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Centre for Economic Transition Expertise
Research and Policy at **LSE**

EU banks and nature-related risk management:

from awareness to action

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List of abbreviations

CRR/CRD - Capital Requirement Regulation and Capital Requirement Directive

CSDDD - Corporate Sustainability Due Diligence Directive

CSRD - Corporate Sustainability Reporting Directive

ECB – European Central Bank

EBA – European Banking Authority

ESG – Environmental, Social and Governance

ESRS - European Sustainability Reporting Standards

EUDR – EU Deforestation Regulation

GRI – Global Reporting Initiative

NGFS – Network for Greening the Financial System

RAFs – Risk Assessment Frameworks

RSPO – Roundtable for Sustainable Palm Oil

SREP – Supervisory Review and Evaluation Process

TNFD – Taskforce on Nature-related Financial Disclosures

Summary

Nature degradation is increasingly recognised as a source of prudential and macro-financial risk. This has prompted regulators and banks in the European Union to move beyond climate-only approaches to assess broader environmental exposures. An analysis of 15 EU banks' public disclosure documents reveals a developing approach to nature-risk mitigation but a gap between ambition and implementation. Banks, financial supervisors and regulators should build on emerging good practices even in the face of regulatory rollbacks. They should treat nature-related risks as material prudential concerns, strengthen monitoring and assessment frameworks, and address environmental risks in their entirety rather than through a climate lens alone.

Nature-related risks and challenges for banks and prudential supervisors

Economic activity depends on ecosystem services including clean water, fertile soils, pollination and climate regulation. Nature degradation, therefore, is a source of prudential and macro financial risk. As recognition of this risk grows among financial policymakers, supervisors and institutions, banks have been encouraged to move beyond climate-only approaches to begin assessing broader environmental risks. They have been supported to do so by the introduction of new EU regulatory requirements, a growing body of research on nature–financial stability linkages, the adoption of the Kunming-Montreal Global Biodiversity Framework and voluntary frameworks such as the Taskforce on Nature-related Financial Disclosures (TNFD). However, recent rollbacks of disclosure requirements under the European Commission's Omnibus on sustainability reporting could stall the progress that has been made.

As nature-related risks are being integrated into prudential supervision, there is a growing need to clarify how climate, environmental and nature-related risks are conceptualised, and how EU and international authorities manage them in practice. Banks can consider nature-related risks as a subset of environmental risks – distinct from, but interconnected with, climate risks. They include physical risks from ecosystem degradation (such as water scarcity, pollination decline and soil erosion) and transition risks from policies and market changes aimed at reversing nature degradation (such as deforestation regulations and shifting consumer preferences).

Ecosystem degradation can transmit to banks in several ways, from disrupting business operations to stranding assets in nature-sensitive locations. These risks materialise along different sectoral and geographical pathways, including high exposure to particular sectors or regions that experience nature degradation or more stringent environmental policies and enforcement. Supervisors should determine the extent to which these risks could impact institutions' financial performance or stability (i.e. view them through the lens of financial materiality or double materiality, depending on the context), navigate data constraints and integrate evolving scientific insights into prudential supervision.

Findings: an evolving approach but uneven progress

We assess 194 public disclosure documents from 15 euro-area banks[1] made available during the period 2020–24. These documents include annual reports, sustainability reports and disclosures under Pillar 3 of the Basel Framework. We systematically benchmark how banks manage nature-related risks

[1] This report refers to 'credit institutions' and 'banks' interchangeably.

through the lens of the risk management process – focusing on the identification, assessment, mitigation and monitoring of risks. Our core findings include:

- **Overall, EU banks' approaches to nature-related risks have evolved gradually since 2020; conceptual framing is now clearer and coverage of nature-related issues broader.** This evolution has been prompted by advances in regulatory guidance, research initiatives and voluntary frameworks.
- **However, progress remains uneven and assessments remain largely qualitative.** Regulatory and supervisory expectations have driven greater recognition of physical and transition nature-related risks. Yet these risks have only been partially integrated into prudential risk frameworks, with limited quantification, weak treatment of time horizons and inconsistent alignment between sustainability disclosures and Pillar 3 assessments.
- **Governance structures and policies on nature-related risks are often high-level, while these risks are not yet embedded into banks' decision-making.** However, the number of initiatives has expanded, particularly through sectoral, region-specific and thematic standards, exclusions, enhanced due diligence and emerging risk appetite approaches.
- **Risk mitigation practices are developing.** This is occurring notably through client engagement, escalation mechanisms and policy tightening in high-risk sectors and biomes, as well as selective investment in nature-positive activities.
- **Monitoring and enforcement remain patchy, and the scale and effectiveness of mitigation actions are difficult to assess.** A significant gap remains between ambition and operational implementation.
- **Nevertheless, emerging practices at frontrunner banks can help peer banks, regulators and supervisors generate ideas about which further steps to take.**

Recommendations for banks and supervisors

EU banks should:

- **Translate nature risk concepts into prudential frameworks** by mapping both physical and transition nature-related risks onto all prudential risk categories, in line with the Network for Greening the Financial System (NGFS) framework.
- **Improve the assessment of physical risks** by distinguishing between chronic and acute risks, the time horizons over which they materialise and the interactions between distinct ecosystem services.
- **Expand transition risk assessment** to cover environmental protection policies and supply-chain due diligence requirements.
- **Integrate the climate–nature nexus into analytical frameworks**, particularly in nature-dependent sectors such as agriculture and real estate.
- **Leverage existing data and enable collaboration across banks** by breaking down siloes in banks' internal functions, as well as by collaborating with other financial institutions, public bodies and academia.
- **Embed nature-related risks into strategy and governance practices** by integrating them into risk appetite frameworks (RAFs), climate transition planning, internal governance and managerial action.

- **Move from exposure mapping of nature-related risks to financial risk assessments** by complementing exposure analysis and heat maps with location and supply-chain data, and by employing forward-looking nature scenarios to anticipate how these risks could evolve.

- **Develop concrete nature-related policies and processes**, using the outcome of materiality assessments to move from high-level awareness to concrete constraints on risk taking.

- **Ensure internal coherence across corporate sustainability and risk management functions** by aligning definitions, terminology and materiality assessments for nature-related risks across sustainability reporting, risk management and Pillar 3 disclosures.

EU financial regulators and supervisors should:

- **Embed nature-related risks into prudential supervision**, including by using supervisory dialogue and regular supervisory assessments to monitor and enforce compliance with the recommendations for credit institutions outlined above.

- **Improve conceptual clarity on the meaning and boundaries of 'nature-related risks'**, making it easier to draw comparisons between bank reports on corporate and prudential matters, in different years and across multiple financial entities.

- **Recognise the close interaction between nature-related impacts and risks:** in contrast to climate pressures, environmental pressures generated by economic activities often directly affect the same production systems and locations on which firms depend, giving rise to visible near-term financial risks.

- **Set progressive expectations**, initially by defining baseline criteria for nature-risk frameworks, including coverage of physical and transition risks, climate–nature interactions and the relevant time horizons.

- **Provide guidance on nature-related multi-metrics and methodologies** by engaging with the scientific community to help banks understand which approaches to prioritise to capture the different characteristics of nature-related risks.

- **Support inter-institutional pooling of data** by facilitating data-sharing with other supervisory authorities in the EU and in third countries, as well as with environmental agencies and research institutions.

- **Build supervisory capability** by investing in deeper nature-risk expertise, joint training on the climate–nature nexus and peer learning across supervisory authorities.

1. Introduction

Credit institutions in the European Union are beginning to assess broader environmental risks beyond those posed by climate change on the back of regulatory and voluntary developments in the EU and globally. This report examines how 15 EU banks incorporated nature-related risks into their practices from 2020 to 2024, analysing 194 public disclosures. It identifies lessons and recommendations for sustaining progress despite potential regulatory rollbacks. In this Introduction, we first set out the primary developments that have catalysed the shift in EU banks' approach to nature risk.

1.1. Background and motivation for the report

Human activities have led to unprecedented nature degradation (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services [IPBES], 2019). Nature's contributions to people (often described as 'ecosystem services') include fertile soil, water availability, pollination and climate regulation. These ecosystem services underpin almost all business and economic activity (IPBES, 2026) by providing essential inputs into production, enabling production processes and regulating environmental conditions. At the same time, the financial system plays an active role in shaping nature outcomes by financing economic activities that exert pressure on ecosystems, including deforestation for agriculture, overfishing, resource extraction and industrial activities that pollute water and soil. These impacts can lead to severe negative outcomes: even a partial collapse of ecosystem services is projected to translate into significant GDP declines globally (Johnson et al., 2021).

This creates a feedback loop in which risks to financial stability are at least partially endogenous (Dasgupta, 2021; NGFS, 2024a; see Figure 2.2). Negative impacts on nature can lead to financial risks such as those linked to compliance and reputational risks (IPBES, 2026). More fundamentally, they can damage future production: the erosion of ecosystem services can cause disruption, reduce asset values and intensify transition pressures, translating into higher credit, market and operational risks – and, in some cases, systemic vulnerabilities. These nature-related financial risks emerge from the interaction between economic dependence on ecosystems and the effects of financial flows (NGFS, 2024a).

There is growing recognition among policymakers, supervisors and financial institutions that nature degradation is a potential source of prudential and macro-financial risk. This shift in perception has been led by international bodies such as the Network for Greening the Financial System (NGFS), World Bank, Organisation for Economic Co-operation and Development (OECD) and central banks themselves. The European Central Bank (ECB), De Nederlandsche Bank, Banque de France and Magyar Nemzeti Bank – as well as the central banks of Mexico, Malaysia, the Philippines and Georgia – have conducted assessments of their exposure to nature-related risks (Network for Greening the Financial System–International Network for Sustainable Financial Policy Insights, Research and Exchange [NGFS–INSPIRE], 2022; Bayangos et al., 2023; Nikuradze and Tvalodze, 2023; Boffo et al., 2024). In parallel, researchers in countries such as Brazil (Calice et al., 2021), the UK (Green Finance Institute, 2024) and Singapore (University of Cambridge Institute for Sustainability Leadership, 2025) have also examined financial sector exposures to nature degradation. This work has contributed to efforts to integrate nature-related risks into regulatory and supervisory frameworks.

In the EU, there have been two phases of integration of nature-related risks into regulatory and supervisory frameworks. The first phase began in 2019 with the introduction of the EU's prudential framework (CRR2/CRD5). This framework introduced the concept of 'environmental risks' and mandated the European Banking Authority (EBA) to evaluate how environmental, social and governance (ESG) risks should be assessed, managed and supervised. The CRR2 also mandated the EBA to develop standards for Pillar 3 disclosures by large banks. In practice, financial authorities and institutions focused predominantly on climate-related risks, guided by the Paris Agreement and the

"tragedy of the horizon" framing by Mark Carney when he was Governor of the Bank of England (Carney, 2015), while paying only limited attention to other forms of environmental degradation. However, the gradual adoption of the EU Sustainable Finance Framework – particularly the EU Taxonomy, the Sustainable Finance Disclosure Regulation, the EU Green Bond Standard, the Corporate Sustainability Reporting Directive (CSRD) and the Corporate Sustainability Due Diligence Directive (CSDDD) – provided clearer definitions of environmental factors and impacts, improving policymakers' understanding of their potential implications for the financial system. Together with international initiatives and soft-law developments, these changes facilitated a gradual shift away from a climate-only focus and towards broader environmental risk management. In parallel, EU banks began to incorporate nature-related considerations into their risk management frameworks.

A second phase followed the 2024 revision of the prudential framework (CRR3/CRD6) and the subsequent adoption of the EBA Guidelines on the management of ESG risks (EBA, 2025a). CRD6 confirmed banking supervisors' mandates to address environmental risks beyond climate change, including through scenario analysis (EBA, 2025b), and the forthcoming revised guidelines on supervisory review and evaluation processes will clarify how supervisors across the EU should adjust their Supervisory Review and Evaluation Process (SREP) remit accordingly (EBA, 2025c). The EBA Guidelines encourage banks to establish methodologies and procedures to quantify climate-related risks, and to qualitatively assess other environmental risks.[2] In line with this enhanced mandate, the ECB may further revise its supervisory guidance to reflect a broader focus on nature-related risks.

A key motivation for this report is, therefore, to document the extent to which banks took action in the first phase (2020–24) and to demonstrate how nature risks can be managed using currently available data. EU regulatory and supervisory authorities are developing more granular requirements for environmental risk management and disclosure by expanding beyond climate alone to include biodiversity, water, land and pollution. In this context, it is timely to examine how EU credit institutions are already addressing these issues in practice. Through retrospective analysis, the report captures existing practices and innovations that emerged before the 2024 reform. In doing so, it offers lessons for how banks can continue developing their approaches to nature-related risk management – notwithstanding the recent revisions to the EU's sustainability disclosure frameworks, which may reduce the volume and quality of publicly available nature-related information. By identifying good practices and persistent shortcomings, the report aims to help both supervisors and credit institutions maintain momentum on environmental risk management in an evolving regulatory landscape.

We rely on publicly available information, which may introduce biases towards positive impact and discrepancies between stated intentions and actual actions.

1.2. Developments in nature-related financial policy initiatives

Since 2020, a rapidly expanding body of analytical, policy and market-led initiatives has laid the foundations for integrating nature-related risks into macroeconomic, financial stability and supervisory frameworks. Early studies by central banks in Europe provided the first empirical evidence linking biodiversity loss to financial exposures, particularly studies by the central banks of the Netherlands and France (Van Toor et al., 2020; Svartzman et al., 2021). International institutions such as the World Bank and the ECB have complemented these studies, demonstrating how ecosystem degradation could transmit to GDP, sectoral performance and banks' balance sheets, including through global supply chains.

In parallel, the NGFS and the OECD translated this growing evidence base into conceptual and operational frameworks. They clarify how nature-related physical and transition risks could be assessed within existing prudential architectures. These efforts coincided with a major global policy milestone: the adoption in 2022 of the Kunming-Montreal Global Biodiversity Framework, which explicitly recognised the role of the financial sector in halting and reversing nature loss.

[2] See paragraph 20 of the EBA Guidelines, 2025a.

Table 1.1. Key initiatives shaping nature-related financial risk frameworks (2020–25)				
Initiative/ Publication	Year introduced/ published	Lead institution(s)	Primary focus	Key contribution
Indebted to Nature	2020	De Nederlandsche Bank	Analytical	Quantifies financial sector exposure to biodiversity loss in the Netherlands
A Silent Spring for the Financial System?	2021	Banque de France	Analytical	Links biodiversity loss to credit and market risk in France
Nature–economy linkages study	2021	World Bank	Analytical	Estimates global GDP losses of US$2.7 trillion from ecosystem collapse
ECB biodiversity and nature working papers	2023–25	European Central Bank	Analytical	Maps ecosystem dependencies, supply-chain spillovers and bank exposures
Central Banking and Supervision in the Biosphere	2022	NGFS–INSPIRE	Conceptual	Identifies macro-financial transmission channels of nature degradation
Kunming-Montreal Global Biodiversity Framework	2022	UN Convention on Biological Diversity (COP15)	Global policy	Sets global biodiversity targets; embeds finance-sector responsibilities (Targets 14, 15, 18, 19)
NGFS Conceptual Framework for Nature-related Risks	2024	NGFS	Supervisory	Defines nature-related risks; provides a conceptual framework for supervisory assessment of nature-related financial risks
OECD Supervisory Framework for Nature-related Financial Risks	2024	OECD	Supervisory	Provides guidance for supervisory assessment and oversight of nature-related financial risks
TNFD Recommendations	2023	TNFD	Voluntary framework	Creates a global framework for assessing and disclosing nature-related dependencies, impacts, risks and opportunities

Nature Target Setting and Sector Guidance	2023–25	UNEP Finance Initiative (Principles for Responsible Banking)	Voluntary/ capacity-building	Provides practical guidance for banks on targets, sectors and implementation
Global Reporting Initiative; CDP; Equator Principles; and Poseidon Principles	Ongoing	Various	Voluntary standards	Embed nature-related metrics into reporting and lending frameworks

Source: Authors

Building on these developments, a range of voluntary initiatives have emerged to support implementation by financial institutions. There is growing convergence in how nature-related dependencies, impacts and risks are identified, assessed and disclosed. This has been aided by frameworks such as the TNFD, alongside standards and principles developed by the Global Reporting Initiative (GRI), CDP, the United Nations Environment Programme Finance Initiative (UNEP FI) and industry-led initiatives. While these initiatives are still evolving, they have created an increasingly coherent ecosystem of tools and expectations for managing nature-related financial risks (see Table 1.1) and an increasingly consistent body of data, improving assessments of the materiality of nature-related risks across sectors and financial institutions.

1.3. The EU regulatory context

The EU's focus on environmental risks began with the 2018 Sustainable Finance Action Plan, which reframed sustainability as integral to financial stability and competitiveness. The Action Plan aimed to redirect capital towards sustainable activities, manage the financial risks of climate and environmental degradation, and improve transparency. In 2019, the Capital Requirements Regulation 2/Capital Requirements Directive 5 (CRR2/CRD5) reforms mandated the EBA to assess how to integrate ESG risks – including environmental risks – into the prudential framework, and to develop standards for Pillar 3 disclosures by large banks. The EBA issued Guidelines on loan origination and monitoring (2020) and internal governance (2021), recommending that financial institutions incorporate ESG factors and associated risks into their credit risk appetite, risk management policies, credit risk policies and procedures, and governance frameworks. In line with the focus of the European Green Deal, these reforms centred mainly on climate issues.

In 2020, the ECB's Guide on Climate-related and Environmental Risks set expectations for banks to integrate climate and environmental risks into their risk management practices. These risks included physical risks stemming from biodiversity loss and water stress. The EBA's 2021 *Report on management and supervision of ESG risks for credit institutions and investment firms* (EBA, 2021) provided an initial definition of environmental risks, and recommended integrating them into banks' risk management practices and supervisory assessments. In 2022, the EBA formalised the EU's definition of environmental risks in its Implementing Technical Standards on Pillar 3 disclosures under CRR2.

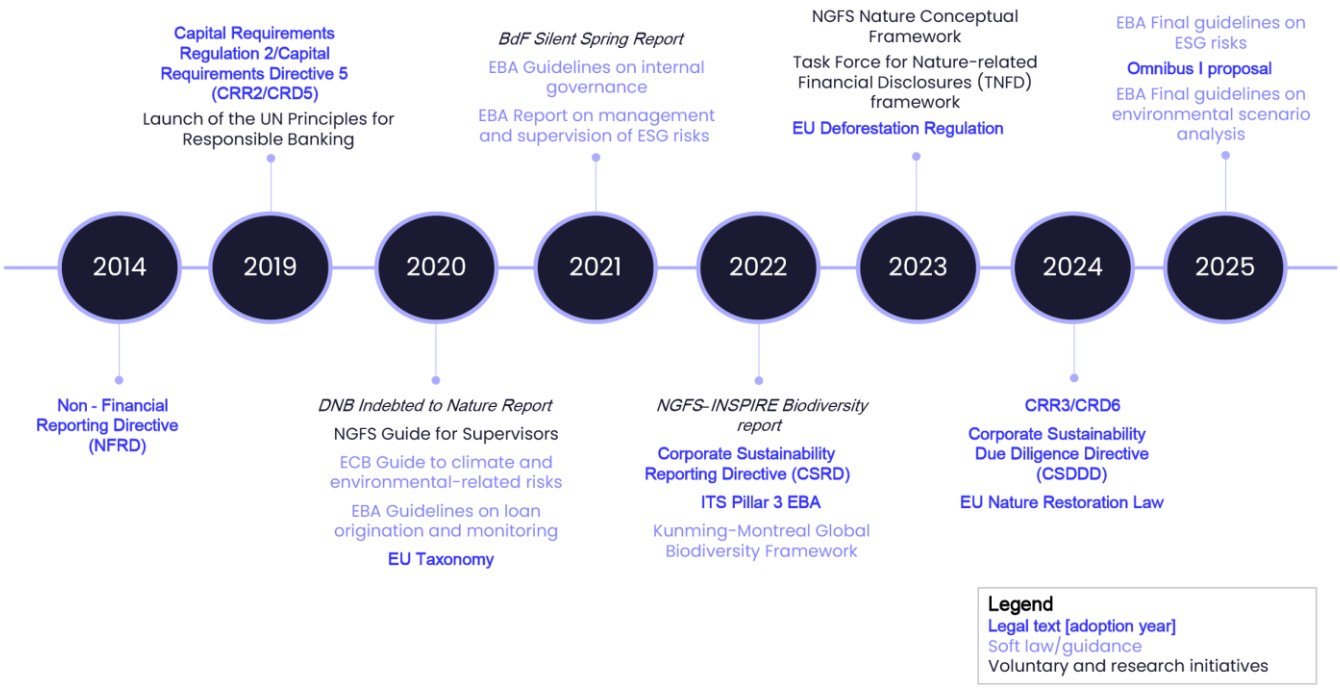
The 2024 CRR3/CRD6 package strengthened these foundations, introducing a standalone definition of environmental risks. This package also extended the time horizon of ESG-related supervision, as part of the annual Supervisory Review and Evaluation Process (SREP).[3] It introduced requirements related to transition planning, stress testing and internal governance expectations. In 2025, within the context of the implementation of the CRR3/CRD6 package, the EBA produced new Guidelines encouraging banks to assess an expanded set of environmental risks, including biodiversity loss, and to conduct environmental scenario analysis. In 2026, updated Pillar 3 rules will further extend disclosures to

[3] SREP is the annual prudential assessment framework used by banking supervisors to evaluate the risks individual banks face, assess the adequacy of their risk management systems and capital levels, and determine necessary supervisory measures.

environmental risks beyond climate for a larger number of banking institutions. A timeline of nature-related regulations and initiatives is shown in Figure 1.1.

Prudential reforms interact closely with the wider EU Sustainable Finance Framework, including the disclosures and definitions under the EU Taxonomy, the CSRD and the CSDDD, which provide crucial environmental data that supervisors and banks rely on to identify, assess, monitor and mitigate emerging prudential risks. The EU Taxonomy offers a lexicon of environmental activities, enabling prudential authorities to prioritise environmental risk factors with greater clarity, while corporate sustainability disclosures under the CSRD provide granular information on companies' environmental impacts, dependencies and risk exposures. The disclosure of non-climate environmental data points in the original CSRD text is conditional on a self-materiality assessment[4] and, sometimes, takes place on a voluntary basis (O'Connell, 2024; Iozzelli and del Carmen Sandoval Velasco, 2023).[5] These disclosures help banks understand the risk profiles of their clients and counterparties, improve their due diligence processes and refine their internal risk management practices. The CSDDD complements this ecosystem by requiring companies to establish due diligence processes for environmental and human-rights impacts, which can inform banks' assessments of client transition risks.

Figure 1.1. Timeline of nature-related regulations and initiatives



Source: Authors

The 2025 revision of the sustainable reporting framework, known as Omnibus I, will significantly weaken and narrow the scope of the CSRD and the CSDDD. Omnibus I will reduce both the number of companies required to report and the breadth of environmental information they disclose. A rollback of transition plan requirements and a reduction in reporting of environmental metrics will likely create data gaps at precisely the time prudential supervisors are raising their expectations of the management of environmental risks. Reduced data availability may hinder banks' ability to conduct robust materiality assessments, scenario analyses and long-term evaluations of environmental risks, especially those focused on issues beyond climate, such as biodiversity loss and resource depletion.

[4] If a company determines that an ESG topic other than climate is not material, it should provide a brief explanation of its conclusion (paragraph 32, Annex I CSRD).

[5] Paragraph 15, Requirement E4-1: "The undertaking **may** disclose its transition plan to improve and, ultimately, achieve alignment of its business model and strategy with the vision of the Kunming-Montreal Global Biodiversity Framework and its relevant goals and targets, the EU Biodiversity Strategy for 2030, and with respecting planetary boundaries related to biosphere integrity and land-system change" (emphasis added).

This may also constrain supervisors' capacity to benchmark institutions, detect systemic vulnerabilities and enforce consistent standards across the sector.

In addition to the Sustainable Finance Framework, the EU has adopted two major nature-related initiatives under the European Green Deal that will have important implications for financial institutions in the coming years. First, the EU Deforestation Regulation (EUDR) aims to ensure that products sold in or exported from the EU market do not contribute to deforestation or forest degradation. The EUDR was adopted in 2023 and is set to come into force for large companies in mid-2026, applying to operators and traders of key forest-risk commodities, particularly soya, coffee, cocoa, cattle, palm oil, rubber, wood and related products. These actors must comply with the relevant laws in the country of production and submit due diligence statements that include geolocation and traceability information. Second, following the adoption of the Kunming-Montreal Global Biodiversity Framework, the EU introduced in 2024 the Nature Restoration Law, which sets binding targets for member states to restore degraded terrestrial and marine ecosystems across the EU. Both these laws are expected to generate indirect transition risks for financial institutions, by accelerating structural change in nature-impacting sectors. For banks financing these sectors, this may result in higher credit and counterparty risks, and may have an impact on the value of assets and collateral.

The regulatory and supervisory momentum of 2020–24, alongside banks' voluntary initiatives, has broadened banks' knowledge base on how to manage nature-related risks. This includes: internal risk methodologies; companies' due diligence requirements; mandatory and voluntary disclosures; data tools; location-specific information on ecosystem and restoration priorities; and ongoing supervisory dialogue. The next phase will test whether credit institutions can implement and further develop these methodological foundations to bridge existing data gaps, ensuring that environmental risks are properly identified, monitored and mitigated.

1.4. Scope of the report

Understanding how banks conceptualise, assess and operationalise nature-related risks is essential to inform both supervisory practice and regulatory implementation. This report analyses how 15 major euro-area banks recognised, disclosed and integrated nature-related risks into their prudential frameworks during 2020–24. In this context, the report:

- Examines how EU credit institutions conceptualise and manage nature-related risks.
- Evaluates the indicators and metrics used to identify and monitor these risks.
- Benchmarks practices against emerging academic and policy frameworks.
- Informs both supervisory expectations and the development of decision-useful indicators.

The report is structured as follows: Section 2 provides a conceptual framework by defining nature-related risks, expounding their transmission channels and providing relevant supervisory perspectives. Section 3 presents our methodology for assessing how our sample of 15 EU credit institutions consider nature-related risks. Section 4 discusses our findings, which we develop into lessons and recommendations in Section 5.

2. Conceptual framework

Given that prudential supervisors increasingly recognise nature-related risks as material, there is a growing need for EU and international authorities to better define climate, environmental and nature risks. This section provides a conceptual framework for understanding the impacts of nature degradation in the EU prudential context. It outlines the channels through which ecosystem degradation can transmit to banks and the sectoral and geographical pathways through which these effects materialise. It also highlights key challenges for supervisors, who must assess materiality, address data gaps and integrate evolving scientific insights into prudential oversight.

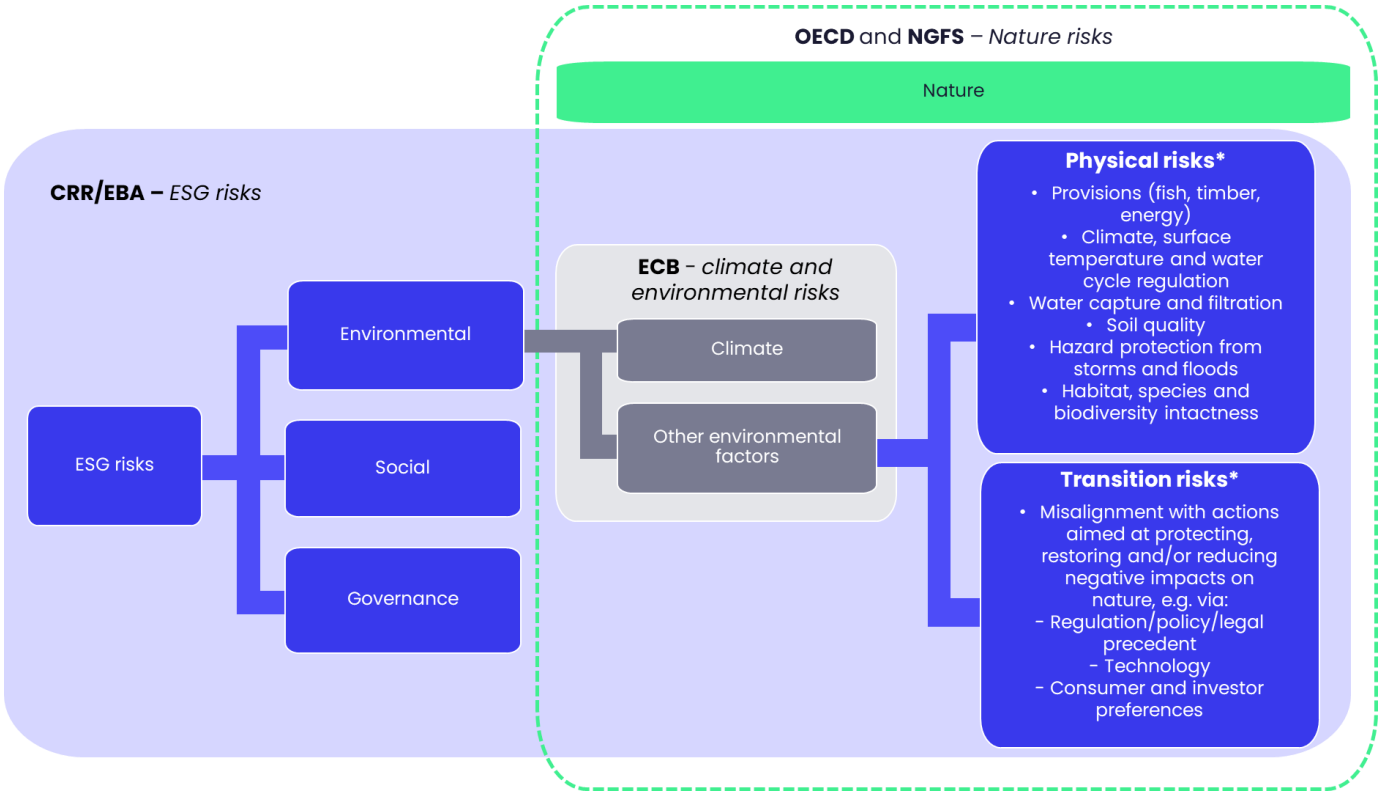
2.1. Conceptualisation of nature-related risks

Since 2020, EU and other international authorities have expanded the vocabulary they use to describe environmental, climate and nature-related financial risks. While interconnected, these terms are defined and conceptualised differently across the EU and other international institutions, frameworks and fora, including the OECD, the NGFS and the TNFD (see Figure 2.1).

In the EU, the prudential framework for banks (CRR2/CRD5), as amended in 2021, refers to ESG risks. The CRR2/CRD5 mandated the EBA to provide a definition of which elements to consider under the umbrella of ESG risks (Smoleńska and van 't Klooster, 2022). The EBA's understanding of the term 'environmental risks', later embedded into the CRR3/CRD6 review of 2024, included climate, biodiversity and other types of risks, in line with the EU Taxonomy framework. However, in practice, supervisory guidance and implementation rules focused on climate. The ECB, in the meantime, prioritised the climate and environmental risk components of ESG factors, reflecting growing evidence of the physical and transition risks faced by banks due to climate and environmental crises (ECB, 2020a). Meanwhile, the EBA's 2022 Pillar 3 Disclosure Implementing Technical Standards only provided for quantitative disclosures of climate change-related risks, covering other environmental factors in exclusively qualitative terms. Since 2022, the ECB has replaced the term 'environmental' with 'nature', following international developments (Elderson, 2022). In 2025, it amended its 2026–28 supervisory priorities to expressly refer to "climate and nature" risks (ECB, 2025a).

Relatedly, the OECD, NGFS and TNFD adopt broader conceptualisations that treat 'nature' as an overarching category. The OECD and NGFS treat 'nature' as an umbrella term that explicitly includes biodiversity and climate, framing financial risks through ecosystem services, dependencies and degradation across biotic and abiotic systems. The NGFS Conceptual Framework (NGFS, 2024a) defines nature-related risks as arising from the degradation of all ecosystem components that involve climate change, effectively merging climate, environmental and biodiversity risk drivers. The TNFD also takes a broad approach, using "nature" to encompass biodiversity loss, pollution, land-use change, resource depletion, water stress, species decline, disease outbreaks and climate change; it also encourages businesses to consider the interactions between nature degradation and climate change.

Figure 2.1. Conceptualisation of the ways EU institutions define nature and environmental risks



**Physical and transition risk examples are taken from the NGFS Conceptual Framework for Nature. Source: Authors' conceptualisation, based on ECB Guide on Climate-related and Environmental Risks; EBA guidelines on the management of ESG risks; EBA guidelines on environmental scenario analysis; OECD's A supervisory framework for assessing nature-related financial risks; NGFS Conceptual Framework for Nature-related Risks.*

In this report, we define nature-related risks as a subset of environmental risks that are distinct from, but closely interconnected with, climate-related risks. They refer to both:

- ***Physical* nature-related financial risks**: arising from the degradation of ecosystems on which economic activities depend
- ***Transition* nature-related financial risks:** arising from changes in policy, regulation, technology, market preferences and societal expectations aimed at halting or reversing nature loss.

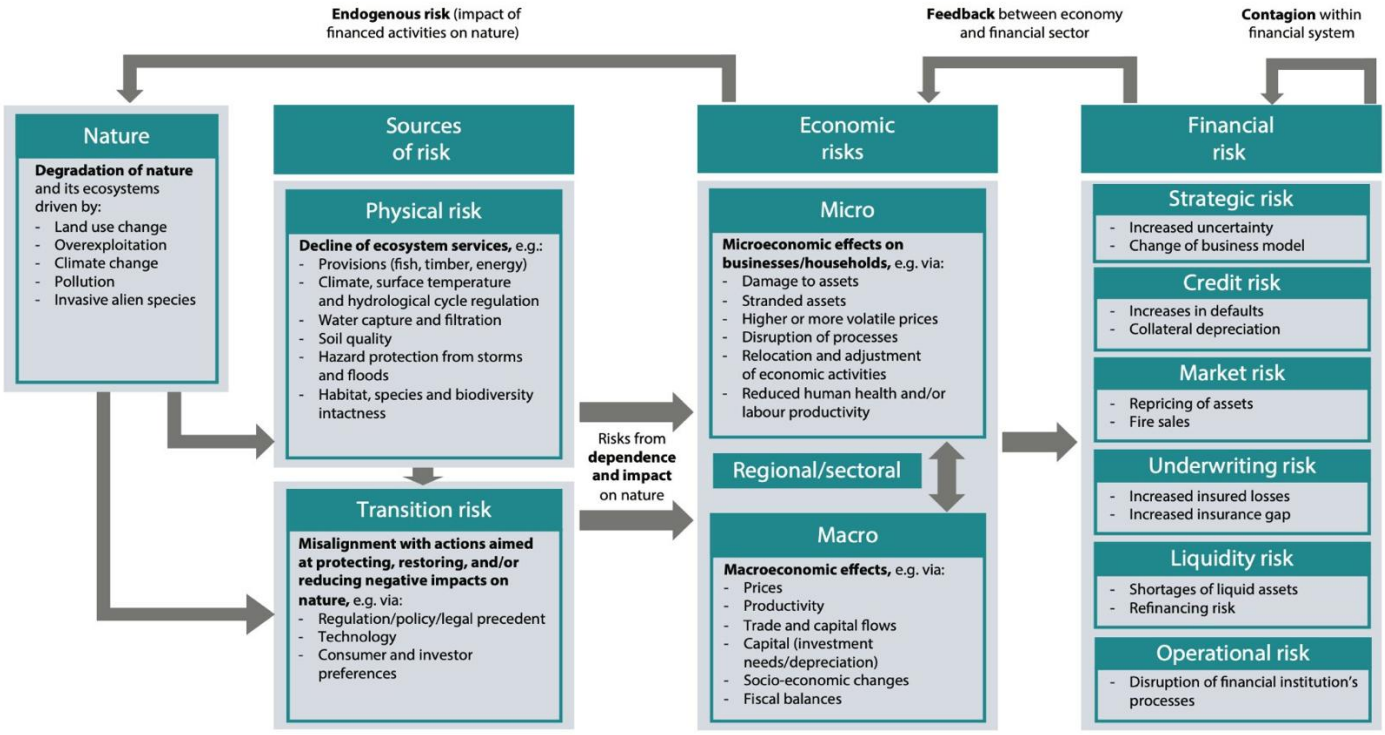
2.2. Transmission of nature-related risks into credit institutions

Transmission of physical and transition risks

Nature-related risks can be transmitted to credit institutions through physical and transition risks. Physical risks can be chronic: when ecosystem services degrade slowly over time, this erodes productivity and raises costs for borrowers. Declining groundwater levels, loss of soil fertility and pollinator collapse can cause such degradation. Physical risks can also be acute: when ecosystem services are suddenly disrupted, this can damage assets and interrupt operations, particularly where natural protection has been eroded. Events such as storms, floods and landslides can cause this type of disruption. In the euro area, salient drivers of physical risks include the availability of fresh water, mass stabilisation and erosion control, flood and storm protection, and bioremediation – the ecosystem services that EU firms are most dependent on, and that EU banks are most exposed to (Boldrini et al., 2023). The ECB shows that these dependencies are both direct and embedded into supply chains. Imported dependencies transmit shocks originating outside the EU into euro-area loan books (Ceglar et al., 2023). Climate–nature interactions and feedback loops compound these risks: climate change accelerates ecosystem degradation – which, in turn, amplifies climate hazards (Almeida et al., 2024).

EU credit institutions are faced with diverse yet fragmented sources of nature-related transition risk. Salient drivers of transition risk include expanding nature conservation and land use targets; water- and air-quality standards under EU law; regimes for deforestation-free supply chains; restrictions on harmful chemicals; and emerging planning systems for biodiversity strategies. Such measures can alter permitting, constrain land and water use, force process changes and capital expenditure, or make projects unviable. Market and sentiment shifts – via customer and investor preferences, procurement standards and reputational expectations – can accelerate repricing. Evidence from national studies shows that transition shocks may propagate across sectors that are not typically considered to be highly correlated with one another. For example, Dutch nitrogen-emissions rulings affected agriculture, construction and aviation through permitting cascades and compliance constraints (Van Toor et al., 2020).

Figure 2.2. Transmission channels in the NGFS framework



Source: NGFS Nature Conceptual Framework (2023)

Liability risk cuts across both physical and transition risk channels. The NGFS assessed emerging nature-related litigation with potential financial implications for financial institutions (NGFS, 2024b). For euro-area credit institutions, this exposure could affect financial institutions directly and indirectly (through state actors or corporate clients). Court rulings could accelerate policy tightening, raising transition costs and stranding assets in nature-sensitive locations.

Sectoral transmission pathways

Transmission from nature degradation is location- and sector-specific, as nature risks are local in origin but global in propagation through trade and finance (NGFS, 2024a). Nature-related risk reaches euro-area credit institutions most strongly through sectors with high ecosystem service dependence and significant regulatory exposure. The agri-food sector (agriculture, forestry, fisheries and processing) sits at the core of this: water stress, soil degradation, increases in pests and invasive species, and pollinator loss drive yield volatility, tighten working capital and weaken collateral via impacts on land values and insurability (Boldrini et al., 2023). These shocks propagate upstream and downstream into inputs, processing, packaging and retail through raw-material availability and cost pass-through, creating indirect exposures in ostensibly diversified manufacturing and wholesale portfolios (Boldrini et al., 2023; Van Toor et al., 2020). Property- and infrastructure-intensive sectors

transmit nature degradation through siting, permitting and protection-service loss. Real estate and construction can face value, marketability and insurability impacts from flooding, erosion and subsidence from groundwater depletion (Ceglar et al., 2025), while EU nature restoration targets are expected to influence spatial planning that may extend timelines and add mitigation costs in sensitive areas. Mining, quarrying and utilities heavily depend on water availability and land access. A loss of access to water or land, or a tightening of permitting conditions, can delay projects, curtail output and increase operating and compliance costs (Boldrini et al., 2023). As the tourism, pharmaceutical and transport industries depend on the quality and accessibility of nature assets, the degradation of those assets can increase operational costs and reduce destination appeal.

Financial implications of nature degradation

Nature-related economic stress causes a deterioration in financial conditions and gives rise to financial risks at both the micro and macro levels. At the micro level, the risks arising from nature degradation map onto the prudential risk categories established under the Basel Framework (see Table 4.1). Current research shows that nature degradation transmits to credit institutions primarily through credit risk: impaired ecosystem services raise borrower costs and output volatility, while collateral values weaken where land, buildings or productive assets lose protection against floods, erosion or water scarcity, and where insurance is withdrawn or repriced (NGFS, 2024a; Boldrini et al., 2023). Market risk arises from the repricing of securities backed by affected cash flows or collateral and wider spreads for issuers that are highly dependent on ecosystem services. Nature-related operational risks for banks include exposure to clients' business interruptions, regulatory penalties for disclosure failures, and litigation costs linked to nature-related harm, which can lead to financial losses and may force banks to set aside more money to cover potential losses (NGFS, 2024b). Liquidity and funding risk can be amplified when markets anticipate these pressures: assets become less marketable or receive larger haircuts as collateral, while funding premia rise for banks with concentrated exposures (NGFS, 2024a).

At the macro level, nature-related shocks do not remain confined to individual entities but propagate through financial linkages, behavioural responses and balance-sheet interactions (ibid.). Layered shocks to key ecosystem services can tighten financial conditions and interact with the global economy. ECB research indicates that these effects are often clustered by sector (agri-food, construction, extractives, utilities, tourism) and by place (water-stressed basins, flood-exposed coasts), creating concentration risk and correlation across loans that otherwise seem diversified (Boldrini et al., 2023). Where exposures are concentrated, these channels can scale into macro-financial stability concerns. Simultaneous ecosystem degradations can increase expected losses across many borrowers at once, tighten credit supply to exposed regions and sectors, and heighten procyclicality. Supply chains can add a cross-border dimension to this when shocks originating outside the EU transmit into euro-area loan books (Ceglar et al., 2024). Furthermore, nature-related risk can become systemic through ecosystem tipping points, which can trigger non-linear regime shifts [6]that lead to rapid asset revaluations, heightened uncertainty and a deterioration in market confidence (Marsden et al., 2024). These effects may be reinforced by the interaction between banks and non-banking financial institutions that channel financial flows towards the destruction of critical ecosystems via capital markets (ibid.).

2.3. Challenges linked to nature-related risks in banking supervision in the EU

In recent years, recognition of the relevance of nature-related risks for EU credit institutions has grown, creating unique challenges for EU regulators and supervisors. We describe four such challenges below.

First, supervisory authorities need to prepare to challenge banks' assessments on the materiality (or lack thereof) of nature-related risks. Although banks increasingly acknowledge that nature-related risks can impact their balance sheets, this awareness has emerged unevenly across the sector. Their initial recognition, which began to develop prior to the adoption of the EU Sustainable Finance Agenda,

[6] Tipping points in the Earth system involve non-linear, self-reinforcing and often irreversible changes that, once triggered by accumulated pressures, can unfold abruptly and continue even if the original drivers are removed, severely limiting the capacity of socio-economic systems to adapt.

was largely centred on governance considerations and focused on reputational and operational exposures linked to environmental legislation, regulatory breaches and environmental crimes. Since 2020, banks have also begun to associate environmental risks with their capital positions, particularly in relation to credit risk. However, banks often view this link primarily through a medium- to long-term lens, meaning that its short-term prudential implications remain underexplored. At the same time, analytical tools, methodologies and risk assessment approaches for nature-related risks are still under development. Banks are experimenting with internal tools, scenario analyses and proxies to approximate exposures to physical and transition risks, while embedding nature-related considerations into governance, credit risk and strategic planning. A further difficulty arises from the tension between the location-specific characteristics of nature-related risks and the cross-border characteristics of financial flows. Banks operating across multiple jurisdictions face challenges in navigating divergent risk profiles and regulatory frameworks for nature-related risks in each market or jurisdiction in which they operate.

A second challenge is that supervisors must operate with an increasingly sophisticated and dynamic regulatory toolbox, which often requires them to step into uncharted territory. Instruments such as stress tests, scenario analyses, transition plans, forward-looking datasets and environmental metrics require supervisors to engage with concepts, methodologies and analytical frameworks that extend far beyond traditional prudential supervision. Supervisors are expected to adhere to the policy choices and definitions set out at the EU and national regulatory levels. However, when exercising their discretionary powers, this may not be sufficient by itself: they should also draw on insights from environmental science, nature modelling and ecological dynamics, as these are essential in efforts to understand nature-related risks. Where needed, they should rely on the best available science and maintain a structured dialogue with the scientific and research community. This will ensure that supervisory expectations remain credible, proportionate and aligned with evolving scientific knowledge.

Third, banks remain central to efforts to support nature-related action, as both providers of finance for nature-related policies and investments, and as institutions exposed to the nature-related risks arising from mismanaged transitions and physical hazards. While the EU entered a new (geo)political phase in 2024, its policy priorities now depend even more on healthy natural ecosystems than before. The EU's earlier ambitions, set out in the 2018 Sustainable Finance Action Plan and reinforced by global cooperation after the 2020 US presidential election, have been weakened by Russia's aggression against Ukraine, the energy crisis, rising protectionism and broader trade tensions, which have contributed to a growing divergence in ESG standards across countries. The European Commission's Competitiveness Compass places industrial competitiveness at the forefront of its policy agenda for the next five years. This shift has reduced the emphasis on integrating sustainability into finance as a tool for both financial stability and nature-positive outcomes. At the same time, the EU continues to pursue its objectives under the Treaties, the European Climate Law and the European Green Deal. In addition, many of the Compass's priority areas fundamentally rely on resilient ecosystems, which contribute to creating more resilient supply chains and reducing reliance on imported materials The EU's efforts to reduce its geopolitical dependencies, implement an effective climate adaptation agenda and strengthen its preparedness strategy all depend on healthy ecosystem services.

Fourth, simplification initiatives are likely to reduce the availability of nature-related information for supervisory purposes. Since the 2024 European Parliament election, a flagship initiative of the Commission has been the simplification of EU regulatory frameworks through a series of Omnibus packages. Omnibus I seeks to reduce compliance burdens for companies and postpone the implementation of such requirements. However, the reopening of negotiations between the Commission, the European Parliament and the Council has introduced substantial amendments, such as the removal of climate transition plans under the CSDDD – increasing regulatory uncertainty. The elimination of the transition plan requirement is concerning, given that credible transition plans must address not only climate mitigation but also climate adaptation, which is intrinsically linked to nature-related risks through ecosystem-based solutions and the protection of natural buffers against climate impacts. Simplification efforts that reduce information transparency may compromise supervisors' ability to ensure that banks adequately address nature-related risks – including those that are interconnected with climate risks – and make it harder for banks to prioritise and manage these compounding risks effectively..

3. Methodology

This section outlines our methods for assessing our sample banks' public reports.

3.1. Case selection and data collection

We drew on a sample of 194 public disclosures from 15 euro-area credit institutions.[7] These 15 banks are major systemically important institutions based in nine EU member states. All are subject to the same regulatory framework (including the EU Taxonomy, the CSRD and Pillar 3 ESG requirements) and under direct supervision from the ECB within the Single Supervisory Mechanism, which controls for institutional variation. The sample captures the diversity of national contexts and banking models (universal, cooperative, regional), enabling meaningful comparative analysis of disclosure practices.

The selection of disclosures was guided by data availability and, in particular, the consistent publication of annual reports, Pillar 3 disclosures and sustainability or non-financial reports for 2020–24. We chose the 2020–24 timeframe to capture the evolution of environmental and nature-related risk disclosures during a period of progress in the regulatory, conceptual and societal landscapes. In terms of regulatory development, this period spans the implementation of the Capital Requirements Regulation 2 (2020), the EBA's initial guidance on ESG risk management (2021) and – from 2023 onwards – the progressive introduction of CSRD and European Sustainability Reporting Standards (ESRS) disclosure requirements.

Crucially, this period also saw the emergence of various reports and statements on nature-related financial risks from central banks and financial supervisors, which helped shape the conceptual foundations for integrating nature into prudential policy.

We rely on publicly available information, which may introduce biases towards positive impact and discrepancies between stated intentions and actual actions. We acknowledge these limitations. Prudential supervisors have access to more comprehensive data from credit institutions, enabling them to better assess current practices related to nature-related risks and their credibility and consistency with internal operations.

3.2. Sources reviewed

Four main types of publicly available documents were systematically reviewed for each bank:

1. Pillar 3 reports focusing on the sections addressing ESG risks and, where applicable, dedicated subsections on environmental or nature-related risk management. These reports were used to examine how banks identify, quantify and disclose environmental risks within prudential frameworks (e.g. risk taxonomy, credit and market risk assessment, stress testing and capital adequacy planning).[8]

2. Annual reports capturing strategic and governance-level discussions of environmental and nature-related risks, covering board oversight, risk appetite frameworks (RAFs) and integration into corporate strategy. These reports also provide insights into the degree of alignment between financial and sustainability disclosures.

3. Corporate sustainability reports (or equivalent ESG/CSRD/non-financial statements), which often provide the most detailed qualitative and quantitative information on nature-related

[7] See the Appendix for the list of banks and the documents we reviewed.

[8] Data analysis and comparison for Pillar 3 disclosures could be substantially improved by the establishment of the EBA Pillar 3 Data Hub in January 2026, which makes it possible to access prudential information from institutions in the European Economic Area through a single digitalised platform (EBA, 2026).

dependencies, impacts and management processes. These sources were reviewed to identify references to biodiversity, water, soil, land use, pollution, waste and other environmental factors, as well as references to emerging disclosure frameworks (e.g. TNFD, GRI). Where available, we also added **topical reports** such as nature-related statements, policies or reports.

4. **Integrated financial and sustainability reports,** which have been a requirement for banks subject to CSRD requirements since 2024.

As this report focuses on nature-related risk management from a prudential perspective, the most relevant information was found in banks' Pillar 3 disclosures; since 2023, these have been required to include environmental risk management. Sustainability disclosures and annual reports (some of which include prudential reporting) provided important additional resources for the analysis, particularly in relation to consolidation efforts. A close examination of these documents facilitates a better understanding of why banks have chosen to address nature-related risks specifically, and whether their approaches are internally consistent across different reporting frameworks.

3.3. Analytical approach

A mix of a qualitative coding method and a benchmarking framework was used for this report, following Smoleńska et al. (2025). The five authors used NVivo[9] to code the reports, following the set of initial questions below, and met regularly to ensure coding alignment and reliability.

The coding framework was designed to identify **four key categories of information**, following a standard risk management cycle (see Figure 3.1 below).

Figure 3.1. Risk management process

Source: Authors

[9] NVivo is qualitative data analysis software that enables systematic coding and thematic analysis of text-based documents.

This framework was informed by, among other sources, the EBA guidelines (EBA, 2025a) and the ECB's Guide on Climate-related and Environmental Risks (ECB, 2020). An important analytical goal of the review was to understand how voluntary sustainability initiatives shaped banks' conceptualisation and disclosure of nature-related risks; we were particularly interested in those addressing nature-related issues such as the TNFD, the GRI and the Poseidon Principles.

The analysis is structured around four questions:

- How are banks conceptualising nature-related risks?
  Focus: how banks defined climate and environmental risks, used related vocabulary and concepts, framed a topic in relation to these risks and linked them to prudential risk categories.

- How are banks incorporating nature-related risks into their strategies and internal governance?
  Focus: integration of nature expertise into governance structures and decision-making processes at various organisational levels, target setting, business strategies and transition planning.

- How are banks identifying and assessing nature-related risks within their risk management frameworks?
  Focus: description of risk identification and risk assessment procedures, policies and processes, and the integration of nature considerations into banks' business strategies.

- How are banks mitigating these risks?
  Focus: identification of ex-ante and ex-post risk mitigation measures banks mentioned in their reports.

4. Findings

Our analysis of 15 EU credit institutions reveals that their treatment of nature-related risks has developed since 2020, but progress remains uneven across institutions and functions. Conceptual framing has improved, but operational depth is limited and their definitions remain misaligned. Nature impacts often translate into location-specific financial risks, but these are not embedded into risk frameworks. Some banks are engaged in efforts to identify these risks and impacts but rarely quantify them, and their materiality assessments diverge. Despite stronger governance structures, many bank policies remain high-level and lack integration into binding risk processes.

4.1. How banks conceptualise nature-related risks

Banks' framing of nature-related risks evolved between 2020 and 2024

Over the years, the 15 euro-area banks in our research sample[10] have used the terms 'environmental' and 'nature-related' risks in heterogeneous ways. This makes it challenging for supervisors, other financial institutions and the public to understand whether banks are appropriately identifying and managing nature-related risks (as defined in Section 2.1). The ambiguity stems from the fact that 'environmental risks' – the 'E' in 'ESG' – and the ECB's references to climate-related and environmental risks have inadvertently encouraged banks to conflate climate risks and non-climate environmental risks. As a result, disclosures on environmental or climate and environmental risks, and related actions that banks report, often focus solely on climate risks. Using 'environmental' or 'climate and environmental' risks as an umbrella term, with limited granularity, reduces comparability and obscures whether non-climate environmental risks are being identified, mapped to prudential categories and managed. Nevertheless, following progress in regulatory and supervisory guidance, banks have paid increasing attention to such categories, as outlined below.

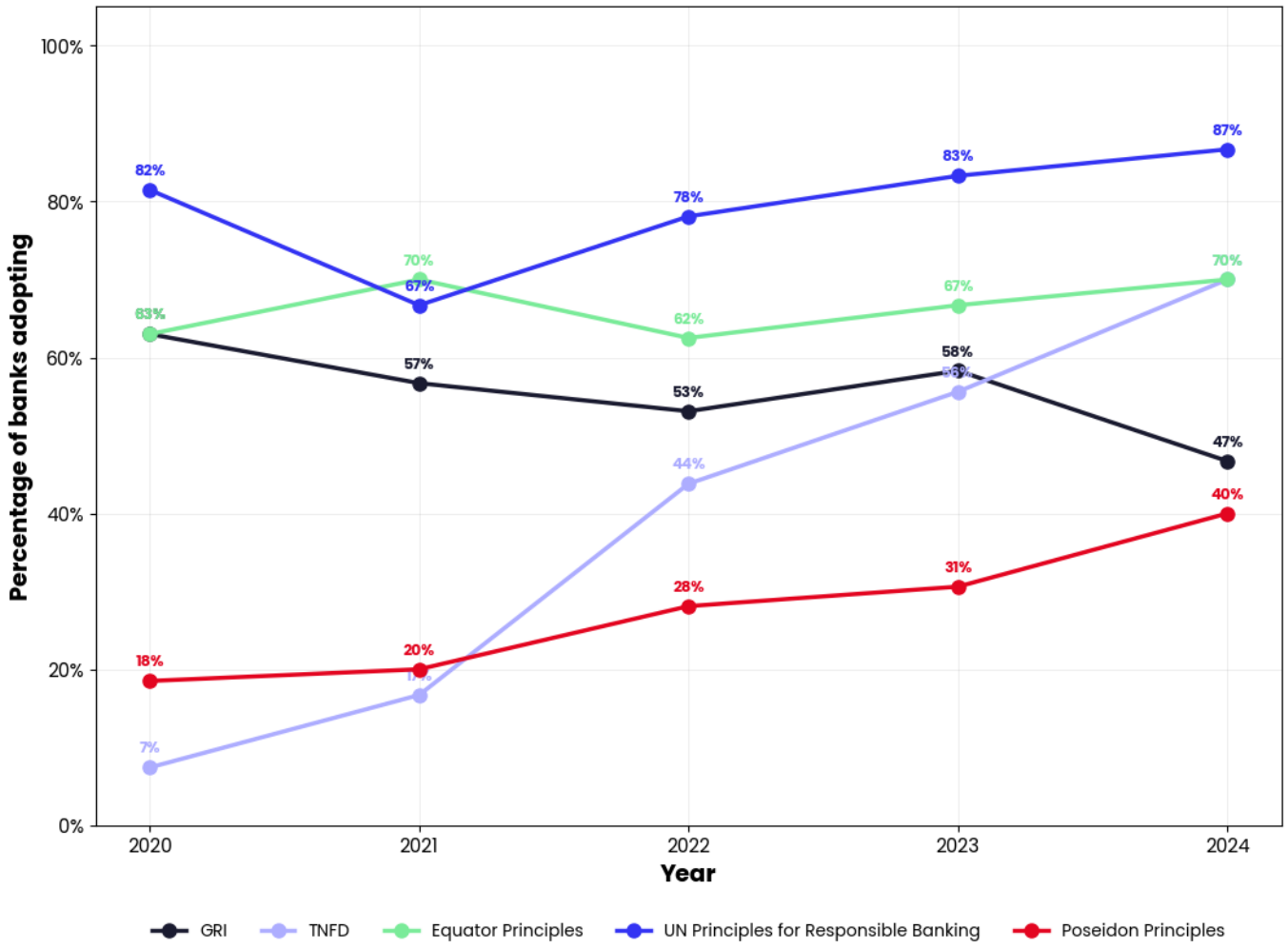
Between 2020 and 2022, the banks treated environmental risks as largely equivalent to climate risks. This tendency reflects the fact that initial regulatory and supervisory guidance, as well as public perceptions of environmental risks, were more focused on climate risk assessment, even if they were not formally limited to it. While there was growing recognition of biodiversity loss, water stress, pollution, land use and resource depletion as environmental risk drivers, these were rarely integrated into risk processes. In this early phase, banks' definitions were based on a non-exhaustive subset of environmental factors, in line with the EBA guidance, including the EU Taxonomy's non-climate environmental objectives (sustainable use and protection of water and marine resources; transition to a circular economy; pollution prevention and control; and protection and restoration of biodiversity and ecosystems), as well as environmental issues such as deforestation, land use and soil degradation (EBA, 2021).

Since 2023, the banks have devoted more attention to nature-related risks. Both the Implementing Technical Standards on Pillar 3 disclosures and EU legislation in the form of CRR3 (introduced in 2024) helped clarify the scope of environmental risks, aligning them with the EU Taxonomy's environmental objectives. This shift coincided with the publication in September 2023 of the NGFS's Conceptual Framework for Nature and the TNFD's Recommendations, which introduced a more explicit nature-based framing and accelerated banks' adoption of nature-specific terminology. Our analysis showed that banks built on their earlier efforts, prioritising non-climate environmental objectives in the Taxonomy, while also giving prominence in their assessments to some sub-categories of the Environmental Delegated Acts dedicated to biodiversity (European Commission, 2023). These Acts

[10] Throughout this section, the analysis refers to this research sample. See the Appendix for the full list of institutions and the documents studied.

were considered material – on deforestation, land-use change and soil degradation – with the support of voluntary frameworks such as the TNFD and the Poseidon Principles[11] (See Figure 4.1).

Figure 4.1. Share of banks in the sample adopting voluntary disclosures (2020–24)



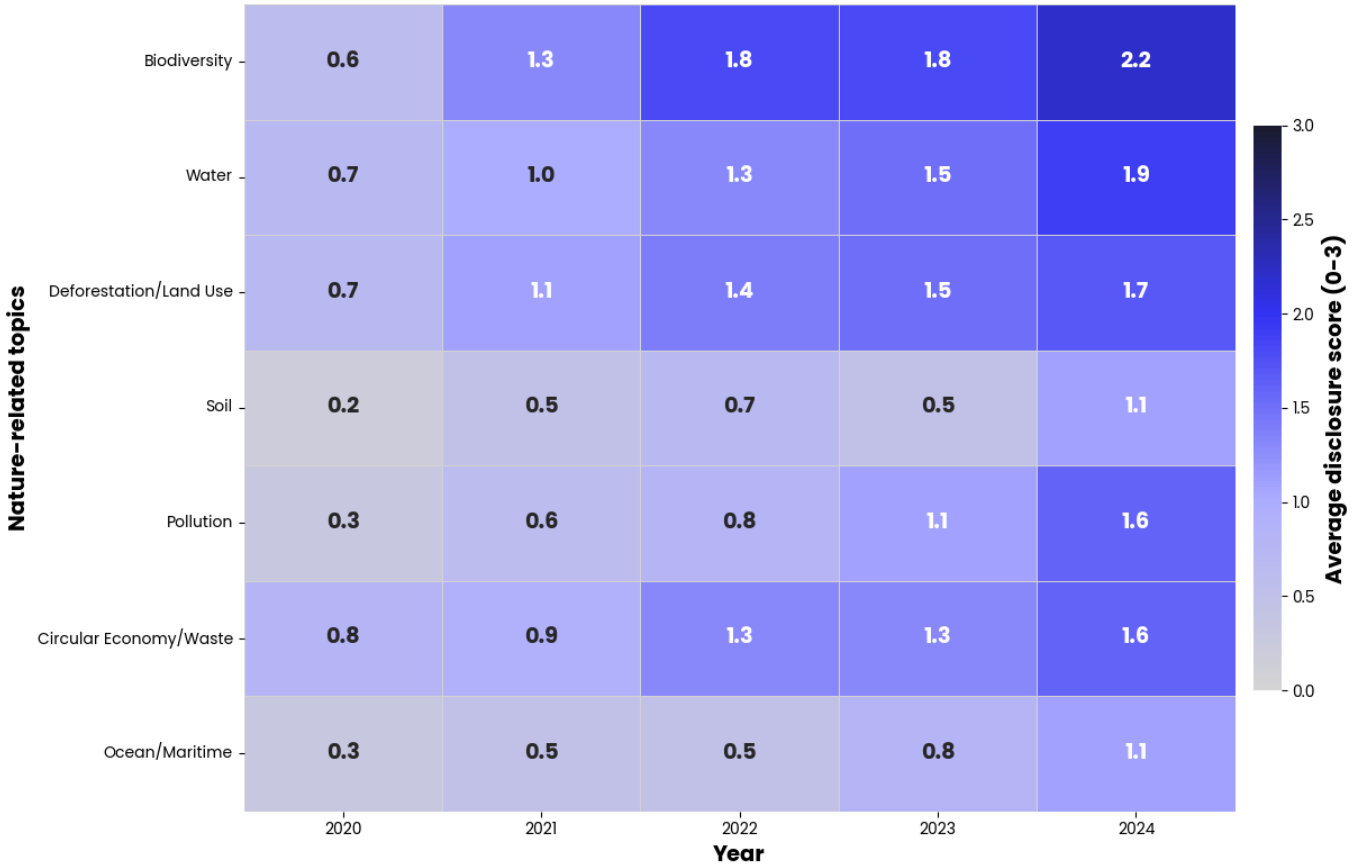
Source: Authors. Banks were assessed on whether they referenced five voluntary disclosure frameworks in their reports: GRI (Global Reporting Initiative), the TNFD, Equator Principles, UN Principles for Responsible Banking, and Poseidon Principles. Each framework received a binary score (1 if mentioned and adopted, 0 otherwise). For each year, the chart illustrates the proportion of bank reports, over time, that state the bank has adopted each framework.

The conceptual shift towards a wider consideration of nature is reflected in the steady expansion of nature-related topics covered in disclosures between 2020 and 2024 (see Figure 4.2). Early disclosures relied on generic environmental-risk language and made only sporadic references to biodiversity. Since 2023, reports have increasingly adopted explicit nature- or biodiversity-related terminology, reflecting a steady increase in engagement with the non-climate environmental objectives of the Taxonomy and other environmental issues outlined by the EBA (2021), such as deforestation and soil degradation. In addition, banks have referenced ecosystem-service dependencies and acknowledged location-specific exposure and climate–nature interactions. They now employ a heterogeneous

[11] The Poseidon Principles are a set of guidelines established by banks to promote the decarbonisation of the maritime shipping industry, aiming to reduce greenhouse-gas emissions in line with international climate targets. They encourage financial institutions to assess and disclose the climate alignment of their ship finance portfolios, fostering accountability and transparency in their lending practices.

vocabulary, ranging from ENCORE-style[12] ecosystem-service concepts (pollination, soil fertility, water availability) and the EBA report's terminology (EBA, 2021) to terms such as 'natural capital'. While terminology varies, these labels increasingly converge around the overarching environmental categories of the EU Taxonomy, as specified in the Taxonomy Environmental Delegated Act (European Commission, 2023).

Figure 4.2. Evolution of nature-related topic coverage in bank reports (2020–2024)



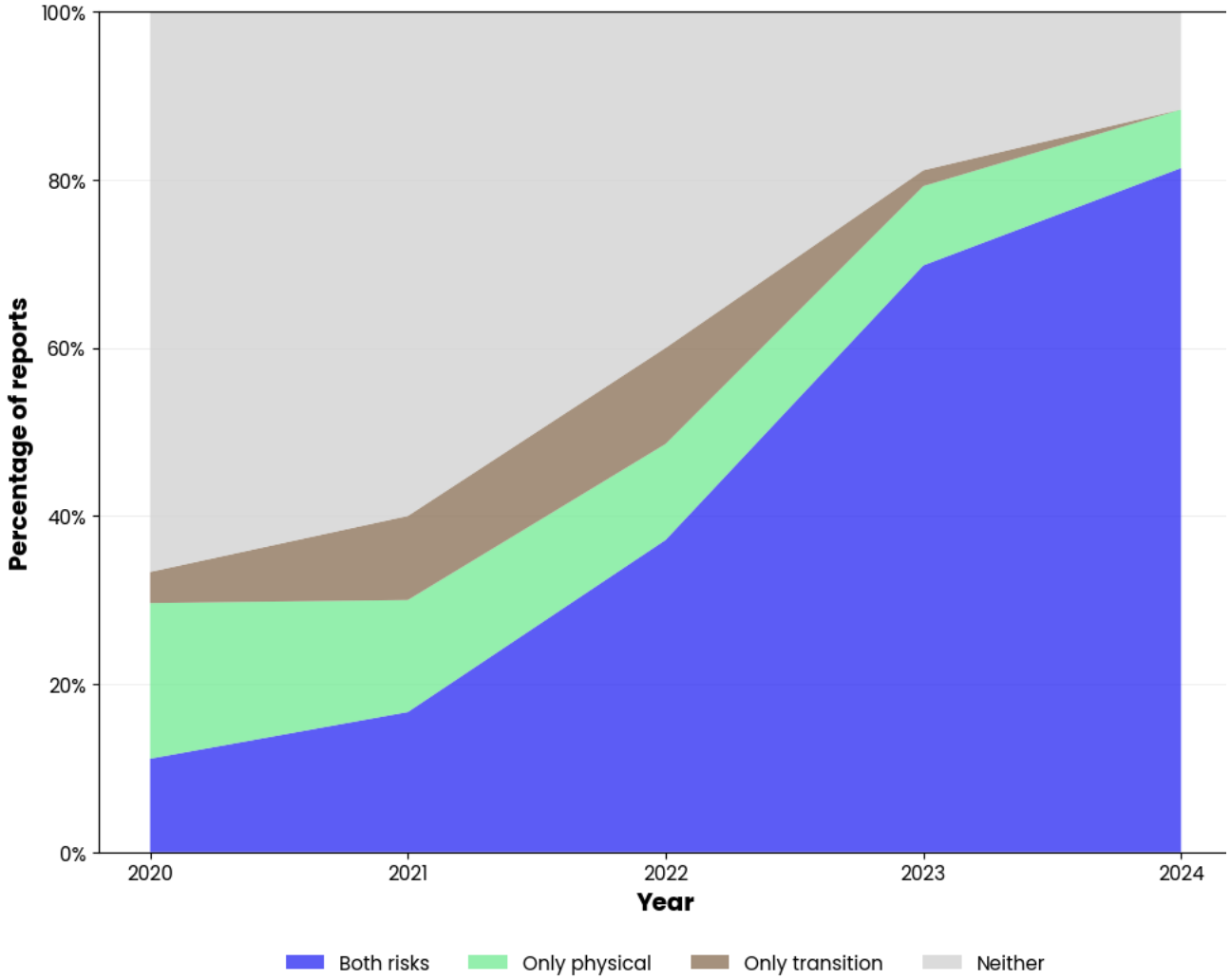
Source: Authors. Authors scored each bank report by topic on a 0–3 scale (0 = not mentioned; 1 = mentioned without detail; 2 = discussed with emerging risk management measures; 3 = advanced practices). Cells report the mean score across the 15 banks for each year.

Banks' broadened coverage of physical and transition risks

Banks' conceptual clarity has improved over time as they developed their understanding of nature risk transmission channels from predominantly physical risk in 2020–21 to physical and transition risks by 2023–24 (see Figure 4.3). This is in line with stronger EU and global policy signals, such as those from the Kunming-Montreal Global Biodiversity Framework and emerging nature-related regulation. Banks have generally increased the degree of granular detail in their description of physical risks, while their transition-risk language has remained less specific, particularly regarding time horizons and decision rules. More recent disclosures also distinguish between acute and chronic nature risks, signalling a more nuanced understanding of how ecosystem degradation unfolds over time.

[12] ENCORE is a tool that allows financial institutions or other companies to assess how their economic activities depend on and impact nature. It was developed by the Natural Capital Finance Alliance (UNEP FI and Global Canopy) in partnership with UNEP's World Conservation Monitoring Centre.

Figure 4.3. Conceptualisation of nature-related risks as physical and transition risks



Source: Authors. Authors coded each bank report for whether it framed nature-related risks as physical and/or transition risks (binary per risk type). The chart shows, for each year, the share of reports in the sample that discuss both risk types, only physical, only transition, or neither.

Banks' differing motivations for including nature-related risks in risk management processes

Most banks refer to stricter regulation at the EU level as their main sources of motivation for including environmental risks in risk management processes. Among these sources of regulation are the EU prudential framework, the Sustainable Finance Framework and supervisory action. However, banks factor multilevel governance frameworks (at the EU, national and international levels) into their environmental risk considerations. In some cases, national law and guidelines in member states increased banks' attentiveness to environmental risks. Examples of this in Germany include the national due diligence law and corporate sustainability disclosure law, as well as an information sheet from the national supervisory authority (e.g. LBBW Pillar 3 Report 2023). In addition, studies and analytical work on nature-related risks conducted by central banks such as De Nederlandsche Bank, Banque de France and the ECB appear to have helped motivate banks to consider nature-related risks (e.g. ABN AMRO Nature Statement 2024, Rabobank Annual Report 2022).

EU strategies and laws on nature and the environment, along with national biodiversity strategies and action plans (NBSAPs), have also prompted banks to assess nature-related risks. Examples at the EU level include the EU Biodiversity Strategy 2030 and the Nature Restoration Law. Banks anticipate that NBSAPs such as France's National Biodiversity Strategy 2030 will require them to align their internal strategies with country-level developments. One bank cites the EUDR (Commerzbank Annual Report

2024). Some banks acknowledge that the role of financial institutions is explicitly recognised in Target 15 of the Kunming-Montreal Global Biodiversity Framework (e.g. Crédit Agricole Integrated Report 2024), showing how international environmental developments can also influence banks' behaviour.

Some banks cite the business opportunity presented by the sound management of environmental risks, as well as by the development of their offerings. Banks report that customers are increasingly asking them to develop financial products with environmental characteristics or an environmental protection dimension (LBBW Annual Report 2024). Examples of this include the circular economy programme to which Intesa Sanpaolo pledged €8 billion in dedicated credit in its 2022–25 business plan, with eligibility criteria covering sustainable farming and the sustainable management of natural resources and soil biodiversity (Intesa Sanpaolo Non-Financial Statement 2022). Banks active in agri-food are especially careful to note that managing nature-related risks is necessary to bolster the resilience and competitiveness of the sector (Crédit Agricole Annual Report 2023). Others refer generally to a perceived shift in market sentiment, as stakeholders considered financing and investments in nature-positive activities, such as those linked to reforestation and biodiversity conservation and restoration, insufficient (Santander Sustainability Statement 2024). Some banks, particularly those in Italy, also link this shift to lessons from the COVID-19 pandemic. The pandemic exposed how tightly economic, social and environmental systems interact with one another, making sustainability topics more important for stakeholders (Unicredit TCFD Report 2021).

Banks' recognition of supply chain risks also prompted them to better understand environmental risks. Disruptions in supply chains caused by the degradation of ecosystem services can affect financing activities and relationships with customers, suppliers and partners across a broad range of sectors and regions (e.g. AIB Annual Report 2024).

Banks link nature-related risks to a majority of prudential risk categories

Banks recognise that, in theory, environmental risks can affect all prudential risk categories, which has implications for their capital and liquidity frameworks, as well as their governance requirements. This recognition reflects the fact that supervisors expect banks to conduct a materiality assessment of nature-related risks over the short, medium and long term, and under various scenarios (Expectation 7.5 of ECB, 2020a; Article 87(a)(1) and (2) of CRD6). Nevertheless, in their disclosure documents, banks explicitly associate environmental risks with the majority of prudential categories, albeit not with all of them.

Globally, supervisors have been working on classifying nature-related risks across prudential categories. Table 4.1 outlines the approach taken by the NGFS in this regard (NGFS, 2024a), and compares it with examples of how banks in the sample describe corresponding nature-related prudential categories in their disclosures.

Table 4.1. Prudential risk categories and nature-related risks

Prudential risk category	Core definition (Basel Committee on Banking Supervision, CRR3)	Nature-related risks (NGFS, 2024a)	Example
Credit risk	Risk that a borrower or counterparty fails to meet obligations	Impaired ecosystems increase borrower costs, default risk, and reduce collateral values	Credit risk is the most material risk category, arising from counterparty exposures through financing activities. Biodiversity- and ecosystem-related risk drivers can reduce credit quality and collateral valuations (Nordea Annual Report 2024)

Liquidity risk	Risk that an institution cannot meet its cash-flow obligations when needed	Pressure to liquidate assets due to ecosystem degradation or regulatory changes	Liquidity risk may be impacted by cash outflows driven by nature-related events (Nordea Annual Report 2024)
Market risk	Risk of losses from movements in market prices	Repricing of securities linked to nature-dependent cash flows; wider spreads for ecosystem-dependent issuers	[No example found]
Operational risk	Risk of losses from failures in people, processes, systems or external events. This may include compliance risk (risk of penalties and losses due to failure in adhering to laws and regulations) and legal risk (risk of losses arising from administrative procedures and lawsuits)	Regulatory, litigation and physical risks from nature-degrading activities	Compliance risk: environmental crimes (e.g. illegal wildlife trade, unlawful extraction and trade of forestry and natural resources, illegal land clearance and waste trafficking) can cause compliance and operational losses (ING Annual Report 2021)
Business model risk	Risk that a strategy, revenue model or cost structure becomes unsustainable	Loss of ecosystem services or rapid regulatory change may undermine strategy	Misaligned long-term strategies or costly operational adjustments may be required (Unicredit Integrated Report 2023)
Reputational risk	Risk of damage to reputation arising from actions or events	Financing nature-degrading activities may undermine stakeholder trust	Loss of ecosystem integrity can disrupt operations and damage reputation (Intesa Sanpaolo Pillar 3 Report 2024)
ESG (or sustainability) risk	Risk of any negative financial impact on an institution stemming from the current or prospective impact of ESG factors on that institution's counterparties or invested assets, materialising through the traditional categories of financial risks (Article 4(52d) CRR3)	N/A	Exposure arising from transactions or customers that pose high reputational risk or are misaligned with sectoral policies on environmental protection (Crédit Agricole Annual Report 2020)

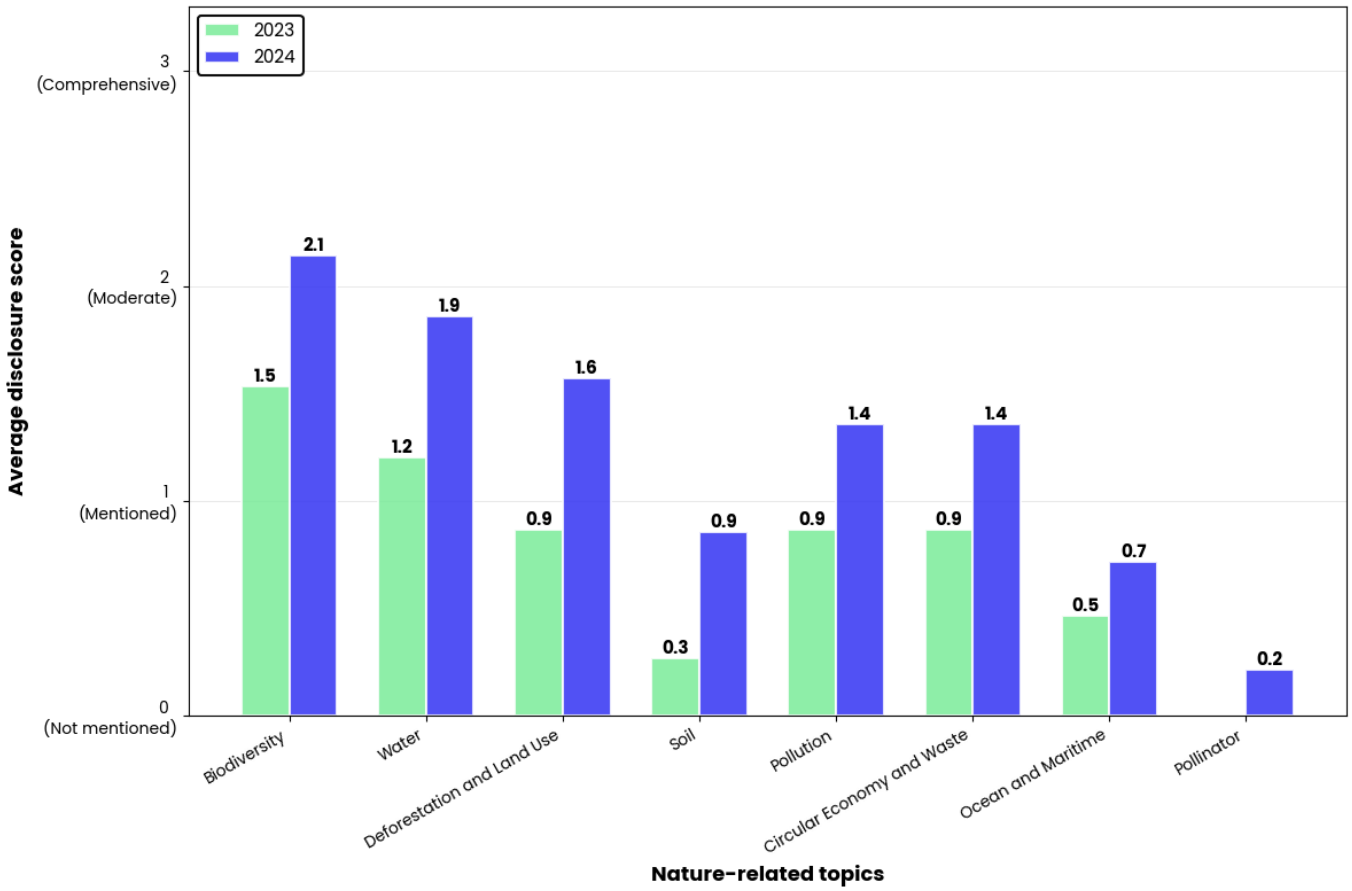
Source: Authors' analysis of banks' documentation

Before the introduction of CRR3, many banks had already begun treating ESG factors as a distinct risk category, using it to capture any negative financial impact arising from ESG factors affecting their

financed assets. However, their approaches varied: some institutions classified ESG risks as subcategories of reputational, business model or operational risks, while others viewed ESG risks more broadly as cross-cutting risk drivers that could influence all prudential categories.

Banks have struggled to systematically integrate nature-related considerations into their risk management frameworks. In particular, they rarely map their transmission to prudential risk categories and time horizons. Following the introduction of the definition of ESG risks under the prudential framework (EBA, 2022; CRR3), banks have increasingly referred to a growing range of nature-related risks in Pillar 3 disclosures (see Figure 4.4). They have increasingly recognised that nature-related risks could be relevant for their governance arrangements and could give rise to prudential risks, particularly reputational, operational and business model risks. In some cases, banks also acknowledge the potential implications for credit risk; however, such recognition remains isolated, as capital assessments in prudential regulation are largely backward-looking and do not adequately capture the distinctive features of novel risks such as nature-related risks (Ramos Muñoz, 2025). Most banks' disclosure reports do not specifically address market and liquidity risks. In addition, very few banks demonstrate an awareness of legal risks related to nature degradation, such as legal challenges, as recommended by the NGFS (2024b) and EU supervisors (Elderson, 2024). Consequently, overall, current approaches fall short of systematically mapping nature-related risks onto prudential risk categories, and of reflecting the specific transmission channels and implications identified in the existing NGFS nature conceptual framework. Moreover, these frameworks often overlook the time horizons over which nature-related risks materialise – despite the evidence that ecological impacts may emerge more rapidly than climate-related impacts, and may even affect prudential risks in the short term (Kedward et al., 2020).

Figure 4.4. Nature-related concepts in Pillar 3 reports (2023-2024)



Source: Authors. This chart shows the average disclosure scores (0-3 scale) for nature-related topics in Pillar 3 reports for 2023 and 2024. The data shows increasing but still selective integration of nature-related topics into banks' prudential risk disclosures.

4.2. How banks incorporate nature-related risks into their strategies and internal governance

Banks increasingly acknowledge nature-related risks in their strategies, but lack robust targets and governance frameworks

Integrating nature into banks' strategies is the first step towards managing nature-related risks. From a supervisory perspective, a bank's strategy defines its forward-looking choices about target markets, client segments, product offerings, balance-sheet structures and capital allocation, while the risk management framework governs how those choices are monitored, addressed and remediated. Strategic priorities inform the institution's risk appetite and its policies.

During the period 2020-24, many EU banks began to position nature within their strategies, either via standalone nature or biodiversity strands or by embedding nature in group sustainability strategies – but they included few quantified, time-bound targets. For example, BBVA refers to the protection of ecosystem services and natural capital as a priority area (BBVA General Sustainability Policy 2024). In addition, banks increasingly report nature-specific commitments, targets and objectives, even though hard, quantified, time-bound targets remain rare. Examples of this include Nordea's roadmap to integrate biodiversity impacts, risks, dependencies and opportunities into its sustainability strategy and governance by 2025 (Nordea Annual Report 2023). Rabobank's Annual Report 2023 sets out its aim to include nature in its materiality and impact assessment by the end of 2024. The report also commits to assessing the impacts of a significant majority of its nature-material portfolio, while continuing to incorporate nature-sensitive portfolios into its risk management approach and allocating clear governance and management accountability for nature-related risks in the same time frame. Several other banks report that they have begun work on specific nature targets without yet publishing metrics. This gap between directional commitments and measurable objectives creates execution risk.

Banks are beginning to include nature alongside climate in their transition planning, but are being slow to reflect this in their execution frameworks. One example is Deutsche Bank's initial transition plan (Deutsche Bank Annual Report 2023), which includes a "beyond carbon" pillar that explicitly features nature and biodiversity. The plan treats nature as both a risk management challenge to be embedded into existing frameworks and as a financing opportunity (e.g. scaling up nature-based solutions via sustainability-linked structures, biodiversity credits and debt-for-nature swaps). The plan commits to developing standards and measurements for nature risk by sector, and to aligning product development within those guardrails. This approach links strategic growth to risk controls and is good practice for credible, holistic bank-wide transition planning. Several other banks are trying to integrate nature into their transition plans, but detailed, bank-wide milestones, metrics and decision rules for steering portfolios on this remain the exception rather than the norm.

Narratives that present nature as providing opportunities are becoming more common, but the credibility of related schemes hinges on scale and integration with risk controls. Banks highlight their support for farmers transitioning to sustainable farming practices through lower financing costs (Rabobank Annual Reports 2021, 2022 and 2023), as well as nature-based solutions such as reforestation (Santander Sustainability Statement 2024). Intesa Sanpaolo's circular economy credit programme translates strategy into capital allocation via a dedicated financing envelope with published eligibility criteria and reporting (Intesa Sanpaolo Non-Financial Statement 2023). Positive initiatives that are small, isolated or unconnected to risk appetite, underwriting or portfolio limits can create reputational, operational and legal risk due to greenwashing concerns.[13] Credible initiatives will require greater scale and time-bound targets linked to risk appetite, as well as evidence of how they de-risk exposures and produce transition outcomes.

A few banks reference "environmental risks" in their risk appetite frameworks (RAFs) but in practice focus on climate risks (e.g. Unicredit Annual Report 2024). RAFs define the type and degree of risk an organisation is willing to accept in the pursuit of its strategic objectives. The consequence of this

[13] At the EU level, greenwashing is intended as "the practice where sustainability-related statements, declarations, actions or communications do not clearly and fairly reflect the underlying sustainability profile, potentially misleading consumers, investors or market participants," according to the common-high-level understanding of the EBA, ESMA and EIOPA, 2024.

discrepancy is that nature-related risks are often treated as strategically material only on paper. One exception is Nordea, which set in 2023 an initial RAF focused on ensuring the identification, monitoring and mitigation of nature-related risks for large corporate counterparties in vulnerable industries such as shipping (Nordea Pillar 3 Report 2023).

Banks are starting to adapt internal governance to integrate nature-related expertise

Most of the banks are using existing governance structures and processes to assess environmental risks. Dedicated committees focused on ESG risks or on due diligence processes, linked to the compliance function, appear to be a popular avenue for assessing environmental risks. Some banks, however, have established a specific nature team within the Group Sustainability Department, which is responsible for: integrating nature into ways of working and for developing a 2050 vision (Rabobank Annual Report and Impact Report 2023); looking comprehensively at footprinting methodologies (including data, metrics and target setting); integrating nature into strategies, policies, risk management and business developments; raising awareness internally and externally, and reflecting those actions in disclosures. In developing its climate–nature strategy, one bank, ING, has integrated nature into climate assessments by establishing a committee that accounts for nature considerations when reviewing, as part of the loan-approval process, the net zero targets of its commercial partners (ING Climate Progress Update 2024).

At the management level, banks report some degree of attention to nature-related risks as a standalone concern, distinct from climate. A notable example is KBC, which has a Sustainable Finance Steering Committee that is chaired by the chief financial officer and monitors the bank's implementation of the Sustainable Finance Programme, including its approach to biodiversity, water and the circular economy. Some management committees regularly discuss environment-related risks, and consult an external scientific committee with academic and professional expertise on environmental topics, with the aim of both supporting the management of risks and leveraging opportunities in these areas (e.g. Deutsche Bank Transition Plan 2023).

Between 2020 and 2024, environmental factors and risks have increasingly emerged as a significant feature of banks' internal culture. Biodiversity, the circular economy and deforestation, in particular, are among the topics of internal cross-sectional working groups that share information and facilitate knowledge transfer. In addition, many banks conduct training for managers and other employees; engage in outreach, awareness activities and collaboration with academia; and develop ethics codes (e.g. Intesa Annual Report 2024).

4.3. How banks identify and assess nature-related risks within their risk management frameworks

Banks employ a range of approaches to identifying and assessing nature-related risks through materiality assessments

Banks take various approaches to materiality assessments of nature-related risks. In their annual and sustainability reports, many banks have been disclosing information on nature-related risks following a double materiality approach (see Box 4.1 below), in accordance with the Guidelines on Climate-related Risks (European Commission, 2019), even prior to the adoption of the CSRD. In Pillar 3 reports, by contrast, they evaluate nature-related risks as material only when they have distinct, short-term impacts on their capital positions, sidelining broader governance factors. This divergence can be attributed to the differing purposes of the two disclosure frameworks, a separation that complicates analysis of their commonalities.

Importantly, banks typically overlook the fact that the relationship between impacts and risks associated with nature degradation differs fundamentally from that between climate-related impacts and risks. This is a blind spot that stems from adopting a climate-first approach to environmental risk assessment. The frameworks and methodologies developed for climate risk have yet to establish clear links between impacts (greenhouse-gas emissions caused by financed activities) and risks (financial exposures to climate change and transition policies). However, these interrelationships are already more apparent and traceable in the case of nature-related risks. Because ecosystem degradation is

largely localised, impacts such as soil erosion, water pollution or deforestation caused or enabled by financial institutions simultaneously feed back into those same institutions in the form of risks: the ecological damage occurring in a given location can directly and rapidly feed back into non-financial firms operating there. This dynamic contrasts with that for greenhouse-gas emissions, whose effects are globally dispersed and materialise over longer time horizons. Therefore, nature impacts and risks are closely intertwined in the short, medium and long term, making it difficult to treat them as separate categories.

Box 4.1. (Double) materiality of nature-related risks: a regulatory overview

Materiality under sustainability reporting disclosure frameworks

The notion of double materiality was used for the first time in the **Guidelines on Climate-related Risks** (European Commission, 2019), which aimed to integrate the Task Force on Climate-related Financial Disclosures (TCFD) framework into EU laws and regulations. While the TCFD framework is grounded in the single materiality perspective, the European Commission proposed a broader approach, encouraging companies to disclose climate-related information under the Non-Financial Reporting Directive (NFRD) from one or both of the following perspectives:

- Financial (or single) materiality: information necessary to understand a company's development, performance or position – mainly for investors and financial stakeholders.
- Impact materiality: information needed to understand the company's impacts on people, the environment and society – relevant to a wider group of stakeholders, including investors increasingly interested in sustainability performance.

The Commission's Guidelines emphasised that these two dimensions of materiality should be considered independently, but also encouraged companies to assess their interconnectivity (i.e. the anticipated financial effects of a company's impact). Although the Guidelines were non-binding, the principle of double materiality gained regulatory traction when the European Securities and Markets Authority (ESMA) incorporated them into its enforcement priorities (ESMA, 2020), thereby reinforcing its relevance within the broader supervisory framework.

With the introduction of the Corporate Sustainability Reporting Directive (CSRD), double materiality became mandatory and expanded beyond climate to all sustainability matters. The CSRD was developed to be interoperable with the TNFD, which allows companies to decide on a single or double materiality lens. Companies must carry out and disclose their double-materiality assessment, explain the processes they used and justify why they might have considered any environmental topic non-material. Under the European Sustainability Reporting Standards (ESRS), a sustainability matter is material if it meets either the impact or financial materiality threshold, or both.

Materiality in the prudential framework

Prudential regulation traditionally focuses on financial materiality. However, elements of double materiality are implicitly embedded into EU guidance.

Due diligence requirements related to aspects of governance such as reputational, operational and business model risks include an impact perspective: banks must identify risks linked to third parties, governance failures, ESG exposures and legal-compliance issues. Supervisors may intervene when due diligence is insufficient. The ECB's **Guide on Climate-related and Environmental Risks** clarifies that institutions must conduct robust environmental due diligence at onboarding and throughout client relationships, collecting and validating information on vulnerabilities to environmental risks. This supports sound risk management and helps mitigate liability and reputational risks, as part of an impact-to-materiality channel.

The EBA's **Guidelines on the management of ESG risks** acknowledge the relevance of double materiality (EBA, 2025a). Although centred on financial materiality under the CSRD, the Guidelines require institutions to consider adverse impacts where they may create financial, reputational, litigation or business model risks (paragraph 31). **The Guidelines, which will be applicable from 2026, recommend that banks use qualitative information on a sufficiently large range of environmental factors, including at least the degradation of ecosystems and biodiversity loss, to conduct such materiality assessments** (paragraph 15).

In sustainability disclosure reports (and annual reports), banks consider the double materiality of nature-related risks from the perspective of impact or financial concerns, or both. In their impact materiality assessments, banks indicate both their direct impacts (e.g. the biodiversity footprint of the bank) and indirect impacts stemming from financing, investment products and other services they provide to clients. Often, banks assess their dependencies on nature together with their indirect impacts by using different metrics and assessment tools. For example, Unicredit uses Natura 2000, a network of protected areas across the EU established under the Birds Directive (1979) and the Habitats Directive (1980), to assess its dependencies and impacts on nature (Unicredit Pillar 3 Report 2024). In their financial materiality assessments, banks generally highlight the fact that nature-related risks can have medium- to long-term implications related to credit, operational, reputational and business model risks for their own operations and for the value chains of their partners and counterparties. Banks are still at an early stage in the process of linking impact materiality to financial materiality, which requires anticipating which impacts could become financially material over time. As double materiality assessments can cover impact or financial concerns, or both, banks may recognise nature-related risks as material under different circumstances but deprioritise them in their risk management practices or view them only as long-term concerns.

In Pillar 3 reports, banks give more prominence to the potential impacts of nature-related risks on their capital positions, sidelining other implications. While materiality assessments for climate have increased, those for nature-related risks are uncommon and, often, do not align with banks' conclusions on the materiality assessment disclosed under their sustainability reports (e.g. LBBW Pillar 3 Report 2024; BBVA Annual Report 2024). For example, banks may assess their portfolio exposure to nature-vulnerable sectors but have difficulty in quantifying related financial losses. Therefore, they may conclude that due to limited direct exposure, nature-related risks were non-material (Nordea Pillar 3 Report 2024). This behaviour could be explained by the fact that banks still need to familiarise themselves with the extended time horizons and forward-looking aspects of ESG prudential rules. As a result, they tend to prioritise and reference in their Pillar 3 reports the short-term consequences for their balance sheets, while overlooking novel risks.

Even before the publication of the EBA Guidelines a few banks had begun to incorporate elements of double materiality into Pillar 3 reporting as a proxy for anticipating nature-related transition risks (EBA, 2025a). Commerzbank, for instance, assessed the biodiversity and ecosystem-service impacts associated with the sectors it finances to identify potential risk areas and to create positive impacts through the development of biodiversity-aligned products and measures. However, these isolated examples illustrate the challenges banks face in navigating double materiality assessments for prudential purposes, and highlight the need for regulators and supervisors to provide additional guidance on transition and physical risks, building on the initial indications set out in the EBA Guidelines. Banks could also take inspiration from the ECB's own climate-related disclosures – which include a nature degradation indicator – as a first step towards assessing nature-related impacts and risks (ECB, 2025b).

Banks apply various data processes, metrics and tools as proxies to measure nature-related risks

To bridge data gaps on nature-related risks, banks are using a mix of public sources and disclosures, third-party private data and client information. These approaches enable banks to conduct a preliminary exposure analysis of nature-related risks, but not yet to quantify potential financial losses stemming from nature degradation (ECB/ESRB 2023). Nevertheless, the NGFS has started developing recommendations for nature-related scenarios that could support banks in this task (NGFS, 2023).

Banks have started to assess the materiality of nature degradation across their activities and clients, using methodologies such as exposure-based screening and portfolio heat maps. To conduct materiality assessments, banks typically begin by screening their portfolios to identify the sectors most exposed to nature-related risks and the associated transmission channels. Exposure analysis enables banks to determine where, and to what extent, they are exposed to such risks (e.g. per sector or geographical region). These exposures can then be portrayed through portfolio heat maps that illustrate the severity and likelihood of potential risks (e.g. Santander Sustainability Statement 2024). However, banks generally do not disclose the proportion of their portfolios or exposures that are

subject to this screening. Most banks[14] report having conducted an exposure analysis with the ENCORE tool,[15] either aggregated or focused on specific ecosystem services such as water (Crédit Agricole Annual Report 2021). ENCORE is widely used because it maps sectoral dependencies onto ecosystem services, providing an initial approximation of nature-related exposure.

Some banks report using a combination of complementary tools and approaches to develop their nature materiality assessments (see Table 4.1). Several banks apply additional sectoral-level tools to refine the initial ENCORE screening. Others supplement ENCORE with country-level risk approaches and intensity values[16] derived from the Species Threat Abatement and Recovery (STAR) metric and the Ecoregion Intactness Index, applying heightened scrutiny to regions they consider to be environmentally sensitive or subject to evolving regulatory requirements. Some institutions adopt a value-chain perspective, using tools such as EXIOBASE to analyse upstream and downstream dependencies, and to capture indirect nature-related risks that may not be visible in portfolio-level data. While these mixed approaches broaden the scope of analysis, their outputs remain largely exposure-based and high-level, limiting their capacity to reflect complex interactions between ecosystems and financial risks.

It is important to note that the use of quantitative metrics alone can create a false sense of precision. This can arise from implying that all material risks have been captured when qualitative analysis remains essential to uncovering risks that models may miss, such as when geographically dispersed portfolios share common dependencies on vulnerable water basins or ecosystems. To address these limitations, several banks have partnered with external organisations to develop tailored tools aimed at strengthening the robustness and scientific basis of their assessments. In other cases, banks rely on proxies and qualitative inputs such as client questionnaires, as well as assumptions and sector averages (e.g. sector-average impact intensity, uniform geographical assumptions, default sector-level exposure scores) where direct measurement is unfeasible, while continuing their efforts to improve data availability.

Methods that produce more granular-detailed results, such as geospatial modelling, scenario analyses and stress testing, can help banks identify high-risk sectors they are exposed to, as well as potential transmission channels impacting their capital positions and governance frameworks. While such approaches are emerging, they are currently applied only by a limited number of frontrunner institutions. Geospatial modelling, for example, enables banks to better monitor locally specific nature-related risks by mapping activities against environmentally sensitive areas, thereby identifying portfolios' exposure to both physical and transition risks. Banks have initially used these methods to assess their own biodiversity or nature impacts and dependencies, focusing on operational factors such as site locations, procurement, water use and waste management. The World Wide Fund for Nature (WWF) Biodiversity Risk Filter, and the World Resources Institute (WRI) Aqueduct Water Risk Atlas are notable tools here. Other innovative approaches include using aggregated impact metrics such as the Mean Species Abundance[17] (MSA) indicator to estimate the entity's direct and indirect impacts (ABN AMRO Impact Report 2021) – although these metrics still have significant limitations (Prodani and Goumet, forthcoming). In recent years, banks have broadened their application of these tools and used additional geospatial approaches to assess their clients' activities across global value chains. A few banks have already adopted scenario analysis[18] to assess the potential impacts of nature-related risks over time in different scenarios (Commerzbank Pillar 3 Report 2024; Nordea Pillar 3 Report 2024; Rabobank Annual Report 2024). Nordea also built on these scenarios, employing stress tests to

[14] KBC Risk Report 2024; Nordea Pillar 3 Report 2023; Rabobank Annual Reports and Pillar 3 Reports 2023 and 2024; Santander – from 2022, UniCredit 2023 and 2024; BBVA Annual Report 2024; Commerzbank Pillar 3 and Annual Reports 2024.

[15] See footnote 12.

[16] Intensity metrics quantify environmental impacts per unit of output.

[17] The MSA is a biodiversity intactness indicator expressing the average abundance of original species relative to undisturbed conditions, developed within Dutch national environmental research and operationalised in the GLOBIO model by PBL Netherlands Environmental Assessment Agency.

[18] Scenario analysis uses forward-looking narratives to help banks and financial authorities assess the potential impacts of nature-related risks over time along different physical and transition pathways.

evaluate the resilience of banks' portfolios to nature-related shocks (Nordea Pillar 3 Report). Table 4.2 summarises the methodologies EU banks use to assess nature-related risks.

Table 4.2. EU banks' methodologies for assessing nature-related risks

Methodology	Tools	Focus	Examples
Sectoral-level screening	ENCORE	Maps sectoral dependencies on ecosystem services	Evaluated the dependence of 21 key ecosystem services in different economic activities within BBVA group's financing portfolio, consider water availability and quality, biodiversity and land use (BBVA Annual Report 2024)
	GLOBIO	Assesses human impacts on biodiversity by modelling how different pressures affect ecosystem integrity over time and across regions	Used alongside ENCORE and EXIOBASE to determine dependencies and impacts of the companies in a corporate portfolio (CaixaBank Pillar 3 Report 2024)
	Global Biodiversity Score (BIA GBS)	Measures contributions to direct impact drivers of biodiversity loss, using Mean Species Abundance (MSA) intensity values	Used to determine dependencies and impacts of the companies in a corporate portfolio (ING Nature Publication 2024)
	Integrated Biodiversity Assessment Tool (IBAT)	Identifies operations or projects located in biodiversity-sensitive areas (e.g. IUCN Red List of Threatened Species, World Database on Protected Areas)	Explores various databases to study the dual materiality perspective of project financing (CaixaBank Management Report 2022)
	Ad hoc tools	Use bespoke or proprietary methodologies to refine sector-level screening	Developed sector-specific instruments such as the Biodiversity Monitor and the Open Soil Index alongside Dutch universities to track soil health and biodiversity performance among agricultural clients (Rabobank Impact Report 2023)
Country-level approaches	Species Threat Abatement and Recovery (STAR)	Assesses species extinction risk and the potential impact of pressures from economic activities	Used to determine country-level scores of impacts on the state of species (ING Nature Publication 2024)

	Ecoregion Intactness Index	Global biodiversity metric that assesses the ecological conditions of ecoregions by measuring the degree to which ecosystems remain intact (natural structure, function and species composition)	Used to determine country-level impacts on the extent and conditions of ecosystems (BBVA Annual Report 2024)
	Baseline Water Stress	Metric developed from the WRI Aqueduct Water Risk Atlas to measure the ratio of water demand to available renewable water supply in a given location.	Used to determine country-level scores of water stress (ING Nature Publication 2024)
Value-chain approaches	EXIOBASE	Estimates environmental footprints across supply chains	Used alongside ENCORE and GLOBIO to determine dependencies and impacts of the companies in a corporate portfolio (CaixaBank Pillar 3 Report 2024)
	Global Impact Database (GID)	Calculates value chain impacts by considering the direct and indirect impact of economic activities in a given sector or country	Records monetisation factors in natural capital impacts (ABN Amro Impact Assessment 2023)
Geospatial approaches	WWF Biodiversity Risk Filter	Maps banks' operations and clients' activities against biodiversity hotspots	Used to determine the material impacts, risks and dependencies of Commerzbank's own operations and commercial banking portfolio on ecosystems and biodiversity-sensitive areas (Commerzbank Annual Report 2024)
	WRI Aqueduct Water Risk Atlas	Geospatial tool that combines hydrological, regulatory and socio-economic data to evaluate water risks for the bank's own operations and customers' assets	Used to identify water-stressed areas where AIB reports to have prioritised efforts to reduce the impact of AIB Group's own operations on freshwater availability (AIB Annual Report 2021); and to determine a water stress risk score for customers in the power generation and cement sectors (BBVA Annual Report 2023)

	Global Forest Watch	Monitors deforestation and land-use change risks linked to financed activities	Monitors detailed loss of tree cover at customer's farms and ranches in the Amazon region (Santander Climate Finance Report 2024)
	MapBiomas	Analyses land-use and land-cover change, water availability and soil quality, particularly in high-risk regions	Also monitors detailed loss of tree cover at customer's farms and ranches in the Amazon region (Santander Climate Finance Report 2024)
	Ad hoc platforms	**Direct impacts:** develop external partnerships or ad hoc tools to measure the nature-related footprint of banks' own operations	Crédit Agricole has partnered with the Iceberg Data Lab to develop a carbon biodiversity footprint of its own operations, a project that is in progress (Crédit Agricole Annual Report 2023)
		Indirect impacts: develop proprietary geospatial platforms combining multiple environmental datasets	Rabobank's Farmland, a geo-analytics platform, consolidates asset location data and enables reusable geospatial insights across the bank (Rabobank Impact Report 2023)
Scenario analyses and stress tests	TNFD scenario narratives	Explore potential physical and transition pathways for nature-related risks over different time horizons	Use narratives such as "ahead of the game" and "sand in the gears" (Commerzbank Pillar 3 Report 2024)
	Bottom-up scenario analysis	Develops internal scenario analysis for specific nature-related risks	Develops internal nitrogen scenarios (Rabobank Annual Report 2024)
	Internal stress tests	Assess portfolio resilience to nature-related shocks based on internally developed scenarios	Incorporate nature-related transition risks into internal stress test (Nordea Pillar 3 Report 2024)
Other	Questionnaires to clients	Collect quantitative, qualitative, and forward-looking information on clients' nature-related risks, impacts and dependencies	Include questions about biodiversity issues (e.g. whether virgin forest will be cleared; or endangered species threatened) in the financing review process (LBBW Sustainability Report 2022)

	Assumptions and sector averages	Apply representative values derived from academic literature, public datasets, industry benchmarks or modelling tools to sectors, subsectors or geographies	Use reasonable assumptions, estimates and sectoral data to prepare sustainability-related information (Unicredit Annual Report 2024)
	Mean Species Abundance (MSA)	Metric measuring the average abundance of a native species in a given area against its abundance in an undisturbed, natural reference state on a scale from 0 (no original species remaining) to 1 (largely intact)	ABN AMRO uses the MSA score to calculate financed land-use impact (ABN AMRO Impact Reports 2021, 2022 and 2023)

Source: Authors

Banks adopt sectoral, geographical and thematic policies to manage nature-related risks

Most banks operationalise nature-related risk management primarily through policy frameworks that structure how environmental risks are identified, assessed and mitigated in lending and investment decisions. These policies are typically sectoral, geographical or thematic, each reflecting the different dimensions through which nature-related risks materialise and are managed in practice. To implement these policies, banks rely on tools such as exclusions and, in some cases, targets and commitments.

Banks are starting to use sectoral policies as a primary tool to address nature-related risks. Credit institutions have developed detailed policies for sectors that are highly dependent on or impactful to nature, such as agriculture, soft commodities, forestry, fisheries, extractives and infrastructure. This reflects their recognition of the links between economic activity and ecosystem pressures. These policies set the conditions for credit approval and renewal, including certification requirements (e.g. those of the Roundtable on Sustainable Palm Oil [RSPO] and the Forest Stewardship Council); no-deforestation commitments; soil and water management expectations; and compliance with biodiversity safeguards. In some cases, they also determine the level of due diligence required, based on the bank's assessment of sectoral dependencies and impacts.

Geographical policies complement this approach by recognising that nature-related risks are highly location-specific. Many banks identify high-risk biomes or regions – most commonly the Amazon, the Cerrado and the Gran Chaco – and subject related transactions to heightened scrutiny, particularly for soya, beef, timber and mining supply chains. Several banks also apply prohibitions or enhanced checks to protected or sensitive areas, such as UNESCO World Heritage Sites, wetlands covered by the Ramsar Convention, areas on the International Union for Conservation of Nature (IUCN) Green List and High Conservation Value/High Carbon Stock zones (EBA, 2021). In Europe, nature-related risks linked to nitrogen pollution, water stress or proximity to Natura 2000 sites are typically related to lending to the agricultural sector. These geographical distinctions often feed into internal heat maps or help determine whether additional due diligence is required (e.g. Rabobank Deforestation and Land Conversion Policy 2025). For third-country exposures, some banks' approaches reflect host countries' legal requirements rather than discretionary standards.

Banks are also increasingly adopting thematic policies, particularly in relation to deforestation (see Box 4.2), biodiversity, nature and the circular economy, alongside associated targets and commitments. These policies tend to define minimum standards, exclusions or certification requirements, while targets signal longer-term ambitions. Some banks, particularly Rabobank and Crédit Agricole, have set

biodiversity or nature-related objectives aligned with the ecological transition or even the Kunming-Montreal Global Biodiversity Framework (Rabobank Annual Report 2024; Crédit Agricole Annual Report 2020). Deforestation-free commitments are the most common thematic target, often tied to specific commodities or biomes. A smaller number of institutions articulate restoration or ecosystem-positive aims, but these remain at an early and mostly qualitative stage.

Box 4.2. Bank deforestation policies: ambition, scope and effectiveness

Several major EU banks have published formal deforestation and biodiversity policies that set out exclusion zones, commodity-specific requirements and supply-chain commitments. These policies can be useful guides to best practice, but their enforcement still seems to be mixed and jurisdiction-dependent. Innovative policies from central banks may encourage banks to look more closely into their due diligence processes in specific locations. For example, the Central Bank of Brazil introduced regulation of rural credit in the Amazon biome and established the Rural Credit Bureau to strengthen supervision of banking activity in a high-risk region.

Policy frameworks

Rabobank, with its large agricultural portfolio, has published a detailed Deforestation and Land-conversion Policy. This prohibits business with upstream clients whose land was illegally deforested or converted after 1 January 2018 and lending on new collateral located in the Brazilian Amazon biome, and requires midstream and downstream clients to implement traceability and no-deforestation strategies. Rabobank also applies prohibitions to customers operating in protected areas (under UNESCO, the Ramsar Convention and IUCN I–II rules) and complements its policy with rules specific to crops and commodities such as soya, palm oil and cocoa.

Santander takes a comprehensive approach to monitoring deforestation, particularly in Brazil. The bank conducts daily checks on farm-level deforestation using the Global Forest Watch and MapBiomas satellite tools, screens cattle suppliers against embargo lists and can require early repayment of loans in cases of material breach. Santander's policies also prohibit financing that endangers Ramsar Convention sites, World Heritage areas or IUCN I–IV zones, and excludes non-certified tropical timber and non-Roundtable of Sustainable Palm Oil (RSPO)-aligned palm oil processors. Its participation in the Brazilian Federation of Banks (FEBRABAN) Amazon Protocol commits Brazilian banks to implement, by December 2025, traceability systems showing that cattle in financed supply chains are not tied to illegal deforestation, including through indirect links.

KBC and Intesa Sanpaolo also publish deforestation-related exclusions, albeit with varying degrees of detail. KBC requires certified supply chains for high-risk commodities and bans financing linked to peatland conversion, primary-forest logging or destructive fishing practices. Intesa's biodiversity and nature rules commit the bank to avoid financing that affects high-biodiversity areas and require enhanced checks for clients operating in nature-sensitive zones.

Evidence and effectiveness challenges in financing

Recent research raises doubts about the effectiveness of these commitments, demonstrating that financial flows to European banks, including Deutsche Bank and Rabobank, still fund companies linked to deforestation and ecosystem degradation in the Brazilian Amazon and Indonesian peatlands (Marsden et al., 2024). Investigations by non-governmental organisations (NGOs) such as Global Witness echo this finding. For example, between 2016 and 2024, European banks such as Rabobank provided substantial credit to firms driving deforestation, generating billions in income despite their strong deforestation and nature policies (Global Witness, 2025).

Such findings suggest that exclusion- and certification-based policies may be insufficient without robust supply-chain tracing, enforcement, portfolio transparency and real-time monitoring of client compliance. Moreover, transition periods (e.g. certification deadlines in KBC's policy) allow continued exposure in the interim.

A significant accountability gap is revealed by the persistent financing of high-risk firms, including in the agricultural and mining sectors, and by banks with formal deforestation policies. Without transparent reporting on compliance, on-the-ground land-use outcomes or the termination of the

contracts of non-conforming clients, policies risk becoming virtue-signalling mechanisms rather than effective safeguards.

While the growing number of formal deforestation and nature-risk policies is a necessary step, the evidence suggests that many banks continue to finance activities tied to deforestation. These policies will only be effective with systematic enforcement, engagement, withdrawal from non-compliant clients, transparent disclosure and robust monitoring at the portfolio level.

Banks are operationalising these sectoral, geographical and thematic policies through a range of instruments that shape their risk assessment and decision-making processes, even if they are not yet fully embedded into core prudential models. At the operational level, exposure to nature-sensitive sectors or locations frequently leads to enhanced due diligence, materiality assessments or internal risk heat maps. These assessments can directly influence credit risk outcomes, as illustrated by Rabobank's application of environmental RAFs to address nitrogen-related pressures in the Dutch agricultural sector. This resulted in Stage 3 impairments and €23.3 million in management adjustments under Standard 9 of the International Financial Reporting Standards (IFRS) (Rabobank Annual Report 2024). A small but growing number of banks are also beginning to reflect nature-related considerations in loan origination, pricing or collateral assessments (e.g. Rabobank Deforestation and Land Conversion Policy 2025). Nevertheless, the translation of these policies into quantitative risk metrics remains limited, with most institutions relying primarily on qualitative tools.

Within this toolkit, exclusions are the most established and widely used instrument for operationalising nature-related policies, but their impact is limited when they are not complemented by other policies. Exclusions were among the first measures banks adopted – often in response to legal risks – and were one of the approaches most cited by the banks in the sample. Banks commonly use exclusion lists to avoid financing activities associated with high or unmitigable environmental harm, such as deforestation, the use of dangerous chemicals or activities affecting protected areas. Institutions including ABN AMRO, AIB and CaixaBank explicitly exclude certain biodiversity-damaging activities or apply stricter criteria in sensitive areas. In some cases, these exclusions concern activities that are already unlawful, such as illegal logging. That said, exclusions are a blunt tool: they can restrict financing in sectors or regions where leading clients set good practice, and they may shift rather than solve underlying risks unless paired with robust engagement and traceability controls.

Over time, banks' policy frameworks have broadened beyond exclusions alone. Some institutions now complement exclusionary measures with targets, commitments and conditionality aimed at limiting financed environmental degradation, supporting nature-positive activities or integrating nature-related risks into risk management processes more directly. While these developments signal a gradual shift away from reputational safeguards and towards risk-based management, their implementation remains uneven and only partially embedded into day-to-day credit and portfolio decisions.

Banks are beginning to embed nature-related risks into prudential risk processes through client engagement and improved governance measures

Banks are progressively embedding nature-related considerations into risk management processes across prudential risk categories. This integration is designed to identify, monitor and mitigate nature-related risks at the client and portfolio levels, thereby enhancing prudential soundness and supporting an orderly transition. Examples of this include Commerzbank's efforts to map biodiversity- and environment-related risks, and ABN Amro's efforts to map the short-, medium- and long-term consequences of these risks across all prudential categories (Commerzbank Pillar 3 Report 2024; ABN Amro Integrated Annual Report 2024).

However, progress on the integration of nature-related considerations into risk management processes remains uneven. Some banks have announced that they consider nature factors such as biodiversity and water stress indicators in risk assessment processes at the portfolio level, drawing on tools indicated in the EBA guidance (EBA, 2021). For example, BBVA (BBVA Pillar 3 Report 2024) uses water stress scores to evaluate exposures in the power generation and cement sectors (see Table 4.1). In addition, a few banks are integrating nature considerations into their business risk assessments,

referring to operational and strategic dependencies that include reliance on ecosystem services such as water availability and soil health, and impacts such as pollution and land degradation (e.g. Rabobank Annual Report 2024).

Such portfolio risk assessments can then feed into the way banks assess their clients' viability and risk profiles. Banks embed sector-specific ESG questionnaires into specific credit processes for high-risk sectors as part of their client evaluation frameworks. For instance, BNP Paribas incorporates ESG assessment questionnaires covering 19 sectors into its credit-process and know-your-customer system, enabling the bank to track compliance and assess the maturity of its ESG strategies (BNP Paribas Annual Report 2023). Due diligence processes related to environmental protection laws and the prevention of environmental crimes complement these measures. Screening mechanisms ensure compliance with environmental regulations and government embargoes, particularly in sectors such as agriculture (Rabobank Impact Report 2023). Some institutions check whether clients appear on public embargo lists for environmental crimes before approving loans (ibid.).

Banks' reporting often fails to clearly distinguish between controls that relate to mandatory legal requirements in third countries and discretionary, risk-based policies that are applied group-wide. In cross-border groups, some controls that are presented as part of the client assessment process (e.g. screening clients against embargo or non-compliance lists) are legally required in certain jurisdictions outside the EU. For example, Brazil's rural-credit rules require checks against embargo or non-compliance lists and prohibit lending when their criteria are not met. To avoid overstating the maturity of risk management, disclosures should ideally indicate when a control or policy fulfils a third-country legal requirement or is a voluntary group-wide practice.

Banks' internal governance structures play an important role in screening and escalating environment-related risk concerns across business lines. Dedicated, cross-functional teams emerge as important intra-institutional hubs of expertise. One example is KBC, which has established a Core Team responsible for the day-to-day implementation of its Sustainable Finance Programme. This team brings together specialists from the finance, credit risk and risk functions, as well as sustainability experts, and collaborates with business units across the group. Its mandate also covers specific environmental themes such as biodiversity, water and the circular economy (KBC Sustainability Report 2023).

Several banks have developed integrated, nature-related risk monitoring and escalation processes. These practices include setting quantitative and qualitative indicators to capture both physical and transition risks, and to measure them against risk appetite limits. Rabobank incorporates sustainability performance assessments throughout the lifecycle of financing, with Client Assessment on Sustainability (CASY) measuring biodiversity and pollution in the air, water and soil. This directly informs credit risk parameters such as Probability of Default and Loss Given Default (Rabobank Annual Report 2024). Deutsche Bank includes nature-related risks in its early-warning indicator monitoring architecture across portfolios, using thresholds for escalation as part of its operational risk management infrastructure (Deutsche Bank Sustainability Statement 2024). In addition, Rabobank has announced that it updated its deforestation and land-conversion policy in 2024, strengthening restrictions for soya, beef and other soft commodities across specific South American biomes, partly as a response to observed client-level and regional breaches (Rabobank Annual Report 2024). This update includes an effective escalation framework for managing nature-related risks. The bank sets clear restrictions on high-risk commodities, monitors client compliance and revises policies when breaches occur. The process ensures that real-world client behaviour informs ongoing improvements, reducing long-term exposure to environmental risks.

4.4. How banks mitigate nature-related risks

Banks adopt policy updates, client and stakeholder engagement, monitoring and reassessment loops, and selective investment in 'positive effect' activities

Risk monitoring practices are a key instrument for triggering the reassessment of specific policies. Several banks adjust sectoral policies once nature risks materialise or when supervisory or civil-society scrutiny highlights gaps. For example, after years of encouraging bad practice, Rabobank updated its

deforestation and land-conversion policy in 2024, strengthening restrictions for soya, beef and other soft commodities across South American biomes such as the Amazon, the Cerrado and the Gran Chaco (Rabobank Impact Report 2023; Rabobank Annual Report 2024). Updates respond to observed client-level or regional breaches and aim to reduce long-term exposure to high-risk areas. Policy revisions act as a risk-based filter that raises onboarding thresholds, tightens conditions at review and supports portfolio rebalancing away from hotspots. As described below, Rabobank reports that it conducts regular reviews of the results of its actions, applying corrective measures where necessary (Rabobank Annual Report 2024). However, some banks have announced nature-related risk-monitoring processes without making the details clear or setting hard limits on related exposures.

Client engagement and escalation are primary levers for risk mitigation. Banks are increasingly using client engagement as both a proactive and reactive tool to manage nature-related risks. ABN AMRO, for example, integrates nature-related risks into its existing four-tier engagement structures, comprising normal intensity, focus list, high intensity and thematic engagement for systemic issues. This model is supported by governance mechanisms such as second-line validation for high-risk clients and annual monitoring, while contract termination remains a last resort for non-compliance. The bank's Nature Statement 2024 also prioritises biodiversity dialogue, particularly in the agricultural sector (ABN AMRO Nature Statement 2024). Rabobank takes a similar approach by requiring clients linked to environmental or social breaches to develop time-bound compliance plans, with relationship termination being a possible outcome if remediation efforts fail (Rabobank Annual Report 2024). Banks also participate in sector-wide efforts to reduce risk in specific value chains.

In addition, banks are expanding their approach to nature-related risks by engaging with a broader range of stakeholders, recognising these risks as systemic challenges that require concerted action. To make progress in this area, institutions are collaborating with NGOs, governments, academics, industry bodies and international fora to develop sector-wide standards and share knowledge and data. For example, Santander, Crédit Agricole and others have announced contributions to initiatives such as the Principles for Responsible Banking (PRB) Target Setting Working Group, which led to the publication of the PRB Nature Target Setting Guidance (UNEP FI, 2023). A significant number of banks in the sample have joined TNFD working groups and pilot projects (e.g. Deutsche Bank Transition Plan 2023). Collaboration with academia and NGOs is also growing, with banks such as LBBW partnering with WWF to tackle practical challenges in biodiversity risk assessment (LBBW Annual Report 2022) and BNP Paribas funding research programmes focused on nature-related topics (BNP Paribas Annual Report 2024). Beyond collaboration, banks are actively engaging with financial counterparties and other stakeholders to reduce risks in specific sectors. For instance, Santander is working with FEBRABAN to create best practices for financing the beef sector in a way that avoids deforestation, employing traceability controls to ensure clients do not acquire cattle linked to illegal deforestation (Santander Sustainability Statement 2024).

Banks are expanding nature-positive financing and framing this as a form of risk mitigation, but the understanding and measurement of its effects on risks are underdeveloped. Banks often highlight their actions as having a positive effect on nature in public reports, sometimes presenting them as risk mitigation measures. In line with the logic of double materiality, banks may mitigate financial risks arising from nature degradation by generating or promoting positive impacts on ecosystems (e.g. UniCredit Integrated Report 2023). However, the articulation and measurement of such positive impacts remain at an early stage. Typically, banks describe their contributions in general terms, stating that they create positive impacts primarily by preventing nature-related damage through environmental requirements and review processes embedded into financing and investment decisions (e.g. LBBW Annual Report 2024). In other instances, banks participate in the issuance of sustainability-linked loans with a specific focus on biodiversity (BNP Paribas Annual Report 2023) in bond issuances that finance actions aimed at preserving the quality of the natural environment, such as forest protection (ibid.), or that finance sustainable fishing (BBVA Annual Report 2022). Nevertheless, many initiatives rarely disclose quantitative information on the scale or actual impact of these activities. This is a major drawback, especially as funding of damaging activities far outweighs that of nature restoration globally (UNEP FI 2026).

Other mitigation initiatives sit outside core lending. Some activities that integrate ecological restoration into client strategies are undertaken not within banks' lending activities but rather through their asset management and insurance offerings. For example, Crédit Agricole Assurances has announced its

support for reforestation and sustainable forest management initiatives through the distribution of forest investment and insurance products (Crédit Agricole Annual Report 2021). Similarly, the regional banks of Crédit Agricole, together with IDIA Capital Investissement, have launched an investment fund dedicated to the French timber industry, with the objective of supporting the value chain in its sustainable growth (Crédit Agricole Annual Report 2022).

Integrated risk mitigation strategies remain limited but show how complementary tools – from client engagement to stakeholder action – may have a positive impact on nature and society, reducing system-level risk. In this regard, Santander's Plano Amazônia – a collaboration between the three largest private banks in Brazil – promotes sustainable development and environmental protection in the Amazon region through complementary measures, such as engaging with clients to advance zero-deforestation goals in key supply chains (e.g. cattle, meat production); financing sustainable crops and bioeconomy sectors (e.g. cocoa) tailored to local producers and cooperatives; establishing mechanisms to address land tenure issues and encourage the regularisation of land titles; and creating strategic partnerships with local governments (Santander Annual Report 2020). However, while this initiative looks comprehensive on paper, there has been no assessment of its effectiveness.

5. Lessons and recommendations

Our analysis of 15 EU banks has highlighted examples of good practice but also limitations in how nature-related risks are conceptualised and managed. This final section summarises key lessons from the research and presents recommendations for EU banks, regulators and financial supervisors.

5.1. Recommendations for EU banks

Enhancing internal coherence across corporate and risk management functions

Banks should improve their internal coherence by aligning definitions, terminology and practices across their corporate, sustainability and risk management functions. This alignment should be consistently reflected in corporate sustainability (CSRD) and risk (Pillar 3) disclosures. Different definitions across corporate and prudential frameworks are underpinned by common conceptualisations of environmental factors outlined in the EU Taxonomy. Nevertheless, banks rarely demonstrate how these concepts are applied consistently across their internal functions. Internal siloes often prevent banks from systematically mapping corporate assessments and prudential risk management, increasing the risk that they will underestimate the links between business and prudential risks. As a result, institutions may prioritise different subsets of nature-related risks and apply different time horizons depending on the disclosure framework.

Good practice consists of explicitly mapping and comparing the nature-related risks identified in corporate disclosures with those assessed for prudential purposes. While recognising the distinct objectives of corporate and prudential reporting, leading institutions align terminology, risk drivers and materiality assessments across functions. They prioritise consistent sets of nature-related risks, transparently explain divergences and ensure coherence across short-, medium- and long-term horizons where relevant. Banks' internal guidance should clearly link EU regulatory definitions to internal risk taxonomies, ensuring that prudential risk management and stress testing exercises rely on the same assumptions and drivers that underpin corporate sustainability analysis.

Integrating the climate–nature nexus into analytical frameworks

Banks should jointly assess climate and nature risks in their analytical frameworks. Despite growing recognition of the climate–nature nexus, there is limited evidence that banks are incorporating the interactions between climate and nature risks into their risk assessments. Continued reliance on a climate-focused perspective leads to insufficient assessment of material nature-related exposures and underestimates compounding risks. Assessing climate and nature-related risks jointly, while clearly distinguishing between their respective transmission channels, is essential to understanding borrower resilience, portfolio vulnerability and long-term individual, sectoral and system-wide stability.

Good practice involves adopting a sectoral-level approach to assess compound climate–nature risks in elevated nature-dependent sectors, such as agriculture and real estate. These assessments require banks to account for nature-related risk drivers that interact with climate risks, as well as those that operate independently of them. In real estate, this involves complementing flood and storm assessments with analysis of land-based pressures such as soil subsidence, erosion and groundwater depletion, which can undermine asset values and insurability even without the onset of extreme weather events. In agriculture, this entails moving beyond drought-centric analysis to account for water quality, soil fertility, pollination services and biological pressures that more directly shape yields, income stability and default risk.

Embedding nature-related risks into strategy and internal governance practices

Banks' strategic statements on nature-related risks need to be translated into tangible actions. Nature is gradually moving from peripheral statements to a core element of strategic positioning, commitments and early transition planning. Many EU banks also highlight opportunities to develop

nature-related financial products that can diversify and enrich their offerings and services. Good practice involves going beyond the treatment of nature as being only of high-level strategic value; thus, nature-related considerations need to be embedded into banks' RAFs with a definition of the level of nature-related risk they are willing to tolerate. Banks – particularly those with operations in nature-rich regions – should also integrate nature into their transition planning alongside climate, supported by time-bound and quantified targets.

Governance of nature-related risks should evolve to serve as the bridge between a bank's overall strategy and its day-to-day risk management practices. Currently, many banks rely on ESG or compliance teams to assess nature-related risks – which, in some cases, receive dedicated attention at the management level. More commonly, these risks are integrated into governance processes through training, workshops and awareness-raising activities. To strengthen governance, banks should clearly assign ownership and accountability for nature-related risks across the three lines of defence (operational management, risk oversight and internal auditing). This includes active oversight by the board and the chief risk officer, as well as regular reporting to ensure that policies and procedures are effectively translated into tangible risk management outcomes.

Translating nature risk concepts into prudential frameworks

Banks should map nature-related risks onto prudential risk categories and integrate them into core risk management processes. Banks' conceptual framing of nature-related risks has matured since 2020 but remains uneven in scope and operational depth. Banks need to translate these concepts into established prudential risk categories and day-to-day risk management processes. Most banks in the sample treat nature-related risks as a subset of ESG risks that materialise through traditional financial risk channels. Although there has been some progress in linking nature-related risks to business model, operational (including compliance) and reputational risk drivers, banks rarely establish the explicit connections between nature loss and credit, liquidity and market risks that are consistent with the NGFS Nature Conceptual framework (NGFS, 2024a). Moreover, within the operational risk category, banks generally do not demonstrate an awareness of the potential legal risks arising from nature degradation, as highlighted by the NGFS (2024b).

To address these gaps, banks should explicitly distinguish between the prudential implications of nature-related physical and transition risks, and should integrate them, first and foremost, into their risk assessment frameworks. For physical risks (e.g. water scarcity, soil erosion and biodiversity loss), banks should conduct forward-looking exposure analyses across different time horizons. These assessments should capture location-specific ecosystem dependencies and nature degradation pathways, covering both chronic and acute risk drivers, as well as interactions across different ecosystem services. Banks should systematically incorporate relevant non-prudential regulatory developments into their assessments of transition risks. These developments include supply-chain due diligence requirements (e.g. the CSDDD and the EU Deforestation Regulation), horizontal and sector-specific environmental policies (e.g. the EU Nature Restoration Law) and related NBSAPs at the member-state level. In addition, banks should consider biodiversity conservation targets, circular economy frameworks, restrictions on harmful chemicals and land use, and deforestation bans.

Moving from exposure mapping to financial risk assessments

Banks should not be discouraged by the absence of fully quantified risk measures for nature-related risks. For complex risks, such as nature-related risks, quantification should be seen as a tool to support banks' understanding and decision-making, not as a prerequisite for action. Quantitative analysis is most effective when anticipated and complemented by qualitative indicators, such as client engagement outcomes, supply-chain due diligence assessments and scenario analysis of regulatory, technological and market developments affecting nature-dependent and nature-detrimental activities.

Collecting, analysing and comparing relevant qualitative and quantitative information could help banks develop a better understanding of nature-related risks. In contrast to human-induced climate change, which is a novel phenomenon, there are past records of nature-related risks that can be used as case studies: nature degradation has already generated observable economic and financial impacts in multiple regions (Almeida et al., 2024), providing a growing evidence base from which

banks can learn. Historical episodes and ongoing cases of soil degradation, water scarcity, fishery collapse and ecosystem loss offer concrete evidence on transmission channels, vulnerabilities and loss amplification that can inform risk assessment today. Advancing from exposure mapping to a mix of qualitative and quantified risk estimation is essential to embedding nature-related risks into prudential risk assessments, including credit decision rules and portfolio management.

Good practice should move beyond high-level exposure screening to forward-looking assessments of material nature-related risks. While many credit institutions use exposure analyses and heat maps based on ENCORE to identify exposed sectors and areas, these approaches primarily capture dependencies rather than the scale, severity or transmission channels of nature-related risks. To address these limitations, exposure analyses and heat maps should be complemented by value-chain-based analytical tools, such as environmentally extended input–output models (e.g. EXIOBASE), scenario analysis and granular client-level data. Client engagement is particularly essential to gather granular information on operational sites, sourcing locations and ecosystem dependencies, as well on their nature-related exposures and data gaps. Limited information on nature-related dependencies and risks can signal weak risk management, insufficient operational controls or a lack of oversight of supply chain activities, which can feed back to banks. Banks should use this knowledge to translate specific ecosystem degradation analysis into financial risk assessments, particularly with regard to credit risks.

Leveraging existing data and enabling collaboration

Banks can make meaningful progress by leveraging existing data and applying it consistently across their internal functions. Across bank disclosures, data systems and collection practices are of uneven maturity, raising concerns about data consistency and decision-usefulness. At the same time, the coexistence of complementary, evolving and experimental approaches demonstrates that meaningful assessment is underway and, if further developed, could help mitigate the build-up of systemic risks across the financial sector.

Data-sharing and collaboration can improve data comparability, with siloes – not scarcity – one of the core constraints on this. Good practice involves leveraging existing data by, for example, drawing on real-world case studies and applied research, and by collaborating with public bodies and academic partners. While post-Omnibus data constraints pose challenges, they are not the primary obstacle to stronger nature-related risk management. The evidence shows that several banks already draw on diverse sources of data, including satellite monitoring, sector datasets, client questionnaires and research partnerships. This underscores the fact that analytical capability and the effective use of the available evidence matter at least as much as the availability of the data itself.

Developing concrete nature-related policies and processes

Risk assessments should serve as a foundation for concrete action. The outcome of materiality assessments provides the evidence base that allows banks to move from high-level awareness to actionable measures.

Banks should refine their nature-related risk management. They should integrate nature-related risks into their capital adequacy assessments, credit decision-making frameworks and ongoing portfolio monitoring, accounting for the short-, medium- and long-term implications of both physical and transition risks. In addition, banks should clearly distinguish between group-wide risk-based controls and measures implemented solely to comply with third-country legal requirements. This differentiation helps reduce the risk of greenwashing allegations and limits the likelihood of supervisory escalation.

Banks should develop comprehensive risk control frameworks for nature-related risks rather than rely on exclusion policies. While many banks have implemented sectoral, region-specific or thematic policies targeting high-risk activities, these are often operationalised mainly through exclusions, which are designed to avoid financing projects associated with significant or unmitigable environmental harm. However, if they are not supported by robust client engagement and traceability controls, exclusion-based approaches can inadvertently restrict financing in vulnerable regions without addressing the underlying nature-related issues. In some cases, reported exclusion policies are largely

nominal, applying only to activities that are already illegal or commercially unviable rather than informed by prudential risk considerations.

Good practice involves translating policy commitments into concrete constraints on risk taking, which enhance the credibility and effectiveness of nature-related governance. Such policies could take the form of comprehensive risk control and engagement frameworks, incorporating client due diligence requirements, exposure limits, covenant structures and escalation triggers, including time-bound actions and exit strategies.

5.2. Recommendations for regulators and financial supervisors

Regulatory actions: strengthening conceptual clarity

EU regulators could support a more holistic integration of nature-related risks by streamlining terminology and setting further conceptual criteria for nature risk assessments – through, for instance, further EBA guidance. Following the regulatory and supervisory actions that have taken place since 2022, banks have moved away from conflating climate and environmental risks, and have begun to address the latter as distinct risk categories requiring dedicated analytical approaches. Nevertheless, the simultaneous use of ESG (or environmental) risks, climate and nature risks, and international nature-related risk frameworks continues to hinder comparability across banks' initiatives and risk management practices, making it difficult to assess the type and extent of specific nature-related risks that are identified and prioritised (e.g. biodiversity loss, water scarcity, deforestation).

EU regulators could enhance clarity through a few concrete measures. In particular, they could articulate how different terms relate to one another and assess whether there are gaps or overlaps in banks' reporting. In addition, they could monitor which drivers of nature degradation EU banks most frequently incorporate into their risk assessments, and which ones they tend to overlook. Finally, regulators could encourage banks to deepen their analysis of climate–nature linkages, interactions between ecosystem services and the scientifically grounded time horizons over which nature-related risks are likely to materialise, drawing on evidence such as IPBES assessments (IPBES, 2026). Such guidance would reduce interpretative variance across institutions and lead to more consistent supervisory expectations.

Supervisory actions: embedding nature risks into supervision

Supervisors could use supervisory dialogue to require institutions to demonstrate how nature-related risk drivers are linked to prudential risk categories and risk management. This practice would improve the coherence of banks' internal functions, linking strategic signalling to risk management practices. Supervisors should expect banks to evidence how nature-related risks map onto credit, market, liquidity, operational, reputational and business model risk drivers rather than refer to ESG risks only in broad terms. Expectations should include clarity on time horizons, decision rules and the percentage of affected portfolios.

Supervisors could also require banks to address the execution gaps identified in Section 5.1. They should test whether banks have translated their stated (current or past) commitments into robust practices and consistently reinforced them in line with scientific evidence and updated data methodologies. At the same time, supervisory teams should closely coordinate with one another to monitor how nature-related policies and processes are applied in different countries.

In this way, supervisors should seek to strengthen market discipline linked to nature-related risks. Without such coordination, a significant divergence in bank-level parameters may persist, making it difficult for supervisors, investors and the wider public to make meaningful comparisons when analysing nature-related exposures disclosed across corporate reporting and Pillar 3 frameworks.

Where gaps persist, supervisors should use their powers outlined in EU legislation. Tools under Article 104 of CRD6 include the reinforcement of internal capital and governance requirements, additional reporting to supervisory authorities, and non-compliance measures such as time-bound remediation expectations.

Treating impacts and risks as tightly coupled

Supervisors should reflect on the relationship between impacts and risks, given that the local, rapid and geographically defined nature of ecosystem degradation can mean that environmental impacts become near-term financial risks, not distant externalities. Distinguishing between impacts and risks is uniquely challenging in the nature context, as many environmental impacts can rapidly translate into financial risks. As a result, firms contributing to ecosystem degradation are often directly exposed to the resulting financial risks in the same locations and on short time horizons. For regulators and supervisors, this implies that short-term profitability can hide the accumulation of sectoral and system-wide vulnerabilities, as well as contagion effects. Ultimately, these affect individual banking institutions in multiple prudential categories.

Supervisors should account for the potential for rapid impact-to-risk transmission in their supervisory activities, asking banks to evidence how (and where) they consider such linkages. Building on the EBA Guidelines on the management of ESG Risks published in 2025, prudential assessments can encourage disciplined practice. These assessments can do so by requiring banks to show – for material sectors and locations – how local environmental pressures such as pollution incidents, land-use change and soil degradation could translate into credit, market, liquidity, operational and business model risk. This involves incorporating shorter time horizons, location-specific exposure analysis and dependency–impact linkages into risk identification, materiality assessments and supervisory dialogue.

Providing guidance on nature-related metrics and methodologies

Supervisory guidance should consider which types of metrics and proxies are suitable for nature-related risk assessments. Some credit institutions already assess soil health, biodiversity impacts, water stress and land-use change, reflecting the interconnected nature of ecosystems. Proxies can be useful entry points to assessing nature degradation if used in a multidimensional manner (e.g. water, land, soil, biodiversity, pollination, pollution). Reliance on single proxies, such as water alone, risks missing interactions and feedback across ecosystems. Likewise, highly aggregated metrics such as MSA-based biodiversity footprints are not, on their own, well-suited to decision-grade prudential risk assessment.

As supervisors grapple with integrating nature-related risks into prudential frameworks, meaningful assessments will require careful consideration of the decision-usefulness of metrics and engagement with the scientific community. Training on metrics for supervisors can equip them with the skills to use ongoing supervisory dialogue to question banks' uptake of metrics and to set expectations of banks' justifications of their choice of metrics. Where metrics are experimental, supervisors can require clear statements of purpose, limits of use and escalation thresholds to ensure decision-usefulness.

Building capability and strengthening collaboration across institutions

Data access, interoperability and inter-institutional collaboration should be improved through partnerships and shared repositories tied to supervisory use cases. The EBA's establishment of the Pillar 3 Hub is an important step in facilitating access to, and comparisons between, prudential data across the EU. In addition, the European Single Access Point will apply to sustainability and financial information across the EU, reducing data fragmentation. Banking supervisors can further develop the data offering by supporting data-sharing arrangements with other financial market supervisors at the EU and national levels, environmental agencies such as the European Environmental Agency and third-country authorities, and platforms such as the NGFS. Promoting partnerships and dialogue between banks and research institutions can also help bolster data quality and availability.

Effective supervision of nature-related risks requires sustained investment in supervisory capability. To maintain specialised supervision of nature-related risks, supervisory staff should receive dedicated training on these risks, as they do on climate-related risks. This should be supported by explicit resourcing and analytical tools for staff. Joint curricula on the climate–nature nexus could help address current capability gaps and ensure consistent treatment across authorities. Knowledge-building could be further strengthened through secondments, collaboration with research institutions and the establishment of internal communities of practice across supervisory teams, both at the horizontal level and focused on individual banks, reflecting the sectoral and geographical diversity of banks' exposures.

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Appendix

Credit institutions in the sample and reports drawn on for the analysis

	2020	2021	2022	2023	2024
ABN AMRO	Annual Report 2020	Integrated Annual Report 2021; Impact Report 2021	Integrated Annual Report 2022; Impact Report 2022	Annual Report 2023; Impact Report 2023; Impact Assessment 2023; Pillar 3 Report 2023	Integrated Annual Report 2024; Nature Statement 2024; Pillar 3 Report 2024
AIB	Annual Report 2020; Sustainability Report 2020	Annual Report 2021; Sustainability Report 2021	Annual Report 2022; Sustainability Report 2022; Pillar 3 Report 2022	Annual Report 2023; Sustainability Report 2023; Pillar 3 Report 2023	Annual and Sustainability Reports 2024; Pillar 3 Report 2024
BBVA	Annual Report 2020	Annual Report 2021	Annual Report 2022	Annual Report 2023; Pillar 3 Report 2023	Annual Report 2024; TCFD Report 2023; Pillar 3 Report 2024
BNP Paribas	Annual Report 2020	Annual Report 2021; Biodiversity Position 2021	Annual Report 2022	Annual report 2023	Annual Report 2024; Climate Report 2024; Pillar 3 Report 2024
CaixaBank	Management Report 2020; SDGs & Socio-economic Report 2020	Management Report 2021; Sustainability & Socio-economic Report 2021	Management Report 2022; Sustainability SDGs Report 2022; Climate Report 2022	Management Report 2023; Sustainability SDGs Report 2023; Climate Report 2023; Pillar 3 Report 2023	Management Report 2024; Sustainability SDGs Report 2024; Pillar 3 Report 2024
Commerzbank	Annual Report 2020	Annual Report 2021	Annual Report 2022	Group Annual Report 2023; GRI Report 2023; Pillar 3 Report 2023	Annual Report 2024; Pillar 3 ESG 2024; Annex 4 to Pillar 3 Report 2024
Crédit Agricole	Annual Report 2020	Annual Report 2021	Annual Report 2022	Annual Report 2023; Net Zero 2023; Pillar 3 Report 2023	Integrated Report 2024; Pillar 3 Report 2024
Deutsche Bank	Annual Report 2020;	Annual Report 2021; Non-	Annual Report 2022; Non-	Annual Report 2023; Non-	Annual Report 2024; Pillar 3

	Non-Financial Report 2020	Financial Report 2021	Financial Report 2022	Financial Report 2023; Pillar 3 Report Q4 2023; Transition Plan 2023	Report 2024; Sustainability Statement 2024
ING	Bank Annual Report 2020	Annual Report 2021	Annual Report 2022	NV Annual Report 2023; Pillar 3 Report 2023; Additional Pillar III Report 2023; Climate Report 2023	NV Annual Report 2024; Additional Pillar III Report 2024; Climate Progress Update 2024; Nature Publication 2024
Intesa Sanpaolo	Annual Report 2020; Non-Financial Statement 2020	Annual Report 2021; Non-Financial Statement 2021	Annual Report 2022; Non-Financial Statement 2022; Pillar 3 Report 2022	Annual Report 2023; Non-Financial Statement 2023; Pillar 3 Report 2023	Annual Report 2024; Pillar 3 Report 2024; SDG Report 2024
KBC	Group Annual Report 2020; Risk Report 2020; Sustainability Report 2020	Group Annual Report 2021; Risk Report 2021; Sustainability Report 2021	Group Annual Report 2022; Risk Report 2022; Sustainability Report 2022; Climate Report 2022	Group Annual Report 2023; Risk Report 2023; Sustainability Report 2023	Group Annual Report 2024; Risk Report 2024; Sustainability Report 2024
Landesbank Baden-Württemberg (LBBW)	Annual Report 2020; Non-Financial Report 2020	Annual Report 2021; Sustainability Report 2021	Annual Report 2022; Sustainability Report 2022	Annual Report 2023; Sustainability Report 2023; Sustainable transformation. (our path to net zero) 2023; Pillar 3 Report 2023	Annual Report 2024; ESG Strategy Excerpt 2024; Pillar 3 Report 2024
Nordea	Annual Report 2020; Sustainability Report 2020	Annual Report 2021; Sustainability Indices 2021	Annual Report 2022; Sustainability Indices 2022; Pillar 3 Report 2022	Annual Report 2023; Sustainability Indices 2023; Pillar 3 Report 2023	Annual Report 2024; Climate Targets and Action Lending Portfolio 2024; Pillar 3 Report 2024
Rabobank	Annual Report 2020; Impact Report 2020	Annual Report 2021; Pillar 3 Report 2021;	Annual Report 2022; Pillar 3 Report 2022;	Annual Report 2023; Pillar 3 Report 2023;	Annual Report 2024; Pillar 3 Report 2024

		Impact Report 2021	Impact Report 2022	Impact Report 2023	Impact Report 2024
Santander	Annual Report 2020; Materiality Assessment 2020; Santander and the SDGs 2020	Consolidated Annual Report 2021	Consolidated Annual Report 2022; Santander and the SDGs 2022; Climate Finance Report 2022	Consolidated Annual Report 2023; Climate Finance Report 2023; Pillar 3 Report 2023	Consolidated Annual Report 2024; Pillar 3 Report 2024; Sustainability Statement 2024; Climate Finance Report 2024
UniCredit	Annual Report 2020; Integrated Report 2020; TCFD Report 2020	Annual Report 2021; Integrated Report 2021; TCFD Report 2021	Annual Report 2022; Integrated Report 2022; Pillar 3 Report 2022; TCFD Report 2022	Annual Report 2023; Integrated Report 2023; Pillar 3 Report 2023; TCFD Report 2023	Annual Report 2024; Pillar 3 Report 2024