



Agricultural Landscapes in East Europe as Reference Areas for Swedish Land Management

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Landscape changes and conservation efforts in West

In Sweden, as in many West-European countries, rural landscape has undergone large scale changes during the last decade. In the forested landscape dominating the Northern 2/3 of the country, almost the entire farming process has ceased. Most of the smaller farms have been abandoned or transformed into leisure houses, agricultural land has been planted with spruce forest, and forest grazing, which was previously common, has been banned in most areas. In the Southern agricultural landscape, farming is industrialized. Farms are large (often of hundreds of hectares), with large, monoculture fields, and little variation of crops.

Many natural grasslands and wetlands have been transferred into ploughed fields. Agricultural practices are highly mechanized, the use of fertilizers and pesticides is intensive, and livestock is sparse and largely kept indoors. One of the most obvious ecological effects resulting from this landscape transition is the dramatic reduction of the area of semi-natural grasslands – grasslands for grazing and mowing.

The present day agricultural system in Sweden is in many respects not sustainable. Biodiversity and ecosystem services are lost, and there is a leakage of nutrients, leading to eutrofication of lakes and seas. Moreover, many cultural values of the landscape are lost, and the created landscape view is less attractive, therefore decreasing the tourism potential of the areas.

The Swedish authorities are concerned with the loss of biodiversity and cultural historical values, and are trying to deal with the problems by preserving what is left of the pre-industrial landscape and re-creating lost values. For example, large efforts are engaged into conserving the small remains of traditionally managed habitats, such as wetlands and semi-natural grasslands, partly to preserve the flora and fauna linked to the agricultural landscape. Much of the agri-environmental subsidies (from the EU and from the Swedish state) are directed to such preservation.

Detailed action plans for threatened species are developed. Other important targets for preserving the cultural heritage from traditional farming are the buildings, the fences, the old cattle trails, and the stone-mounds.

Restoration of wetlands, semi-natural grasslands, pollard trees, and other rare habitats receive a lot of attention, as well. There are many prominent examples of Swedish landscape restoration projects; some of them that worth mentioning are the agricultural landscape of Southern Öland (presently a Unesco World Heritage, were agricultural subsidies very efficiently have been directed to benefit of environmental preservation), the Bråbygden region (were a local landscape restoration initiative has formed a basis for a positive rural development), and Lake Hornborgasjön (were restored grazing and water regimes has significantly improved its value to the birdlife, and the lake is visited by several thousands of tourists each year).

The Swedish agri-environmental subsidies total some 400 million Euro annually. Many landscape restoration project budgets range up to millions of Euro. The total value of all preservation and restoration efforts in Sweden is not known but it should sum up to billions of Euro.

However one problem in preservation and restoration is that we have only a vague idea of the original state of the traditionally managed landscape of Sweden. The present contents of the landscape, such as the distributions of species or ancient remains, give us some clues. Historical sources – maps, pictures, written information – are also important in this respect. Studies of agrarian history have received much attention among preservationists, and have grown into a scientific discipline itself, but it has its obvious limitations.

Romania as a reference

In Romania, and some of its neighbouring countries, vast areas in mountain regions still have intact, traditionally managed agricultural landscapes, with biodiversity and cultural values that are outstanding as comparing to the international situation. Such landscapes may serve as reference for Swedish preservation and restoration efforts, in addition to agrarian history studies.



Figure 1. Set of images from Romanian rural landscape.

Preliminary studies indicate that the small scale farms in mountain areas of Romania are managed in similar ways as the pre-industrial farms in Sweden. For example, live stock systems, harvesting methods, crop rotation, and land owning structures are similar. At higher altitudes in the Carpathians, the environment and vegetation is largely similar to those in Sweden, and the species pool of flora and fauna is overlapping to a large extent. Many species linked to the agricultural landscape that are red-listed in Sweden appear to be in large populations in Romania.

Hence, the areas of Romania could be studied to better understand Swedish landscapes and Swedish history. Particularly, the following aspects are of interest:

- harvesting methods and dynamics;
- extent and ecology of semi-natural grasslands (hay-fields and pastures);

- population ecology of species that have previously been common in Sweden, but now they are rare;
- transhumance and shepherding systems;
- grazing in alpine environments (frequency, structure, and its effects on vegetation);
- tree management on agricultural land (pollarding and coppicing of trees, the resulting vegetation structure);
- occurrence and use of farm buildings and fences;
- occurrence and nature of cultural remains;
- occurrence and preservation of local breeds and autochthonous crops;
- traditional knowledge of the natural resources use;
- systems for the inheritance and owning of land, and its effects on land management.

One current example: Population ecology studies of grassland plants and beetles

Restoring declining populations of threatened species require detailed knowledge about several aspects of the species and its environment. For species in the agricultural landscape, some examples are:

What method of management?

What timing of management?

Is there a time variation?

Are there any effects of fragmentation?

Are there any effects on small-population?

Is there an interplay with the surrounding landscape?

Our sources of knowledge are often limited. We can describe the remnant populations in Sweden in order to perform deficit analyses. We must however acknowledge the risk of reaching the wrong conclusions because the studied populations are small, fragmented, and often appear in suboptimal and untypical habitats.

Experimental manipulations may provide additional information, but they are not always possible to perform because of the small population sizes.

Historical data may inform us about the species' environment in the previous landscapes, i.e. before the decline, but most historical sources contain rather few ecologically relevant data.

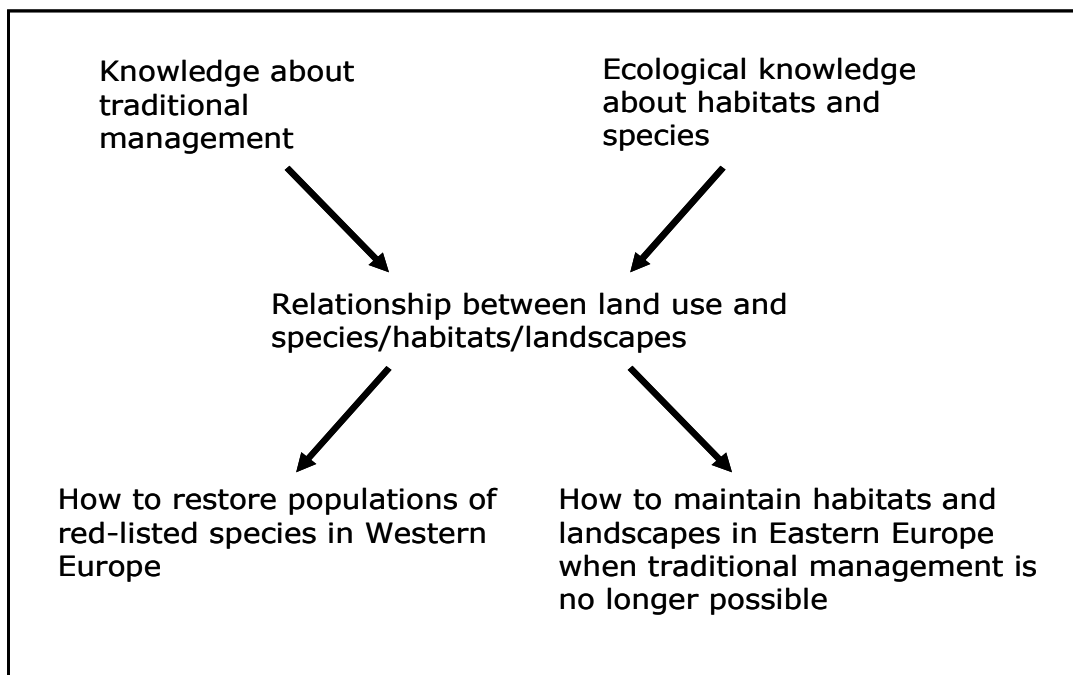


Figure 2. Relationship between land use and species/habitats/landscapes.

Instead, we may turn to landscapes in which the species are still common, and in which they can be assumed to appear in their original habitats. Such reference landscapes for Swedish red-listed species are found, for example, in Romania. As a pilot project we have started to study five red listed Swedish species using this approach: *Gentianella* spp., the tortoise beetles *Cassida murraea* and *C. ferruginea* (feeding on *Inula*), the butterfly *Parnassius mnemosyne* (feeding on *Corydalis*), and the longhorn beetle *Plagionotus detritus* (living on oak). For the *Gentianella* species, for example, it seems clear that the Romanian landscape can fill most of the gaps in our knowledge about the most important relationships between the species and the management of its habitats.

By collecting ecological data about the species and its habitat along with information about traditional management of the habitat, we can analyse the relationship between the land use and the landscape, habitats, and species. These results can be brought back to Sweden to help us restoring populations of the declining species.

The results are, however, also important for the management of the Romanian nature. If the ongoing traditional land use will change in the future, it is necessary to know which aspects of the traditional farming we need to keep, in order to avoid similar losses of biodiversity as we have experienced in Western Europe.

An asset for development

In addition to the value as a reference, the traditionally managed landscapes in Romania are an important component of the European cultural and natural heritage, and therefore have a value themselves. The international importance of the traditionally managed landscapes should be considered as an asset for development, both at a local scale and all over Romania. Both the international attention and potential international funding could be important for the rural development. The agri-environmental support from the EU will be important in this respect, as well. The development of the rural eco-tourism and cultural tourism are obvious opportunities, while the export of certified organic products is another possibility. There are options for further innovative solutions based on local initiatives. This unique potential of rural Romania must be emphasized in international negotiations.

Scientifically, there is a need for knowledge exchange programmes, where to Swedish professionals are given the opportunity to visit and study the Romanian landscapes, and *vice versa*. Such bilateral studies would give important new insights for researchers and land managers about how to deal with their daily work, and new ideas for research and management projects. The Swedish Biodiversity Centre, together with a network of Swedish county administrations, universities, and KSLA, are presently developing collaborations with universities of Timișoara, Arad and Cluj, to establish such knowledge exchange and joint research programmes.