**Research question and hypothesis**

Does an edge effect exist in forest ecosystems of the Polish Carpathians regarding forest structure and beetles?

**Hypothesis:**
- The diameter and the height of the trees increases from the forest edge along the transect
- Differences between pristine and young forest concerning species richness exist
- Beetle and tree biodiversity is highest at the edge
- The abundance of beetles and trees is increasing along the transect into the forest
- The number of trees and the number of beetles are interconnected

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**Methods**

- Transects lines perpendicular to the forest edges that adjoin meadows
- Transects with four plots each
- Three transect lines examined for analyzing forest structure and two for analyzing beetles
- Beetle parameters: number of specimen and species composition
- Forest structure parameters: diameter at breast height (DBH), tree height and species composition

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**Results**

- No coherent edge effect detected
- Big difference between primary and secondary forest concerning the species richness of the trees, the decline of tree species along the transect in the pristine forests is remarkable
- Biodiversity and abundance of beetles is not affected by the edge
- In transect 3 there is a linear increase in tree diameter
- Occurrence of beetles determined by effects like temperature, precipitation and bison scat

**References**

MOLNÁR et al. 2001: Ground beetles (Carabidae) and edge effect in oak-hornbeam forest and grassland transects. Éditions scientifiques et médicales Elsevier SAS
Impact of Land-Use on forest plant diversity

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Research question

How does land use intensity affect forest vascular plant species diversity and composition in Bieszczady Mountains?

Background

The Bieszczady Mountains are part of the Outer Eastern Carpathians and are located at the very south-east end of Poland, bordering Ukraine and Slovakia. The highest peaks have an elevation of 1450 m a.s.l.. During and immediately after World War II the region experienced a heavy demographic loss, due both to warfare and to dramatic historical events which included political resettlements, deportation and extermination. Even in the following decades the population continued to decrease due to political and economic insecurities. Existing villages and farmland were abandoned. This led to secondary succession and the expansion of forest. Some parts of these young forests are under current management, other parts experienced barely any human influence until today. This young forest is geographically contiguous to big patches of ancient forest, i.e. forest which was almost untouched even before the second world war. Due to these circumstances the Bieszczady Mountains host some of widest and best connected old and untouched forests in Europe.

Study design

- Three forest types (treatments):
  - YM - young managed forest
  - YUM - young unmanaged forest
  - PUM - primeval unmanaged forest
- Three 10x10 m random plots for each treatments
- Plant species composition and cover in three layers: tree, shrub and herb layer.
- Environmental parameters and general information: overall cover, average height of the three layers, dead wood cover, stoniness and rockiness, slope, exposition, altitude, basal area, canopy cover
- Soil samples (upper and the lower soil layer)

Results

Boxplots of the diversity indices (Shannon/Simpson) and species richness for the three treatments. The young forest has a higher species richness. The two diversity indices reported contrasting results: while the Shannon index returned a higher diversity in young forests, the Simpson index identified primeval forests as more diverse.
Species-Area-Relationships of butterflies, moths, and flowering plants in the Polish Carpathians

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Study site and methods

After sampling butterflies, moths, and flowering plants in a nested design we found:
- both SAR-curves show that in a given area the meadow has a higher species richness than the pasture.
- the pasture curves reach the saturation point earlier than the meadows

Discussion:
- grazing sheep lower the amount of flowering plants, less food supply for specific butterfly and moth species
- meadow is a better protected habitat for butterflies and moths: higher grass offers better protection for placing cocoons on grass stalks and better protection from predators

Results and discussion

Flowering Plants

Butterflies & Moths

References

Maciej Augustyn (2004): Anthropogenic changes in the enviromental parameters of Bieszczady Mountains. Biosphere Conservation 6 (1)