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10.10 Forest habitat fragmentation – Effective Mesh Density

Project Name: PHUSICOS (Grant Agreement no. 776681)

Author/s and affiliations: Gerardo Caroppi^{1,2}, Carlo Gerundo², Francesco Pugliese², Maurizio Giugni², Marialuce Stanganelli², Farrokh Nadim³, Amy Oen³

¹ Aalto University, Department of Built Environment, Espoo, Finland (gerardo.caroppi@aalto.fi)

² University of Naples Federico II (UNINA), Department of Civil, Architectural and Environmental Engineering, Naples, Italy

³ Norwegian Geotechnical Institute (NGI), Oslo, Norway

Effective Mesh Density	Biodiversity
Description and justification	This indicator evaluates whether the Design scenarios ensure the removal of physical barriers obstructing forest habitat connectivity.
Definition	Effective mesh density quantifies the degree to which wildlife movement is interrupted by barriers in the environment. It expresses the degree of fragmentation of a landscape and measure the effective number of patches (forest areas) per 1 km ² (EEA).
Strengths and weaknesses	<p>+ It easily expresses how much the forest habitats are fragmented; in a long-term scenario, these indicators could be re-assessed, monitoring, through a direct survey, if the NBS implementation has produced impact on forest habitat fragmentation.</p> <p>- A detailed identification of forest patches localization should require a field and/or aerial survey and time-consuming data post-processing.</p>
Measurement procedure and tool	<p>It can be calculated using the following expression:</p> $s_{eff} = 1/m_{eff}$ <p>given:</p>

$$m_{eff} = \frac{1}{A_{tot}} \cdot (A_1^2 + A_2^2 + \dots + A_i^2 + \dots + A_n^2)$$

where:

n is the number of patches;

A_{tot} is the total area of the study area;

A_i is the size of patch i ($i = 1, \dots, n$)

Scale of measurement

1 / ha

Data source

Required data

Spatial data concerning forest patches in the study area.

Data input type

Quantitative

Data collection frequency

Annually

Level of expertise required

Medium

Synergies with other indicators

Connection with SDGs

15

Opportunities for participatory data collection

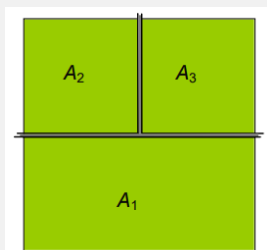
Local stakeholders could provide information about

Additional information

References

Jaeger, J.A. (2000), *Landscape division, splitting index, and effective mesh size: new measures of landscape fragmentation*. *Landscape Ecology* 15, 115–130
<https://doi.org/10.1023/A:1008129329289>

Example: A forest is fragmented by streets into three patches.



$A_{TOT} = 4$ ha

$A_1 = 2 \text{ ha}$

$A_2 = 1 \text{ ha}$

$A_3 = 1 \text{ ha}$

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

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)

Author/s and affiliations: Stuart Connop

Sustainability Research Institute, University of East London, UK

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.