EIOPA Staff paper on nature-related risks and impacts for insurance

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EXECUTIVE SUMMARY

1.1. The European Commission issued a proposal for a regulation on nature restoration in June 2022. In December 2022, the Parties to the UN Biodiversity Conference (COP15) adopted the Kunming-Montreal Global Biodiversity Framework to secure biodiversity and ecosystems for the next decade, including initiatives on 'nature finance'.

1.2. This impetus reminds the world of the potentially life-threatening consequences of the loss of nature to humankind. Nature can be considered as a source of defense against climate change, and a major source of physical and mental wellbeing.[1] Failure to account for, mitigate, and adapt to the consequences of the loss of nature can be a source of economic risks potentially jeopardising financial stability. Over half of global GDP depends on nature and services it provides. Biodiversity underpins healthy and nutritious diets and improves rural livelihoods and agricultural productivity. More than 75% of global food crop types rely on animal pollination.[2] Estimates have been made of biodiversity loss that could lead to between €1.7 trillion and €3.9 trillion losses each year.[3]

1.3. In this context it is vital to consider what the role of the insurance sector can be in contributing to the restoration and conservation of nature through investment and underwriting activity and to assess from a prudential perspective how nature-related risks can affect (re)insurers' balance sheets and business more generally.

1.4. As part of its sustainable finance strategy, EIOPA aims to establish supervisory expectations for the management of nature-related risks and impacts in a step-by-step approach. This staff paper is a first step in this process.

1.5. Building on existing research referred to in conceptual papers from, among others, the Sustainable Insurance Forum (SIF) and the Network for Greening the Financial Sector (NGFS), EIOPA's staff paper provides a framework to identify the key areas that need to be addressed in the treatment of nature-related risks and impacts in the insurance sector.

1.6. The paper describes the transmission channels of nature-related risk into society and economy and the relation between climate and nature-related risks. The paper identifies how nature-related risks can translate into risks to (re)insurers' assets and liabilities, how (re)insurers can impact on these and the types of approaches for assessing risks and impacts.

1.7. EIOPA's next initiatives will focus initially on identifying the relevant data sets and tools for performing risk assessments. For this purpose, EIOPA supports the open access to data and

[1] Biodiversity - our strongest natural defense against climate change | United Nations

[2] COM Inception impact assessment on 'Protecting biodiversity: nature restoration targets under EU biodiversity strategy'

[33] DNB Biodiversity Working Group Biodiversity Working Group (dnb.nl)

development of scenarios and modelling to allow forward-looking risk assessment of nature-related risks.

1.8. Going forward, this will allow conducting materiality assessments for nature-related risks and impacts, by supervisors as well as by undertakings in their ORSAs.

1. TRANSMISSION OF NATURE-RELATED RISKS INTO SOCIETY AND ECONOMY

1.1. Nature-related risks refer to the risk of loss of nature, i.e. the loss of natural capital, the reduction of the stock of renewable and non-renewable natural resources, plants and animal species on earth, as well damage to the way in which they interact with each other ('ecosystems'). The term nature is used often interchangeably with 'biodiversity and ecosystem services (BES)'.[4]

1.2. The identification of nature-related risks can be based on the same typology applied to climate-related risks: nature-related risks can materialise because of transition risk (resulting from changes in policy, technological, legal requirements, consumer preferences aimed at reducing or reversing damage to nature) or physical risk (due to the materialisation of damage to nature, changes in natural stock and flows).

1.3. Economic activities that negatively impact nature, and with it the economy and society at large, are most likely to be exposed to nature-related transition risks. Economic activities that are highly dependent on intact nature are most likely to be exposed to nature-related physical risks. The bigger and more catastrophic the expected physical risks are, the stronger the drivers for transition get (increased policy and regulatory changes, changing market sentiment or technological innovation to support conservation and restoration), causing increased transition risks.

1.4. Nature-related risks are transmitted into society directly ('first-order'), indirectly (i.e. 'second order', for example through value chains,) or through spill-over impacts (contagion), affecting citizens, businesses and the economy at large.

1.4.1. For example, in first order, loss of biodiversity would have an impact on the productivity of agricultural activity (declining soil productivity), impacting in second order the food production value chain. As a spill-over, lower productivity in agricultural business can impact on insurance lines providing coverage for loss of revenue. In second order, loss of biodiversity can also lead to a lack of diversity in diets causing malnutrition, diseases and premature deaths and spill over into insurance lines providing health coverage.

1.4.2. For example, in first order, nature-related losses would have an impact on climate regulation or adaptation, leading in a second order effect to increased exposure to climate-related risks caused by natural catastrophes, spilling over into reduced

[4] See the Annex for more detailed definitions.

values of properties in exposed areas, affecting the collateral value of assets backing mortgages, leading to credit risk for banks.

1.5. An accumulation of economic impacts at the micro level (e.g. at business level) can lead to impacts at the meso level (e.g. at local government level), and when occurring at a larger scale (countrywide, regional or global), lead to macroeconomic impacts such as the disruption of economy-wide value chains, raw material price volatility, the adjustment or relocation of business activities or an increased rate of capital depreciation. This is well illustrated by the following example:

1.5.1. The Amazonian forest's water recycling system (one of the ecosystem services) has been severely damaged over the last decade because of deforestation. This, in turn, has resulted in water shortages for irrigation and the loss of soil moisture, directly impacting Brazil's farming industry, which accounts for 30 percent of the country's GDP. The water shortages also mean less water for the country's hydroelectric plants, causing competition among several industries for limited electricity production. This, along with the increasing use of more expensive thermal power as an alternative, contributes to increasing electricity prices for businesses and households. Since Brazil is one of the leading global exporters of agricultural commodities like soy, these price increases can have a global macroeconomic impact.[5]

1.6. From a financial risk-based perspective, loss of natural capital and the ensuing loss of value to society and economic activity translate into risk on the financial market participant's balance sheet. In addition to economic firm-level financial risk, the risk of environmental collapse resulting from biodiversity loss and natural capital depletion may also create a systemic risk to the financial sector and broader to financial stability.

[5] SIF (2021).

2. THE RELATION BETWEEN CLIMATE AND NATURE-RELATED RISKS

2.1. The terms nature-related and environmental risks are on occasions used interchangeably. Environmental risks include nature- as well as climate-related risks and encompass the interaction between nature losses and climate change. While nature-related and climate-related risks are closely connected, nature-related risks are not identical to natural hazards that arise with increasing frequency and intensity because of climate change.[6]

2.2. Mapping the similarities and differences between nature-related and climate risks can contribute to defining nature-related risks and identifying tools for addressing nature-related risks.

Similarities between nature- and climate-related risks	**Differences between nature- and climate-related risks**
Risk characteristics	
Climate and nature-related risks are environmental risks which can transmit to (re)insurance through physical and transition risks. Physical and transition risks can translate on the insurers' balance sheet via existing prudential and conduct risks categories (reputational, legal, market, counterparty default, underwriting). Fundamental uncertainty exists around the timing and severity of climate and nature-related impacts, the non-linearity of natural processes and the possibility of crossing irreversible tipping points. Systemic nature of the risks due to interrelation of risks. Likely impacts on economies and financial systems will be far-reaching, likely to be subject to tipping points and many are likely to be irreversible.	Nature-related risk is (even more) multidimensional (than climate change) and cannot be reduced to a single metric. For example, in terms of prevention, there is no equivalent to the climate change mitigation indicator which is focused on reducing carbon emissions regardless of where in the world they are produced. Nature-related risk restoration and conservation requires taking into consideration more intricate interactions within an ecosystem, often at regional level.[7] Economic impacts of nature-related risks may impact financial stability more dramatically, due to high dependency of economic actors on a range of ecosystem services.

[6] Natural hazards, which are hazards that are due to natural variability (i.e. temperature, wind, water or solid-mass related chronic or acute hazards; not human-induced) are most often associated with climate change in the sustainability context.

[7] For example, the presence of a diverse and functioning plant community can encourage infiltration of water into the soil, recharging ground and surface water, anchoring the soil, reducing erosion and aiding flood protection. These interactions between plant biodiversity and sustainable land-use might not be well understood by non-specialists.

Data, methodologies and metrics	
Non-linear increase in the frequency, intensity and concentration of risks makes historical data and linear modelling assumptions less relevant. Need for forward-looking risk assessments (e.g. scenario analysis, stress testing) on different pathways of development to assess the impact of the risks and integrate potential prevention measures.	Nature-related risk data are even more difficult to collect and ecological interactions even more difficult to model than climate change. Nature-related risk, in particular the complexity of ecosystems, cannot be measured through a single indicator such as CO2-equivalent for climate change. Unique challenges for constructing biodiversity scenario analysis for transition and physical risks result from this lack of specific biodiversity targets or metrics comparable to those for climate change; the multiplicity of pathways and the lack of biodiversity equivalents of the Representative Concentration Pathways (RCPs) used in physical climate risk scenarios (NGFS).
Insurability	
Difficulties to diversify and pool risks across individuals or companies, due to the interrelation of risks.	Natural catastrophes are characterized by major, unpredictable single events; biodiversity losses are not easily connected with single events. This may require more granular disaggregation of risks and encompassing complex data needs. Possibly more intensified risk concentration, threatening risk pooling across a region: a large number of ecological processes are local, e.g. fresh water regulation or food and feed support. On the other hand, the collapse of some systemically important biomes (Amazon Rainforest, coastal ecosystems within the Coral Triangle reef system and the boreal forests of North America and Eurasia) would have potentially even wider systemic impacts, for climate regulation for example, making risk diversification impossible.

2.3. Beyond these commonalities and particularities, climate and nature-related risks and impacts are inextricably linked (referred to as the 'climate- biodiversity nexus') and exhibit self-reinforcing feedback loops. The decline in biodiversity can have a material impact on the ability of ecosystems to regulate climate and natural processes, which determine the ecosystem's contribution to prevent natural disasters and mitigate climate change, which in turn affects biodiversity and ecosystems.

2.4. Climate and nature-related risks can be mutually reinforcing through[8]:

2.4.1. the pressure of climate change on biodiversity and ecosystems. For example, the absorption of excess carbon dioxide by oceans has increased their temperature and

[8] SIF (2021).

acidity, making it difficult for many marine species such as shellfish to form their calcium shells. As a result, many such species at the bottom of marine food chains are disappearing, with negative impacts on the growth and distribution of fish stock higher up in the food chain.

2.4.2. biodiversity loss exacerbating climate change. For example, the destruction of marine life in the oceans leads to a decrease in the capacity of oceans to sequester CO2 from the atmosphere (i.e. degrading carbon storage), hence accelerating global warming.

2.5. Climate change and nature-related prevention measures can have mutually mitigating effects through:

2.5.1. the prevention of damage caused by natural catastrophes, through nature-based solutions. For example, coral reefs, wetlands or other nature-based solutions act as nature-based prevention measures against wind, water or temperature-related damage caused by climate-related natural catastrophes. For example, forests with a rich and diverse range of vegetation can create natural fire breaks and slow down the spread of wildfires.

2.6. Adversely, some mitigating action for climate change may also have negative impacts on nature, resulting in negative trade-offs or unintended effects (for example, poorly planned tree planting, such as exotic species and monocultures, to capture carbon dioxide emissions), leading to invasive alien species threatening biodiversity[9]. In developing solutions, these interactions need to be considered, too.

[9] NGFS (2022).

3. NATURE-RELATED RISKS FOR (RE)INSURERS' INVESTMENTS AND LIABILITIES

3.1 The dependency or impact on nature of the (re)insurance sector itself is limited: from its direct operations, the (re)insurance industry neither impacts heavily on nature nor consumes many natural resources compared to other sectors.

3.2 (Re)insurers will mostly experience **indirect nature-related risks** through their investments and liabilities: by investing in or providing coverage to companies that are not adapted to the transition to a low impact (nature positive or neutral) environment or that are (increasingly) at risk from reduced biodiversity and ecosystem services, (re)insurers will face indirect nature-related transition or physical risks, respectively.

3.3 Nature-related transition risk: Misalignment of (re)insurers' asset and liabilities portfolios with developments (policy, technological, legal, consumer preferences) aimed at reducing or reversing damage to nature can result in increased counterparty defaults or declining asset values (market risk) on their investments in bonds, stocks and funds, as well as risks of mispricing and increasing claims (underwriting risk). For example, due to the 'tightening' (increase) of legal requirements for due diligence or mandatory liability for environmental damage, transition risks may materialise in liability insurance (environmental liability[10], Directors and Officers insurance[11]), credit and suretyship insurance.

3.4 Nature-related physical risk: Materialisation of damage to nature, changes in natural stock and flows, can result in increased losses in investments or liabilities, also causing market or underwriting risk. Where insured goods or activities suffer nature-related damage, insurers may face increasing numbers and amounts of claims, for example in:

- Property and business interruption insurance: due to natural catastrophes losses impacted by the absence of nature-based prevention measures. For example, absence of coral reefs, wetlands or other nature-based solutions that can act as nature-based prevention measures against wind, water or temperature-related damage, by providing coastal protection or climate regulation.[12] For example, lack of

[10] For example, when a company has polluted the environment causing biodiversity damage to surrounding properties, or if deforestation leads to water damages which in return are covered by insurance policies, thereby increasing payouts by insurance companies. See Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage Environmental Liability Directive.

[11] For example, pending adoption of the Corporate Sustainable Due Diligence Directive, which as per the Commission's proposal includes a mandatory liability regime for failure to mitigate or to adapt to sustainability impact.

[12] For example, coastal and riverine forests and mangroves provide erosion protection, with tree roots building a defence against waves and providing water storage in cases of heavy rainfall. Globally, the flood protection benefits provided by mangroves exceed US$65bn

raw materials, e.g. for cosmetics or pharmaceutical production, or power shortages for energy generated by hydropower, resulting from soil degradation leading to water scarcity/drought caused by damage to nature, leading to business interruption.

- Marine, Aviation and Transport insurance: due to nature-related erosion reducing waterway navigability, causing sinkholes and infrastructure damage and leading to loss of revenue.
- Crop insurance: due to loss of revenues because of reduced soil productivity resulting from extensive land-use or lack of pollination.
- Life and health insurance: due to increase in morbidity and mortality caused by respiratory diseases, temperature-related deaths or mental diseases, increase in zoonotic diseases and pandemics as a result of changes in nature, such as eradication of green spaces or the transformation of animal habitat.[13] Increase in morbidity and mortality resulting from limited availability/absence of nature-based solutions for pharmaceutical products, due to depletion of raw material.

3.5 Furthermore, due to financial devaluations and/or default of (re)insurers' investees, caused by biodiversity and ecosystem disruption and not anticipated within the Solvency Capital Requirement, (re)insurers could experience a long-term decrease in financial returns that reduces their future financial flows, causing solvency risks.

3.6 Insurers can additionally face **direct nature-related risks**, such as physical risk to property held for own use (e.g. company offices), which are located in, for example, land- and seascapes that suffer damage related to the loss of nature (e.g. property exposed to increasing flood risk as a result of soil erosion due to deforestation). Furthermore, being associated with investees or policyholders (in the latter case, also irrespective of the nature of the insured risk) who have a negative impact on nature can cause direct reputational risk, leading to loss of policyholders or divestment of stakeholders. Depending on the applicable regulatory framework, insurers may also face direct legal risk from failing to disclose or report adverse impacts[14], or to perform due diligence under (emerging[15]) regulatory requirements on their investees or policyholders. These risks may ultimately adversely impact stakeholder and shareholder value of the insurer (operational risk).

per year. In areas where such forests have disappeared, landslides are more frequent and storm surges move further inland, increasing property losses. See: Dunn and Rutherford-Liske (2021).

[13] Increasing green space in urban areas also reduces the impacts of extreme heat and the related costs of hospitalization, and an increasing number of people gravitate to outdoor spaces to help manage their mental health. Forests and vegetation purify the air: where they exist, the burden of respiratory diseases is lower than it is in areas without trees.

[14] As per Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector (SFDR) and Directive (EU) 2022/22464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 204/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting (CSRD).

[15] Pending adoption of EU Directive on Corporate Sustainability Due Diligence.

3.7 Finally, as nature-related physical and transition risks increase, this can reduce the availability of insurable as well as investable assets, affecting business opportunities more generally.[16]

3.8 Besides prudential risks, (re)insurers could suffer direct conduct risk, if insurance products are unclear about coverage of losses caused by nature-related risks. Increasing exclusions of cover will have negative consequences on the value of insurance products for consumers.

3.9 Eventually, where nature-related risks are of increasingly systemic nature, and diversification of risks becomes more difficult, reinsurance solutions for covering losses caused by nature-related physical or transition risks may become more expensive, causing premiums for insurance to rise, making insurance less affordable for businesses and consumers. If, in addition, proper risk management of insured risks fails (e.g. due to mis-pricing), insurers facing solvency issues can fail, and economic losses will remain uncovered or require governments to step in, causing further spill-over effects. Broader economic vulnerabilities can develop where economic losses would remain uninsured, leaving costs to citizens and public authorities, negatively impacting further on the resilience of the economy.

[16] SIF (2021).

4. ASSESSMENT OF RISKS

4.1. There are two main approaches for identifying and quantifying nature-related risks, based on:

4.1.1. **The dependency of an economic activity on biodiversity and ecosystem services.** This involves mapping production processes to biodiversity and ecosystem services and rating their degree of dependency, considering whether the dependency is direct or through the value chain. This methodology could be applied to build indicators for assessing the exposure of the activity to nature-related physical risk (high dependency meaning high exposure to the physical risk of damage to nature).

4.1.2. **The impact of an economic activity on biodiversity and ecosystems ('biodiversity footprint').** The biodiversity footprint is the contribution of an economic activity to changes to nature (biodiversity and ecosystem changes) from its own operations or from the operations it enables (e.g. through investing or insuring). This methodology could be applied to build indicators for assessing nature-related transition risk (high footprint meaning the activity is at risk of increased measures for conservation and restoration).

4.2. Combining data on economic sectors' dependency and their impact on nature with data on exposure of (re)insurers to these sectors through investments and liabilities, can support a high-level materiality assessment for nature-related risk exposures on the (re)insurer's balance sheet.

Materiality assessment for nature-related risks to (re)insurers based on economic sector and geographical exposure

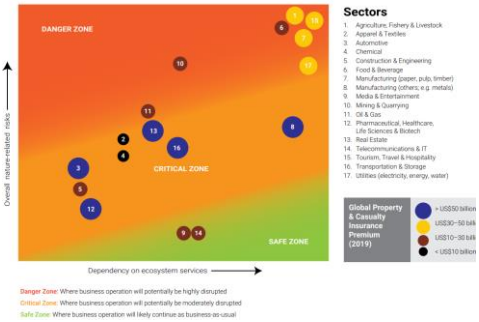
A high-level materiality assessment of nature-related risks for the (re)insurance underwriting and investment activity can be made by assessing the amount of premiums written in economic sectors with a high dependency on ecosystem services and/or high biodiversity footprint (**economic exposure**).

For example, SIF provided a mapping of exposure to economic sectors, suggesting that – subject to firm- and geography-specific characteristics - seven economic sectors, contributing to about 10 percent of the global P&C insurance premium, could be exposed to significant disruption as nature-related risks become more severe.[17]

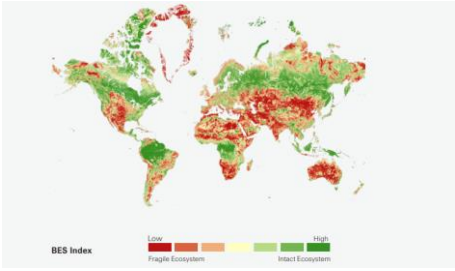
[17] SIF 2021.

Combining such economic sector mapping with a **geographical exposure** mapping (e.g. Global Swiss Re BES index[18]), the corresponding nature loss for an economic activity in a particular geography could be assessed at a more granular level.

Physical and transition risk exposure of non-life insurers (directional estimate) to economic sectors (SIF)



Global Swiss Re Institute Biodiversity and Ecosystem Index mapping and overlaying intact and fragile locations



4.3. Various tools are being developed and tested to assess risk exposures and to allow to identify how financial flows contribute directly or indirectly to nature-related risks (see NGFS 2022, Appendix 3).

[18] SRI 2020.

5. APPROACHES TO MANAGING NATURE-RELATED RISKS

A. TARGETS AND TRANSPARENCY

5.1 Managing nature-related related risks requires targets, at global and regional level, setting the pathway to conserve and restore biodiversity and ecosystems. These targets provide the high-level narrative for biodiversity transition scenarios.

5.2 The intricacies of ecological interactions and the complexity of the loss dynamic make it virtually impossible to devise one target for nature-related conservation and restoration, unlike for example the Paris Agreement target for limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C.

5.3 The Kunming-Montreal Global Biodiversity Framework agreed in December 2022 sets targets for a transition pathway to protect and restore biodiversity, which governments need to implement, and economic and financial market participants should follow through in their activities.

5.4 The financing of the targets, as well as the monitoring of their implementation are crucial in achieving measurable progress. Signatory parties to the Kunming-Montreal targets commit to financing the targets through a Global Biodiversity Fund: financing from different sources should amount to USD 200 billion per year by 2030. Subsidies harmful to biodiversity should be identified by 2025 and eliminated by 2030 for a total of at least USD 500 billion per year. Before the next COP in 2024, countries must prepare updated National Biodiversity Strategies and Action Plans as well as National Biodiversity Finance Strategies. The next COPs will consider if the cumulative impact of the national actions is sufficient to reach the global goals and targets for 2030 and 2050.

5.5 Companies and financial institutions will be required to regularly monitor, assess and disclose risks, dependencies and impacts on biodiversity; and provide information to consumers to promote sustainable consumption.

5.6 At EU level, the EU Biodiversity strategy aims to ensure that Europe's biodiversity will be on the path to recovery by 2030, including by aiming for legal protection of a minimum of 30% of the EU's land area and a minimum of 30 % of the EU’s sea area; and restoration, by 2030, of significant area of degraded and carbon-rich ecosystems, ensuring that habitats and species do not show deterioration in conservation trends and status, and at least 30 % to reach favourable conservation status or at least show a positive trend.

5.7 The European Commission Proposal for a Regulation on nature restoration, as well as the EU Taxonomy objectives and criteria need to integrate these targets into technical screening criteria in order to identify economic activities that meet such ‘nature-related’ objectives. Two of the

six EU Taxonomy's environmental objectives are related directly to the sustainable treatment of natural capital: the protection and restoration of biodiversity and ecosystems, as well as the sustainable use and protection of water and marine resources.[19] To date, the EU Taxonomy provides technical screening criteria for climate change mitigation and adaptation objective (Taxonomy Climate Delegated Act 2021/2139). The adoption of technical screening criteria for the other four environmental objectives is expected in the course of 2023; in turn, the European Sustainability Reporting Standards will need to be consistent with these criteria.

Table: Summary targets, objectives and indicators of risks & impacts related to biodiversity and water & marine resources

Kunming-Montreal biodiversity targets	**EU Biodiversity strategy targets**[20]	**Taxonomy objectives as per Taxonomy Delegated Regulation 2020/852**	**Risks and impact indicators related to biodiversity and water & marine resources under EU Corporate Sustainability Reporting and Sustainable Finance Disclosure**
Protect 30 % of global terrestrial and marine areas and restore 30 % of degraded ecosystems. Four goals and 23 targets, supported by indicators[21] for national biodiversity strategies and action plans.	Protect a minimum of 30% of the EU's land area and a minimum of 30 % of the EU sea area; and restoration, by 2030, of significant area of degraded and carbon-rich ecosystems, ensuring that habitats and species do not show deterioration in conservation trends and status, and at least 30 % to reach favourable conservation status or at least show a positive trend.	Do no significant harm to the good status or the good ecological potential of bodies of water, including surface water and groundwater, or the good environmental status of marine waters; the good condition and resilience of ecosystems, or the conservation status of habitats and species.[22] Substantially contribute to protection and restoration of biodiversity and ecosystems through: (a) nature and biodiversity conservation, including achieving favourable conservation status of natural and semi-natural habitats and species, or preventing their deterioration where they already have favourable conservation status, and protecting and restoring terrestrial, marine and other aquatic ecosystems in order to improve	Technical screening criteria for economic activities to comply with biodiversity/ water and marine resources conservation and restoration objectives under the EU Taxonomy (pending adoption of the Taxonomy Delegated act incl. the environmental objectives on biodiversity and water & marine resources). Mandatory disclosure from 2023 by insurers within scope of the Sustainable Finance Disclosure Regulation of a mandatory principal adverse impact indicator on the impact of their investment portfolios on biodiversity (share of investments in investee companies with sites/operations located in or near to biodiversity-sensitive areas where activities of those investee

[19] Taxonomy Regulation, Article 9.

[20] EU Biodiversity Strategy Actions Tracker: EU Biodiversity Strategy Actions Tracker (europa.eu)

[21] Monitoring framework for the Kunming-Montreal Global Biodiversity Framework (CBD/COP/DEC/15/5).

[22] Taxonomy Regulation, Article 17.

	16 targets with over 100 sub-targets.	their condition and enhance their capacity to provide ecosystem services; (b) sustainable land use and management, including adequate protection of soil biodiversity, land degradation neutrality and the remediation of contaminated sites; (c) sustainable agricultural practices, including those that contribute to enhancing biodiversity or to halting or preventing the degradation of soils and other ecosystems, deforestation and habitat loss; (d) sustainable forest management, including practices and uses of forests and forest land that contribute to enhancing biodiversity or to halting or preventing degradation of ecosystems, deforestation and habitat loss; or (e) enabling any of the activities listed in points (a) to (d).[23] In addition: compliance with minimum social safeguards.[24]	companies negatively affect those areas).[25] Mandatory disclosure, from 2024 onwards by insurers within scope of the Corporate Sustainability Reporting Directive of information on factors related to biodiversity and ecosystems, as well as water and marine resources. (adoption by the European Commission of Delegated Acts specifying the reporting standards pending).[26] Mandatory disclosure from 2024 of KPIs on the proportion of assets that are directed at funding, or are associated with the protection and restoration of biodiversity and ecosystems, and water and marine resources according to the EU Taxonomy[27]

B. NATURE-BASED INVESTMENT AND UNDERWRITING ACTIVITIES

5.8 The European Commission defines nature-based solutions as "s*olutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and*

[23] Taxonomy Regulation, Article 15.

[24] Alignment with the OECD Guidelines for Multinational Enterprises and the UN Guiding Principles on Business and Human Rights, including the principles and rights set out in the eight fundamental conventions identified in the Declaration of the International Labour Organisation on Fundamental Principles and Rights at Work and the International Bill of Human Rights.

[25] Additional (voluntary) nature-related indicators are: Share of investments in investee companies whose operations affect threatened species; the share of investments in investee companies without a biodiversity protection policy covering operational sites owned, leased, managed in, or adjacent to, a protected area or an area of high biodiversity value outside protected areas; the share of non-vegetated surface area (surfaces that have not been vegetated in ground, as well as on roofs, terraces and walls) compared to the total surface area of the plots of all assets (for investments in real estate assets).

[26] The Commission will take into consideration the technical advice from EFRAG to prepare the Delegated Act. EFRAG has issued its technical advice on a first set of sustainability reporting standards in November 2022, including general disclosure requirements on biodiversity and ecosystems, including on transition plans, material impacts, risks and opportunities, due diligence process, metrics and targets.

[27] Commission Delegated Regulation 2021/2178 of 6 July 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by specifying the content and presentation of information to be disclosed by undertakings subject to Articles 19a or 29a of Directive 2013/34/EU concerning environmentally sustainable economic activities and specifying the methodology to comply with that disclosure obligation (Taxonomy Disclosure Regulation).

economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions." Nature-based solutions support major EU policy priorities, in particular the European Green Deal, the EU biodiversity strategy and climate adaptation strategy, as a way to foster biodiversity and make Europe more climate-resilient.[28]

5.9 (Re)insurers' investment or underwriting strategies could contribute to funding or covering risk for nature-based solutions, aiming to protect and restore biodiversity and ecosystem services. Such investment or underwriting decisions will also contribute to reducing transition and physical risks on the (re)insurers' balance sheets.

5.10 The extent of nature-related externalities generated by the insurance industry through their investment or underwriting activity could provide a basis for identifying how (re)insurers could target their activity to nature-based solutions. This can be based on the assessment of their investees and/or policyholders' nature-related footprint or dependency (see above), to serve as input for science-based due diligence requirements to identify, monitor and mitigate the most important impacts.

5.11 Nature-based investment or underwriting activities can aim at supporting the financing or the coverage of risks for activities related to[29]:

a) **nature and biodiversity conservation** including achieving favourable conservation status of natural and semi-natural habitats and species, or preventing their deterioration where they already have favourable conservation status, and protecting and restoring terrestrial, marine and other aquatic ecosystems in order to improve their condition and enhance their capacity to provide ecosystem services;
b) **sustainable land use and management**, including adequate protection of soil biodiversity, land degradation neutrality and the remediation of contaminated sites;
c) **sustainable agricultural practices**, including those that contribute to enhancing biodiversity or to halting or preventing the degradation of soils and other ecosystems, deforestation and habitat loss;
d) **sustainable forest management**, including practices and uses of forests and forest land that contribute to enhancing biodiversity or to halting or preventing degradation of ecosystems, deforestation and habitat loss

5.12 Where (re)insurers contribute to reducing nature-related impacts through their underwriting and/or investment activity, this could in turn mitigate the risks transmitted to their balance sheets. Based on a common risk assessment methodology for nature-related risks and impacts, (re)insurers can consider investment and underwriting strategies for incentivising the

[28] See: Research policy (europa.eu)

[29] Based on the activities that can have a 'substantial contribution to the protection and restoration of biodiversity', according to the Taxonomy Regulation.

preservation of natural capital, potentially also as part of strategies and decisions to mitigate or adapt to climate change.

Nature-based investment solutions

5.13 Investment activity could be directed to support activities that reduce the risk of loss of biodiversity.[30] Existing financial industry initiatives pledge to act this way, focused on closing the financing gap through investments.[31]

5.14 Insurers are at an early stage in using tools to assess and disclose the biodiversity footprint for their investments, to identify where the investment portfolio exerts most pressure on nature, and hence where mitigation or adaptation measures could be appropriate.

Measures for degradation of ecosystems caused by investment activities using the Corporate Biodiversity Footprint (CBF)

The CBF aims to identify, at a portfolio level, the biodiversity-related impact of an investor's investment activities. The unit of biodiversity impact used to calculate CBF is the "Mean Species Abundance" (MSA) which expresses the average relative abundance of native species in an ecosystem compared to their abundance in undisturbed ecosystems.

Using the tool can support the measurement of the risk of biodiversity degradation generated by the activities of the companies invested in, expressed in km2 MSA/M€ invested: the metric shows the surface in km² artificialized (i.e. where native species in an ecosystem have disappeared) per million euros invested.

Nature-based underwriting solutions

5.15 Insurance activity can also aim in a risk-based manner to underwrite losses for companies that have nature-positive impacts - irrespective of whether the insured risk is related to the nature-positive activity.

5.16 Less advanced is the offer of 'nature-aligned' insurance products. EIOPA's concept of impact underwriting considers nature-based solutions as innovative underwriting practices serving important mitigation (reduce loss of biodiversity) as well as adaptation measures against climate-related hazards while preserving biodiversity.[32] Natural structures such as forests, coral

[30] See: The EU Business @ Biodiversity Platform | Home (europa.eu)

[31] See for example: Finance for Biodiversity Pledge – Reverse nature loss in this decade

[32] EIOPA 2023

reefs, wetlands and dunes reduce the impact of natural hazards such as hurricanes and floods. For example, coastal wetlands prevented USD 650 million worth of damages during the 2012 hurricane Sandy[33]. Examples exist of nature-based solutions that can limit underwriting losses from crop insurance by supporting high diversity of crop species that improves the resilience of crops to pests and pathogens, positive impact of ecological forestry on the risk and price for wildfire insurance coverage.[34] Community-based insurance, written by an insurer and purchased directly by local government, for example for the protection of coral reefs, or to support investment in ecological forestry can lead to premium savings and investments in preservation and conservation, reducing damages caused by windstorms or wildfires and keeping insurance affordable.[35] Including the measurement of protective benefits of biodiversity and ecosystems into insurance risk models could contribute to improving loss management.

C. PRUDENTIAL TREATMENT OF NATURE-RELATED RISKS AND IMPACTS

5.17 Sustainability risks in the Solvency II regulatory framework integrate environmental, social and governance (ESG) risks in the (re)insurers' governance and risk management requirements.[36] This ensures that environmental sustainability risks are treated similarly in a prudential risk context, irrespective of their underlying cause. If considered a material risk source, nature-related risk should therefore be treated conceptually similar like other environmental-related risks (e.g. climate change), where similar risk channels affect the balance sheet. This is even more important considering the interrelation of some nature-related risks and climate change related risks.

5.18 Following challenges and opportunities exist for addressing the management of nature-related risks in Solvency II:

5.18.1 **Pillar I**: There is no explicit prudential treatment for sustainability-related capital requirements in Solvency II, and hence also no capital requirements exist for nature-related risks today. EIOPA has launched a discussion on initial considerations for a prudential treatment for climate-related transition risks, where data seems to be most advanced at this stage.[37] There are still important challenges to the measurement of the potential impact of nature-related risks on insurers balance sheets, mainly due to issues related to data availability, common risk indicators and absence of common scenarios. For this reason, a

[33] Investing in Nature for a Resilient Future | The OECD Forum Network (oecd-forum.org)

[34] SIF 2021, Dunn and Rutherford-Liske 2021.

[35] SIF 2021 includes a case study of a coral reef insurance policy for the Mesoamerican Reef in Mexico.

[36] Commission Delegated Regulation (EU) 2021/1256 of 21 April 2021 amending Delegated Regulation (EU) 2015/35 as regards the integration of sustainability risks in the governance of insurance and reinsurance undertakings.

[37] EIOPA 2022a.

Pillar I-based prudential treatment of nature-related risks is unlikely to develop in the short term.

5.18.2 **Pillar II**: The management of sustainability risks – hence also nature-related risks – is part of the Solvency II Pillar II governance and risk management requirements, including the Own Risk and Solvency Assessment (ORSA). To perform ORSA on nature-related risks, (re)insurers need clear definitions and (consistent) methodologies for assessing the materiality of the risks. For climate risk, the EIOPA Opinion on the Supervision of the use of climate change risk scenarios in ORSA[38] requires 2-type scenario analysis on material climate change risks, supported by application guidance and reference to common scenarios. The materiality assessment of nature-related risk through quantitative scenario analysis, similar to climate-related risk, is inherently difficult, and work is underway to define appliable scenarios.[39] However, a high level qualitative risk assessment should be possible to comply with the ORSA requirements today.[40] Furthermore, as part of the Prudent Person Principle under Solvency II, undertakings are required to consider the impact of their investment strategy and decisions on sustainability factors – hence including on nature-related factors.[41] Targets and indicators, such as under SFDR and the EU Taxonomy Disclosure Regulation will contribute to identifying the impacts and the progress in achieving nature-related objectives. Similar to impact underwriting for climate-related adaptation, insurers should identify measures to mitigate nature-related risks through underwriting practices and services.[42]

[38] EIOPA 2021.

[39] For example, by the Network for Greening the Financial System.

[40] Pending the outcome of the review of the Solvency II Directive, EIOPA may also be called in the medium term to evaluate whether and to what extent insurance and reinsurance undertakings assess their material exposure to risks related to biodiversity loss as part of ORSA. The Council General Approach for amending the Solvency II Directive stipulates in proposed article 304a – Mandates as regards sustainability risk: […]: *3. EIOPA shall evaluate whether and to what extent insurance and reinsurance undertakings assess their material exposure to risks related to biodiversity loss as part of [ORSA]. EIOPA shall subsequently assess which actions could be taken in order to ensure that insurance and reinsurance undertakings do so, where necessary, taking into account existing measurement tools. EIOPA shall submit a report on its findings to the Commission by [one year after the entry into force of this amending Directive]*.

[41] From a conduct perspective, the Insurance Distribution Directive requires insurance undertakings and insurance intermediaries to integrate customer's sustainability preferences in the suitability assessment, and where relevant, these preferences shall be reflected in the investment strategy of the insurer. Commission Delegated Regulation (EU) 2021/1257 of 21 April 2021 amending Delegated Regulations (EU) 2017/2358 and (EU) 2017/2359 as regards the integration of sustainability factors, risks and preferences into the product oversight and governance requirements for insurance undertakings and insurance distributors and into the rules on conduct of business and investment advice for insurance-based investment products.

[42] EIOPA 2023.

5.18.3 **Pillar III**: unlike for climate change risks to investments, Solvency II does not require today supervisory reporting or public disclosure on nature-related risks.[43] However, extensive corporate sustainability reporting under CSRD and SFDR is materialising.

[43] EIOPA 2022. While corporate sustainability disclosure requirements under CSRD and sustainable finance disclosure requirements under SFDR are being gradually implemented, EIOPA has taken a step-by-step approach to supervisory reporting, starting with climate risks to investments (first reporting based on YE 2023).

6. ROLE OF SUPERVISORS AND REGULATORS

7.1 As part of their mandates to protect consumers and preserve financial stability, supervisors and regulators will increasingly have to assess nature-related physical and transition risks transmitted to the (re)insurance industry's investment and underwriting portfolios.

7.2 This will require, in a first step

7.2.1 integrating the consideration of nature-related risks in the prudential and conduct supervisory frameworks; and

7.2.2 contributing to the establishment of methodologies and provide guidance on macro-/micro-prudential risk assessment of nature-related risks.

7.3 Furthermore, similar to activity on climate-related risks, supervisors have a role in promoting transparency and risk-based prevention measures that induce behaviour towards conservation and restoration of nature to prevent the rise of (insured) losses from causing protection gaps to the detriment of consumers and systemic risks from jeopardising financial stability. For this purpose, supervisors and regulators

- need to support disclosure on nature-related risks, impacts and opportunities
- can promote measures increasing risk awareness of policyholders and investees about nature-related risks
- should consider addressing regulatory opportunities for conservation and restoration incentives through investment and underwriting requirements
- can contribute to identifying public-private risk transfer solutions based on risk assessment and risk prevention analysis.

7.4 Especially, similar to the analysis of climate-related financial risks, the use of scenarios is needed to provide insights on consequences of different actions based on agreed targets. Stress testing should help in identifying vulnerabilities, beyond simulating effects of past crises but also potentially addressing the endogenous contribution by insurers to nature-related risks through their investing or underwriting activity.

7.5 To improve the assessment and management of inherently complex nature-related risks requires the sharing of knowledge and data across disciplines. Such efforts benefit from supervisory cooperation at European and international level, as well as with external stakeholders and academics. EIOPA supports the open access to data and development of scenarios and modelling to allow forward-looking risk assessment of nature-related risks.

7.6 As part of its sustainable finance strategy, EIOPA aims to establish supervisory expectations regarding the management of nature-related risks and impacts for the insurance industry in a step-by-step approach.

7.7 Including through its engagement with the Network for Greening the Financial System, and the European Systemic Risk Board, initiatives will focus initially on identifying the relevant data sets and tools for performing risk assessments.

This will form the basis for conducting materiality assessments for nature-related risks and impacts, by supervisors as well as by undertakings through their ORSAs.

ANNEX: DEFINITIONS

Nature. The global natural ecosystem in its entirety. This encompasses both the stock of natural capital as well as the way in which they interact with each other ('ecosystem').

Ecosystem. The dynamic community that comprises living organisms, such as microorganisms, plants and animals, as well as non-living environments, each interacting with one another. Different types of ecosystems include terrestrial, marine, freshwater, forest and grassland.

Ecosystem services. Functions and processes that take place within ecosystems, and which capture the (non-)material benefits that humans can obtain directly or indirectly from nature and that sustain and fulfil human life. Ecosystems provide following services:

a) Provisioning: provisioning of raw materials, such as food and water, shelter[44], energy and other resources
b) Regulating & maintenance/supporting: regulation of climate and natural processes, pollination, filtering of waste, purifying and maintenance of natural resources[45]
c) Cultural: non-materialistic goods and services ('spiritual and recreational benefits'), such as green spaces, as well as land and seascapes that allow for leisure and tourism-related activities.

Biodiversity. The variability among living organisms arising from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. It includes diversity within species, between species and of ecosystems.[46] Biodiversity is part of ecosystems and supports ecosystem services, referred to together as 'biodiversity & ecosystem services' (BES), and on occasions used interchangeably with nature-related risks.

Biodiversity loss. An average loss in biological diversity over time and/or space. It is typically detected using indicators derived from observational data such as species population counts.

[44] E.g. habitats providing shelter for plant and animal species while also maintaining their diversity.

[45] E.g. the ecosystem of wetlands that provides vital filtering services of animal and human waste, which purifies water.

[46] Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (Taxonomy Regulation), Article 2(15).

Natural capital. From an economic-utilitarian perspective, the stock of renewable and non-renewable natural resources, plants and animal species on earth that combine to yield a flow of benefits to people.[47]

Nature-related risk. The risk of loss of nature, i.e. the loss of natural capital, the reduction of stock of renewable and non-renewable natural resources, plants and animal species on earth as well damage to the way in which they interact with each other ('ecosystems'). The five (direct) drivers of nature-related losses are: changes in land- and sea-use[48], direct exploitation of organisms, climate change, pollution and invasion of alien (animal and plant) species. [49] Indirect drivers of nature-related risk include production and consumption patterns and associated trade and financial flows that enable or amplify direct drivers.

Nature-related financial risk. The expected or potential negative impact on economic and financial activities that is directly connected to the loss of natural capital. Nature-related financial risks can arise from physical and transition risks that occur at the micro-level (households, companies, financial institutions etc.) and/or the macro-level (national and global financial systems, states etc.).[50]

[47] For example, more than half of global GDP depends on ecosystem services, 75% of the world's crops depend on pollinators or 70% of cancer drugs are natural or inspired by nature (EU COM, 2022). Societal benefits of 'ecosystem services' would be worth USD 125 – 140 trillion US dollars per year, more than one and a half times the size of global GDP (OECD, 2019).

[48] Such as intensive monoculture and urbanisation for the production sector – food (incl. through agricultural expansion), wood, energy and traffic, industry, hunting/gathering/recreation and tourism.

[49] Identified by the IBPES 2019 Global Assessment Report on Biodiversity and Ecosystem Services.

[50] Estimates have been made of biodiversity loss that could lead to between €1.7 trillion and €3.9 trillion losses each year (DNB Biodiversity Working Group Biodiversity Working Group (dnb.nl)).

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