E7.2 Hemiboreal and boreal wooded pasture and meadow

Summary

These are open wooded landscapes of the lowlands, foothills and mountains of the boreal zone, traditionally managed for grazing, hay-making and woodland products, mainly by pollarding. Diverse very open canopies of broadleaved and coniferous trees, including veterans, often with few or no associated shrubs, occur scattered over pasture and meadow vegetation. Long traditions of complex interactions and cultural associations made these landscapes both dynamic and distinctive and the biggest threat is dislocation of management of the different elements of the landscape, abandonment which permits encroachment of shrubs and extension of tree cover, afforestation and urbanisation. Losses in extent and degradation of quality have been enormous and the condition of remaining wooded pastures and meadows are still deteriorating rapidly, especially for the most valuable examples where grasslands are maintained by mowing. Conservation management should focus on the maintenance of traditional use or on reintroducing new ways of mowing and grazing. Old trees should be protected as they provide habitat for many rare epiphytic cryptogams. Less damaged example can have a high capacity to recover if mowing, grazing and tree management is reintroduced but, if untouched, there is no regeneration as areas turn quickly into forest.

Synthesis

The habitat is Critically Endangered (CR) as both quantity and quality decreased by >80% over the last 50 years.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
CR	A1, C/D1	CR	A1, C/D1

Sub-habitat types that may require further examination

The habitat includes a variety of mosaic habitats. A main division would be in wooded meadows versus wooded grasslands, with the former being even more threatened than the latter. Alternative subdivisions are possible, for example based on deciduous or coniferous tree layer. It is likely that regardless of a further subdivision, all subtypes are extremely threatened.

Habitat Type

Code and name

E7.2 Hemiboreal and boreal wooded pasture and meadow
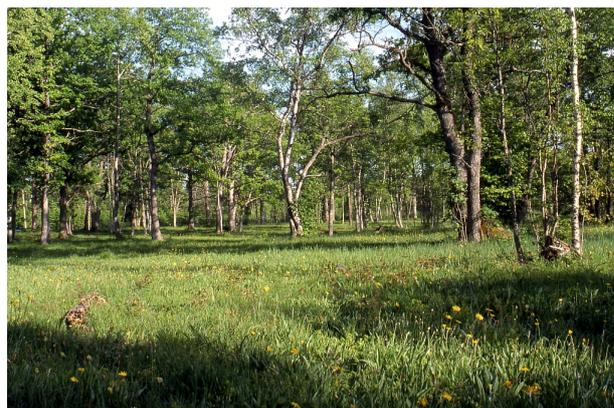
Habitat description

These are open wooded landscapes of lowlands, hills and mountains of northern Europe, created and maintained to a significant degree through traditional grazing, hay-making and woodland (tree) management, mainly by pollarding. Variation in land use and disturbance regime as well as in their abiotic environment make wooded pastures very diverse and dynamic. The species composition and structure are strongly influenced by the conscious management by the owner/herder. Traditional wooded pastures express part of the local social and economic history and are therefore of considerable cultural significance and are considered as high nature value farmland areas. These are threatened by various factors, most of them related to land-use change (abandonment due to lack of grazing or hay-making, and tree cutting because of CAP rules, e.g. trees with higher than 3 meter crone diameter are not regarded as pasture).

The hemi-boreal and boreal wooded pastures and meadows occur in Fennoscandia and in Estonia. They are grazed mainly by cattle and sheep. The type also includes (particularly in Finland) deciduous forests established after slash-and-burn cultivation, that was a characteristic feature of the former land use in Finland. Wooded meadows were once abundant in northern Europe. The most common type of the wooded meadows are *Kratt* wood and deciduous leaf meadows. Wooded meadows are among the most diverse habitats of Europe. Some of the current wooded meadows in Estonia are amongst ecosystems with the world record in plant species diversity (up to 76 species of vascular plants on a square meter). However, not all occurrences of the habitat type are particularly rich in species.

Characteristic plant species of the canopy layer include *Betula* spp., *Quercus robur, Fagus sylvatica, Tilia cordata, Alnus incana, Corylus avellana* and conifers (*Pinus sylvestris, Picea abies*). The canopy cover typically varies between 10 and 35 %, and in the field layer meadow-like vegetation is more abundant compared to forest vegetation. Old, large oaks also occur in some pastures. Typically the shrub layer is missing or scarce, but *Juniperus communis* is rather common. Dominant plant species of the herb layer include graminoids like *Agrostis capillaris, Deschampsia* spp., *Festuca ovina, Luzula campestris* and *Poa pratensis*, and herbs like *Alchemilla* spp., *Fragaria vesca, Geranium sylvaticum* and *Trifolium repens*. The species composition is a mixture of meadow and forest species and therefore includes also many fringe species. Typical forest species are among others *Vaccinium myrtillus, Anemone nemorosa* and *Maianthemum bifolium*. Epiphytes may form an important added value, especially if there is oak, ash, elm or maple present among the trees.

Indicators of quality:

High presence and abundance of old-growth, veteran trees; Presence and abundance of epiphytes lichens; Forest regrowth, shrub encroachment, forest succession decrease the quality through the loss of the typical physiognomy; No land-use abandonment (e.g. high enough grazing pressure); No land-use intensification (e.g. too high livestock densities or fertilization); No spread of any non-native species from planted stock or naturally invasive sources.

Characteristic species:

Trees/shrubs: *Alnus incana, Betula* spp., *Corylus avellana, Fagus sylvatica, Fraxinus excelsior, Juniperus communis, Pinus sylvestris, Picea abies, Quercus petraea, Tilia cordata, Ulmus glabra, U. minor*

Understorey: *Ajuga pyramidalis, Antennaria dioica, Campanula rotundifolia, Fragaria vesca, Luzula campestris, Succisa pratensis, Veronica officinalis , V. chamaedrys*

Epiphytic bryophytes: *Diplotomma alboatrum, Gyalecta ulmi, Homalothecium sericeum,Lobularia pulmonaria, Orthotrichum stramineum, Ramalina* spp*., Sclerophora* spp*., Usnea* spp*.*

Classification

This habitat may be equivalent to, or broader than, or narrower than the habitats or ecosystems in the following typologies.

EUNIS:

X09 Pasture woods (with a tree layer overlaying pasture)

EuroVegChecklist:

Wood pastures and wooded meadows have been rarely described as phytosociological units. This habitat is related among others to alliances of the orders *Quercetalia roboris*, *Fagetalia*, *Vaccinio-Piceetalia*, *Salicetalia albae* and P*ino-Juniperetalia*

Annex 1:

6530 Fennoscandian wooded meadows

9070 Fennoscandian wooded pastures

Emerald:

X09 Pasture woods (with a tree layer overlying pasture)

MAES:

-

IUCN:

-

Does the habitat type present an outstanding example of typical characteristics of one or more biogeographic regions?
Yes

<u>Regions</u>
Boreal

<u>Justification</u>
The habitat is an outstanding – but disappearing – example of traditionally managed landscapes in the Fennoscandian region.

Geographic occurrence and trends

EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Estonia	Present	58 Km^2	Decreasing	Decreasing
Finland	Finland mainland: Present	34 Km^2	Decreasing	Decreasing
Latvia	Present	11.6 Km^2	Decreasing	Decreasing
Lithuania	Present	12-15 Km^2	Decreasing	Decreasing
Sweden	Present	696 Km^2	Decreasing	Decreasing

EU 28 +	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Norway	Norway Mainland: Present	500 Km^2	Decreasing	Decreasing

Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
EU 28	1317050 Km^2	4024	813 Km^2	
EU 28+	1317050 Km^2	4024	1313 Km^2	AOO and EOO lack Norwegian data

Distribution map
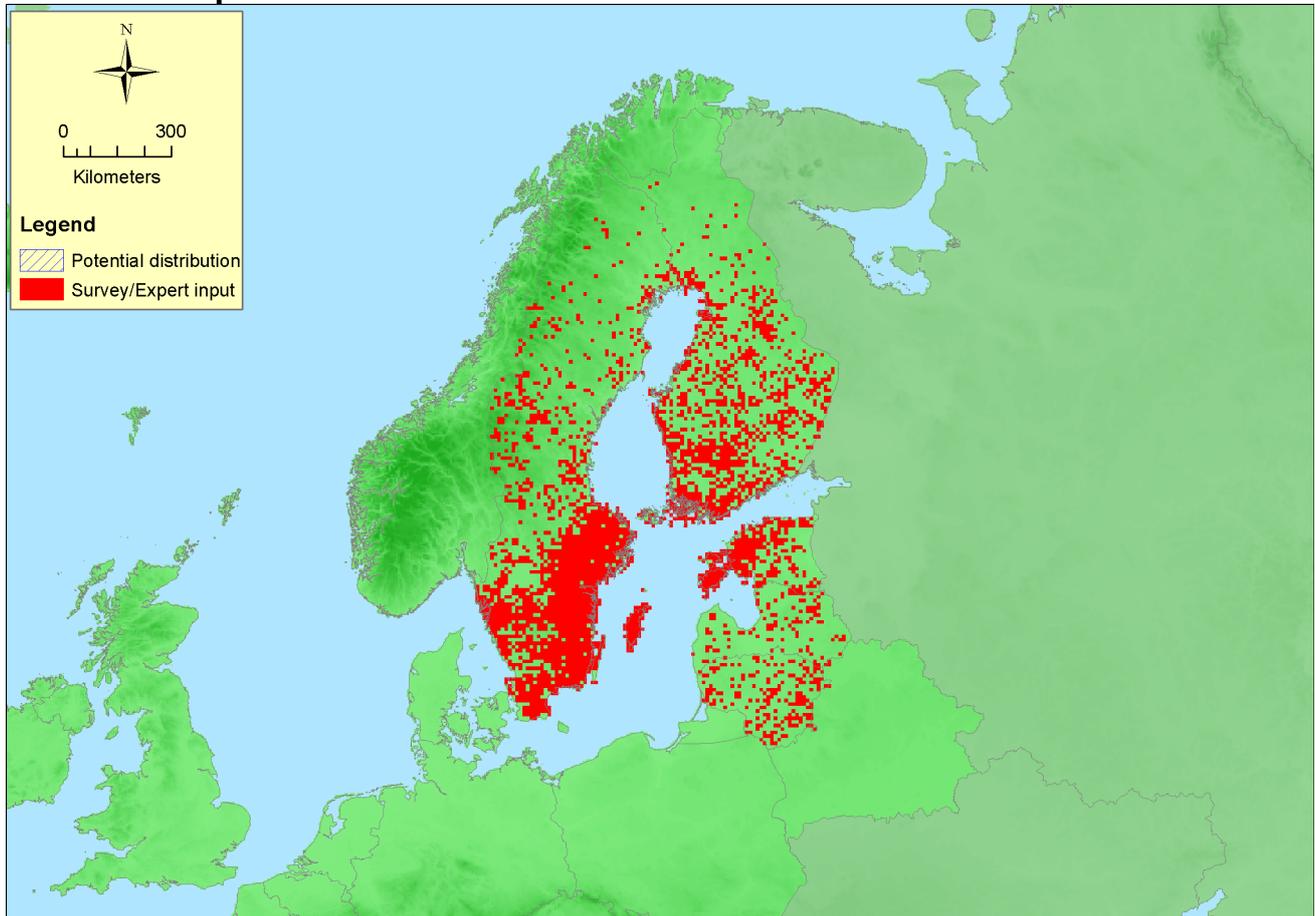
Map is rather complete for EU28, but misses data for Norway. Data sources: Art17, AGFOR.

How much of the current distribution of the habitat type lies within the EU 28?

50-90%. It is unknown how large areas exist in Russia and Belorussia.

Trends in quantity

The decrease is very severe, about 93% for EU28. Norway may have a smaller decrease but no reliable data were reported. Sweden provided no data on decrease. Most probably decreasing will continue, but several initiatives have started that could stabilise the area or even restore some area.

- Average current trend in quantity (extent)
  EU 28: Decreasing
  EU 28+: Decreasing
- Does the habitat type have a small natural range following regression?
  No
  Justification
  Within the hemi-boreal and boreal region, the habitat is widespread.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?

No

Justification

The habitat may occur in large patches. Even though it has been reduced to small sites and a small amount of sites, this is not due to a restricted potential distribution.

Trends in quality

Extent of degradation: 90% Severity of degradation: 80%. Most stands that existed 50 years ago lost their good quality. The whole area of this habitat which is not managed is regarded as degraded plus areas which are managed are also partly degraded. 2015-2020 small part of presently degradated habitat area will be managed and increase in quality, but the most part will further degrade (abandonment), at the moment managed area probably moves toward to Favourable conservation status.

- Average current trend in quality
  EU 28: Decreasing
  EU 28+: Decreasing

Pressures and threats

The biggest threat is abandonment, which causes forest enchroachment and may provoke afforrestations. In some areas urbanisation is an increasing pressure. The conditions of remaining wooded pastures and meadows are deteriorating rapidly, especially for the most valuable wooded grasslands, those maintained by mowing, as only very few such stands are maintained. Wooded grasslands used for livestock grazing are still under active management to some extent, although the management practices have changed and consequently also the effects on associated biodiversity.

In wooded meadows, pollarding is a laborious practise of managing and therefore difficult to organise. In practise only wooded meadows in national parks or in other nature reserves are managed and even there the management is not always traditional. Nowadays the tree stand in wooded pastures is more even-aged, younger and dense, because the areas are managed according to standard instructions which are used in modern silviculture. Especially old trees and decayed tree trunks have declined in wooded pastures. Overgrowing has led to a situation where open meadow patches are small in area and the vegetation and species composition has changed. Stock feeding and grazing in contact with grass fields increases even more overgrowing process.

List of pressures and threats

Agriculture

Abandonment / Lack of mowing
Abandonment of pastoral systems, lack of grazing

Sylviculture, forestry

Forest planting on open ground (native trees)

Urbanisation, residential and commercial development

Urbanised areas, human habitation

Natural biotic and abiotic processes (without catastrophes)

Biocenotic evolution, succession

Conservation and management

Wood pastures and wood meadows have a combined exploitation system. Modern agriculture has started to erode these habitats as they are not so productive in the short term. Conservation management should focus on the maintenance of traditional use or on reintroducing new ways of mowing and grazing. Old trees should be protected as they provide habitat for many rare species.

List of conservation and management needs

Measures related to agriculture and open habitats

Maintaining grasslands and other open habitats

Conservation status

Annex I:

6530: BOR U2, CON U2

9070: ALP U2, BOR U2, CON U2

When severely damaged, does the habitat retain the capacity to recover its typical character and functionality?

The habitat has a high capacity to recover if mowing, grazing and human (tree) management is reintroduced. If abandoned, there is no regeneration as areas turn quickly into forest. For extremely species-rich examples of the habitat it may take a long time to recover, as the diversity is the result of a long-term stable management.

Effort required

10 years	20 years	50+ years	200+ years
Through intervention	Through intervention	Through intervention	Through intervention

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-93 %	unknown %	unknown %	unknown %
EU 28+	-90 %	unknown %	unknown %	unknown %

The habitat decreased more than 90% in area in the last 50/200 years in Finland, Estonia, Latvia and Lithuania, together covering about 14% of the EU-area and less of the EU28+ area. It is expected that the situation in the other, larger part of the range (Sweden, Norway) is similar. This value leads to the category Critically Endangered. The future is uncertain, as it depends on management incentives. Long-term trends are unknown, but a decline of more than 90% is likely.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50000 Km^2	Yes	Yes	No	not yet available	Yes	Yes	No	No
EU 28+	>50000 Km^2	Yes	Yes	No	not yet available	Yes	Yes	No	No

Even though there are negative trends and threats, the habitat scores Least Concern, because the EOO and AOO are (still) much higher than the thresholds for criteria B1 and B2, and the habitat is present in

many locations.

Criterion C and D: Reduction in abiotic and/or biotic quality

Criteria C/D	C/D1		C/D2		C/D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	90 %	80 %	unknown %	unknown %	unknown %	unknown %
EU 28+	<90 %	?? %	unknown %	unknown %	unknown %	unknown %

Criterion C	C1		C2		C3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %
EU 28+	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %

Criterion D	D1		D2		D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	unknown %	unknown%	unknown %	unknown%	unknown %	unknown%
EU 28+	unknown %	unknown%	unknown %	unknown%	unknown %	unknown%

Of the remaining stands more than 90% are severely degraded, due to improper or no longer management. This leads to the category Critically Endangered. Again, the data is based upon a small part of the area, but it is expected that the situation in the other, larger part of the range (Sweden, Norway) is similar.

Criterion E: Quantitative analysis to evaluate risk of habitat collapse

Criterion E	Probability of collapse
EU 28	unknown
EU 28+	unknown

There is no quantitative analysis available that estimates the probability of collapse of this habitat type.

Overall assessment "Balance sheet" for EU 28 and EU 28+

	A1	A2a	A2b	A3	B1	B2	B3	C/D1	C/D2	C/D3	C1	C2	C3	D1	D2	D3	E
EU28	CR	DD	DD	DD	LC	LC	LC	CR	DD	DD	DD	DD	DD	CR	DD	DD	DD
EU28+	CR	DD	DD	DD	LC	LC	LC	CR	DD	DD	DD	DD	DD	CR	DD	DD	DD

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
CR	A1, C/D1	CR	A1, C/D1

Confidence in the assessment
Medium (evenly split between quantitative data/literature and uncertain data sources and assured expert knowledge)

Assessors

Zs. Molnár

Contributors

Habitat description: Zs. Molnár, A. Varga, K. Tytti & M. Aronsson

Territorial experts: E. Framstad, T. Kontula, V. Rašomavičius, E. Roosaluste, S. Rusina

Working Group Grasslands: I. Biurrun, J. Dengler, D. Gigante, Z. Molnar, D. Paternoster, J. Rodwell, J. Schaminée, R. Tzonev

Reviewers

J. Janssen

Date of assessment

15/10/2015

Date of review

29/02/2016

References

Bergmeier, E., Petermann, J. & Schröder, E. (2010). Geobotanical survey of wood-pasture habitats in Europe: diversity, threats and conservation. *Biodiversity and Conservation* 19: 2995-3014.

Bergmeier, E., Roellig, M. (2014). Diversity, threats and conservation of European wood-pastures. In: Hartel, T. & Plieninger, T. (Eds.). *European wood-pastures in transition: A social-ecological approach.* Routledge, London and New York, 19-38. pp.

Garbarino, M., & Bergmeier, E. (2014). Plant and vegetation diversity in European wood-pastures. In: Hartel, T. & Plieninger, T. (Eds.). *European wood-pastures in transition: A social-ecological approach.* Routledge, London and New York 113-125. pp.

Hartel, T., Dorresteijn, I., Klein, C., Máthé, O., Moga, C. I., Öllerer, K., Roellig, M., von Wehrden, H. & Fischer, J. (2013). Wood-pastures in a traditional rural region of Eastern Europe: Characteristics, management and status. *Biological Conservation* 166: 267-275.

Hartel, T. & Plieninger, T. (2014). *European wood-pastures in transition: A social-ecological approach.* Routledge, London and New York. 322 pp.

Kaasik, A., Sepp, K., Raet, J. & Kuusemets, V. (2011). Transformation of rural landscapes in Hiiumaa since 1956 and the consequences to open and half-open semi-natural habitats. *Ekológia* (Bratislava) 30(2): 257-268.

Otsus, M., Kukk, D., Kattai, K., & Sammul, M. (2014). Clonal ability, height and growth form explain species' response to habitat deterioration in Fennoscandian wooded meadows. *Plant Ecology* 215: 953-962.

Palo, A., Ivask, M. & Liira, J. (2013). Biodiversity composition reflects the history of ancient semi-natural woodland and forest habitats—Compilation of an indicator complex for restoration practice. *Ecological Indicators* 34: 336-344.

Rois-Diaz, M., Mosquera-Losoda, M.R. & Rigueiro-Rodríguez, A. (2006). *Biodiversity Indicators on Silvopastoralism across Europe.* EFI Technical Report 21, European Forest Institute.

Rodríguez, A. R., McAdam, J. & Mosquera-Losada, M. R. (2008, eds.). *Agroforestry in Europe: current status and future prospects* (Vol. 6). Springer Science & Business Media. pp. 450.

Tomson, P., Bunce, R.G.H. & Sepp, K. (2015). The role of slash and burn cultivation in the formation of southern Estonian landscapes and implications for nature conservation. *Landscape and Urban Planning*

137: 54-63.