GBF as an example of the Nature conservation networks between Republic of Karelia and Finland

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Development of transboundary ecological networks

- The presence of corridors between the protected territories is essential for biodiversity conservation
- The impact on biodiversity on non protected territories is bigger if when the perimeter is bigger
- Do we have the connectivity between the nature conservation networks in Finland and Republic of Karelia?



Why do we need to analyze the connectivity between PA and habitats?

- To establish the network of high conservation value areas along the border
- To secure the biodiversity exchange through the border
- To enable the expected movement of organisms due to climate change and mitigate its influences

Approaches for analyzing the connectivity

- "Existing networks of the protected territories"
 - The networks were created by humans and could be analyzed using the GIS layers received from KRC and SYKE
- "Existing connections between high conservation value habitats"
 - The connections were created by nature and could be observed from satellites

Existing networks of the protected territories

- Data: vector layers of the PA in Finland and Russia
- Method: connectivity analysis
- Results: distribution of the existing PA along the border

Corridor, m	Finland	Karelia
■ 100 m	1	1
= 500 m	3	2
= 1000 m	1	1
5000 m	8	1
Total	13	5



Mapping existing connections between high conservation value habitats

- Study area: Republic of Karelia + 200 km buffer zone along the border
- Data:
 - mosaics of Landsat images
 - 337 sample plots from HOTSPOT project (see poster)
 - 57 sample plots from KRC
 - More than 5000 plots from National Forest Inventory of Finland
- Methods:
- Land cover classification
 - Landsat mosaics (2002)
 - Update by MODIS image from 2008 (clear cuts)



Existing connections between high conservation value habitats

- Method:
- Image segmentation (6 mln. objects) using DEFINIENS Image Intelligence Suite
- Selection of ground truth data (data Karhukolmio and HOTSPOT projects + QuickBird Scenes from Google Earth)
- Feature Space Optimization (ch 1,2,3+border index, Length/Width, Shape index)
- 4. Analyzing the connectivity:
 - Old growth forest (Fin) Old growth forests (Rus)
 - Petlands (Fin) Peatlands (Rus)
 - Existing nature reserves (Fin) Existing nature reserves (Rus)
 - GAP = (Connected forests + Connected Peatlands) Connected existing nature reserves. How much is



Land cover structure

- Clearcut
 Forest
 Grassland
- Mire
- 🗆 Tundra
- Water
- Bare Soil



Age structure along the border



Elimyssalo area – good connectivity



Rasvasuo: Isolated area for forests

Rasvan of Nikashe Capiterin a amalge

Good connectivity: Ulvensalo – Muozerskiy rayon



Preliminary results: high conservation value habitats along the border

- The natural connectivity is still existing along the border
- In Russia the existing big untouched ecosystems should be protected
- In Finland there is a need to create the corridors to ecosystems located in Russia

The width of the forest corridors at the border between Russia and Finland (border bertween Louhskiy and Suojarvkiy rayons)





Russian – Finnish part of the Green Belt







Implications: Joint Finnish – Russian nature conservation plan

- 1. This research allowed to answer the question "Where is the gaps?"
- 2. Complex assessment of social, environmental and economic factors is needed:
 - How much is enough?
 - What are the costs?
 - What are the constrains?
 - What are the most optimal development scenarios?

