TRANSYLVANIA DISSERTATION/THESIS PROJECT

TRA-T04 Modelling species' distributions across taxa across Transylvania's grassland landscapes using GIS and remote sensing data

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Species distribution models (SDMs) allow us to address fundamental questions in ecology and conservation by allowing us to connect a species known occurrences to its environment (e.g. climate, topography, land cover, and landscape and vegetation metrics). These data allow us to create and validate a model for each species (e.g. using Maxent), producing a habitat suitability map that tells us how likely a species is to occur in a given location. We can then project how the distribution of that species might change as the environment changes. Students will have access to our extensive dataset that includes occurrence data, which have been collected annually for 2013 – 2019 for several taxa (birds, plants, butterflies, and small mammals), as well as environmental geospatial data. Students will also actively contribute to this dataset in the field. This project might focus on one taxon (e.g. birds), a group of species within a taxon (e.g. birds within a certain feeding guild or family), or multiple taxa (e.g. birds and butterflies), depending on interests and conservation relevance. The resulting models and maps provide key communication tools in the context of managing this changing landscape.

Recommended Reading

Fielding, Bell (1997) A review of methods for the assessment of prediction errors in conservation presence/absence models. Environmental Conservation 24 (1): 38–49

Guisan, Thullier (2005) Predicting species distribution: offering more than simple habitat models. Ecology Letters 8: 993–1009

Gusian, Zimmerman (2004) Predictive habitat distribution methods in ecology. Ecological Modeling 135: 147-186

Hirzel, Guisan (2002) Which is the optimal sampling strategy for habitat suitability modeling? Ecological Modeling 137: 331-341

Liu et al (2005) Selecting thresholds of occurrence in the prediction of species distributions. Ecography 28: 385-393

Pearson (2004) Modeling species distributions in Britain: a hierarchical integration of climate and landcover data. Ecography 27: 285-298

Preau et al (2018) Modeling potential distributions of three European amphibian species comparing ENFA and MaxEnt. Herpetological Conservation and Biology 13(1):91-104

Zimmerman et al (2015) Aliens in Transylvania: risk maps of invasive alien plat species in Central Romania. NeoBiota 24: 55-65