goals.*
   Legal/Strategic Implications: *Non-binding but highly influential as a framework for national biodiversity policies.*
   Key Takeaways: *Provides a clear roadmap for Kosovo's biodiversity conservation policy.*

4. **2014 - Dinaric Arc Biodiversity Resolutions (Voluntary Agreement)**

Brief Description: *A regional agreement focused on strengthening transboundary conservation in the Balkans.*
Relevance to Kosovo: *Kosovo can participate in these initiatives to enhance regional biodiversity collaboration.*
Legal/Strategic Implications: *Voluntary in nature but could lead to partnerships and joint projects with neighboring countries.*
Key Takeaways: *Regional cooperation is essential for Kosovo's biodiversity conservation efforts.*

5. **2018 - IPBES Regional Assessment for Europe and Central Asia (Assessment Report)**
   Brief Description: *A scientific report providing recommendations for biodiversity policies in Europe and Central Asia.*
   Relevance to Kosovo: *Kosovo can adopt the policy recommendations to enhance biodiversity protection.*
   Legal/Strategic Implications: *Non-binding, but crucial for informing policy and action plans.*
   Key Takeaways: *Provides actionable insights for Kosovo to improve its biodiversity policies.*

6. **2019 - European Green Deal (Guideline)**
   Brief Description: *A non-binding policy framework integrating biodiversity conservation with broader climate and environmental goals, including ecosystem restoration and zero pollution.*
   Relevance to Kosovo: *Provides guidance for integrating biodiversity conservation into climate adaptation strategies.*
   Legal/Strategic Implications: *Non-binding; supports access to funding and policy alignment.*
   Key Takeaways: *Serves as a blueprint for ecosystem-based approaches to biodiversity and climate integration in Kosovo.*

7. **2020 - EU Biodiversity Strategy for 2030 (Strategy)**
   Brief Description: *Sets ambitious goals to protect 30% of Europe's land and sea and restore ecosystems.*
   Relevance to Kosovo: *Kosovo could align with the 30x30 target and integrate biodiversity into national policies.*
   Legal/Strategic Implications: *A non-binding strategy that guides national biodiversity efforts.*
   Key Takeaways: *Kosovo should adopt similar goals for land and ecosystem protection and restoration.*

8. **2022 - Citizen-Science Projects on Freshwater Biodiversity (Voluntary Agreement)**
   Brief Description: *Engages Europeans in monitoring rivers and lakes.*
   Relevance to Kosovo: *Kosovo could replicate these initiatives to involve citizens in biodiversity monitoring.*
   Legal/Strategic Implications: *Non-binding but could support national biodiversity monitoring systems.*
   Key Takeaways: *Encourages public participation in biodiversity conservation, a key aspect for Kosovo's future policies.*

EARLY LEGAL FRAMEWORKS AND AWARENESS

ESTABLISHMENT OF PROTECTED AREAS AND GLOBAL COMMITMENTS

GROWING PUBLIC AWARENESS AND SCIENTIFIC ASSESSMENTS

STRENGTHENING POLICY AND REGIONAL COOPERATION

4.4 BILLION

+0.4°C

6.13 BILLION

+0.6°C

Bern Convention on the Conservation of European Wildlife and Natural Habitats
Binding
First treaty aimed at protecting species and habitats across Europe.

EU Habitats Directive & Natura 2000 Network
Binding
Establishes a network of protected areas across Europe to safeguard species and habitats.

EU Biodiversity Strategy to 2010
Non Binding
The first EU-wide biodiversity strategy with measurable conservation goals

Energy Community Treaty
Binding
A treaty focused on harmonizing energy and environmental standards with EU directives, indirectly benefiting biodiversity by reducing emissions and promoting renewables.

EU Biodiversity Strategy to 2020
Non-Binding
Sets targets for ecosystem restoration, protection, and biodiversity conservation.

Countdown 2010 Movement
Non-Binding
A European initiative to halt biodiversity loss by 2010.

Dinaric Arc Biodiversity Resolutions
Non-Binding
A regional agreement focused on strengthening transboundary conservation in the Balkans.

Biodiversity Loss (-%)

1979

1992

-30%

2001

2006

2007

2010

2014

-60%

Parks Dinarides

Network of protected areas of Dinarides

NATURA 2000

EU HABITATS DIRECTIVE & NATURA 2000 NETWORK – CREATION OF EUROPE'S LARGEST PROTECTED AREA NETWORK.

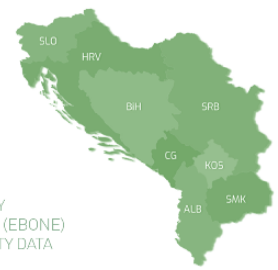
Life

LAUNCH OF THE LIFE PROGRAMME – EU FUNDING FOR BIODIVERSITY AND ENVIRONMENTAL PROTECTION PROJECTS.

COUNTDOWN 2010 MOVEMENT – EU INITIATIVE MOBILIZING EFFORTS TO HALT BIODIVERSITY LOSS.

GEO BON
Group on Earth Observations Biodiversity Observation Network

EUROPEAN BIODIVERSITY OBSERVATION NETWORK (EBONE) – IMPROVES BIODIVERSITY DATA COLLECTION



8 COUNTRIES

100+ PROTECTED AREAS

16 SITES UNDER UNESCO PROTECTION

40 NATIONAL PARKS

AMBITIOUS RESTORATION GOALS AND NEW CHALLENGES

FUTURE TARGETS FOR EUROPEAN BIODIVERSITY

8.16 BILLION

+1.54°C

GLOBAL WARMING

EU Nature Restoration Law
Binding
Strengthens the EU's commitment to restoring ecosystems, enhances biodiversity, and addresses environmental degradation.

EU Biodiversity Strategy for 2030
Non-Binding
Sets ambitious goals to protect 30% of Europe's land and sea and restore ecosystems. Kosovo should adopt similar goals for land and ecosystem protection and restoration.

European Green Deal
Non-Binding
Policy framework integrating biodiversity conservation with broader climate and environmental goals, including ecosystem restoration and zero pollution. Serves as a blueprint for ecosystem-based approaches to biodiversity and climate integration in Kosovo.

IPBES Regional Assessment for Europe and Central Asia
Non-Binding
Provides actionable insights for Kosovo to improve its biodiversity policies. Crucial for informing policy and action plans.

Citizen-Science Projects on Freshwater Biodiversity
Non-Binding
Engages Europeans in monitoring rivers and lakes. Encourages public participation in biodiversity conservation, a key aspect for Kosovo's future policies.

Future Targets and Deadlines
Non binding

Large-Scale Ecological Corridors – Connecting habitats to improve biodiversity.

Future Targets and Deadlines
Non binding

30x30 Target – Protection of **30% of EU land and sea.**

Future Targets and Deadlines
Non binding

Full restoration of degraded ecosystems – Large-scale rewilding and ecosystem recovery.

2018

2019

2020

2022

2024

2030

2035

2050

7.5%
OF ITS ANNUAL BUDGET TO BIODIVERSITY OBJECTIVES, AS PART OF ITS BROADER ENVIRONMENTAL STRATEGY.

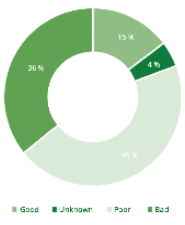
26.1%
OF THE EU'S LAND IS UNDER PROTECTION

12%
OF THE EU'S SEAS ARE PROTECTED

-80%

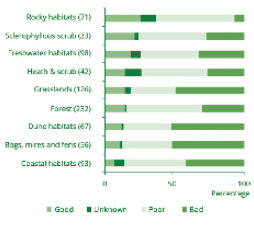
-85%

-90%



Note: Statistics are based on the number of EU habitat assessments (818).

Source: Article 17 Member States' reports and EU assessments.



Note: The number of assessments per group is indicated in parentheses. The total number of assessments is 818.

Source: Article 17 Member States' reports and EU assessments.

Conclusion

The state of biodiversity across the globe is rapidly declining, despite decades of concerted international efforts and regional commitments. Global frameworks like the Convention on Biological Diversity (CBD) and the EU Biodiversity Strategy for 2030 have provided significant direction, but the gap between policy goals and on-the-ground implementation continues to widen. These frameworks highlight the urgency of ecosystem restoration, protection of endangered species, and sustainable use of natural resources. However, challenges such as habitat fragmentation, pollution, and insufficient funding persist, requiring stronger enforcement and broader engagement from all sectors of society.

Kosovo, while not a member of the European Union, has made commendable strides in aligning with these regional and global biodiversity frameworks. Its participation in initiatives such as the Bern Convention and the Emerald Network, along with the establishment of protected areas, signals a willingness to adopt European principles of conservation. However, there are significant gaps that need to be addressed. Kosovo's non-signatory status in key European agreements, including some that provide financial and technical support, limits its access to vital resources. Additionally, a lack of comprehensive data and monitoring systems hampers effective conservation efforts, making it difficult to track the progress of biodiversity management and identify priority areas for action.

Kosovo has shown promise in areas such as eco-tourism, civil society involvement, and the protection of important habitats, yet much work remains to be done. The country's biodiversity is threatened by unsustainable practices, illegal logging, and unregulated development. These pressures, along with limited capacity for enforcement and inconsistent legal frameworks, continue to impede progress toward a more sustainable future for Kosovo's natural heritage.

Key recommendations for Kosovo include prioritizing alignment with key European frameworks like the EU Nature Restoration Law and Biodiversity Strategy for 2030. The development of a robust National Biodiversity Strategy is essential, providing clear conservation goals, legal commitments, and a framework for monitoring. Strengthening law enforcement mechanisms to tackle illegal activities such as poaching and habitat destruction is critical for protecting Kosovo's valuable ecosystems. Additionally, regional cooperation, particularly through initiatives like the Dinaric Arc Biodiversity Resolutions, offers an opportunity for more coordinated efforts in preserving shared natural resources.

In conclusion, Kosovo stands at a crossroads where the integration of its biodiversity policies with European frameworks offers both challenges and opportunities. With clear policy actions, stronger enforcement, and enhanced regional cooperation, Kosovo can contribute meaningfully to the broader European and global goal of halting biodiversity loss. This alignment will not only enhance Kosovo's conservation strategies but also ensure that its rich and unique biodiversity is safeguarded for future generations.

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BIODIVERSITY GOVERNANCE IN KOSOVO: LEGAL INSTRUMENTS AND STRATEGIC DIRECTIONS

5

KOSOVO'S BIODIVERSITY GOVERNANCE HAS DEVELOPED GRADUALLY SINCE THE EARLY 2000S, SHAPED BY GLOBAL CONVENTIONS LIKE THE CBD AND EU DIRECTIVES. KEY STEPS INCLUDE THE NATURE PROTECTION LAW (2010), THE CREATION OF NATIONAL PARKS, AND THE BIODIVERSITY STRATEGY AND ACTION PLANS (2011–2020, 2016–2020). WHILE THESE FRAMEWORKS MARK PROGRESS TOWARD CONSERVATION AND EU ALIGNMENT, CHALLENGES SUCH AS WEAK ENFORCEMENT, HABITAT LOSS, AND SPECIES DECLINE—ESPECIALLY OF THE BALKAN LYNX—CONTINUE TO HINDER EFFECTIVE PROTECTION.

5. Biodiversity Governance in Kosovo: Legal Instruments and Strategic Directions

5.1 Foundations and Evolution of the Biodiversity Discourse in Kosovo

5.1.1 Origins of Biodiversity as a Concept in Kosovo

The concept of biodiversity, referring to the variety of life in all its forms, has evolved globally over the past several decades. Although the term “biodiversity” emerged in the international arena during the late 20th century, particularly with the adoption of the Convention on Biological Diversity (CBD) in 1992, its recognition in Kosovo took shape more recently. The growing concern for biodiversity in Kosovo emerged in the early 2000s, as the country navigated its post-conflict recovery and urbanization. Kosovo’s diverse natural environments, including its forests, rivers, and rich species, began to be recognized as invaluable assets for both national development and environmental sustainability.

The recognition of biodiversity as a national concern in Kosovo was influenced by the country’s increasing integration into the international community and its aspirations for EU membership. As global awareness of environmental issues like species extinction and habitat loss intensified, Kosovo began to align its environmental policies with international agreements. The CBD provided the global framework, while the European Union’s biodiversity directives prompted Kosovo to incorporate conservation measures into its legal framework. The nation’s engagement with these global and regional efforts set the stage for the creation of Kosovo’s own biodiversity legal and policy structures [1].

5.1.2 The Development of Kosovo’s Biodiversity Legal Framework

Kosovo’s legal and institutional frameworks for biodiversity conservation have evolved gradually since the early 2000s. The first steps toward establishing a formal national biodiversity strategy began with the introduction of laws such as the Law on Nature Protection (2010), followed by the creation of protected areas, including Bjeshkët e Nemuna and Sharr National Parks. These steps reflected both a national recognition of Kosovo’s rich natural heritage and an effort to align with international biodiversity protection standards.

Further, Kosovo’s adoption of the Biodiversity Strategy and Action Plan (2011-2020) and the Action Plan for Biodiversity (2016-2020) demonstrated a formal commitment to biodiversity protection. These plans not only identified key national goals but also addressed the broader environmental threats, such as climate change and habitat loss, that continue to impact ecosystems worldwide. Kosovo’s growing body of administrative instructions and regulations—such as guidelines for protecting wild species and habitats—underscored the country’s approach to integrating biodiversity conservation into its legal framework [2,3].

1. *Convention on Biological Diversity. Convention on Biological Diversity. 1992. https://www.cbd.int/convention/.*
2. *Government of the Republic of Kosovo. Biodiversity Strategy and Action Plan of the Republic of Kosovo (2011-2020). 2011. https://www.ks-gov.net/en-us/ministries/ministries/environmental-and-spatial-planning/environmental-strategy/biodiversity-strategy-action-plan.*
3. *Government of the Republic of Kosovo. Action Plan for Biodiversity (2016-2020). 2016. https://www.ks-gov.net/en-us/ministries/ministries/environmental-and-spatial-planning/environmental-strategy/biodiversity-strategy-action-plan.*

5.1.3 Significance of Biodiversity Protection Today

Biodiversity conservation is more critical than ever, with the global community facing unprecedented environmental challenges such as climate change, habitat degradation, and species extinction. Kosovo, like many other nations, faces these challenges while balancing economic growth with environmental sustainability. The loss of biodiversity has wide-ranging impacts on ecological health, food security, water availability, and public health. As Kosovo continues to experience rapid land use changes and deforestation, protecting its natural assets is not only essential for maintaining ecosystem services but also for fostering long-term economic and social well-being [4].

The global and regional discussions on biodiversity, framed by initiatives such as the EU Biodiversity Strategy for 2030 and the UN Decade on Ecosystem Restoration, emphasize the urgency of preserving natural ecosystems. Kosovo's biodiversity strategies are closely aligned with these broader conversations, positioning the country within global efforts to halt biodiversity loss and mitigate climate change. However, Kosovo must also navigate local realities, including its unique biodiversity and development needs, as it works to strengthen its conservation policies and legal frameworks [5].

5.1.4 Objectives of the Study

This paper aims to provide an overview of Kosovo's biodiversity legal and policy frameworks, examining their development, influence, and current effectiveness. The study is guided by the following objectives:

1. **Researching the Development of Kosovo's Biodiversity Frameworks:** This objective focuses on exploring the historical progression of biodiversity protection policies in Kosovo, from early environmental movements to the establishment of contemporary legal frameworks. By tracing this development, the study will highlight key milestones in Kosovo's biodiversity journey.
2. **Collection and Analysis of Kosovo Policy Documents:** This objective involves reviewing key legal documents, strategic plans, and environmental reports produced by Kosovo's institutions. These documents, including laws, action plans, and administrative instructions, will be analyzed to understand their role in shaping the country's approach to biodiversity protection.

By fulfilling these objectives, the paper will provide a comprehensive analysis of Kosovo's biodiversity legal framework, its alignment with global and regional efforts, and its ongoing challenges and opportunities in biodiversity conservation.

1. *European Commission. EU Biodiversity Strategy for 2030: Bringing Nature Back into Our Lives. Brussels: European Commission, 2020. https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en.*
2. *United Nations Environment Programme (UNEP) and Food and Agriculture Organization (FAO). UN Decade on Ecosystem Restoration 2021–2030. Nairobi/Rome: UNEP and FAO, 2021. https://www.decadeonrestoration.org.*

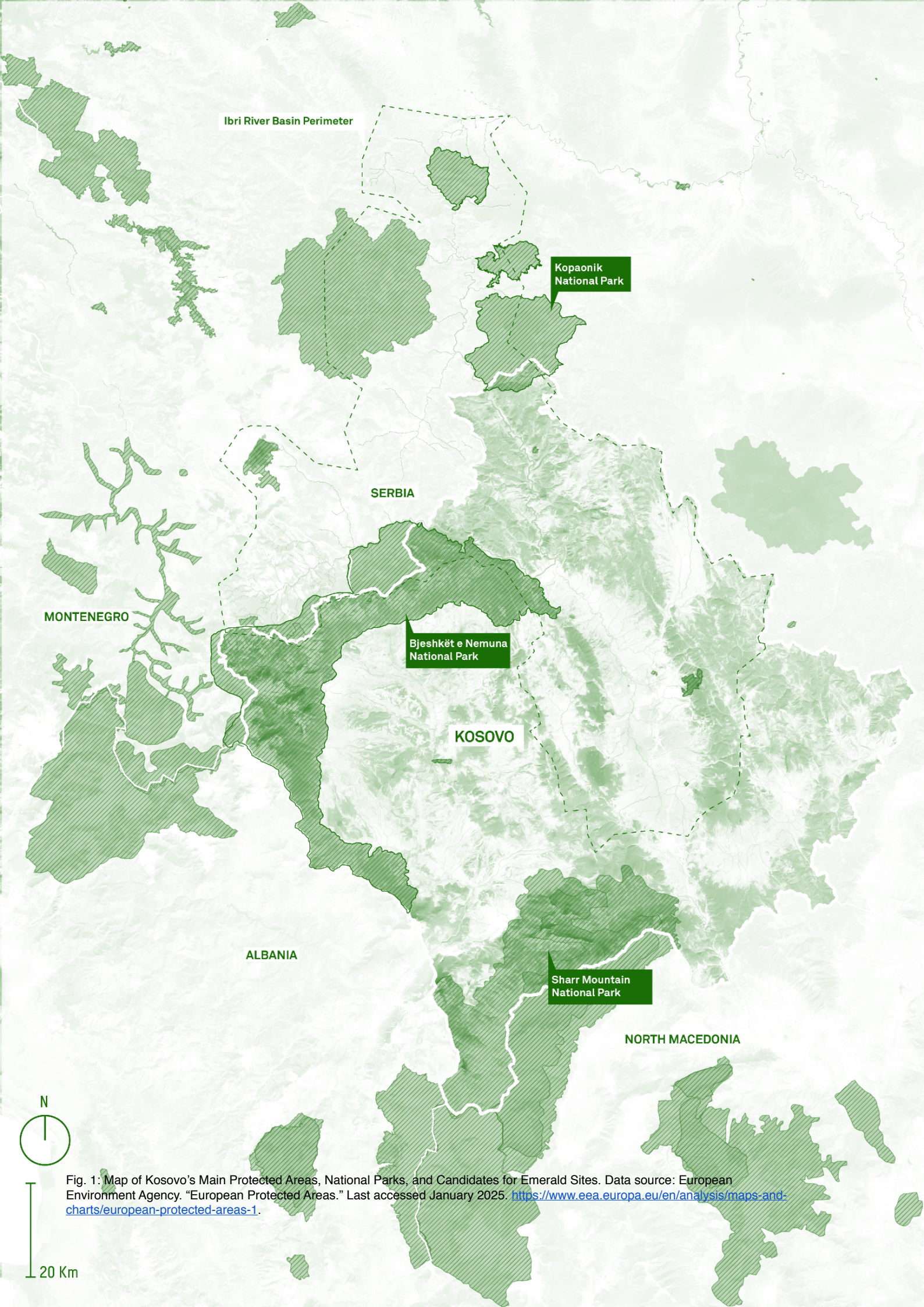


Fig. 1: Map of Kosovo's Main Protected Areas, National Parks, and Candidates for Emerald Sites. Data source: European Environment Agency. "European Protected Areas." Last accessed January 2025. https://www.eea.europa.eu/en/analysis/maps-and-charts/european-protected-areas-1.

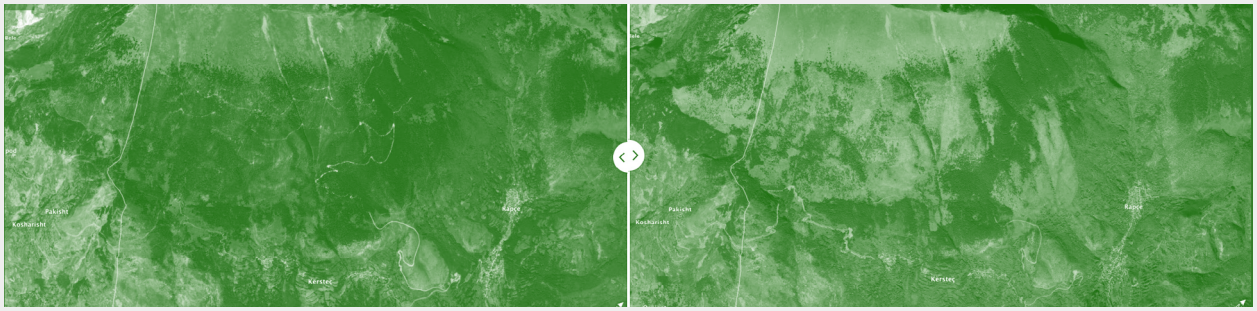


Fig.2: Before-and-after satellite images (2000s–2022s): Telegrafi. Forests of Kosovo in Disappearance: What Do Satellite Images Show? December 2024. Accessed February 7, 2025. https://telegrafi.com/en/pyjet-e-kosoves-ne-zhdukje-cka-tregojne-pamjet-satelitore/.

5.2 Kosovo Biodiversity Frameworks and Milestones

Kosovo's biodiversity frameworks focus on protecting ecosystems and species through a series of laws, strategies, and administrative instructions, aligning with global conventions like the CBD and EU directives.

5.2.1 Historical Narrative: The Evolution of Global Biodiversity Frameworks

5.2.1.1 Pre-2010: Initial Awareness and International Influence

Before 2010, Kosovo's biodiversity was largely unregulated, and the country did not have specific national legislation or strategies in place to protect its diverse ecosystems and species. The lack of formal environmental laws meant that many natural habitats were under threat from illegal logging, hunting, and unsustainable agricultural practices, leading to habitat degradation and a loss of biodiversity [6].

However, during the 1990s and early 2000s, international environmental efforts began to influence Kosovo's approach to biodiversity conservation. Kosovo, then part of the Federal Republic of Yugoslavia, was included in several regional and global environmental frameworks, notably the Convention on Biological Diversity (CBD), which had been signed by many countries in 1992. This global treaty set the stage for nations to develop strategies aimed at preserving biodiversity. Additionally, regional cooperation through organizations like the Balkan Environmental Association played a significant role in raising awareness about the environmental challenges facing the Balkan Peninsula. These initiatives encouraged Kosovo's environmentalists, scientists, and policymakers to recognize the importance of biodiversity and the need for legislative frameworks to protect the country's natural resources [7,8].

By the late 2000s, as Kosovo sought to define its statehood and develop its institutional structures, the influence of international treaties and regional cooperation began to lay the groundwork for a more formalized biodiversity conservation approach, leading to the first legal measures adopted in the following decade [9].

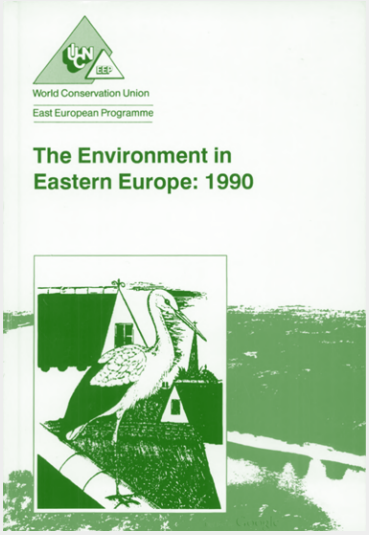


Fig. 3 : IUCN East European Program. The Environment in Eastern Europe: 1990. . https://iucn.org/resources/publication/environment-eastern-europe-1990. https://portals.iucn.org/library/sites/library/files/documents/EEP-ER-no.003.pdf

1. *Ministry of Environment and Spatial Planning of Kosovo. State of the Environment Report in Kosovo 2008-2009. Pristina: Ministry of Environment and Spatial Planning, 2009.*
2. *Convention on Biological Diversity. Convention on Biological Diversity. 1992. https://www.cbd.int/convention/.*
3. *Balkan Environmental Association (B.EN.A.). Environmental Challenges and Sustainable Development in the Balkans. Thessaloniki: B.EN.A., 2005.*
4. *Assembly of the Republic of Kosovo. Law on Nature Protection No. 03/L-233. Pristina: Official Gazette of the Republic of Kosovo, 2010.*

5.2.1.2 2010-2019: Establishing Legal Foundations

The period between 2010 and 2019 marked a transformative era for biodiversity conservation in Kosovo, as the country began to lay down its legal foundations for environmental protection amidst a growing awareness of the threats facing its natural ecosystems. The passage of Law No. 03/L-233 (Nature Protection) in 2010 was a landmark achievement. This law was pivotal in officially recognizing the need to preserve Kosovo's ecosystems, species, and habitats. The legislation was designed to halt the rapid loss of biodiversity and provided the foundation for future conservation efforts. However, its implementation faced significant challenges, particularly in the early years. Kosovo's enforcement capacity was minimal, and the country struggled with illegal logging, unsustainable agricultural practices, and a lack of comprehensive land-use planning. These issues exacerbated habitat destruction and contributed to the alarming loss of biodiversity [10,11].

During the same period, the 2011 Strategy and Action Plan for Biodiversity (2011-2020) was approved, marking another crucial step in formalizing the country's commitment to biodiversity conservation. The plan sought to curb the alarming rate of biodiversity loss by establishing protected areas, improving species protection, and facilitating habitat restoration. The strategy set ambitious targets, such as the protection of 5-10% of Kosovo's land area by 2020, with an emphasis on key ecosystems like forests and wetlands. However, despite these efforts, habitat degradation continued, particularly in forest ecosystems, which faced high deforestation rates of about 1.5% annually. This was compounded by the spread of invasive species, such as Japanese knotweed, which threatened native plant species, especially in riparian zones [12].

By 2013, Kosovo took further steps in safeguarding its biodiversity through the establishment of National Parks in Bjeshkët e Nemuna and Sharri. These parks were designated as protected areas, covering around 12-14% of Kosovo's land, and were intended to preserve critical habitats for species such as the Balkan lynx and the brown bear. Despite these advances, challenges remained, as habitat fragmentation and human activities continued to undermine the integrity of these ecosystems. The population of the Balkan lynx remained critically endangered, and efforts to reintegrate the species into its natural habitat, with the support of international conservation organizations, showed limited success. Additionally, discussions began about the reintroduction of the European bison, but logistical and ecological obstacles hindered progress [13,14].
The 2010s thus represented a pivotal decade in Kosovo's biodiversity conservation journey. Although substantial legal frameworks were established, challenges in enforcement, habitat degradation, and species decline persisted. Moving forward, Kosovo's commitment to addressing these issues would require increased capacity for law enforcement, continued international cooperation, and adaptive strategies to mitigate the impacts of climate change on its biodiversity [15].

1. *Assembly of the Republic of Kosovo. Law on Nature Protection No. 03/L-233. Pristina: Official Gazette of the Republic of Kosovo, 2010.*
2. *Ministry of Environment and Spatial Planning of Kosovo. State of the Environment Report in Kosovo 2015-2016. Pristina: Ministry of Environment and Spatial Planning, 2016.*
3. *Government of the Republic of Kosovo. Biodiversity Strategy and Action Plan of the Republic of Kosovo (2011-2020). Pristina: Ministry of Environment and Spatial Planning, 2011.*
4. *Assembly of the Republic of Kosovo. Law on National Parks No. 04/L-087. Pristina: Official Gazette of the Republic of Kosovo, 2013.*
5. *Kaczensky, Petra, et al. Status, Ecology, and Conservation of the Balkan Lynx (Lynx lynx balcanicus). Large Carnivore Initiative for Europe, 2015.*
6. *European Environment Agency. Kosovo Environmental Outlook 2020. Copenhagen: EEA, 2020.*

Fig. 4: EuroNatur and ERA. "Better Protection for the Balkan Lynx." EuroNatur, [date of publication]. Image: "A rare shot: A Balkan lynx has fallen into a photo trap in Kosovo." © ERA. https://www.euronatur.org/en/what-we-do/news/better-protection-for-the-balkan-lynx.

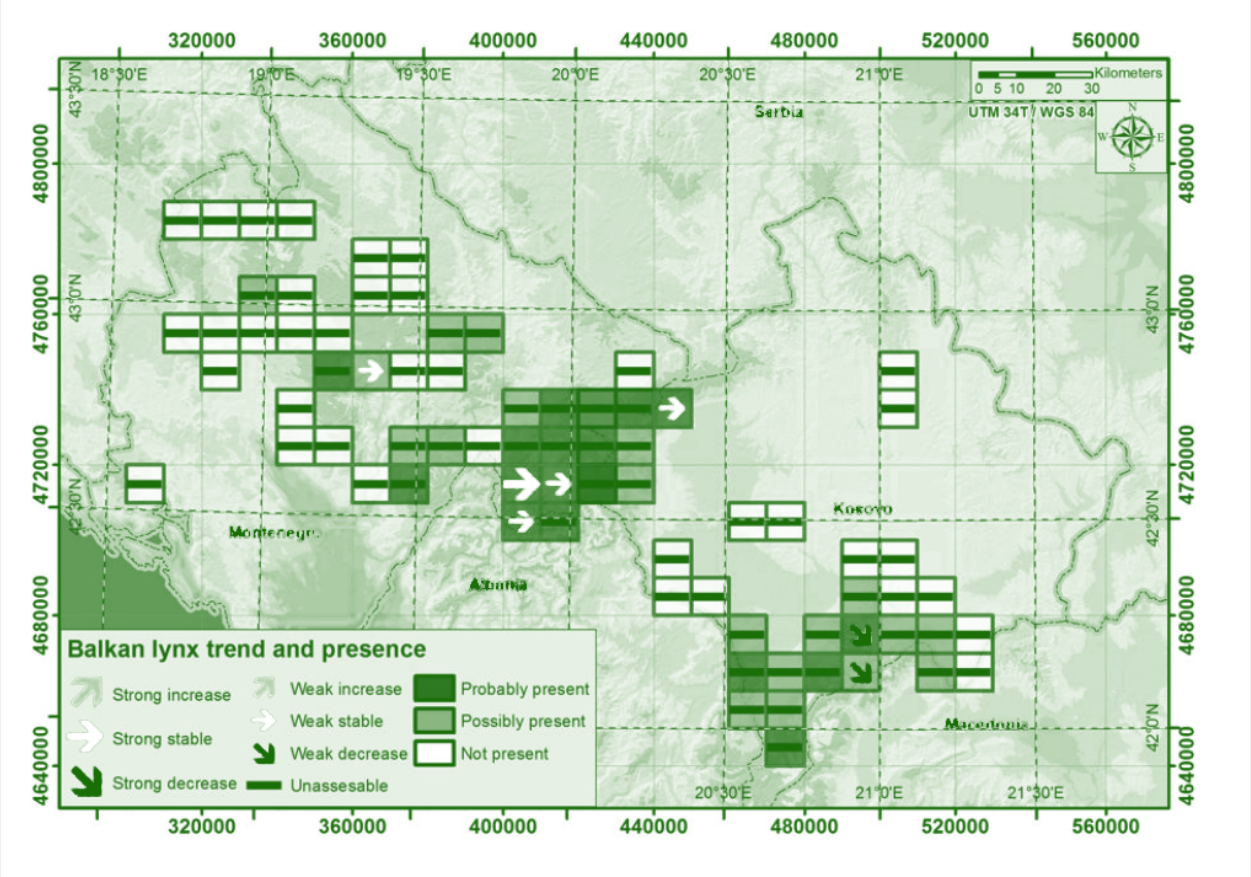


Fig. 5 : EuroNatur and ERA. “Balkan Lynx trend and presence”,Balkan Lynx, an Endangered Species in Kosovo. Telegrafi, 2014. https://telegrafi.com/en/rreqebulli-ballkanik-specie-e-rrezikuar-ne-kosove/. Kosovo has made efforts to protect the Balkan lynx through legal measures, particularly with the Nature Protection Law (2010), which lays the groundwork for biodiversity conservation. Additionally, the Biodiversity Strategy and Action Plan (2011-2020) outlines measures to protect species like the Balkan lynx, though enforcement challenges persist. Kosovo’s National Parks, such as Bjeshket e Nemuna, are designated protected areas that aim to conserve critical habitats for the lynx and other species, but issues like habitat fragmentation continue to undermine these legal protections.

5.2.1.3 2015-2020: Strengthening Implementation, Regional Cooperation, and EU Integration

Between 2015 and 2020, Kosovo took significant steps toward strengthening the implementation of its biodiversity conservation efforts, navigating both regional cooperation and its aspirations for EU integration. Central to these efforts was the Action Plan for Biodiversity (2016-2020), which set specific conservation goals aligned with the EU’s environmental standards. This action plan served as a critical framework, aiming to conserve Kosovo’s unique ecosystems and meet the EU’s rigorous environmental criteria for accession. It was clear that achieving biodiversity targets was no longer just a matter of national interest but also a key component of Kosovo’s broader EU integration process [16,17].

During this period, Kosovo strengthened its cooperation with regional organizations such as the Regional Environmental Center (REC) and the Balkan Green Belt initiative. These regional partnerships emphasized the importance of cross-border conservation, recognizing that biodiversity does not respect national borders. Collaborative efforts focused on protecting migratory species, preventing habitat fragmentation, and addressing the threats posed by

invasive species. Kosovo's engagement with these organizations helped to raise awareness about the need for transboundary conservation and reinforced the country's commitment to biodiversity preservation on a larger scale [18].

However, despite these legal frameworks and regional collaborations, Kosovo faced persistent challenges in terms of enforcement. By 2020, approximately 25% of Kosovo's land area was designated as protected, but this coverage often lacked sufficient management or oversight, making it difficult to prevent illegal activities such as poaching and deforestation. Species populations, particularly key mammals and birds, continued to decline. The Balkan lynx, brown bear, and grey wolf populations were dangerously small, with fewer than 50 individuals of each species remaining, putting them on the brink of local extinction. Similarly, amphibians like the European green toad and smooth newt faced heightened risks due to habitat loss and the broader effects of climate change [19].

Efforts to reintegrate species like the Balkan lynx continued, but the reintroduction programs faced obstacles such as limited genetic diversity and inadequate habitat. At the same time, there were discussions about the potential reintroduction of the European bison in Sharri National Park. The goal was to establish a viable population by 2030, yet the practicalities of such a project—particularly in terms of habitat suitability and ecological balance—remained a complex challenge [20].This period marked both a recognition of Kosovo's growing biodiversity challenges and an acknowledgment of the country's crucial role in regional environmental cooperation. As Kosovo continued to pursue EU integration, the need for effective biodiversity management became intertwined with its broader environmental policy goals, underscoring the interconnectedness of ecological health and sustainable development [21].

1. *Government of the Republic of Kosovo. Action Plan for Biodiversity (2016-2020). Pristina: Ministry of Environment and Spatial Planning, 2016.*
2. *European Commission. Kosovo 2020 Report: Chapter 27 – Environment and Climate Change. Brussels: European Commission, 2020.*
3. *Regional Environmental Center (REC). Transboundary Environmental Cooperation in the Western Balkans. Budapest: REC, 2018.*
4. *Kosovo Institute for Nature Protection. State of Biodiversity in Kosovo 2020. Pristina: Ministry of Environment and Spatial Planning, 2020.*
5. *Large Carnivore Initiative for Europe. Conservation Strategy for the Balkan Lynx in Kosovo and Neighboring Countries. 2019.*
6. *European Environment Agency. Western Balkans Environmental Outlook 2021. Copenhagen: EEA, 2021.*

ACTION PLAN FOR BIODIVERSITY 2016 - 2020

Activity	indicators of success	Responsible Institution	Supporting institutions	Timeline for implementation	The financial cost and source of funding	Comments
Strategic Objective: 1. By 2020, the Ministry of Environment and Spatial Planning has taken steps to develop and implement the legal and institutional framework in line with EU standards						
Measure/sub Strategic objective: 1.1 Full harmonization and strengthening of the legislation for nature protection in line with EU Acquis, and foster the progress towards the signature of main conventions						
1.1.1.Drafting and adoption of sub-legal acts that derive from the Law on Nature Protection	Sub legal acts approved	MESP	Government	Q1 2017 - Q4 2018	T.50,000 EUR BK. 50,000	T= Total BK.= Budget of Kosovo
1.1.2. Continue the promotion of legislation for nature protection to municipalities	Legislation has been presented to the community	MESP	Municipalities	Q1 2017 – Q4 2018	T. 40,000 EUR BK. 10,000 SIDA 30,000	SIDA = Project for Environment
1.1.3. Adoption of programs for nature protection for each municipality	Adopted programs	Municipalities	MESP	Q1 – Q4 2020	T.180,000 EUR BK. 180,000	
1.1.4. Lobby for the ratification of relevant conventions and treaties	Relevant Conventions are signed	MFA	MESP, Kosovo Parliament	Q1 2017 – Q4 2020	T. 50,000 EUR BK. 50,000	
1.1.5. Harmonization and strengthening of legislation and clarification of competencies for the management of N. Parks	Clear competencies	MESP	MAFRD, Government	Q1 – Q4 2017	T. 10,000 EUR BK. 10,000	

Fig. 6: Government of Kosovo. Action Plan for Biodiversity 2016-2020. Ministry of Environment and Spatial Planning, 2020. Table, "Strategic Objective 1: Legal and Institutional Framework in Line with EU Standards," p. 61. https://kryeministri.rks-gov.net/wp-content/uploads/2022/08/Eng-SAPB-2016-2020.pdf.

5.2.1.4 2020 and Beyond: Climate Change, EU Integration, and Post-2020 Global Biodiversity Framework

As Kosovo moves into the 2020s and beyond, its environmental policies are increasingly shaped by the dual imperatives of EU integration and the Post-2020 Global Biodiversity Framework. A key development in this regard is Kosovo's alignment with the EU Biodiversity Strategy for 2030, which mandates the protection of 30% of land and marine areas by 2030. This ambition coincides with Kosovo's ongoing process of EU integration, requiring the country to harmonize its environmental policies with the EU's ambitious biodiversity and climate goals. One of the immediate priorities in this transition is cross-border cooperation with neighboring countries like Albania and North Macedonia, particularly in shared ecosystems such as the Sharr Mountains. These areas are critical to biodiversity conservation, and cooperation across borders helps strengthen monitoring efforts and enforce protection strategies [22,23].
As Kosovo adopts more comprehensive climate adaptation strategies, climate change emerges as a growing threat to biodiversity. Rising temperatures, altered precipitation patterns, and extreme weather events such as droughts and floods are forcing species to shift their habitats

or face extinction. Forest ecosystems are particularly vulnerable, with deforestation continuing at an unsustainable rate of 1-2% annually. Kosovo's forests, which are home to rare species like the Balkan lynx, brown bears, and wolves, are under severe pressure from illegal logging and human-wildlife conflicts [24].

In response to these challenges, Kosovo is developing its National Biodiversity Strategy for 2021–2030, with a strong focus on climate resilience and ecosystem restoration. The strategy prioritizes species conservation, including urgent measures to stabilize the critically endangered Balkan lynx population and explore the potential reintroduction of the European bison to Sharri National Park. By 2030, Kosovo aims to align with the EU biodiversity target of protecting 30% of its land area and restoring degraded ecosystems. These efforts are expected to curb biodiversity loss and aid the recovery of species like the Egyptian vulture and golden eagle, which have suffered due to habitat destruction and human-wildlife conflict [25].

The integration of climate adaptation into species protection, as outlined in Kosovo's biodiversity strategy, will play a crucial role in mitigating climate-induced threats. The European bison reintroduction efforts, alongside other species reintegration programs, will not only contribute to the overall success of Kosovo's biodiversity goals but also enhance the resilience of local ecosystems. By 2030, the goal is for biodiversity loss to be reduced by 30-40%, thanks to robust conservation measures, cross-border collaborations, and sustained efforts to restore vital habitats and species populations. Kosovo's evolving biodiversity framework, rooted in regional and global cooperation, will be critical in preserving its rich natural heritage for future generations [26].

1. *European Commission. EU Biodiversity Strategy for 2030: Bringing Nature Back into Our Lives. Brussels: European Commission, 2020. https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en.*
2. *Regional Cooperation Council. Environmental Protection and Biodiversity Conservation in the Western Balkans: Cross-Border Cooperation Initiatives. Sarajevo: RCC, 2021.*
3. *Ministry of Environment, Spatial Planning, and Infrastructure of Kosovo. Climate Change and Biodiversity Report 2022. Pristina: MESP, 2022.*
4. *Government of the Republic of Kosovo. National Biodiversity Strategy and Action Plan 2021-2030. Pristina: Ministry of Environment and Spatial Planning, 2025.*
5. *International Union for Conservation of Nature (IUCN). Biodiversity Action Plans and Conservation Targets in Southeastern Europe. Gland: IUCN, 2023.*

5.2.1.5 Key Biodiversity Targets for Kosovo (2020s and Beyond)

Looking ahead to the 2020s and beyond, Kosovo's biodiversity conservation efforts are focused on achieving ambitious targets aligned with the EU Biodiversity Strategy for 2030. The goal is to protect 30% of the country's land and sea by 2030, an essential step to halt biodiversity loss and align with EU environmental standards. To further these efforts, Kosovo aims to reduce species loss by 30-40% by 2030, with a strong focus on critically endangered species like the Balkan lynx, European bison, and European wildcat. Species reintegration initiatives will play a key role in restoring populations of these vulnerable species, whose survival hinges on targeted conservation programs and adequate habitat protection [27,28].

Another central goal is the restoration of 30% of degraded ecosystems, particularly forests, wetlands, and riparian zones, which are vital to the region's biodiversity. Invasive species, such as the Asian hornet and Japanese knotweed, are a growing threat, and Kosovo has committed to targeted removal programs to protect native species and habitats [29].

To support these ambitious objectives, Kosovo is strengthening its biodiversity monitoring systems, ensuring reliable data and early warning systems to track progress and detect threats in real time. While challenges like climate change and habitat destruction persist, the success of

these efforts will determine Kosovo's ability to create a more resilient ecological landscape and secure a sustainable future for its biodiversity.

1. *European Environment Agency. Western Balkans Environmental Report 2024: Biodiversity and Ecosystem Protection. Copenhagen: EEA, 2024.*
2. *Large Carnivore Initiative for Europe. Conservation Status and Management of Large Carnivores in the Balkans. 2023.*
3. *Kosovo Institute for Nature Protection. Invasive Species Management and Ecosystem Restoration Strategies in Kosovo. Pristina: Ministry of Environment and Spatial Planning, 2024.*

5.3 Inventory of Kosovo's Biodiversity Legal Framework: Overview, Objectives, and Implementation

5.3.1 Legal Framework

5.3.1.1 Law on Nature Protection LAW No.03/L–233:

Background: The Law No. 03/L-233 on Nature Protection was enacted by the Assembly of the Republic of Kosovo to ensure the protection and conservation of natural resources, biological diversity, and landscapes. It establishes a comprehensive legal framework to safeguard the natural heritage of Kosovo while aligning with international standards, particularly those set by the European Union. This law acknowledges the intrinsic value of nature and recognizes the importance of sustainable development, public participation, and informed decision-making. The background of this legislation is rooted in Kosovo's commitment to preserving ecological integrity, responding to growing environmental concerns, and protecting rare and endangered species as well as natural habitats.

Objective: The primary objective of the law is to regulate the protection, conservation, and sustainable use of nature and its resources. It aims to ensure the rejuvenation of damaged ecosystems, the establishment of protected areas, and the preservation of biological and landscape diversity. The law focuses on preventing the over-exploitation of flora, fauna, and natural habitats, particularly those classified as endangered or of high ecological significance. Additionally, it aims to foster public awareness, participation, and the right to a healthy environment, including the promotion of recreational and educational activities in nature. The law also supports compliance with EU standards for nature conservation and the integration of nature protection into broader strategic planning and economic activities.

Implementing Institutions: The implementation of Law No. 03/L-233 on Nature Protection involves several key institutions. The Ministry of Environment and Spatial Planning serves as the primary authority responsible for supervising and enforcing the law. The Kosovo Environmental Protection Agency – Unit for Nature Protection plays an essential role in conducting research, monitoring biodiversity, maintaining data registries, and providing technical expertise related to nature protection. Additionally, municipal authorities are tasked with managing and protecting natural areas within their jurisdictions, including establishing administrative departments for protected areas and ensuring compliance with protection measures. The law mandates cooperation between various governmental bodies, municipalities, and public entities to achieve its objectives. These institutions are also responsible for aligning their activities with EU conservation standards and maintaining Kosovo's contributions to the European ecological network NATURA 2000.

5.3.1.2 Law no. 04/l-086 on National Park "Bjeshkët e Nemuna"

Background: The Law No. 04/L-086 on National Park "Bjeshkët e Nemuna" establishes the protection and management framework for the territory of Bjeshkët e Nemuna, a region of significant natural value located in the Republic of Kosovo. This national park is recognized for its exceptional forest ecosystems, endemic species, geomorphological features, hydrological elements, and landscapes of scientific, cultural, historical, educational, and recreational importance. The law was enacted to ensure the preservation of these unique ecological and geological characteristics, while supporting sustainable development and ecotourism in accordance with environmental standards. Covering an area of 62,488 hectares, the park encompasses parts of the municipalities of Gjakovë, Junik, Deçan, Pejë, and Istog.

Objective: The objective of Law No. 04/L-086 is to declare Bjeshkët e Nemuna as a national park to protect and conserve its rich natural heritage and biodiversity. This includes safeguarding rare and endangered species, preserving forest and other ecosystems, and maintaining the park's geomorphological, hydrological, and landscape features. The law also aims to promote educational, cultural, recreational, and tourism activities that align with environmental protection criteria. By designating protection regimes within the park, the law ensures the balanced management and sustainable use of natural resources while preventing activities that may harm the park's ecological integrity.

Implementing Institutions: The implementation of Law No. 04/L-086 on National Park "Bjeshkët e Nemuna" is primarily overseen by the Directorate for Administration of National Park "Bjeshkët e Nemuna", which is established under the Ministry of Environment and Spatial Planning. The Directorate, headquartered in Peja, is responsible for the administration, management, and enforcement of protection measures within the park. This body ensures that all activities, such as tourism, agriculture, and resource use, comply with the protection regimes specified by the law. Additionally, property rights and denationalization issues related to the park are managed through special laws separate from this legislation.

5.3.1.3 Law no. 04/l-087 on National Park "Sharri"

Background: The Law No. 04/L-087 on National Park "Sharri" designates the territory of the Sharr Mountains as a national park in the Republic of Kosovo. This legislation is driven by the need to protect the area's significant natural heritage, which includes diverse ecosystems, rich geomorphological features, hydrology, endemic and relict species, and landscapes of scientific, cultural, historical, and recreational importance. The Sharr Mountains, known for their biodiversity and unique environmental features, are crucial for conservation and sustainable development. The law aims to ensure that the park supports activities like ecotourism and traditional agriculture while maintaining environmental integrity. The designated area covers 53,469 hectares and spans the municipalities of Kaçanik, Shtrpce, Suhareka, Prizren, and Dragash.

Objective: The objective of Law No. 04/L-087 is to declare the Sharr Mountains as a national park to preserve its ecological and environmental values. This includes protecting rare and endangered plant and animal species, conserving forest and other natural ecosystems, and

maintaining the park's unique geomorphological and hydrological characteristics. The law supports sustainable practices, including ecotourism and traditional land use, to balance conservation with economic and recreational activities. It also seeks to enhance scientific, educational, and cultural engagement with the park while safeguarding it against harmful activities.

Implementing Institutions: The implementation of Law No. 04/L-087 is overseen by the Directorate for Administration of National Park "Sharri," which is established by the Ministry of Environment and Spatial Planning within three months of the law's enactment. The Directorate is responsible for managing the park, enforcing protection measures, and ensuring that all activities within the park comply with the specified protection regimes and broader environmental legislation. Property rights and denationalization issues related to the park are managed by special laws that fall outside the scope of this specific legislation.

5.3.2 Administrative Instructions

5.3.2.1 Administrative instructions no. 12/2020 for proclamation of wild species protected and strictly protected

Background: The **Administrative Instruction No. 12/2020** was issued by the **MESPI**. It aligns with the legal framework established by the **Law on Nature Protection No. 03/L-233** and relevant regulations governing the responsibilities of ministries and government offices. This instruction serves as a legal instrument for the official proclamation of wild species as protected or strictly protected within the territory of Kosovo. It harmonizes national regulations with the **Council Directive 92/43/EEC** concerning the conservation of natural habitats and wild fauna and flora.
Objective: The primary objective of this administrative instruction is to identify and declare specific wild species of plants and animals as either protected or strictly protected. It sets out clear guidelines for requesting permits for activities that might affect these species and outlines the reporting obligations associated with such activities. The instruction aims to safeguard biodiversity by ensuring that threatened, endangered, and vulnerable species receive the necessary legal protection to prevent their decline or extinction.
Implementing Institutions: The implementation of this instruction is the responsibility of the **MESPI**. This ministry oversees the enforcement of the protection measures, the processing of permits related to the handling of protected species, and the monitoring and reporting of activities impacting these species. The ministry collaborates with other governmental bodies, environmental agencies, and law enforcement to ensure compliance with the instruction and adherence to conservation goals.

5.3.2.2 Administrative instruction no. 12/2011
(for the sorts of natural habitat types, natural habitat map, threatened and rare natural habitat types, as well as safeguard measures for conservation of natural habitat types)

Background: The **Administrative Instruction No. 12/2011** issued by the **Ministry of Environment and Spatial Planning of the Republic of Kosovo** focuses on defining the types of natural habitats, their mapping, and the classification of rare and threatened natural

habitat types. It also establishes the measures needed to protect and conserve these habitats. The instruction is aligned with the **European Union's Habitats Directive (92/43/EEC)**, which underscores the importance of preserving biodiversity and natural ecosystems. This legal framework aims to ensure the identification and preservation of ecologically significant habitats in Kosovo, reflecting the country's commitment to environmental conservation and compliance with European environmental standards.

Objective: The primary objective of this administrative instruction is to protect and conserve natural habitats in Kosovo, particularly those identified as rare and threatened. The document outlines specific habitat types that need protection and the measures required to maintain them in a favorable condition. By classifying and mapping these habitats, the instruction seeks to provide a clear framework for conservation efforts and ensure sustainable management of natural resources. It also aims to harmonize Kosovo's conservation practices with European standards, thereby facilitating better integration into international environmental protection frameworks. The instruction emphasizes the need for ongoing monitoring, scientific research, and adaptive management to address emerging threats to these habitats.

Implementing Institutions: The implementation of this administrative instruction is primarily the responsibility of the **Ministry of Environment and Spatial Planning**. This ministry oversees the enforcement of habitat protection measures, the classification of natural habitats, and the creation and maintenance of habitat maps. Additionally, the **Institute for Nature Protection** plays a crucial role in monitoring the status of threatened habitats and proposing updates based on new scientific data. Local government authorities and environmental agencies are also involved in enforcing conservation measures and ensuring compliance with the legal framework. The collaborative approach between national institutions and local entities ensures the effective protection and sustainable management of Kosovo's natural habitats.

5.3.2.3 Administrative instruction qrk no. 18/2013 on proclamation of the ecological network

The **Administrative Instruction No. 18/2013** was enacted by the Government of the Republic of Kosovo on November 13, 2013. This instruction is grounded in the Constitution of Kosovo, specifically Article 93(4), and the Law on Nature Protection No. 03/L-233. It also refers to the Government's Rules of Procedure No. 09/2011. The purpose of this regulation is to establish and proclaim an **ecological network** for the Republic of Kosovo, which serves as a comprehensive framework for protecting important ecological zones and corridors.

The instruction identifies and formalizes critical ecological areas and migration routes essential for maintaining biodiversity. It aligns with international, European, and national conservation standards and agreements, reflecting Kosovo's commitment to preserving its natural habitats and species. The instruction repeals previous related administrative regulations, consolidating the legal structure for ecological protection.

The ecological network encompasses:

1. **Ecologically Important Areas** for the conservation of wild species and threatened habitat types.
2. **Ecological Corridors** that connect these areas, ensuring the free movement and migration of species.
3. **Speleological Objects** (caves and subterranean habitats) relevant to the broader ecosystem.

This regulation was designed to align Kosovo's environmental policy with European Union directives and international environmental agreements, particularly Directive 92/43/EEC for the conservation of natural habitats and species.
Objective: The primary objective of the Administrative Instruction GRK No. 18/2013 is to establish and protect an ecological network within Kosovo that conserves threatened species and their habitats while maintaining biodiversity integrity. The instruction aims to identify key ecological areas, designate ecological corridors, and ensure that these zones are effectively protected and managed. By providing detailed guidelines, it seeks to mitigate biodiversity loss, maintain habitat connectivity, and enable the migration and dispersal of species. It also focuses on integrating these conservation efforts with the sustainable use of natural resources to achieve a balance between environmental protection and economic development. This instruction supports the long-term sustainability of Kosovo's natural heritage and ensures alignment with international and European environmental protection standards, particularly the EU Habitats Directive.
Implementing Institutions: The implementation of this instruction is primarily overseen by the **Ministry of Environment and Spatial Planning (MESP)**, which coordinates the management, enforcement, and monitoring of the ecological network. The **Kosovo Institute for Nature Protection** is tasked with drafting and mapping the ecological network, ensuring that designated areas and corridors are accurately charted and scientifically validated. The **Kosovo Cadastral Agency** collaborates by mapping these areas on Kosovo's official cartographic platforms at detailed scales (1:5000 and 1:10000). **Directorates for Environment and Urbanism** at the municipal level manage ecological network areas that do not fall within protected zones, ensuring that local conservation measures align with national guidelines.
Additionally, **Nature Protection Inspectors** are responsible for overseeing compliance with the instruction, enforcing regulations, and preventing violations. In municipalities where specific directorates for managing protected areas do not yet exist, **local governments** assist in implementing the relevant management plans. Individuals and legal entities that utilize natural resources within these zones are required to adhere to conservation measures and may be obligated to contribute to funding specific protection activities. International organizations and donors also play a key role by providing technical assistance and financial support to ensure the successful implementation and sustainability of the ecological network. This multi-institutional approach ensures cohesive, well-monitored, and enforceable management of Kosovo's ecological heritage.

5.3.3 Policy documents

5.3.3.1 Spatial Plan of Kosovo
Legal Status : The **Spatial Plan of Kosovo** is a **binding** national-level document. It derives its legal authority from the Ministry of Environment and Spatial Planning (MESP) and is enacted to regulate spatial development, environmental protection, and biodiversity conservation. The plan mandates compliance with established policies for land use, natural resource management, and environmental preservation. It enforces legal obligations to protect natural habitats and ecosystems, aligning Kosovo's conservation efforts with international standards and directives such as the EU's **Habitats Directive (92/43/EEC)**.
Type of Document: This is a **spatial development plan** that integrates policies for sustainable land use, environmental protection, and socio-economic growth. The plan outlines strategies for

managing natural resources, protecting biodiversity, and promoting sustainable development. It serves as a comprehensive framework for decision-making at national and municipal levels, covering diverse sectors like agriculture, forestry, urban planning, and environmental conservation.
Function: The Spatial Plan of Kosovo functions as a framework for action by providing strategic guidelines for biodiversity protection and sustainable development. It sets out strategic goals and targets for conserving ecosystems, protecting threatened species, and promoting environmentally friendly land use practices. The plan includes implementation and monitoring tools, such as conservation programs, zoning regulations, and environmental impact assessments, to ensure that biodiversity goals are achieved. Additionally, it fosters collaborative agreements between government institutions, local municipalities, and international partners to support effective biodiversity management and ecosystem restoration.
Topics Covered: The plan extensively addresses biodiversity-related topics. Conservation is a major focus, with detailed measures for protecting forests, national parks, and endemic species. It includes strategies for preserving habitats like the Sharr Mountains and Bjeshkët e Nemuna. Ecosystem restoration is prioritized through reforestation, erosion control, and habitat rehabilitation initiatives. The climate-biodiversity nexus is acknowledged, emphasizing adaptive management to mitigate climate impacts on ecosystems. The plan also promotes the sustainable use and trade of natural resources, balancing economic development with environmental protection.
Analysis of the Document: The Spatial Plan of Kosovo outlines a comprehensive strategy for spatial development, emphasizing biodiversity conservation, sustainable land use, and environmental protection. It identifies key natural areas, such as national parks and forests, that require protection and management. The plan provides specific measures for preserving ecosystems, restoring degraded habitats, and mitigating environmental threats like deforestation, erosion, and pollution. It integrates biodiversity goals with socio-economic development, promoting sustainable practices in agriculture, forestry, and tourism.
Relevance to Kosovo: The plan addresses critical biodiversity challenges facing Kosovo, such as habitat loss, deforestation, and environmental degradation. With significant portions of the population relying on natural resources for their livelihoods, the plan's emphasis on sustainable use and conservation is highly relevant. It highlights priority areas like the Gardens of Kosovo (Prizren region), the Sharr Mountains, and the Bjeshkët e Nemuna as key biodiversity hotspots that need protection. By aligning with international conservation standards, the plan supports Kosovo's efforts to join the European Union and participate in global biodiversity initiatives.
Legal/Strategic Implications: As a binding document, the Spatial Plan of Kosovo has significant legal implications for land use and environmental management. It mandates the protection of biodiversity through zoning regulations, habitat conservation measures, and sustainable development policies. The plan reinforces the need for compliance with national laws and international directives, such as the Habitats Directive (92/43/EEC). Strategically, it provides a roadmap for integrating biodiversity conservation into broader development plans, ensuring that environmental goals are prioritized alongside economic growth.
Key Takeaways: The Spatial Plan of Kosovo highlights the importance of biodiversity conservation as a foundation for sustainable development. It identifies key natural areas and ecosystems that require protection, such as forests, rivers, and national parks. The plan emphasizes ecosystem restoration through reforestation and erosion control measures, aiming to rehabilitate degraded landscapes. It also recognizes the interconnection between climate

change and biodiversity, promoting adaptive management strategies to protect vulnerable ecosystems. The focus on sustainable use of natural resources ensures that economic activities, such as agriculture and tourism, are conducted in an environmentally responsible manner. The Gardens of Kosovo are highlighted as areas of both cultural and ecological significance, representing opportunities for conservation and sustainable tourism development.

5.3.3.2 Strategy and Action Plan on Biodiversity 2011 – 2020:

Legal Status: The " Strategy and Action Plan on Biodiversity 2011 – 2020" is the country's principal framework for biodiversity conservation. The strategylays the groundwork for future compliance with binding international agreements such as the Convention on Biological Diversity (CBD), CITES (Convention on International Trade in Endangered Species), and other biodiversity-related treaties. Although Kosovo is not a signatory to these conventions, the strategy anticipates alignment with their requirements. It also addresses the harmonization of Kosovo's legal framework with the European Union's Natura 2000 network and directives, including the Habitats Directive (1992) and the Birds Directive (1979), as part of the country's preparation for EU integration.

Type of Document: This document is a national strategic plan focusing on biodiversity conservation and sustainable use of natural resources for the period between 2011 and 2020. It combines both a strategic vision and an action plan, establishing goals, priorities, and specific measures for conserving biodiversity, enhancing ecosystems, and integrating biodiversity protection into national development strategies. The strategy is comprehensive and multidisciplinary, covering various sectors such as forestry, agriculture, water management, energy, education, and tourism.

Function: The "Strategjia dhe Plani i Veprimit për Biodiversitetin 2011–2020" functions as a framework for action by setting out clear guidelines and steps to protect and conserve biodiversity in Kosovo. It identifies strategic goals and targets, emphasizing the importance of halting biodiversity loss, restoring ecosystems, and promoting sustainable development practices. The document also serves as an implementation and monitoring tool by defining specific activities, responsible institutions, and timeframes for achieving biodiversity-related objectives. Furthermore, the strategy supports collaborative agreements by encouraging partnerships between government bodies, local communities, civil society organizations, and international partners. It aims to foster a coordinated approach to biodiversity management and ensure that Kosovo's efforts align with European and international standards.

Topics Covered: The strategy addresses several critical themes related to biodiversity and environmental management. The conservation of species, habitats, and ecosystems is a central focus, with measures to protect endemic and threatened species, expand protected areas, and implement effective conservation management practices. The document also emphasizes ecosystem restoration, recognizing the need to rehabilitate degraded forests, rivers, wetlands, and other natural habitats. Although not explicitly focused on climate change, the strategy touches on the climate-biodiversity nexus by acknowledging the impacts of environmental changes on biodiversity and advocating for adaptive management practices. Additionally, the strategy promotes the sustainable use and trade of natural resources, including forestry, agriculture, and tourism, ensuring that these activities do not compromise biodiversity and that benefits are equitably distributed among the population.

Analysis of the Document: The "Strategjia dhe Plani i Veprimit për Biodiversitetin 2011–2020" is a comprehensive blueprint for biodiversity conservation in Kosovo. It outlines a vision

for preserving the country's rich biological diversity and ensuring sustainable development practices. The strategy emphasizes the importance of conserving Kosovo's diverse flora, fauna, and ecosystems, many of which are unique to the region. It identifies specific goals such as developing a robust legal and institutional framework, protecting endangered species and habitats, integrating biodiversity considerations into other sectors, and enhancing public awareness and participation in environmental protection.

The document is highly relevant to Kosovo's environmental and socio-economic challenges. Kosovo faces significant biodiversity threats, including habitat loss, pollution, illegal logging, and inadequate management of protected areas. The strategy addresses these issues by proposing concrete actions such as expanding protected areas, improving biodiversity monitoring, and developing management plans for nature reserves. Additionally, the strategy recognizes the need for institutional capacity-building, better coordination between government bodies, and increased funding for biodiversity initiatives. Given Kosovo's aspiration to join the European Union, the strategy's focus on aligning national policies with EU directives and the Natura 2000 network is particularly significant.

The legal and strategic implications of this document are profound. By setting out a clear framework for biodiversity protection, the strategy helps Kosovo establish a foundation for future compliance with international environmental agreements. It also supports the integration of biodiversity considerations into broader national policies and development plans. The strategy highlights the need for legal reforms, better enforcement of existing environmental laws, and the creation of new regulations to address emerging biodiversity challenges. Furthermore, it emphasizes the importance of education, communication, and public participation in achieving biodiversity goals, reflecting a holistic approach to environmental management.

The key takeaways from the strategy underscore the importance of preserving Kosovo's natural heritage and promoting sustainable development. The document provides a roadmap for protecting endangered species, conserving critical habitats, and restoring degraded ecosystems. It also highlights the need for improved data collection, biodiversity monitoring, and scientific research to inform conservation efforts. The strategy's focus on public awareness and education is crucial for fostering a culture of environmental stewardship among Kosovo's citizens. Additionally, the emphasis on inter-sectoral collaboration and international partnerships reflects a recognition that biodiversity conservation requires coordinated efforts at local, national, and global levels.

For Kosovo's biodiversity planning, the most interesting and relevant aspects of the strategy include its emphasis on aligning with European standards, its detailed action plan for implementing biodiversity initiatives, and its focus on integrating biodiversity considerations into other sectors. The identification of pilot zones for implementing conservation projects provides a practical approach for testing and refining biodiversity management practices. The strategy's recognition of the importance of education, public participation, and community engagement is also noteworthy, as these factors are essential for the long-term success of biodiversity conservation efforts in Kosovo. Overall, the strategy offers a comprehensive and forward-thinking approach to preserving Kosovo's natural heritage and promoting sustainable development.

5.3.3.3 Spatial Development Plan - National Park 'Sharri'

Legal Status: The "National Park 'Sharri' Spatial Plan" is a binding national-level planning document formulated by the Ministry of Environment, Spatial Planning and Infrastructure and the Institute for Spatial Planning of Kosovo. This document derives its authority from national legislation, specifically laws on Spatial Planning, Environmental Protection, Nature Protection, Agricultural Land, Housing, and Waters. It provides legal guidance for spatial development and management within the Sharr Mountains National Park. As a binding document, it establishes concrete regulations for land use, conservation measures, infrastructure development, and sustainable resource management within the park's boundaries.

Type of Document: The document is a spatial development plan for a designated protected area, specifically the Sharr Mountains National Park. It integrates detailed assessments of the park's geography, ecosystems, socio-economic factors, and infrastructure, providing a strategic framework for development, conservation, and sustainable use. The plan is part of Kosovo's overarching spatial planning system and serves as a legally mandated blueprint for managing the park's natural resources and guiding future development.

Function: The "National Park 'Sharri' Spatial Plan" serves as a framework for action by defining clear spatial policies and guidelines for managing the park. It outlines the vision, principles, and goals for conservation, sustainable development, and land-use management. Additionally, the plan sets forth strategic goals and targets, such as the protection of endemic species, restoration of degraded areas, and promotion of eco-tourism. The document functions as an implementation and monitoring tool by providing specific zoning regulations, infrastructure plans, and measures for enforcement. It also supports collaborative agreements by encouraging cooperation between government agencies, municipalities, local communities, and international organizations to achieve shared conservation and development objectives.

Topics Covered: The plan covers several essential topics relevant to biodiversity and sustainable development. It emphasizes conservation of flora, fauna, and ecosystems, identifying protected zones, special natural reserves, and management strategies to preserve biodiversity. Ecosystem restoration is addressed through measures to rehabilitate degraded forests, prevent soil erosion, and restore natural habitats. The plan also recognizes the climate-biodiversity nexus, acknowledging the impacts of climate change on the park's ecosystems and proposing adaptive management strategies. Additionally, it promotes the sustainable use and trade of natural resources, balancing tourism, agriculture, and forestry activities with conservation goals.

Brief Description: The "National Park 'Sharri' Spatial Plan" is a comprehensive legal document that sets the framework for the protection, development, and sustainable use of the Sharr Mountains National Park. It defines the park's boundaries, zoning regulations, and management strategies to preserve its rich biodiversity, unique landscapes, and cultural heritage. The plan addresses various environmental, social, and economic challenges, providing guidelines for infrastructure development, tourism, agriculture, and community involvement. It aims to balance conservation with sustainable development by establishing clear policies and measures to protect natural resources and promote eco-friendly activities.

Relevance to Kosovo: The plan is highly relevant to Kosovo's environmental protection and sustainable development goals. The Sharr Mountains are a region of significant ecological, cultural, and economic importance, home to diverse species, endemic plants, and valuable forest ecosystems. The plan addresses critical issues facing Kosovo, such as habitat loss, illegal logging, pollution, and unplanned urbanization. By establishing clear zoning regulations

and management practices, the plan helps protect the park's natural heritage while supporting local livelihoods through sustainable tourism, agriculture, and forestry. Moreover, the plan aligns with Kosovo's aspirations for EU integration by incorporating principles from the Natura 2000 network and international conservation standards.

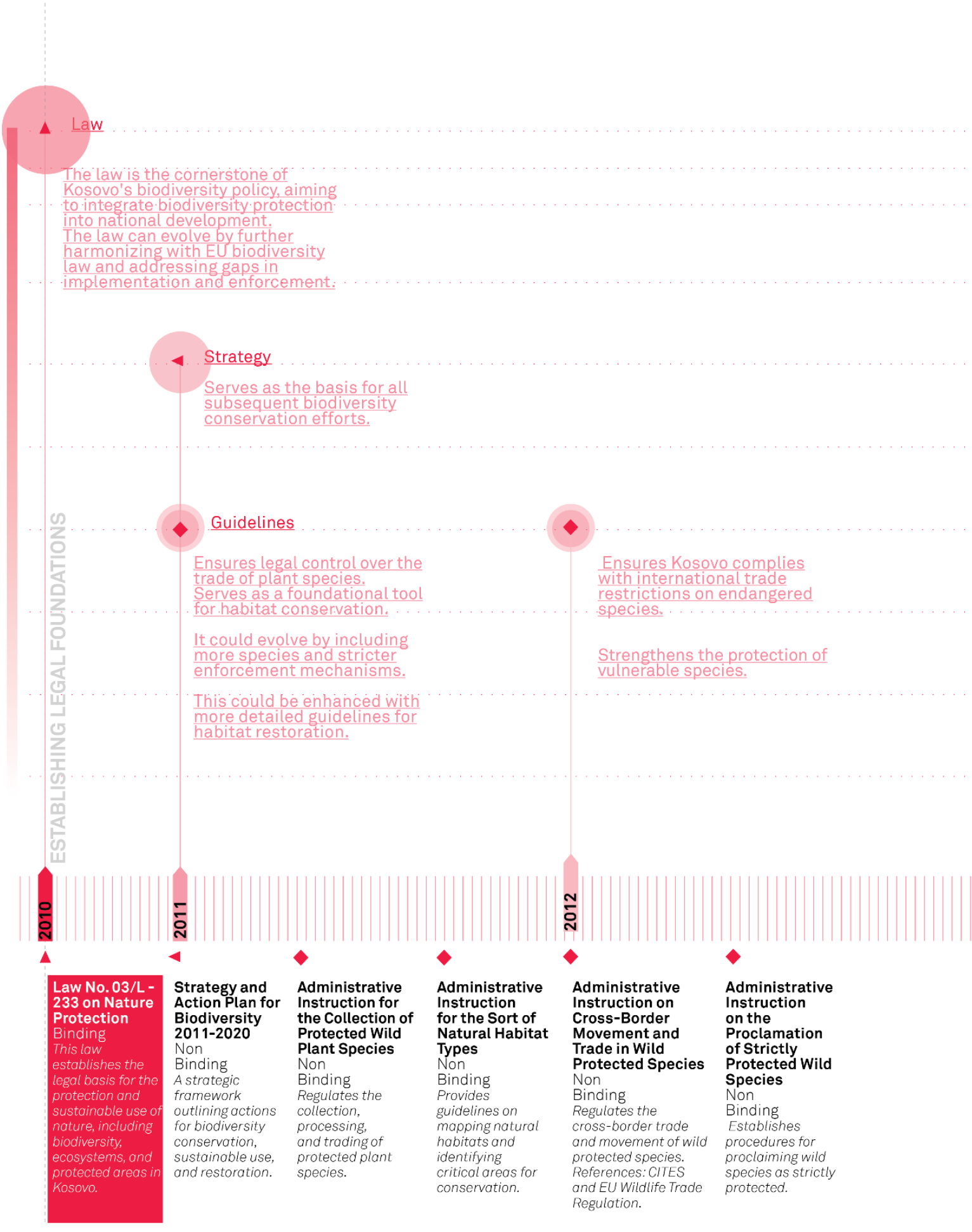
Legal/Strategic Implications: The plan has significant legal and strategic implications for spatial planning and environmental management in Kosovo. As a binding document, it mandates compliance with zoning regulations, land-use policies, and conservation measures. It strengthens the legal framework for protecting natural resources and provides a basis for enforcement actions against illegal activities, such as logging and construction. Strategically, the plan promotes integrated management, encouraging coordination between government agencies, municipalities, and local communities. It also emphasizes the importance of data collection, monitoring, and adaptive management, ensuring that the park's development aligns with environmental sustainability goals.

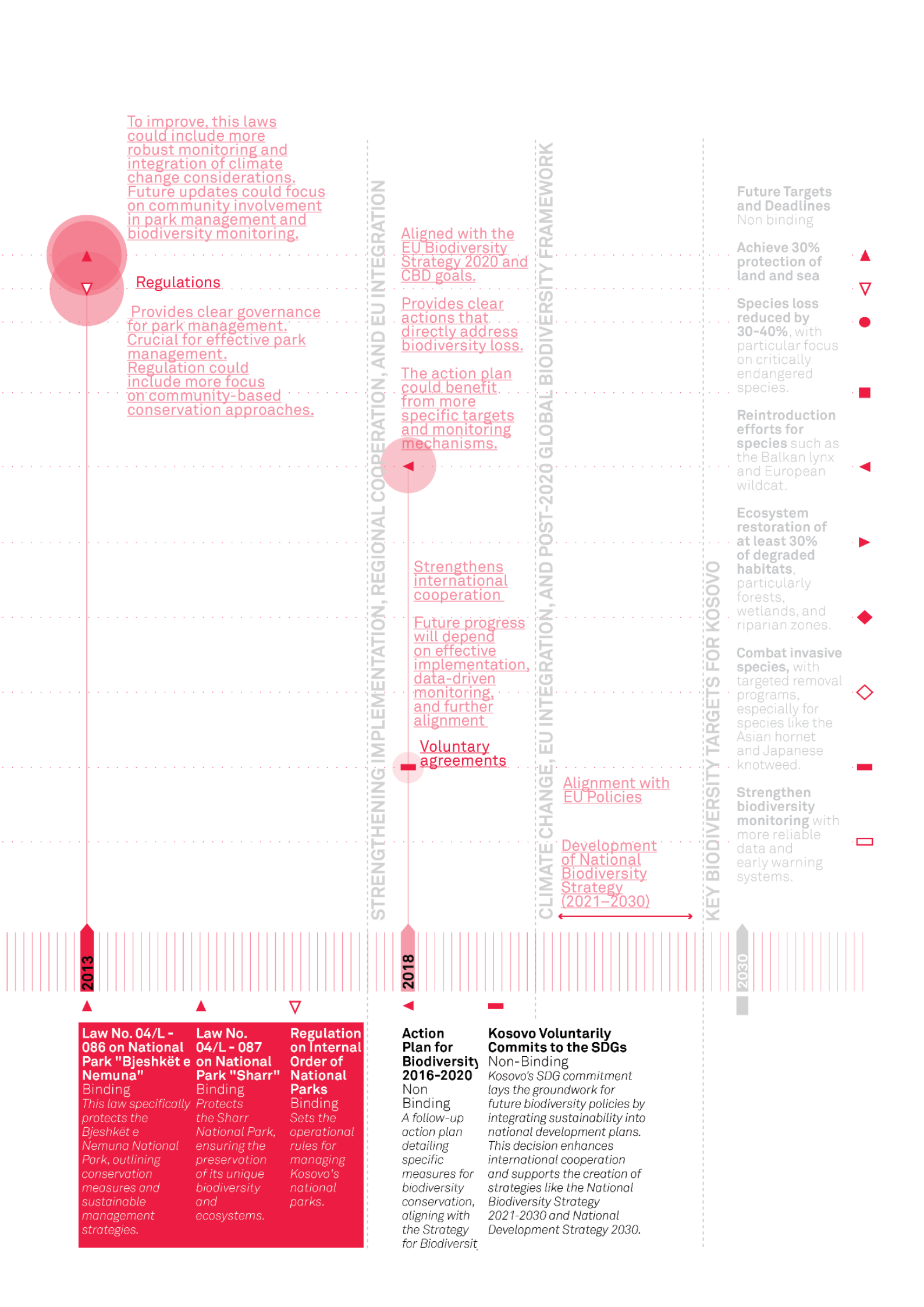
Key Takeaways: The "National Park 'Sharri' Spatial Plan" highlights the importance of conserving Kosovo's natural heritage through legally binding policies and strategic planning. The document underscores the need for protecting endemic and endangered species, restoring degraded ecosystems, and promoting sustainable development practices. It provides a detailed zoning framework that balances conservation with economic activities, such as tourism and agriculture. The plan also addresses challenges such as habitat degradation, pollution, and climate change, proposing adaptive management strategies to mitigate these threats. Public participation, education, and community involvement are identified as crucial elements for the plan's successful implementation, reflecting a holistic approach to conservation and development.

The important aspects of the plan for Kosovo's biodiversity planning are its comprehensive zoning regulations, strategic goals for conservation, and emphasis on sustainable use of natural resources. The identification of restricted natural reserves, special protection zones, and buffer areas provides a clear framework for preserving biodiversity and preventing environmental degradation. The plan's focus on restoring ecosystems, protecting endemic species, and promoting eco-tourism offers practical solutions for balancing conservation with economic development. Additionally, the plan's alignment with EU environmental standards and its emphasis on collaborative management provide a roadmap for Kosovo to enhance its biodiversity planning and integrate with international conservation efforts. The detailed spatial analysis, infrastructure guidelines, and implementation strategies make this plan a critical tool for safeguarding Kosovo's natural heritage and promoting sustainable development in the Sharr Mountains region.

5.4 Kosovo Biodiversity Frameworks and Documents Organized by Legal Status

National Biodiversity Frameworks & Protocols




To improve, this laws could include more robust monitoring and integration of climate change considerations. Future updates could focus on community involvement in park management and biodiversity monitoring.
Regulations
Provides clear governance for park management. Crucial for effective park management. Regulation could include more focus on community-based conservation approaches.
Aligned with the EU Biodiversity Strategy 2020 and CBD goals.
Provides clear actions that directly address biodiversity loss.
The action plan could benefit from more specific targets and monitoring mechanisms.
Strengthens international cooperation
Future progress will depend on effective implementation, data-driven monitoring, and further alignment
Voluntary agreements
Alignment with EU Policies
Development of National Biodiversity Strategy (2021–2030)
STRENGTHENING IMPLEMENTATION, REGIONAL COOPERATION, AND EU INTEGRATION
CLIMATE CHANGE, EU INTEGRATION, AND POST-2020 GLOBAL BIODIVERSITY FRAMEWORK
KEY BIODIVERSITY TARGETS FOR KOSOVO
Future Targets and Deadlines
Non binding
Achieve 30% protection of land and sea
Species loss reduced by 30-40%, with particular focus on critically endangered species.
Reintroduction efforts for species such as the Balkan lynx and European wildcat.
Ecosystem restoration of at least 30% of degraded habitats, particularly forests, wetlands, and riparian zones.
Combat invasive species, with targeted removal programs, especially for species like the Asian hornet and Japanese knotweed.
Strengthen biodiversity monitoring with more reliable data and early warning systems.
2013
2018
2030
Law No. 04/L - 086 on National Park "Bjeshkët e Nemuna"
Binding
This law specifically protects the Bjeshkët e Nemuna National Park, outlining conservation measures and sustainable management strategies.
Law No. 04/L - 087 on National Park "Sharr"
Binding
Protects the Sharr National Park, ensuring the preservation of its unique biodiversity and ecosystems.
Regulation on Internal Order of National Parks
Binding
Sets the operational rules for managing Kosovo's national parks.
Action Plan for Biodiversity 2016-2020
Non Binding
A follow-up action plan detailing specific measures for biodiversity conservation, aligning with the Strategy for Biodiversit
Kosovo Voluntarily Commits to the SDGs
Non-Binding
Kosovo's SDG commitment lays the groundwork for future biodiversity policies by integrating sustainability into national development plans. This decision enhances international cooperation and supports the creation of strategies like the National Biodiversity Strategy 2021-2030 and National Development Strategy 2030.

5.4.1 Laws (Binding)

5.4.1.1 Law No. 03/L - 233 on Nature Protection (2010)

Brief Description: This law establishes the legal basis for the protection and sustainable use of nature, including biodiversity, ecosystems, and protected areas in Kosovo.
References: This law aligns with the EU's Nature Directives, particularly the Habitats Directive, as well as international conventions like the Convention on Biological Diversity (CBD).
Legal/Strategic Implications: The law sets the framework for nature protection and establishes enforcement mechanisms for conservation.
Key Takeaways: The law is the cornerstone of Kosovo's biodiversity policy, aiming to integrate biodiversity protection into national development.
Most Relevant for Kosovo: It provides a foundation for all subsequent biodiversity protection measures.
Evolution: The law can evolve by further harmonizing with EU biodiversity law and addressing gaps in implementation and enforcement.

5.4.1.2 Law No. 04/L - 086 on National Park "Bjeshkët e Nemuna" (2013)
Brief Description: This law specifically protects the Bjeshkët e Nemuna National Park, outlining conservation measures and sustainable management strategies.
References: In line with the UNESCO's World Heritage and Biosphere Reserve policies, aligning with EU conservation strategies.
Legal/Strategic Implications: It mandates strict conservation protocols within the park, ensuring biodiversity protection.
Key Takeaways: Strengthens the protection of a significant natural area.
Most Relevant for Kosovo: It highlights Kosovo's commitment to conserving critical habitats and ecosystems.
Evolution: To improve, this law could include more robust monitoring and integration of climate change considerations.

5.4.1.3 Law No. 04/L - 087 on National Park "Sharr" (2013)
Brief Description: Protects the Sharr National Park, ensuring the preservation of its unique biodiversity and ecosystems.
References: Consistent with EU policies on Natura 2000 sites and regional efforts to protect the Balkan region's biodiversity.
Legal/Strategic Implications: Supports biodiversity conservation and sustainable tourism development.
Key Takeaways: Ensures the protection of another key ecological area in Kosovo.
Most Relevant for Kosovo: Integral for maintaining biodiversity hotspots.
Evolution: Future updates could focus on community involvement in park management and biodiversity monitoring.

5.4.2 Policy Documents (Non-Binding)

5.4.2.1 Strategy and Action Plan for Biodiversity 2011-2020 (2011)

Brief Description: A strategic framework outlining actions for biodiversity conservation, sustainable use, and restoration.
References: Influenced by the CBD and EU biodiversity strategies.
Legal/Strategic Implications: Guides Kosovo's biodiversity-related actions, though not legally binding.
Key Takeaways: A roadmap for improving biodiversity protection in Kosovo.
Most Relevant for Kosovo: Serves as the basis for all subsequent biodiversity conservation efforts.
Evolution: The strategy can evolve by incorporating climate change resilience and linking more closely with the EU's biodiversity strategy for 2030.

5.4.2.2 Action Plan for Biodiversity 2016-2020 (2018)

Brief Description: A follow-up action plan detailing specific measures for biodiversity conservation, aligning with the Strategy for Biodiversity.
References: Aligned with the EU Biodiversity Strategy 2020 and CBD goals.
Legal/Strategic Implications: Supports practical biodiversity conservation steps, though its implementation is not legally required.
Key Takeaways: Ensures a more focused approach on tangible biodiversity outcomes.
Most Relevant for Kosovo: Provides clear actions that directly address biodiversity loss.
Evolution: The action plan could benefit from more specific targets and monitoring mechanisms.

5.4.3 Administrative Instructions (Non-Binding)

5.4.3.1 Administrative Instruction for the Collection of Protected Wild Plant Species (2011)

Brief Description: Regulates the collection, processing, and trading of protected plant species.
References: Aligned with international conventions such as the Convention on International Trade in Endangered Species (CITES).
Legal/Strategic Implications: Establishes guidelines for the sustainable use of protected plants.
Key Takeaways: Ensures legal control over the trade of plant species.
Most Relevant for Kosovo: Important for preventing overexploitation of rare species.
Evolution: It could evolve by including more species and stricter enforcement mechanisms.

5.4.3.2 Administrative Instruction for the Sort of Natural Habitat Types (2011)

Brief Description: Provides guidelines on mapping natural habitats and identifying critical areas for conservation.
References: EU Habitat Directive and international biodiversity mapping practices.
Legal/Strategic Implications: Vital for identifying key areas for protection.

Key Takeaways: Essential for the creation of a national ecological network.
Most Relevant for Kosovo: Serves as a foundational tool for habitat conservation.
Evolution: This could be enhanced with more detailed guidelines for habitat restoration.

5.4.3.3 Administrative Instruction on Cross-Border Movement and Trade in Wild Protected Species (2012)

Brief Description: Regulates the cross-border trade and movement of wild protected species.
References: CITES and EU Wildlife Trade Regulation.
Legal/Strategic Implications: Ensures Kosovo complies with international trade restrictions on endangered species.
Key Takeaways: Contributes to the control of illegal wildlife trade.
Most Relevant for Kosovo: Key to preventing the illegal export of protected species.
Evolution: This could evolve by increasing cooperation with neighboring countries on enforcement.

5.4.3.4 Administrative Instruction on the Proclamation of Strictly Protected Wild Species (2012)

Brief Description: Establishes procedures for proclaiming wild species as strictly protected.
References: Aligns with the CBD and EU Habitats Directive.
Legal/Strategic Implications: Provides a framework for species conservation.
Key Takeaways: Strengthens the protection of vulnerable species.
Most Relevant for Kosovo: Directly impacts species conservation efforts.
Evolution: More species could be added as new threats emerge.

5.4.4 Regulations

5.4.4.1 Regulation on Internal Order of National Parks (2013)

Brief Description: Sets the operational rules for managing Kosovo's national parks.
References: EU park management policies.
Legal/Strategic Implications: Provides clear governance for park management.
Key Takeaways: Ensures a structured approach to managing protected areas.
Most Relevant for Kosovo: Crucial for effective park management.
Evolution: Regulation could include more focus on community-based conservation approaches.

5.4.5 Voluntary agreements

5.4.5.1 Kosovo's Voluntary Commitment to the SDGs (2018)

Brief Description: In 2018, Kosovo voluntarily committed to the **2030 Sustainable Development Goals (SDGs)**, aligning its national policies with global sustainability efforts. This commitment serves as a roadmap for integrating biodiversity conservation, climate action, and sustainable development into national strategies.

References: This voluntary commitment aligns with the **United Nations 2030 Agenda for Sustainable Development**, particularly **SDG 15 (Life on Land)** and **SDG 13 (Climate Action)**, as well as regional sustainability efforts.
Legal/Strategic Implications: While not legally binding, this commitment influences Kosovo's **policy direction** by promoting sustainability-driven reforms. It supports the **National Biodiversity Strategy (2021-2030)** and the **National Development Strategy 2030**.
Key Takeaways: This milestone **establishes Kosovo's dedication** to sustainable development and environmental protection, providing a **foundation for biodiversity policies and conservation initiatives**.
Most Relevant for Kosovo: Strengthens **international cooperation** and ensures that biodiversity protection is **embedded in national development plans**.
Evolution: Future progress will depend on **effective implementation**, **data-driven monitoring**, and further alignment with **EU sustainability policies and international biodiversity frameworks**.

Key Takeaways & Recommendations

1. **Effectiveness**: Kosovo has a relatively comprehensive legal framework for biodiversity, but enforcement remains a challenge. More robust monitoring and accountability mechanisms would strengthen these efforts.
2. **Relation to Global/European Frameworks**: Kosovo aligns with key global frameworks like the CBD and EU policies, but its integration into the European and global biodiversity community could be enhanced through further harmonization with EU law.
3. **Areas for Improvement**:
    a) **Monitoring and Implementation**: A stronger emphasis on monitoring the effectiveness of these laws and instructions, with clearer roles for local and national authorities.
    b) **Community Engagement**: More focus on local communities' involvement in conservation practices, especially in national parks.
    c) **Climate Change Consideration**: Incorporating biodiversity resilience in the face of climate change is an emerging necessity.

INITIAL AWARENESS AND INTERNATIONAL INFLUENCE

ESTABLISHING LEGAL FOUNDATIONS

6.13 BILLION

+0.6°C

Law No. 03/L - 233 on Nature Protection
Binding
This law establishes the legal basis for the protection and sustainable use of nature, including biodiversity, ecosystems, and protected areas in Kosovo.

Strategy and Action Plan for Biodiversity 2011-2020
Non Binding
A strategic framework outlining actions for biodiversity conservation, sustainable use, and restoration.

Administrative Instruction for the Collection of Protected Wild Plant Species
Non Binding
Regulates the collection, processing, and trading of protected plant species.

Administrative Instruction for the Sort of Natural Habitat Types
Non Binding
Provides guidelines on mapping natural habitats and identifying critical areas for conservation.

Administrative Instruction on Cross-Border Movement and Trade in Wild Protected Species
Non Binding
Regulates the cross-border trade and movement of wild protected species. References: CITES and EU Wildlife Trade Regulation.

Administrative Instruction on the Proclamation of Strictly Protected Wild Species
Non Binding
Establishes procedures for proclaiming wild species as strictly protected.

Law No. 04/L - 086 on National Park "Bjeshkët e Nemuna"
Binding
This law specifically protects the Bjeshkët e Nemuna National Park, outlining conservation measures and sustainable management strategies.

Law No. 04/L - 087 on National Park "Sharr"
Binding
Protects the Sharr National Park, ensuring the preservation of its unique biodiversity and ecosystems.

Biodiversity Loss (-%)

-60%

OF THE PLANET BIODIVERSITY

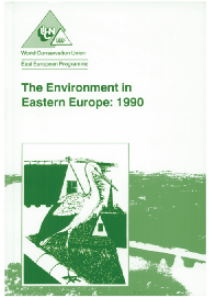
2010

2011

2011

2012

2013



INTERNATIONAL EFFORTS IN THE 1990S AND EARLY 2000S, INCLUDING TREATIES SUCH AS THE CONVENTION ON BIOLOGICAL DIVERSITY (CBD) AND THE BALKAN ENVIRONMENTAL ASSOCIATION, LAID THE GROUNDWORK FOR LATER BIODIVERSITY ACTION IN KOSOVO.

30-40%

STUDIES ESTIMATE OF KOSOVO'S BIODIVERSITY IS THREATENED BY HABITAT DESTRUCTION, INVASIVE SPECIES, AND CLIMATE CHANGE IMPACTS.

FOREST ECOSYSTEMS HAVE SUFFERED SIGNIFICANT DEGRADATION, WITH DEFORESTATION RATES OF ABOUT 1.5% PER YEAR IN SOME REGIONS (AN UNSUSTAINABLE RATE).

SPECIES SUCH AS THE BALKAN LYNX AND EUROPEAN WILDCAT ARE INCREASINGLY RARE IN KOSOVO.
BIRD SPECIES, PARTICULARLY RAPTORS, SUCH AS THE EGYPTIAN VULTURE, FACE SERIOUS DECLINES, WITH POPULATION REDUCTIONS OF UP TO 50% OVER THE PAST TWO DECADES.

STRENGTHENING IMPLEMENTATION, REGIONAL COOPERATION, AND EU INTEGRATION

CLIMATE CHANGE, EU INTEGRATION, AND POST-2020 GLOBAL BIODIVERSITY FRAMEWORK

KEY BIODIVERSITY TARGETS FOR KOSOVO

8.16 BILLION

+1.54°C

GLOBAL WARMING

Regulation on Internal Order of National Parks
Binding
Sets the operational rules for managing Kosovo's national parks.

Action Plan for Biodiversity 2016-2020
Non Binding
A follow-up action plan detailing specific measures for biodiversity conservation, aligning with the Strategy for Biodiversity.

Kosovo Voluntarily Commits to the SDGs
Non-Binding
Kosovo's SDG commitment lays the groundwork for future biodiversity policies by integrating sustainability into national development plans. This decision enhances international cooperation and supports the creation of strategies like the National Biodiversity Strategy 2021-2030 and National Development Strategy 2030.

Future Targets and Deadlines
Non binding

Achieve 30% protection of land and sea

Species loss reduced by 30-40%, with particular focus on critically endangered species.

Reintroduction efforts for species such as the Balkan lynx and European wildcat.

Ecosystem restoration of at least 30% of degraded habitats, particularly forests, wetlands, and riparian zones.

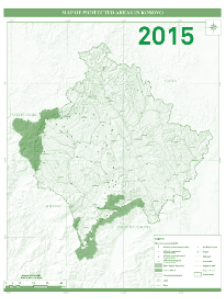
Combat invasive species, with targeted removal programs, especially for species like the Asian hornet and Japanese knotweed.

Strengthen biodiversity monitoring with more reliable data and early warning systems.

2013

2018

2030



-80%

OF THE PLANET BIODIVERSITY

-85%

Conclusion

In summary, Kosovo has made important strides in aligning its biodiversity policies with international frameworks, such as the Convention on Biological Diversity (CBD) and the EU Biodiversity Strategy. The development of legal structures, including the Law on Nature Protection, national parks, and the Biodiversity Strategy and Action Plan, reflects Kosovo's commitment to biodiversity conservation. However, when compared to global, European, and regional standards, Kosovo is somewhat behind in its implementation and integration of biodiversity-related policies.

Kosovo faces challenges, including legal gaps (e.g., its non-signatory status to certain international conventions), inadequate institutional coordination, and limited funding for biodiversity initiatives. Moreover, there is a conceptual gap in integrating biodiversity into broader national sectors, such as energy and urban development. Yet, Kosovo has shown significant progress with its regulatory framework, establishing protected areas and creating administrative guidelines for species and habitat conservation. Kosovo's ongoing participation in regional initiatives and its aspirations for EU membership provide both opportunities for further integration and the development of more comprehensive biodiversity policies.

Although Kosovo lags behind in certain areas, this presents a unique opportunity to leapfrog ahead by prioritizing alignment with the EU's biodiversity frameworks and seeking membership in international conventions like the Berne Convention. Strengthening biodiversity-related sectors, improving cross-sectoral partnerships, and incorporating biodiversity more deeply into national development strategies can accelerate Kosovo's progress. The country can turn its position into an advantage by leveraging international support, gaining access to additional funding, and fostering institutional development to better manage its biodiversity resources.

Key recommendations for Kosovo's continued biodiversity conservation efforts include improving its legal frameworks, enhancing monitoring systems, and ensuring stronger integration of biodiversity across national policies. By aligning more closely with global and European standards, Kosovo has the opportunity to not only preserve its rich natural heritage but also contribute significantly to regional and global biodiversity goals.

In conclusion, while Kosovo may be behind in some areas, this is the perfect moment for the country to accelerate its efforts in biodiversity conservation. With the right policies and international cooperation, Kosovo can make up for lost time and become a leader in biodiversity protection in the region.

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BACKGROUND AND THE NEED FOR A NEW APPROACH TO BIODIVERSITY MAPPING

6

KOSOVO'S RED BOOK IDENTIFIES THREATENED SPECIES BUT LACKS HABITAT MAPPING AND BROADER ECOSYSTEM ANALYSIS. A NEW APPROACH INTEGRATES SPATIAL DATA, CLIMATE RISKS, AND LOCAL KNOWLEDGE TO ADDRESS UNDERLYING PRESSURES. THIS SHIFT ENABLES PROACTIVE AND EFFECTIVE BIODIVERSITY CONSERVATION.

6. Background and the Need for a New Approach to Biodiversity Mapping

Among the key national documents related to biodiversity in Kosovo is the Red Book (Libri i Kuq), which serves as an official register of threatened species. Developed in alignment with the methodology of the International Union for Conservation of Nature (IUCN), the Red Book provides a scientific framework for assessing the conservation status of species based on risk criteria. It is part of Kosovo's broader effort to align with international environmental standards and to identify conservation priorities at the national level.

The *Red Book of Kosovo* (*Libri i Kuq*) plays a crucial role in documenting species that are under threat within the country, following a model derived from the global IUCN Red List. It categorizes species according to their level of risk—such as endangered, critically endangered, or vulnerable—and serves as a national inventory of flora and fauna facing extinction. As such, it functions as a foundational tool for conservation efforts and environmental policy, helping to set national priorities for species protection.

However, while *Libri i Kuq* is a key reference for identifying species already recognized as threatened, it remains limited in its scope and application when it comes to understanding broader biodiversity dynamics. First, it is important to emphasize that *Libri i Kuq* is not a biodiversity inventory. It does not provide a comprehensive picture of all species, nor does it account for the richness and complexity of ecosystems, genetic diversity, or habitat functionality. Moreover, it is not spatialized—it does not map where these species live, how their habitats are changing, or where ecological pressures are most concentrated.

The Red Book is also reactive by nature: it registers species that are already at risk of extinction but does not systematically analyze the causes of endangerment, such as habitat fragmentation, pollution, or climate-induced shifts. It largely overlooks the ecological interactions between species, the processes of habitat degradation, and the migration or adaptation strategies of species responding to new environmental conditions. In this sense, *Libri i Kuq* offers a snapshot of biodiversity loss, but not a broader, proactive understanding of biodiversity or its spatial and ecological dynamics.

This project aims to build a more systemic and spatial understanding of biodiversity vulnerability in Kosovo. It does so by integrating a multi-scalar methodology that includes spatial analysis of land use and habitat change, climate vulnerability assessments, species migration patterns, and the identification of ecologically significant zones that are not yet under formal protection. It also incorporates local ecological knowledge and field-based observations, helping to identify subtle or early-stage ecological shifts that may not yet be reflected in formal databases.
By expanding the focus beyond what is already endangered, this project contributes to a more proactive approach—one that seeks to understand and respond to underlying ecological pressures before they result in irreversible biodiversity loss. In doing so, it bridges the gap between species-based risk documentation and landscape-based vulnerability analysis, supporting more informed conservation strategies and long-term ecological resilience.

METHODOLOGICAL APPROACH: FROM AQUATIC INSECTS TO SENSITIVE ZONES

7

THIS PROJECT USES AQUATIC INSECTS—HIGHLY SENSITIVE SPECIES THAT BRIDGE AQUATIC AND TERRESTRIAL ECOSYSTEMS—AS INDICATORS TO MAP BIODIVERSITY VULNERABILITY. BY ANALYZING THEIR HABITAT NEEDS ACROSS RIVERBEDS, RIPARIAN ZONES, AND FOREST BUFFERS, THE STUDY IDENTIFIES EARLY WARNING SIGNALS OF ECOLOGICAL STRESS. THIS HABITAT-CENTERED, SPATIAL APPROACH ENABLES PROACTIVE CONSERVATION BY HIGHLIGHTING SENSITIVE ZONES BEFORE IRREVERSIBLE BIODIVERSITY LOSS OCCURS.

7. Methodological Approach: From Aquatic Insects to Sensitive Zones

To move from species-at-risk lists to a more nuanced, spatial, and anticipatory understanding of biodiversity, this project proposes a shift in both perspective and methodology. Rather than taking all biodiversity as an abstract totality, we begin from the specific ecological role and habitat of a particular group of organisms: aquatic insects—more precisely, insects that are born or develop in rivers and wetlands but later emerge and live part of their lifecycle on land. These organisms are known in ecology as *specialist species*, meaning they have narrow habitat requirements and specific ecological functions, making them highly sensitive to environmental changes.

Aquatic insects—such as certain mayflies, caddisflies, and stoneflies—are key indicators of ecological health. Their lives span both aquatic and terrestrial systems, which means their survival depends on the integrity of both. These species require clean, oxygenated water for reproduction, stable microclimates for emergence, and undisturbed riparian habitats for shelter and feeding. Because of this ecological specificity, they act as a lens through which we can observe broader ecosystem dynamics: degradation in water quality, temperature shifts due to climate change, or even small changes in vegetation cover can result in large population changes or local extinctions.

7.1 A Habitat-Centered Definition of Biodiversity

For the purpose of this study, biodiversity is approached not as a static list of species, but as an interplay of ecological relationships and spatial conditions. It is defined through the habitat needs and vulnerabilities of these riverine insects. By starting from the specific requirements of these species and tracing how their habitat is shifting, fragmenting, or adapting due to climatic and anthropogenic pressures, we aim to construct a more actionable and grounded understanding of biodiversity in transition.

This methodological entry point allows to:

- Anchor abstract biodiversity discussions in **concrete species-habitat relationships**.
- **Bridge scales**, moving from micro-habitats (like riparian plant assemblages or soil moisture conditions) to landscape-level transitions (such as river course alterations, land use change, or deforestation).
- **Visualize vulnerability**, by mapping where these specific ecological conditions are disappearing, shifting, or under threat.
- **Identify early-warning signals**, since aquatic insect populations often reflect subtle environmental stress before it becomes visible in larger fauna or ecosystem collapse.

7.1.1 Why start from Aquatic insects?

Aquatic insects—such as certain mayflies, caddisflies, and stoneflies—are key indicators of ecological health. Their lives span both aquatic and terrestrial systems, which means their survival depends on the integrity of both. These species require clean, oxygenated water for reproduction, stable microclimates for emergence, and undisturbed riparian habitats for shelter and feeding. Because of this ecological specificity, they act as a lens through which we can observe broader ecosystem dynamics: degradation in water quality, temperature shifts due to climate change, or even small changes in vegetation cover can result in large population

changes or local extinctions.
Aquatic insects are vital because they serve as:

- **Indicators** (of ecosystem health),
- **Connectors** (between land and water),
- **Supporters** (of food webs),
- **Specialists** (highlighting fragile conditions),
- and **Catalysts** (for nutrient cycles and biodiversity resilience).

Indicators of ecosystem health
Aquatic insects are among the most widely used bioindicators in freshwater ecosystems. Their sensitivity to changes in water quality, oxygen levels, pollution, and habitat disturbance allows for early detection of ecological stress. Monitoring their population trends offers insight into both short- and long-term impacts on river systems, providing a scientifically grounded method for assessing ecosystem integrity. Their presence or absence reflects the cumulative effects of environmental pressures that may not yet be visible through other forms of observation.

Connectors between aquatic and terrestrial environments
Many aquatic insect species undergo a lifecycle that spans both aquatic and terrestrial domains. Larval stages typically develop in rivers, streams, or wetlands, while adult stages emerge and function in terrestrial environments. This dual existence enables the transfer of energy and nutrients between ecosystems and plays a key role in maintaining ecological continuity across spatial boundaries. Their population dynamics are thus shaped by the conditions of both the aquatic habitats they originate from and the terrestrial environments into which they emerge.

Supporters of food webs
Aquatic insects occupy foundational positions in both aquatic and terrestrial food chains. As primary consumers, they contribute to the breakdown of organic material and regulate microbial populations in freshwater systems. In their adult forms, they become an essential food source for a wide range of species, including fish, amphibians, birds, and bats. Their abundance and diversity are closely tied to the health and stability of trophic interactions across multiple ecosystems.

Specialists with narrow habitat requirements
A significant number of aquatic insect species are ecological specialists, meaning they depend on very specific environmental conditions to survive and reproduce. These may include clean, fast-flowing waters, particular substrate compositions, or shaded and stable riverbanks. As a result, they are among the first organisms to respond to habitat degradation, fragmentation, or climatic shifts. Their specialist nature makes them highly valuable for detecting emerging vulnerabilities within ecosystems that may not yet be formally recognized or protected.

Catalysts for ecosystem processes and biodiversity resilience
Beyond their role in trophic dynamics, aquatic insects contribute directly to essential ecosystem processes. Larval stages engage in bioturbation—restructuring sediments and enhancing oxygen flow—while feeding behaviors contribute to the decomposition of organic material and nutrient cycling. These functions support the long-term resilience of aquatic systems, enabling them to better withstand and recover from environmental disturbances. Their presence

contributes to ecosystem multifunctionality, particularly in dynamic or transitional landscapes.

7.1.2 What the Loss of Aquatic Insects Signals – And Why It Matters

The disappearance of aquatic insects is not merely a biological concern—it signals a wider ecological and systemic crisis. Their loss disrupts food webs, weakens ecosystem functionality, and undermines the capacity of environments to sense and respond to change. The implications span from the breakdown of localized ecological processes to the broader failure of environmental governance.

1. Ecological breakdown at the base of food webs

- Fish populations decline due to lack of food (especially species that feed on larvae).
- Amphibians, birds, and bats lose critical protein sources during reproductive seasons.
- Reduced prey availability forces predators to relocate, potentially destabilizing surrounding ecosystems.

Aquatic insects form the foundation of many freshwater and riparian food chains. Larvae serve as a primary food source for fish, while adult insects support amphibians, birds, and bats—particularly during key seasonal windows such as breeding or migration. When insect populations decline, these feeding relationships begin to collapse. Fish experience reduced growth and reproductive success, while terrestrial predators lose essential protein-rich resources. This ripple effect destabilizes trophic relationships, weakening the broader ecosystem and its capacity to maintain balance across species.

2. Collapse of nutrient cycling and ecological functions

- Aquatic insects decompose organic matter and regulate microbial communities.
- They contribute to sediment mixing (bioturbation), maintaining oxygen levels and water quality.
- Their lifecycle transports energy and nutrients between aquatic and terrestrial systems.

Many aquatic insects play critical roles in maintaining freshwater ecosystem functions. As detritivores and herbivores, they help break down organic material, regulate microbial populations, and keep nutrient cycles in motion. Larvae that burrow and stir sediments (a process called bioturbation) improve oxygen penetration and prevent stagnation. Their life cycle also links aquatic and terrestrial systems: nutrients consumed in the river are released on land as the insects emerge, mate, and die. The loss of these organisms interrupts these cycles, leading to organic accumulation, slowed nutrient turnover, and potentially harmful imbalances like algal blooms or dead zones.

3. Disruption of ecological indicators and early warning systems

- Aquatic insects are bioindicators—sensitive to water quality, pollution, and temperature changes.
- Their loss removes a key early warning signal of ecosystem stress.
- Without them, management becomes reactive rather than proactive.

Because of their sensitivity to environmental variables—like pollutants, dissolved oxygen, pH, and flow—many aquatic insects are used as biological indicators of freshwater ecosystem health. Their disappearance removes a critical feedback system from the landscape. Without this "living data," environmental stressors go undetected until they reach critical levels. This delays intervention, leading to reactive (often costly and ineffective) responses. The absence of insects means a loss of ecological sensing—the capacity of ecosystems to indicate stress through the lived responses of their inhabitants.

4. Loss of specialist species and homogenization of ecosystems

- Specialist insects disappear due to habitat alteration and pollution.
- Generalist or disturbance-tolerant species (e.g. midges, mosquitoes) take over.
- Unique ecological identities of rivers are erased—ecosystems become biologically similar.

Many aquatic insects are ecological specialists: they depend on specific conditions such as clean, fast-flowing water, shaded banks, or particular substrates for their development. These are the first species to disappear when rivers are modified or degraded. In their absence, ecosystems are increasingly dominated by generalist species that tolerate or even benefit from disturbance, including some with negative implications for human health (e.g., invasive mosquitoes). Over time, this shift results in the **homogenization** of biodiversity—different rivers begin to resemble each other ecologically, regardless of their natural or cultural distinctiveness. This loss of ecological identity undermines both resilience and regional uniqueness.

5. Indicator of broader socio-environmental failure

- Declines often reflect failures in water governance and pollution control.
- Linked to unsustainable agriculture, pesticide runoff, river engineering, and climate stress.
- Their disappearance reveals the dysfunction of environmental management systems.

The decline of aquatic insect populations rarely occurs in isolation—it often reflects deeper failures in how land and water are managed. Poor enforcement of pollution controls, unchecked agricultural runoff, heavy pesticide use, and widespread river modification (e.g., dams, channelization) all contribute. Climate change amplifies these impacts through altered flow regimes, increased temperatures, and droughts. The absence of these species therefore serves as a systemic warning: environmental governance structures are not functioning effectively, and ecological thresholds are being crossed—often unnoticed or unacknowledged in policy frameworks.

6. Irreversible losses in evolutionary and genetic diversity

- Many aquatic insects are endemic and exist only in specific microhabitats or watersheds.
- Their extinction erases millions of years of evolutionary adaptation.
- We lose unknown potentials for science, medicine, and ecological resilience.

Some aquatic insects have extremely narrow geographic ranges, adapted over millennia to very specific hydrological and microclimatic conditions. Their extinction constitutes an irreversible loss of evolutionary history—these species cannot be replaced or reintroduced once gone. This loss also narrows the genetic pool that ecosystems need to adapt to future environmental changes. Furthermore, many aquatic insects remain poorly studied; their disappearance forecloses unknown ecological functions and scientific opportunities, including biomimicry, natural product discovery, or ecosystem-based design strategies. Their loss diminishes not only nature's resilience—but also our capacity to learn from it.

In short, the loss of aquatic insect biodiversity is not just about species numbers — it is about the loss of ecological function, environmental sensing, and relational balance between species and habitats. It reflects our inability to sustain interconnected systems. Protecting these species is thus not only about conservation, but about maintaining the livability and resilience of our landscapes.

7.1.3 Defining Biodiversity Through Habitat-Specific Vulnerability

To move beyond generalized notions of biodiversity loss, this study proposes a habitat-centered approach rooted in the ecological needs of aquatic insects. Rather than treating biodiversity as an abstract or purely species-based concept, we focus on the specific ecological requirements of organisms whose survival depends on the integrity of multiple, interconnected environments. Aquatic insects—whose life cycles span both aquatic and terrestrial ecosystems—offer a particularly effective and sensitive entry point for this type of analysis.
These insects are ecologically sensitive and spatially embedded. Their lifecycle depends on the functioning of distinct yet interconnected habitat types, from riverbeds and sediment layers to riparian zones and surrounding forested areas. By grounding biodiversity assessment in their life cycle and translating each developmental stage into a corresponding spatial habitat, we are able to better understand how landscape-level pressures such as pollution, land use change, and climate variability impact ecological functioning.

To do so, we identify three critical phases in the life cycle of selected aquatic insect species:

- Aquatic breeding and larval development phase
- Transitional emergence and riparian edge phase
- Terrestrial dispersal and reproduction phase

Each of these phases corresponds to a specific habitat that can be spatially mapped and assessed for vulnerability. This translation from life cycle to habitat forms the core of our spatial

and ecological mapping methodology. By analyzing the conditions and pressures facing each of these habitat types, we gain a more precise and actionable understanding of how biodiversity is being reshaped.

1. Riverbeds and secondary tributaries (Aquatic breeding and larval development phase)
This habitat corresponds to the aquatic breeding and larval development phase. It includes the main river channels, smaller tributaries, and seasonal watercourses where aquatic insects lay eggs and complete their early developmental stages. These zones are highly sensitive to changes in water temperature, pollution, hydrological regime, oxygen levels, and substrate composition. Disruption in these conditions can lead to significant reductions in larval survival.

2. Riparian edge zones (Transitional emergence and riparian edge phase)
These areas reflect the transitional emergence phase, where insects move from water to land. Comprising riverbanks, gravel bars, moist soil margins, and low riparian vegetation, these zones support metamorphosis and successful emergence into the terrestrial phase. Their integrity is often compromised by erosion, grazing, vegetation clearance, and changes in moisture and temperature regimes.

3. Forested buffer zones (Terrestrial dispersal and reproduction phase)
This final habitat corresponds to the terrestrial dispersal and reproduction phase. Adult insects rely on surrounding forested and shrubby areas for feeding, mating, and dispersal. These zones also serve as ecological corridors, supporting gene flow and population connectivity. They are threatened by land fragmentation, deforestation, rising temperatures, and loss of habitat complexity—all of which limit species mobility and resilience.
By starting from the ecological specificity of these life stages and translating them into spatial units of analysis, the study produces a framework for mapping biodiversity vulnerability in a way that is both biologically meaningful and spatially relevant. This methodology allows us to anticipate where vulnerabilities are emerging—often before they are captured in conventional conservation inventories such as red lists—and to develop more proactive, habitat-based strategies for biodiversity resilience.

2.2 Mapping Methodology: Multi-Scalar, Spatial, and Situated

Building on the fieldwork insights and policy review, the mapping of biodiversity vulnerability in the Sharr region was carried out by spatially identifying and analyzing key habitats that support aquatic biodiversity. These include:

1. riverbeds and secondary tributaries,
2. riparian edge zones, and
3. forested buffer zones.

The aim was to develop a methodology for detecting ecologically sensitive areas and examining how these habitats intersect with existing land use patterns—both within and beyond protected areas. By identifying zones where all three habitat types coexist, the analysis highlights areas

of high ecological value and vulnerability. This spatial overlap provides insight into current and emerging pressures on biodiversity, while also identifying where future opportunities for integrated landscape management may emerge. Ultimately, the goal is to use these findings to assess how such vulnerable areas are influenced by or exposed to changing climate patterns

This multi-layered and cross-disciplinary approach allows us to produce vulnerability maps that are not only scientifically rigorous but also contextually grounded. These maps will highlight zones where ecologically significant transitions are taking place, where protective measures are most urgent, and where future conservation strategies can be spatially targeted before irreversible loss occurs.

Conclusions

Although the protection of areas like the Sharr Mountains and Bjeshkët e Nemuna National Park, along with initiatives such as the Red Book of endangered species, indicate that there are several efforts to safeguard biodiversity in Kosovo, these remain partial and insufficient. As highlighted in previous chapters, the integration of biodiversity concerns into broader sectors—particularly agriculture, energy, forestry, and urban planning—remains limited. Institutional capacity for monitoring and enforcement is also still developing.
This becomes especially evident when considering vulnerable habitats such as riverine and wetland ecosystems, which are essential for aquatic plants and invertebrates. These habitats—often located at the interface of multiple land uses—hold unique potential for ecological restoration and integrated planning. Mapping these transitional zones opens a critical opportunity: to identify where biodiversity protection aligns with broader landscape management, rural development, and climate resilience goals. The following chapter explores these spatial relationships, highlighting zones of ecological vulnerability and overlap with competing or complementary land uses.

About EC

EC Ma Ndryshe is a community-based organization, established in 2006, committed to sustainable development through an inclusive approach.

EC's activism envisions a Kosovo where democratic governance is participatory, transparent, and accountable, ensuring that institutions, communities, and stakeholders work together towards sustainable development.

This vision promotes inclusive decision-making, stronger policies, and greater public participation, ensuring that sustainability is an integral part of governance at both local and national levels.

Through better institutional coordination, evidence-based policymaking, and citizen engagement, EC's work aims to bridge the gap between communities and institutions, ensuring that good governance leads to tangible and lasting change.

Vision statement

"Empowering a resilient and inclusive Kosovo, where communities actively shape sustainable, digitalized, and conscientious institutions."

Mission statement

"EC Ma Ndryshe supports democratic governance and sustainable development in Kosovo by fostering sustainable socioeconomic, cultural, and green growth through digital education, environmental stewardship, community mobilization, advocacy for participatory public decision-making, and the cultivation of strategic partnerships."


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