Nature Restoration Law & new EU Forest Strategy

Assessment of Carpathian forest connectivity and prioritisation for conservation / restoration

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Delivering data and knowledge to achieve Europe’s vision on climate and environment

- European environment information and observation network (Eionet)

How we will work: Strategic Objectives

**SO1 Supporting policy implementation and sustainability transitions**

Produce evidence-based knowledge to support policy implementation and development of new initiatives to accelerate and scale up the transition to sustainability.

**SO2 Providing timely input to solutions for sustainability challenges**

Deliver targeted inputs to inform policy and public discussions, by organising and communicating knowledge on responses, including innovative solutions to societal challenges.

**SO3 Building stronger networks and partnerships**

Strengthen our network through more active engagement at the country level and work with other leading organisations in order to facilitate the sharing of knowledge and expertise.

**SO4 Making full use of the potential of data, technology and digitalisation**

Embrace digitalisation, including new technologies, big data, artificial intelligence and earth observation that will complement and potentially replace established information sources to better support decision making.

**SO5 Resourcing our shared ambitions**

Develop structures, expertise and capacity across our network to meet evolving knowledge needs, securing and diversifying the resources needed to achieve our joint vision.
The environmental acquis, the EU green deal and the flagship strategies

**Green Deal**

- Biodiversity Strategy for 2030
- Fit for 55’ package
- Forest Strategy for 2030

**Strategies**

- Nature Restoration Law
- FISE
- 3 billion tree pledge
- Roadmap for the 3 billion trees
- EU Framework on Forest Monitoring and Strategic Plans
Bringing back nature into our lives - Biodiversity strategy for 2030 and forests

• Protection commitments include protecting all remaining EU primary and old-growth forests, and further protection to build a truly coherent Trans-European Nature Network.

• Increasing the quantity of forests and improving forest health and resilience are actions that are viewed to drive a joint agenda for achieving both biodiversity targets and climate neutrality.

• All public forests and an increased number of private forests should have management plans that include biodiversity-friendly afforestation and reforestation and closer-to-nature-forestry practices.
Ongoing harmonisation of definitions: primary and old growth forests (Working group on Forests and Nature)

- Primary forest according to the FAO definition
- Still under development for the OGFs

Establish protected areas for at least 30% of land (forests?)

With stricter protection of the (primary and old growth forests) remaining

10% strictly protected forests
Measures, Responses and Solutions

Nature-based solutions
Protection
Sustainable management
Regeneration

Enablers
Legislation
Governance
Finance and investments

Knowledge
Research
Practices
Tools

Monitoring

Networks and partnerships

European Environment Agency
• Indicators selected for monitoring forest ecosystem restoration (EU Nature Restoration Law)
• EU Framework for Forest Monitoring and Strategic plans
• Under development to monitor the achievement of climate, biodiversity, rural development and sustainable bio-economy objectives
ASSESSMENT OF FOREST CONNECTIVITY AND PRIORITISATION FOR CONSERVATION / RESTORATION IN CARPATHIAN MOUNTAINS

Outlining the method – DEMO
Outline – Assessment of forest connectivity and prioritisation for conservation / restoration

Define connectivity / fragmentation

Define the area of interest

Assess the current connectivity

Model scenarios to improve the connectivity

Identification of priority areas to restore

From functional or/and spatial perspective

Virgin forest, virgin and quasi-virgin forests, biodiversity priority areas, carbon-rich ecosystems,......?
Virgin forest

Connectivity/fragmentation assessment

Priorities areas to connect

Ecological corridors for large carnivores

Peatlands

Ecosystem services trade-offs and synergies

European primary forest

Protected areas

Provisioning

Cultural

Supporting

Regulating

Restoration scenarios

Scenario 1 – Restoring for natural ecosystems

Scenario 2 – Restoring for multifunctional ecosystems

Scenario 3 – Minimum restoration

Identification of priority areas for restoration

Co-benefits targeting climate resilience & reduction of biodiversity loss
TESTING THE APPROACH
Assessing connectivity
1) **Network of interest** → composed by land cover parcels, species habitats, or any other homogeneous area. This is the base area to reconnect. => Virgin forest and other old-growth forest

2) **Resistance map** for the non-network pixels → Difficulty to traverse/restore a given pixel [3 – 100 (max)]. This is key, driving the expense of a given restoration pathway or ultimately, the geographic location of cost-efficient restoration pathways, which will follow the path of least resistance.
Key steps (1) Definition of NOI. Classify forest according to biodiversity/conservation value

1. **VF and QF forest.** Identification of polygons:
   1. VF & QVF + sabatini et al. 2021 polygons
   2. Refinement of VF and QF areas by overlapping with forest cover map – > to update the area and remove potential clear-cut areas

2. **Other old growth forest** \(<\) records from Sabatini et al. database that do not overlap with CC VF & QVF plots (refinement by forest land cover)

3. **Protected forests not included in previous classes** \(\rightarrow\) (PA + forest land cover) [https://www.protectedplanet.net/en/search-areas?search_term=poland&geo_type=country]
Key steps (1) Classify forest to define the network

Legend
- Virgin forest
- Quasi-virgin forest
- Other old growth forest
- Protected forest
- Rest of forest

Test 1
DEMO

European Environment Agency
Morphological Spatial Pattern Analysis (MSPA) of forest network

- Virgin forests are the inner part of forest patches. No edges.
- The protection of the forest ensures better integrity of forest (higher percentage of core) but lower than virgin forest.
Components of resistance map:

1. Land cover & land use
2. Natural and seminatural protected ecosystems (excluding forest that is in the network)
3. Forests out of NOI (non-protected and non-classified as old-growth forest)
4. Wetlands - Protected wetlands / non-protected
5. ConnectGREEN output
6. Former wetlands (peatlands)
7. Ownership
8. ??

How to score the resistance value? Based on ES tradeoff
Test 1: Show optimum BIG 5. Land cover + Forest well conserved.

| Area characteristic                        | Resistance value *
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Virgin forest</td>
<td>2</td>
</tr>
<tr>
<td>Quasi-virgin forest</td>
<td>2</td>
</tr>
<tr>
<td>Other old growth forest</td>
<td>2</td>
</tr>
<tr>
<td>Protected forest (non in previous classes)</td>
<td>2</td>
</tr>
<tr>
<td>Forest</td>
<td>4</td>
</tr>
<tr>
<td>Shrubs</td>
<td>15</td>
</tr>
<tr>
<td>Herbaceous vegetation</td>
<td>15</td>
</tr>
<tr>
<td>Herbaceous wetland</td>
<td>6</td>
</tr>
<tr>
<td>Moss and lichen</td>
<td>7</td>
</tr>
<tr>
<td>Bare / sparse vegetation</td>
<td>60</td>
</tr>
<tr>
<td>Cultivated and managed</td>
<td>70</td>
</tr>
<tr>
<td>Urban / build</td>
<td>100</td>
</tr>
<tr>
<td>Permanent water bodies</td>
<td>100</td>
</tr>
</tbody>
</table>

*Resistance values assigned for testing the method. Non consolidated criteria behind.

OPTIMUM big 5: This option will calculate the pairwise optimum pathway between the five largest objects on a restoration-compliant resistance image.
The result shows the restoration pixels in red between the 5 largest objects color-coded in decreasing size from the largest object in blue (1), cyan(2), green(3), yellow(4) and brown(5).

- This is a demo to test tools for scenario modeling. This support the decision making
- Restoration scenarios setup requires the Scientifics backing → resistance dimensions and scores
Concluding remarks

- The work tested under the CCS collaboration has been valuable for future monitoring of forest connectivity as requested for upcoming EU forest assessments (i.e. EU Nature Restoration Law).

- Needs to be operational at EU level by 2025/26 if the NRL and EU Framework for forest monitoring are agreed for implementation.

- Budget cuts ahead for 2023, EEA considering how to prioritise and tackle these challenges to meet the legal requests as well as needs for protecting, restoring and maintaining sustainable management of our forests.
Thank you for your attention!

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