

## DISCLAIMER

### *General disclaimer for SR TEG public agenda papers*

This paper has been prepared by the EFRAG Secretariat for discussion at a public meeting of EFRAG SR TEG. The paper forms part of an early stage of the development of a potential EFRAG position. Consequently, the paper does not represent the official views of EFRAG or any individual member of the EFRAG SRB or EFRAG FR TEG. The paper is made available to enable the public to follow the discussions in the meeting. Tentative decisions are made in public and reported in the EFRAG Update. EFRAG positions, as approved by the EFRAG SRB, are published as [Draft] ESRS, comment letters, discussion or position papers, or in any other form considered appropriate in the circumstances.

### *Additional disclaimer for SR TEG public agenda papers 25 October 2022*

This paper is a draft [Draft] standard prepared by the EFRAG Secretariat for approval of SR TEG and, once approved, it forms the advice that according to EFRAG Due Process SR TEG delivers to SRB as recommended content of the [Draft] final standards to be delivered to the European Commission in November 2022.

This draft reflects the tentative decisions of the SRT in the meetings from June to October 2022 (and reflects the content of the Agenda Papers prepared for those meetings). It has been developed starting from the ESRS Exposure Draft of April 2022, taking into account:

- the revised CSRD text released at the end of June;
- alignment with EDs IFRS S1, S2 and GRI standards as required by the new CSRS whenever possible;
- feedback received from the public consultation.

This draft is an intermediate version of the [Draft] standard and quality checks are still in progress that will result in editorial changes and further presentation/language streamlining.

This includes editorial and presentation review, consistency of language across the standards, update of the references to paragraphs/chapters/sessions within the standard and across all the standards, alignment of definitions and glossary across all standards, possible changes of terminology due to recent IFRS decisions. The items in yellow are also subject to change (reflecting the ongoing quality check or pending other external confirmations). In ESRS 2 items in grey mark the datapoints that have been added for alignment with IFRS S1.

Changes are also possible in the next steps of SRB deliberation and approval, including changes other than editorial.

[Draft] ESRS E4 Biodiversity and ecosystems is set out in paragraphs **REF** and Appendices A: Defined terms and B: Application Guidance. All the paragraphs, including those in the Appendices A and B, have equal authority. Each Disclosure Requirement objective is stated in a bold paragraph, followed by a paragraph that illustrates the principle to be followed in the preparation of the respective disclosures. The [draft] Standard also uses terms defined in other [draft] ESRS and should be read in the context of its objective.

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## Objective

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1. 'Biodiversity and ecosystems' is a cross-topic subject as the main drivers of biodiversity and ecosystems change according to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) are climate change, pollution, land-use and sea-use change, direct exploitation and invasive alien species. As a general remark and to obtain an encompassing understanding of material impacts and dependencies on Biodiversity and ecosystems, information of other environmental standards should be read and interpreted together with the specific disclosure warranted in this Standard.
2. The objective of this [draft] Standard is to specify disclosure requirements which will enable stakeholders to understand:
  - (a) how the undertaking affects biodiversity and ecosystems, in terms of positive and negative material actual and potential impacts;
  - (b) any actions taken, and the result of such actions, to prevent, mitigate or remediate actual or potential adverse impacts and to protect and restore biodiversity and ecosystems;
  - (c) and the plans and capacity of the undertaking to adapt its business model and operations in line (i) with the fundamental and conceptually defining respect of planetary boundaries of the biosphere integrity and land-system change<sup>1</sup>, [(ii) targets outlined in the Post-2020 Global Biodiversity Framework<sup>2</sup> of no net loss by 2030, net gain from 2030 and fully recovery by 2050,] the EU Biodiversity Strategy for 2030<sup>3</sup> with the targets set under the EU Nature Restoration Plan<sup>4</sup> and Enabling Transformative Change<sup>5</sup> and comparable amended or new frameworks and strategies;
  - (d) the nature, type and extent of the undertaking's material risks and opportunities related to the undertaking's impacts and dependencies on biodiversity and ecosystems, and how the undertaking manages them; and
  - (e) the effects of risks and opportunities, related to the undertaking's impacts and dependencies on biodiversity and ecosystems, on the undertaking's development, performance and position over the short-, medium- and long-term and therefore on its ability to create enterprise value.
3. This [draft] Standard derives from the Corporate Sustainability Reporting Directive stating that the sustainability reporting standards shall specify information to disclose about biodiversity and ecosystems.
4. This [draft] Standard sets out disclosure requirements related to the undertaking's relationship to terrestrial, freshwater and marine habitats, ecosystems and populations of related fauna and flora species, including diversity within species, between species and of ecosystems<sup>6</sup> and their interrelation with many indigenous and affected communities<sup>7</sup>.
5. 'Biological diversity' covers the variability among living organisms from all sources including, inter alia, terrestrial, freshwater, marine and other aquatic ecosystems and the ecological complexes of which they are part. An environmental limit is usually interpreted as the point

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<sup>1</sup> <https://www.stockholmresilience.org/research/planetary-boundaries/the-nine-planetary-boundaries.html>.

<sup>2</sup> The Post 2020 Global Biodiversity Framework is designed by the Secretariat of the UN Convention on Biological Diversity (CBD) to guide actions worldwide through 2030, to preserve and protect nature and its essential services to people: <https://www.cbd.int/article/draft-1-global-biodiversity-framework>.

<sup>3</sup> The EU Biodiversity Strategy for 2030: [https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030\\_en](https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030_en).

<sup>4</sup> <https://dopa.jrc.ec.europa.eu/kcbd/dashboard/#EU%20NATURE%20RESTORATION%20PLAN>

<sup>5</sup> <https://dopa.jrc.ec.europa.eu/kcbd/dashboard/#ENABLING%20TRANSFORMATIVE%20CHANGE>

<sup>6</sup> Convention on Biological Diversity (CBD, 1992)

<sup>7</sup> Kunming Declaration, Declaration from the High-Level Segment of the UN Biodiversity, Conference 2020 (Part 1) under the theme: "Ecological Civilization: Building a Shared Future for All Life on Earth"

or range of conditions beyond which there is a significant risk of abrupt irreversible, or difficult to reverse, changes to the benefits derived from natural resource systems with impacts on human well-being (e.g., planetary boundaries).

## Interactions with other ESRS

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6. 'Biodiversity and ecosystems' is a cross-topic subject as the main drivers of biodiversity ecosystems change according to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) are climate change, pollution, land-use and sea-use change, direct exploitation and invasive alien species<sup>8</sup>.
7. To provide a comprehensive overview of what is material to biodiversity and ecosystems, all disclosure requirements concerning material impacts related to biodiversity and ecosystems change arising from other ESRS are listed and referenced in this Standard, and in particular to:
  - (a) ESRS E1 Climate change;
  - (b) ESRS E2 Pollution;
  - (c) ESRS E3 Water and marine resources;
  - (d) ESRS E5 Resource use and circular economy.
8. The content of this [draft] Standard consists of Disclosure Requirements on:
  - (a) General requirements, governance, strategy and management of impacts, risks and opportunities;
  - (b) Implementation – Policies, targets, actions and resources; and
  - (c) Performance measurement.
9. This [draft] Standard covers an environmental sub-topic, however as people benefit from biodiversity and ecosystems, the undertaking' impacts on biodiversity and ecosystems affect communities. When reporting on material negative impacts on affected communities from biodiversity and ecosystem change under ESRS E4, the undertaking shall consider the requirements of ESRS S3 Affected communities.
10. This [draft] Standard covers sector-agnostic disclosure requirements. Sector-specific disclosure requirements are prescribed in ESRS sector specific standards.

## Disclosure requirements

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### **Section 1: General requirements, governance, strategy and materiality assessment**

11. The provisions of this [draft] Standard shall be read in conjunction with and reported alongside the disclosure requirements of ESRS 2.
12. Appendix B of this [draft] Standard contains specific biodiversity and ecosystems-related application requirements the undertaking shall consider and describe these considerations following when disclosing information under ESRS 2, in particular with regards to Disclosure Requirements IRO 1 and 2 regarding the materiality assessment of biodiversity and

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<sup>8</sup> Direct drivers of biodiversity loss: <https://ipbes.net/models-drivers-biodiversity-ecosystem-change>.

ecosystems-related impacts, dependencies, risks and opportunities and the outcome of this process.

13. In addition to the requirements in ESRS 2, this [draft] Standard also includes the topic specific ESRS E4 Disclosure Requirement 1 on transition plan, to be applied by undertakings operating in specific sectors, in line with the targets outlined by the Convention on Biological Diversity in the Post-2020 Global Biodiversity Framework and the EU Biodiversity Strategy.

#### ***Disclosure Requirement E4-1 – Transition plan on biodiversity and ecosystems***

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14. **The undertaking shall disclose its plan to ensure that its business model and strategy are compatible with the respect of planetary boundaries of the biosphere integrity and land-system change and relevant targets outlined in [the Post-2020 Global Biodiversity Framework of no net loss by 2030, net gain from 2030 and fully recovery by 2050, and] the EU Biodiversity Strategy for 2030.**
15. The objective of this Disclosure Requirement is to allow an understanding of the compatibility of the transition plan of the undertaking with regard to planetary boundaries and its capacity to contribute to public policy targets to preserve and restore biodiversity and ecosystems.
16. Based on the list of priority sectors provided by TNFD<sup>9</sup>, this disclosure requirement is mandatory for undertakings in the following industries Agriculture and Farming (AAF), Forestry (AFO), Construction and Engineering (CCE), Oil and Gas – from Midstream and Downstream (EOG), Energy Production and Utilities (EPU), Water and Waste Services (EWW), Food and Beverages (MFB), Paper and Wood Products (MPW), Building materials (MMB), Chemical products (MCP), Coal Mining (MCM), Mining (MMI), Pharma and biotechnology (MPB), Textiles, Accessories, Footwear and Jewelleries (MTA), Tobacco (MTO), and Transportation (TTR).
17. In case the undertaking does not have a transition plan in place, it shall provide an explanation of its biodiversity and ecosystems-related ambition and whether and when it will adopt a transition plan.
18. When disclosing its transition plan, the undertaking shall:
  - (a) provide a high-level explanation on how it will adjust its strategy and business model to ensure compatibility with the:
    - i. planetary boundaries on the biosphere integrity and land-system change<sup>10</sup>;
    - ii. [targets outlined in the Post-2020 Global Biodiversity Framework of no net loss by 2030, net gain from 2030 and fully recovery by 2050;] and
    - iii. relevant targets as part of the EU Biodiversity Strategy for 2030 concerning the EU Nature Restoration Plan and Enabling Transformative Change.
  - (b) disclose its plans for its own operations and its upstream and downstream value chain;
  - (c) explain how its business development strategy interacts with the achievability of its transition plan;
  - (d) highlight the contribution to impact drivers and possible mitigation actions following the mitigation hierarchy and the main path-dependencies and locked-in assets and

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<sup>9</sup> The TNFD Nature-Related Risk and Opportunity Management and Disclosure Framework Beta v0.2 June 2022 p.

<sup>10</sup> A description of the nine planetary boundaries can be found here:

<https://www.stockholmresilience.org/research/planetary-boundaries/the-nine-planetary-boundaries.html>.

resources (e.g., plants, raw materials) that are associated with biodiversity and ecosystems change;

- (e) whether or not biodiversity offsets are part of the transition plan. And if so, where the offsets are planned to be used, the extent of use in relation to the overall transition plan, and whether the mitigation hierarchy was considered;
- (f) indicate whether the i) administrative, ii) management and iii) supervisory bodies have approved the transition plan;
- (g) provide information how the process of implementing and updating the transition plan is managed;
- (h) its metrics and related tools used to measure progress that are integrated in this measurement approach; and
- (i) current challenges and limitations to draft a plan in relation to areas of significant impact and actions the company is taking to address them.

19. Where applicable, this disclosure shall refer to and contextualize information presented under other disclosure requirements of this [draft] Standard.

#### ***Disclosure Requirement related to SBM 4 on resilience of strategy and business model***

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20. The undertaking shall describe the resilience of its strategy and business model(s) in relation to biodiversity and ecosystems. The description shall include:

- (a) an assessment of the resilience of the current business model(s) and strategy to biodiversity and ecosystems-related physical and transition risks. The undertaking shall disclose whether the business model(s) has been verified using a range of biodiversity and ecosystems scenarios – or other scenarios with a modelling of biodiversity and ecosystems related consequences – with different possible pathways and information on the scenarios:
  - i. why the considered scenarios were taken into consideration;
  - ii. how the considered scenarios are updated according to evolving conditions and emerging trends; or
  - iii. whether the scenarios are informed by expectations in authoritative intergovernmental instruments such as the Convention for Biological Diversity and, where relevant, by scientific consensus, that is, in the case of biodiversity and ecosystem services, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).
- (b) the scope of the resilience analysis, (i) along the own operations and the upstream and downstream value chain and (ii) the material transition and physical biodiversity and ecosystems-related risks covered;
- (c) the key assumptions made;
- (d) the time horizon over which the analysis has been conducted;
- (e) the results of the resilience analysis; and
- (f) the involvement of stakeholders, including, where appropriate, holders of indigenous and local knowledge.

**Disclosure requirement related to IRO-1 on description of processes to identify and assess material biodiversity and ecosystem-related impacts, risks and opportunities**

21. The description of the process to identify and assess biodiversity and ecosystems-related impacts, dependencies, and corresponding risks and opportunities shall include:
- (a) how impacts on biodiversity and ecosystems were considered;
  - (b) how dependencies on biodiversity and ecosystems and their services were considered;
  - (c) the process of how such impacts and dependencies were translated into relevant risks and opportunities for the undertaking, including the process to assess and select material transition and physical risks and opportunities, including:
    - (i) the identification of site locations in its own operations and upstream and downstream value chain;
    - (ii) the methodologies to screen its activities in order to identify its physical risks in its own operations and upstream and downstream value chain, including whether these methodologies adopt a spatially explicit approach; and
    - (iii) the definition of the considered time horizons, scenario analysis, assessment of size and scale of the risks and opportunities and how material physical risks are selected, in consideration of severity (scale, scope, remediability) and likelihood criteria.
  - (d) a description of how the undertaking has considered systemic risks to
    - (i) its own business model; and
    - (ii) society as a whole in its assessment of biodiversity and ecosystems-related risks.
  - (e) the process of conducting consultations with affected communities on sustainability assessments of shared biological resources and ecosystems and in particular<sup>11</sup>:
    - i. when a site or a raw material production or sourcing is likely to adversely impact biodiversity and ecosystems, the identification of the specific sites and raw materials production or sourcing with adverse or potential adverse impacts on affected communities;
    - ii. when affected communities are likely to be impacted, the undertaking, shall disclose how these communities were involved in the materiality assessment; and
    - iii. with respect to impacts on priority ecosystem services of relevance to affected communities in its own operations, the undertaking shall indicate how adverse impacts may be avoided. If these impacts are unavoidable, the undertaking may indicate its plans to minimise them and implement mitigation measures that aim to maintain the value and functionality of priority services.
  - (f) whether it uses a methodology that allows it to assess how its own operations or upstream and downstream value chain depend on raw materials or ecosystem services that are disrupted or likely to be, including loss of functionality and financial loss.
22. The undertaking shall specifically disclose:
- (a) whether or not it has sites located in or near biodiversity-sensitive areas and whether activities related to these sites negatively affect these areas:

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<sup>11</sup> Source: IFC Performance Standard 6, 2012.

- iv. by leading to the deterioration of natural habitats and the habitats of species and disturb the species for which a protected area has been designated; and
  - v. where conclusions or necessary mitigation measures identified by any of the following assessments have not been implemented accordingly (Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds; Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora; an Environmental Impact Assessment (EIA) as defined in Article 1(2), point (g), of Directive 2011/92/EU of the European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment; and for activities located in third countries, in accordance with equivalent national provisions or international standards, such as the International Finance Corporation (IFC) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.
- (b) a list of material sites based on the results of paragraph 22 (a). The undertaking shall disclose these locations by:
- i. specifying the activities negatively affecting these areas;
  - ii. providing a breakdown of sites according to the impacts and dependencies identified, and to the ecological status of the areas (with reference to the specific ecosystem baseline level) where they are located; and
  - iii. mentioning site-coordinates using a universally valid location syntax for users to be able to determine the exact location.
- (c) whether or not it has identified material negative and positive impacts with regards to land degradation, desertification or soil sealing<sup>12</sup>; and
- (d) whether it or not it has material impacts on threatened species in its own operations.

## **Section 2: Implementation – Policies, targets, action plans and resources**

### **Disclosure Requirement E4-2 – Policies related to biodiversity and ecosystems**

23. **The undertaking shall disclose its policies implemented to manage its material impacts, risks and opportunities related to biodiversity and ecosystems.**
24. The objective of this Disclosure Requirement is to allow an understanding of the extent to which the undertaking has implemented policies that address the identification, assessment, management and/or remediation of its material biodiversity and ecosystem-related impacts, dependencies, risks and opportunities, and how they are connected to and in alignment with the Post- 2020 Global Biodiversity Framework and the EU Biodiversity Strategy for 2030.
25. The summarized description of the policy shall contain the information required in **ESRS 2 - Disclosure Guideline IRO – DG 1-1** on policies adopted to manage material sustainability matters.
26. In addition to the provisions of **Disclosure Guideline IRO - DG 1-1** the undertaking shall describe on whether and how its biodiversity and ecosystems-related policies:

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<sup>12</sup> This information supports the information needs of financial market participants subject to Regulation (EU) 2019/2088 as reflecting an additional principal adverse impact as set out by indicator #10 in Table 2 of Annex 1 of the related Delegated Regulation with regard to disclosure rules on sustainable investments.



- (a) is connected to and in alignment with the Post-2020 Global Biodiversity framework as well as the EU Biodiversity Strategy for 2030 and other relevant EU and national policies and legislation related to biodiversity and ecosystems. The undertaking may use a cross-reference to the information provided under Disclosure Requirement E4-1 – Transition plan on biodiversity and ecosystems;
- (b) relate to the sub-sub-topics specified in AR 4;
- (c) relate to material biodiversity and ecosystems-related impacts;
- (d) relate to material dependencies and material physical and transition risks and opportunities;
- (e) supports traceability of products, components and raw materials with significant actual or potential impacts on biodiversity and ecosystems along the value chain;
- (f) addresses production, sourcing or consumption from ecosystems that are managed to maintain or enhance conditions for biodiversity, as demonstrated by regular monitoring and reporting of biodiversity status and gains or losses; and
- (g) addresses social consequences of biodiversity and ecosystems related impacts.

27. The undertaking shall specifically disclose, whether it has adopted:

- (a) a biodiversity and ecosystem protection policy covering operational sites owned, leased, managed in or near a protected area or a biodiversity-sensitive area outside protected areas, where land with high biodiversity value refers to Article 7b(3) of Directive 98/70/EC of the European Parliament and of the Council and “protected area” means designated areas in the European Environment Agency’s Common Database on Designated Areas (CDDA);
- (b) sustainable land / agriculture practices or policies<sup>13</sup>;
- (c) sustainable oceans / seas practices or policies<sup>14</sup>; and
- (d) policies to address deforestation<sup>15</sup>.

### ***Disclosure Requirement E4-3 – Targets related to biodiversity and ecosystems***

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28. **The undertaking shall describe the biodiversity and ecosystem-related targets it has adopted.**

29. The objective of this Disclosure Requirement is to allow an understanding of the targets the undertaking has adopted to support its biodiversity and ecosystems policies and address its material related impacts, dependencies, risks and opportunities.

30. The description of the targets shall contain the information requirements defined in ESRS 2 related to the **Disclosure Guideline MT-DG 1** – on targets, progress and tracking effectiveness towards achieving policy objectives.

31. Specific requirements for the disclosure of biodiversity and ecosystem-related targets in addition of the provisions of **Disclosure Principles 1-2** include:

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<sup>13</sup> This information supports the information needs of financial market participants subject to Regulation (EU) 2019/2088 as reflecting an additional principal adverse impact as set out by indicator #11 in Table 2 of Annex 1 of the related Delegated Regulation with regard to disclosure rules on sustainable investments.

<sup>14</sup> This information supports the information needs of financial market participants subject to Regulation (EU) 2019/2088 as reflecting an additional principal adverse impact as set out by indicator #12 in Table 2 of Annex 1 of the related Delegated Regulation with regard to disclosure rules on sustainable investments.

<sup>15</sup> This information supports the information needs of financial market participants subject to Regulation (EU) 2019/2088 as reflecting an additional principal adverse impact as set out by indicator #15 in Table 2 of Annex 1 of the related Delegated Regulation with regard to disclosure rules on sustainable investments.

- (a) whether or not the undertaking has set targets related to material sub-sub-topics specified in AR 4;
- (b) whether or not the target has set dates and milestones;
- (c) whether or not (local) ecological thresholds (e.g. the biosphere integrity and land-system change planetary boundaries) and allocations of, e.g. raw materials or ecosystem services, specific to the undertaking were taken into consideration when setting targets. If so, the undertaking shall specify:
  - (i) state the ecological threshold identified and indicate the methodology used in the process of identifying the threshold;
  - (ii) specify whether or not the threshold is organization-specific and if so, indicate the methodology used to identify the organisation-specific allocation; and
  - (iii) how responsibility for respecting thresholds are allocated to the organisational level.
- (d) whether and how the targets are informed by, connected to and / or aligned with the Post-2020 Global Biodiversity Framework, the EU Biodiversity Strategy for 2030 and other biodiversity and ecosystem-related national policies and legislation as well as authoritative intergovernmental instruments like the IPBES;
- (e) whether or not the undertaking used biodiversity offsets in calculating its targets. If the targets do contain biodiversity offsets, the undertaking shall disclose:
  - (i) the aim of the offset and key performance indicators used;
  - (ii) the financing (direct and indirect costs) of biodiversity offsets in monetary terms; and;
  - (iii) a description of offsets including area, type, the quality criteria applied and the standards that the biodiversity offsets fulfil; and
- (f) to which layer in the mitigation hierarchy a target can be allocated to: avoidance, reduction and minimisation, restoration and rehabilitation.

#### **Disclosure Requirement E4-4 – Actions and resources in relation to biodiversity and ecosystems-related policies and targets**

- 32. **The undertaking shall disclose its biodiversity and ecosystems-related action plans and the resources allocated for their implementation.**
- 33. The objective of this Disclosure Requirement is to allow an understanding of the key actions taken and planned that significantly contribute to achievement of biodiversity and ecosystems-related policy objectives and targets.
- 34. The description of key action and resources shall follow the principles defined in ESRS 2 **Disclosure Guideline 1-3 Action plans** and resources in relation to policies and targets.
- 35. In addition **to following the steps in ESRS 2 Disclosure Guideline 1-3**, the undertaking shall:
  - (a) indicate to which layer in the mitigation hierarchy an action and resources can be allocated to: avoidance, reduction and minimisation, restoration and rehabilitation;
  - (b) whether or not the undertaking used biodiversity offsets as described in **31 (e)**;
  - (c) describe how it has incorporated local and indigenous knowledge and nature-based solutions into biodiversity and ecosystems-related actions and actions plans;
  - (d) provide the following details for key actions:

- i. a list of key stakeholders involved (e.g. competitors, suppliers, retailers, other business partners, affected communities and authorities, government agencies) and how they are involved, mentioning key stakeholders negatively or positively impacted by actions and how they are impacted, including impacts or benefits created for affected communities, smallholders indigenous groups or other vulnerable groups;
- ii. where applicable, an explanation on the need for appropriate consultations and the need to respect the decisions of these communities;
- iii. a brief assessment whether key actions may induce significant adverse sustainability impacts;
- iv. an explanation whether the action is intended to be a one-time initiative or systematic practice;
- v. whether it is carried out only by the undertaking, using the undertaking's resources, at the level of the undertaking's own operations. Or whether it is part of a wider action plan, of which the undertaking is a member. The undertaking shall then provide more information on the project, its sponsors and other participants.

### **Section 3: Performance Measurement**

#### **Disclosure Requirement E4-5 – Impact metrics related to biodiversity and ecosystems change**

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36. **The undertaking shall report metrics related to its material impacts resulting in biodiversity and ecosystem change.**
37. The objective of this Disclosure Requirement is to allow an understanding of the performance of the undertaking against impacts identified as material in the materiality assessment on biodiversity and ecosystems change.
38. Reported metrics shall reflect at a minimum the information and metrics used within the materiality assessment.
39. Performance measures on Biodiversity and ecosystems are currently the object of many ongoing collective work at the time of the drafting of this Standard. That is why the disclosure requirements proposed in this Standard are mostly principles-based to clarify the categories of performance measures expected, as well as laying out the features of quality biodiversity and ecosystems-related measures rather than proposing specific measures per say. Wherever possible, the application guidance refers to examples of commonly used metrics and tools in the public domain to allow application of the different categories of measures required under this Disclosure Requirement. Undertakings may refer specifically to the recommendations provided by Aligning Accounting Approaches for Nature (Align)<sup>16</sup>.
40. If the undertaking identified sites located in or near biodiversity-sensitive areas that it is negatively affecting under paragraph 22 (a), the undertaking shall disclose 52(b)the number and area (in hectares) of sites owned, leased or managed in or near protected areas and / or key biodiversity areas.
41. Undertakings required to disclose against E4-1 shall also disclose on the results of a Life Cycle Assessment on land-use or use an equally scientifically established approach.

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<sup>16</sup> UNEP-WCMC, Capitals Coalition, Arcadis and ICF (2022) Recommendations for a standard on biodiversity measurement and valuation, Consultation Draft. Aligning Accounting Approaches for Nature (Align).

42. The undertaking shall specifically disclose 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<sup>17</sup>.
43. If the undertaking has concluded that it directly contributes to the impact drivers of land-use change and / or sea-use change, the undertaking shall report relevant metrics considering:
- (a) the conversion over time (e.g. one or five years) of land cover (e.g., deforestation or mining);
  - (b) changes over time (e.g. one or five years) in the management of the ecosystem (e.g., through the intensification of agricultural management, or the application of better management practices or forestry harvesting);
  - (c) changes in the spatial configuration of the landscape (e.g., fragmentation of habitats, changes in ecosystem connectivity);
  - (d) changes in ecosystem structural connectivity (e.g., habitat permeability based on physical features and arrangements of habitat patches);
  - (e) the functional connectivity (e.g., how well genes, gametes, propagules or individuals move through land, freshwater and seascape).
44. If the undertaking concluded that it directly contributes to the impact drivers of accidental or voluntary introduction of invasive alien species, the undertaking shall disclose how it manages pathways of introduction and spread of invasive alien species and the risks posed by invasive alien species. The undertaking may disclose, for example, the pathways and number of invasive alien species identified in or adjacent to the undertaking's own operations or its value chain sites, or the extent of surface covered by invasive alien species..
45. If the undertaking identified material impacts related to the state of species, the undertaking shall report metrics it considers relevant and:
- (a) may be referred to in ESRS E1 on Climate change, ESRS E2 on Pollution, ESRS E3 on Water and Marine Resources, and ESRS E5 on Circular Economy.
  - (b) consider population size or abundance, population richness and extinction risk. These aspects provide insight on the health of a single species' population and its relative resilience to human induced and naturally occurring change;
  - (c) include one or more indicators that measures changes in the number of individuals of a species within a specific area, e.g. counting the number of individuals or breeding pairs may provide information on changes in suitability of an area as a breeding ground;
  - (d) when disclosing information on species at global extinction risk<sup>18</sup> also report one or more indicators that measures:
    - i. the threat status of species and how activities/pressures may affect the threat status.; or
    - ii. change in the relevant habitat for a threatened species as a proxy for the undertakings impact on the local population's extinction risk.
46. If the undertaking identified material impacts related to ecosystems, the undertaking shall consider, per ecosystem category (IUCN Global Ecosystem Typology 2.0), two aspects to obtain insights into the health of ecosystems:

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<sup>17</sup> This information supports the information needs of financial market participants subject to Regulation (EU) 2019/2088 as reflecting an additional principal adverse impact as set out by indicator #22 in Table 2 of Annex 1 of the related Delegated Regulation with regard to disclosure rules on sustainable investments.

<sup>18</sup> As indicated in The IUCN Red List of Threatened Species. Source: <https://www.iucnredlist.org/en>.

- (a) ecosystems extent: the undertaking shall report an indicator that measures area coverage of a particular ecosystem without necessarily considering the quality of the area being assessed, such as habitat cover. For example, forest cover is a measure of the extent of a particular ecosystem type, without factoring in the condition of the ecosystem (e.g. provides the area without describing the species diversity within the forest).
- (b) ecosystems condition:
  - (i) one or more indicators that measures the quality of ecosystems relative to a pre-determined reference state; or
  - (ii) one or more indicators that measures multiple species (rather than the number of individuals within a single species) within an ecosystem: e.g. Mean Species Abundance that measures the average change in population size of native species in an area from a reference intact state or Potentially Disappeared Fraction that measures the average change in local species richness in an area from a reference intact state; or
  - (iii) one or more indicators that may also reflect structural components of condition such as habitat connectivity (i.e., how linked habitats are to each other).

#### ***Disclosure Requirement E4-6 – Potential financial effects from biodiversity and ecosystem-related risks and opportunities***

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- 47. **The undertaking shall disclose its potential financial effects from risks and opportunities arising from biodiversity- and ecosystem-related impacts and dependencies.**
- 48. The objective of this Disclosure Requirement is to provide an understanding of:
  - (a) potential negative material financial effects due to risks arising from biodiversity- and ecosystem-related impacts and dependencies and how these risks may affect the undertaking's financial performance and position over the short-, medium-, and long-term.
  - (b) potential positive material financial effects due to benefits arising from biodiversity- and ecosystem-related opportunities and how these opportunities may affect the undertaking's financial performance and position over the short-, medium-, and long-term.
- 49. The disclosure shall include:
  - (a) a quantification of the risks and opportunities and their potential financial effects in monetary terms and with regard to the overall financial position of the undertaking;
  - (b) a description of the risks and opportunities considered, the underlying biodiversity and ecosystem services, impacts and dependencies to which they relate and the time horizon in which they are likely to materialise; and
  - (c) the approach and methodology used to estimate disclosed risks and opportunities, including relevant assumptions, underlying scientific sources as well as the level of uncertainty attached to corresponding estimate.
- 50. In the context of this Disclosure Requirement, potential financial effects shall explicitly include financial effects that do not meet the recognition criteria for inclusion in the financial statement line items and notes to the financial statements.
- 51. The undertaking may include an assessment of the market size of related products and services over the short-, medium-, and long-term, explaining how these are defined, how financial amounts are estimated, and which critical assumptions are made.

52. For the first three years of application of this ESRS, to comply with this Disclosure Requirement the undertaking may provide qualitative information only. [THIS LAST PARAGRAPH WILL BE MOVED TO ESRS 1 – APPLICATION PROVISION WHERE ALL THE PHASE-IN REQUIREMENTS WILL BE LISTED]

DRAFT

## **Appendix A: Defined terms**

This appendix is an integral part of the [draft] ESRS E4.

<b>Avoidance</b>	Measures taken to prevent impacts from occurring in the first place, for instance by changing or adjusting the development project's location and/or the scope, nature and timing of its activities. (Conway, M., Rayment, M., White, A., and Berman, S. (2013) Exploring Potential Demand for and Supply of Habitat Banking in the EU and Appropriate Design Elements for a Habitat Banking Scheme. Final Report submitted to DG ENV, ICF GHK.
<b>Biodiversity access and benefit-sharing</b>	Access and benefit-sharing refers to the way in which genetic resources may be accessed, and how the benefits that result from their use are shared between the people or countries using the resources (users) and the people or countries that provide them (providers). (CBD, 2010)
<b>Biodiversity offsetting</b>	Measures taken to compensate for any residual significant, adverse impacts that cannot be avoided, minimised and/or rehabilitated or restored, in order to achieve no net loss or a net gain of biodiversity. Offsets can take the form of positive management interventions such as restoration of degraded habitat, arrested degradation or averted risk, protecting areas where there is imminent or projected loss of biodiversity. (Carbon Disclosure Project (CDP), Business and Biodiversity Offsets Programme (BBOP), 2012)
<b>Impact drivers</b>	All the factors that cause changes in nature, anthropogenic assets, nature's contributions to people and a good quality of life. Direct drivers of change can be both natural and anthropogenic; they have direct physical (mechanical, chemical, noise, light etc.) and behaviour-affecting impacts on nature. They include, inter alia, climate change, pollution, different types of land use change, invasive alien species and zoonoses, and exploitation. Indirect impact drivers operate diffusely by altering and influencing direct drivers (by affecting their level, direction or rate) as well as other indirect drivers. Interactions between indirect and direct drivers create different chains of relationship, attribution, and impacts, which may vary according to type, intensity, duration, and distance. These relationships can also lead to different types of spill-over effects. Global indirect drivers include economic, demographic, governance, technological and cultural ones. Special attention is given, among indirect drivers, to the role of institutions (both formal and informal) and impacts of the patterns of production, supply and consumption on nature, nature's contributions to people and good quality of life. (IPBES online glossary)
<b>Biodiversity loss</b>	The reduction of any aspect of biological diversity (i.e., diversity at the genetic, species and ecosystem levels) is lost in a particular area through death (including extinction), destruction or manual removal; it can refer to many scales, from global extinctions to population extinctions, resulting in decreased total diversity at the same scale. (IPBES online glossary)
<b>Biodiversity or biological diversity</b>	The variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part. This includes variation in genetic, phenotypic, phylogenetic, and functional

	attributes, as well as changes in abundance and distribution over time and space within and among species, biological communities and ecosystems. (IPBES online glossary)
<b>Biodiversity-sensitive area</b>	Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas ('KBAs'), as well as other protected areas, as referred to in Appendix D of Annex II to Commission Delegated Regulation (EU) 2021/2139
<b>Biosphere or ecological integrity</b>	Integrity refers to an unimpaired condition, a state of being complete or undivided. Biological integrity has been defined as "[t]he ability to support and maintain a balanced, integrated adaptive assemblage of organisms having species composition, diversity, and functional organisation comparable to that of natural habitat of the region". (Karr and Dudley 1981, Karr et al. 1986)
<b>Deforestation</b>	Temporary or permanent human-induced conversion of forested land to non-forested land. (Annex I point 21 of COMMISSION DELEGATED REGULATION (EU) 2022/1288 of 6 April 2022 supplementing Regulation (EU) 2019/2088)
<b>Degradation or degraded ecosystem</b>	Degradation <sup>19</sup> refers to chronic human impacts resulting in the loss of biodiversity and the disruption of an ecosystem's structure, composition, and functionality.
<b>Dependencies</b>	Dependency is the result of an undertaking relying on biodiversity and/or ecosystems within its business model and/or conduct of business. A prominent and scientifically well-established approach to assess, monitor and value biodiversity and ecosystem dependencies is by assessing the undertakings dependence on ecosystem services (source: IPBES).
<b>Desertification</b>	Desertification means land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities. Desertification does not refer to the natural expansion of existing deserts. (IPBES online glossary)
<b>Ecological (or socio-ecological) breakpoint or threshold</b>	The point at which a relatively small change in external conditions causes a rapid change in an ecosystem. When an ecological threshold has been passed, the ecosystem may no longer be able to return to its state by means of its inherent resilience. (IPBES online glossary)
<b>Ecological condition</b>	Refers to the quality of an ecosystem measured in terms of its abiotic and biotic characteristics (UN SEEA EA glossary).
<b>Ecosystem extent</b>	Refers to the size of an ecosystem asset, whereas an ecosystem asset is the contiguous space of a specific ecosystem type characterized by a distinct set of biotic and abiotic components and their interactions (UN SEEA EA glossary).
<b>(Ecosystem) Conversion</b>	Situations in which, for a given location, there is a change in ecosystem type involving a distinct and persistent change in ecological structure, composition and function which, in turn, is reflected in the supply of a different set of ecosystem services (UN SEEA EA glossary).
<b>Ecosystem(s)</b>	A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit. (IPBES glossary). A typology of ecosystems is provided by the IUCN Global Ecosystem Typology 2.0 <sup>20</sup> .

<sup>19</sup> <https://www.ser-rrc.org/what-is-ecological-restoration/>

<sup>20</sup> <https://www.iucn.org/content/iucn-global-ecosystem-typology-20>



<b>Ecosystem preservation</b>	The set of policies and measures to maintain the conditions favouring the evolution and continuity of the ecosystems and natural habitats, as well as the conservation of viable populations of species in their natural environments and the components of biodiversity outside their natural habitats. (IUCN definitions)
<b>Ecosystem restoration</b>	Any intentional activities that initiate or accelerate the recovery of an ecosystem from a degraded state. (IPBES glossary)
<b>Ecosystem services</b>	Refers to the contributions of ecosystems to the benefits that are used in economic and other human activity (UN SEEA EA glossary), respectively the benefits people obtain from ecosystems. In the Millennium Ecosystem Assessment, ecosystem services can be divided into supporting, regulating, provisioning and cultural. (IPBES online glossary). The Common International Classification of Ecosystem Services (CICES) classifies types of ecosystems services.
<b>Genetic resources</b>	The genetic material with real or potential value. (IUCN)
<b>Habitat</b>	The place or type of site where an organism or population naturally occurs. Also used to mean the environmental attributes required by a particular species or its ecological niche. (IPBES online glossary)
<b>Habitat fragmentation</b>	A general term describing the set of processes by which habitat loss results in the division of continuous habitats into a greater number of smaller patches of lesser total and isolated from each other by a matrix of dissimilar habitats. Habitat fragmentation may occur through natural processes (e.g., forest and grassland fires, flooding) and through human activities (forestry, agriculture, urbanisation). (IPBES online glossary)
<b>Invasive or alien species</b>	Species whose introduction and/or spread by human action outside their natural distribution threatens biological diversity, food security, and human health and well-being. ‘Alien’ refers to the species’ having been introduced outside its natural distribution (‘exotic’, ‘non-native’ and ‘non-indigenous’ are synonyms for ‘alien’). ‘Invasive’ means ‘tending to expand into and modify ecosystems to which it has been introduced’. Thus, a species may be alien without being invasive, or, in the case of a species native to a region, it may increase and become invasive, without actually being an alien species. (IPBES online glossary)
<b>Key Biodiversity Area</b>	Sites contributing significantly to the global persistence of biodiversity’, in terrestrial, freshwater and marine ecosystems. Sites qualify as global KBAs if they meet one or more of 11 criteria, clustered into five categories: threatened biodiversity; geographically restricted biodiversity; ecological integrity; biological processes; and, irreplaceability. The World Database of Key Biodiversity Areas is managed by BirdLife International on behalf of the KBA Partnership. (Integrated Biodiversity Assessment Tool (IBAT))
<b>Land degradation</b>	Refers to the many processes that drive the decline or loss in biodiversity, ecosystem functions or their benefits to people and includes the degradation of all terrestrial ecosystems. (IPBES online glossary)
<b>Land-use (change)</b>	The human use of a specific area for a certain purpose (such as residential; agriculture; recreation; industrial, etc.). Influenced by, but not synonymous with, land cover. Land use change refers to a

	change in the use or management of land by humans, which may lead to a change in land cover. (IPBES online glossary)
<b>Land-system (change)</b>	Land systems are the terrestrial component of the Earth system, encompassing all processes and activities related to the human use of land. These include socio-economic, technological and organisational inputs and arrangements, as well as the benefits gained from land and the unintended social and ecological outcomes of societal activities. The land systems concept combines land use (the activities, arrangements and inputs associated with land use) with land cover (the ensemble of physical characteristics of land discernible by Earth Observation). (EEA)
<b>Mitigation hierarchy</b>	The sequence of actions to anticipate and avoid impacts on biodiversity and ecosystem services; and where avoidance is not possible, reduce or minimise; and, when impacts occur, rehabilitate or restore; and where significant residual impacts remain, offset. (CDP, Cross-Sector Biodiversity (CSBI), 2015)
<b>Natural resources</b>	Natural assets (raw materials) occurring in nature that can be used for economic production or consumption. (OECD Glossary of Statistical Terms)
<b>Nature-based solutions</b>	Nature-based solutions are understood as actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits (cf. United Nations Environment Assembly Resolution UNEP/EA.5/Res.5)
<b>Planetary boundaries</b>	This concept allows to estimate a safe operating space for humanity with respect to the functioning of the Earth. The boundary level for each key Earth System process that should not be transgressed if we are to avoid unacceptable global environmental change, is quantified. (Rockström et al. 2009)
<b>Protected area</b>	A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. (IPBES online glossary)
<b>Raw material</b>	Raw material – primary or secondary material that is used to produce a product. (International Organisation for Standardisation ISO 14040:2006)
<b>Systemic risks</b>	Risks arising from the breakdown of the entire system, rather than the failure of individual parts. They are characterised by modest tipping points combining indirectly to produce large failures with cascading of interactions of physical and transition risks (contagion), as one loss triggers a chain of others, and with systems unable to recover equilibrium after a shock. An example is the loss of a keystone species, such as sea otters, which have a critical role in ecosystem community structure. When sea otters were hunted to near extinction in the 1900s, the coastal ecosystems flipped and biomass production was greatly reduced. (TNFD, 2022)

<b>Soil degradation</b>	'Soil degradation' means the diminishing capacity of the soil to provide ecosystem goods and services as desired by its stakeholders, according to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) as referred to in paragraph 100 of Decision No 1386/2013/EU.
<b>Soil sealing</b>	A "sealed area" means any area where the original soil has been covered (such as roads) making it impermeable. This non-permeability can create environmental impacts (Annex IV EMAS Regulation - EU 2018/2026).
<b>Sustainable land and agriculture</b>	[to be added]
<b>Sustainable ocean and seas</b>	[to be added]
<b>Threatened species</b>	Threatened species' means endangered species, including flora and fauna, listed in the European Red List or the IUCN Red List, as referred to in Section 7 of Annex II to Delegated Regulation (EU) 2021/2139.
<b>Local and indigenous knowledge</b>	Local and indigenous knowledge refers to the understandings, skills and philosophies developed by societies with long histories of interaction with their natural surroundings. For rural and indigenous peoples, local knowledge informs decision-making about fundamental aspects of day-to-day life. (Local and Indigenous Knowledge Systems (LINKS) by UNESCO)

## **Appendix B: Application Requirements**

The provisions of this appendix shall be considered in conjunction with the [draft] disclosure requirements defined in paragraphs 1 to 51.

This appendix describes how to apply the disclosure requirements, has the same authority as the disclosure requirements and is an integral part of the proposed [draft] ESRS E4 Biodiversity and ecosystems.

### **Section 1: General requirements, governance, strategy and materiality**

#### **Disclosure Requirement E4-1 – Transition plan on biodiversity and ecosystems**

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AR 1. When disclosing relevant targets under **paragraph 18 (a) iii**, the undertaking may consider:

(a) the following targets under the EU Nature Restoration Plan:

- i. Target 5 - The decline of pollinators is reversed.
- ii. Target 6 - The risk and use of chemical pesticides is reduced by 50%, and the use of more hazardous pesticides is reduced by 50%.
- iii. Target 8 - At least 25% of agricultural land is under organic farming management, and the uptake of agro-ecological practices is significantly increased.
- iv. Target 9 - Three billion additional trees are planted in the EU, in full respect of ecological principles.
- v. Target 10 - Significant progress in the remediation of contaminated soil sites.
- vi. Target 11 - At least 25,000 km of free-flowing rivers are restored.
- vii. Target 13 - The losses of nutrients from fertilisers are reduced by 50%, resulting in the reduction of the use of fertilisers by at least 20%.
- viii. Target 15 - The negative impacts on sensitive species and habitats, including on the seabed through fishing and extraction activities, are substantially reduced to achieve good environmental status.

(b) enabling Transformative Change

- i. Business for biodiversity<sup>21</sup>
- ii. Financing for biodiversity<sup>22</sup>

AR 2. When disclosing relevant targets under **paragraph 18**, the undertaking may consider the Sustainable Development Goals using the SDG Compass<sup>23</sup> as guidance and with focus on the following targets:

(c) 2 - End hunger, achieve food security and improved nutrition and promote sustainable agriculture<sup>24</sup>;

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<sup>21</sup> <https://dopa.jrc.ec.europa.eu/kcbd/actions-tracker/#Business%20for%20biodiversity>

<sup>22</sup> <https://dopa.jrc.ec.europa.eu/kcbd/dashboard/#Financing%20for%20biodiversity>

<sup>23</sup> [https://www.globalcompact.de/fileadmin/user\\_upload/Dokumente\\_PDFs/SDG\\_Compass\\_English.pdf](https://www.globalcompact.de/fileadmin/user_upload/Dokumente_PDFs/SDG_Compass_English.pdf)

<sup>24</sup> <https://sdgs.un.org/goals/goal2>

- (d) 6 - Ensure availability and sustainable management of water and sanitation for all<sup>25</sup>;
- (e) 14 - Conserve and sustainably use the oceans, seas and marine resources for sustainable development<sup>26</sup>; and
- (f) 15 - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss<sup>27</sup>.

### ***Biodiversity and ecosystems-related specific application guidance on ESRS 2***

#### ***Disclosure Requirement SBM 1 on the resilience of the strategy and business model***

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AR 3. In the absence of a yet to be established global set of relevant scenarios and following the principle-based approach as defined within this standard, the undertaking may refer to the following tools and methodologies when applying and disclosing on relevant scenarios **20 Error! Reference source not found.**

- (a) “Methodological Assessment Report on Scenarios and Models of Biodiversity and Ecosystem Services’ published by the IPBES in 2016<sup>28</sup>;
- (b) the Globio model<sup>29</sup> allows trends in biodiversity and ecosystem services to be modelled under future socio-economic development scenarios, as well as different policy interventions;
- (c) the Risk Filter Suite<sup>30</sup> by WWF includes, in its Water Risk Filter tool, TCFD-aligned scenarios of water risks for 2030 and 2050 based on climate scenarios (IPCC CMIP5 Representative Concentration Pathways – RCP) and socio-economic scenarios (IIASA Shared Socioeconomic Pathways – SSP). Among physical water risks, the tool includes risks related to ecosystem services status;
- (d) the ENCORE<sup>31</sup> allows exploration of future scenarios in terms of the potential impacts and dependencies of activities on biodiversity (available for some sectors, e.g. agriculture and mining);
- (e) the EXIOBASE<sup>32</sup> is a global, detailed Multi-Regional Environmentally Extended Supply-Use Table (MR-SUT) and Input-Output Table (MR-IOT). The MR-IOT that can be used for the analysis of the environmental impacts associated with the final consumption of product groups; and
- (f) climate change scenarios as drivers for biodiversity and ecosystems aspects (see ESRS E1).

### ***Biodiversity and ecosystems-related specific application guidance on ESRS 2***

#### ***Disclosure Requirements IRO 1 and IRO 2 on materiality assessment***

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AR 4. The sub-sub-topics covered by the materiality assessment under ESRS E4 Biodiversity and Ecosystems include the undertakings’:

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<sup>25</sup> <https://sdgs.un.org/goals/goal6>

<sup>26</sup> <https://sdgs.un.org/goals/goal14>

<sup>27</sup> <https://sdgs.un.org/goals/goal15>

<sup>28</sup> Source: <https://ipbes.net/assessment-reports/scenarios>

<sup>29</sup> Source: <https://www.globio.info/why-use-globio>

<sup>30</sup> Source: [www.riskfilter.org/](http://www.riskfilter.org/)

<sup>31</sup> Source: <https://encore.naturalcapital.finance/en>

<sup>32</sup> Source: <https://www.exioibase.eu/>

- (a) contribution to direct impact drivers on biodiversity loss as defined by IPBES<sup>33</sup>:
    - (i) climate change;
    - (ii) land use change (e.g. land artificialisation) and sea use change;
    - (iii) direct exploitation;
    - (iv) invasive alien species;
    - (v) pollution; and
    - (vi) others.
  - (b) impacts on the state of species (i.e. species population size, species global extinction risk);
  - (c) impacts on the extend and condition of ecosystems (classified as per the IUCN Global Ecosystem Typology 2<sup>34</sup> and defined within the UN SEEA EA accounting framework (e.g. land degradation, desertification and soil sealing); and
  - (d) impacts and dependencies on ecosystem services (as defined within the UN SEEA EA accounting framework).
- AR 5. When assessing the materiality of impacts, dependencies, risks and opportunities the undertaking shall consider the provisions in **ESRS 2 General Disclosures IRO 1 and ESRS 1 General Requirements section 4.7** and describe these considerations.
- AR 6. To conduct the materiality assessment on environmental sub-topics, the undertaking may consider in regards to the first three phases of the LEAP approach by TNFD<sup>35</sup>: Locate, Evaluate and Assess. The materiality assessment for ESRS E4 corresponds to Phase 1: Locate in **AG 7**, Phase 2: Assess in **AG 8** and relevant elements of Phase 3 are covered in **AR 99**. For further guidance the undertaking may refer to the TNFD Nature-Related Risk & Opportunity Management and Disclosure Framework.
- AR 7. Phase 1 requires the undertaking to **locate** where there are material sites regarding its interface with biodiversity and ecosystems. To identify these material sites the undertaking may consider to:
- (a) develop a list of locations of direct assets and operations and related upstream and downstream that are material to the undertakings business activities. Furthermore, the undertaking may provide information about sites for which future operations have been formally announced.
  - (b) list the biomes and ecosystems interface with<sup>36</sup> based on the list of locations identified under **AR 5 (a)**.
  - (c) identify the current integrity and importance of biodiversity and ecosystem at each location taking into consideration the information provided in **paragraph 22**.
  - (d) provide a list of locations where the undertaking is interfacing with locations in or near biodiversity-sensitive areas taking into consideration the information provided in **paragraph 23**.
  - (e) identify which sectors, business units, value chains or asset classes are interfacing with biodiversity and ecosystems in these material sites. Instead of disclosure per site, the undertaking may choose to disclose per raw material procured or sold by weight in tons, if such practice offers greater transparency.

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<sup>33</sup> The direct driver climate change is to be reported under ESRS E1 Climate Change and pollution under ESRS E2 Pollution.

<sup>34</sup> <https://portals.iucn.org/library/sites/library/files/documents/2020-037-En.pdf>

<sup>35</sup> The TNFD Nature-Related Risk and Opportunity Management and Disclosure Framework Beta v0.2 June 2022.

<sup>36</sup> This information supports the information needs of financial market participants subject to Regulation (EU) 2019/2088 as reflecting a mandatory principal adverse impact as set out by indicator #7 in Table 1 of Annex 1 of the related Delegated Regulation with regard to disclosure rules on sustainable investments.

- AR 8. In Phase 2 the undertaking may consider **evaluating** actual or potential biodiversity and ecosystem-related impacts and dependencies for material sites by:
- (a) identifying business processes and activities as well as impacts and dependencies on biodiversity and ecosystem-related assets and ecosystem services;
  - (b) identifying the impacts and dependencies;
  - (c) indicating the size, scale, frequency of occurrence and speed of the impacts on biodiversity and ecosystems taking into consideration the disclosures under paragraph 24. Furthermore, the undertaking may disclose:
    - i. the percentage of its suppliers' facilities which are located in risk prone areas (with threatened species on the IUCN Red List of Species, the Birds and Habitats Directive or nationally list of threatened species, or in officially recognised Protected Areas, the Natura 2000 network of protected areas and Key Biodiversity Areas);
    - ii. the percentage of its procurement spend from suppliers with facilities which are located in risk prone areas (with threatened species on the IUCN Red List of Species, the Birds and Habitats Directive or nationally list of threatened species, or in officially recognised Protected Areas, the Natura 2000 network of protected areas and Key Biodiversity Areas); and
  - (d) indicating the size and scale of the dependencies on biodiversity and ecosystems, including on raw materials, natural resources and ecosystem services taking into consideration the disclosures under paragraph 25. The undertaking may rely on the international classifications such as the Common International Classification of Ecosystem Services (CICES).
- AR 9. Based on the results of Phase 1 and 2, the undertaking may consider to **assess** material risks and opportunities in Phase 3 identifying its material:
- (a) physical risks:
    - (i) distinguished between acute risks (e.g. natural disasters exacerbated by loss of coastal protection from ecosystems, leading to costs of storm damage to coastal infrastructure, disease or pests affecting the species or variety of crop the undertaking relies on, especially in the case of no or low genetic diversity, species loss and ecosystem degradation; and
    - (ii) chronic risks (e.g. loss of crop yield due to decline in pollination services, increasing scarcity or variable production of key natural inputs, ecosystem degradation due to operations leading to, for example, coastal erosion and forest fragmentation, ocean acidification, land loss to desertification and soil degradation and consequent loss of soil fertility, species loss).
  - (b) transition risks and opportunities by the categories of<sup>37,38</sup>:
    - (i) policy and legal: e.g. introduction of regulation or policy (e.g. changes such as increased land protection), ineffective biodiversity governance in an area, across boundaries (i.e. transboundary governance) and cooperation resulting in biodiversity and ecosystem change (e.g. biodiversity-rich ecosystems crossing national boundaries), exposure to sanctions and litigation (e.g. spills of polluting effluents that damage human and ecosystem health; or violation of biodiversity-related rights, permits or allocations; or negligence towards or killing of threatened species), enhanced reporting obligations on biodiversity, ecosystems and related services;
    - (ii) technology: e.g. substitution of products or services with a lower impact on biodiversity or dependence on ecosystem services, lack of access to data or access to poor quality data that hamper biodiversity-related assessments, transition to more efficient and cleaner technologies (i.e. with lower impacts

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<sup>37</sup> Source: TNFD, 2022, p.37

<sup>38</sup> Source: CDSB Biodiversity Application Guidance 2021

on biodiversity), new monitoring technologies (e.g. satellite), adaptation technologies required to cope with new future scenarios and trends (e.g. climate resistant crops, mechanical pollinators, water purification, flood protection) used by regulators;

(iii) market: e.g. shifting supply, demand and financing, volatility or increased costs of raw materials (e.g. biodiversity-intense inputs for which price has raised due to ecosystem degradation);

(iv) reputation: e.g. changing societal, customer or community perceptions as a result of an organisation's role in loss of biodiversity, violation of nature-related rights through operations, negative media coverage due to impacts on critical species and/or ecosystems, biodiversity social conflicts over endangered species, protected areas, resources or pollution;

(c) Identifying its contribution to systemic risks, including:

(i) ecosystem collapse risks that a critical natural system no longer functions, e.g. tipping points are reached and the collapse of ecosystems resulting in wholesale geographic or sector losses (summing physical risks);

(ii) aggregated risk linked to fundamental impacts of biodiversity loss to levels of transition and physical risk across one or more sectors in a portfolio (corporate or financial); and

(iii) contagion risks that financial difficulties of certain corporations or financial institutions linked to failure to account for exposure to biodiversity-related risks spill over to the entire economic system as a whole.

(d) identifying material opportunities categorized by<sup>39,40</sup>:

(i) resource efficiency: e.g. transition to more efficient services and processes requiring less natural resources;

(ii) markets: e.g. development of less resource-intense products and services, nature-based solutions, diversification of business activities;

(iii) financing: e.g. access to biodiversity related or green funds, bonds or loans;

(iv) resilience: e.g. diversification of biodiversity-related resources (e.g.: use of different plant species) and business activities (e.g. start a new business unit on ecosystem restoration), investing in green infrastructures, adopting a landscape approach to biodiversity management and implement nature-based solutions, participation in programmes and adoption of resource-efficiency, recycling and circularity mechanisms that reduce the dependencies and impacts on biodiversity and ecosystems; and

(v) reputation: positive stakeholder relations as a result of a proactive stance on managing biodiversity and ecosystem-related risks (e.g. leading to preferred partner status).

AR 10. When conducting the materiality assessment, the undertaking may refer to information provided by the EU Business @ Biodiversity Platform, which provides periodic updates on available tools, metrics and data sources relevant for this [draft] Standard. The undertaking may further refer to the "Exploring Natural Capital Opportunities, Risks and Exposure" (ENCORE) tool during all phases and specifically in:

(a) Phase 1 to:

(i) Protected Planet database, a source of data on protected areas and other effective area-based conservation measures (OECMs), the Natura 2000 network of protected areas;

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<sup>39</sup> Source: TNFD, 2022, p.37

<sup>40</sup> Source: CDSB Biodiversity Application Guidance 2021



- (ii) the Common Database on Designated Areas (CDDA) as the official source of protected area information from European countries to the World Database of Protected Areas (WDPA);
- (iii) the Global Biodiversity Information Systems (<https://www.gbif.org/>); The Ocean Data Viewer (<https://data.unep-wcmc.org/>); and
- (iv) the tool “Trase”<sup>41</sup> on deforestation risk to assess raw materials or to the tool “Bioscope”<sup>42</sup> to assess the impact drivers of biodiversity change for raw materials and to address the materiality of impact drivers of biodiversity change by raw material.

(b) and Phase 2 and / or 3 to:

- (i) information provided by the WWF Risk Filter Suite that includes the Biodiversity Risk Filter - a web-based tool integrating spatially explicit biodiversity data. It allows firms to understand and assess biodiversity impacts and dependencies, risks and opportunities, prioritize areas of action and develop tailored response plans; and
- (ii) national, European or international specialised databases (for example Global Forest Watch (<https://www.globalforestwatch.org/>); The Living Planet Database (<https://livingplanetindex.org/home/index>), The International Waterbird Census Database (<http://wpe.wetlands.org/>)).

**Presentation of information:**

AR 11. The undertaking may consider the below tables to present its materiality assessment of material sites identified under AR 7:

Raw material / Ecosystem service...	Actual or potential dependencies	
...	Change of functionality	Financial loss
...	Limited, moderate or significant	Limited, moderate or significant
...	...	...

Site location	Threatened species, protected areas, key biodiversity areas	Actual or potential impacts			
		Frequency of occurrence	Speed of impact	Severity of impact	Potential for mitigation
...	...	High, medium or low	<1 year or 1-3 years or >3 years	High, medium or low	High, medium or low
...	...	...	...	...	...

<sup>41</sup> The tool “Trase” can be found here: <https://supplychains.trase.earth/>. It only covers deforestation risk and for a limited number of countries to date.

<sup>42</sup> The tool “Bioscope” can be found here: <https://bioscope.info/>. It covers commodities and resources purchased from 170 sectors in 43 countries, including the EU countries.

AR 12. When disclosing on **AR 77 (d)** may consider the below table for presentation:

Where are the raw materials produced or sourced from?	Absolute weight of raw materials (and percentage of the raw material weight)
In areas with species listed on the IUCN Red List of Threatened Species, the Birds and Habitats Directive or on national lists of threatened species	...
In officially recognised protected Areas	...
In other Key Biodiversity Areas	...

## Section 2: Implementation – Policies, Targets, Actions and Resources

### Disclosure Requirement E4-2 – Policies implemented to manage biodiversity and ecosystems

AR 13. The undertaking may also provide information on how the policy refers to the production, sourcing or consumption of raw materials<sup>43</sup>:

- (c) refer to policies limiting procurement from suppliers that cannot demonstrate that they are not contributing to significant conversion of protected areas or key biodiversity areas (e.g. through certification);
- (d) refer to recognised standards or third-party certifications overseen by regulators; and
- (e) originating from ecosystems that have been managed to maintain or enhance conditions for biodiversity, as demonstrated by regular monitoring and reporting of biodiversity status and gains or losses.

AR 14. When disclosing policies related to social consequences of biodiversity and ecosystems related dependencies and impacts under 26(e), the undertaking may notably refer to the Nagoya Protocol<sup>44</sup> and the Convention for Biological Diversity (CBD)<sup>45</sup>, but may also refer to IFC Performance Standard 4, 5, 6 and 7<sup>46</sup> and the Core Principles from the Accountability Framework, Principle 2 “Respect for Human Rights”<sup>47</sup>.

AR 15. When disclosing on the social consequences of policies under **26 (g)**, the undertaking may provide information in relation to:

- (a) the fair and equitable benefit-sharing from the benefits arising from the utilisation of genetic resources; and
- (b) the prior informed consent (i.e. the permission given by the competent national authority of a provider country to a user prior to accessing genetic resources, in line with an appropriate national legal and institutional framework) for access to genetic resources; and

AR 16. When disclosing how its policies are connected to and in alignment with policies and legislation relation to biodiversity and ecosystems under **26(a)**, the undertaking may also disclose connections and alignment with other global goals and agreements such as the SDGs 2, 6, 14 and 15 or any other well established global convention related to biodiversity and ecosystems.

<sup>43</sup> Refers to IFC Performance Standard 6.

<sup>44</sup> The Nagoya Protocol can be found here: <https://www.cbd.int/abs/>.

<sup>45</sup> The Convention for Biological Diversity can be found here: <https://www.cbd.int/convention/>.

<sup>46</sup> IFC Performance Standards can be found here :

[https://www.ifc.org/wps/wcm/connect/topics\\_ext\\_content/ifc\\_external\\_corporate\\_site/sustainability-at-ifc/publications/publications\\_handbook\\_pps](https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_pps).

<sup>47</sup> The Accountability Framework Core Principles can be found here: <https://accountability-framework.org/the-framework/contents/core-principles/>.

- AR 17. This information may be complemented on how the policy allows the undertaking to:
- (a) avoid its negative impacts on biodiversity and ecosystems in its operations and throughout the value chain (downstream and upstream);
  - (b) reduce and minimise its negative impacts on biodiversity and ecosystems in its operations and throughout the value chain that cannot be avoided;
  - (c) restore and rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/or minimised; and
  - (d) mitigate material biodiversity loss drivers as disclosed in the section dependencies, impacts, dependencies, risks and opportunities.
  - (e) When disclosing its policies, if referring to third-party standards of conduct, the undertaking may disclose whether the standard used<sup>48</sup>:
    - (a) is objective and achievable based on a scientific approach to identifying issues, and realistic in assessing how these issues can be addressed on the ground under a variety of practical circumstances;
    - (b) is developed or maintained through a process of ongoing consultation with relevant stakeholders with balanced input from all relevant stakeholder groups, including producers, traders, processors, financiers, local people and communities, indigenous peoples, and civil society organisations representing consumer, environmental and social interests, with no group holding undue authority or veto power over the content;
    - (c) encourages step-wise and continuous improvement - both in the standard and its application of better management practices, and require the establishment of meaningful targets and specific milestones to indicate progress against principles and criteria over time;
    - (d) is verifiable through independent certifying or verifying bodies—which have defined and rigorous assessment procedures that avoid conflicts of interest, and are compliant with ISO guidance on accreditation and verification procedures; and
    - (e) conforms to the ISEAL Code of Good.

### ***Disclosure Requirement E4-3 – Targets related to biodiversity and ecosystems***

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- AR 18. When determining (local) ecological thresholds to set targets, the undertaking may refer to the guidance provided by the Science-Based Targets Initiative for Nature (SBTN) or any other guidance with a scientifically acknowledged methodology that allows to set science-based targets by identifying ecological thresholds and, if applicable, organisation-specific allocations.
- AR 19. When disclosing information required under **paragraph 31** for the purpose of setting targets the undertaking shall consider the need for an informed and willing consent of local and indigenous communities, the need for appropriate consultations and the need to respect the decisions of these communities.
- AR 20. When disclosing under **paragraph 31 (e)**, the undertaking may refer to “The BBOP Principles on Biodiversity Offsets” (2018), “Biodiversity Offsets: A User Guide” (2016), and “Guidance on achieving no net loss or net gain of biodiversity and ecosystem services” (2020, EU document).

### **Presentation of information**

- AR 21. The targets related to material impacts may be presented in a table as illustrated below:

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<sup>48</sup> Refers to IFC Performance Standard 6.

Type of target according to mitigation hierarchy	Baseline value and base year	Target value and geographical scope			Connected policy or legislation <sup>49</sup>
		2025	2030	Up to 2050	
Avoidance					
Reduction and minimisation					
Restoration and rehabilitation					

AR 22. The targets related to sub-topics listed in **AR 4**, may be presented in a table as illustrated below:

Type of target	Baseline value and base year	Target value and geographical scope			Connected policy or legislation <sup>50</sup>
		2025	2030	Up to 2050	

AR 23. Measurable targets related to biodiversity and ecosystems may be expressed as:

- (a) size and location of all habitat areas protected or restored, whether directly or indirectly controlled by the undertaking, and whether the success of the restoration measure was or is approved by independent external professionals;
- (b) area of land with a permanently protected land status as of the end of the reporting period;
- (c) area of land with a protected land status as of the end of reporting period;
- (d) recreated surfaces (environments in which management initiatives are implemented so as to create a habitat on a site where it did not exist initially); or
- (e) number or percentage of projects / sites whose ecological transparency was increased (e.g. installation of fish passes, wildlife corridors).

#### **Disclosure Requirement E4-4 – Action plans and resources in relation to biodiversity and ecosystems-related policies and targets**

AR 24. The disclosure required by paragraph 35 (d) may also include for each key actions:

- (a) an explanation whether the action is intended to be a one-time initiative or a systematic practice.
- (b) if the action is individual or collective, and for a collective, the undertaking may explain its role and whether the success of it depends on the undertaking's support.
- (c) a description of how the actions or actions plans to contribute to systemwide change, notably to alter the drivers of biodiversity and ecosystem change, e.g. through technological, economic, institutional, and social factors and changes in underlying values and behaviours<sup>51</sup>.

AR 25. When disclosing policies regarding sourcing of raw materials under 26 (e), the undertaking may refer to what actions the undertaking may take to shift suppliers when

<sup>49</sup> Refer to Global and EU goals and targets related to biodiversity and ecosystems

<sup>50</sup> Refer to Global and EU goals and targets related to biodiversity and ecosystems

<sup>51</sup> The system-wide approach in paragraph 39 refers to the Taskforce for Nature Financial related Disclosures (TNFD) Proposed Technical Scope from June 2021 and the Science-Based Targets for Nature (SBTN) Initial Guidance for Business from September 2020.

they contribute to significantly adversely impacting those protected areas or key biodiversity areas.

- AR 26. As regards to paragraph 35 (a), the undertaking may disclose whether it considers “avoidance” actions and action plan which prevent damaging actions before they take place. Avoidance often involves a decision to deviate from the business-as-usual project development path. The clearest examples of avoidance are altering the footprint of a project to avoid destruction of natural habitat on the site and/or establishing set-asides where priority biodiversity values are present and will be conserved. At a minimum, avoidance should be considered where there are biodiversity and ecosystem-related values that are in one of the following categories: particularly vulnerable and irreplaceable, of particular concern to stakeholders, or where a cautious approach is warranted due to uncertainty in impact assessment or the efficacy of management measures.
- AR 27. The three main types of avoidance are defined below:
- (a) avoidance through Site Selection (Locate the entire project away from areas recognised for important biodiversity values);
  - (b) avoidance through Project Design (Configure infrastructure to preserve areas at the project site with important biodiversity values); and
  - (c) avoidance through Scheduling (Time project activities to account for patterns of species behaviour (e.g., breeding, migration) or ecosystem functions (e.g., river dynamics)).
- AR 28. In the context of this Disclosure Requirement, the term ‘Reduction and minimisation’ refers to reducing the extent, intensity, and duration of impacts on biodiversity that are not prevented by avoidance.

### **Section 3: Performance Measurement**

#### **Disclosure Requirement E4-5 – Impact metrics related to biodiversity and ecosystem change**

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- AR 29. The undertaking shall consider and describe these considerations the following when preparing the information required under this Disclosure Requirement:
- (a) methodologies and metrics used and explanation for why these methodologies and metrics are selected, as well as their assumptions, limitations and uncertainties, as well as any changes in methodologies made over time and why they occurred;
  - (b) the scope of the metrics and methodologies:
    - i. undertaking, site, brand, commodity, corporate business unit, activity;
    - ii. entire value chain, upstream, downstream value chain or own operations and leased assets;
    - iii. sub-topic covered.
  - (c) the biodiversity components of the metrics: species specific, ecosystem specific;
  - (d) a description of the geographies covered by the methodology and, an explanation of why the relevant geographies identified were not included;
  - (e) how the metrics integrate ecological thresholds (e.g. the biosphere integrity and land-system change planetary boundaries<sup>52</sup>) and allocations;
  - (f) the frequency of monitoring, key indicators being monitored, and the baseline condition/value and baseline year/period, as well as the reference period;

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<sup>52</sup> A description of the nine planetary boundaries can be found here : <https://www.stockholmresilience.org/research/planetary-boundaries/the-nine-planetary-boundaries.html>.

- i. whether the parametrisation of these metrics rely on primary data, secondary data, modelled data or on expert judgement, or a mixture of these;
- ii. an indication of which actions are measured and monitored via the metrics and how they relate to the achievement of targets;
- iii. whether metrics are mandatory (based on legislation) or voluntary. If they are mandatory, the undertaking may consider listing the relevant legislation; if voluntary, refer to the voluntary standard/procedure used; and
- iv. whether the metrics are informed by or correspond to expectations or recommendations of relevant and authoritative national, EU-level or intergovernmental guidelines, policies, legislation or agreements, such as the Convention for Biological Diversity (CBD) and IPBES.

AR 30. When selecting metrics, the undertaking shall consider using and describe these considerations to use technically robust and verifiable information, as well as data and methods that, from a scientific perspective, are fit for decision making and responsive to decision making over the appropriate timeframe and spatial scale. For example, there should be an accepted theory of the relationship between the indicator and the purpose, with agreement that change in the indicator indicates change in the issue of concern. Uncertainties should be reduced as far as possible. Data or mechanisms used should be supported by well-established organisations and updated over time. Robust modelled data and expert judgment can be used where data gaps exist<sup>53</sup>. The methodology must be sufficiently detailed to allow for meaningful comparison of impacts and mitigation activities over time. Information gathering processes and definitions must be systematically applied. This allows a meaningful review of an undertaking's performance over time and helps internal and peer comparison<sup>54</sup>.

AR 31. If a metric corresponds to a target, the baseline for both shall be aligned. The biodiversity baseline is an essential component of the larger biodiversity and ecosystems management process. The baseline is necessary to inform impact assessment and management planning, as well as monitoring and adaptive management<sup>55</sup>. The undertaking may refer to the work in "Good Practices for the Collection of Biodiversity Baseline Data" (Gullison, 2015) for baseline creation, and in particular the checklist available on page 18.

AR 32. When identifying relevant metrics, the undertaking may refer to the biodiversity and ecosystems-related indicators listed for the Sustainable Development Goals<sup>56</sup>, IPBES Assessment Report 2019<sup>57</sup> and the Report on biodiversity measurement approaches developed by the Business for Biodiversity Platform<sup>58</sup>.

AR 33. Methodologies available to collect data and measure the undertakings' impacts on biodiversity state may be separated into three categories as follows<sup>59</sup>:

- (a) primary data: collected in-situ using on the ground surveys;
- (b) secondary data: including geospatial data layers that are overlaid with geographic location data of business activities:
  - i. at the species level, data layers on the ranges of different species can be used to predict the species that may be present at different locations. This includes operation sites and sourcing locations. Range layers, each will have

<sup>53</sup> Source: UNEP-WCMC, Conservation International and Fauna and Flora International, 2020.

<sup>54</sup> Source: UNEP-WCMC, Conservation International and Fauna and Flora International, 2020.

<sup>55</sup> Source: Gullison, R.E., J. Hardner, S. Anstee, M. Meyer. 2015. Good Practices for the Collection of Biodiversity Baseline Data. Prepared for the Multilateral Financing Institutions Biodiversity Working Group and Cross-Sector Biodiversity Initiative.

<sup>56</sup> Source: <https://sustainabledevelopment.un.org/content/documents/11803Official-List-of-Proposed-SDG-Indicators.pdf>

<sup>57</sup> Supplementary material in chapter 2.2 available at <https://ipbes.net/global-assessment>.

<sup>58</sup> Source: [https://ec.europa.eu/environment/biodiversity/business/news/news-277\\_en.htm](https://ec.europa.eu/environment/biodiversity/business/news/news-277_en.htm)

<sup>59</sup> Source: Align (2022), "Recommendations for a standard on 8 biodiversity measurement and valuation, draft 01", unpublished.

differing levels of accuracy depending on factors (e.g. whether species ranges have been refined based on availability of habitat). Information on the threat status of the species, and the activities that threaten them, can provide an indication of the likely contribution that business activities may be having on driving population trends and threat status;

- ii. at the ecosystem level, data layers reflecting change in the extent and condition of ecosystems can be applied, including levels of habitat fragmentation and connectivity;
  - (c) modelled biodiversity state data: Model-based approaches are commonly used for measuring ecosystem level indicators (e.g. extent, condition, or function). Models quantify how the magnitude of different pressures affects the state of biodiversity. These are referred to as pressure-state relationships and are based on globally collected data. Modelling results are applied locally to estimate how undertaking-level pressures will cause changes in ecosystem condition.
- AR 34. An impact driver generally has three main characteristics: magnitude (e.g. amount of contaminant, noise intensity), spatial extent (e.g. area of land contaminated) and temporal extent (duration of persistence of contaminant)<sup>60</sup>.
- AR 35. The undertaking may refer to guidance on Life Cycle Assessment provided by the German Environment Agency in “The Land Rucksack”<sup>61</sup> or a technical report on “Land-use related environmental indicators for Life Cycle Assessment” by the Joint Research Center<sup>62</sup>, when disclosing on paragraph 41.
- AR 36. When reporting on the state of species under paragraph:
- (d) 43 (d) i, the undertaking may consider that contribution to extinction risk metrics use threat assessments and range sizes of the species present at a given location to estimate how different activities at that location may drive species extinctions globally.
  - (e) 43 (d) ii, the undertaking may consider that changes in species area of habitat-metrics measure the change in habitat size as a proxy of a change to a species population size. Indicators such as these can be used when direct population counts are not possible to obtain, however, direct in-situ population measures are preferred.
- AR 37. The undertaking may disclose in units of area (e.g. m<sup>2</sup> or ha) on land-use using guidance provided by the Eco-Management and Audit Scheme<sup>63</sup>:
- (a) total use of land;
  - (b) total sealed area;
  - (c) total nature-oriented area on site; and
  - (d) total nature-oriented area off site.
- AR 38. The undertaking may disclose, for example, land cover change, which is the physical representation of the drivers “habitat modification” and “industrial and domestic activities”, i.e., the man-made or natural change of the physical properties of Earth’s surface at a specific location. Examples for metrics include<sup>64</sup>:
- (a) area (ha) of forest, grassland or wetland converted due to urbanisation;
  - (b) area (ha) of degraded land converted to agricultural land;

<sup>60</sup> Source: Align (2022), “Recommendations for a standard on 8 biodiversity measurement and valuation, draft 01”, unpublished

<sup>61</sup>

[https://www.umweltbundesamt.de/sites/default/files/medien/376/publikationen/the\\_land\\_rucksack\\_2022\\_05\\_25.pdf](https://www.umweltbundesamt.de/sites/default/files/medien/376/publikationen/the_land_rucksack_2022_05_25.pdf)

<sup>62</sup> [https://eplca.jrc.ec.europa.eu/uploads/QMS\\_H08\\_MonscenReff\\_del-land-use\\_FINAL.pdf](https://eplca.jrc.ec.europa.eu/uploads/QMS_H08_MonscenReff_del-land-use_FINAL.pdf)

<sup>63</sup> As proposed by the COMMISSION REGULATION (EU) 2018/ 2026 of 19 December 2018 amending Annex IV to Regulation (EC) No 1221/2009 of the European Parliament and of the Council on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS).

<sup>64</sup> Source: CDSB Biodiversity Application Guidance 2021

- (c) area (ha) of land converted to monoculture;
  - (d) area (ha) of mangrove protected and/or restored;
  - (e) area (ha) of marine area for aquaculture (e.g. to grow mussels).
- AR 39. Land cover is a typical variable that can be assessed with earth observation data. Examples include: Validated global land-cover datasets are produced annually since 2015 by the Copernicus Global Land Service<sup>65</sup>. A high-resolution alternative is ESA's WORLDCOVER<sup>66</sup> dataset, a global land cover map with a spatial resolution of 10 meters. However, this dataset has so far only been generated for the year 2020, so no changes can be assessed yet, but an annual calculation is envisaged. Alternatively, the undertaking may refer to the following metrics and open-access tools: the Invest Habitat Quality Model, the Corine Land Cover, the ESRI Land Cover, the catalogue of Earth Engine Data, the Eurostat Land Use and Land Cover Survey, the habitat modification metric from the ENCORE database or the Biodiversity Intactness Index<sup>67</sup>.
- AR 40. When disclosing under **paragraph 44** on the introduction of invasive alien species, the undertaking may disclose, for example, the pathways and number of invasive alien species identified in or adjacent to the undertaking's own operations or its value chain sites, or the extent of surface covered by invasive alien species.
- AR 41. Data layers on the ranges of different species may be used to predict the species that may be present at different locations. This includes operation sites and sourcing locations. Range layers has differing levels of accuracy depending on factors, e.g., whether species ranges have been refined based on availability of habitat. Information on the threat status of the species, and the activities that threaten them, can provide an indication of the likely contribution that business activities may be having on driving population trends and threat status.
- AR 42. When reporting on material impacts related the ecosystems under **paragraph 46**, the undertaking may consider a third aspect of on the functioning of ecosystems by using:
- (a) an indicator that measures a process (or function) that the ecosystem completes or reflects the ability to undertake that specific process (or function): e.g. net primary productivity, which is the measure of plant productivity that measures the rate that energy is stored by plants and made available to other species in the ecosystem. It is a core process that occurs for ecosystems to function. It is related to many factors, such as species diversity, but does not measure these factors directly; or
  - (b) an indicator that measures changes to the population of scientifically identified.
- AR 43. When reporting on impacts contributing to state changes under **paragraph 45 and 46**, indicators for ecosystem extent and condition shall form the core of measurements, but can be supplemented with species level indicators for a more complete assessment.
- AR 44. At the ecosystem level, data layers reflecting change in the extent and condition of ecosystems may be applied, including levels of habitat fragmentation and connectivity.

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<sup>65</sup> Source: <https://land.copernicus.eu/global/products/lc>

<sup>66</sup> Source: <https://esa-worldcover.org/en>

<sup>67</sup> <https://naturalcapitalproject.stanford.edu/software/invest>,  
<https://land.copernicus.eu/pan-european/corine-land-cover>,  
<https://livingatlas.arcgis.com/landcover/>,  
<https://developers.google.com/earth-engine/datasets/tags/landcover>,  
[https://ec.europa.eu/eurostat/statistics-explained/index.php?title=LUCAS\\_-  
\\_Land\\_use\\_and\\_land\\_cover\\_survey](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=LUCAS_-_Land_use_and_land_cover_survey), <https://encore.naturalcapital.finance/en/drivers/7>,  
[https://www.nhm.ac.uk/our-science/data/biodiversity-indicators/about-the-biodiversity-intactness-index.html#:~:text=The%20Biodiversity%20Intactness%20Index%20\(BII,given%20area%20C%20despite%20human%20impacts.\)](https://www.nhm.ac.uk/our-science/data/biodiversity-indicators/about-the-biodiversity-intactness-index.html#:~:text=The%20Biodiversity%20Intactness%20Index%20(BII,given%20area%20C%20despite%20human%20impacts.))





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