

Prioritising Essential Biodiversity Variables (EBVs) to support European Union (EU) policy needs based on the EU's Biodiversity Strategy for 2030



1. INTRODUCTION

The EU's Biodiversity Strategy for 2030 (EU BDS 2030) sets out the EU's approach to protecting nature and reversing the degradation of ecosystems and serves as the EU's key instrument for implementing the Kunming-Montreal Global Biodiversity Framework. It also provides a framework for the coordination and alignment of other biodiversity-related policies and legislation, such as the Habitats and Birds Directives, to meet national, European and global biodiversity goals. The EU BDS 2030 includes 16 targets and six sub-targets to be met by 2030, to achieve the overall objective of putting Europe's biodiversity on a path to recovery by 2030 for the benefit of people, climate and the planet (European Commission, 2020). To meet these targets, the EU and its Member States have committed to implementing a set of 102 actions and sub-actions by 2030 (European Commission, n.d.). Each of these measures represents an entry point where Essential Biodiversity Variables (EBVs) could be used to support the implementation of the EU BDS 2030. The European Commission's Knowledge Centre for Biodiversity (KCB) has also developed tools to monitor progress towards implementing the EU BDS 2030, including the EU Biodiversity Strategy for 2030 Dashboard, which includes a set of indicators to track progress towards the targets. Initially, this Dashboard included 16 indicators covering 8 of the 16 targets.

WHAT ARE EBVS?

EBVs are defined as "a minimum set of common, observable values across the various dimensions of biodiversity that can be used to create indicators of system-level biodiversity trends" (Brummitt et al., 2017).

DEFINING EBVS IN OBSSGESSION

EBVs provide a standardised framework for monitoring, managing, and reporting biodiversity changes across spatial and temporal scales, and can enable the generation of indicators to inform policy planning, implementation, reporting and review processes (Bellingham et al., 2020; Boyd et al., 2023). GEO BON proposes 21 EBVs, grouped into 6 classes (Table 1). Following Skidmore et al. (2021), OBSSGESSION refers to these as "EBV candidates" throughout.

Under the OBSSGESSION project, UNEP-WCMC published a [Policy Landscape and Needs Assessment](#) in March 2025, which builds on the [EuropaBON User and Policy Needs Assessment](#) (Moersberger et al., 2022). The assessment identified a set of priority EBV candidates that could be used to support EU policy needs as outlined in the EU BDS 2030. Specifically, the potential

applicability of EBVs was assessed in relation to supporting the implementation of each of the 102 actions and sub-actions, as well as for monitoring the 16 available indicators. Actions and indicators deemed “EBV-applicable” were then mapped to EBV classes and candidates of the GEO BON EBV framework. EBV candidates were subsequently ranked from high to low priority based on the total number

of actions and indicators they were mapped to, both overall and within different ecosystem realms and stages of the policy process. Candidates linked to the greatest number of actions and indicators were considered the highest policy priority. This assessment can be used to inform the development of EBV data products to address EU policy needs under OBSGESSION.

Table 1: GEO BON’s EBV classes and candidates.

EBV CLASS	EBV CANDIDATES
Genetic composition	Genetic diversity (richness and heterozygosity), Genetic differentiation (number of genetic units and genetic distance), Effective population size, Inbreeding
Species populations	Species distributions, Species abundances
Species traits	Morphology, Physiology, Phenology, Movement, Reproduction
Community composition	Community abundance, Trait diversity, Interaction diversity
Ecosystem functioning	Primary productivity, Ecosystem phenology, Ecosystem disturbances
Ecosystem structure	Live cover fraction, Ecosystem distribution, Ecosystem vertical profile

2. EVIDENCE AND ANALYSIS

EBVs were identified as broadly applicable to 37 out of 102 actions and sub-actions outlined in the EU BDS 2030. Additionally, EBVs were considered relevant to monitor 5 out of 16 indicators from the [Dashboard](#).

Overall, the top four ranked EBV candidates in terms of policy priority fell under the species population and ecosystem structure classes. The species abundance candidate ranked 1st, closely followed by species distributions, ecosystem distribution and ecosystem vertical profile (Table 2). These candidates had markedly

higher scores compared to other candidates, highlighting their strong relevance for monitoring and supporting the implementation of a range of actions and indicators from the EU BDS 2030. They were also consistently ranked among the top four candidates across different ecosystem realms and stages of the policy cycle, indicating their importance to multiple dimensions of biodiversity policy. These rankings are to some extent consistent with the EBV rankings from the EuropaBON User and Policy Needs Assessment, except for the ecosystem vertical profile, which was considered a low policy priority.

Table 2: The Policy Landscape and Needs Assessment ranked EBV candidates based on the total number of actions and indicators from the EU BDS 2030 that could be supported during implementation and monitoring by EBVs, excluding 65 actions and 11 indicators which were not categorised as EBV-applicable. Colours correspond to the EBV class as presented in the legend.

EBV Candidate	Number of actions	Number of indicators	Total score	Rank
Species abundances	31	4	35	1 st
Species distributions	33	1	34	2 nd
Ecosystem distribution	30	2	32	3 rd
Ecosystem Vertical Profile	28	1	29	4 th
Primary productivity	20	1	21	5 th
Ecosystem disturbances	17	0	17	6 th
Live cover fraction	12	0	12	7 th
Movement	11	0	11	8 th
Reproduction	7	1	8	9 th

EBV Candidate	Number of actions	Number of indicators	Total score	Rank
Taxonomic diversity	8	0	8	9 th
Community abundance	8	0	8	9 th
Interaction diversity	7	0	7	10 th
Phenology	6	1	7	11 th
Ecosystem Phenology	5	0	5	12 th
Physiology	5	0	5	12 th
Morphology	4	1	5	12 th
Effective population size	5	0	5	12 th
Trait diversity	3	0	3	13 th
Genetic differentiation	3	0	3	13 th
Genetic diversity	3	0	3	13 th
Inbreeding	3	0	3	13 th

EBV Class

- Genetic composition
- Species populations
- Species traits
- Community composition
- Ecosystem functioning
- Ecosystem structure

3. POLICY IMPLICATIONS AND RECOMMENDATIONS FOR FUTURE STEPS

Based on the results of the Policy Landscape and Needs Assessment and the EuropaBON assessment, species abundances, species distributions, and ecosystem distribution EBV candidates have been identified as particularly relevant for meeting EU policy needs and for helping to define the relevance of EBV data products under OBSGESSION. Further consideration is required to determine the importance of the ecosystem vertical profile candidate to policy implementation and monitoring. Its relevance could be ascertained through interviews with policymakers to understand national policy priorities.

Further mapping could help contextualise implementation approaches and data requirements for actions under the EU Biodiversity Strategy 2030, including through targeted interviews with policymakers and practitioners to understand how actions are implemented and monitored in practice.

The technical feasibility for monitoring different EBV candidates and classes might have influenced their mapping to actions and indicators, and rankings in this analysis. Higher-ranked EBVs, such as ecosystem distribution, species abundances and species distributions, have a much longer history of monitoring with more established monitoring schemes and data compared to genetic composition candidates (Moersberger et al., 2022). Further prioritisation considering scientific knowledge gaps and the technical feasibility of monitoring EBV candidates using remote sensing will continue as part of a Science Policy Traceability Matrix (SPTM) produced under Task 1.2 of the OBSGESSION project. The SPTM will support the uptake and use of EBVs for EU monitoring schemes and the design of policy-relevant EBV data products.

4. SUSTAINABILITY AND LEGACY

The [Policy Landscape and Needs Assessment](#) will be expanded throughout the project life cycle. An updated version of the report (Policy landscape and needs (update)) will be published in June 2026 to refine the

mapping and prioritisation of EBVs, based on EU policy needs as articulated in the Goals and Targets of the Kunming–Montreal Global Biodiversity Framework.

5. PROJECT OBJECTIVES AND METHODOLOGY

The Horizon Europe OBSGESSION project aims to monitor and predict biodiversity change and its direct and indirect drivers in terrestrial and freshwater ecosystems through the integration of state-of-the-art multi-sensor Earth Observation (EO) data, innovative in situ (including citizen science) data, and products, along with next-generation ecological models that account for

uncertainty. Work Package 1 aims to align OBSGESSION's findings and activities to current EU policy needs, including through the production of the Policy Landscape and Needs Assessment, which identified a set of priority EBV candidates based on EU policy needs as outlined in the EU BDS 2030.

6. PROJECT IDENTITY

PROJECT NAME: OBSERVATION OF ECOSYSTEM CHANGES FOR ACTION (OBSGESSION)

PROJECT COORDINATOR: Prof. Petteri Vihervaara, Finnish Environment Institute (SYKE)

FUNDING SCHEME: Call: HORIZON-CL6-2023-BIODIV-01, Topic: HORIZON-CL6-2023-BIODIV-01-3, Type of action: EU HORIZON Research and Innovation Actions, Granting Authority: European Research Executive Agency

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BUDGET: EU Contribution: 5 303 940 €

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FURTHER READING: Policy landscape and needs (upcoming, June 2026) [Project RIO collection](#)



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