

MIRABEL Models for Integrated Review and Assessment of Biodiversity in European Landscapes: Land abandonment

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Example 3: Land abandonment

Definition

Change in land use from traditional/recent practises to less intensive use (Baudry 1991).

Methodology

We attempted to predict vegetation change empirically from a knowledge of the mechanisms of succession taken from the scientific literature. We used level 3 EUNIS habitat types as the basis for describing vegetation. Data from Natura 2000 sites and Corine biotopes was used to quantify the location and amount of habitat that could be threatened by land abandonment.



Factors that affect succession pathway and rate

Physical factors
Soil/nutrients
Climate
Relief/geomorphology
Altitude
Natural disturbance/fire
Water availability
Time
Management
Planned afforestation
Fertilisers
Grazing
Field margins
Type of agricultural habitat
Pattern of abandonment
Landscape
Initial composition
Landscape context
Vegetation
Past vegetation
Litter cover
Sward height
Species
Dispersal strategy
Regeneration strategy

Atlantic

Pressure
Low risk of abandonment. Small scale- fragmented units. Marginal land e.g. uplands in Britain, wetlands in Netherlands.

Impact
Cessation of grazing leads to dominance of tall grasses then scrub invasion. Climax vegetation is woodland. Heathland is also an important component, invaded by scrub when grazing removed.

Mediterranean

Pressure
High risk of abandonment. Low profitability of agricultural activities, small size of farms and ageing populations.

Impact
The successional pathway does not necessarily go to woodland. It frequently stops at scrub/shrub because of the lack of water, temperature and stability of the shrub layer. Re-establishment of Mediterranean forest is possible under the right conditions. Abandonment of dehesas leads to overaging of oaks and lack of regeneration. A major impact of land abandonment in the Mediterranean is fire due to the increased availability of flammable shrubs. This leads to the promotion of fire-resistant shrubs and lowers diversity.

Alpine

Pressure
Abandonment focused on the high mountains areas, Vosges, northern Alps, Corsica, Pyrenees. Widespread abandonment of unprofitable meadows in Slovakia.

Impact
Scrub development and forest. Vegetation changes take place more slowly as because of higher altitudes and variable temperatures. Vulnerable region to abandonment, losses of diversity have been shown.

Boreal

Pressure
Variable. Small scale abandonment of marginal habitats in Denmark and Finland, greater impacts in semi-natural grasslands in Latvia and Estonia. Afforestation is commonly associated with abandonment.

Impact
Cessation of grazing on grasslands leads to scrub invasion and woodland. Heathland is an important component. There are more wet habitats which may be impacted by abandonment than in other regions. Intentional afforestation impacts on diversity particularly of species associated with open habitats.

Continental

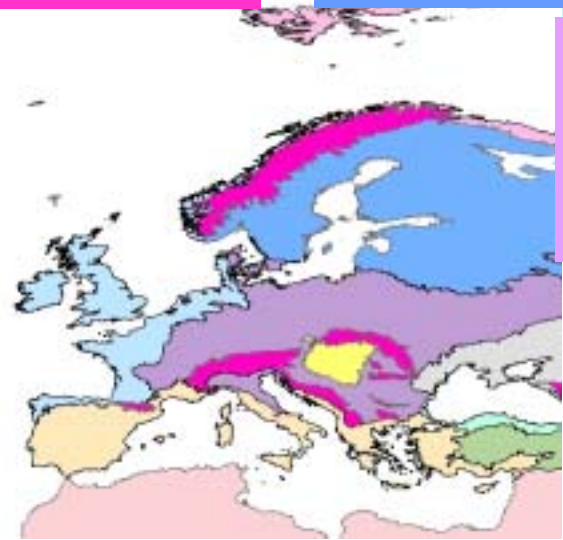
Pressure
Land abandonment is prevalent in former communist countries (Czech republic, Bulgaria, Romania). Post communist land and agrarian reforms have led to de-collectivising and restructuring.

Impact
Complex successional pathways. Many habitat types in this region because it covers a large geographic area and range of habitats. Scrub encroachment and then forest with a loss of diversity of specialist species.

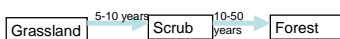
Pannonian

Pressure
During the past two decades in Hungary thousands of hectares of arable fields have been abandoned. Some are on protected areas some on lands with marginal productivity.

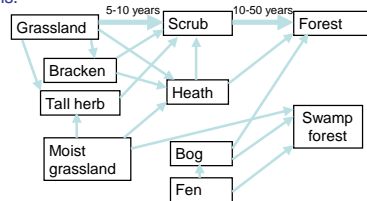
Impact
There was not much information available on successional pathways. There are less EUNIS habitats because the Pannonian region is smaller, habitat complexity has reduced. There are rare habitats rich in endemics that may be at risk of diversity loss from abandonment.



Basic successional pathway after grassland abandonment

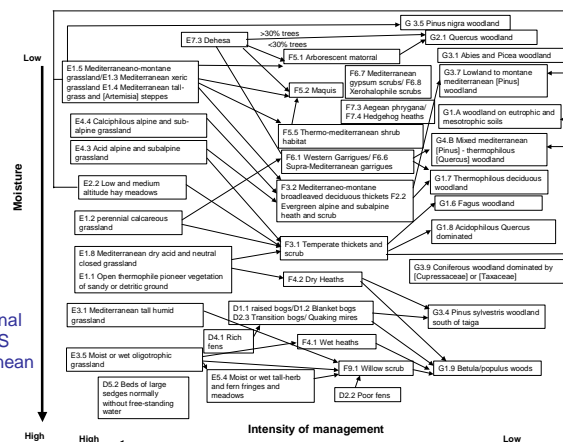


Successional pathway after grassland abandonment showing alternative pathways and demonstrating the influence of moisture levels.



More complex successional pathways between EUNIS habitats in the Mediterranean region

Successional pathways in the Mediterranean region



Gaps in knowledge

Pressure

More information is needed on the complex process of land abandonment.

Indicators to determine the distribution of abandonment at the landscape scale are required.

State

More information on habitats is needed particularly for accession countries. We have only looked at protected habitats. There is a need to have uniform data on species and habitats at the same resolution across Europe.

Impact

A lot more work is required on successional pathways in different habitat types. There are very few studies at sufficient temporal and spatial scales to predict vegetation changes, particularly in the Boreal, Continental (including many accession countries) and Pannonian regions. Studies were available on a limited number of habitat types, this needs to be expanded to include many more habitats that can be identified using a common classification such as EUNIS.

Response

The character and impacts of land abandonment vary so much between regions that there is no one common response. Improved integration of information on pressures, and impacts will enable better decision-making.