Landscape Ecological Potential

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Ecosystem accounting needs to be based on (among others) physical accounts of ecosystems and the benefits they provide.

Ecosystems, unfortunately, are very complex, diverse, and difficult to define and delineate.

Simplified approach needed as a basis for physical (ecosystem) accounting.

Is this simplified approach the ‘Net Landscape Ecological Potential’?
What?


- NLEP = Composite indicator for ecosystem integrity at the macro scale

- Developed by EEA for Europe for 1990 and 2000.

- Changes in NLEP reflect degradation or rehabilitation of ecosystems
How?

- \( \text{NLEP} = f(\text{vegetation cover, protected status, fragmentation}) \)
Aggregation (and smoothing) of forests, pasture, inland waters, wetlands, semi-natural land and agricultural mosaics. Equal weighting?
Protected status, on the basis of designated sites (e.g. Natura2000, Ramsar) + high ecological value close to protected site (<5 km)
- Reflects barriers to wildlife from roads, railways and constructions. The more barriers the lower the index value. Log conversion.
Combined into: NLEP (0 to 255)

- GLEP = Green background Index + Naturalis Index (stretched from 0 to 255 ?)
- NLEP = \( \sqrt{\text{GLEP} \times \text{Fragmentation index}} \)

\[
NLEP = \sqrt{\text{vegetation index} + \text{protected index} } \times \text{fragmentation index}
\]
NLEP (1 km grid)

Legend
Net Landscape Ecological Potential 2000
NLEP, scale : 0 - 255
- High : 159
- Low : 0

Source:
EEA/ETCLUSI from GBLI, NATURILIS and MEFF
Methodology:
EEA/ETCLUSI

European Environment Agency
Change in the NLEP 1990-2006
Observations on the Methodology (1)

- Heavy weighting of Fragmentation, around twice as much impact as vegetation or protected status.
  - Not all species strongly affected by fragmentation (e.g. birds)
- Some choices appear subjective (log transformation of fragmentation, choice of 5 km form protected areas, equal aggregation of specific habitat types in the greenness maps)
- Why is fragmentation the difference between net and gross LEP?
Observations on the Methodology (2)

- No embedding of bottom-up / national data (e.g. EBONE Project / GEO)
Observations on the Methodology (3)

- Index does not allow to analyse ecosystem or species diversity at a European scale (e.g. index may remain the same even if all wetlands are lost if this is compensated by forests)
NLEP proposed as proxy for ecosystem integrity (defined as ability of ecosystems to support biological communities comparable to natural habitat)

Ecosystem use not reflected in the NLEP, but NLEP may reflect the potential to supply ES.

Relation between ecosystem integrity and the supply of (all?) ecosystem services unclear.
Discussion questions

- Is the NLEP a correct indicator for ecosystem integrity?
  - how can it be improved?
- Will a reduction in NLEP lead to a loss of ES supply?
  - Can NLEP be used to reflect the supply of some ecosystem services?
- CAN NLEP serve the creation of physical accounts?
  - Should we have a top-down approach (such as NLEP) or have a bottom-up approach (starting with ES supply and linking those to ecosystem properties), or is there scope to test both approaches?
- Where to go from here in defining ecosystem units/properties in support of establishing physical accounts?
- What other questions do you have?
Question 1

- Is the NLEP a correct indicator for ecosystem integrity?
  - how can it be improved?
Question 2

- Will a reduction in NLEP lead to a loss of ES supply?
  - Can NLEP be used to reflect the supply of some ecosystem services?
Question 3

- CAN NLEP serve the creation of physical accounts?
  - Should we have a top-down approach (such as NLEP) or have a bottom-up approach (starting with ES supply and linking those to ecosystem properties), or is there scope to test both approaches?
Question 4

- Where to go from here in defining ecosystem units/properties in support of establishing physical accounts?
Ecosystem change is complex