

Indicator assessment for habitat fragmentation

- Comments -

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Table 28: Evaluation of the fragmentation indicators.

Indicator	Category									
	Representation			Operation			Application			
	Validity	Reliability	Sensitivity	Measurability	Data Availability	Ethical concerns	Transparency	Interpretability	Target relevance	Actionability
Number of patches, NP (Turner et al., 1989)	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	x	x
Mean patch size, MPS (McGarigal et al., 2002)	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	x	x
Largest patch index, LPI (With and King, 1999; Saura & Martínez-Millán, 2001)	xxx	xxxx	x	xxxx	xxxx	xxxx	xxxx	xxxx	x	x
Patch density, PD (McGarigal and Marks, 1995; Saura & Martínez-Millán, 2001)	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	x	x
Average patch carrying capacity, Kavg (Vos et al., 2001)	x	xxxx	x	x	x	xxxx	xx	xx	x	x
Core area (McGarigal and Marks, 1995; Schumaker, 1996)	xxx	xxxx	x	x	x	xxxx	xx	xxx	x	x
Perimeter area ratio, P/S (Krummel et al., 1987; McGarigal and Marks, 1995)	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xx	x	x
Shape index, SI (McGarigal and Marks, 1995; Schumaker, 1996)	xxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxx	x	x
Square pixel, SqP (Frohn, 1998)	xx	xxxx	x	xxxx	xxxx	xxxx	xxxx	xxx	x	x
Nearest neighbour, d ₁ (Moilanen and Nieminen, 2002)	xx	xxxx	x	xxxx	xxxx	xxxx	xxxx	xx	x	x
Relative size of the biggest patch in the landscape, RS ₁ (Turner, 2001)	xxxx	xxxx	x	xxxx	xxxx	xxxx	xxx	xxx	x	x
Connectivity index, CI (Martín et al., 2007)	xxxx	xxxx	xxxx	x	xxxx	xxxx	xx	xx	x	x
Patch cohesion (COH) index (Schumaker, 1998)	xxxx	xxxx	xxxx	x	xxxx	xxxx	xx	xx	x	x
Integral index of connectivity, (IIC) (Pascual-Hortal & Saura, 2007)	xxxx	xxxx	xxxx	x	xxxx	xxxx	xx	xx	x	x

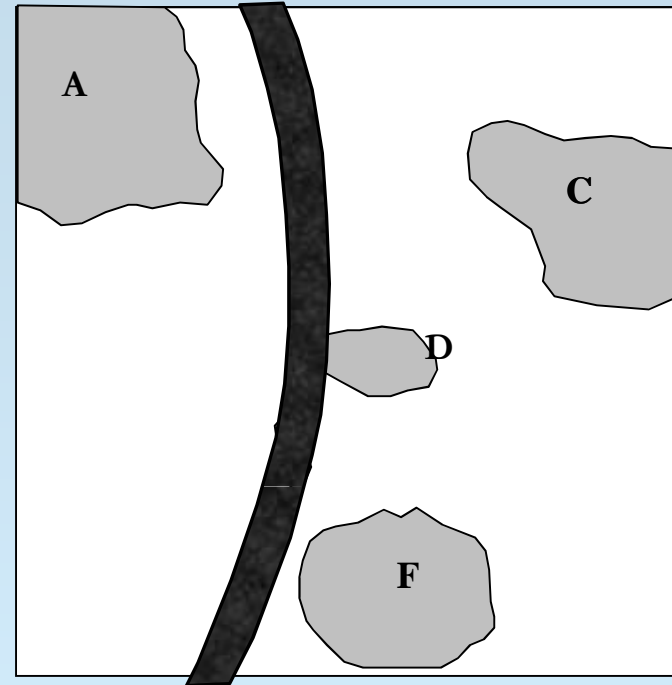
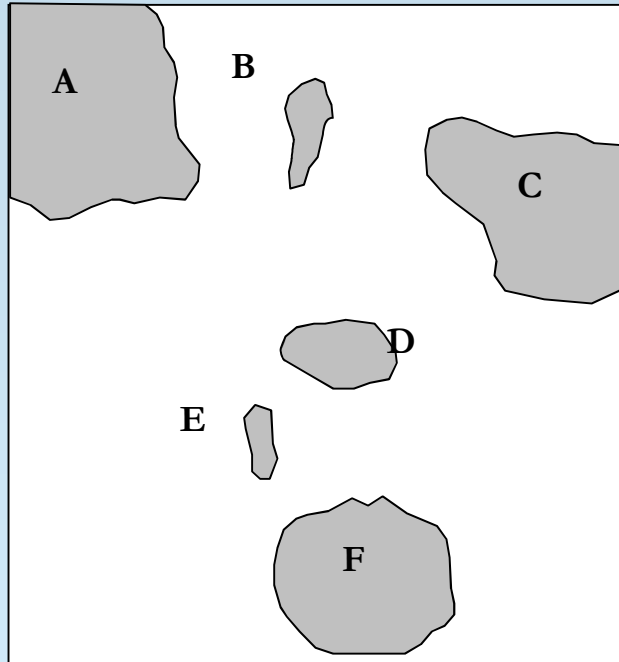
Comments

- Interpretability
- Scale
- Target relevance
- Aggregation of indicators

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Perimeter area ratio, P/S (Krummel et al., 1987; McGarigal and Marks, 1995)	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xx	x	x
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Square pixel, SqP (Frohn, 1998)	xx	xxxx	x	xxxx	xxxx	xxxx	xxxx	xxx	x	x
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Example of ambiguous interpretation



Less and larger patches: Positive impact?

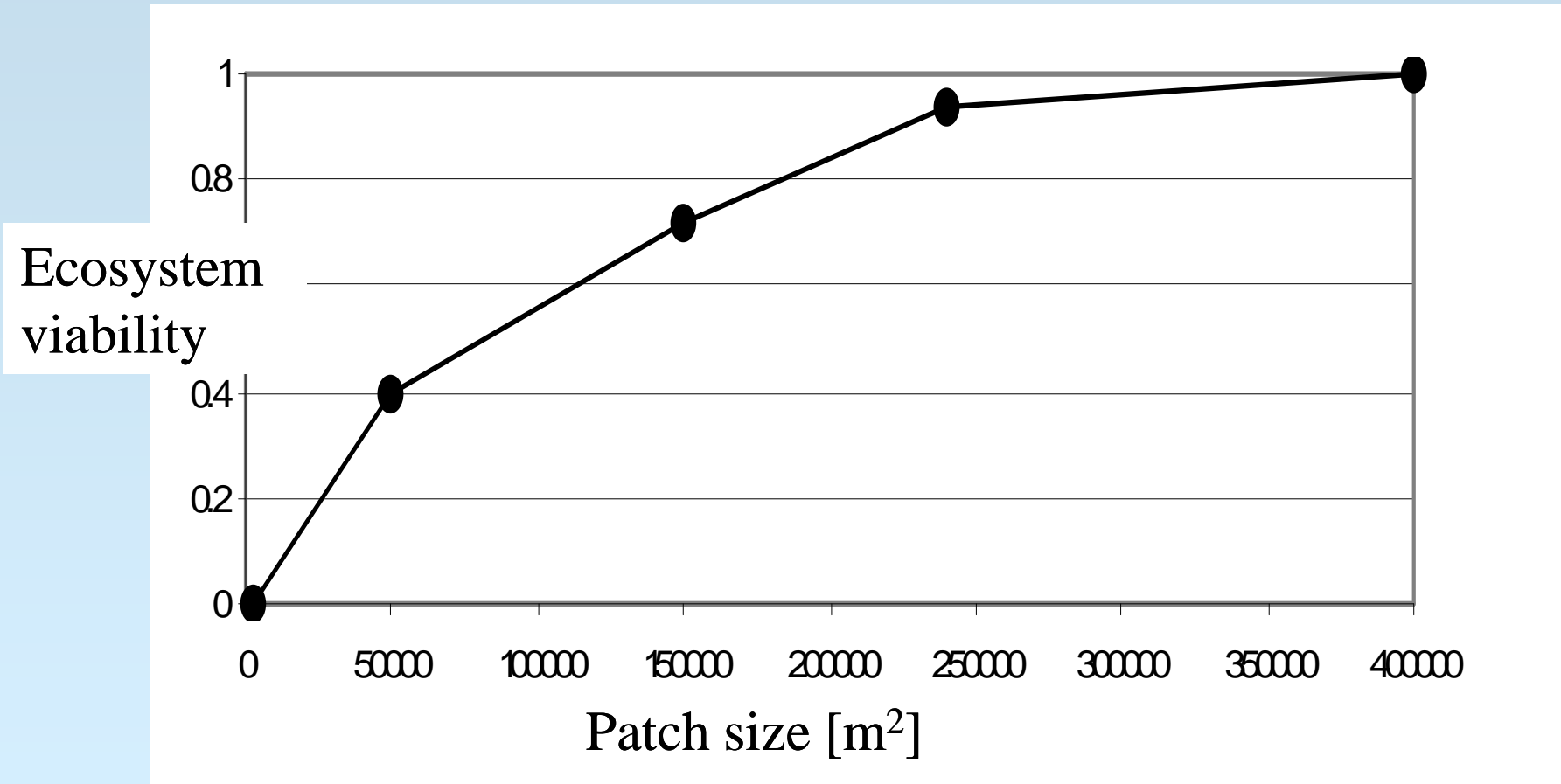
Scale of the analysis



Target relevance

- In order to set meaningful targets, key species (or habitat types) need to be selected, by referring to:
 - Rarity
 - Naturalness
 - Representativeness
 - Natura 2000
 - ...
- Fragmentation indicators need to be coupled with other ecological indicators

Target



Joint consideration of indicators

- Redundancy and double-counting
- Indicator inter-dependency

Conclusion

- As stand-alone indicators, they are good for measuring impacts, but they are not always sufficient to support decision-making;
- Future research should address how to complement them with other ecological indicators, without losing transparency