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Effects of landscape evolution on flora and habitats in agricultural mosaics

Albert Palou Vilar

BETA Technology Centre (TECNIO network)

Project abstract

A landscape mosaic is a landscape that consist of various patches, inhabited by different habitat communities over time. Agricultural mosaics are a result of the long history between societies and the environment. The understanding of the driving forces for change in this landscapes, and their effect on biodiversity, allow the development of useful tools to assess and manage natural heritage. Plant diversity, endangered plant species and interesting habitats receive the center of attention, because of their capability to integrate and reflect the main changes of this landscapes after medium and long-term.

Objectives

1) Elaborate a theoretical framework and create a functional link between landscape patterns and flora.
2) Create a diachronic vegetation map of the Vic plain, analize the landscape trends and establish those socio-economic and climatic indicators that could be related to them.
3) Develop a model to hypothesize future landscapes under different scenarios.
4) Assess the evolution of interesting taxons of flora and habitats under the considered scenarios

Methodology / Materials

Diachronic vegetation maps of the Vic plain are being elaborated using information about actual vegetation, knowledge of vegetation dynamics and photointerpretation of historical aerial images. Three steps are being taken into consideration: 1956, 1985 and actual. These maps will permit to quantify vegetation changes, and also to identify key socio-economic indicators related with the evolution of this rural landscape, the basis for the development of a Markov chains and a Markov-CA models of future socio-economic and climatic scenarios. Distribution trends and menaces affecting taxons of interest under this scenarios will be calculated using the MaxEnt methodology. Plant composition changes in some communities will be analysed for the period 1985-actual, due to the possibility of re-survey phytosociological inventories.

1956   Actual

1985
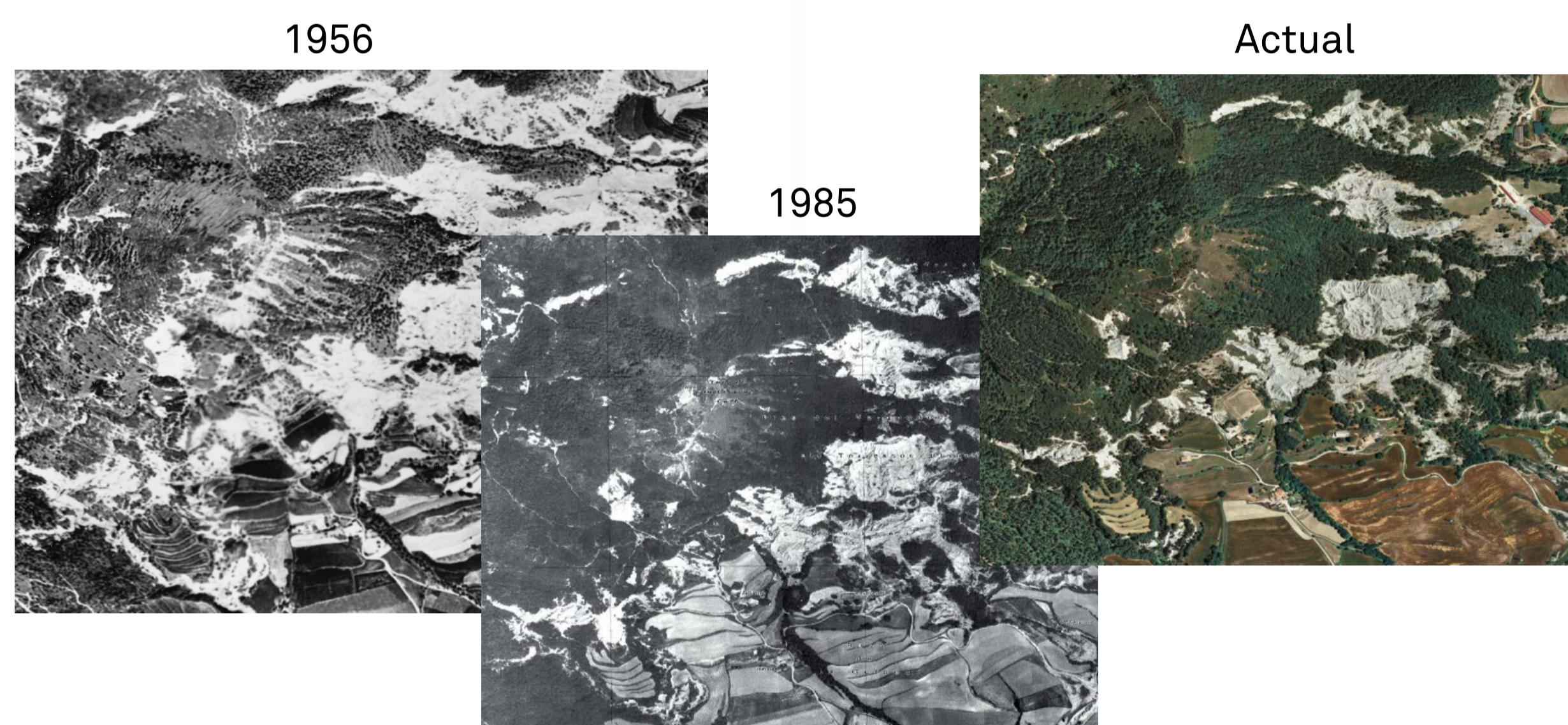
Findings / Research update

Some endangered taxons or interesting habitats could be found in the Vic plain. The first preliminary evaluations of vegetation change, focused in places where taxons of interest are located, show a high rate of conversion of mediterranean grassland communities to different sort of forest or shrub types.
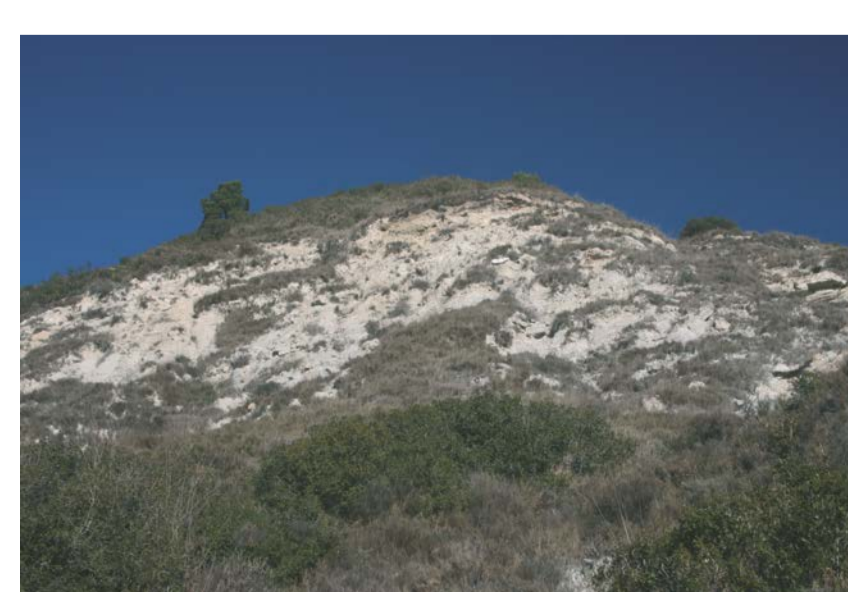
There is a high disparity between the population structure of this taxons, going from populations apparently without viability problems to other that seem to show the consequences of aging and isolation.

Limonium hibericum

Spiraea crenata subsp. *parvifolia*

Gypsum *communities*

Astragalus austriacus

Conclusions

The integration of landscape changes and indicators related to them will be useful to understand the evolution of other agricultural landscapes with similar characteristics.
Our agricultural mosaic have tended to a loss of complexity and a reduction of landscape units where many of the valuable floristic elements are located preferentially.
It will be necessary to understand if the regional planification could be compatible with the theoretical conditions that allow the best ecological and biodiversity standings in the Vic plain, and how to develop more scientifically based projections for this region.

Bibliography

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