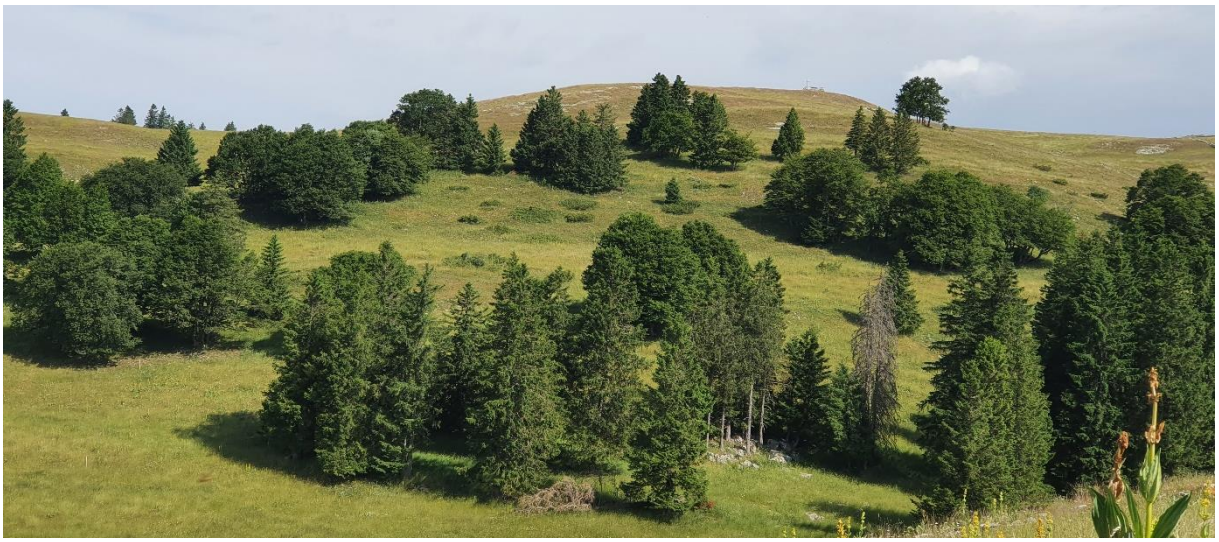
Biodiversity in wooded pastures of the Jura Mountain in Neuchâtel



Background:

Wooded pasture is a specific type of agroforestry system which may be defined as an assemblage of cattle grazed pastures and scattered trees or shrubs. In the Jura mountains of Switzerland, wooded pastures have a high value of biodiversity because of their richness in vegetation types influenced by irregular tree cover. Moreover, variation in trees attributes such as tree height, trunk diameter, crown surface, tree species etc. leads to structural heterogeneity, providing a wide variety of microhabitats and different types of resources for a range of taxonomic groups such as bird, bats, rodents, meso-mammals, amphibians, invertebrates and plants.

In the Jura mountain, wooded pastures are threatened by intensive agricultural practices and land abandonment. To persist, such systems need the right balance between cattle grazing pressure and tree regeneration rate. Too intensive grazing would lead to open pastures and inversely land abandonment would result in trees recolonization to a forested stage.

Being able to characterize environmental heterogeneity of wooded pastures and better understand how it relates to species diversity would help better plan conservation strategies of such ecosystems.

Research framework:

We are looking for motivated students that are interested in conservation, field work (vegetation inventories, animal monitoring) and topics such as environmental heterogeneity, biodiversity and GIS analysis.

In the context of an existing project that focuses on wooded pasture in the Jura of Neuchâtel, we propose the students to work on different characteristics of environmental heterogeneity within various wooded pastures sites. They will conduct vegetation surveys on the field and use new technologies such as airborne Lidar, drone and/or terrestrial laser scanner. Moreover, in our study system, we focus on bird and pollinators communities. The students would also have the possibility to choose one group and relate its diversity (taxonomic, functional…) to environmental heterogeneity.

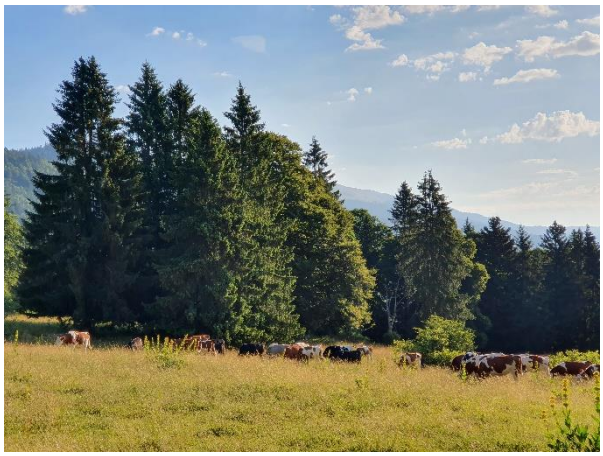
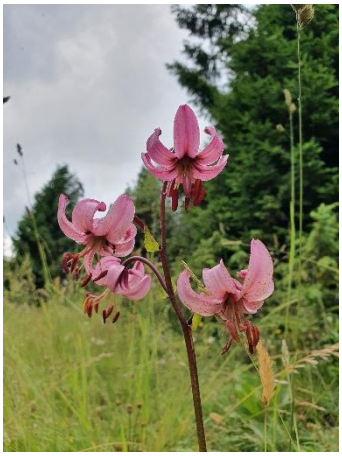
Proposed Master Projects:

- ***Microstructure diversity in wooded pastures***

  Using field survey, the student will characterize microstructures diversity in wooded pastures (shrubs, stump, rocky outcrop etc..) in the Jura of Neuchâtel. Moreover, the student could use a drone, airborne Lidar data or a terrestrial laser scanner to collect 3 dimensional data of the microstructure in order to evaluate the relationships between information derived from these new technologies and field-based monitoring.

- ***Vegetation diversity related to pollinators communities in wooded pastures***

  Using field inventories of indicator plant species, the student would characterize different vegetation types within the grass layer of wooded pastures in the Jura of Neuchâtel. He/She would then explore the effect of vegetation types on pollinators communities. To do so, he/she would also monitor pollinators on the field using Pan Traps and sweep net.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