

Romania – Frasin case study

Case study forest area: 10,500 ha

Ownership: 60% public, 40% private

Forest goods and services:

Timber, fuel wood, carbon sequestration, biodiversity, non timber forest products, hunting grazing, fishing, berries and mushrooms tourism, conservation

Special local conditions:

The restitution of forests to heirs of pre-war owners between 1991 and 2005 as well as privatisation of wood harvesting, transport and processing sectors had a big impact on the development of the forest sector and forest management.

Stakeholders

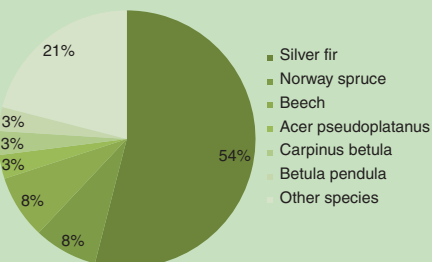
Private forest owners associations (Association of Private Forest Owners of Romania and Association of Forest and Mountain Owners). There are also three trade associations which officially represent most of the forest logging and wood industry operators: The Association of Romanian Foresters (ASFOR) the Association of Romanian Furniture Producers (APMR) and the Association of Romanian Pulp and Paper Producers (ROMPAP)

Management and governance issues

The same forest management legislative structure (Forest Code, 2008) is applied to private and public or communal forests. It outlines the rules regarding administration, forest management planning, forest regeneration, harvesting, protection and legality of timber harvesting and transportation.

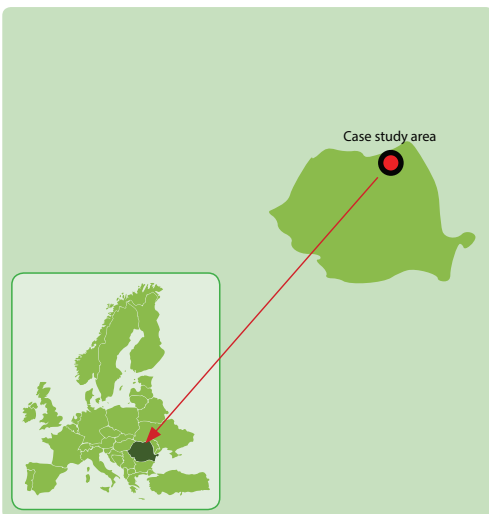
The main principle of the Forest Code is that forest owners need to manage their forests via the agreed state administration. The main instrument for joint-decision making is the forest management plan. Without such a plan, private owners cannot harvest their forests.

Proportion of species of Frasin



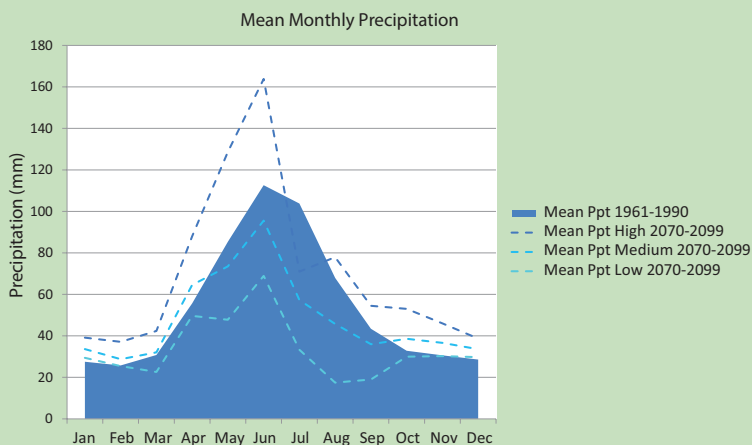
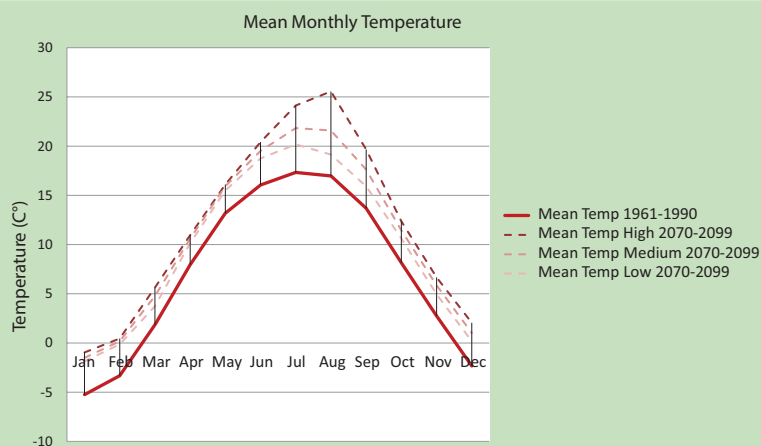
Aspect from an actual uneven-aged mixed stand in Frasin forest.

Photo: Gabriel Duduman



Climate change challenge

The current humid climate brings harsh winters and cool summers, and a moderate regime of air temperature fluctuations. The Frasin climate is predicted to be warmer and higher variations in temperature and rain regime are expected. The Norway-based spruce forests from Frasin will suffer more frequently from drought, insect damage (*Ips typographus*) and windthrow.



The predicted climate evolution will effect biomass volume and diversity of future forests. Depending on climate scenario used, Norway spruce may decline or even disappear while new species which are more thermophilic, such as larch, pine and maple may come to dominate in the future in the Frasin forests.



Photo: Mihai Leonard Duduman.



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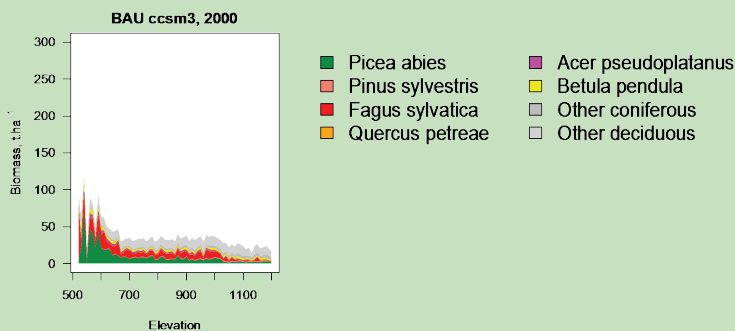
Natural drivers may lead to major disturbances in the forest ecosystem if nothing is changed in the current forest management approach. The difficulties encountered today by forest owners and managers to maintain economically viable forest management may encourage a trend towards unsustainable practices in future.

In case of disturbances, the projected temperature increase will become a handicap for Norway spruce regeneration. The photo shows a 15-year old windthrow.

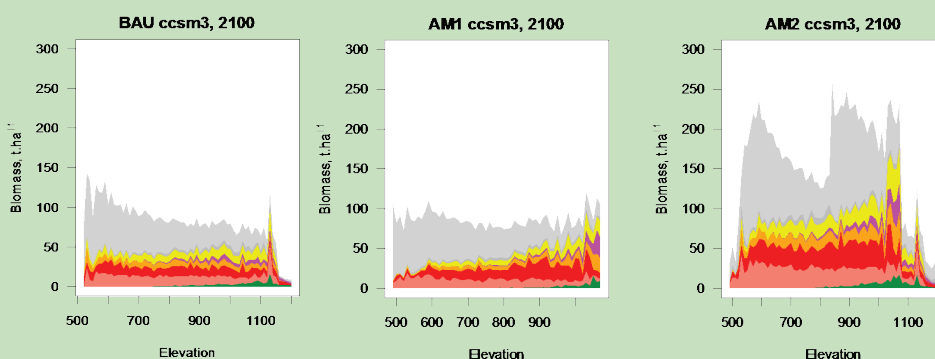


Photo: Olivier Bouriaud.

There may be changes in the forest species composition as forest managers are looking at the regeneration of existing stands. Species diversity will increase, and Norway spruce will be less dominant. New forest species which are more thermophile, such as larch, pine and maple may come to dominate the Frasin forests. The share of broadleaves in general, and pioneer species in particular, is expected to increase at elevations higher than 600 m.



Growing stock in t ha^{-1} at different elevations in the year 2000 for Norway spruce (*Picea abies*), Scots pine (*Pinus sylvestris*), beech (*Fagus sylvatica*), oak (*Quercus petraea*), Sycamore maple (*Acer pseudoplatanus*), birch (*Betula pendula*) and other coniferous and deciduous species.



Growing stock in t ha^{-1} at different elevations for the year 2100. Three management strategies were used, BAU, AM1, AM2. Both adaptive management scenarios will produce higher timber volumes and higher biodiversity than BAU management. They are based on a strategy of saving water: more intense and more frequent thinning is combined with the reduction of the rotation length from 120 year (BAU) to 110 years (AM1) and to 100 years (AM2). The greater biomass predicted by AM2 is due to the intensive thinning proposed and also because a high share of the biomass is represented by pioneer species such as birch. This climate change scenario predicts that Norway spruce will only persist at higher elevations and will be replaced by Scots pine (*Pinus sylvestris*) at lower elevations.

Conclusion

Expected climate change will influence the species composition towards less coniferous trees. Adaptive management, which involves intensifying the harvests, will amplify this trend. This change in species may significantly affect forest owners' revenues. The forecasted species shift will impose a change in management practices. The climate has more influence on the species composition and forest standing biomass at this location than management practices.