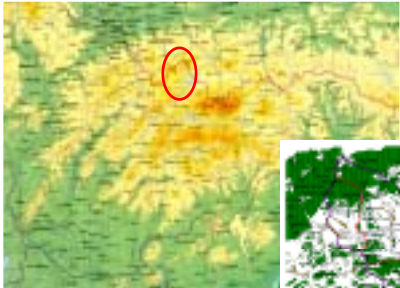




# THE BIODIVERSITY OF NON-FOREST HABITATS IN THE ORAVA REGION (SLOVAKIA)

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### Objects of the research:

- analyses of land use changes – anthropogenic and succession
- mapping of non-forest habitats in the rural landscape
- evaluation of environmental and structural characteristic of vegetation
- proposals for the landscape planning and nature conservation.



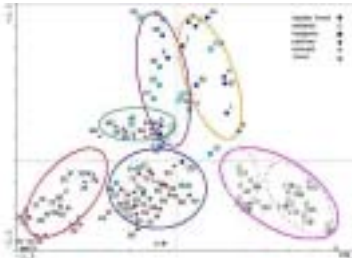
### ENVIRONMENTAL CHARACTERISTICS

#### Environmental Units

- Geomorphological province: Western Carpathians
- Climatic zones: temperate climate
- Phyto-geographical zones: Mountain vegetation; deciduous forests of temperate latitudes
- River basins: Veslovianka

#### Land Use and Main Ecosystems Within the Network

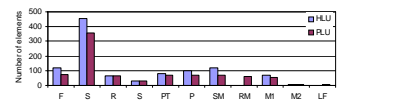
- Forests: approx 41,96 %
- Shrubs: approx 8,87 %
- Pastures: approx 13,14 %
- Semi-natural meadows: approx 2,28 %
- Recultivated meadows: approx 15,11 %
- Arable farming: approx 9,56 %
- Historical agricultural landscape: approx 0,66 %
- Inland waters and wetlands: approx 0,3 %.



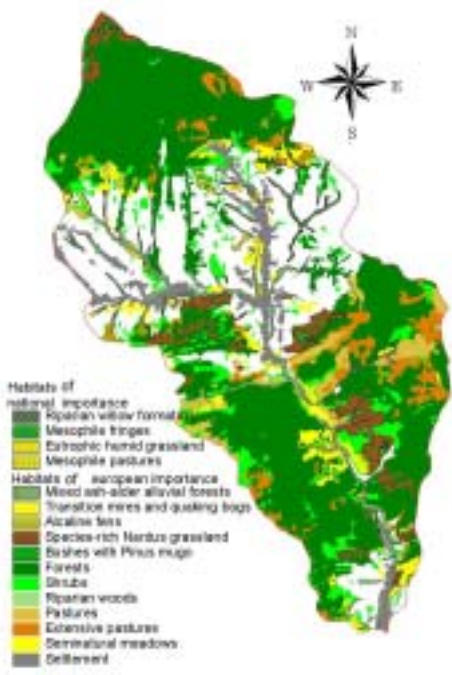
Ordination diagram – Analyses of sample of non-forest habitats (CA - Correspondence Analysis)



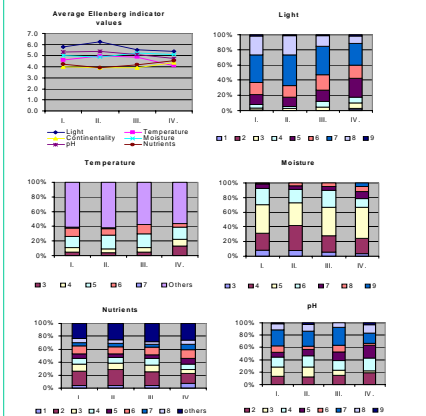
Changes of historical land use (1958) to present land use (2001)



Number of land use elements (Legend: F – forest; S – shrubs; R – floodplain woods; S – settlement; PT – pastures with trees; P – pastures; S1 – semi-natural meadows; RM – reclaimed meadows; M1 – narrow-strip mosaic of arable fields; M2 – mosaic of arable fields, grassland and woods; LF – large-block arable field.



- Habitats of national importance:**
  - Riparian willow forest
  - Mesophile fringes
  - Eutrophic humid grassland
  - Mesophile pastures
- Habitats of european importance:**
  - Mixed ash-alder alluvial forests
  - Transition mires and quaking bogs
  - Acidic fens
  - Species-rich Nardus grassland
  - Bushes with Pinus mugo
  - Forests
  - Shrubs
  - Riparian woods
  - Pastures
  - Extensive pastures
  - Seminal meadows
  - Settlement

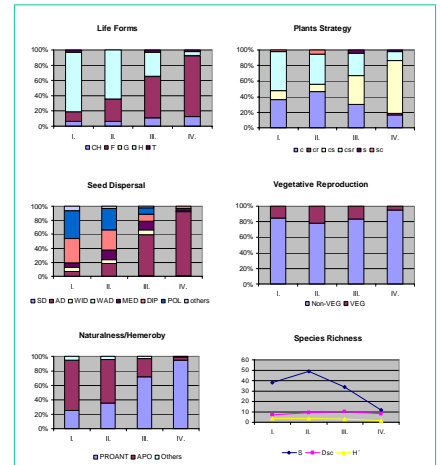


### Indication of ecological site characteristics at the ecotones between pastures and forest

Legend: I – Initial stage, II – Sprouting stage, III – Stage of thickening, IV – Stage of connected forest  
Eco-numbers:  
**Light** – 1 – very shade-tolerant species; 2 – between 2 and 3; 3 – shade-tolerant; 4 – between 3 and 5; 5 – penumbra species; 6 – between 5 and 7; 7 – semi-light-demanding species; 8 – light-demanding species; 9 – species demanding full sunlight  
**Temperature**: 3 – indicator of cold; 4 – between 3 and 5; 5 – indicator of moderate temperature; 6 – between 5 and 7; 7 – thermophilic species; 8 – between 7 and 9, (categories 1,2,9 were not presented within the study area).  
**Moisture**: 3 – indicator of dry place; 4 – between 3 and 5; 5 – indicator of fresh soil; 6 – between 5 and 7; 7 – indicator of humid soils; 8 – between 7 and 9; 9 – indicator of wet soils, 10 – indicator of alternately flooded soils, (categories 1,2,11,12 were not presented within the study area).  
**Nutrients (Productivity)**: 1 – the nitrogen poorest site; 2 – between 1 and 3; 3 – nitrogen poor site; 4 – between 3 and 5; 5 – nitrogen average rich site; 6 – between 5 and 7; 7 – upper nutrient rich site; 8 – nutrient rich site; 9 – exceptionally nutrient rich site.  
**pH**: 1 – strong acid; 2 – between 1 and 3; 3 – acid; 4 – between 3 and 5; 5 – moderately acid; 6 – between 5 and 7; 7 – thin acid to thin alkaline; 8 – between 7 and 9; 9 – alkaline to calcic.



Floodplain forest of Veslovianka river



### Structural characteristic of species composition at the transect from pastures to forest

Legend: I – Initial stage, II – Sprouting stage, III – Stage of thickening, IV – Stage of connected forest  
**Life Forms**: CH – chamaephytes, F – phanerophytes, G – geophytes, H – hemicyphytes, T – therophytes  
**Plant Strategy**: C – competitor, S – stress-tolerator, R – ruderal, cr., cs., sr., csr – secondary strategies  
**Seed Dispersal**: SD – Self-Dispersal, AD – Animal Dispersal, WID – Wind Dispersal, WAD – Water Dispersal, MED – Metro Dispersal, DIP – Diplochory, POL – Polychory  
**Vegetative Reproduction**: Non-VEG – non-vegetative, VEG – vegetative reproduction  
**Naturalness / Hermeroby**: PROANT – proantrophytes, APO – apophytes, others  
**Species Richness**: S – number of species, Dsc – Index of scale diversity, H' – Shannon-Weiner index



Pasture in Oravska Jasenica cadaster



Gladiolus imbricatus

### Conclusion and proposals

- proposal of the ecologically functional landscape classification the aim of which is to conserve the biological and landscape values of the area
- The most significant landscape elements:
  - \* the mixed stands of pioneer tree species on pastures and the extensively used pastures
  - \* fens
  - \* floodplain forests of the Veslovianka.
- The well conserved species-rich habitats of high stability ensure the conditions for biodiversity conservation as well as continuous fulfilment of the functions of the stands of non-forest woody habitats in the landscape.
- The proposals of measures for:
  - \* vegetation protection and creation
  - \* optimal land use
  - \* measures for the development of recreation, urbanization and agriculture



Oxycoccus palustris



Active raised bogs (Mutné cadaster)

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