# EBONE

## **European Biodiversity Observation Network**

## Implementation of SEBI 2010 Indicator Fragmentation and Connectivity of Ecosystems: Preliminary results over one EBONE regional site

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#### **Definitions and concepts**

Landscape level ecosystem spatial pattern: spatial arrangement or configuration of focal ecosystem across the landscape.

Fragmentation: breaking up of large habitat into smaller parcels. In the broader sense, fragmentation refers to ecosystem loss and isolation.

Spatial processes in ecosystem loss (Forman 95, Fahrig 2003...):

- •New perforation: holes in ecosystem patch (e.g. logging in forest).
- •Shrinkage: decrease in the size of patches
- Attrition: total removal of patches
- ·Fragmentation: breaking up of patches

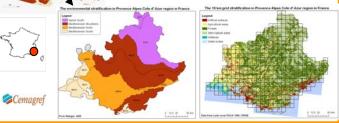
**Connectivity**: 'property of landscape structure (state) is a degree to which the landscape facilitates or impedes movement among resource patches". Connectivity is crucial for the viability and survival of species, for the control of invasive species and diseases

#### **EBONE** regional Mediterranean case study Two reporting frame (Env. Strata and 10 km grid)



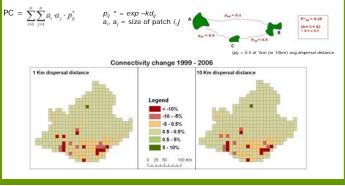
Indicators related to fragmentation and connectivity are reported per 10km grid and per environmental strata. The assessment is based on land cover maps from 1999 and 2006 at 30 m resolution over the Mediterranean French region (PACA). The analysis is here for forest as focal ecosystem

Forest class: broad-leaved +coniferous +mixed forest (incl. young plantation above 500 subjects/ha, transitional woodland when canopy closure > 50 %). Non-forest class: include transitional other wooded land, young plantations (<500 subjects/ha), clear cuts, burned areas, forest nurseries and natural/semi-natural non-wooded vegetation, artificial and agricultural surfaces, wetlands.

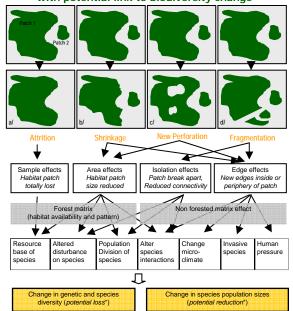


#### Indicator 2: Forest connectivity change in 1999-2006

Method: GIS change analysis from the Probability of forest Connectivity (PC) index calculated with the software Conefor Sensinode 2.2 (Saura and Torne, 2009) based on topology (inter patches distance) and patch attributes (area) for forest dwelling species with low or high mobility (average dispersal distance 1km, 10km). The non-forested landscape is considered as homogeneous



#### Spatial pattern (fragmentation) processes with potential link to biodiversity change



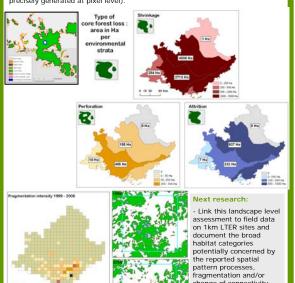
Adapted from Zuidema, 1996; Lindenmeyer & Franklin, 2003; Kupfer, 2004

Indicator 1 : Spatial processes in core forest loss

- Attrition of core patch - Shrinkage of core patch - New perforation in patch

- Fragmentation of core patch (Type of forest conversion to agriculture, artificial
or non forested semi-natural land not shown here).

Core forest : area of forest patch minus an edge of a certain width artitrarily
defined (here, protection belt 30m corresponding to generic forest edge width)
Method: GIS change analysis with as input forest spatial pattern maps obtained
with the JRC Morphological Spatial Pattern Analysis (MSPA) Guidos
freeware (Soille and Vogt, 2009 : spatial pattern classes automatically and
precisely generated at pixel level).



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change of connectivity -Implement to other focal cosystem (semi-nat non rooded land)