Annex:

Factsheets describing the indicators proposed to be added in the EU BDS dashboard

INDICATOR FACTSHEET 1

This factsheet describes candidate indicators proposed for tracking the progress in achieving the targets of the EU Biodiversity Strategy for 2030 (EU BDS 2030).

BdS target and subtarget	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 1.3 - Build a truly coherent Trans-European Nature Network integrating ecological corridors, on land
Indicator name	Natural area connectivity on land
Indicator definition	Average proportion of connected natural area on land within a local neighbourhood of approximately 50 km^2
Underlying data	ESA-CCI Land cover map (spatial resolution: 300 m)
Short methodology description	Land cover classes of the input ESA-CCI Land cover map are reclassified into two categories: natural area and non-natural area. Among the 37 classes of ESA-CCI Land cover map, the following classes are considered as non-natural: • Cropland, rainfed (herbaceous, tree or shrub cover) • Cropland, irrigated or post-flooding • Mosaic cropland (>50%) / natural vegetation (tree, shrub, herbaceous cover) (<50%) • Grassland • Urban areas The class "Water bodies" is flagged as "No data" and does not contribute to connectivity. Therefore, this indicator refers only to terrestrial areas. The reclassified dataset is then submitted to the Foreground Area Density (FAD) analysis, performed using GWB[1] (GuidosToolbox Workbench): for each pixel classified as natural area, the relative number of connected pixels also classified as natural areas in its local neighbourhood of 23 x 23 pixels, equivalent to

[1] Vogt P. et al., 2022. GuidosToolbox Workbench: spatial analysis of raster maps for ecological applications. Ecography, Vol. 2022, issue 3,
DOI: 10.1111/ecog.05864. Software available for free at: https://forest.jrc.ec.europa.eu/en/activities/lpa/gwb/

	approximately 50 km^2 is calculated. Specifically, for each pixel, the FAD value is computed as: FAD = Number of pixels classified as natural areas / Total number of pixels in local neighbourhood The output map from FAD analysis is then intersected with administrative boundaries (source: FAO GAUL, 2014): zonal statistics are computed by country and the average FAD values for each country are retained. The overall EU27 average is also computed.
Current data availability	FAD data are available at JRC and can be obtained upon request.
Spatial resolution, extent available	Spatial resolution of input land cover dataset: 300 m Extent available: Global - EU – Country
Temporal resolution, extent available	Possibly every year Input datasets cover the span 1992 - 2022
Update frequency	Yearly, depending on availability of updated ESA CCI land cover maps
Used in a policy monitoring system	Partially true: the forest connectivity indicator used in both 8EAP and NRL is based on the same methodology, the main difference being that forest connectivity measures the connectivity of forest area while the proposed indicator measures the connectivity of natural area.
API operational	No
Source	EC – Joint Research Centre
Pros and cons	Pros: • the indicator can be computed in a short time • the analysis tool is publicly available and well documented • the indicator can be calculated globally and therefore possibly used to report under the Global Biodiversity Framework • the indicator relies on the same methodology than the forest connectivity indicator used in 8EAP. Cons: • the spatial resolution (300m) of the input dataset used does not allow to take into account small-scale natural areas. • the indicator is based on a reclassification of land cover classes into a binary classification (natural and non-natural areas), and therefore (i) it does not capture the actual naturalness gradient of land areas and (ii) it represents overall connectivity of natural land, without distinguishing connectivity within each land cover class of natural land.

INDICATOR FACTSHEET 2

This factsheet describes candidate indicators proposed for tracking the progress in achieving the targets of the EU Biodiversity Strategy for 2030 (EU BDS 2030).

BdS target and subtarget	Target 7 - At least 10% of agricultural area is under high-diversity landscape features
Indicator name	Woody landscape features on agricultural land in Europe
Indicator definition	Share of area covered by woody landscape features on agricultural land in Europe
Underlying data	• Agricultural area 2018 based on Copernicus data - version 1, Sept. 2022[2] • Woody landscape features on agricultural land 2018 (raster 100 m)[3], based on the High Resolution Layer Woody Vegetation Mask (under the Small Woody Features product portfolio)[4] • NUTS administrative units[5]
Short methodology description	• The base layer of agricultural area is derived from the Corine Land Cover data for 2018 (including its classes of agricultural area and natural grasslands) and it was refined using Copernicus High Resolution Layers (HRL). • The original 5m x 5m information on woody features is aggregated at 100m x 100m as a percentage share inside a 1ha cell of the agricultural area mask to match the spatial resolution of that mask. • The share of the area of the woody features is then aggregated to different administrative units (NUTS). The actual percentage within each 1ha cell is used for the calculation, i.e. if the percentage within one cell is 50%, then only 0.5ha is taken into account for the sum for the NUTS region. • The surface covered by landscape features is compared to the surface covered by the agricultural area (per administrative unit). • The results are expressed as a percentage. The full methodology is detailed in an ETC report[6].

[2] https://www.eea.europa.eu/data-and-maps/data/external/agricultural-area-2018-based-on
[3] https://www.eea.europa.eu/data-and-maps/data/external/share-of-woody-landscape-features
[4] https://land.copernicus.eu/en/products/high-resolution-layer-small-woody-features
[5] https://www.eea.europa.eu/data-and-maps/data/external/nuts
[6] https://www.eionet.europa.eu/etcs/etc-di/quantification-of-landscape-features-in-agricultural-areas-using-copernicus-products-an-overview-of-recent-developments

Current data availability	Indicator values are already available and can be consulted on https://www.eea.europa.eu/en/analysis/indicators/woody-landscape-features-on-agricultural-land
Spatial resolution, extent available	Pan-Europe (EEA 38)/EU/Country/Sub-country
Temporal resolution, extent available	Every 3 years (currently available for the year 2018)
Update frequency	Every 3 years
Used in a policy monitoring system	False
API operational	No operational API in place yet at EEA, but there is a possibility to develop one
Source	EEA (info@eea.europa.eu)
Pros and cons	Pros: • The indicator values are already available and will be updated every 3 years by EEA • The accuracy of the data is overall high and is expected to further improve in the coming years • This indicator is based on remote-sensing data to monitor small woody features, and therefore nicely complements the other indicator selected to inform target 7 ("Share of agricultural area covered with landscape features") that is based on field surveys to monitor a broader range of landscape features. Cons: • The indicator is a proxy to monitor target 7, as it does not include all high-diversity landscape features, but only the woody ones • Due to the resolution of the input dataset, the indicator may overlook relevant features such as individual trees and narrow tree lines • The accuracy of the data varies across Europe.

INDICATOR FACTSHEET 3

This factsheet describes candidate indicators proposed for tracking the progress in achieving the targets of the EU Biodiversity Strategy for 2030 (EU BDS 2030).

BdS target and subtarget	The objective to which the indicator refers is stated in Section 3.3.2 of the EU BDS: "at least €20 billion a year should be unlocked for spending on nature", and corresponds to action 69 in the actions tracker
Indicator name	Biodiversity financing indicator
Indicator definition	Biodiversity-related funding in the EU from EU and national, public and private sources mobilised through EU funds and repayable financial support
Underlying data	*1)* EU biodiversity-related funding from the main relevant Multiannual Financial Framework (MFF) and NextGenerationEU (NGEU) funds (Horizon Europe, European Space Programme, ERDF, Cohesion Fund, Just Transition Fund, REACT-EU, Recovery and Resilience Facility, rescEU, EAFRD, EAGF, EMFAF, Life): re-use of the data from the yearly Commission Draft Budget. Source: European Commission *2)* MS co-financing for the funds under shared management: average MS co-financing rate for biodiversity-related expenditures, calculated over the whole period (2021-2027 for ERDF, CF, JTF and EMFAF; 2023-2027 for EAFRD). Source: European Commission *3)* Investment mobilised through InvestEU: estimate based on the data reported by the InvestEU Implementing Partners on the amount of investment (signed operations) that supports biodiversity and ecosystems and on the expected multiplier observed for similar operations. Source: European Commission.
Short methodology description	The indicator provides an aggregate estimate of biodiversity-related funding in the EU from different sources (EU and national, public and private) mobilised through EU funds (from the MFF and NGEU) and repayable support (focusing on InvestEU, which is the most important instrument). The indicator is calculated every year as the sum of the 3 components mentioned above. For component 1, the data from the Programme Performance Statements related to the last available EU annual Draft Budget are re-used. Regarding the scope, all relevant EU funds as mentioned above are included. EU funds for external action (NDICI, OCT, IPA III) are not included in the core indicator (because the EU BDS financing target of €20 billion/year refers to biodiversity action in the EU), but are presented separately. For component 2, MS co-financing for the EU funds that are under shared management is approximated by multiplying, for each fund, EU funding by the average MS co-financing rate for biodiversity-related expenditures for this fund.

	For component 3, investment related to biodiversity and ecosystems mobilised through InvestEU is estimated based on the amount of signed operations reported by Implementing Partners and an expected multiplier effect, which is based on experience for similar operations and provides an indicative estimate of the total amount of financing that InvestEU support helps mobilise in this policy area. The indicator can be calculated every year for all 7 years of each MFF, as it builds on data from the EU Draft Budget, which include financial programming (however, InvestEU data cannot be included in the projections for future years).
Current data availability	The first complete calculation of the indicator annual values over the 2021-2027 period was produced in March 2024. It is based on the data from the EU Draft Budget for 2024 (June 2023) and on the first InvestEU reporting data for operations related to biodiversity and ecosystems (February 2024).
Spatial resolution, extent available	EU
Temporal resolution, extent available	Annual
Update frequency	Annual
Used in a policy monitoring system	False. However, the data underlying 2 of the 3 components of the indicator are used for policy monitoring: the data underlying component 1) are used in the annual monitoring of green priorities in the EU budget; the data underlying component 3) are used in the monitoring of implementation of InvestEU.
API operational	No. The data updates cannot be automated.
Source	EC - Joint Research Centre
Pros and cons	Pros: • The indicator would provide information on financing mobilised for biodiversity from various sources, which is recognised as a key enabling factor for the achievement of biodiversity objectives. • The indicator would fill a gap in the monitoring of progress towards the targets of the EU BDS. • The annual update of the indicator could be done smoothly and quickly for every year of the MFF, as the approach proposed is as simple as possible. Cons: • The scope is limited to financing mobilised through EU funds and instruments, which is explained by the enabling role of these funds and the availability of consistent data, whereas there is a lack of complete and consistent data to have a more comprehensive coverage. • The indicator is a proxy, reflecting methodological choices made to balance accuracy and feasibility. • Automation is not possible given the nature of the data used, and annual updates would require the data to be compiled manually.