The current state of silvo-pastoral habitats in Estonia

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The silvo-pastoral habitats in Estonia are mainly related to an old traditional extensive agriculture with species rich meadows and pastures and single or group of trees.
These heritage communities are ecologically very valuable and therefore nowadays the silvo-pastoral habitats are in first order protected areas with related management system. Therefore, the first priority to conserve these systems is the protection of biodiversity.
Because of labour-intensive cultivation, small areas and segregated location, these areas were not cultivated during last 50-60 years and most of them are overgrown and valuable habitats disappeared.
The most valuable silvo-pastoral habitats in Estonia are wooded meadows and pastures. They are species rich semi-natural grasslands with single trees like oaks, birches, ash trees and others.
This habitat depends on extensive agriculture, involving integrated grazing, mowing and management of the trees. In this respect they are similar to montados and dehesas and have comparable problems in their maintenance.
They are very old (at least 1000 years) traditional communities and very suitable agricultural systems for Estonian conditions. They are comparable with similar ecosystems in Scandinavia, which are designated as Annex One habitats.
The wooded meadows have very high species diversity, the number of vascular plants have been found up to 76 species per m², often 50-60 species per m². There are growing 30% of protected species in Estonia, e.g. Orchids. But there is also high diversity of mosses, fungi, insects, birds.
The reasons for high diversity:

• the continuous grazing/mowing;
• mosaic environmental/landscape conditions;
• high Ph, calcareous soils;
• well balanced soil conditions;
• gene pool of species;
• well balanced human impact.
Diversity of butterflies

Procentage of forest in 250m distance

$\text{Diversity of bumblebees}$

$r = 0.43$

$p = 0.047$

$r = 0.62$

** $p < 0.01$
Relationships between the local abundance of bumblebee species and the studied landscape characteristics at various spatial scales based on the Spearman rank correlation coefficients. The width of the circle describes the strength of the relationship, the colour determines the direction of the relationship (black circles correspond to positive relationships and white circles to negative relationships).
If traditional management ceases, then they overgrow and become forests.
At the beginning of 20th of century the area of wooded meadows was 850 000 ha (18% from whole territory of Estonia).
Nowadays about 8500 ha can still be considered as wooded meadows, however, the real cultivation is taking place on less than 1000 ha (0.1%). The wooded meadows are the most vulnerable and lost habitats and landscape types in Estonia.
Therefore, the key is management
and restoration...
The other most important habitat, also within the Annex One series, are the unique grasslands growing on the hard limestones. They are mainly present in Western and Northern Estonia. These are termed Alvars and have very shallow calcareous soils (less than 30 cm) with much bare rock. For many centuries they were managed as pastures with variable densities of juniper (*Juniperus communis*).
Alvars are most of the year very dry, soil layer is thin but fertile (high humus content), they have very diverse (up to 50 species per m²) specific plant communities, plants from mountainous regions, steps, tundra.
Once the grazing goes below a certain level, the juniper bushes and pines colonize rapidly, turning the grasslands into dense scrub with low biodiversity.
In the 1930-s the area of Alvars reached 43 000ha. Nowadays about 3000 ha (7%) is left as Alvar community.
The best management can be done by sheep
Some positive news:

These areas are mostly under protection as Habitat Directive (Natura) sites.

Because of additional support, there is rather high interest for renting these areas for grazing and mowing.

Large EU Life project for restoration Alvars on 2500 ha.
Habitat Directive sites rented for grazing in Matsalu National Park
Conclusion:

A detailed understanding is required of the management procedures necessary to maintain biodiversity, involving not only a knowledge of the domestic stock but also an appreciation of the ecological requirements of the species concerned. An integrated approach is therefore needed between the farmers who own the sheep, the landowners and the conservation agencies.
Thank you!