A$_1$ = 2 ha

A$_2$ = 1 ha

A$_3$ = 1 ha

$$m_{eff} = \frac{1}{A_{tot}} \cdot \left({A_1}^2 + {A_2}^2 + {A_3}^2\right) = \frac{1}{4} \cdot \left(2^2 + 1^2 + 1^2\right) = \frac{6}{4} = 1,5\ ha$$

so

$$s_{eff} = {}^{1}/_{m_{eff}}\ {}^{1}/_{1,5} = 0,67$$

10.11 Extent of habitat for native pollinator species

Project Name: CONNECTING Nature (Grant Agreement no. 730222)

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Extent of habitat for native pollinator species	**Biodiversity**
Description and justification	Pollinators play a key role in ecosystems, supporting crop production and pollinating trees and wildflowers necessary for supporting other ecosystem functions. Global declines mean that provision of habitat for supporting these species has been identified as a critical conservation target internationally. Evaluation of extent of habitat for native pollinator species is a proxy measure of the health of pollinators and the ecosystems and crops they support.
Definition	Pollinators are organisms that facilitate the transfer of pollen from a male part of a plant to a female part of a plant, supporting fertilisation and seed production. This includes many groups of insect and some birds, and bats. In order to support pollination, it is vital that habitats suitable for supporting pollinators is retained. This can include such diverse provisions as pesticide free zones, wildflower-rich areas, and bare ground for nesting. The critical first step of defining extent of habitat for native pollinator species is to define the target habitats that are being quantified. Typically, this comprises an assessment of wildflower areas, or nectar and pollen-rich flowering areas. However, more detailed characterisation of pollinator habitat needs and associated habitat characteristics provides a more effective measure of biodiversity value.

Strengths and weaknesses	Surveys including evaluation of habitats that provide a diversity of resources to support all the life cycle requirements of pollinators can provide an effective measure of the biodiversity value of landscapes to pollinators. Such approaches tend to require surveys to be carried out in the field and can be resource intensive if repeated regularly. This can represent an excellent opportunity for community participation though as training in the recognition of habitat features can be delivered relatively easily. Remote sensing-based methodologies tend to be focused on single habitat types (e.g., availability of wildflowers) and thus tends to provide less information on the nuances of pollinator habitat requirements. For example, diversity of forage, duration and timing of forage, and habitats associated with other life cycle requirements (e.g., nesting, hibernation, etc).
Measurement procedure and tool	A variety of measurement procedures are available depending upon the level of characterisation of pollinator habitats. For pollen and nectar-rich habitats at a field survey level, surveys can comprise a simple count of flower-rich habitats using established habitat classification methods (EEA 2014), or a quantification of the flora available to pollinators (Carvell et al. 2004). Habitat Maps can also be developed from the interrogation of vegetation maps, land use maps and Earth Observation data (e.g., NDVI) analysis (Corbane et al. 2015; Alleaume et al. 2018). UAVs also provide opportunities for mapping habitat areas (Alvarez-Vanhard et al. 2020). However, this can be more challenging in urban areas due to flight restrictions. All methodologies characterise pollinator habitat extent in terms of a proportion of the total area (e.g., % or m^2/ha).
Scale of measurement	Dependent upon the method of evaluation. For field-based survey, scale can be determined by effort required. As such, this tends to be better suited for site and neighbourhood scales. Remote sensing methods are typically more appropriate for larger regional or city-wide (e.g., Functional Urban Area) scales
Data source	
Required data	Landscape data, such as aerial photos and Ordnance Survey maps are useful to act as a foundation for both field

	survey and remote sensing techniques. Beyond that, data is generated either by interrogation of aerial images or field survey.
Data input type	Both ground survey and remote sensing methodologies generate spatial records of habitat type. These are either recorded using GPS for subsequent transfer to GIS mapping, or directly so for Remote Sensing methodologies. In addition to habitat extent, this if measures of habitat quality are included, quantitative data is also generated
Data collection frequency	Data collection frequency is typically defined by the area of interest and the availability of resources. For site and neighbourhood scale evaluation, annual or even seasonal survey is recommended. For more substantial areas, frequency may have to be reduced dependent upon resources.
Level of expertise required	Dependent upon the level of complexity of habitat classification, level of expertise required can be quite varied. For remote sensing approaches, basic GIS data processing expertise is required. For field survey, it might be possible to train a team of citizen scientists with low level of expertise.
Synergies with other indicators	Synergies with other greenspace mapping indicators and protected habitats and species indicators, particularly Article 17 listed species.
Connection with SDGs	Strongest links to SDGs 2& 15. However there are links to all SDGs except 1 and 5: Biodiversity underpins food production; Links between biodiversity and health & wellbeing benefits; Links to environmental education; Links between biodiversity and water quality; Links between biodiversity and clean energy (biosolar, biofuel); Job creation; Improved green infrastructure and industry associated with biodiversity (potential disservices also); Social equality in relation to access to nature; Sustainable urban development; Biodiversity a good indicator of responsible consumption; Climate change adaptation; More sustainable water management; Biodiversity benefits; Environmental Justice in relation to biodiversity; Opportunities for collaborative working.
Opportunities for participatory data collection	Surveying habitats represents an excellent opportunity for widening participation. Alternatively, participatory GIS portals can be used to ground-truth satellite imagery.
Additional information	
References	Alleaume, S., Dusseux, P., Thierion, V. Commagnac, L., Laventure, S., Lang, M., Féret, J-B., Hubert-Moy, L and Luque, S (2018) A generic remote sensing approach to derive operational

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10.12 Polluted soils

Project Name: PHUSICOS (Grant Agreement no. 776681)

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Polluted Soils	**Biodiversity**
Description and justification	This indicator evaluates whether the project scenarios enhance the ability of a soil to resist or recover their healthy state in response to destabilising influences.
Definition	This Indicator describes the quantity of soils in the study area, measured in hectares, used for highly polluting industries, brownfields, drosscapes, mines, dumps, construction sites. It provides a quick evaluation of soil quality since the less polluted a soil is, the higher its overall quality.
Strengths and weaknesses	+ In a long-term scenario, the Indicator could be re-assessed, monitoring, through a direct survey, if the NBS implementation has produced impact on soil resilience.