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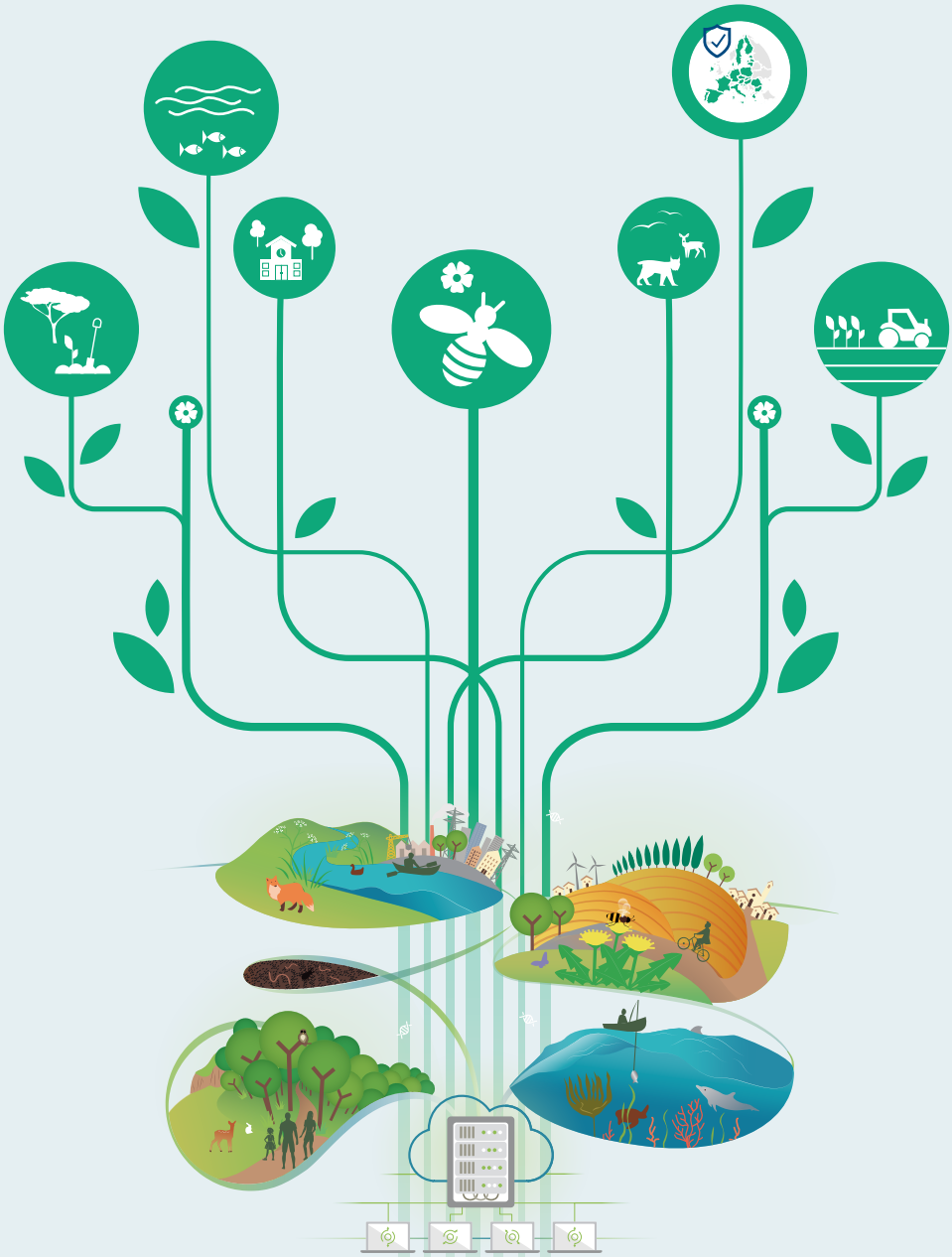

Science for policy report of the **Knowledge Centre for Biodiversity**

Assessing progress in monitoring and implementing the EU Biodiversity Strategy for 2030

European Commission

European Environment Agency

EUR 40323

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Abstract

The aim of this science for policy report is twofold. First, it presents the state of play and the next steps in developing a monitoring framework for the EU Biodiversity Strategy for 2030 (EU BDS). Second, it provides an overview of progress made in implementing the EU BDS to date, as well as an assessment of the likelihood of reaching its targets by 2030. It mobilises various data sources – the official EU BDS and other policy-relevant progress monitoring tools, scientific literature and expert opinions – to provide a state of play of key achievements and remaining gaps in both monitoring and implementing the EU BDS as we approach its mid-term mark. Almost half of the actions are completed; the remaining half are mostly in progress, and a few are delayed. Indicators are published to track progress towards more than 40 % of the EU BDS targets and, with the notable exception of those on the state of biodiversity, the EU is showing progress in the right direction towards most of the evaluated targets; however, the pace of progress needs to accelerate massively to reach the 2030 targets. Further effort and engagement with the scientific community is needed to fill the remaining monitoring gaps, while a better implementation of the environmental policies would be necessary to meet the maximum of targets by 2030.

Forewords

Biodiversity underpins the health of our planet and the resilience of our economies.
A rich and thriving natural world is not only essential for ecological balance and human well-being, but also a fundamental driver of long-term competitiveness and prosperity.

Healthy ecosystems support vital services: they sustain our agricultural productivity, provide us with clean water and mitigate the impacts of climate change, enabling businesses and communities to thrive. As such, halting biodiversity loss is not just an environmental imperative. It is a strategic one for the future of our Union.

This report marks a fundamental step in evaluating how far we have come in implementing the EU Biodiversity Strategy for 2030. It provides an overview of our progress, drawing on robust and evidence-based insights from the Joint Research Centre, in close collaboration with the European Environment Agency, Eurostat, and the broader scientific community across Europe.

While there is still much work to be done, the progress made so far is a cause for optimism. The fact that almost half of the EU Biodiversity Strategy actions are completed, and the remaining half are mostly in progress, demonstrates a clear commitment to action.

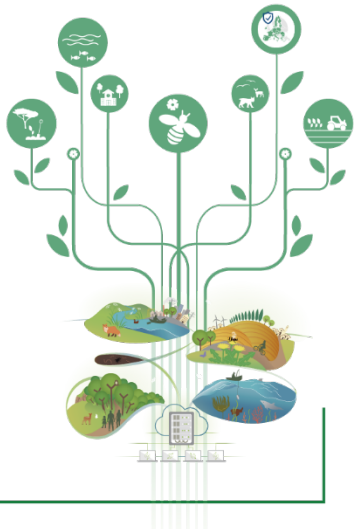
On the other hand, this report also highlights the importance of accelerating efforts to meet the EU's ambitious targets for 2030. It clearly calls for further action to enhance our monitoring capacities, as a lack of data hinders the evaluation of progress towards almost half of the targets.

The work of the European Commission's Knowledge Centre for Biodiversity lies at the heart of both past and future research efforts to support the EU Biodiversity Strategy. As a vital science-to-policy interface, the Knowledge Centre will continue to play a crucial role in filling the remaining monitoring gaps, providing a complete and comprehensive picture of our progress until 2030.

I truly welcome this work and its significance among EU's efforts aimed at preserving our treasured biodiversity.

Alessandra Zampieri
Director

European Commission
Joint Research Centre
Directorate D – Sustainable Resources



This report is the first to assess progress in monitoring and implementing the EU Biodiversity Strategy for 2030 (EU BDS). It presents the current status of the EU BDS monitoring framework, still under development, and provides results for those indicators that are already part of the framework, assessing progress towards the respective policy targets.

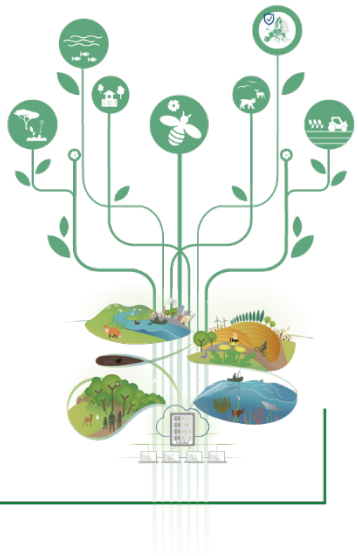
Well-defined targets and a carefully designed monitoring framework ensure an effective policy implementation. Essential for a successful monitoring is the selection of indicators, which must build on high-quality data. On the basis of these indicators, progress towards achieving the objectives can be measured and presented transparently.

Eurostat's mission is to provide high-quality data and statistics on Europe. Some of Eurostat's statistical offer are used for the monitoring of the European Green Deal and the 8th Environment Action Programme. Examples are indicators on the EU's material footprint, waste, energy, transport and agricultural statistics, and evidently macroeconomic and employment data. Many of these statistics are also used to measure the EU progress towards the Sustainable Development Goals. Under the umbrella of the Knowledge Centre for Biodiversity, Eurostat is supporting the EU BDS monitoring with several indicators. Beyond the EU BDS dashboard, Eurostat is contributing to the monitoring plan for the EU implementation of the Kunming-Montreal Global Biodiversity Framework.

As we strive to produce robust environmental indicators that provide evidence for EU policy making and substantiate EU reporting, we see this EU BDS report as an important milestone to widely use and recognise EU biodiversity monitoring. Building on this report, the EU BDS monitoring will guide policy actions to help recover the EU's biodiversity.

Arturo de la Fuente
Acting Director

European Commission
Eurostat
Directorate E – Sectoral and regional statistics
(including environment, energy, transport and agriculture)



At a time when biodiversity's key role in contributing to the resilience of Europe's economy, society, and well-being is increasingly recognised, this new report—assessing progress toward the EU Biodiversity Strategy for 2030—is both timely and essential.

The European Environment Agency is proud to have collaborated with our colleagues at the European Commission's Joint Research Centre and across the wider Commission to produce this authoritative and impactful report. This reflects several years of effective cooperation between the different institutions, through discussions, development and joint contributions to the Knowledge Centre for Biodiversity, working to identify available indicators, and how to fill the identified gaps.

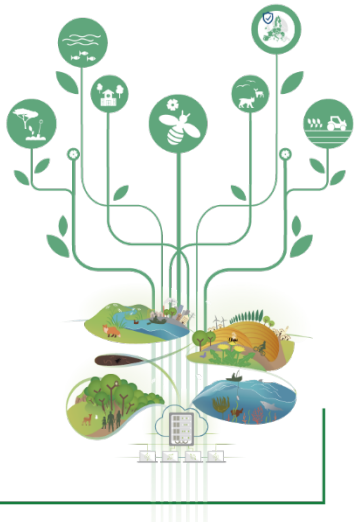
For the Agency, this report also shows the valued role of our European Environment Information and Observation Network (EIONET) country network and its members, and the work they do at a national level to collect data and share this with the Agency. The relationship with EIONET is a central part of the work of the Agency and helps us collectively answer key policy questions, sharing experiences and knowledge.

This report demonstrates that positive progress is being made on many of the ambitions of the EU Biodiversity Strategy, while acknowledging that there are still some gaps to be addressed. While we are seeing progress, this report and the indicators that underpin it, highlight the need to increase the pace of progress across the different targets and ambitions of the Strategy.

Having a clear understanding of where we are and, where we need to go is essential, to both understand and demonstrate the key role of nature and biodiversity play as components of Europe's long-term resilience.

Martin Adams
Director

European Environment Agency
Environment Department



Biodiversity is the fabric of life on Earth. Healthy ecosystems underpin human wellbeing, climate mitigation and adaptation and the resilience of Europe's economy. It is imperative to reduce pressures on nature and safeguard its benefits on which we all depend.

The EU Biodiversity Strategy for 2030 (EU BDS) builds on this recognition. It aims to put nature on a path to recovery by 2030, thereby also delivering on the EU's global biodiversity commitments. The Strategy is remarkable in terms of its scope and ambition, but also in its design. Its time-bound, quantified targets – to protect and restore nature, reduce pressures on ecosystems and ensure their sustainable management by 2030 – provide the basis for progress tracking and assessment.

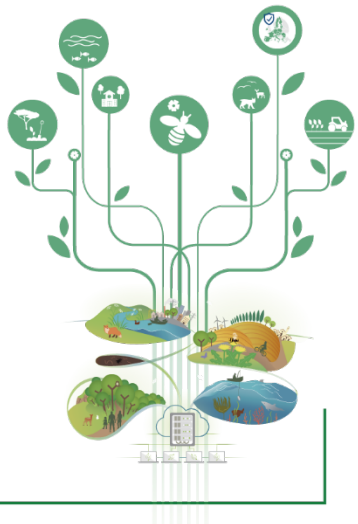
The EC Knowledge Centre for Biodiversity (KCBD) was created with the aim to strengthen the contribution of science and research to biodiversity policy. Since its launch in 2020, the KCBD has become a core part of the EU's biodiversity knowledge governance landscape. It has put in place a system to respond to knowledge-for-policy requests, an online dashboard of indicators and an actions tracker to report on implementation and progress to the targets set in the EU BDS. While work continues on these tools, they are already supporting knowledge-based biodiversity policy.

This first KCBD science-for-policy report comes midway between the Strategy's launch and its target year 2030. It draws on the action tracker and the dashboard, providing a snapshot of where we stand as well as an outlook for reaching the EU BDS targets by 2030. The report reveals progress in some areas but also worrying trends of continued biodiversity decline. It shows what we know, but also where significant gaps remain in our progress tracking framework.

The findings from this report will feed into the upcoming EU report to the Convention of Biological Diversity on progress in implementing the Kunming-Montreal Global Biodiversity Framework (GBF). They will also help us reflect on how to enhance implementation, increase synergies with other EU policy objectives, and mobilise and support the efforts of actors across the board, at all levels. Further work by the KCBD will be needed to finalise a robust progress tracking framework for the EU BDS. This process will also be an opportunity to increase coherence with relevant EU policy monitoring frameworks, and with EU reporting on GBF implementation.

Humberto Delgado Rosa
Director

European Commission
Directorate-General for Environment
Directorate D – Biodiversity



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Executive summary

Policy context

The EU Biodiversity Strategy for 2030 (EU BDS) was published in May 2020 as a core part of the European Green Deal (EGD). It aims to put Europe's biodiversity on the path to recovery by 2030 for the benefit of people, climate and the planet. It contains targets and actions for protecting nature, restoring ecosystems, enabling transformative change, and stepping up EU external actions for biodiversity. The European Commission established the Knowledge Centre for Biodiversity (KCBD) in October 2020 with the mandate to support the implementation of the EU BDS and in particular the monitoring of progress towards its actions and targets. As we are approaching the mid-term of the EU BDS, the aims of this KCBD report are to:

- present the state of play and future work to develop a monitoring framework for the EU BDS, and
- provide an overview of progress in implementing the EU BDS, as well as an assessment of the likelihood to reach its targets by 2030.

This work highlights key achievements and remaining gaps in both monitoring and implementing the EU BDS up to 2025. It can be used to support reflections on policy action for strengthening the implementation of the EU BDS in the five remaining years. It can further serve as an interim step towards the final evaluation of the EU BDS and its interactions with other relevant EGD policy instruments.

Main findings and key conclusions

As concerns the implementation of the EU BDS actions and as indicated in the EU BDS actions tracker[1] (the official tool monitoring progress towards the implementation of the more than 100 EU BDS actions), in March 2025 about half of the actions were completed and many more were close to completion or in progress. For several actions that have been delayed, the EU BDS actions tracker provides information on their state of play and likely delivery date, where known.

As concerns the analysis of progress towards the EU BDS targets, we took as a skeleton the 16 targets mentioned in the EU BDS dashboard[2] (the official tool monitoring progress towards the EU BDS targets). As some of these targets cover several aspects, we broke down those targets into subtargets. In the end, we carried out our analysis for 29 (sub)targets, each one covering a single aspect. For each (sub)target, we highlighted:

- the availability of indicators to track progress towards them in the EU BDS dashboard, as well as ongoing work to further develop indicators
- the progress achieved so far towards them
- the outlook of meeting them by 2030.

Table ES1 gives a summary of these results for each (sub)target. Regarding the availability of indicators, so far, indicators have been (or will soon be) published in the EU BDS dashboard for 12 out of the 29 (sub)targets (Table ES1).

Regarding the progress achieved so far, our analysis indicates that progress is going in the right direction for 10 (sub)targets, that progress is stagnant for 3 (sub)targets, and that current trends run counter to the desired direction for 2 (sub)targets (Table ES1). However, progress could not be evaluated due to a lack of data for 14 (sub)targets (Table ES1).

[1] https://dopa.jrc.ec.europa.eu/kcbd/actions-tracker/
[2] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/?version=1

Table ES1. Table summarising the availability of indicators to track progress towards the EU BDS targets in the EU BDS dashboard, the progress achieved so far towards them and the outlook of meeting them by 2030.

Indicators (soon to be) published in the EU BDS dashboard

Yes No

Progress achieved so far

Good direction Stable Bad direction Cannot be evaluated

Outlook of meeting the target

On track to meet 2030 target | Progress needs to accelerate to meet the 2030 target | 2030 target is unlikely to be reached | Progress towards target cannot be assessed due to lack of data

	Indicators (soon to be) published in the EU BDS dashboard	Progress achieved so far	Outlook of meeting the target
Target 1 **Legally protect a minimum of 30 % of the EU's land area and a minimum of 30 % of the EU's sea area, and integrate ecological corridors, as part of a true Trans-European Nature Network.**			
1.1: Legally protect a minimum of 30 % of the EU's land area	☑	→	🟡
1.2: Legally protect a minimum of 30 % of the EU's sea area	☑	→	🟡
1.3: Build a truly coherent Trans-European Nature Network integrating ecological corridors, on land	☑	–	🟡
1.4: Build a truly coherent Trans-European Nature Network integrating ecological corridors, at sea	☒	⊗	⚪
Target 2 **Strictly protect at least a third of the EU's protected areas, including all remaining EU primary and old-growth forests.**			
2.1: Strictly protect at least a third of the EU's protected areas	☒	⊗	🟡
2.2: Strictly protect all remaining EU primary and old-growth forests	☒	⊗	⚪
Target 3 **Effectively manage all protected areas, defining clear conservation objectives and measures, and monitoring them appropriately**	☒	⊗	⚪
Target 4 **Legally binding EU nature restoration targets to be proposed in 2021, subject to an impact assessment. By 2030, significant areas of degraded and carbon-rich ecosystems are restored. Habitats and species show no deterioration in conservation trends and status; and at least 30 % reach favourable conservation status or at least show a positive trend.**			
4.1: Significant areas of degraded and carbon-rich ecosystems are restored	☒	–	⚪
4.2: Habitats show no deterioration in conservation trends and status	☒	⊗	⚪
4.3: Species show no deterioration in conservation trends and status	☑	←	🟠
4.4: At least 30 % of species currently not in favourable conservation status reach favourable conservation status or at least show a positive trend	☒	⊗	⚪
4.5: At least 30 % of habitats currently not in favourable conservation status reach favourable conservation status or at least show a positive trend	☒	⊗	⚪
Target 5 **The decline in pollinators is reversed**	☑	←	🟠
Target 6 **The risk and use of chemical pesticides is reduced by 50 %, and the use of more hazardous pesticides is reduced by 50 %.**			
6.1: The risk and use of chemical pesticides is reduced by 50 %	☒	→	⚪
6.2: The use of more hazardous pesticides is reduced by 50 %	☒	→	⚪
Target 7 **At least 10 % of agricultural area is under high-diversity landscape features**	☑	⊗	⚪

	Indicators (soon to be) published in the EU BDS dashboard	Progress achieved so far	Outlook of meeting the target
Target 8 **At least 25% of agricultural land is under organic farming management, and the uptake of agro-ecological practices is significantly increased.**			
8.1: At least 25 % of agricultural land is under organic farming management	☑	→	●
8.2: The uptake of agro-ecological practices is significantly increased	☑	–	●
Target 9 **Three billion trees are planted in the EU, in full respect of ecological principles**	☑	→	●
Target 10 **Significant progress in the remediation of contaminated soil sites**	☑	→	●
Target 11 **At least 25,000 km of free-flowing rivers are restored**	☒	⊗	●
Target 12 **There is a 50 % reduction in the number of Red List species threatened by invasive alien species**	☒	⊗	●
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 %**			
13.1: The losses of nutrients from fertilisers are reduced by 50 %	☑	→	●
13.2: The use of fertilisers is reduced by at least 20 %	☒	→	●
Target 14 **Cities with at least 20,000 inhabitants have an ambitious Urban Greening Plan**	☒	⊗	●
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.**			
15.1: The negative impacts on sensitive species through fishing and extraction activities are substantially reduced	☑	→	●
15.2: The negative impacts on sensitive habitats, including on the seabed through fishing and extraction activities, are substantially reduced	☒	⊗	●
15.3: Good environmental status is achieved	☒	⊗	●
Target 16 **The by-catch of species is eliminated or reduced to a level that allows species recovery and conservation**	☒	⊗	●

Source: JRC

Regarding the outlook of meeting the (sub)targets by 2030, our evaluation suggests that EU is not on track to meet any of the 13 evaluated (sub)targets, although 9 of these evaluated (sub)targets could still be met should the pace of progress accelerate (Table ES1). EU is unlikely to meet the remaining 4 evaluated (sub)targets. However, outlook could not be evaluated due to a lack of data for the 16 remaining (sub)targets (Table ES1).

Interestingly, EU has progressed in the right direction mainly for the (sub)targets focusing on mitigating some pressures on biodiversity (e.g. designation of protected areas, reduction in the use of pesticides and fertilisers and conversion to organic farming), while for the (sub)targets concerning biodiversity state, EU is still regressing (i.e. common birds and pollinators continue to decline). This could suggest that, so far, the level of reduction of these pressures on biodiversity has not been enough to stop biodiversity decline.

The KCBD will continue leading the efforts to set up a robust monitoring framework for the EU BDS, and will further engage with the scientific community to fill the remaining monitoring gaps and provide a complete EU BDS dashboard, with indicators to track progress towards all 29 (sub)targets, by 2030. To meet the maximum of EU BDS targets by 2030, a better implementation of the existing environmental policies is needed, including the full implementation of the Nature Restoration Regulation.

Related and future JRC work

This report on the EU BDS is part of the broader JRC work supporting the monitoring of the environmental policies set under the EGD. Such JRC work includes, among others, a sustainability gap analysis of the EGD targets, the monitoring and outlook of the Zero Pollution Action Plan, the monitoring of the EU Soil Strategy through the EU Soil Strategy Actions Tracker, and the development of a monitoring framework for the Farm to Fork Strategy. Future JRC work will further improve coherence and complementarity and could focus on strengthening the interoperability between these EGD monitoring frameworks, as well as on links with the EU and national monitoring of the implementation of the Kunming-Montreal Global Biodiversity Framework.

Quick guide

This report is organised in five sections. The first section is an introduction. The second section briefly describes the EU BDS progress monitoring tools. The third section highlights progress made so far in implementing the EU BDS actions. The fourth one focuses on the progress in monitoring, progress towards achieving and outlook of meeting the EU BDS targets. The fifth section is a conclusion highlighting key achievements and remaining gaps in monitoring and implementing the EU BDS.

1 Introduction

The EU Biodiversity Strategy for 2030[3] (EU BDS) was published in May 2020 as a core part of the European Green Deal[4] (EGD). It aims to put Europe's biodiversity on the path to recovery by 2030, for the benefit of people, climate and the planet. This draws on the recognition that biodiversity and ecosystem services support human life and wellbeing, climate change mitigation and adaptation, as well as economic recovery, long-term prosperity and resilience.

The EU BDS contains specific actions and sets timebound targets for protecting nature, restoring ecosystems and ensuring their sustainable use, while reducing key pressures on biodiversity. It further sets out actions to enable implementation and transformative change, and outlines the EU's ambition and commitments to mobilise external actions for global biodiversity. As announced in the EU BDS, the Nature Restoration Regulation[5] (NRR) adopted in June 2024 introduces legally binding targets to restore degraded ecosystems and contribute to climate change mitigation and adaptation.

The European Commission established the Knowledge Centre for Biodiversity[6] (KCBD) in October 2020 with the mandate to support the implementation of the EU BDS and in particular the monitoring of progress towards its actions and targets. The KCBD is co-chaired by the European Commission's Joint Research Centre (JRC), which hosts its Secretariat, and the Directorate-General for the Environment (DG ENV). It operates under the guidance of a Steering Group, which currently includes eight services of the Commission (Research and Innovation, Eurostat, Agriculture and Rural Development, International Partnerships, Climate Action, Maritime Affairs and Fisheries, Health and Food Safety, and Financial Stability, Financial Services and Capital Markets Union) as well as the European Environment Agency (EEA).

As we are approaching the mid-term of the EU BDS implementation timeline, this report aims to:

- present the state of play of developing a monitoring framework for EU BDS implementation, and outline ongoing work to further improve its monitoring
- assess the state of implementation of EU BDS actions as well as progress to date towards the EU BDS targets, and evaluate the likelihood to reach the EU BDS targets by 2030.

To that end, the KCBD has mobilised evidence from various sources: the official EU BDS progress monitoring tools (the EU BDS dashboard[7] and actions tracker[8]), monitoring frameworks and progress reporting on relevant EGD policy instruments (e.g. Marelli et al., 2025; EEA and JRC, 2025; EEA, 2025; Tóth et al., 2024), scientific literature and expert opinion. This work highlights the state of play, key achievements and remaining gaps in both monitoring and implementing the EU BDS up to 2025. It can be used to guide policy reflection and actions for strengthening implementation in the five remaining years.

This report can further serve as an interim review process for the future evaluation of the EU BDS. Moreover, as the targets set in the EU BDS cover pressures on biodiversity, biodiversity state and response to the biodiversity crisis across different ecosystems, the information provided in this report is relevant for environmental objectives of other EU policies such as the EU Forest Strategy for 2030[9], the EU Soil Strategy[10], the Common Agricultural Policy (CAP)[11], the Farm to Fork Strategy

[3] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52020DC0380
[4] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52019DC0640&qid=1727880713254
[5] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R1991&qid=1727880762545
[6] https://knowledge4policy.ec.europa.eu/biodiversity_en
[7] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/?version=1
[8] https://dopa.jrc.ec.europa.eu/kcbd/actions-tracker/
[9] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0572
[10] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0699
[11] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R2115&qid=1727883828268

(F2F)[12], the Zero Pollution Action Plan (ZPAP)[13], the Common Fisheries Policy (CFP)[14], the Marine Strategy Framework Directive (MSFD)[15] and the Water Framework Directive (WFD)[16]. At international level, it can contribute to the EU's 7th National Report on the implementation of the Kunming-Montreal Global Biodiversity Framework (GBF), due in 2026.

After this introduction (Section 1), the rest of this report is organised in four main sections. Section 2 briefly describes the EU BDS progress monitoring tools, one of the main sources of evidence used in this report. Section 3 highlights the progress made so far in implementing the EU BDS actions. Section 4 focuses on the progress in monitoring, progress towards achieving and outlook of meeting the EU BDS targets. The final section consists in a conclusion stressing the key achievements and remaining gaps in both monitoring and implementing the EU BDS.

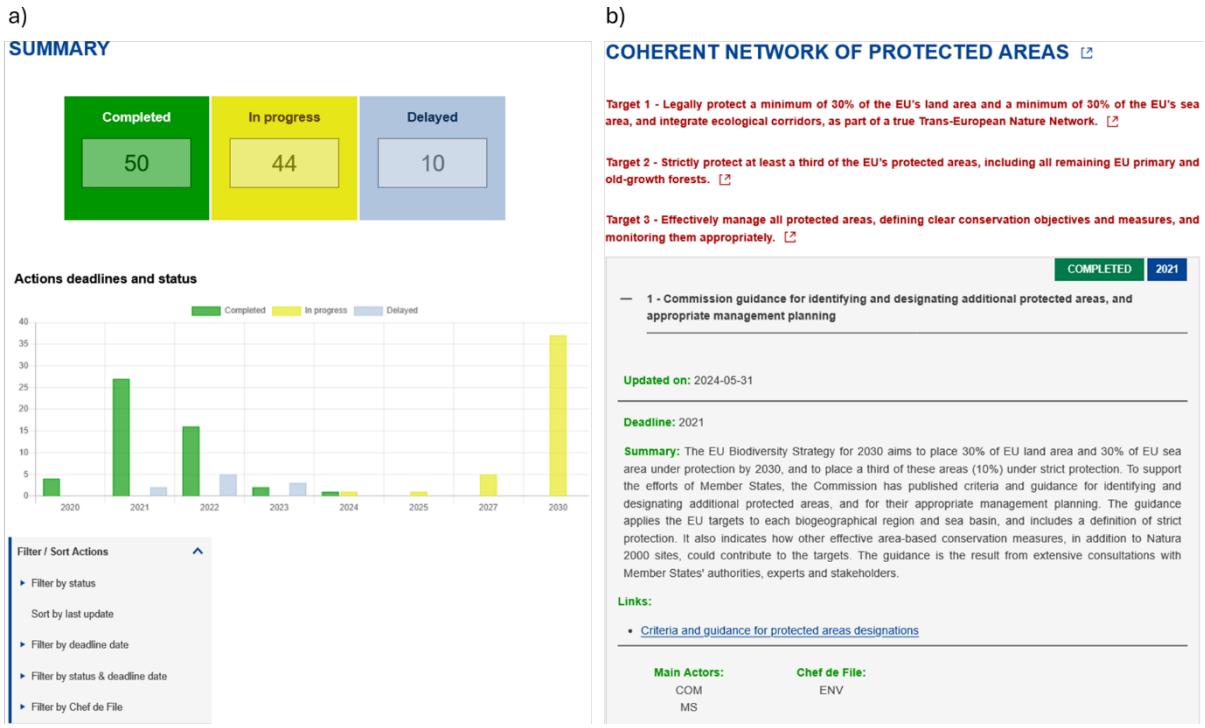
[12] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0381
[13] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0400&qid=1623311742827
[14] https://eur-lex.europa.eu/eli/reg/2013/1380/oj
[15] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32008L0056
[16] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02000L0060-20141120

2 Presentation of the EU BDS progress monitoring tools

To fulfil its mandate, the KCBD has developed two online tools that are used by the European Commission to track progress in the implementation of the EU BDS: an actions tracker and a dashboard. These tools are publicly accessible through the KCBD website, thus providing a transparent overview of EU level implementation efforts and of progress made towards achieving the EU BDS objectives by 2030, and are also used by Member States' authorities and other stakeholders. The Commission also draws on these tools to provide progress updates to Council and the European Parliament, and to contribute to relevant reporting obligations (such as the 8th EAP mid-term review). What these tools are and how they work has been described in depth in a recent scientific publication (Viti et al., 2024). Therefore, the purpose of this section is to briefly summarise how the action tracker and the dashboard have been used for preparing this report.

The actions tracker is a tool designed to monitor the implementation of the more than one hundred actions outlined in the EU BDS. It consists of two parts. The first part presents a summary of the number of actions that have been completed, delayed, or are currently in progress, with the possibility to filter actions according to their state of implementation, or their target date (Figure 1a). The second part itemizes the actions to implement the EU BDS and highlights, for each action, its implementation status (completed, delayed, or in progress) and their (anticipated) completion dates (Figure 1b). Each listed action can be expanded to provide the date of the last update, a summary of the aim of the action and how it has been or is intended to be implemented, links to deliverables or relevant resources, and information regarding the key institutions involved. Technically, the actions tracker is developed and maintained by the KCBD Secretariat, while the content for each action is updated by the Commission services that are in charge of implementing the corresponding action. The actions tracker is fully operational. In this report, it is used to analyse progress in implementing the EU BDS actions (section 3).

Figure 1. Screenshots of the actions tracker showing a) the number of actions that have been completed, delayed, or are currently in progress as well as the options to filter them and b) an action related to the first three EU BDS targets, its status of implementation, its expected completion date, and the additional information the user can see when it is expanded

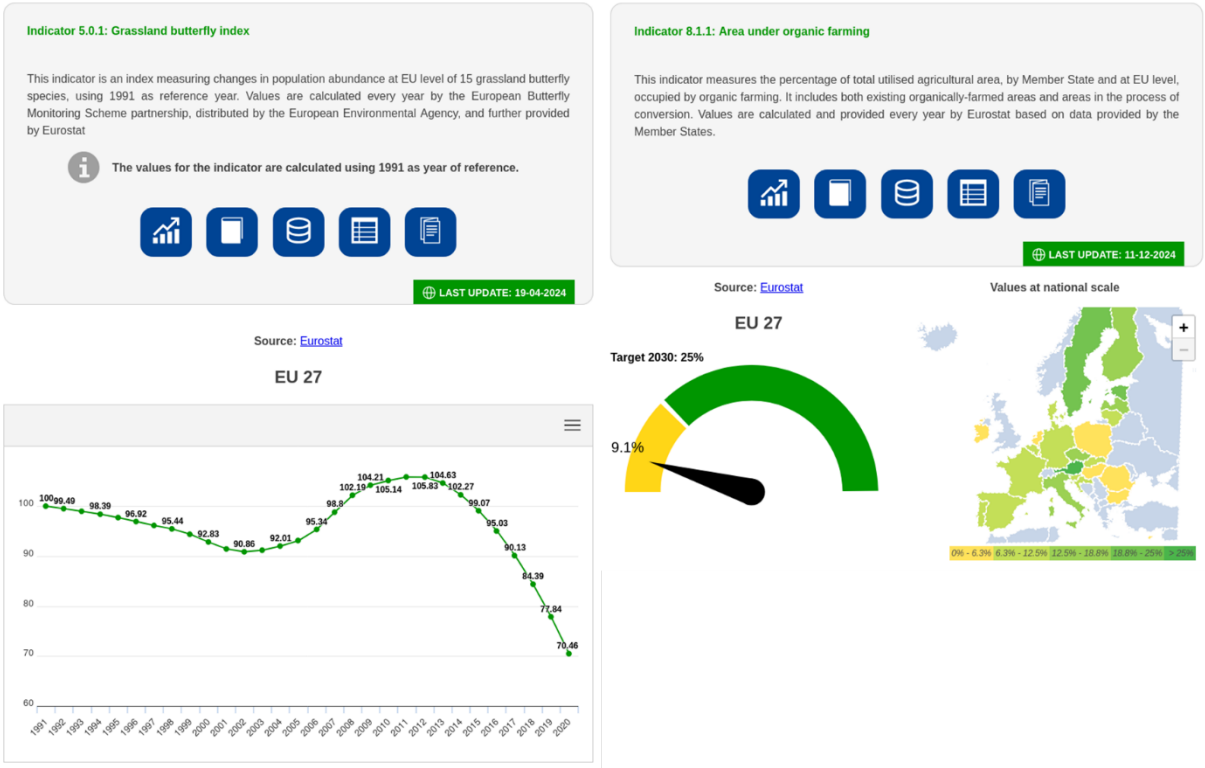


Source: KCBD (https://dopa.jrc.ec.europa.eu/kcbd/actions-tracker/)

The dashboard is a monitoring tool designed to track progress to the EU BDS targets, using a set of indicators. The targets that encompass a very diverse scope are divided in sub-targets, each of them with their own indicator(s). The dashboard is developed and maintained by the KCBD Secretariat, and its content is also updated by the KCBD Secretariat based on information provided and/or produced by the EEA and Eurostat (ESTAT). It will include other data providers in the future, such as JRC or other research groups. The dashboard is a progress monitoring tool that is still in the process of being populated: it does not yet contain a complete set of indicators to inform all the targets. Currently, the dashboard contains 16 indicators that offer information on 8 EU BDS targets. Each indicator displays values at EU level, and, when data are available, also at Member State level[17]. Depending on the nature of the target, different visualizations are employed (Figure 2).

Figure 2. Screenshots of the dashboard illustrating different types of visualization

The left panel illustrates the visualization type "EU 27 temporal trend" used for example for the Grassland butterfly index. The right panel illustrates the visualization type "gauge chart at EU 27 level and map at MS level" used for example for Area under organic farming. For all indicators, the five blue buttons lead to individual pages with (from left right): the indicator graphs, the indicator documentation, the list and description of datasets used to calculate the indicator, the indicator values and the API (application programming interface) developed by the KCBD Secretariat to share indicator information from machine to machine.



Source: KCBD (https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/?version=1)

Each indicator in the dashboard is described in a standardised manner to ensure transparency and, as much as possible, replicability of the computation of the presented values. To include an indicator to the dashboard, it must meet the following criteria:

- Policy relevance: the indicator must be pertinent for monitoring one of the (sub-)targets of the EU BDS across all EU;

[17]Further Member State level information is available in the country pages of the BISE – the Biodiversity Information System for Europe (Countries | Biodiversity Information System for Europe).

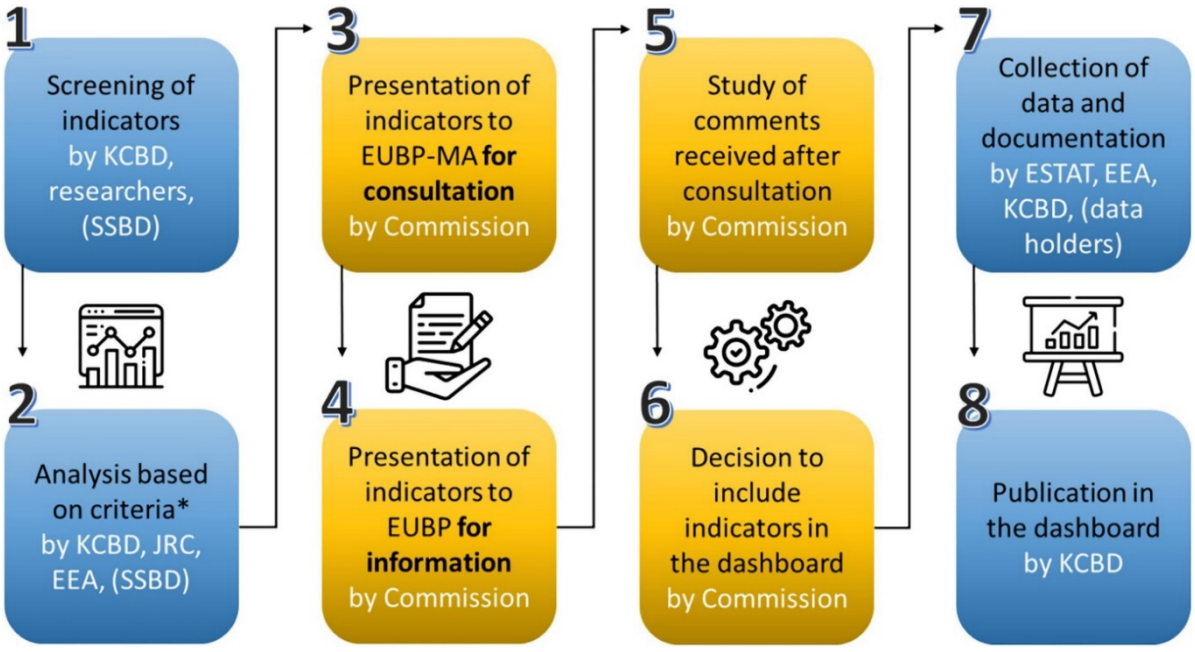
- Data availability: indicator values must be accessible and collectible on a regular basis, at least at the EU level;
- Scientific quality: the indicator should be validated, meaning it has been published in a peer-reviewed journal or a scientific/technical report, or submitted to a review for the EEA's Eionet network, and the calculation method must be well-documented.

While the publication of the indicator in a peer-reviewed journal and the public availability of the code to calculate it are additional criteria for scientific quality, they are not mandatory for inclusion in the dashboard. Nevertheless, information on these two criteria is clearly indicated in the documentation for the indicators that are currently included or will be added to the dashboard.

The process for including a new indicator in the dashboard involves scientific, technical and policy steps (see Figure 3). It starts with a list of candidate indicators that meet, or are expected to meet, the three criteria mentioned above. This list is regularly updated by the KCBD Secretariat, based on input from EEA, Eurostat, the JRC (beyond the KCBD Secretariat), and ongoing scrutiny of scientific developments. Twice a year, the KCBD Secretariat assesses these candidate indicators and suggests a shortlist of the most relevant and mature ones to be added to the dashboard. These are then evaluated by a Commission expert group, the Monitoring and Assessment subgroup of the EU Biodiversity Platform (EUBP-MA). This shortlist of indicators is also presented to the EU Biodiversity Platform (EUBP)[18], for information. Based on the comments received, the European Commission decides whether the indicator will be included in the dashboard. The KCBD Secretariat then begins the process of collecting indicator values and full documentation in collaboration with data providers and publishes the indicators in the dashboard.

Figure 3. Diagram representing the process to identify and select indicators for the dashboard

*Blue boxes represent technical steps and yellow boxes policy consultation and decision steps. In parenthesis are future expected inputs. Steps 7 and 8 only occur if the Commission decides to include the indicators in the dashboard. * refers to the criteria described in the main text. SSBD = Science Service for Biodiversity. Other acronyms are explained in the main text.*



Source: Viti et al., 2024.

[18] https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?lang=en&groupID=2210

In this report, indicators that are published in the dashboard or simply identified as candidate indicators are used in combination with input from the scientific literature and expert opinion to analyse progress in monitoring, progress towards achieving and outlook of meeting the EU BDS targets (section 4).

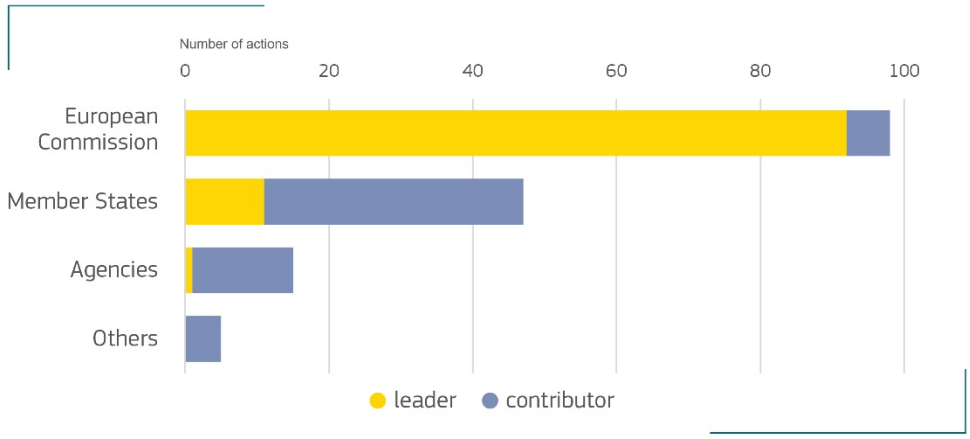
3 Progress in implementing the EU BDS actions

The EU BDS includes as an annex an action plan with 39 key measures. The Commission services translated those key measures, as well as further measures that the European Commission should put in place to ensure the successful implementation of the Strategy, into 104 specific workable actions that are tracked, one by one, in the EU BDS actions tracker[19].

Both the action plan and the actions tracker were designed to be mainly implemented and reported by the Commission, in the absence of a dedicated national reporting mechanism under the EU BDS. National reporting only exists under some instruments for which the EU BDS sets out relevant targets or measures, such as the Nature Directives, the Regulation on Invasive Alien Species (IAS) and the Nature Restoration Regulation. Different Commission services (COM) lead on 92 of the listed 104 actions (and contribute to other 6), reflecting a cross-cutting approach to implementation at EU level. The EEA leads on 1 action, while EU agencies contribute to other 14. EU Member States (MS) are the main actors for 11 actions, and contribute to other 36. A few other institutions (the EU External Actions Service, the European Investment Bank, the Covenant of Mayors, cities over 20,000 inhabitants, the Committee of the Regions and the Outermost Regions) are to contribute to 5 actions. While the actions tracker assigns lead roles to COM, other EU agencies and public authorities in the MS, the success of every single action will heavily depend on the engagement, support and active contribution by a range of stakeholders. Thus, the actions tracker reflects joint EU progress and effort (Figure 4).

Figure 4. Count of EU BDS actions led by, or with contribution from, different actors

Due to double count of joint actions, the total sum in this graph exceeds 104 actions. COM: European Commission. MS: EU Member States.



Source: JRC

In particular, MS-led actions deal with implementation on the ground, such as designating protected areas, removing barriers, reviewing permits, developing urban nature plans, environmental compliance assurance, or promoting environmental tax reforms.

Each action in the actions tracker shows its implementation status with an explanation of the progress and achievements, and links to any deliverables or resources. By mid-March 2025 about half (50) of the actions were complete, 44 were in progress and 10 delayed. Importantly, some of the complete actions are still progressing and pursuing further achievements (Figure 5). Updates in the actions tracker aim to cover such developments that go beyond the original definition of the EU

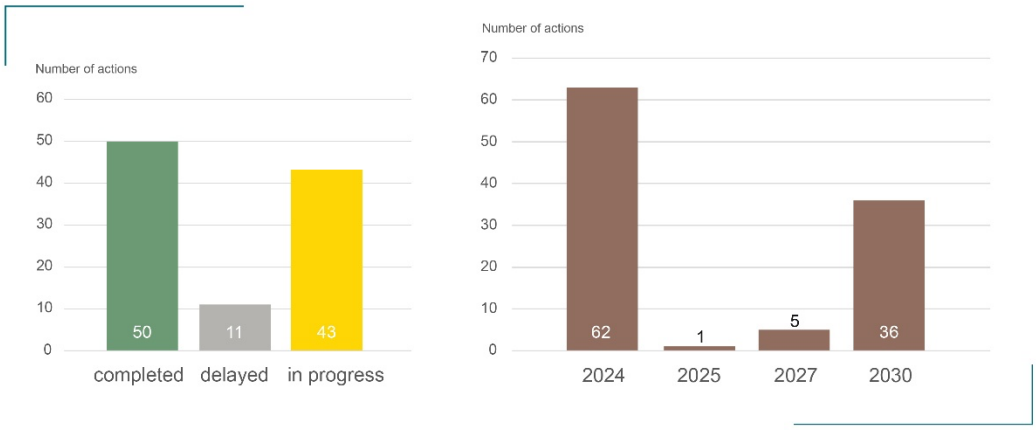
[19] https://dopa.jrc.ec.europa.eu/kcbd/actions-tracker/

BDS actions, but that are nevertheless relevant for the policy area. This is typically done by complementing the action summary with new information and links - even for some "completed" actions.

The indication of whether an action has been completed or not reflects the original timeline set for the actions. The deadline for 62 actions was 2024 or before, 1 should be finished by 2025, 5 should be finished by 2027 and the remaining 36 are continuous, or should be delivered by 2030 (Figure 5). It is anticipated that by the end of 2025, almost all the actions that were due by 2024 or 2025 will be completed.

Figure 5. Number of actions classified by their implementation status by March 2025 (left) and number of actions classified by their deadline (right)

The 2024 category sums up actions with deadlines between 2021 and 2024.



Source: JRC

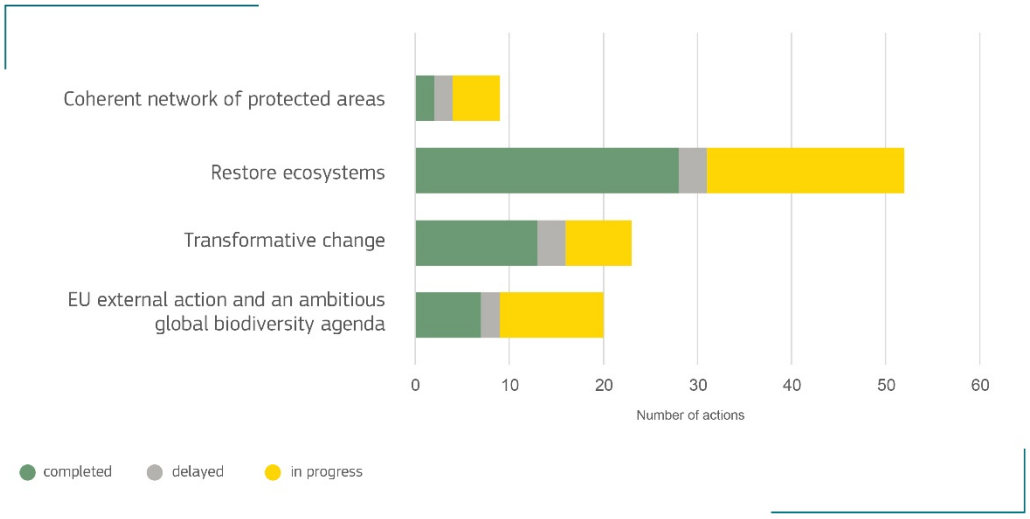
The 104 actions of the actions tracker are classified under the main EU BDS pillars (Figure 6):

1. A coherent network of protected areas, with 9 actions, all linked to target 3 of the EU BDS. Two of the actions under the first pillar, related to guidance documents issued by the Commission, are completed. The rest of the actions are in progress (5) or delayed (2). They rely on the identification and designation of different protected areas and corridors by Member States, supported by dialogues, mainstreaming and research mechanisms that have been set in recent years.
2. Restore ecosystems, with 52 actions, most of them linked to specific EU BDS targets. 28 actions under the second pillar are completed, all led by the Commission. They include 10 legislative proposals (about e.g. restoration, pollinators, soils and pesticides), 13 guidelines (about e.g. methods to assess ecosystems, forests' sustainability, CAP measures, urban greening and water abstraction), and 5 revisions (about e.g. organic farming, renewable energy solutions and biomass fuels). Most of the 21 actions in progress aim to close implementation gaps and, hence, have a continuous long-term vision until 2030. They will implement and encourage sustainability measures around pesticides, excess nutrients, agroforestry, restoration, sustainable soil management, fluvial barriers, and fisheries. Three actions are delayed.
3. Enabling transformative change, with 23 actions. 13 of these actions are completed, such as the review of the Environmental Crime Directive or of the Taxonomy Regulation, the establishment of biodiversity knowledge governance mechanisms (e.g. the KCBD), or dedicated investments for natural capital under InvestEU. Eight ongoing actions will further

unlock investments, improve environmental compliance assurance or guide business decision-making, among others. Two actions are delayed.

4. EU external action and an ambitious global biodiversity agenda, with 20 actions. 7 actions are complete, notably legal proposals and negotiations for ambitious agreements (for example about the post-2020 biodiversity framework, avoid placing products associated with deforestation or forest degradation on the EU market, or ban harmful fisheries subsidies). The 11 actions in progress deal mainly with the full implementation of trade agreements and with economic and knowledge support to partner countries to foster ecosystems' health and sustainable practices. Two actions are delayed.

Figure 6. Status of implementation of the different actions grouped by EU BDS pillar



Source: JRC

We can see that the pillars "restore ecosystems" and "enabling transformative change" have more than 50% of their actions completed, while the pillars "coherent network of protected areas" and the "EU external action and an ambitious global biodiversity agenda" have more than 50% of their actions in progress.

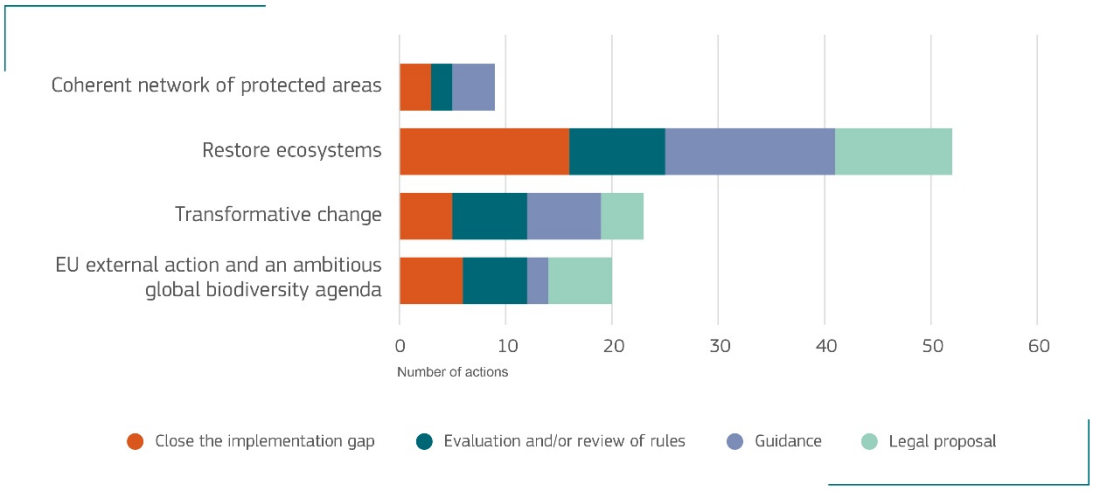
The 10 delayed actions at the moment belong to the four EU BDS pillars. These are:

- Possible adjustment of the reporting format for nationally designated protected areas (pillar "coherent network of protected areas")
- Progress significantly in legally designating new protected areas and integrating ecological corridors (pillar "coherent network of protected areas")
- EU Strategy for a Sustainable Built Environment (pillar "restore ecosystems")
- Review the data on biofuels with high indirect land-use change risk and set up a trajectory for their gradual phase out by 2030 (pillar "restore ecosystems")
- Integrated Nutrient Management Action Plan (pillar "restore ecosystems")
- Assess the effectiveness of the cooperation-based biodiversity governance framework, and the need for an enhanced approach to biodiversity governance (pillar "enabling transformative change")

- Strengthen the biodiversity proofing framework to ensure that EU funding supports biodiversity-friendly investments (pillar “enabling transformative change”)
- Revise criteria and monitoring to encourage Nature Based Solutions for Green Public Procurement (pillar “enabling transformative change”)
- Broker an agreement on three vast Marine Protected Areas in the Southern Ocean (pillar “enabling transformative change”)
- Consider strengthening the coordinating and investigative capacities for biodiversity of the European Anti-Fraud Office (pillar “enabling transformative change”).

For the purpose of this report, we further developed a new classification illustrating the type of action (Figure 7). 29% of the actions aim to close the implementation gap of existing policies, 28% produce guidance for a proper implementation, 23% evaluate or review existing rules, and 20% propose new legal acts. The actions related to a coherent network of protected areas have the largest proportion of guidance tasks, while the global and external actions have the largest proportion of legal proposals (including mainstreaming).

Figure 7. Classification of the type of action grouped by EU BDS pillar



Source: JRC

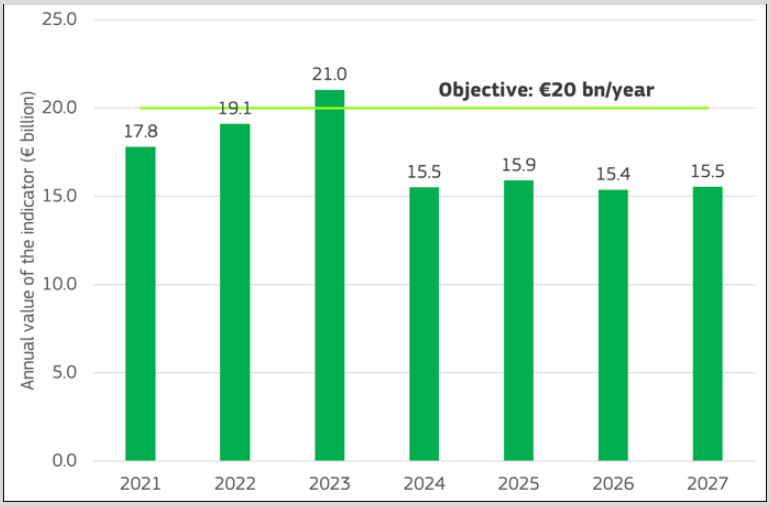
Box 1: Developing an indicator to track the commitment "unlock at least €20 bn/year for biodiversity"

Under the pillar "enabling transformative change", one of the key enabling factors to ensure a successful implementation of the EU BDS was the commitment to unlock at least €20 bn/year for biodiversity (action 69). This is to be achieved through mobilising private and public funding at national and EU level, including through a range of different programmes in the long-term EU budget.

The KCBD Secretariat facilitated the development of a new indicator to track the delivery of this commitment (Neuville, Périer, and Barbuto, 2024). This indicator focuses on the main public and private funding flows mobilised through EU funds and instruments, in consideration of the availability of consistent data, thanks to the EC biodiversity tracking methodology, and of their enabling role. It includes three components: biodiversity-related spending from the relevant programmes in the long-term EU budget (such as Common agricultural policy funds, regional policy funds and LIFE) and NextGenerationEU (in particular the Recovery and Resilience Facility - RRF); co-financing by the EU Member States (for the funds under shared management); and private and public funding mobilised via the main EU repayable support instrument, InvestEU. The indicator is annual, but its values are presented for the 7 years of the financial programming period, including projections for future years, in line with what is done for EU budget data.

The first calculation of the indicator over the 2021-2027 period suggests that the EU BDS target of €20 bn/year was met in 2023 (with a substantial contribution from the RRF), but that further biodiversity mainstreaming efforts would be needed to achieve this target in 2024 and the following years, for which there are substantial financing gaps of more than €4 bn/year.

Figure 8. Annual biodiversity financing indicator (€ bn) (update: June 2024)



Source: Neuville et al., 2024

It can be noted that according to a recent study (Nesbit et al., 2022), the overall financial needs for fully implementing the EU BDS may be substantially higher than €20 bn/year. However, there are currently no comprehensive and consistent data allowing to track total finance flows from all sources.

4 Progress in monitoring, progress towards achieving and outlook of meeting the EU BDS targets

This section describes, target by target, the progress in identifying indicators to monitor the EU BDS targets, the progress towards achieving the EU BDS targets and the outlook of meeting them by 2030. Specifically, for each target, two figures indicate (i) the state of play in identifying indicators to monitor the target and (ii) the availability of indicators to monitor the target as well as a description of progress to target. To ensure a proper assessment of all the aspects of a target, our analyses are carried out at the target level, or, when a target comprises different aspects to monitor, at subtarget level. Therefore, the assessment has been done for 16 targets corresponding to 29 individual (sub)targets. The text further specifies (i) the indicators available in the EU BDS dashboard, (ii) the ongoing work to develop indicators for the EU BDS dashboard, (iii) the progress to date towards achieving the (sub)target and (iv) the outlook of meeting the (sub)target by 2030. Depending on the information available for each (sub)target, the outlook part is either based on past trends in indicators, modelling studies carried out at the JRC, scientific literature or expert opinion.

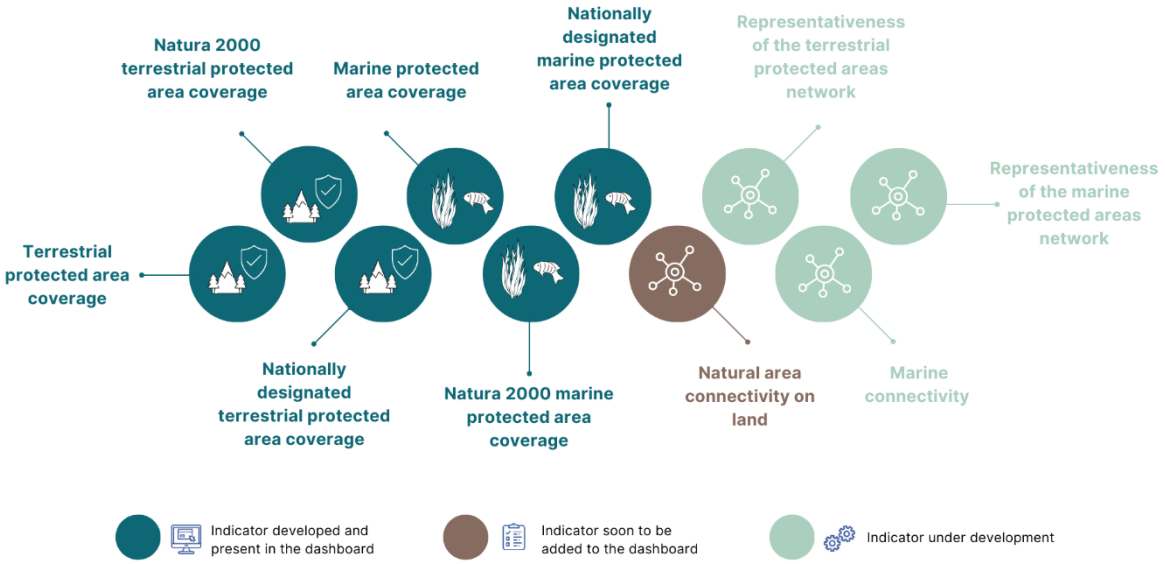
4.1 Target 1: protected area coverage and Trans-European Nature Network

Legally protect a minimum of 30% of the EU's land area and a minimum of 30% of the EU's sea area, and integrate ecological corridors, as part of a true Trans-European Nature Network.

There are six indicators already published in the EU BDS dashboard to monitor target 1, and four under development (Figure 9). The indicators published in the EU BDS dashboard allow to track progress on protected area coverage, and they all show a trend going in the right direction (EEA, 2023) - although progress needs to accelerate to reach 30% of protection by 2030 for both the EU's land area and the EU's sea area (Figure 10). The indicators soon to be added to the dashboard or under development show that, on land, while the representativeness of the protected areas network has progressed[20], natural area connectivity has remained stable. Until these indicators become available for the marine realm, progress towards such coherence target cannot be assessed at sea (Figure 10).

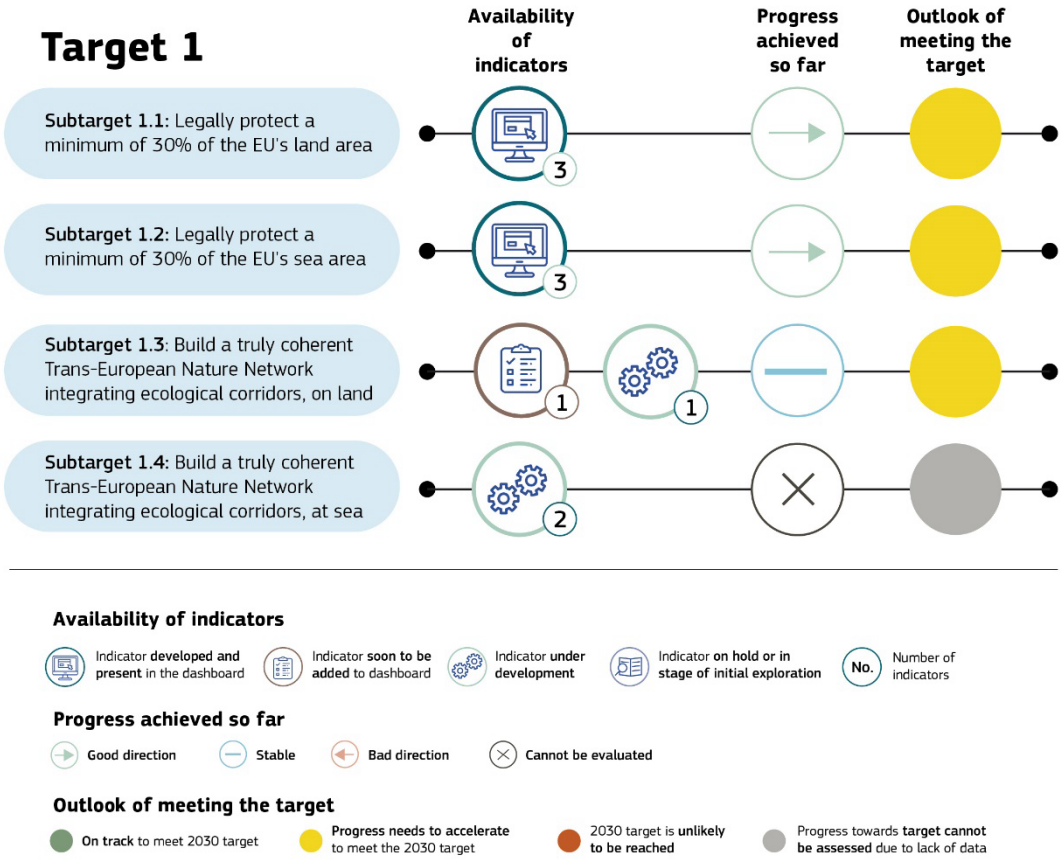
[20] https://martin-jung.github.io/EUMTA/dashboard.html#

Figure 9. State of play regarding indicators to monitor target 1 of the EU Biodiversity Strategy



Source: JRC

Figure 10. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 1 of the EU Biodiversity Strategy



Source: JRC

4.1.1 Subtarget 1.1: legally protect a minimum of 30% of the EU's land area

4.1.1.1 Indicator(s) available in the EU BDS dashboard

There are currently three indicators to monitor progress towards this subtarget in the EU BDS dashboard:

- Terrestrial protected area coverage[21]
- Natura 2000 terrestrial protected area coverage[22]
- Nationally designated terrestrial protected area coverage[23].

Terrestrial protected area coverage measures the percentage of land, by Member State and at EU 27 level, covered by protected areas. It considers both nationally protected areas and Natura 2000 sites. Values are calculated and provided every year by the European Environment Agency based on Member States reports. This indicator is also used in the EU Sustainable Development Goal (SDG) indicator framework monitoring the EU progress towards SDG 15 "Life on land"[24] and in the 8th Environment Action Programme (8EAP) to monitor biodiversity and ecosystems[25].

Natura 2000 terrestrial protected area coverage measures the percentage of land, by Member State and at EU 27 level, covered by Natura 2000 sites designated under the EU Habitats and Birds Directives. Values are calculated and provided each year by the European Environment Agency based on data reported by the Member States.

Nationally designated terrestrial protected area coverage measures the percentage of land, by Member State and at EU 27 level, covered by nationally designated protected areas. Values are calculated and provided each year by the European Environment Agency based on data reported by Member States.

4.1.1.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is no need to further develop indicators for the EU BDS dashboard as the indicators already published are sufficient to monitor progress towards the subtarget.

4.1.1.3 Progress to date towards achieving the subtarget

Over the 2011-2022 period, terrestrial protected area coverage increased from 24.3% to 26.1%, mainly through the designation of new Natura 2000 sites (EEA, 2025). The current 26.1% of EU's land area covered by protected areas include 18.6% covered by Natura 2000 designated sites and 17.3% by nationally designated protected areas, with some areas designated as both.

4.1.1.4 Outlook of meeting the subtarget by 2030

If the designation of protected areas continues at the rate seen in the past decade (1.8 percentage points increase since 2011), the subtarget will not be met[26]. To meet the subtarget by 2030, the annual expansion rate will need to triple compared to that of the past 10 years.

[21] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.1.0.1.1.1/?version=1
[22] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.1.0.1.1.2/?version=1
[23] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.1.0.1.1.3/?version=1
[24] https://doi.org/10.2908/SDG_15_20
[25] https://www.eea.europa.eu/publications/european-union-8th-environment-action-programme/indicators/09-designated-terrestrial-protected-areas/view
[26] https://www.eea.europa.eu/ims/terrestrial-protected-areas-in-europe

4.1.2 Subtarget 1.2: legally protect a minimum of 30% of the EU's sea area

4.1.2.1 Indicator(s) available in the EU BDS dashboard

There are currently three indicators to monitor progress towards this subtarget in the EU BDS dashboard:

- Marine protected area coverage[27]
- Natura 2000 marine protected area coverage[28]
- Nationally designated marine protected area coverage[29].

Marine protected area coverage measures the percentage of marine waters, by Member State and at EU 27 level, covered by protected areas. It considers both nationally protected areas and Natura 2000 sites. Values are calculated and provided every year by the European Environment Agency based on data reported by Member States. This indicator is also used in the EU SDG indicator framework monitoring the EU progress towards SDG 14 "Life below water"[30], and in the 8EAP to monitor biodiversity and ecosystems[31].

Natura 2000 marine protected area coverage provides the percentage of marine waters, by Member State and at EU 27 level, covered by Natura 2000 sites designated under the EU Habitats and Birds Directives. Values are calculated and provided each year by the European Environment Agency based on data reported by the Member States.

Nationally designated marine protected area coverage provides the percentage of marine waters, by Member State and at EU 27 level, covered by nationally designated protected areas. Values are calculated and provided each year by the European Environment Agency based on data reported by Member States.

4.1.2.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is no need to further develop indicators for the EU BDS dashboard as the indicators already published are sufficient to monitor progress towards the target.

4.1.2.3 Progress to date towards achieving the subtarget

Over the last decade, marine protected area coverage increased substantially, from 5.9% in 2012 to 12.3% in 2022, mainly through the designation of new Natura 2000 sites (EEA, 2025). The current 12.3% of EU's sea area covered by protected areas include 9% covered by Natura 2000 designated sites and 4.5% covered by nationally designated protected areas, with some overlap between the different types of designation.

4.1.2.4 Outlook of meeting the subtarget by 2030

Despite the substantial increase in marine protected area coverage since 2012, if the designation of protected areas continues at the rate seen in the past 10 years (6.4 percentage points increase since 2012), the subtarget will not be met[32]. To meet the subtarget by 2030, the annual expansion rate will need to more than triple compared to that of the past 10 years.

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[27] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.1.0.1.2.1/?version=1
[28] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.1.0.1.2.2/?version=1
[29] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.1.0.1.2.3/?version=1
[30] https://doi.org/10.2908/SDG_14_10
[31] https://www.eea.europa.eu/publications/european-union-8th-environment-action-programme/indicators/10-designated-marine-protected-areas/view
[32] https://www.eea.europa.eu/en/analysis/indicators/marine-protected-areas-in-europes-seas

4.1.3 Subtarget 1.3: build a truly coherent Trans-European Nature Network integrating ecological corridors, on land

4.1.3.1 Indicator(s) available in the EU BDS dashboard

Although there is currently no indicator to monitor progress on this subtarget in the EU BDS dashboard, one will be published soon: Natural area connectivity on land. This indicator corresponds to the average proportion of connected natural area on land within a local neighbourhood of approximately 50 km^2. It is based on a re-classification of land cover classes[33] into two categories: natural and non-natural. This indicator would help in monitoring progress towards the integration of ecological corridors to build a True Trans-European Nature Network on land. It was first proposed as a candidate indicator to the EUBP-MA in spring 2024, and a factsheet further describing it was published on this occasion (Robuchon, Liquete, Neuville, Delli, et al., 2024). Following the consultation with EUBP-MA, natural area connectivity was selected to be published in the EU BDS dashboard. The indicator is ready in terms of development as it was calculated at the JRC for the years 2016, 2018, 2020 and 2022 at EU and Member State scale. The next step is to actually publish it in the EU BDS dashboard.

4.1.3.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is currently one indicator under development to monitor progress towards this subtarget in the EU BDS dashboard: the representativeness of the terrestrial protected areas network, expressed as the mean target achievement (MTA). The MTA calculates, for any set of biodiversity features of interest (e.g. habitats, or species), the ratio between the extent of the feature range (in area units) that is covered by protected areas and the protected range extent that is considered sufficient, or desirable. It relies on spatial distribution of the biodiversity features of interest, a sufficiency assessment for each of these biodiversity features of interest (e.g. how much of its range should be protected to fill its protection needs) and a map of the protected areas network. The MTA would help evaluating the coherence of the EU protected areas network by showing the extent to which such network fills biodiversity protection needs. The MTA was first presented to the EUBP-MA and EUBP in autumn 2023 (Robuchon et al., 2023). Since, researchers of the NaturaConnect project made preliminary MTA assessments for all habitats listed in annex I and species listed in annex II of the Habitats Directive[34] over time, and the MTA was proposed as a candidate indicator to the EUBP-MA in autumn 2024 (Robuchon, Liquete, Neuville, Vasilakopoulos, et al., 2024). The European Commission is currently collecting and analysing EUBP-MA feedback on this indicator proposal to decide whether and how to include it in the EU BDS dashboard.

4.1.3.3 Progress to date towards achieving the subtarget

As this subtarget is qualitative, a way to assess whether EU has progressed in building a truly coherent Trans-European Nature Network integrating ecological corridors on land is to analyse whether the representativeness of the protected areas network and natural area connectivity on land have increased over the last years. Regarding the representativeness of the protected areas network, preliminary MTA assessments indicate that, on average, over all species and habitats assessed, the percentage of biodiversity protection needs covered by protected areas has progressed from 30.3 before 2000 to 49.9 for the period 2018-2024[35]. Regarding natural area connectivity on land, it has remained quite stable between 2016 (80.1%) and 2022 (79.8%).

[33] https://cds.climate.copernicus.eu/datasets/satellite-land-cover?tab=overview
[34] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A01992L0043-20130701
[35] https://martin-jung.github.io/EUMTA/dashboard.html#

4.1.3.4 Outlook of meeting the subtarget by 2030

Assuming that a truly coherent Trans-European Nature Network would fill 100% of biodiversity protection needs and based on the last MTA assessment showing that, on average, 51.1% of species and habitats' range extent in need of protection is still not covered by protected areas, the protected area network would need to be significantly extended both quantitatively (in terms of coverage) and qualitatively (to cover places contributing to fill the gaps in biodiversity protection needs) to reach this subtarget by 2030.

Assuming that it is desirable to have ecological corridors more integrated in the 2030 Trans-European Nature Network than in the 2020 one and based on the analyses of temporal trends in natural area connectivity between 2016 and 2022 showing that natural area connectivity has remained quite stable, the restoration of natural area is urgently needed to meet the subtarget by 2030.

Member States are in the process of submitting pledges to designate new protected areas, and these pledges will provide new insights into the prospects of achieving the 2030 subtarget (EEA, 2023), whether in terms of coherence or integration of ecological corridors.

4.1.4 Subtarget 1.4: build a truly coherent Trans-European Nature Network integrating ecological corridors, at sea

4.1.4.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress towards this subtarget in the EU BDS dashboard.

4.1.4.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There are currently two indicators under development to monitor progress towards this subtarget in the EU BDS dashboard:

- Representativeness of the marine protected areas network, expressed as the MTA
- Marine connectivity.

The MTA indicator in development for this subtarget is conceptually the same than for subtarget 1.3. For subtarget 1.4, it will however rely on spatial distribution data and sufficiency assessments for marine habitats and more than 30,000 species that will be provided and made freely available by the MPA Europe project[36]. The first MTA assessment for marine habitats and species should be available in 2025. It will then be proposed as a candidate indicator to the EUBP-MA.

The exact methodology for the marine connectivity indicator is still to be determined. MPA Europe will propose a marine connectivity indicator and align the methodology conceptually to the counterpart terrestrial connectivity indicator (Natural area connectivity on land). This approach will allow to indicate a well-connected network of MPAs by 2030. A first proposal for this marine connectivity indicator should be ready before the end of 2025.

4.1.4.3 Progress to date towards achieving the subtarget

As there is no baseline yet to evaluate the representativeness of the marine protected areas network expressed as the (MTA) nor marine connectivity, and despite numerous proposals and methodologies to analyse the coherence and connectivity of marine protected area networks (e.g. Agnesi et al., 2020; Agnesi et al., 2017; Olsen et al., 2013; Sciberras et al., 2013), progress towards the subtarget cannot be assessed yet at EU scale. However, some regional assessments, like in the North-East Atlantic, show good progress towards a coherent network.

[36] https://zenodo.org/communities/mpaeurope

4.1.4.4 Outlook of meeting the subtarget by 2030

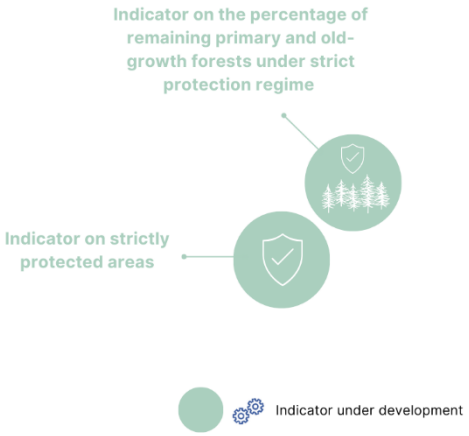
Given that we lack indicators to characterise trends in the representativeness of the marine protected areas network and marine connectivity, it is too early to draw any conclusion on whether the 2030 subtarget will be met.

4.2 Target 2: strict protection

Strictly protect at least a third of the EU's protected areas, including all remaining EU primary and old-growth forests

There is no indicator published in the EU BDS dashboard yet to monitor target 2, although two are under development (Figure 11). It is therefore too soon to track progress towards this target based on these indicators under development. However, the coverage of strictly protected areas on land estimated by an independent scientific study (Cazzolla Gatti et al., 2023) combined to the rate of designation of protected areas over the last years[37] suggests that progress needs to accelerate to reach 10% of strict protection by 2030 (Figure 12). Due to gaps on the mapping of primary and old-growth forests, the outlook of having them 100% strictly protected by 2030 is currently impossible to evaluate (Figure 12). The indicators under development will allow to assess the state of play and the remaining gaps to fill for meeting the target by 2030.

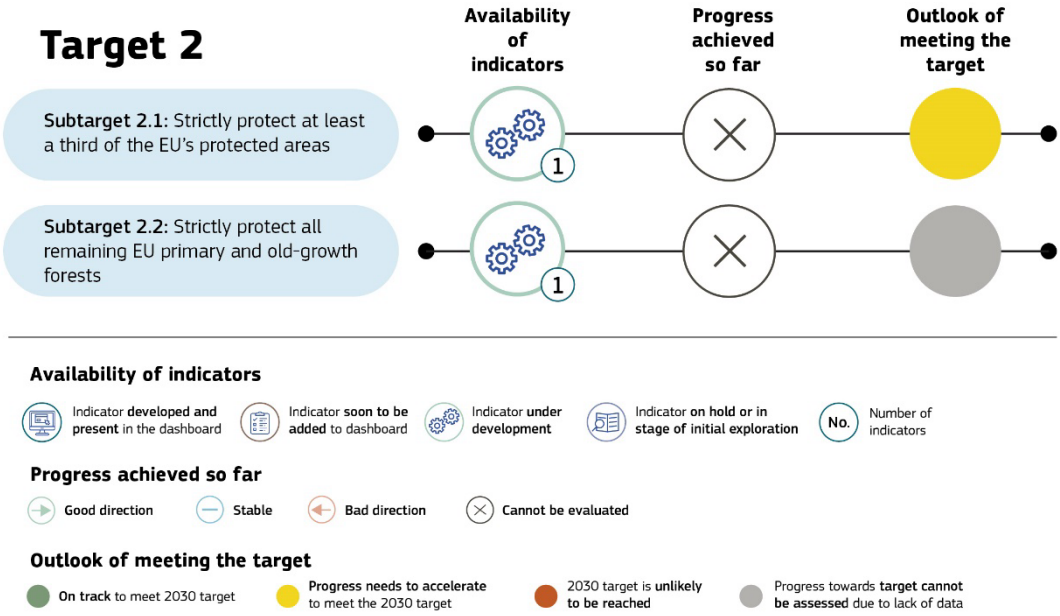
Figure 11. State of play regarding indicators to monitor target 2 of the EU Biodiversity Strategy



Source: JRC

[37] https://www.eea.europa.eu/ims/terrestrial-protected-areas-in-europe

Figure 12. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 2 of the EU Biodiversity Strategy



Source: JRC

4.2.1 Subtarget 2.1: strictly protect at least a third of the EU's protected areas

4.2.1.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this subtarget in the EU BDS dashboard.

4.2.1.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

The EEA is currently working on developing a possible indicator on strictly protected areas to track progress towards this subtarget. The indicator will be based on the information available from the annual dataflow on the nationally designated areas hosted by the EEA, including some future adjustments to the format that will be introduced to enable collection of more specific information on this topic. Additionally, EEA is reviewing the information on strictly protected areas available through the currently ongoing Pledge-and-review process for proposing and discussing contributions towards achieving the protected areas related targets of the EU BDS. Since the reporting under this process is delayed[38] and the format is not necessarily spatially explicit, there are still no quantitative elements to derive an EU indicator.

4.2.1.3 Progress to date towards achieving the subtarget

There is not yet an officially endorsed indicator to assess progress towards achieving this subtarget. However, a recent scientific publication has shown that strictly protected areas defined as IUCN management categories Ia, Ib, and II cover 3.4% of the EU terrestrial territory (Cazzolla Gatti et al., 2023). Even if this definition of such strict protection does not completely overlap with the definition in the Commission guidelines[39], this estimate can be considered as a conservative one. Regarding strict protection in the marine realm, EEA highlighted in 2019 that it could apply to less

[38] https://reportnet.europa.eu/public/dataflow/703
[39] https://environment.ec.europa.eu/publications/criteria-and-guidance-protected-areas-designations-staff-working-document_en

than 1% of European marine protected areas (EEA, 2019) and a more recent study estimates it to 0.2% of the protected areas (Aminian-Biquet et al., 2024). The same study warns about the low protection levels of 86% of European marine protected areas. In the pledges submitted by Member States so far, only one provides an estimate of marine areas that would be strictly protected by 2030, and the coverage is below 10%.

4.2.1.4 Outlook of meeting the subtarget by 2030

Assuming that strictly protected areas cover 3.4% of the EU territory (Cazzolla Gatti et al., 2023), at least 6.6% more of EU's area would need to be strictly protected to reach the subtarget of 10% by 2030. This implies that around 1% of additional strictly protected areas will need to be designated each year up to 2030 to reach the 10% subtarget. Such annual increase is higher than the annual increase observed so far for the designation of all protected areas[40,41]. Therefore, the designation of strictly protected areas needs to accelerate drastically to reach 10% coverage by 2030.

4.2.2 Subtarget 2.2: strictly protect all remaining EU primary and old-growth forests

4.2.2.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this target in the EU BDS dashboard.

4.2.2.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

The EEA is currently exploring possibilities to develop an indicator on the percentage of remaining primary and old-growth forests under strict protection regime. A first necessary step for the monitoring of this target is to complete the mapping of all primary and old-growth forests within the EU. This is because, despite previous efforts to map primary and old-growth forests, particularly the study by Sabatini et al. (Sabatini et al., 2021), it is estimated that around 4.4 Mha of these forests remain unmapped in the EU (Barredo et al., 2021). The extent of primary and old-growth forests that have been mapped is about 3.2 Mha in the EU, which is equivalent to less than 3% of the EU's forest land. These forests are unevenly distributed in Europe. About 90% of the reported primary and old-growth forests in the EU are located in Sweden, Bulgaria, Finland and Romania (Barredo et al., 2021; Barredo, Marí Rivero, and Janoušková, 2025). Once it is possible to compile information on strictly protected areas, an indicator on the percentage of remaining primary and old-growth forests that are under strict protection regime can be developed by integrating information on strictly protected areas with information on extent of primary and old-growth forests in the EU.

4.2.2.3 Progress to date towards achieving the subtarget

There is a substantial level of strict protection (defined as protected areas in IUCN protection categories Ia, Ib, and II) in the 1.35 Mha of mapped primary and old-growth forests, estimated at 87% of their extent (Barredo et al., 2021). However, the Commission guidelines[42] are ambiguous as regards the definition of strict protection in relation to IUCN category II. This ambiguity creates difficulties in the operational mapping of strictly protected areas using the IUCN database. Additionally, the level of strict protection of the estimated 4.4 Mha of unmapped primary and old-growth forests is currently unknown. Work is underway to further map and protect primary and old-growth forests in the Member States, and the Commission has contracted a study to develop an overview of the current situation. However, current information remains insufficient to assess progress towards achieving this subtarget.

[40] https://www.eea.europa.eu/ims/terrestrial-protected-areas-in-europe
[41] https://www.eea.europa.eu/en/analysis/indicators/marine-protected-areas-in-europes-seas
[42] https://environment.ec.europa.eu/publications/criteria-and-guidance-protected-areas-designations-staff-working-document_en

4.2.2.4 Outlook of meeting the subtarget by 2030

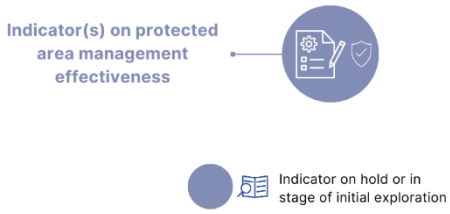
The Commission guidelines for defining, mapping, monitoring and strictly protecting EU primary and old-growth forests[43] published in 2021 provides a roadmap for the complete mapping and strict protection of primary and old-growth forests in the EU. Whether the complete mapping of primary and old-growth forests (both public and private) will be finished by 2025 and the strict protection of these identified and mapped primary and old-growth forests will be complete by 2029 as planned will depend on the actions undertaken in the Member States. The limited information available so far suggests that the complete mapping of primary and old-growth forests will not be finished by 2025. As long as the current extent of primary and old-growth forests under strict protection remains unknown, the outlook of meeting the subtarget cannot be evaluated. Such assessment differs from the conclusion made in the report on progress towards the EGD targets (Marelli et al., 2025), which was drawn earlier, at a time when there was no evidence that would suggest a delay in the implementation of the roadmap steps.

4.3 Target 3: protected area management effectiveness

Effectively manage all protected areas, defining clear conservation objectives and measures, and monitoring them appropriately

There is no indicator published in the EU BDS dashboard yet to monitor target 3, although EEA is exploring options to develop one - or a set of - indicator(s) on protected area management effectiveness (Figure 13). It is therefore too soon to track progress towards this target (Figure 14). The indicator(s) in initial stage of exploration will allow to assess the state of play and the remaining gaps to fill for meeting the target by 2030.

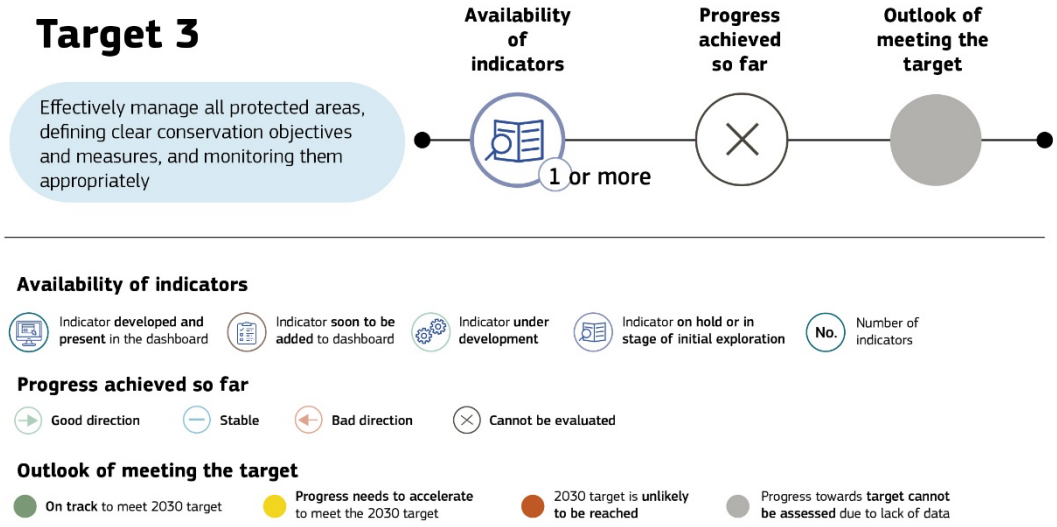
Figure 13. State of play regarding indicators to monitor target 3 of the EU Biodiversity Strategy



Source: JRC

[43] https://op.europa.eu/en/publication-detail/-/publication/cef2f588-7c54-11ee-99ba-01aa75ed71a1

Figure 14. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 3 of the EU Biodiversity Strategy



Source: JRC

4.3.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this target in the EU BDS dashboard.

4.3.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

The EEA is currently exploring options for a possible indicator - or a set of indicators - on management effectiveness, based on the information that will be collected through the revised Standard Data Form (SDF) for Natura 2000 and possible additional information collected through the nationally designated areas dataflow. However, it should be noted that given the time needed to implement these new changes and for the Member States to collect and report this information, it will take several years before such information is available and can be used to develop an indicator.

4.3.3 Progress to date towards achieving the subtarget

We lack indicators to characterise effective management of EU protected areas and therefore progress in achieving effective management. However, EEA is currently revising the reporting format to enable Member States to report this information. If and when this revised format is accepted, Member States will be able to report on management effectiveness of their protected areas, and EEA will be able to provide an assessment of progress towards achieving this target. So far, and despite methodologies for assessing protected area management effectiveness (PAME) being well-established, EEA highlighted in 2020 that only 7.6% of the protected areas recorded in the EU are PAME-assessed (EEA, 2020). This same report also indicates that management plans exist for about 70% of protected areas designated as Natura 2000 sites, but that in several Member States, objective setting and management planning is delayed or is not in accordance with the PAME standards set out in Commission guidance. Regarding the marine realm, a recent independent analysis found that 86% of MPAs in Europe do not aim to protect biodiversity and less than 1% aim to protect it from human impacts (Aminian-Biquet et al., 2024).

4.3.4 Outlook of meeting the target by 2030

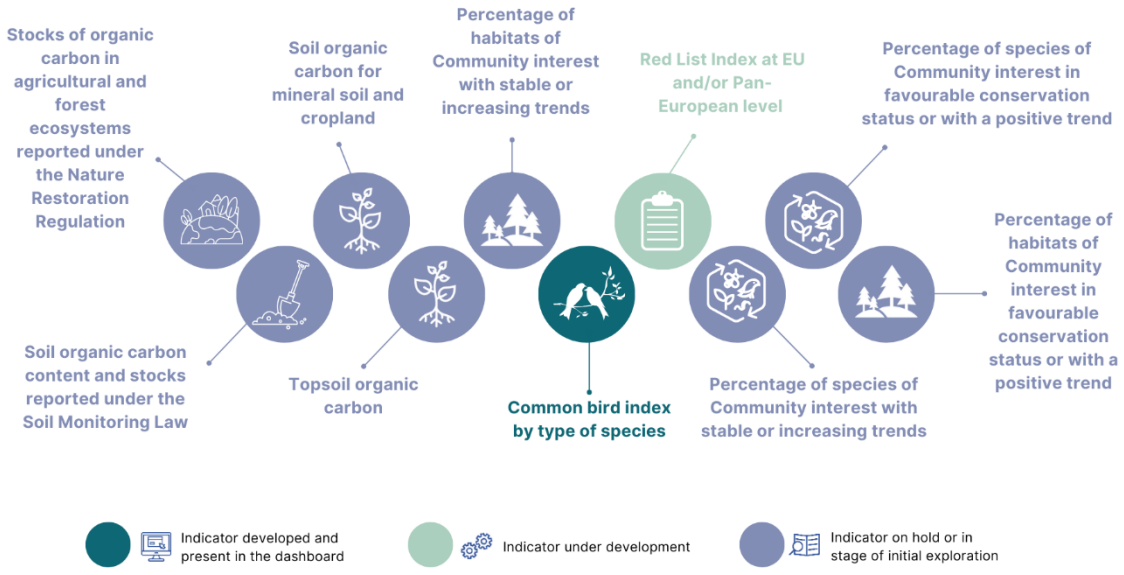
Given that we lack indicators to characterise effective management of EU protected areas, it is too early to draw any conclusion on whether the 2030 target will be met.

4.4 Target 4: habitats and species conservation trends and status

Legally binding EU nature restoration targets to be proposed in 2021, subject to an impact assessment. By 2030, significant areas of degraded and carbon-rich ecosystems are restored. Habitats and species show no deterioration in conservation trends and status; and at least 30% reach favourable conservation status or at least show a positive trend.

The first part of this target "*Legally binding EU nature restoration targets to be proposed in 2021, subject to an impact assessment*" is covered by the NRR and is therefore not specifically assessed in this report. There is one indicator published in the EU BDS dashboard to monitor target 4, one under development and 6 in initial stages of exploration (Figure 15). Although it is too soon to track progress towards all aspects of this target, the steady decline in the common bird index by type of species[44] suggests that it is unlikely that bird populations will stop deteriorating by 2030 (Figure 16). The indicators under development or initial stage of exploration will allow to assess the state of play and the remaining gaps to fill for meeting the other aspects of the target by 2030.

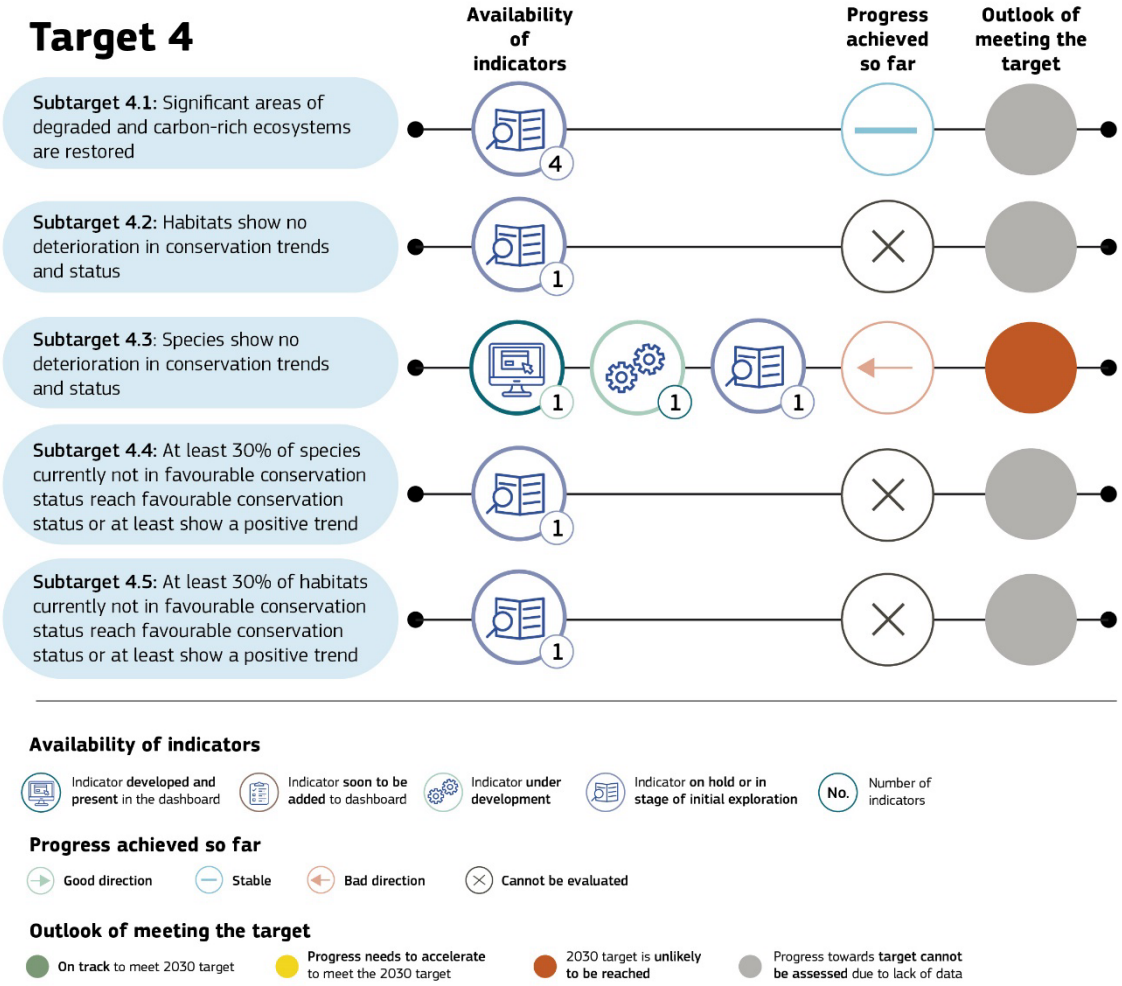
Figure 15. State of play regarding indicators to monitor target 4 of the EU Biodiversity Strategy



Source: JRC

[44] https://ec.europa.eu/eurostat/databrowser/view/sdg_15_60/default/table?lang=en

Figure 16. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 4 of the EU Biodiversity Strategy



Source: JRC

4.4.1 Subtarget 4.1: significant areas of degraded and carbon-rich ecosystems are restored

4.4.1.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this subtarget in the EU BDS dashboard.

4.4.1.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

Although there is no ongoing work to develop indicators specifically to monitor this subtarget in the EU BDS dashboard yet, Member States will soon have to report on stocks of organic carbon in agricultural and forest ecosystems under the NRR and may also need to report on soil organic carbon concentration (necessary to estimate carbon content) through the Soil Monitoring Law proposal[45] (Hammond et al., under review). Such reporting would provide the bases to track progress towards this subtarget. In addition, two already existing datasets have been identified as relevant to

[45] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52023PC0416

inform such reporting and may therefore contribute to track progress towards this subtarget (Princé et al., 2024). These are:

- Topsoil organic carbon based on field surveys.
- Soil organic carbon estimated through remote-sensing

Topsoil organic carbon can be mapped based on field surveys such as the Land Use/Cover Area frame statistical Survey (LUCAS) Soil (Jones et al., 2021), as it has been done by the European Soil Data Centre (ESDAC) for EU25 following a paper of de Brogniez et al. (2015). As LUCAS is now covering the 27 EU Member States and is carried out regularly, it is possible to use it for modelling topsoil organic carbon over time at EU scale and therefore monitor progress in the restoration of carbon-rich ecosystems (De Rosa et al., 2024). Such approach, integrating ground data from LUCAS Soil with an advanced modelling framework, is the one used to calculate the CAP impact indicator I.11 Soil organic carbon in agricultural land.

Soil organic carbon content for cropland can be mapped at field and regional scale using remote sensing data from Copernicus Sentinel-2 (Castaldi et al., 2019). Should such information become available at EU scale and monitored regularly, it could be used to calculate trends in soil organic carbon stocks for cropland at EU scale, and therefore monitor progress in the restoration of carbon-rich ecosystems.

For the marine realm, the MPA Europe project has compiled a preliminary database of approximately 35,000 records of organic carbon in marine sediments in European seas and the adjacent Atlantic Ocean. These data are being modelled against a suite of environmental variables to map seabed organic carbon concentrations, providing a baseline of where organic carbon concentrations are the highest (Addamo et al., 2024).

The possibility of using these datasets alone and/or in combination with Member State reporting under NRR and the Soil Monitoring Law to compute and maintain an indicator that would inform progress towards subtarget 4.1 will need to be closely discussed with the EU Soil Observatory[46].

4.4.1.3 Progress to date towards achieving the subtarget

There is not yet any officially endorsed indicator(s) to assess progress towards achieving this subtarget. However, a recent study in agricultural land in the EU + UK highlighted a slight overall decrease of topsoil organic carbon stocks of 0.75% for the period 2009-2018 (De Rosa et al., 2024). This suggests that over this period and for these agricultural ecosystems, there has been no overall gain in topsoil organic carbon, contrary to what would be desired to achieve subtarget 4.1.

Furthermore, a screen of the scientific literature for publications on progress/assessments of the restoration of degraded and carbon-rich ecosystems at the EU level highlighted that there is a lack of independent assessments at the EU-level on the restoration of degraded and carbon-rich ecosystems. An explanation of this could be that several papers report existence of key barriers to understanding EU-wide trends in status of habitats, including the lack of systematic monitoring of progress against baselines and lack of accessible data, in addition to methodological differences between countries/sites in measuring restoration progress or ecosystems status (Ockendon et al., 2018; Cortina-Segarra et al., 2021; Andersen et al., 2017; Alberdi et al., 2019; Delbosc et al., 2021; Gerovasileiou et al., 2019). The papers that did report on the progress of ecosystem restoration in Europe report lack of progress in ecosystem restoration within in the EU despite the backdrop of past policies that included restoration and species/habitats status objectives such as the Biodiversity Strategy for 2020 (Target 2) and the Habitats and Birds Directives (Hermoso et al., 2022; Cortina-Segarra et al., 2021; Andersen et al., 2017). We found several papers reporting

[46] https://joint-research-centre.ec.europa.eu/eu-soil-observatory-euso_en

increased interest in nature restoration for certain habitat types, including coastal habitats (Delbosc et al., 2021) and peatlands (Andersen et al., 2017).

4.4.1.4 Outlook of meeting the subtarget by 2030

Given that we lack indicators to characterise trends in the restoration of degraded and carbon-rich ecosystems, it is too early to draw any conclusion on whether the 2030 subtarget will be met. On the one hand, a recent study on topsoil organic carbon change in agricultural land (De Rosa et al., 2024) suggests that we are not going in the good direction to achieve subtarget 4.1. On the other hand, the NRR setting legally binding targets to restore ecosystems has been adopted in 2024, and its implementation will likely help to restore significant areas of degraded and carbon-rich ecosystems.

4.4.2 Subtarget 4.2: habitats[47] show no deterioration in conservation trends and status

4.4.2.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this subtarget in the EU BDS dashboard.

4.4.2.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is currently no ongoing work to develop indicator(s) to monitor progress on this subtarget for the EU BDS dashboard. However, the data reported by Member States following Article 17 of the Habitats Directive could be used to calculate the percentage of habitats of Community interest with stable or increasing trends. Such information was produced at EU level by EEA for the State of nature reports, based on Member States reporting for the periods 2007-2012 and 2013-2018[48]. The percentage of habitats of Community interest with stable or increasing trends for the period 2019-2024 that will be available in the next State of nature report is therefore a good candidate indicator to monitor progress on this subtarget for the EU BDS dashboard. As soon as it is published (in 2026 or 2027), it will be proposed as a candidate indicator to the EUBP-MA.

4.4.2.3 Progress to date towards achieving the subtarget

There is not yet any officially endorsed indicator(s) to assess progress towards achieving this subtarget. However, the latest State of nature report (Naumann et al., 2020) indicates that only 43% of habitats of Community interest not in good status had stable or increasing trends for the period 2013-2018.

4.4.2.4 Outlook of meeting the subtarget by 2030

Given that we lack recent indicators to characterise conservation trends and status of habitats, it is too early to draw any conclusion on whether the 2030 subtarget will be met.

4.4.3 Subtarget 4.3: species[49] show no deterioration in conservation trends and status

4.4.3.1 Indicator(s) available in the EU BDS dashboard

There is currently one indicator to monitor progress towards this subtarget in the EU BDS dashboard: the Common bird index by type of species[50], provided by ESTAT based on information collated by the European Bird Census Council through the Pan-European Common Bird Monitoring Scheme programme, strongly relying on citizen science observations. This indicator shows population trends (not conservation trends) of common birds (so a limited number of species) and is

[47] This refers to the habitats listed under the Habitats Directive (Council Directive 92/43/EEC)
[48] Explore nature reporting data | European Environment Agency's home page
[49] This refers to species listed under the Habitats Directive (Council Directive 92/43/EEC) and the Birds Directive (Directive 2009/147/EC)
[50] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.1.4.1.1/?version=1

therefore used as a proxy to inform this subtarget. This indicator is also used in the EU SDG indicator framework monitoring the EU progress towards SDG 15 "Life on land"[51] and in the 8EAP to monitor biodiversity and ecosystems[52].

4.4.3.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

Following the tender specifications of the "Providing technical and scientific support in measuring the pulse of European biodiversity using the Red List Index" (ERL Pulse) contract, the International Union for the Conservation of Nature (IUCN) will produce a European Red List Index (ERLI) at the Pan-European level following the methodology adopted at the global level (Butchart et al., 2010) for each comprehensively assessed species group (encompassing vertebrates, some invertebrates and some plant groups) that is being reassessed by the ERL Pulse project. Such ERLIs will show trends in overall extinction risk for species, based on data for taxa that have undergone a genuine change in Red List status since the first assessment for the European Red List. IUCN will also produce an overall ERLI for all groups assessed through the Pulse project. The calculation of ERLIs for all ERL Pulse species groups will commence in early 2024, with all available by the end of 2024. Then, the overall ERLI will be proposed as a candidate indicator to the EUBP-MA.

Furthermore, the data reported by Member States under the Birds and Habitats Directives could be used to calculate the percentage of species of Community interest with stable or increasing trends. As for the percentage of habitats of Community interest with stable or increasing trends, such information was produced at EU level by EEA for the State of nature reports, based on Member States reporting for the periods 2007-2012 and 2013-2018[53]. The percentage of species of Community interest with stable or increasing trends for the period 2019-2024 that will be available in the next State of nature report is therefore a good candidate indicator to monitor progress on this subtarget for the EU BDS dashboard. As soon as it is published (in 2026 or 2027), it will be proposed as a candidate indicator to the EUBP-MA.

4.4.3.3 Progress to date towards achieving the subtarget

Using the common bird index to assess progress to date towards achieving the subtarget, we can only evaluate whether common bird populations have stopped deteriorating. The common bird index for all common birds has been in continuous decline between 1990 and 2022[54] (-13.8%). The decline in common farmland birds over the same period was much more pronounced (-39.7%) while the common forest bird index decreased by 3.3% (EEA, 2025). Overall, the trends in bird populations are not going in the right direction.

Once available, the ERLI can be used to assess progress towards achieving the subtarget by evaluating whether overall extinction risk for species has stopped deteriorating. Such evaluation cannot be done until the ERLI values are available. However, the global RLI[55] shows a continuing deterioration, and so it is suspected that the same will be valid for Europe.

The latest State of nature report (Naumann et al., 2020) indicates that only 34% of species of Community interest not in good status had stable or increasing trends for the period 2013-2018.

4.4.3.4 Outlook of meeting the subtarget by 2030

Given the steady decline in common bird populations and the uncertainty in the timing and effect of upcoming EU restoration measures, it is unlikely but uncertain that common bird populations will stop deteriorating by 2030 (EEA, 2023). To revert this decline, Member States need to significantly increase the implementation of existing policies such as the EU Habitats and Birds Directives – that

[51] https://doi.org/10.2908/SDG_15_60
[52] https://www.eea.europa.eu/publications/european-union-8th-environment-action-programme/indicators/11-common-bird-index-in/view
[53] Explore nature reporting data | European Environment Agency's home page
[54] https://ec.europa.eu/eurostat/databrowser/view/sdg_15_60/default/table?lang=en
[55] https://www.iucnredlist.org/assessment/red-list-index

have been proven effective to protect some target bird species and their habitats (e.g. EEA, 2020; Princé et al., 2021) – and the NRR – that includes obligations to achieve an increasing trend of common farmland and forest bird indices by 2030 and thereafter. It is also crucial that more effective and ambitious measures to halt biodiversity loss are included in other policies, such as in the CAP, to support the implementation and effectiveness of the current and upcoming EU biodiversity legislation[56].

As the ERLI is not available yet, it is not possible to evaluate whether the overall extinction risk for species will stop deteriorating by 2030.

The next State of nature report will provide more insights to evaluate whether all species of Community interest not in good status show stable or increasing trends.

4.4.4 Subtarget 4.4: at least 30% of species[57] currently not in favourable conservation status reach favourable conservation status or at least show a positive trend

4.4.4.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this target in the EU BDS dashboard.

4.4.4.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is currently no ongoing work to develop indicator(s) to monitor progress on this subtarget for the EU BDS dashboard. However, the data reported by Member States under the Birds and Habitats Directives could be used to calculate the percentage of species of Community interest in favourable conservation status or with a positive trend. As for the percentage of species and habitats of Community interest with stable or increasing trends, such information was produced at EU level by EEA for the State of nature reports, based on Member States reporting for the periods 2007-2012 and 2013-2018[58]. The percentage of species of Community interest in favourable conservation status or with a positive trend for the period 2019-2024 that will be available in the next State of nature report is therefore a good candidate indicator to monitor progress on this subtarget for the EU BDS dashboard. As soon as it is published (in 2026 or 2027), it will be proposed as a candidate indicator to the EUBP-MA.

4.4.4.3 Progress to date towards achieving the subtarget

There is not yet any officially endorsed indicator(s) to assess progress towards achieving this subtarget. However, the latest State of nature report for the period 2013-2018 (Naumann et al., 2020) indicates that 21% of non-bird species of Community interest are in bad conservation status and 42% at poor status. Only 6% of those in poor and bad status show an increasing trend. The situation looks a bit better for birds where 19% are in bad status and 20% in poor status. Increasing trends concern 23% of the bird species. A lot of effort is still needed to cover the unknown information, particularly for trends as this reaches 31% for non-bird species of Community importance and 17% or birds.

4.4.4.4 Outlook of meeting the subtarget by 2030

Given that we lack recent indicators to characterise conservation trends and status of species, it is too early to draw any conclusion on whether the 2030 subtarget will be met.

[56] https://www.eea.europa.eu/en/analysis/indicators/common-bird-index-in-europe
[57] This refers to species listed under the Habitats Directive (Council Directive 92/43/EEC) and the Birds Directive (Directive 2009/147/EC)
[58] Explore nature reporting data | European Environment Agency's home page

4.4.5 Subtarget 4.5: at least 30% of habitats[59] currently not in favourable conservation status reach favourable conservation status or at least show a positive trend

4.4.5.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this target in the EU BDS dashboard.

4.4.5.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is currently no ongoing work to develop indicator(s) to monitor progress on this subtarget for the EU BDS dashboard. However, the data reported by Member States under the Habitats Directive could be used to calculate the percentage of habitats of Community interest in favourable conservation status or with a positive trend. As for the percentage of species and habitats of Community interest with stable or increasing trends, and the percentage of species of Community interest in favourable conservation status or with a positive trend, such information was produced at EU level by EEA for the State of nature reports, based on Member States reporting for the periods 2007-2012 and 2013-2018[60]. The percentage of habitats of Community interest in favourable conservation status or with a positive trend for the period 2019-2024 that will be available in the next State of nature report is therefore a good candidate indicator to monitor progress on this subtarget for the EU BDS dashboard. As soon as it is published (in 2026 or 2027), it will be proposed as a candidate indicator to the EUBP-MA.

4.4.5.3 Progress to date towards achieving the subtarget

There is not yet any officially endorsed indicator(s) to assess progress towards achieving this subtarget. However, the latest State of nature report for the period 2013-2018 (Naumann et al., 2020) indicates that 36% of habitats of Community interest are in bad conservation status and 45% in poor status. Only 9% of those in poor and bad status show an increasing trend. A lot of effort is still needed to cover the unknown information, particularly for trends as this reaches 21% of the assessments.

4.4.5.4 Outlook of meeting the subtarget by 2030

Given that we lack recent indicators to characterise conservation trends and status of species, it is too early to draw any conclusion on whether the 2030 subtarget will be met.

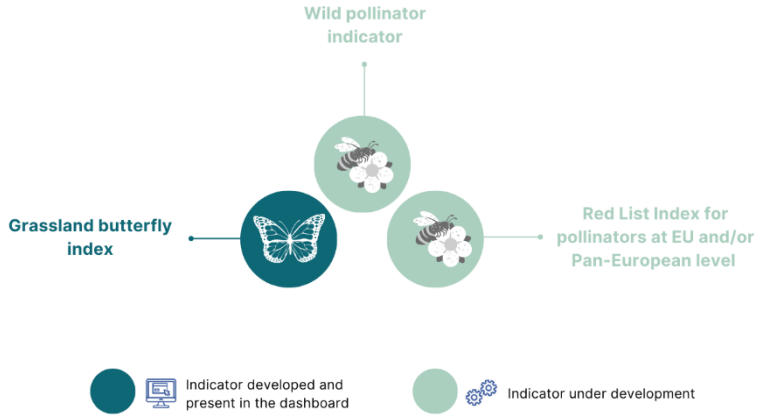
4.5 Target 5: pollinators

The decline of pollinators is reversed

There is one indicator published in the EU BDS dashboard to monitor target 5, and two additional indicators are under development (Figure 17). The declining trend of the Grassland butterfly index[61] as well as several scientific studies (e.g. Barendregt et al., 2022; Vray et al., 2019) suggest that pollinators are still declining, and therefore that it is unlikely to reverse the decline of pollinators by 2030 (Figure 18). The indicators under development will permit to assess the state of play for a broader range of pollinators and the remaining gaps for meeting the target by 2030.

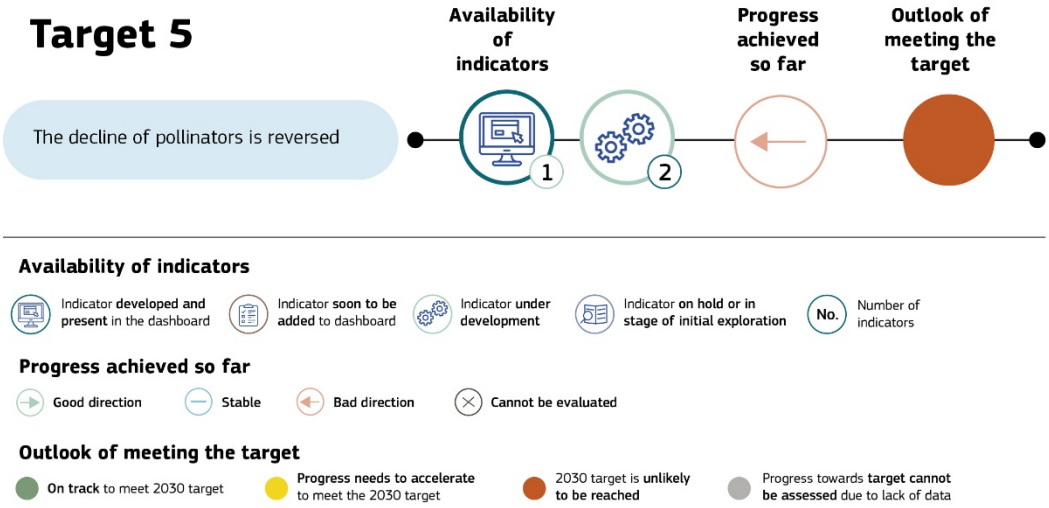
[59] This refers to habitats listed under the Habitats Directive (Council Directive 92/43/EEC)
[60] Explore nature reporting data | European Environment Agency's home page
[61] https://ec.europa.eu/eurostat/databrowser/view/sdg_15_61/default/table?lang=en

Figure 17. State of play regarding indicators to monitor target 5 of the EU Biodiversity Strategy



Source: JRC

Figure 18. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 5 of the EU Biodiversity Strategy



Source: JRC

4.5.1 Indicator(s) available in the EU BDS dashboard

There is currently one indicator to monitor progress towards this target in the EU BDS dashboard: the Grassland butterfly index[62], provided by ESTAT based on information collated by Butterfly Conservation Europe through the European Butterfly Monitoring Scheme partnership, strongly relying on citizen science observations. This indicator shows population trends over 15 grassland butterfly species (so a limited set of pollinators) and is therefore used as a proxy to inform this target. It is also part of the EU SDG indicator framework monitoring SDG 15 "Life on land"[63].

[62] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.2.5.0.1/?version=1
[63] https://doi.org/10.2908/SDG_15_61

4.5.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

The JRC - through the projects STING (Science and Technology for Pollinating Insects) and STING+ providing technical assistance for the implementation of the revised EU Pollinators Initiative[64] and Article 10 of the NRR - is developing a scientifically robust wild pollinator indicator based on high quality data in view of setting up an EU-wide Pollinator Monitoring Scheme (EU PoMS) (Potts et al., 2021; Potts et al., 2024). An EU PoMS is essential to overcome outstanding knowledge gaps and to provide high quality data on insect pollinators and pollination trends. The monitoring scheme as well as the indicator proposed by Potts et al. (2024) are being refined under the follow-up project of STING, STING+, which will run from 2024 through 2026. Consequently, some variations to the proposal of Potts et al. (2024) might be expected. To fulfil the requirements laid out in Article 10 of the NRR, the indicator needs to deliver estimates of the abundance and diversity of pollinator species and allow the assessment of pollinator population trends. According to the current proposal (Potts et al., 2024), the data underlying the wild pollinator indicator will be collected following the Core Scheme, which includes those taxa that are feasible to monitor in the short term (i.e. wild bees, hoverflies, butterflies and moths) and are expected to be identified at the species level. The wild pollinator indicator will be calculated annually. Once operational, the wild pollinator indicator will be proposed as a candidate indicator to the EUBP-MA.

In addition, the IUCN, through the Pulse project, will also produce an aggregated Red List Index for pollinators (encompassing butterflies and bees) at EU and/or Pan-European level. Once operational, this indicator will also be proposed as a candidate indicator to the EUBP-MA.

4.5.3 Progress to date towards achieving the target

Using the Grassland butterfly index to assess progress to date towards achieving the target, we can only evaluate whether populations of grassland butterflies have stopped declining. The latest report of the Grassland butterfly index from 1990 to 2020 shows a linear decline of 36% in Europe in the last ten years and of 32% across the 27 EU Member States (Van Swaay et al., 2022), suggesting that trends in populations of grassland butterflies are not going in the right direction.

In addition, according to the European Red List of Bees, around 9% of all bee species are threatened in the EU (Nieto et al., 2014). Scientific literature has also reported declines in insect pollinators' abundance and richness across several European countries (Barendregt et al., 2022; Powney et al., 2019; Rada et al., 2019; Vray et al., 2019). Such evidence suggests that overall, pollinators are still declining.

Once available, the wild pollinator indicator and the Red List Index for pollinators will provide a more complete picture of trends in pollinators, respectively on trends in pollinators' abundance and/or diversity and trends in pollinators' extinction risk.

4.5.4 Outlook of meeting the target by 2030

The available evidence depicts a worrying situation for butterflies, hoverflies, and bees: the Grassland butterfly indicator has declined by 32% across the 27 EU Member States between 1990 and 2020 (Van Swaay et al., 2022) and scientific literature has also reported declines in insect pollinators' abundance and richness across several European countries (Barendregt et al., 2022; Powney et al., 2019; Rada et al., 2019; Vray et al., 2019). Therefore, and despite current data gaps for some pollinators, all the evidence currently available suggests that we are not on track to meet the target.

[64] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2023%3A35%3AFIN

Implementing the EU PoMS will allow the collection of data to calculate the wild pollinator indicator, thus addressing data gaps. However, the short time available before 2030 to gather robust information and assess the trends in pollinating insects is an important limiting factor. The Core Scheme is unlikely to be fully implemented before 2026, hence, there will be at the most 4-5 years of scientifically robust data to assess the pollinator trends. Following White (2019), pollinator experts have recommended to have at least 10 years of data to obtain reliable trends (Potts et al., 2021). The wild pollinator indicator will be used to assess whether the target of reversing the decline of pollinators by 2030 is met. To this purpose, different approaches are being discussed under STING+: e.g. Bayesian vs. classical statistics to establish significance testing and single vs. multiple metrics (e.g. a composite indicator). Each of these approaches have advantages and disadvantages (see **Annex 1** for more information).

As stressed in the revised EU Pollinators Initiative in January 2023 (A New Deal for Pollinators[65]), significant challenges still need to be overcome to halt and reverse pollinator decline. However, several actions have been identified to reduce pollinator decline by effectively tackling the main drivers of the decline, namely habitat loss and fragmentation, intensive agriculture and pesticide use, environmental pollution, invasive alien species, pathogens and climate change (Potts et al., 2010). The endorsement of ambitious legislations that directly counteract some the most important threats causing the decline of pollinators would be essential. For instance, the implementation of measures that will enable reaching EU BDS targets such as bringing at least 10% of agricultural area under high-diversity landscape features (target 7) or 25% of agricultural land under organic farming and the uptake of agro-ecological practices is significantly increased (target 8), would play a critical role to meet also the pollinator target.

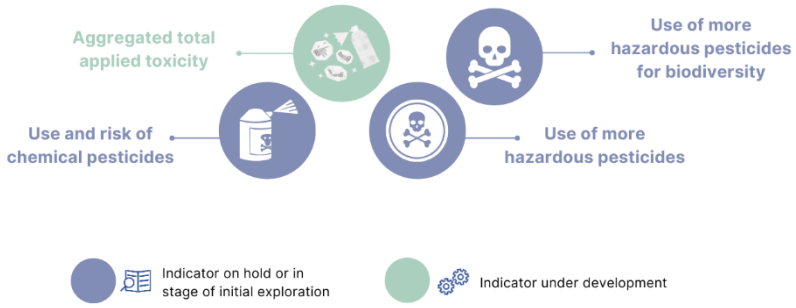
4.6 Target 6: pesticides

The risk and use of chemical pesticides is reduced by 50%, and the use of more hazardous pesticides is reduced by 50%.

There is no indicator published yet in the EU BDS dashboard to monitor progress towards target 6. The JRC is supporting the development of one indicator measuring the potential risk of pesticides for biodiversity (the aggregated total applied toxicity), including in view of meeting the EU's reporting obligations under the GBF. It is also exploring the development of another one to measure the use of more hazardous pesticides for biodiversity (Figure 19). Both the use and risk of chemical pesticides and the use of more hazardous pesticides, two indicators focusing on general risks rather than specific risks on biodiversity and which are used to track progress towards the F2F pesticide targets, have declined over the last years[66]. However, these reductions have not (yet) resulted in improvement of environmental quality (EEA and JRC, 2025). Moreover, as these indicators are not adapted to measure pesticide risks specifically on biodiversity and pending the development of indicators that will do so, it is not yet possible to evaluate whether the target will be met by 2030 (Figure 20).

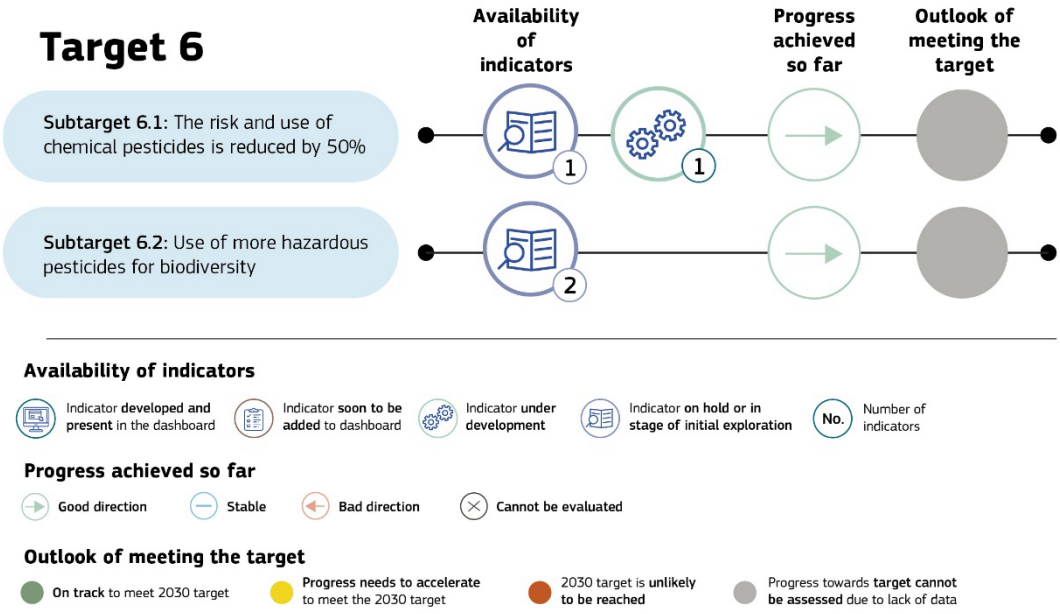
[65] https://environment.ec.europa.eu/publications/new-deal-pollinators_en
[66] https://food.ec.europa.eu/plants/pesticides/sustainable-use-pesticides/farm-fork-targets-progress/eu-trends_en

Figure 19. State of play regarding indicators to monitor target 6 of the EU Biodiversity Strategy



Source: JRC

Figure 20. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 6 of the EU Biodiversity Strategy



Source: JRC

4.6.1 Subtarget 6.1: the risk and use of chemical pesticides is reduced by 50%

4.6.1.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress towards this subtarget in the EU BDS dashboard.

4.6.1.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

One indicator was previously considered to monitor progress towards this subtarget: the use and risk of chemical pesticides. This indicator is already used to monitor progress towards F2F pesticide reduction targets for the period 2011-2022[67] and within the EU SDG indicator framework to monitor progress towards SDG2 "Zero hunger"[68]. It measures the use and risk of chemical pesticides based on (i) the quantities of active substances contained in the pesticides which are placed on the

[67] https://food.ec.europa.eu/plants/pesticides/sustainable-use-pesticides/farm-fork-targets-progress/eu-trends_en
[68] https://doi.org/10.2908/SDG_02_53

market (sold) in each Member State, and (ii) the hazard groups these active substances belong to. As such, each active substance is given a weighting factor representing its hazard properties: 1 for low-risk active substances, 8 for approved active substances not falling into any other category, 16 for approved active substances which are candidates for substitution and 64 for active substances which are not approved. Values can be calculated and provided every year by Eurostat based on pesticide sales by categorisation of active substances[69]. However, because the hazard component of this indicator does not focus specifically on hazards for biodiversity, it is not the most appropriate to monitor this subtarget under the EU BDS, and its inclusion in the EU BDS dashboard was therefore put on hold.

The Commission is committed to develop more appropriate indicators in the future, focusing on better consideration of substance hazard properties related to biodiversity. Specifically, the JRC is currently supporting the development of an alternative indicator to measure the potential risk of pesticides for biodiversity: the aggregated total applied toxicity (ATAT)[70]. This indicator is also part of the obligatory (headline) indicators to monitor progress under the GBF, and the EU as well as Member States will have to use it to report on progress towards GBF target 7 in relation to pesticides. The ATAT is defined as the risk to ecological communities based on the combined risks to key species groups from the annual use of pesticides. It is based on two main factors: (i) the mass of applied active substance each year and (ii) regulatory threshold levels (RTLs) representing species-specific toxicity thresholds. As RTLs are available for different tested species within each species groups, the RTL for a specific species group reflects the RTL of the most sensitive species of the group to ensure conservative safety margins that also protect less sensitive species. To calculate the total applied toxicity (TAT), toxicity-weighted application rates for each species group and active substance are first calculated. These values can then be aggregated over active substances, species groups and spatial scales to obtain the ATAT. This methodology ensures that the ATAT reflects both the intrinsic toxicity of pesticides and their application intensity, providing a robust measure of potential risks to biodiversity. The ATAT methodology is in the process of being finalised by the Food and Agriculture Organization (FAO). Upon finalisation of the methodology, the ATAT would then be proposed as a candidate indicator to the EUBP-MA.

Currently, the public availability of data on the application of active substance is limited to a small number of Member States. However, the entry into force of the Commission Implementing Regulation (EU) 2023/564[71], requiring electronic record-keeping of Plant Protection Products (PPP) use, might significantly enhance data availability and granularity. This would allow in the future to base the ATAT on data on pesticide use rather than on pesticide sales.

4.6.1.3 Progress to date towards achieving the subtarget

The F2F indicator on the use and risk of chemical pesticides at EU scale decreased by 46% between the baseline period of 2015-2017 and 2022[72], suggesting a trend in the right direction. However, these reductions have not (yet) resulted in improvement of environmental quality, as shown by the indicators "Pesticides in rivers, lakes and groundwater" and the signals on the "Ecological risk of pesticides in EU soils" used to track progress towards the ZP targets (EEA and JRC, 2025). Moreover, other indicators might offer a different perspective on the rate of reduction of risks for biodiversity. For instance, the TAT in Germany reveals only a minimal decline in toxicity risk to all assessed groups between 2011 and 2019 (Bub et al., 2023).

[69] https://ec.europa.eu/eurostat/databrowser/view/AEI_PESTSAL_RSK__custom_2366409/default/table?lang=en
[70] https://gbf-indicators.org/metadata/headline/7-2
[71] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R0564
[72] https://food.ec.europa.eu/plants/pesticides/sustainable-use-pesticides/farm-fork-targets-progress/eu-trends_en

4.6.1.4 Outlook of meeting the subtarget by 2030

As elaborated above, a more appropriate indicator to assess the risks of pesticides for biodiversity while meeting the EU's reporting requirements under the GBF is currently under development. In the absence of such an indicator, it is not yet possible to evaluate the outlook of meeting this EU BDS subtarget by 2030. Such assessment differs from the conclusions made on progress towards the EGD targets (Marelli et al., 2025) and the ZP targets (EEA and JRC, 2025), which were drawn based on trends in another indicator, the F2F indicator on the use and risk of chemical pesticides, not focusing specifically on risks for biodiversity.

4.6.2 Subtarget 6.2: the use of more hazardous pesticides is reduced by 50%

4.6.2.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress towards this target in the EU BDS dashboard.

4.6.2.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

One indicator was previously considered to monitor progress towards this subtarget: the use of more hazardous pesticides. This indicator is already used to track the progress towards F2F pesticide reduction targets for the period 2011-2022[73]. It measures the use of more hazardous pesticides based on the quantities of the more hazardous active substances contained in PPP sold in each Member State. In the context of the F2F, more hazardous pesticides are PPP containing one or more active substances approved as candidates for substitution in accordance with Article 24 of Regulation (EC) No 1107/2009[74] and listed in Part E of the Annex to Implementing Regulation (EU) No 540/2011[75], or containing one or more active substances listed in the Annex to Implementing Regulation (EU) 2015/408[76]. Values for this indicator are calculated and provided every year by Eurostat based on PPP sales data[77]. However, pesticides classified as more hazardous in this F2F indicator may not necessarily be the ones most relevant to biodiversity impacts. The F2F indicator on the use of more hazardous pesticides in the context of the F2F is therefore not the most appropriate indicator to monitor this subtarget under the EU BDS, and its inclusion in the EU BDS dashboard was therefore put on hold.

The JRC is exploring an alternative option to develop an indicator that would capture the use of more hazardous pesticides for biodiversity. These more hazardous pesticides for biodiversity" could be defined using the information on toxicological sensitivity for different groups of organisms, which is planned for in development of the ATAT indicator. Once this option is mature enough, this indicator on the use of more hazardous pesticides for biodiversity will be proposed as a candidate indicator to the EUBP-MA.

4.6.2.3 Progress to date towards achieving the subtarget

The F2F indicator on the use of more hazardous pesticides at EU scale decreased by 25% between the baseline period of 2015-2017 and 2022[78], suggesting that we are going in the right direction. However, there is no robust information yet at EU scale on the trends in the use of pesticides that are more hazardous specifically for biodiversity. Outlook of meeting the subtarget by 2030

In the absence of an indicator documenting the use of pesticides that are more hazardous for biodiversity at EU scale, it is not yet possible to evaluate the outlook of meeting this EU BDS subtarget by 2030. Such assessment differs from the conclusions made on progress towards the

[73] https://food.ec.europa.eu/plants/pesticides/sustainable-use-pesticides/farm-fork-targets-progress/eu-trends_en
[74] https://eur-lex.europa.eu/eli/reg/2009/1107/oj/eng
[75] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02011R0540-20240523
[76] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02015R0408-20230731
[77] https://ec.europa.eu/eurostat/databrowser/view/AEI_PESTSAL_RSK__custom_2366409/default/table?lang=en
[78] https://food.ec.europa.eu/plants/pesticides/sustainable-use-pesticides/farm-fork-targets-progress/eu-trends_en

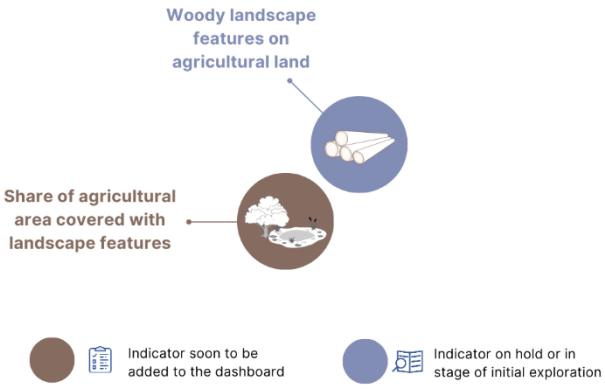
EGD targets (Marelli et al., 2025) and the ZP targets (EEA and JRC, 2025), which were drawn based on trends in another indicator, the F2F indicator on the use more hazardous pesticides, focusing on general hazards rather than hazards relevant for biodiversity.

4.7 Target 7: agricultural area under high-diversity landscape features

At least 10% of agricultural area is under high-diversity landscape features

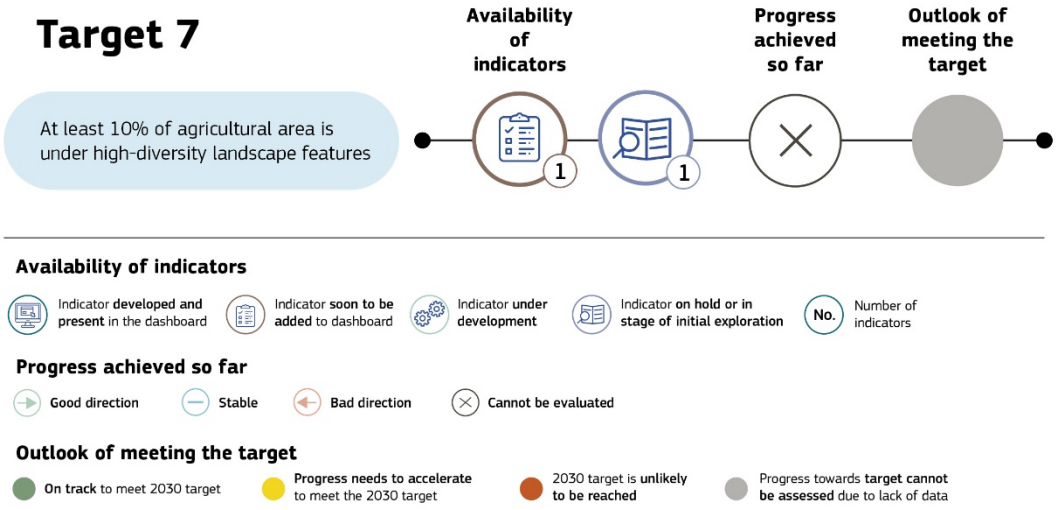
One indicator is soon to be published in the EU BDS dashboard to monitor target 7, and one additional indicator is on hold waiting for its update based on additional data for a second reference year and improvement of data quality (Figure 21). In 2022, the share of agricultural area under landscape features at EU scale was estimated at 5.6% (d'Andrimont et al., 2023; d'Andrimont et al., 2024). However, in the absence of other data points and a common methodology to monitor high-diversity landscape features, it is currently impossible to estimate how much we have progressed and whether we are on track to reach the target by 2030 (Figure 22).

Figure 21. State of play regarding indicators to monitor target 7 of the EU Biodiversity Strategy



Source: JRC

Figure 22. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 7 of the EU Biodiversity Strategy



Source: JRC

4.7.1 Indicator(s) available in the EU BDS dashboard

Although there is currently no indicator to monitor progress on this target in the EU BDS dashboard, one will be published soon: the share of agricultural area under landscape features. This indicator is also used to monitor the impact of the CAP regarding agricultural land (CAP I.21/C.21)[79]. It measures the ratio (in %) between the area covered by landscape features (small fragments of non-productive and - typically, but not only - semi-natural vegetation present in or adjacent to agricultural land) and the area covered by agricultural land for each Member State and can be aggregated at EU scale (d'Andrimont et al., 2023). Values are currently available for the year 2022, and will probably be updated in 2027 by JRC, based on the areas covered by landscape features and by agricultural land estimated via the LUCAS Landscape Feature module. It must be noted, however, that this indicator is a proxy to monitor progress towards target 7, as it measures the share of landscape features, and not of high-diversity landscape features.

4.7.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

An additional indicator, woody landscape features on agricultural land, has been developed by EEA[80] and considered as a candidate indicator to monitor target 7 in the EU BDS dashboard (Robuchon, Liquete, Neuville, Delli, et al., 2024). This indicator measures the share of area covered by woody landscape features on agricultural land in Europe based on remote-sensing data both for the area covered by woody landscape features[81] and agricultural land[82]. However, following the EUBP-MA meeting of April 2024, some criticisms have been received on the quality of remote-sensing data to characterise woody landscape features. The Commission therefore decided to put this indicator on hold until its next update, planned in 2025, that will include additional data for a second reference year and improvement of data quality.

4.7.3 Progress to date towards achieving the target

In 2022, the share of agricultural area under landscape features has been estimated at 5.6% at EU scale (d'Andrimont et al., 2023; d'Andrimont et al., 2024). However, in the absence of any other estimation, it is impossible to evaluate how the share of agricultural area under landscape features has progressed. A new estimation is foreseen in the next years and will allow to assess trends in the share of agricultural area under landscape features.

4.7.4 Outlook of meeting the target by 2030

As trends in the share of agricultural area under landscape features are not available yet, and that the Commission's methodology to monitor high-diversity landscape features foreseen under Article 14 of the NRR is yet to be published, it is currently not possible to evaluate whether the 10% target of agricultural area under high-diversity landscape features will be met by 2030.

4.8 Target 8: organic farming and agro-ecological practices

At least 25% of agricultural land is under organic farming management, and the uptake of agro-ecological practices is significantly increased

One indicator is already published in the EU BDS dashboard to monitor progress towards target 8 and another one is soon to be published (Figure 23). The percentage of agricultural land under organic farming management has increased over the last decade[83], but the pace of conversion to

[79] https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://agriculture.ec.europa.eu/system/files/2023-02/pmef-context-impact-indicators_en.pdf&ved=2ahUKEwjQ35i3m9GHAxUwAfsDHdmmBOMQFnoECBgQAQ&usg=AOvVaw1Q5eGVy6F3Y5b3uIYGMqda

[80] https://www.eea.europa.eu/en/analysis/indicators/woody-landscape-features-on-agricultural-land

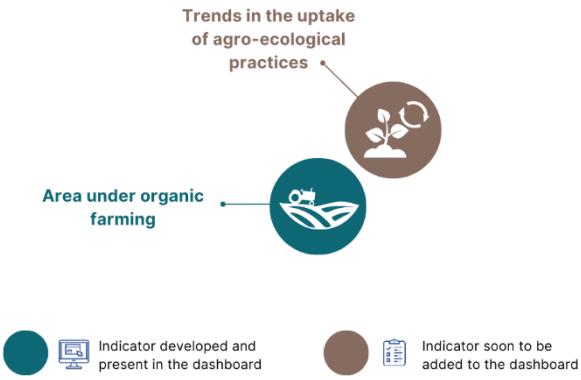
[81] https://land.copernicus.eu/en/products/high-resolution-layer-small-woody-features

[82] https://www.eea.europa.eu/data-and-maps/data/external/agricultural-area-2018-based-on

[83] https://ec.europa.eu/eurostat/databrowser/view/sdg_02_40/default/table?lang=en

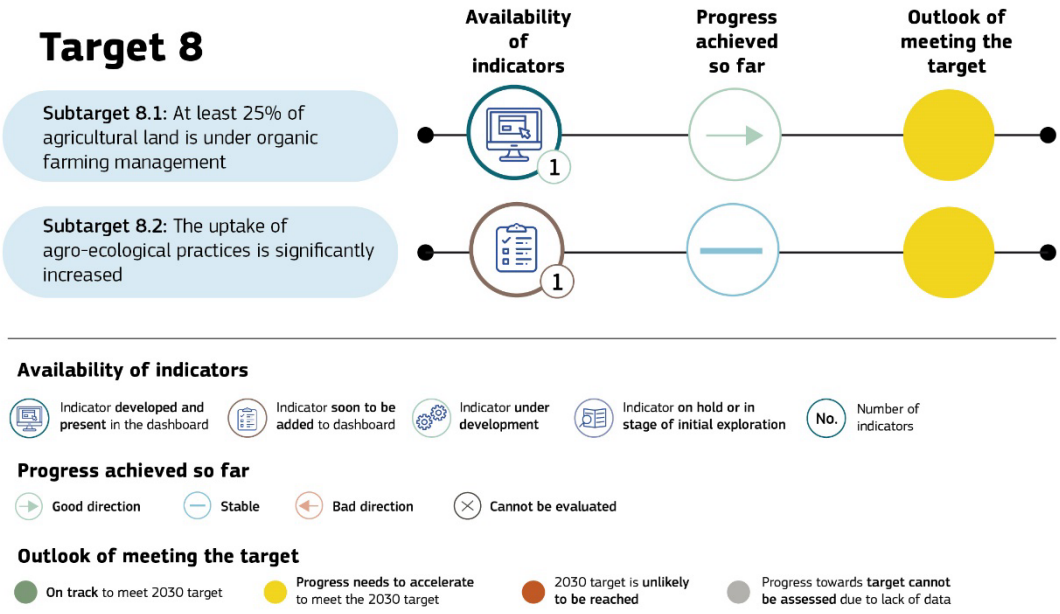
organic farming management would need to at least double to reach 25% by 2030. Trends in the uptake of agro-ecological practices have remained stable between 2011 and 2018[84], and more efforts are needed to guarantee that the uptake of agro-ecological practices will significantly increase in the remaining years to reach the target by 2030 (Figure 24).

Figure 23. State of play regarding indicators to monitor target 8 of the EU Biodiversity Strategy



Source: JRC

Figure 24. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 8 of the EU Biodiversity Strategy



Source: JRC

[84] https://pacioli.org/PacioliImages/documents/d2ac8ea2-e758-4ba5-9771-9e341c730a53.pdf

4.8.1 Subtarget 8.1: at least 25% of agricultural land is under organic farming management

4.8.1.1 Indicator(s) available in the EU BDS dashboard

There is currently one indicator to monitor progress towards this subtarget in the EU BDS dashboard: area under organic farming[85]. It measures the percentage of total utilised agricultural area, by Member State and at EU level, occupied by organic farming. It includes both existing organically-farmed areas and areas in the process of conversion. Values are calculated and provided every year by Eurostat based on data provided by the Member States. The indicator is also part of the EU SDG indicator framework to monitor progress towards SDG 2 "Zero hunger"[86], of the indicator set to monitor progress towards CAP objectives[87], of the F2F monitoring framework (Tóth et al., 2024), and in the 8EAP to monitor environmental and climate pressures related to EU production and consumption[88].

4.8.1.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is no need to further develop indicators for the EU BDS dashboard as the indicator already published is sufficient to monitor progress towards the subtarget.

4.8.1.3 Progress to date towards achieving the subtarget

The share of agricultural land under organic farming at EU level has progressed from 5.9% in 2012 to 10.5% in 2022 (EEA, 2025).

4.8.1.4 Outlook of meeting the subtarget by 2030

Current policies in place and public support will most likely increase the share of organic farming. However, meeting the subtarget requires the pace in the increase of the share of agricultural area under organic farming to more than triple compared to that of the last decade.

4.8.2 Subtarget 8.2: the uptake of agro-ecological practices is significantly increased

4.8.2.1 Indicator(s) available in the EU BDS dashboard

Although there is currently no indicator to monitor progress on this subtarget in the EU BDS dashboard, one will be published soon: trends in the uptake of agro-ecological practices. This is a composite indicator describing the degree to which EU farms, as represented in the FADN (Farm Accountancy Data Network) sample, have taken up agro-ecological practices. The composite indicator is composed of several individual indicators that represent five key principles of agro-ecological farming: (i) maintenance of soil health, (ii) decrease of total input intensity, (iii) increased reliance on self-produced inputs, (iv) avoidance of most harmful inputs and (v) improvement of the ecological infrastructure. The composite indicator is not simply representing the degree to which farms in the sample adopt one among all possible agro-ecological practices, as listed for example in Wezel et al. (2014), but the overall magnitude of a shift towards the adoption of management principles key to improve the overall ecological performance of the farm. The indicator builds on work from the LIFT[89] project's (Rega et al., 2022). It was first proposed as a candidate indicator to the EUBP-MA in autumn 2023, and a factsheet further describing it was published on this occasion

[85] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.2.8.1.1/?version=1
[86] https://doi.org/10.2908/SDG_02_40
[87] https://agridata.ec.europa.eu/extensions/IndicatorsSectorial/AreaUnderOrganicFarming.html
[88] https://www.eea.europa.eu/publications/european-union-8th-environment-action-programme/indicators/17-agricultural-area-under-organic/view
[89] The LIFT "Low-Input Farming and Territories Integrating knowledge for improving ecosystem-based farming" (ID: 770747) is a research project funded under the European Union's Horizon 2020 research programme

(Robuchon et al., 2023). Following the consultation with EUBP-MA, trends in the uptake of agro-ecological practices was selected to be published in the EU BDS dashboard. Values are already available for the period 2011-2018. The next step is to publish it in the EU BDS dashboard. In parallel, the long-term maintenance and future updates for this indicator are currently being discussed between the JRC and the Directorate-General for Agriculture and Rural Development.

4.8.2.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is no need to further develop indicators for the EU BDS dashboard as the indicator soon to be published is sufficient to monitor progress towards the subtarget.

4.8.2.3 Progress to date towards achieving the subtarget

Between 2011 and 2018, trends in the uptake of agro-ecological practices have remained stable[90]. It is possible though to detect some variations both by analysing changes within the same farm type, or across farm types. Within the same farm type, farms with a higher uptake of agro-ecological practices are on average associated with being economically smaller, physically larger, having a smaller share of rented land and a higher output/input ratio. Looking across different farm types, farms with a higher uptake of agro-ecological practices are on average associated with being economically smaller, being physically larger, having a smaller share of rented land, more likely to receive environmental subsidies and to be organic.

4.8.2.4 Outlook of meeting the subtarget by 2030

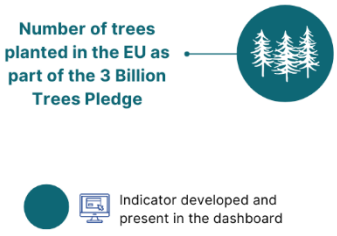
As the uptake of agro-ecological practices has remained stable over the last years, more efforts are needed to guarantee that it will significantly increase in the remaining years to reach the target by 2030.

4.9 Target 9: planting three billion additional trees

Three billion additional trees are planted in the EU, in full respect of ecological principles

One indicator is already published in the EU BDS dashboard and is sufficient to monitor progress towards target 9 (Figure 25). In January 2025, the number of additional trees planted in the EU as part of the 3 Billion Trees Pledge has reached almost 24 million[91]. However, even if this is going in the right direction, the rate of tree planting would need to be more than 100 times higher in the 5 remaining years to reach the 3 Billion target by 2030 (Figure 26).

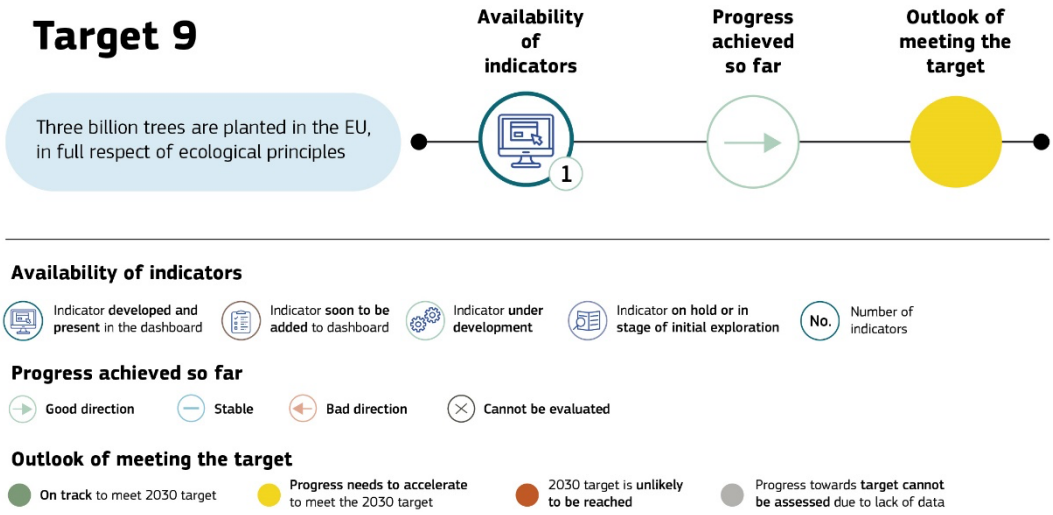
Figure 25. State of play regarding indicators to monitor target 9 of the EU Biodiversity Strategy



Source: JRC

[90] https://pacioli.org/PaciioliImages/documents/d2ac8ea2-e758-4ba5-9771-9e341c730a53.pdf
[91] https://mapmytree.eea.europa.eu/

Figure 26. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 9 of the EU Biodiversity Strategy



Source: JRC

4.9.1 Indicator(s) available in the EU BDS dashboard

There is currently one indicator to monitor progress towards this target in the EU BDS dashboard: Number of trees planted in the EU as part of the 3 Billion Trees Pledge[92]. This indicator counts the number of planted trees, by Member State and at EU27 level, as part of the EU 3 Billion Trees Pledge. Values are calculated and produced by the European Environment Agency, based on values reported by organisations participating in the Pledge.

4.9.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is no need to further develop indicators for the EU BDS dashboard as the indicator already published in the EU BDS dashboard is sufficient to monitor progress towards the target.

4.9.3 Progress to date towards achieving the target

Since May 2020 (the date set to start counting additional trees for the target)[93], more than 24 million trees have been planted. This represents a planting rate of c.a. 4.8 million additional trees per year. However, this number may be underestimated as this represents the number of trees that have been both planted and reported to the MapMyTree counter[94]. The Commission is working on communication activities in order to promote further reporting.

4.9.4 Outlook of meeting the target by 2030

To reach the desired target and based on the number of trees that have been both planted and reported to the MapMyTree counter so far, c.a. 2 976 000 000 additional trees need to be planted by 2030. This would require an annual planting rate of c.a. 595 million additional trees per year, which is over 100 times more than the observed rate so far. Therefore, tree planting needs to accelerate drastically to reach the target.

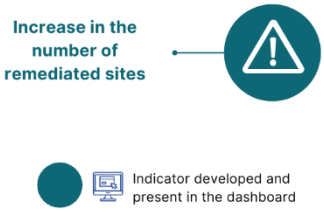
[92] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.3.9.0.10/?version=1
[93] https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030/3-billion-trees_en
[94] https://forest.eea.europa.eu/3-billion-trees/introduction

4.10 Target 10: remediation of contaminated soil sites

Significant progress in the remediation of contaminated soil sites

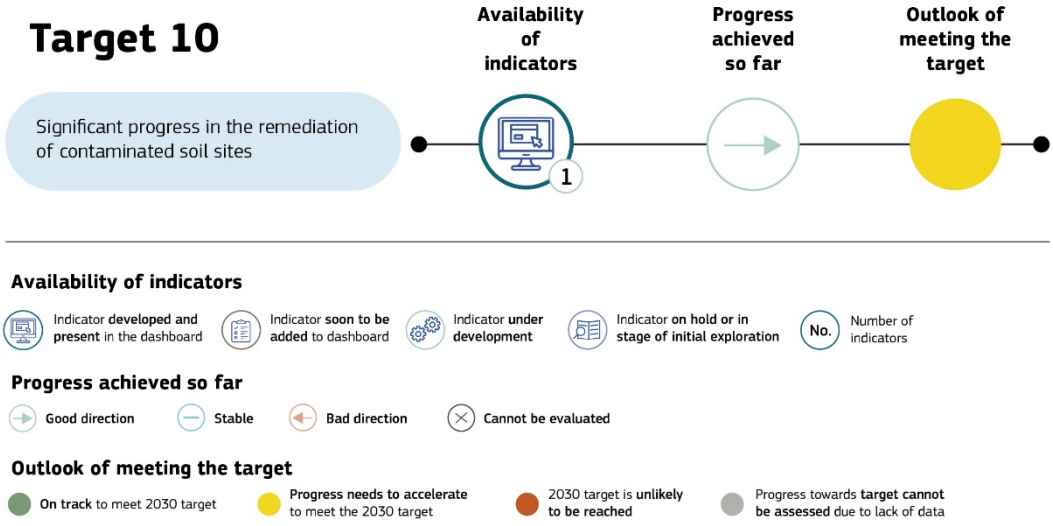
One indicator is already published in the EU BDS dashboard (Figure 27) and, although the indicator itself is sufficient to monitor progress towards target 10, data collection to calculate this indicator can still be improved. This indicator estimates that 57,110 additional sites have been remediated in 2016 compared to 2006 at EU scale[95], but the overall remediation rate is low, and will need to accelerate to remediate all expected contaminated soil sites by 2030 (Figure 28).

Figure 27. State of play regarding indicators to monitor target 10 of the EU Biodiversity Strategy



Source: JRC

Figure 28. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 10 of the EU Biodiversity Strategy



Source: JRC

4.10.1 Indicator(s) available in the EU BDS dashboard

There is currently one indicator to monitor progress towards this target in the EU BDS dashboard: Increase in the number of remediated sites[96]. This indicator measures the increase in the number of remediated sites, by Member State and at EU27 level, between 2006 and 2016. Values are

[95] https://www.eea.europa.eu/en/analysis/indicators/progress-in-the-management-of
[96] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.4.10.0.1/?version=1

calculated and produced by the EEA, based on data reported by Member States. While the indicator published in the EU BDS dashboard covers the entire target, the data behind this indicator suffers from extreme variability among Member States and therefore can only provide a rough estimate of the remediation of contaminated sites.

4.10.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is no need to further develop indicators for the EU BDS dashboard, but there is however room to improve the estimation of the remediation of contaminated sites through better data collection for the indicator already published in the EU BDS dashboard. Such improvement would be facilitated through the Soil Monitoring Law that would require Member States to (i) set up a public register for (potentially) contaminated sites and (ii) report to the Commission and the EEA on the progress they are making on identification, investigation and remediation of contaminated sites. Additionally, a new update of the number of remediated sites will soon be available based on data that are currently being reported by Member States, providing a more recent view in the increase in the number of remediated sites.

4.10.3 Progress to date towards achieving the target

Currently, with existing national implementation structures and funding, countries' progress in detecting, investigating and remediating contaminated sites varies considerably, from 20 sites/year to 3,000 sites/year. In 2016, 115,000 contaminated sites were remediated in the EU, representing 8.3% of the currently registered potentially contaminated sites[97].

4.10.4 Outlook of meeting the target by 2030

To remediate all expected contaminated sites (e.g. the most ambitious way of reaching the target), it would take between 10 years (based on the average current remediation rate of 614 sites/year per country) and 47 years (based on a median remediation rate per country of 129 sites/year)[98]. Therefore, despite the observed increase in the number of remediated sites between 2006 and 2016, remediation rate should accelerate further to remediate all contaminated sites by 2030.

However, the European Commission has recognised the fundamental role that may be played by sustainable technologies for reaching the goal - particularly the adoption of bioremediation. There are existing challenges associated to the large-scale applicability of bioremediation, from proper understanding of microbial metabolic pathways during pollutant degradation to poor adaptability of microorganisms to new, contaminated, soils. To address this and to fill in knowledge gaps and promote the usage of such sustainable tools, the European Commission has been discussing the inclusion of soil bioremediation as key topic for funding research calls of the EU Mission "A Soil Deal for Europe". Results from this EU mission, together with the impulse of the Soil Monitoring Law including obligations for Member States to identify potentially contaminated sites, to investigate these sites and to bring the risks to acceptable levels through risk reduction measures, may contribute to make significant progresses in the remediation of contaminated soil sites in Europe by 2030.

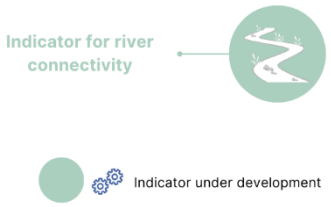
[97] https://www.eea.europa.eu/en/analysis/indicators/progress-in-the-management-of
[98] https://www.eea.europa.eu/en/analysis/indicators/progress-in-the-management-of

4.11 Target 11: free-flowing rivers

At least 25.000 km of free-flowing rivers are restored

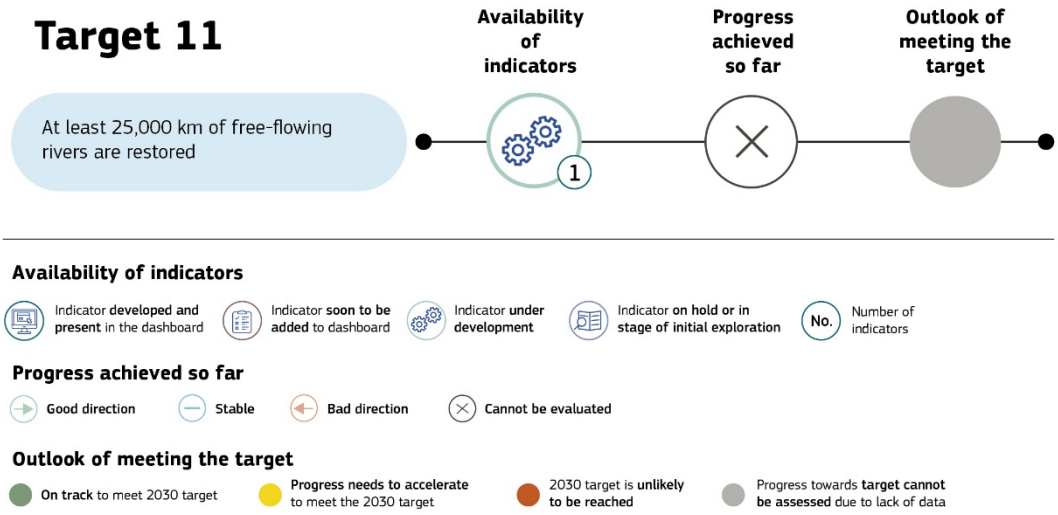
There is no indicator published in the EU BDS dashboard yet to monitor target 11, although one is under development (Figure 29). It is therefore too soon to track progress towards or outlook of achieving this target based on this indicator under development (Figure 30).

Figure 29. State of play regarding indicators to monitor target 11 of the EU Biodiversity Strategy



Source: JRC

Figure 30. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 11 of the EU Biodiversity Strategy



Source: JRC

4.11.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this target in the EU BDS dashboard.

4.11.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is currently ongoing work to develop an indicator for river connectivity to monitor progress towards this target. In 2022, the Commission published a technical guidance document clarifying the key terms and concepts of the 25.000 km target (European Commission, 2022). It also recommended that a set of criteria should be defined to assess whether a river is free-flowing in a joint process in which the Commission and the Member States work to achieve a harmonised approach at EU level. A set of harmonised criteria addressing longitudinal, lateral and vertical

connectivity considering both local and catchment scales has now been proposed (Van De Bund et al., 2024), and is expected to be finalised in 2025 following extensive testing by the Member States.

Article 9 of the NRR prescribes that Member States shall make an inventory of artificial barriers and identify the barriers that need to be removed and take measures to improve the natural functions of the related floodplains. Member States need to report the length of free-flowing rivers to be achieved by these measures in their national restoration plans. Reporting templates are currently in development.

The criteria for identifying free-flowing rivers and the NRR reporting information will serve as a basis for the development of the indicator, which is being led by the EEA, for target 11. Once ready, it will be proposed as a candidate indicator to the EUBP-MA group.

4.11.3 Progress to date towards achieving the target

As the work to develop an indicator measuring the length of free-flowing rivers is still ongoing, there is no data available yet to measure progress towards the target.

4.11.4 Outlook of meeting the target by 2030

As the work to develop an indicator measuring the length of free-flowing rivers is still ongoing, there is no data available yet to evaluate the outlook of meeting the target by 2030.

4.12 Target 12: invasive alien species

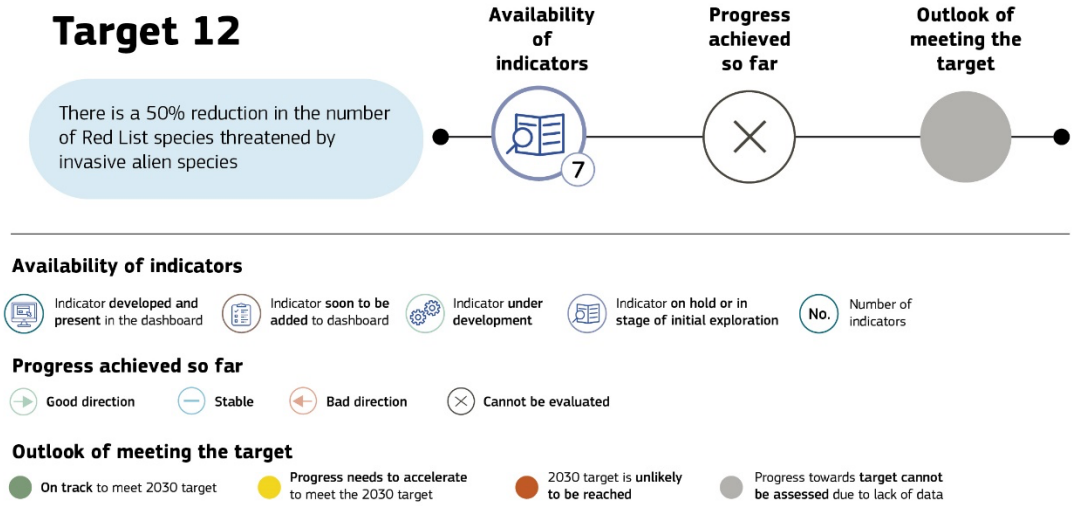
There is a 50% reduction in the number of Red List species threatened by invasive alien species (IAS)

There is no indicator published in the EU BDS dashboard yet to monitor target 12, although several indicators are under exploration (Figure 31). It is therefore too soon to track progress towards or outlook of achieving this target (Figure 32).

Figure 31. State of play regarding indicators to monitor target 12 of the EU Biodiversity Strategy

Source: JRC

Figure 32. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 12 of the EU Biodiversity Strategy



Source: JRC

4.12.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this target in the EU BDS dashboard.

4.12.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

Several possibilities are currently being explored to develop suitable indicator(s) to monitor progress towards target 12. First, to monitor progress towards this target, data on threats posed by IAS to Red List species needs to be made available as a baseline and at additional time points so that progress can be monitored. The most relevant data set to do this is the IUCN European Red List assessments at the EU scale[99]. However, many of these assessments are out of date (i.e. more than 10 years old), and in some cases did not clearly delineate specific IAS threats to the assessed species, and therefore recent threats from IAS may not be reflected in these datasets. Through the IUCN-led European Red List Pulse project, 11 species groups will be re-assessed at the EU level by 2024. In addition, the birds are re-assessed at the EU level on a periodic basis (last done in 2021). Also, it is important to define what a Red List species is for the purposes of the EU BDS target 12: Smith (2022) has defined this as any species assessed as threatened (Critically Endangered, Endangered or Vulnerable) or Near Threatened (NT) at the EU scale.

Once the IUCN European Red List assessments are available for several time points, there are three possible options of indicators for this target that use those assessments. The first, and most directly in line with the target, would be to track change in the number of assessed species threatened by IAS. However, this approach may be affected by some caveats, and actual trends may be not accurately reflected. For example, a species may not change Red List category even if the threat from IAS is successfully mitigated (see **Annex 2** for more information on this possible indicator).

The second option is the application of the ERLI (see target 4), which measures trends over time in the aggregate extinction risk using IUCN Red List assessments, for species threatened by IAS. An ERLI is being produced for selected species groups through the IUCN Red List Pulse project, and therefore disaggregation to species threatened by IAS will be possible once results from this project

[99] https://environment.ec.europa.eu/topics/nature-and-biodiversity/european-red-list-threatened-species_en#:~:text=The%20European%20Red%20List%20identifies,taken%20to%20improve%20their%20status.

will be available. While this will not present a change in the number of Red List species threatened by IAS, it will present the change in extinction risk associated with this threat, which is consistent with the intent of the target (see **Annex 2** for more information about the ERLI for IAS).

Finally, the third option is the use of the recently published Species Threat Abatement and Restoration Metric (STAR) (Mair et al., 2021). The application of STAR to the IUCN European Red List data would permit the identification and quantification of opportunities to reduce regional species extinction risk (at the EU level) through IAS management across the EU. While this will not present the number of assessed species threatened by IAS, it will allow for the tracking of a reduction in threat intensity posed by IAS to reduce regional species extinction risk (see **Annex 2** for more information on the use and challenges of STAR for this purpose).

Beyond these three Red List-based options for indicators, other indicators already used in other environmental policies may complement the picture to track progress towards fighting the threats posed by IAS in the EU more broadly. This is the case of the rate of IAS establishment (McGeoch et al., 2023; Magliozzi, Gervasini, and Cardoso, 2024), which has been proposed as an headline indicator under the Kunming-Montreal Global Biodiversity Framework (GBF)[100] to monitor target 6 on IAS, as well of national response to IAS in terms of policy, practice, and budget[101], which is both used to monitor the SDG 15 "Life on land" at global level, and as a binary indicator to monitor target 6 of the GBF. Other candidate indicators include the potential cumulative pressure of IAS on ecosystems used in the context of the EU ecosystem assessment and suggested to monitor the IAS Regulation 1143/ 2014[102] (Polce et al., 2023; Magliozzi et al., 2023) and the number of newly introduced non-indigenous species in EU marine areas used in the MSFD context (Magliozzi et al., 2024).

All these possibilities will need to be further explored before proposing candidate indicator(s) to the EUBP-MA.

4.12.3 Progress to date towards achieving the target

Although the change in the number of Red List species threatened by IAS cannot be evaluated at the moment, scientific studies indicate that the cumulative observed number of new invasive alien plants globally has grown steadily since 1800 (McGeoch et al., 2023) and that IAS of policy concerns still show widespread patterns of invasion and potential pressure across European ecosystems (Polce et al., 2023). Globally, over the last decade, there has been small improvement in the adoption by countries of policy relevant to invasive alien species, a substantial increase in countries adopting national-level legislation, and widespread adoption of IAS targets by countries; however, resource allocation in support of IAS prevention and control remains woefully inadequate[103].

4.12.4 Outlook of meeting the target by 2030

As the work to develop indicator(s) to monitor this target is still ongoing, there is no data available yet to evaluate the outlook of meeting the target by 2030.

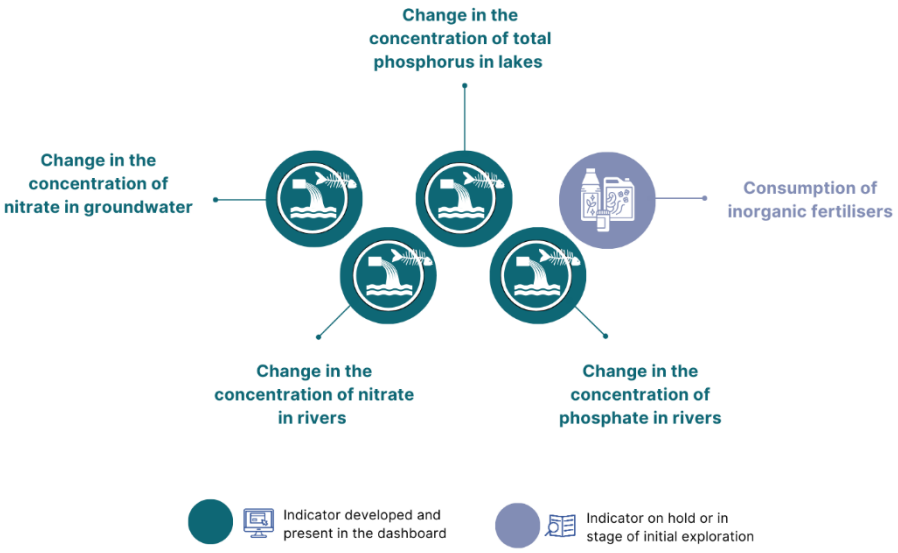
4.13 Target 13: nutrient losses

The losses of nutrients from fertilisers are reduced by 50%, resulting in the reduction of the use of fertilisers by at least 20%

[100] https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf
[101] https://www.bipindicators.net/indicators/adoption-of-national-legislation-relevant-to-the-prevention-or-control-of-invasive-alien-species
[102] https://eur-lex.europa.eu/eli/reg/2014/1143/oj/eng
[103] https://www.bipindicators.net/indicators/adoption-of-national-legislation-relevant-to-the-prevention-or-control-of-invasive-alien-species

Four indicators are already published in the EU BDS dashboard to monitor progress in reducing the losses of nutrients, and another one is on hold to track the reduction in the use of fertilisers (Figure 33). Nutrients losses at EU scale have been reduced by 13% between 2000 and 2021 on average (over the four indicator(s) published in the EU BDS dashboard[104, 105, 106, 107]), while the consumption of fertilisers over the past decade has remained quite stable. Whereas the observed trends in the losses of nutrients and modelling studies suggest that the subtarget of 50% reduction in nutrient losses is unlikely to be reached by 2030, more data are needed to evaluate whether this holds true for the subtarget of 20% reduction in the use of fertilisers (Figure 34).

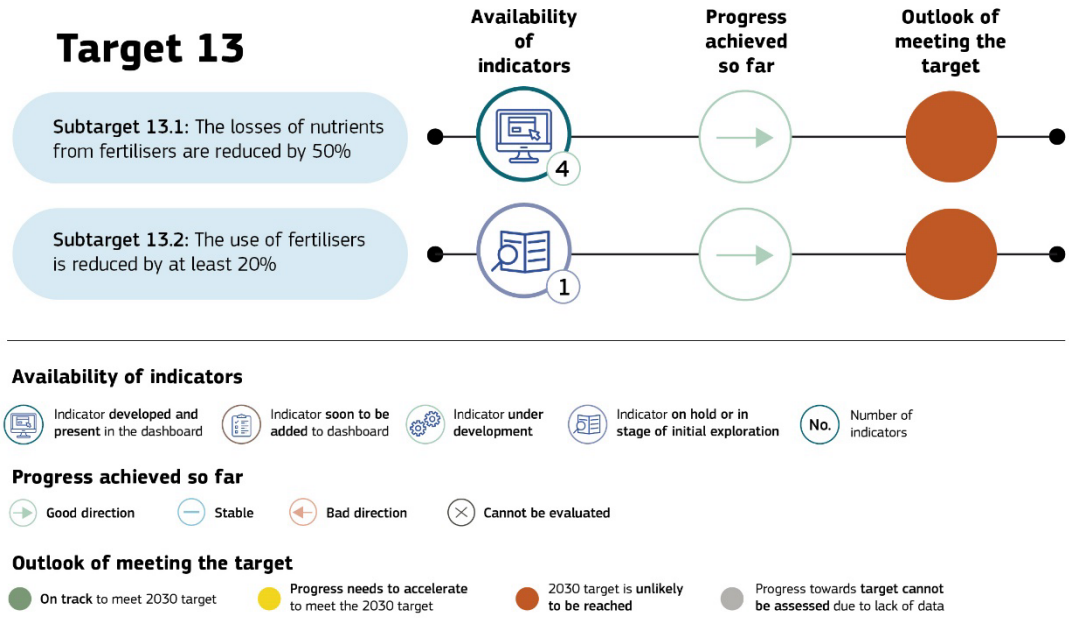
Figure 33. State of play regarding indicators to monitor target 13 of the EU Biodiversity Strategy



Source: JRC

[104] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.8.13.1.1/?version=1
[105] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.8.13.1.2/?version=1
[106] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.8.13.1.3/?version=1
[107] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.8.13.1.4/?version=1

Figure 34. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 13 of the EU Biodiversity Strategy



Source: JRC

4.13.1 Subtarget 13.1: the losses of nutrients from fertilisers are reduced by 50%

4.13.1.1 Indicator(s) available in the EU BDS dashboard

There are currently four indicators to monitor progress towards this target published in the EU BDS dashboard:

- Change in the concentration of nitrate in groundwater[108]
- Change in the concentration of nitrate in rivers[109]
- Change in the concentration of total phosphorus in lakes[110]
- Change in the concentration of phosphate in rivers[111].

These indicators measure the percentage of change in the concentration of the different nutrients (nitrate in groundwater, nitrate in rivers, total phosphorus in lakes, phosphate in rivers), by Member State and at EU27 level, between 2000 and 2021. Values are calculated and produced by the European Environment Agency, based on data reported by Member States. The indicators on nitrate in groundwater and phosphate in rivers are also part (in a slightly different form) of the EU SDG monitoring set to monitor progress towards SDG 6 "Clean water and sanitation"[112], and nitrate in groundwaters is also used in the 8EAP to monitor pollution[113].

[108] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.8.13.1.1/?version=1
[109] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.8.13.1.2/?version=1
[110] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.8.13.1.3/?version=1
[111] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.8.13.1.4/?version=1
[112] https://doi.org/10.2908/SDG_06_40
[113] https://www.eea.europa.eu/publications/european-union-8th-environment-action-programme/indicators/08-nitrate-in-groundwater-indicator/view

All these indicators highlight change in the concentration of nutrients in groundwater, rivers or lakes, but do not reflect directly the losses of nutrients from fertilisers and are therefore used as proxies to inform this subtarget.

4.13.1.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is no ongoing work to further develop indicators for the EU BDS dashboard, although it would be useful to have one indicator more directly measuring losses of nutrients from fertilisers to align better with the subtarget.

4.13.1.3 Progress to date towards achieving the subtarget

Between 2000 and 2021, the concentration of nutrients at EU scale has decreased by 3.2% for nitrate in groundwater[114], 8.7% for nitrate in rivers[115], 17.6% for total phosphorus in lakes[116], and 22.4% for phosphate in rivers[117].

4.13.1.4 Outlook of meeting the subtarget by 2030

The pace of decrease in nutrients loss observed over the last twenty years is likely insufficient to reach 50% decrease by 2030. This is reinforced by available modelling studies which indicate that the target of reducing nutrient losses in the EU by at least 50% will not be met by 2030 (Grizzetti et al., 2023; European Commission Joint Research Centre, 2022; Macias Moy et al., 2022). Alone, a more balanced mineral fertilisation in areas where nitrogen surplus is above the average (50 kgN/ha, EUROSTAT data) will not be sufficient to cut the nitrogen losses to air, soil and water. EU policies to improve domestic wastewaters treatment (COM(2022) 541 final[118]; Pistocchi et al., 2023), to reduce GHGs emissions (Fit for 55 package[119]; Pisoni et al., 2023), and new measures under the CAP, the EU BDS and the F2F (Barreiro-Hurle et al., 2021) will reduce the nutrients load to the European seas but not to the level of ambition of the target and with regional differences (Grizzetti et al., 2023; Macias Moy et al., 2022). Such assessment differs from the conclusion made in the report on progress towards the EGD targets (Marelli et al., 2025), in which the outlook of meeting this subtarget was based on trends in nitrate in groundwater, while our conclusion is based on outputs from modelling studies.

Further analysis of the agri-food system shows that the measures foreseen by the F2F seem insufficient to halve nitrogen losses to the atmosphere and the water system and highlights that structural changes of the agricultural production and a transition in the diet are necessary to reach food and feed self-sufficiency of Europe and meet environmental objectives (Billen et al., 2024).

Future initiatives on integrated nutrient management could maximise synergies between policies and strengthen actions to address the nutrient cycle in integrated and effective way, reducing nutrient losses to the environment and managing nutrients better through their lifecycle. In addition, the EU has also committed to reduce the excess nutrients lost to the environment by at least half, including through more efficient nutrient cycling, in the context of GBF (target 7).

4.13.2 Subtarget 13.2: the use of fertilisers is reduced by at least 20%

4.13.2.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this subtarget in the EU BDS dashboard.

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[114] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.8.13.1.1/?version=1
[115] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.8.13.1.2/?version=1
[116] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.8.13.1.3/?version=1
[117] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.8.13.1.4/?version=1
[118] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0541
[119] https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55/

4.13.2.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

There is currently one indicator on hold to monitor progress towards this subtarget: consumption of inorganic fertilisers[120]. This indicator was proposed as a candidate indicator to EUBP-MA in April 2022, but following the feedback received highlighting that it did not include organic fertilisers and was therefore not appropriate to fully capture progress towards this subtarget, the European Commission decided to put it on hold and is currently exploring options of more comprehensive indicator(s).

4.13.2.3 Progress to date towards achieving the subtarget

The consumption of inorganic fertilisers slightly increased between 2012 and 2017. Since then, the trend inverted and in 2022, a sharp reduction on the use of inorganic fertilisers in agriculture was observed, leading to an overall reduction of 7.2% in the whole period[121]. Regarding the consumption of organic fertilisers (i.e. manure), the trends over the past decade look quite stable at EU scale[122], with some sources indicating a small decrease[123] and others a small increase (JRC CAPRI baseline, 2023).

4.13.2.4 Outlook of meeting the subtarget by 2030

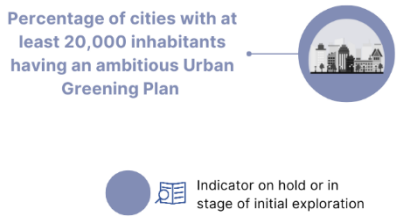
Although there is no comprehensive indicator to monitor progress towards this subtarget yet, the Common Agricultural Policy Regionalised Impact Modelling System (CAPRI) provides projections in reduction of both inorganic fertilisers and organic ones (manure). Such projections indicate that, by 2040, the use of inorganic fertilisers would decrease by 6.9% and the use of manure by 0.4% compared to the average observed over the period 2013-2018 (JRC CAPRI baseline, 2023). Based on these projections, the subtarget of reducing the use of fertilisers in the EU by at least 20% is unlikely to be met by 2030.

4.14 Target 14: urban greening plans

Cities with at least 20,000 inhabitants have an ambitious Urban Greening Plan

There is no indicator published in the EU BDS dashboard yet to monitor target 12, and one is stage of initial exploration (Figure 35). It is therefore too soon to track progress towards or outlook of achieving this target (Figure 36).

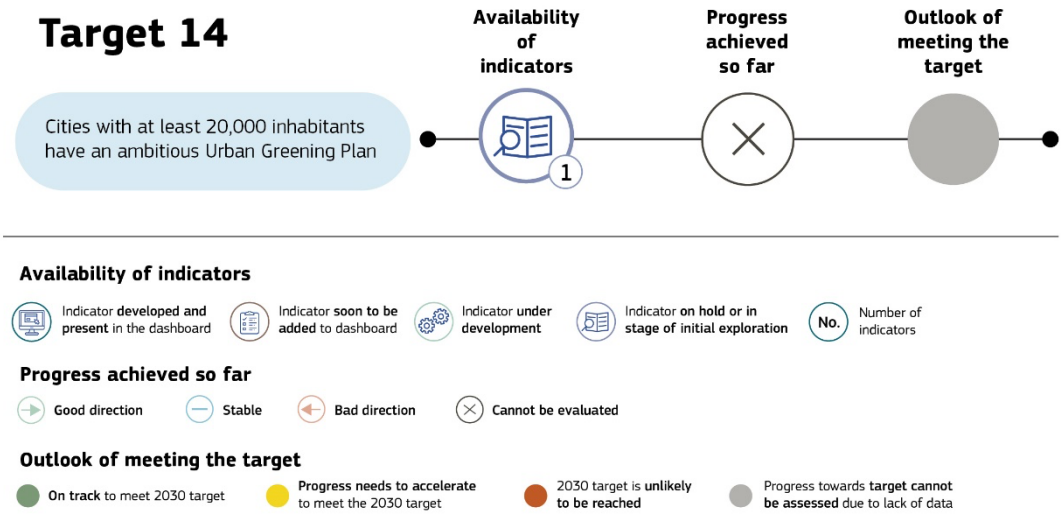
Figure 35. State of play regarding indicators to monitor target 14 of the EU Biodiversity Strategy



Source: JRC

[120] https://ec.europa.eu/eurostat/databrowser/view/aei_fm_usefert/default/line?lang=en
[121] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Agri-environmental_indicator_-_mineral_fertiliser_consumption
[122] https://unfccc.int/ghg-inventories-annex-i-parties/2023
[123] https://www.fao.org/faostat/en/#data/EMN

Figure 36. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 14 of the EU Biodiversity Strategy



Source: JRC

4.14.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this target in the EU BDS dashboard.

4.14.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

The ideal indicator to measure progress towards this target would be the percentage of cities with at least 20,000 inhabitants having an ambitious Urban Greening Plan. Building such indicator would require to (i) check, for each city in the EU, whether it has an Urban Greening Plan and (ii) evaluate the ambition level of such Urban Greening Plan(s). Currently, there is no mechanism or plan to gather and process such data and therefore to get such indicator. However, some work has been carried out to evaluate the ambition level of Urban Greening Plans for 10 European cities, with criteria covering urban biodiversity goals and targets, collaborative governance, institutional support, public participation, financing mechanisms, and monitoring and evaluation (Mahmoud et al., 2025). Such work could serve as a reference to evaluate the ambitious level of Urban Greening Plans. However, it would need to be drastically enlarged to cover all EU cities over 20,000 inhabitants, and it is still unclear whether and how this will be achieved.

4.14.3 Progress to date towards achieving the target

As the work to develop an indicator monitor this target is still in stage of initial exploration, there is no data available yet to measure progress towards the target.

4.14.4 Outlook of meeting the target by 2030

As the work to develop an indicator monitor this target is still in stage of initial exploration, there is no data available yet to evaluate the outlook of meeting the target by 2030.

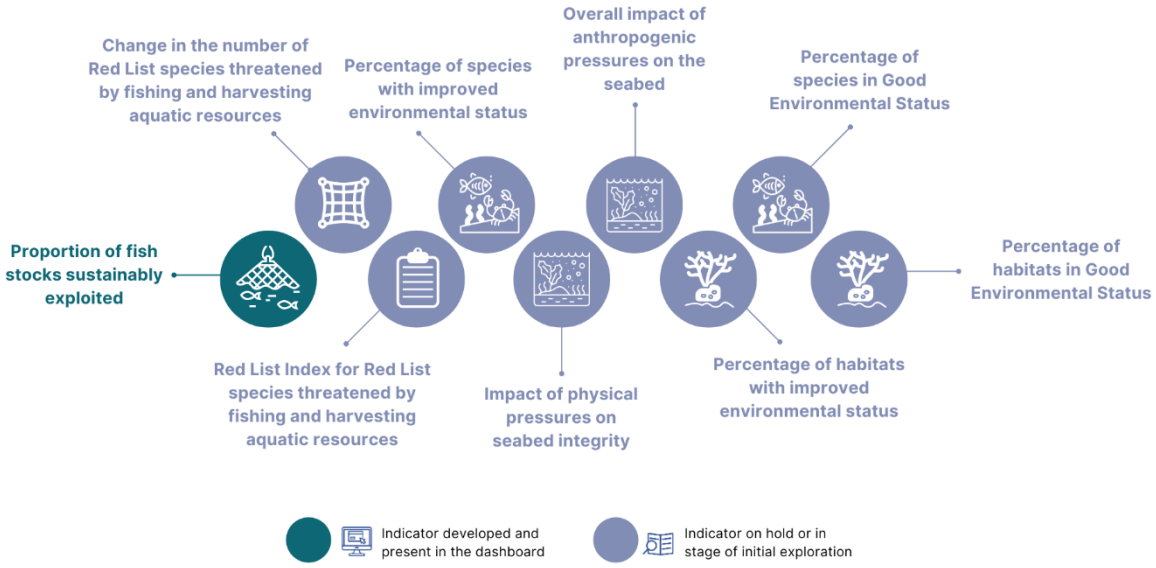
4.15 Target 15: sensitive marine species and habitats

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

There is already one indicator published in the EU BDS dashboard to monitor target 15, and 8 others are in stage of initial exploration (Figure 37). The indicator published in the EU BDS

dashboard allows to track progress in the proportion of fish stocks sustainably exploited, which shows a trend going in the right direction[124] - although progress needs to accelerate to reach 100% of fish stocks sustainably exploited by 2030 (Figure 38). The indicators in stage of initial exploration will allow to better characterise the negative impacts on sensitive species and habitats beyond commercially-exploited fish stocks, and to assess whether good environmental status will be achieved by 2030 for marine species and habitats.

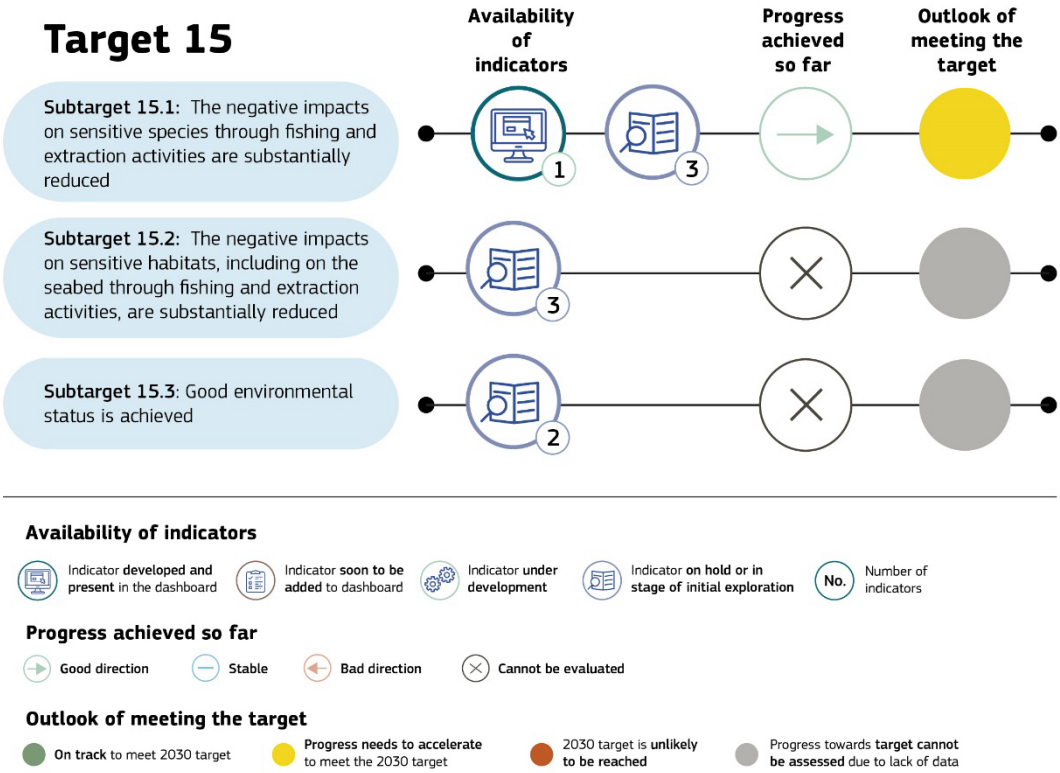
Figure 37. State of play regarding indicators to monitor target 15 of the EU Biodiversity Strategy



Source: JRC

[124] https://ec.europa.eu/eurostat/databrowser/view/env_bio5__custom_15044455/default/table?lang=en

Figure 38. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 15 of the EU Biodiversity Strategy



Source: JRC

4.15.1 Subtarget 15.1: the negative impacts on sensitive species through fishing and extraction activities are substantially reduced

4.15.1.1 Indicator(s) available in the EU BDS dashboard

There is currently one indicator to monitor progress towards this subtarget in the EU BDS dashboard: proportion of fish stocks sustainably exploited[125]. This indicator provides the percentage of fish stocks, in North-East Atlantic and adjacent seas basin (NEA), the Mediterranean and Black Sea basin (MBS) and in EU waters overall (which are the combination of the two basins NEA and MBS), that is sustainably exploited. Values are derived each year by an adhoc expert group from the Joint Research Centre, reviewed by the Scientific, Technical and Economic Committee for Fisheries (STECF), and disseminated by Eurostat. This indicator focuses on the impact of fishing (so no extraction activities) on commercially-exploited fish stocks that are assessed with analytical methods (so a limited number of fish stocks corresponding to a limited number of species). Therefore, an increased coverage of fish stocks is needed to improve the representativeness of this indicator (Gras et al., 2024), and other indicators on extraction activities and other sensitive species are needed to comprehensively track progress towards this subtarget.

4.15.1.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

As for target 12, several indicators could be developed to further monitor progress towards subtarget 15.1 based on the IUCN European Red List assessments that are currently being updated under the IUCN Red List Pulse project. The first option would be to track change in the number of

[125] https://dopa.jrc.ec.europa.eu/kcbd/EUBDS2030-dashboard/1.2.10.15.1.1/?version=1

Red List species threatened by fishing and harvesting aquatic resources. However, as for the change in the number of Red List species threatened by IAS that is explored to inform target 12, this approach may be affected by some caveats, and actual trends may be not accurately reflected. For example, a Red List species may not change Red List category even if the threat from fishing and harvesting aquatic resources is successfully mitigated.

The second option is the application of the ERLI (see also targets 4, 5, 12), which measures trends over time in the aggregate extinction risk using IUCN Red List assessments, for species threatened by fishing and harvesting aquatic resources. An ERLI is being produced through the IUCN Red List Pulse project, and therefore disaggregation to species threatened by fishing and harvesting aquatic resources will be possible once results from this project will be available. Such indicator would reflect the change in extinction risk associated with this threat.

Beyond Red List data, data on the environmental status of marine species that are reported every six years by Member States under the MSFD (Descriptor 1 "Biodiversity") could be used to calculate an indicator on the percentage of species with improved environmental status between two assessment cycles. The latest reports were produced in 2018[126], and the following ones were due in October 2024. When they become available, it will be possible to evaluate the percentage of species with improved environmental status between 2018 and 2024.

These three possibilities will need to be further explored before proposing candidate indicator(s) to the EUBP-MA.

4.15.1.3 Progress to date towards achieving the subtarget

The proportion of fish stocks aiming to be sustainably exploited has increased from 28.3 % in 2003 to 56.5 % in 2021[127], so an average increase of 1.57 percentage points per year.

Regarding other species, the latest Red List assessments for Europe show that, of the 1,196 marine species assessed, 9% are threatened, while 3% are near-threatened. Birds, mammals and turtles are particularly at risk, with over 20% of species being threatened. Overall, the loss of marine biodiversity in Europe's seas has not been halted (EEA, 2019).

4.15.1.4 Outlook of meeting the subtarget by 2030

If the trend in the proportion of fish stocks sustainably exploited continues as observed over the period 2003-2021, around 70% of fish stocks will be sustainably exploited by 2030. While this would be a progress in the good direction, an ambitious interpretation of the subtarget would be to have 100% of fish stocks sustainably exploited by 2030. For this to happen, the pace of progress in the sustainability of fisheries will need to triple compared to that of the 2003-2021 period.

Regarding the negative impacts of fishing and extraction activities on other species, it will only be possible to evaluate whether they will be substantially reduced by 2030 when updated assessments (Red List assessments from the IUCN Red Pulse project and MSFD reporting on the environmental status of marine species) become available.

4.15.2 Subtarget 15.2: the negative impacts on sensitive habitats, including on the seabed through fishing and extraction activities, are substantially reduced

4.15.2.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this subtarget in the EU BDS dashboard.

[126] https://water.europa.eu/marine/resources/msfd-reporting-data-tools/ges-assessment-dashboards/good-environmental-status-ges-assessments-by-eu-member-state-and-descriptor-full-dashboard

[127] https://ec.europa.eu/eurostat/databrowser/view/env_bio5__custom_15044455/default/table?lang=en

4.15.2.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

One possibility to develop suitable indicator(s) to monitor progress towards this subtarget would be to use data that are reported by Member States under MSFD. Indeed, this EU BDS subtarget corresponds with one of the objectives of the MSFD for descriptor 6 (D6): sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems are not adversely affected[128]. While in this descriptor the aspect of "sensitive habitats" is not directly tackled as it covers broad habitats, Member States can also include in their assessments other habitats (which often refer to sensitive ones). Within this descriptor, Member States are required to assess six different criteria referring to physical loss (e.g., removal of sand and gravel) and disturbance of the seabed (e.g., by fishery dredging or trawling) as well as to adverse effects from anthropogenic pressures:

- D6C1: Spatial extent and distribution of physical loss (permanent change);
- D6C2: Spatial extent and distribution of physical disturbance pressures;
- D6C3: Spatial extent of each habitat type which is adversely affected by physical disturbance, to be based on the outcomes of D6C2;
- D6C4: The extent of loss of the habitat type, resulting from anthropogenic pressures, to be based on the outcomes of D6C1; and
- D6C5: The extent of adverse effects from anthropogenic pressures on the condition of the habitat type, including those from D6C3 and D6C4.

The first four criteria should provide information on the extent of physical loss and disturbance overall (D6C1 and D6C2) and per habitat type (D6C3 and D6C4), while D6C5 addresses the overall assessment of benthic habitats and should take into account other (non-physical) pressures and impacts from other descriptors of the MSFD. Thus, the results from the integrated assessment of these descriptors using the latest integration rules (European Commission, 2022) could be used to develop indicators on:

- the impact of physical pressures on seabed integrity (D6C1-C4)
- the overall impact of anthropogenic pressures on the seabed (D6C5).

In addition, as MSFD reporting occurs every 6 years (latest reporting cycle in 2018, next one is planned to be completed in 2024), it should be soon possible to evaluate the percentage of habitats with improved environmental status between 2018 and 2024.

All these possibilities will need to be further explored before proposing candidate indicator(s) to the EUBP-MA.

4.15.2.3 Progress to date towards achieving the subtarget

It is currently difficult to assess progress towards this subtarget based on assessments from the latest MSFD reporting cycle as very few complete assessments for D6 were reported, most only covered some of the criteria and habitat types, and the trend analysis is inconclusive due to the lack of time-series data (Boschetti, Palialexis, and Connor, 2021). For the time being, the latest assessments from 2018 reported a good status of seabed habitats in less than 20% of the EU assessments of the relevant criteria (D6C3, C4 and C5)[129]. The upcoming 2024 assessments may provide more information on the current state of seabed habitats in EU waters and allow for a better assessment of progress to date towards achieving the subtarget.

[128] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017D0848
[129] https://water.europa.eu/marine/resources/msfd-reporting-data-tools/ges-assessment-dashboards/general-dashboards

4.15.2.4 Outlook of meeting the subtarget by 2030

As data to develop relevant indicator(s) to inform this target are pending, it is not possible yet to evaluate the outlook of meeting the subtarget by 2030.

4.15.3 Subtarget 15.3: good environmental status is achieved

4.15.3.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this subtarget in the EU BDS dashboard.

4.15.3.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

The ideal indicator(s) to measure progress towards this subtarget would be the percentage of species in good environmental status (GES) and the percentage of habitats in GES, both based on GES data reported by Member States under MSFD. While underlying GES data are available through the MSFD reports[130] (2018 and soon 2024), they yet must be transformed into integrated indicators measuring the percentage of species/habitats in GES over the different descriptors at EU scale. How this can be achieved needs to be further explored before proposing these two candidate indicators to the EUBP-MA.

4.15.3.3 Progress to date towards achieving the subtarget

The GES assessments from the 2018 MSFD reports indicate that the percentage of species in GES in EU waters varies according to the descriptor, between 7.69% for deep-toothed cetaceans and 64.58% for grazing birds. This also holds true for the percentage of habitats in GES which varies between 0 for the physical loss of the seabed and 12.96% for other benthic habitats. The upcoming 2024 assessments will provide further information on how the percentage of species/habitats has progressed between 2018 and 2024.

4.15.3.4 Outlook of meeting the subtarget by 2030

As relevant indicator(s) to inform this subtarget are pending, it is not possible yet to evaluate the outlook of meeting the subtarget by 2030.

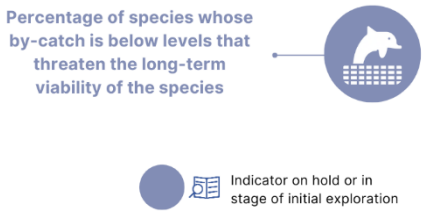
4.16 Target 16: by-catch

The by-catch of species is eliminated or reduced to a level that allows species recovery and conservation

There is no indicator published in the EU BDS dashboard yet to monitor target 16, and one is stage of initial exploration (Figure 39). The available data on by-catch indicate that most species evaluated so far have levels of by-catch that threaten their long-term viability[131,132,133] (Palialexis and Boschetti, 2021). However, given that the temporal, geographical and species scope of the available information on by-catch is very limited, it is too soon to track progress towards or outlook of achieving this target (Figure 40).

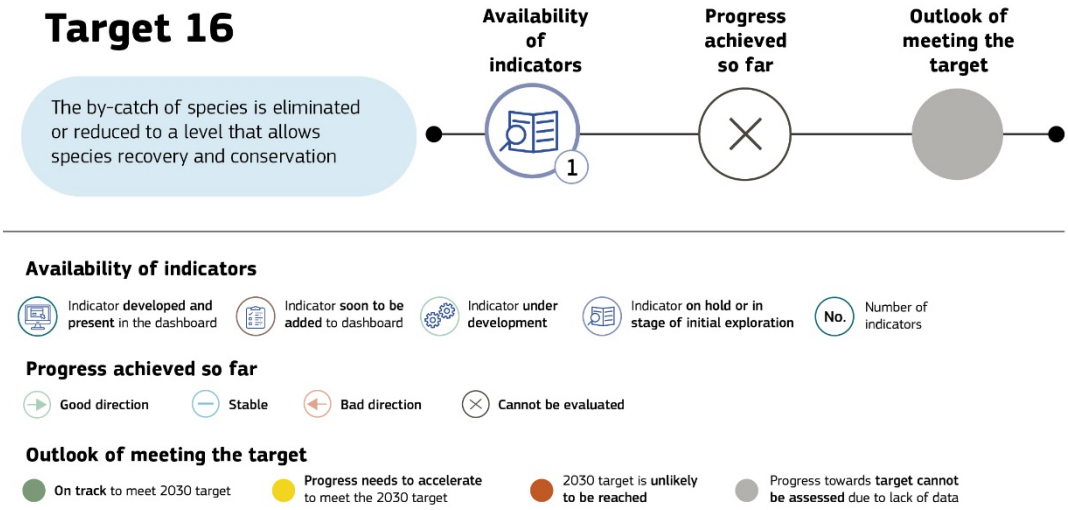
[130] https://water.europa.eu/marine/resources/msfd-reporting-data-tools/ges-assessment-dashboards/general-dashboards
[131] https://indicators.helcom.fi/indicator/bycatch/
[132] https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/indicator-assessments/marine-mammal-bycatch/
[133] https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/indicator-assessments/marine-bird-bycatch-pilot/

Figure 39. State of play regarding indicators to monitor target 16 of the EU Biodiversity Strategy



Source: JRC

Figure 40. Availability of indicators to monitor progress in the EU Biodiversity Strategy dashboard, progress achieved so far and outlook of meeting the target for target 16 of the EU Biodiversity Strategy



Source: JRC

4.16.1 Indicator(s) available in the EU BDS dashboard

There is currently no indicator to monitor progress on this target in the EU BDS dashboard.

4.16.2 Ongoing work to develop indicator(s) for the EU BDS dashboard

One possibility to develop a suitable indicator to monitor progress towards this target would be to use data that are reported by Member States under MSFD. Indeed, this EU BDS target corresponds with one of the objectives of the MSFD for descriptor 1, criterion 1 (D1C1): achieve a mortality rate per species from incidental by-catch that is below levels that threaten the long-term viability of the species (i.e. threshold levels). This criterion is to be assessed for species of mammals, birds, reptiles and non-commercially-exploited species of fish and cephalopods that are at risk from incidental by-catch. Thus, the assessment of this criterion could serve as a basis to develop an integrated indicator capturing the overall percentage of species whose by-catch is below levels that threaten the long-term viability of the species in EU waters.

However, assessing criterion D1C1 in practice is challenging as highlighted in the review of MSFD 2018 reports (Palialexis and Boschetti, 2021) showing that, overall, many Member States did not assess this criterion due to a lack of threshold values (Vasilakopoulos et al., 2022) and monitoring

data. As a policy reply to this issue, the recently released EU Marine Action Plan calls[134] for Member States to improve data collection planning and efforts in relation to by-catch of sensitive species and to develop threshold values for the maximum allowable mortality rate from incidental catches. In this regard, the MSFD Expert Network on Marine Biodiversity, in collaboration with the JRC and other relevant actors, is currently working towards developing an approach to set by-catch threshold values that can be used under different scenarios of data availability, that are robust, and that enable a comparable environmental status assessment. This approach should improve the assessment of criterion D1C1 in future MSFD reports and consequently contribute to the development of an integrated indicator based on these assessments for the EU BDS dashboard. The possibility of developing such indicator based on 2024 MSFD reports will need to be explored before proposing the candidate indicator to the EUBP-MA.

4.16.3 Progress to date towards achieving the target

Of the 20 Member States that submitted their assessments through the 2018 MSFD reports, assessments for D1C1 were only reported by 16 Member States for mammals, 8 for birds, 3 for reptiles, 5 for fish, and 1 for cephalopods (Palialexis and Boschetti, 2021). For those reported, the vast majority could not assess the status[135]. Where assessments were reported, D1C1 was most commonly assessed based on the mortality rate due to by-catch (number of individuals incidentally caught) for a particular species. These assessments, which are limited in terms of both geographic and species scope, indicate that the percentage of species whose mortality rate from incidental by-catch is below levels that threaten the long-term viability of the species varies between 0.96% for fish and 13.04% for mammals.

Although the assessment of by-catch has generally been constrained by the lack of reliable by-catch data, this situation is improving. The International Council for the Exploitation of the Sea (ICES) collects annual data on by-catch of protected, endangered and threatened species from EU Member States and neighbouring countries, from which by-catch estimates are derived (ICES, 2023). However, the lack of thresholds or reference points makes it difficult to assess whether by-catch estimates threaten the long-term viability of populations.

At a regional level, there has been some progress on the assessment of by-catch, particularly for mammal and bird species. For instance, both the Baltic Marine Environment Protection Commission (HELCOM)[136]and the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)[137,138] have developed indicators and threshold values for the assessment of by-catch of several marine mammal and bird species at a regional level based on estimations of the number of individual incidentally caught for a particular species or population. The evaluations carried out in the Baltic Sea indicate that the threshold for good status was not met in any case and demonstrate that significant mortality from by-catch in fishing gear is widespread across species of marine mammals and waterbirds. Those carried out in North-East Atlantic show that two out of the three evaluated mammal species and two out of four bird species have by-catch levels exceeding threshold values.

Overall, although assessments of by-catch are limited, the available assessments depict a worrying situation with most populations evaluated showing levels of by-catch that threaten their long-term viability.

[134] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023DC0102
[135] https://water.europa.eu/marine/resources/msfd-reporting-data-tools/ges-assessment-dashboards/general-dashboards
[136] https://indicators.helcom.fi/indicator/bycatch/
[137] https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/indicator-assessments/marine-mammal-bycatch/
[138] https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/indicator-assessments/marine-bird-bycatch-pilot/

4.16.4 Outlook of meeting the target by 2030

Based on the available information, it is difficult to evaluate the current by-catch levels in EU waters and thus to assess whether target 16 is likely to be reached by 2030. Given the progress on the assessment of by-catch in some regions, it is expected that in the next MSFD reporting, which is due in October 2024, more Member States will be able to provide an assessment for mortality rate from incidental by-catch, at least for some species. The results from these 2024 MSFD reports may therefore provide more information on the current situation and allow for a better assessment of whether it will be possible to achieve the target. Meanwhile, the limited available assessments showing that most species evaluated have levels of by-catch threatening their long-term viability indicate that reducing by-catch below those levels by 2030 will be at the minimum challenging.

5 Conclusions: key achievements and gaps in monitoring and implementing the EU BDS

This work assessing progress in monitoring and implementing the EU BDS complements similar monitoring frameworks existing for other environmental policies such as the EGD (Marelli et al., 2025), the ZPAP (EEA and JRC, 2025), the F2F (Tóth et al., 2024) and the 8EAP (EEA, 2025). While all these initiatives have been closely coordinated and have created many synergies, there is an ongoing effort to further improve their policy relevance, coherence and complementarity. Yet, this work provides a solid basis to evaluate where EU stands regarding the objectives set in the EU BDS midway between the launch of the EU BDS and its target year 2030.

Regarding the EU BDS actions, both the amount already implemented, and the pace of implementation indicates that the progress is in line with the 2030 objectives. EU institutions at all levels contribute to this large progress and effort. By mid-March 2025, about half (50) of the actions were completed, 44 were in progress and 10 delayed - but they will probably be completed before 2030.

Under EU BDS pillar 1 (A coherent network of protected areas), most actions are in progress. Under pillar 2 (Restore ecosystems), more than half of the actions are completed, including for example 10 new legal proposals and 5 revisions, while the remaining actions require to close the implementation gap of existing policies. Also, under pillar 3 (Enabling transformative change) more than half of the actions are completed, the present focus being on unlocking investment and ensuring sustainable finance and business practices. Under pillar 4 (EU external action and an ambitious global biodiversity agenda) most actions are in progress depending on international agreements, although we can highlight the large progress and leadership exerted by the EU for the GBF.

A new analysis of the actions shows that 29% relate to close the implementation gap of existing policies, 28% to produce guidelines, 23% to review existing rules, and 20% propose new legal acts. The last three categories, which sum up most actions, are mostly procedural, a characteristic that is shared with many other action plans. This explains that a proper implementation of the action plan does not necessarily correlate with the output or impact indicators included in the EU BDS dashboard.

Regarding the EU BDS targets, an overview of key achievements and gaps in monitoring them as well as the outlook of reaching them is available in Table 1. Indicators are published (or soon to be published) in the EU BDS dashboard to track progress towards 12 out of the 29 (sub)targets. The KCBD will need to continue leading the efforts and further engage with the scientific community to fill the remaining monitoring gaps and provide a complete EU BDS dashboard, with indicators to track progress towards all 29 (sub)targets, by 2030.

Out of the 15 (sub)targets for which progress has been evaluated based on indicator(s) published in the EU BDS dashboard and/or scientific literature, 10 show progress in the good direction. These (sub)targets are mainly those concerned with mitigating human pressures on biodiversity, such as the designation of protected areas, the reduction in the use of pesticides and fertilisers, the conversion to organic farming, tree planting and the sustainability of fisheries. Contrastingly, there has been no progress for 3 (sub)targets, and trends run counter to the desired direction for the 2 (sub)targets concerned with the state of biodiversity: both common birds and pollinators continue to decline. This suggests that so far, the level of implementation of the policies trying to mitigate human pressures on biodiversity is not enough to stop biodiversity decline.

The outlook of meeting the (sub)targets by 2030 has been evaluated for 13 (sub)targets. This analysis suggests that EU is not on track to meet any of these 13 evaluated (sub)targets. Four other (sub)targets are unlikely to be met: species show no deterioration in conservation trends and status, the decline of pollinators is reversed, 50% reduction in nutrient losses and 20% reduction in use of fertilisers. For the remaining 9 (sub)targets, they may be met by 2030, should the pace of progress accelerate compared to the pace of progressed observed so far. As such, the designation rate of

protected areas, the conversion rate to organic farming and the pace of progress in the sustainability of fisheries need to triple while the annual tree planting rate needs to be multiplied by 100 to meet the 2030 targets. To meet the maximum of EU BDS targets by 2030, a better implementation of the existing environmental policies is needed, including the full implementation of the NRR.

Table 1. Table summarising the availability of indicators for monitoring each of the (sub)targets of the EU Biodiversity Strategy (EU BDS) in the EU BDS dashboard (left column), the progress achieved so far (middle column) and the outlook of meeting the (sub)targets by 2030 (right column).

In the right column, red dots (🔴) indicate that the (sub)target is unlikely to be met; yellow dots (🟡) indicate that that progress needs to accelerate to meet the 2030 (sub)target; and grey dots (⚪) indicate that the outlook cannot be evaluated due to a lack of data. The asterisks (*) indicate when the outlook is based on other information than the one (soon to be) published in the EU BDS dashboard. For references to scientific literature and justification of the outlook, the reader is referred to the main text.

Availability of indicators	**Progress achieved**	**Outlook**
Target 1: Legally protect a minimum of 30% of the EU's land area and a minimum of 30% of the EU's sea area, and integrate ecological corridors, as part of a true Trans-European Nature Network		
Subtarget 1.1: Legally protect a minimum of 30% of the EU's land area		
Three indicators are available in the EU BDS dashboard: - *Terrestrial protected area coverage* - *Natura 2000 terrestrial protected area coverage* - *Nationally designated terrestrial protected area coverage.* No more indicators are needed.	Over the 2011-2022 period, terrestrial protected area coverage increased from 24.3% to 26.1%, mainly through the designation of new Natura 2000 sites. The current 26.1% of EU's land area covered by protected areas includes 18.6% covered by Natura 2000 designated protected areas and 17.3% by nationally designated protected areas.	🟡
Subtarget 1.2: Legally protect a minimum of 30% of the EU's sea area		
Three indicators are available in the EU BDS dashboard: - *Marine protected area coverage* - *Natura 2000 marine protected area coverage* - *Nationally designated marine protected area coverage.* No more indicators are needed.	Over the last decade, marine protected area coverage increased substantially, from 5.9% in 2012 to 12.3% in 2022, mainly through the designation of new Natura 2000 sites. The current 12.3% of EU's sea area covered by protected areas include 9% covered by Natura 2000 designated sites and 4.5% covered by nationally designated protected areas, with some overlap between the different types of designation.	🟡
Subtarget 1.3: Build a truly coherent Trans-European Nature Network integrating ecological corridors, on land		
There is no indicator available yet in the EU BDS dashboard, although one is soon to be published: *Natural area connectivity on land.* Another indicator is under development: *Representativeness of the terrestrial protected areas network, expressed as the mean target achievement (MTA).*	Natural area connectivity on land has remained quite stable between 2016 and 2022. Preliminary MTA assessments indicate that, on average, over all species and habitats assessed, the percentage of biodiversity protection needs covered by the protected areas network has progressed from 30.3 before 2000 to 49.9 for the period 2018-2024.	🟡

Subtarget 1.4: Build a truly coherent Trans-European Nature Network integrating ecological corridors, at sea		
There is no indicator available yet in the EU BDS dashboard. Two indicators are under development: - *Representativeness of the marine protected areas network, expressed as the MTA* - *Marine connectivity.*	As there is no baseline yet to evaluate the representativeness of the marine protected areas network expressed as the (MTA) nor marine connectivity, progress achieved cannot be assessed.	
Target 2: Strictly protect at least a third of the EU's protected areas, including all remaining EU primary and old-growth forests		
Subtarget 2.1: Strictly protect at least a third of the EU"s protected areas		
There is no indicator available yet in the EU BDS dashboard. An *indicator on strictly protected areas* is under development.	An independent scientific assessment shows that currently, only 3.5% of terrestrial protected areas are strictly protected. In the marine realm, EEA has estimated less than 1% of European marine protected areas are strictly protected.	
Subtarget 2.2: Strictly protect all remaining EU primary and old-growth forests		
There is no indicator available yet in the EU BDS dashboard. An *indicator on the percentage of remaining primary and old-growth forests under strict protection regime* is under development.	87% of the mapped primary and old-growth forests are under strict protection. However, the level of strict protection of the estimated 4.4 Mha of unmapped primary and old-growth forests is currently unknown. This lack of data limits the possibility to assess progress achieved so far.	
Target 3: Effectively manage all protected areas, defining clear conservation objectives and measures, and monitoring them appropriately		
There is no indicator available yet in the EU BDS dashboard. Several options to develop possible *indicator(s) on protected area management effectiveness* are under exploration.	We lack indicators to characterise effective management of EU protected areas, and therefore progress in achieving effective management.	
Target 4: Legally binding EU nature restoration targets to be proposed in 2021, subject to an impact assessment. By 2030, significant areas of degraded and carbon-rich ecosystems are restored. Habitats and species show no deterioration in conservation trends and status; and at least 30% reach favourable conservation status or at least show a positive trend.		
Subtarget 4.1: Significant areas of degraded and carbon-rich ecosystems are restored		

[139]Such assessment differs from the conclusion made on progress towards the EGD targets (Marelli et al., 2025), which was drawn earlier, at a time when there was no evidence that would suggest a delay in the implementation of the roadmap steps.

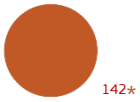
There is no indicator available yet in the EU BDS dashboard. Four indicators are in stage of initial exploration: - *Soil organic carbon for mineral soils and cropland* - *Topsoil organic carbon.* - *Stocks of organic carbon in agricultural and forest ecosystems reported under the Nature Restoration Regulation* - *Soil organic carbon content and stocks reported under the Soil Monitoring Law*	A recent study in agricultural land in the EU + UK highlighted a slight overall decrease of topsoil organic carbon of 0.75% for the period 2009-2018, suggesting that over this period and for these agricultural ecosystems, there has been no overall gain in topsoil organic carbon. A screen of the scientific literature for publications on progress/assessments of the restoration of degraded and carbon-rich ecosystems at the EU level highlighted that there is a lack of independent assessments at the EU-level on the restoration of degraded and carbon-rich ecosystems.	
Subtarget 4.2: Habitats show no deterioration in conservation trends and status		
There is no indicator available yet in the EU BDS dashboard. One indicator is in stage of initial exploration: the *Percentage of habitats of Community interest with stable or increasing trends.*	The latest State of nature report indicates that only 43% of habitats of Community interest not in good status had stable or increasing trends for the period 2013-2018.	
Subtarget 4.3: Species show no deterioration in conservation trends and status		
One indicator is available in the EU BDS dashboard: the *Common bird index by type of species.* An additional indicator is under development: the *Red List Index at EU and/or Pan-European level.* Another indicator is in stage of initial exploration: the *Percentage of species of Community interest with stable or increasing trends.*	The common bird index for all common birds has been in continuous decline between 1990 and 2022 (-13.8%). The decline in common farmland birds over the same period was much more pronounced (-39.7%) while the common forest bird index decreased by 3.3%. Overall, the trends in bird populations are not going in the right direction. The latest State of nature report indicates that only 34% of species of Community interest not in good status had stable or increasing trends for the period 2013-2018.	
Subtarget 4.4: At least 30% of species currently not in favourable conservation status reach favourable conservation status or at least show a positive trend		
There is no indicator available yet in the EU BDS dashboard. One indicator is in stage of initial exploration: the *Percentage of species of Community interest in favourable conservation status or with a positive trend.*	The latest State of nature report for the period 2013-2018 indicates that 21% of non-bird species of Community interest are in bad conservation status and 42% in poor status. Only 6% of those in poor and bad status show an increasing trend. The situation looks a bit better for birds where 19% are in bad status and 20% in poor status. Increasing trends concern 23% of the bird species.	
Subtarget 4.5: At least 30% of habitats currently not in favourable conservation status reach favourable conservation status or at least show a positive trend		
There is no indicator available yet in the EU BDS dashboard. One indicator is in stage of initial exploration: the *Percentage of habitats of Community interest in favourable conservation status or with a positive trend.*	The latest State of nature report for the period 2013-2018 indicates that 36% of habitats of Community interest are in bad conservation status and 45% in poor status. Only 9% of those in poor and bad status show an increasing trend.	
Target 5: The decline in pollinators is reversed		

One indicator is available in the EU BDS dashboard: the *Grassland butterfly index*. Two indicators are under development: - *Wild pollinator indicator* - *Red List Index for pollinators at EU and/or Pan-European level.*	The grassland butterfly index has declined by 32% across the 27 EU Member States between 1990 and 2020. In addition, according to the European Red List of Bees, around 9 % of all bee species are threatened in the EU. Scientific literature has also reported declines in insect pollinators' abundance and richness across several European countries. Such evidence suggests that overall, pollinators are still declining.	
Target 6: The risk and use of chemical pesticides is reduced by 50%, and the use of more hazardous pesticides is reduced by 50%		
Subtarget 6.1: The risk and use of chemical pesticides is reduced by 50%		
There is no indicator available yet in the EU BDS dashboard. One indicator is under development: *Aggregated applied total toxicity*. An additional indicator is on hold: *Use and risk of chemical pesticides*.	The use and risk of chemical pesticides at EU scale decreased by 46% between the baseline period of 2015-2017 and 2022, suggesting a trend in the right direction. However, these reductions have not (yet) resulted in improvement of environmental quality, Moreover, other indicators offer a different perspective on the rate of reduction of risks for biodiversity, such as the only minimal decline in toxicity risk to all assessed groups observed between 2011 and 2019 in Germany.	
Subtarget 6.2: The use of more hazardous pesticides is reduced by 50%		
There is no indicator available yet in the EU BDS dashboard. One indicator is in stage of initial exploration: *Use of more hazardous pesticides for biodiversity*. An additional indicator is on hold: *Use of more hazardous pesticides*.	The use of more hazardous pesticides at EU scale decreased by 25% between the baseline period of 2015-2017 and 2022, suggesting a trend in the right direction. However, there is no robust information yet at EU scale on the trends in the use of pesticides that are more hazardous specifically for biodiversity.	
Target 7: At least 10% of agricultural area is under high-diversity landscape features		

[140] Such assessment differs from the conclusions made on progress towards the EGD targets (Marelli et al., 2025) and the ZP targets (EEA and JRC, 2025), which were drawn using another indicator not focusing specifically on risks for biodiversity (Use and risk of chemical pesticides)

[141] Such assessment differs from the conclusions made on progress towards the EGD targets (Marelli et al., 2025) and the ZP targets (EEA and JRC, 2025), which were drawn using another focusing on general hazards rather than hazards relevant for biodiversity (Use of more hazardous pesticides)

There is no indicator available yet in the EU BDS dashboard, although one is soon to be published: the *Share of agricultural area under landscape features*. An additional indicator is on hold: *Woody landscape features on agricultural land*.	In 2022, the share of agricultural area under landscape features has been estimated at 5.6% at EU scale. However, in the absence of any other previous estimation, it is impossible to evaluate how the share of agricultural area under landscape features has progressed.	
Target 8: At least 25% of agricultural land is under organic farming management, and the uptake of agro-ecological practices is significantly increased		
Subtarget 8.1: At least 25% of agricultural land is under organic farming management		
One indicator is available in the EU BDS dashboard: *Area under organic farming*. No more indicators are needed.	The share of agricultural land under organic farming at EU level has progressed from 5.9% in 2012 to 10.5% in 2022.	
Subtarget 8.2: The uptake of agro-ecological practices is significantly increased		
There is no indicator available yet in the EU BDS dashboard, although one is soon to be published: *Trends in the uptake of agro-ecological practices*. No more indicators are needed.	Between 2011 and 2018, trends in the uptake of agro-ecological practices have remained stable.	
Target 9: Three billion trees are planted in the EU, in full respect of ecological principles		
One indicator is available in the EU BDS dashboard: *Number of trees planted in the EU as part of the 3 Billion Trees Pledge*. No more indicators are needed.	In January 2025, the number of additional trees planted in the EU as part of the 3 Billion Trees Pledge has reached more than 24 million.	
Target 10: Significant progress in the remediation of contaminated soil sites		
One indicator is available in the EU BDS dashboard: *Increase in the number of remediated sites*. No more indicators are needed, although data collection for the indicator already published can be improved.	Currently, with existing national implementation structures and funding, countries' progress in detecting, investigating and remediating contaminated sites varies considerably, from 20 sites/year to 3,000 sites/year. In 2016, 115 000 contaminated sites were remediated in the EU, representing 8.3% of the currently registered potentially contaminated sites.	
Target 11: At least 25,000 km of free-flowing rivers are restored		
There is no indicator available yet in the EU BDS dashboard. An *indicator on river connectivity* is under development.	As the work to develop an indicator measuring the length of free-flowing rivers is still ongoing, there is no data available yet to measure progress achieved.	
Target 12: There is a 50% reduction in the number of Red List species threatened by invasive alien species		

There is no indicator available yet in the EU BDS dashboard. Seven indicators are in stage of initial exploration: - *Change in the number of Red List species threatened by invasive alien species* - *Red List Index for Red List species threatened by invasive alien species* - *Species Threat Abatement and Restoration attributed to invasive alien species threats to Red List species* - *Rate of invasive alien species establishment* - *National response to invasive alien species in terms of policy, practice, and budget* - *Potential cumulative pressure of invasive alien species on ecosystems* - *Number of newly introduced non-indigenous species.*	Although the change in the number of Red List species threatened by IAS cannot be evaluated at the moment, scientific studies indicate that the cumulative observed number of new invasive alien plants globally has grown steadily since 1800 and that IAS of policy concerns still show widespread patterns of invasion and potential pressure across European ecosystems. Globally, over the last decade, there has been small improvement in the adoption by countries of policy relevant to invasive alien species, a substantial increase in countries adopting national-level legislation, and widespread adoption of IAS targets by countries; however, resource allocation in support of IAS prevention and control remains woefully inadequate.	
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%		
Subtarget 13.1: The losses of nutrients from fertilisers are reduced by 50%		
Four indicators are available in the EU BDS dashboard: - *Change in the concentration of nitrate in groundwater* - *Change in the concentration of nitrate in rivers* - *Change in the concentration of total phosphorus in lakes* - *Change in the concentration of phosphate in rivers.*	Nutrients losses at EU scale have been reduced by 13% between 2000 and 2021 on average (over the four indicators published in the EU BDS dashboard).	
Subtarget 13.2: The use of fertilisers is reduced by at least 20%		
There is no indicator available yet in the EU BDS dashboard. One indicator is on hold: *Consumption of inorganic fertilisers.*	The consumption of inorganic fertilisers slightly increased between 2012 and 2017. Since then, the trend inverted and in 2022, a sharp reduction on the use of inorganic fertilisers in agriculture was observed, leading to an overall reduction of 7.2% in the whole period. The consumption of organic fertilisers (i.e. manure), has remained quite stable at EU scale over the last decade, with some sources indicating a small decrease and others a small increase.	
Target 14: Cities with at least 20,000 inhabitants have an ambitious Urban Greening Plan		

[142] Such assessment differs from the conclusion on progress towards the EGD targets (Marelli et al., 2025), in which the outlook of meeting this subtarget was based on trends in nitrate in groundwater, while our conclusion is based on outputs from modelling studies

There is no indicator available yet in the EU BDS dashboard. One indicator is in stage of initial exploration: *Percentage of cities with at least 20,000 inhabitants having an ambitious Urban Greening Plan*.	As the work to develop an indicator monitor this target is still in stage of initial exploration, there is no data available yet to measure progress achieved.	
Target 15: The negative impact on sensitive species and habitats, including on the seabed through fishing and extraction activities, are substantially reduced to achieve good environmental status		
Subtarget 15.1: The negative impacts on sensitive species through fishing and extraction activities are substantially reduced		
One indicator is available in the EU BDS dashboard: the *Proportion of fish stocks sustainably exploited.* Three indicators are in stage of initial exploration: - *Change in the number of Red List species threatened by fishing and harvesting aquatic resources* - *Red List Index for Red List species threatened by fishing and harvesting aquatic resources* - *Percentage of species with improved environmental status*	The proportion of fish stocks sustainably exploited has increased from 28.3% in 2003 to 56.5% in 2021. Regarding other species, the latest Red List assessments for Europe show that, of the 1,196 marine species assessed, 9% are threatened, while 3% are near-threatened. Birds, mammals and turtles are particularly at risk, with over 20% of species being threatened. Overall, the loss of marine biodiversity in Europe's seas has not been halted.	
Subtarget 15.2: The negative impacts on sensitive habitats, including on the seabed through fishing and extraction activities, are substantially reduced		
There is no indicator available yet in the EU BDS dashboard. Three indicators are in stage of initial exploration: - *Impact of physical pressures on seabed integrity* - *Overall impact of anthropogenic pressures on the seabed* - *Percentage of habitats with improved environmental status.*	It is currently difficult to assess progress towards this subtarget as very few data have been reported. For the time being, the 2018 reports for the Marine Strategy Framework Directive (MSFD) indicate a good status of seabed habitats for less than 20% of the EU assessments.	
Subtarget 15.3: Good environmental status is achieved		
There is no indicator available yet in the EU BDS dashboard. Two indicators are in stage of initial exploration: - *Percentage of species in good environmental status (GES)* - *Percentage of habitats in GES.*	The GES assessments from the 2018 MSFD reports indicate that the percentage of species in GES in EU waters varies according to the descriptor, between 7.69% for deep-toothed cetaceans and 64.58% for grazing birds. This also holds true for the percentage of habitats in GES which varies between 0 for the physical loss of the seabed and 12.96% for other benthic habitats. The upcoming 2024 assessments will provide further information on how the percentage of species/habitats has progressed between 2018 and 2024.	

Target 16: The by-catch of species is eliminated or reduced to a level that allows species recovery and conservation		
There is no indicator available yet in the EU BDS dashboard. One indicator is in stage of initial exploration: *Percentage of species whose by-catch is below levels that threaten the long-term viability of the species*.	The available data on by-catch indicate that most species evaluated so far have levels of by-catch that threaten their long-term viability. However, given that the temporal, geographical and species scope of the available information on by-catch is very limited, it is too soon to robustly track progress achieved.	

Source: JRC

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List of abbreviations and definitions

CAP	Common Agricultural Policy
EC	European Commission
EEA	European Environment Agency
EGD	European Green Deal
ERL	European Red List
ERLI	European Red List Index
ESTAT	Eurostat
EU	European Union
EU27	27 EU Member States
EU BDS	EU Biodiversity Strategy for 2030
EU PoMS	EU-wide Pollinator Monitoring Scheme
FADN	Farm Accountancy Data Network
FFR	Free-flowing rivers
GBF	Global Biodiversity Framework
GES	Good Environmental Status
IAS	Invasive alien species
INMAP	Integrated Nutrient Management Action Plan
IPCHEM	International Platform on Chemical Monitoring
IUCN	International Union for Conservation of Nature
JRC	Joint Research Centre
KCBD	European Commission's Knowledge Centre for Biodiversity
LUCAS	Land Use/Cover Area frame Survey
MS	Member States
MSFD	Marine Strategy Framework Directive
MTR	Mid-term review
MVS	Minimum Viable Scheme
NRR	Nature Restoration Regulation
NT	Near threatened (IUCN Red List category)
PPP	Plant Pesticide Products
STAR	Species Threat Abatement and Restoration Metric (STAR)
STING	Science and Technology for Pollinating Insects
SUD	Directive 2009/128/EC on sustainable use of pesticides
SUR	Regulation on the sustainable use of plant protection products
SWF	Small Woody Features

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Annexes

Annex 1: Additional information regarding target 5

Ongoing work to develop an indicator for target 5

Since the proposed indicator of general trend in pollinators will deliver estimates of the abundance and diversity of pollinator species, and allow the assessment of pollinator population trends, it would differ from other biodiversity indicators like the Farmland Bird Index or the Grassland Butterfly Index, which measure changes solely in population abundance. Species abundance is considered an appropriate metric for reporting biodiversity change as it is more responsive to environmental change than other metrics, and it is directly related to species" probability of extinction. Species abundance data, however, present some challenges for modelling, particularly when abundance fluctuates markedly from one year to another. Extreme fluctuations are commonly observed in insect populations, arising from a capacity for rapid population growth, strong density dependence and the fact that population counts reflect true abundance as well as insects" activity, the latter being primarily a function of weather conditions. For this reason, indicators of insect population abundance are unlikely to show significant trends over a short time (White, 2019). One solution to assess whether observed population fluctuations are a real signal or the results of noise (for instance due to weather conditions), is to apply statistical smoothing, the aim of which is to reveal the multi-year trajectory underlying the observed inter-annual variation.

For calculating the indicator, the statistical models currently considered include a species abundance model. A version of this model was implemented by the STING expert group, but further refinement and testing will be done during the STING+ project. (Isaac et al., 2020) Other modelling options presented in Potts et al. (2024) comprise indicators of richness and occupancy, community diversity, and a group abundance model. These options will also be further developed during STING+.

The different approaches for assessing the target discussed under STING

A classical null hypothesis significance testing (NHST) could lead to ambiguous results about whether the target has been achieved. This is because the power to reject the null hypothesis is strongly influenced by the confidence intervals around the quantity being estimated: if these are wide then it creates a strong bias toward detecting no overall change. Bayesian statistics, on the other hand, allows the assessment of a target in probabilistic terms, by setting a threshold on the confidence required to reach it. Concerning the selection of a single indicator or a composite one, the simplest approach would be to select one metric, but that would capture only a partial picture of how biodiversity is changing. A composite indicator, on the other hand, would make full use of the breadth of biodiversity metrics; in this case, the assessment of the target would be based on the trends for different metrics.

Limited availability of data at appropriate temporal and spatial scales on insect pollinators

The only long-term data source at European scale comes from the European Butterfly Monitoring Scheme, which does not consider important pollinator taxa such as bees and hoverflies. The butterfly scheme does not follow a random sampling strategy across different habitats and biogeographical regions, and the Grassland Butterfly Indicator is based only on abundance metrics. All these factors limit our capacity to have a full understanding of the trends for European pollinators.

Addressing data limitations

As discussed above, insect abundance time-series tend to be very noisy as populations fluctuate markedly from year to year, requiring smoothing before assessment. Smoothing will dampen out these fluctuations but will make it more difficult to detect changes in the trajectory of the indicator. Thus, pollinator experts contributing to STING suggest basing the assessment on both an abundance metric and a community metric such as Shannon's index of species diversity, the latter being less

noisy than abundance, whilst more sensitive to changes than compositional metrics (i.e. species richness, occupancy).

Annex 2: Additional information regarding target 12

Data needs to monitor the target

Currently there are 20 different species groups that have been comprehensively assessed at the EU level (plus 1 group at the European level), meaning that their risk of extinction and threats coded are fully relevant to the EU. Based on these existing datasets, we know that of the 13,919 species that have had their risk of extinction assessed at the EU level, 3,783 are threatened (i.e. CR, EN, VU) or Near Threatened with extinction. Of these 529 species (255 animal and 274 plant species) were recorded as being threatened by *Invasive non-native/alien species/diseases* (Smith et al. 2022). Regarding the re-assessment at the EU level of 11 species groups by the Red List "Pulse" project, this will provide an update on the extinction risk, and threats posed to these species groups and allow an indication of progress towards the target to be known. However, in order to work out if the target has been met it will require re-assessments of as many of these comprehensively assessed groups as possible soon after 2030.

The possible indicator "number of Red List species affected by IAS"

This indicator may be affected by some caveats, and actual trends may be not accurately reflected. For example, a Red List species may not change Red List category if the threat from IAS is successfully mitigated, and genuine and non-genuine changes in Red List category need to be treated differently (see Table S1). One key caveat is that the addition or removal of a threat in the re-assessment of a species is not recorded as genuine or non-genuine (unlike the change in Red List Category or criteria). Therefore, in situations where an IAS is coded as a "new" threat in a re-assessment of species, it will always lead to an "increase" in the indicator. However, this may have been the result of new information being made available and the IAS should have been recorded as a threat in the previous assessment. Another caveat is that the IAS threat may be not systematically included in the assessment, and no standards for data codification/collection were set in past assessments, which may lead to biased conclusions, unless retrospective assessment of threats is also conducted.

Table S1. How changes in a species Red List assessment will affect the putative indicator on Red List species threatened by IAS

1st assessment (e.g. 2020)		**2nd assessment (e.g. 2030)**		**Indicator**
RL category	IAS coded as threat	RL category	IAS coded as threat	Trend in *# Red List species threatened by IAS*
NT or threatened	Yes	NT or threatened	No	Decrease
NT or threatened	No	NT or threatened	Yes	Increase
LC or DD*	N/A	NT or threatened (genuine change)	Yes	Increase
LC or DD*	N/A	NT or threatened (non-genuine change)	Yes	Stable
NT or threatened	Yes	LC* (genuine change)	N/A	Decrease
NT or threatened	Yes	LC* (non-genuine change)	N/A	Stable
NT or threatened	Yes	EX or EW (genuine change)	Yes	Stable

**Note that for LC or DD species, the recording of threats is not required*

Source: IUCN

The EU RLI for IAS

The RLI measures trends over time in the aggregate extinction risk using IUCN Red List assessments (see https://unstats.un.org/sdgs/metadata/files/Metadata-15-05-01.pdf; and Butchart et al. 2010 for methodology). The RLI can be disaggregated in various ways, including for all species showing trends driven by different factors (e.g. invasive alien species, fishing, use, etc.), for aggregations of species (such as pollinators), and for regions or countries. The RLI IAS for Europe uses global scale assessments for mammals, birds, amphibians, and corals as these are the only species groups that have been repeatedly assessed, and are present in Europe.

The possible use of STAR for the monitoring of target 12

The total “STAR units” attributed to IAS threats to Red List species within the comprehensively assessed groups could be calculated at different time periods, e.g. based on the data updated through the Pulse project, and then again with the reassessments c. 2030. While this will not present the number of Red List species threatened by IAS, it will allow for the tracking of a reduction in threat intensity posed by IAS to reduce regional species extinction risk. One important caveat is that a reduction in the threat intensity posed by IAS could be driven by genuine conservation impact, but could also be driven by species becoming extinct. This challenge is overcome by the development of "Calibrated" STAR values, based on in situ data. However, there are currently limitations on the use of the STAR metric at the EU level. At present, STAR values have

only been calculated for globally comprehensively assessed groups that also have “area of habitat” (AOH) values calculated; the birds, amphibians and mammals. The opportunity for inclusion of other globally-assessed species groups such as trees, reptiles, cacti, cycads, freshwater fish and reef-building corals will come as these taxa have AOH data made available. A proposal for the development of a regional STAR metric is being developed by IUCN that could be applied to comprehensively-assessed species groups at the EU level.

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