

E3.4a Moist or wet mesotrophic to eutrophic hay meadow

Summary

These meadows are typical of moist, sometimes seasonally inundated, nutrient-rich soils on floodplains and in brook-valleys throughout lowland and sub-montane Europe. The herbage has traditionally been cut for hay, though there is sometimes light grazing in late summer and autumn. The vegetation is often species-rich with a diverse associated invertebrate fauna attracted by the abundance of flowers. Major threats are abandonment of traditional management with agricultural intensification, changes in the hydrology, urbanisation and associated infrastructure development. Decline in quantity and quality of this habitat during the last century have been considerable all over Europe. Continuation of traditional hay making and safeguarding the appropriate hydrological conditions, both on site and at a landscape level, are the key factors for conserving this habitat type, though the effectiveness of these measures can be problematic where the habitat is much fragmented and the typical biota lost from the wider landscape.

Synthesis

Based on a reduction in quantity over the past 50 years, this habitat type is endangered both in EU28 and EU28+ (EN). Furthermore, a substantial reduction in biotic and abiotic quality results in a nearly threatened status (NT).

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Endangered	A1	Endangered	A1

Sub-habitat types that may require further examination

No sub-types in need of further examination. The reduction in quantity and quality refers to the whole range of the habitat type.

Habitat Type

Code and name

E3.4a Moist or wet mesotrophic to eutrophic hay meadow



Hay meadow near Lanzaropole (Macedonia) with red-flowering *Geum coccineum* (Photo: Nico de Bruin).



Calthion palustris hay meadow in the eastern Ardennes (Belgium) with flowering *Lychnis flos-cuculi* and *Ranunculus acris* (Photo: John Janssen).

Habitat description

The habitat comprises various wet to moist grasslands that are influenced by a high water table level and

in some cases can be temporarily flooded. This group contains nutrient rich hay meadows, which sometimes are (moderately) grazed at the end of the summer period or in autumn after hay making. When the human impact is reduced or stopped, the habitat will be invaded by tall forb species (*Filipendulion*, *Galio-Urticetea*) and consequently by shrub and tree species (*Salicion cinereae*, *Alno-Fraxinetalia*). On the other hand, an intensive grazing regime will convert these meadows into pastures (*Cynosurion cristati*, *Potentillo-Polygonetalia*). Time and duration of flooding and/or the impact of groundwater are important factors in determining the floristic composition, as they influence the physiological (e.g. roots become in anaerobic condition) and ecological conditions (e.g. availability of nutrients). The main soil types are palanosol and gleysol (also amphigley). These mesotrophic to eutrophic hay meadows can be found widespread over Europe. In temperate zones, they may occur in fresh and relatively nutrient-rich flooded plains along rivers and on wet mesotrophic mineral to peaty soils in brook valleys and comparable landscapes. In other parts of Europe (subcontinental, submediterranean), such wet meadows are found on alluvial plains that are relatively dry during parts of the year.

These habitats should be mown regularly to prevent afforestation process. This process can be started with various high forb communities (mainly from the alliance *Filipendulion*). The other threat for these grasslands is increased drainage of the habitat that causes turnover of species and formation of low and medium altitude hay meadows. In case of increased humidity, there appear sedges and reed (*Phragmiti-Magnocaricetea*). Communities from the alliance *Oenanthion fistulosae* indicate the transition between those two classes: *Molinio-Arrhenatheretea* and *Phragmiti-Magnocaricetea*. A further threats is (over)grazing that could convert those meadows into pastures.

The following characteristics can be considered as Indicators of good quality:

- High richness in herb species;
- Occurrence of regionally distinct species;
- Long-term habitat stability;
- Extensive management regime aimed at long-term continuation of yearly mowing;
- No encroachment of trees en shrubs.

Characteristic species:

Vascular plants: *Alchemilla* subsp., *Alisma plantago-aquatica*, *Allium angulosum*, *Alopecurus bulbosus*, *Alopecurus pratensis*, *Bromus racemosus*, *Caltha palustris*, *Carex divisa*, *Centaurea carniolica*, *Cirsium helenioides*, *Cirsium oleraceum*, *Cirsium rivulare*, *Clematis integrifolia*, *Crepis paludosa*, *Dactylorhiza majalis*, *Eleocharis palustris*, *Equisetum palustre*, *Filipendula ulmaria*, *Fritillaria meleagris*, *Galium debile*, *Galium palustre*, *Geum coccineum*, *Geum rivale*, *Gratiola officinalis*, *Hypericum tetrapterum*, *Leucosium aestivum*, *Lotus uliginosus*, *Lychnis flos-cuculi*, *Lysimachia vulgaris*, *Myosotis nemorosa*, *Myosotis scorpioides*, *Oenanthe fistulosa* subsp. *fistulosa*, *Oenanthe silaifolia*, *Plantago altissima*, *Polygonum bistorta*, *Pseudolysimachion longifolium*, *Ranunculus ophioglossifolius*, *Ranunculus sardous*, *Rhinanthus angustifolius*, *Sanguisorba officinalis*, *Scirpus sylvaticus*, *Senecio aquaticus*, *Silaum silaus*, *Stachys palustris*, *Thalictrum flavum*, *Trifolium michelianum*, *Trollius europaeus*, *Valeriana officinalis*, *Viola elatior*.

Classification

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

EUNIS:

E2.2 Low and medium altitude meadows

E3.4 Moist or wet eutrophic and mesotrophic grassland

EuroVegChecklist:

Calthion palustris Tx. 1937

Deschampsion cespitosae Horvatić 1930

Oenanthion fistulosae de Foucault 2009

Incl. *Cnidion*, *Alopecurion*

Annex 1:

6440 Alluvial meadows of river valleys of the *Cnidion dubii*

6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)

Emerald:

E3.4 Moist or wet eutrophic and mesotrophic grassland

MAES-2:

Grassland

IUCN:

4.4 Temperate grassland

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

No

Justification

The types has a wide distribution throughout Europe. It has been recorded from 32 countries.

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)
<i>Austria</i>	Present	200 Km ²	Decreasing	Decreasing
<i>Belgium</i>	Present	50 Km ²	Decreasing	Decreasing
<i>Bulgaria</i>	Present	3.8 Km ²	Decreasing	Decreasing
<i>Croatia</i>	Present	750 Km ²	Decreasing	Decreasing
<i>Czech Republic</i>	Present	160 Km ²	Decreasing	Decreasing
<i>Denmark</i>	Present	Unknown Km ²	Decreasing	Stable
<i>Estonia</i>	Present	46 Km ²	Decreasing	Decreasing
<i>Finland</i>	Finland mainland: Present	40 Km ²	Decreasing	Decreasing
<i>France</i>	France mainland: Present	1500 Km ²	Decreasing	Decreasing
<i>Germany</i>	Present	Unknown Km ²	Decreasing	Decreasing
<i>Hungary</i>	Present	300 Km ²	Decreasing	Decreasing
<i>Italy</i>	Italy mainland: Present	605 Km ²	Decreasing	Decreasing
<i>Latvia</i>	Present	Unknown Km ²	Decreasing	Decreasing
<i>Lithuania</i>	Present	130 Km ²	Decreasing	Decreasing
<i>Netherlands</i>	Present	30 Km ²	Decreasing	Decreasing

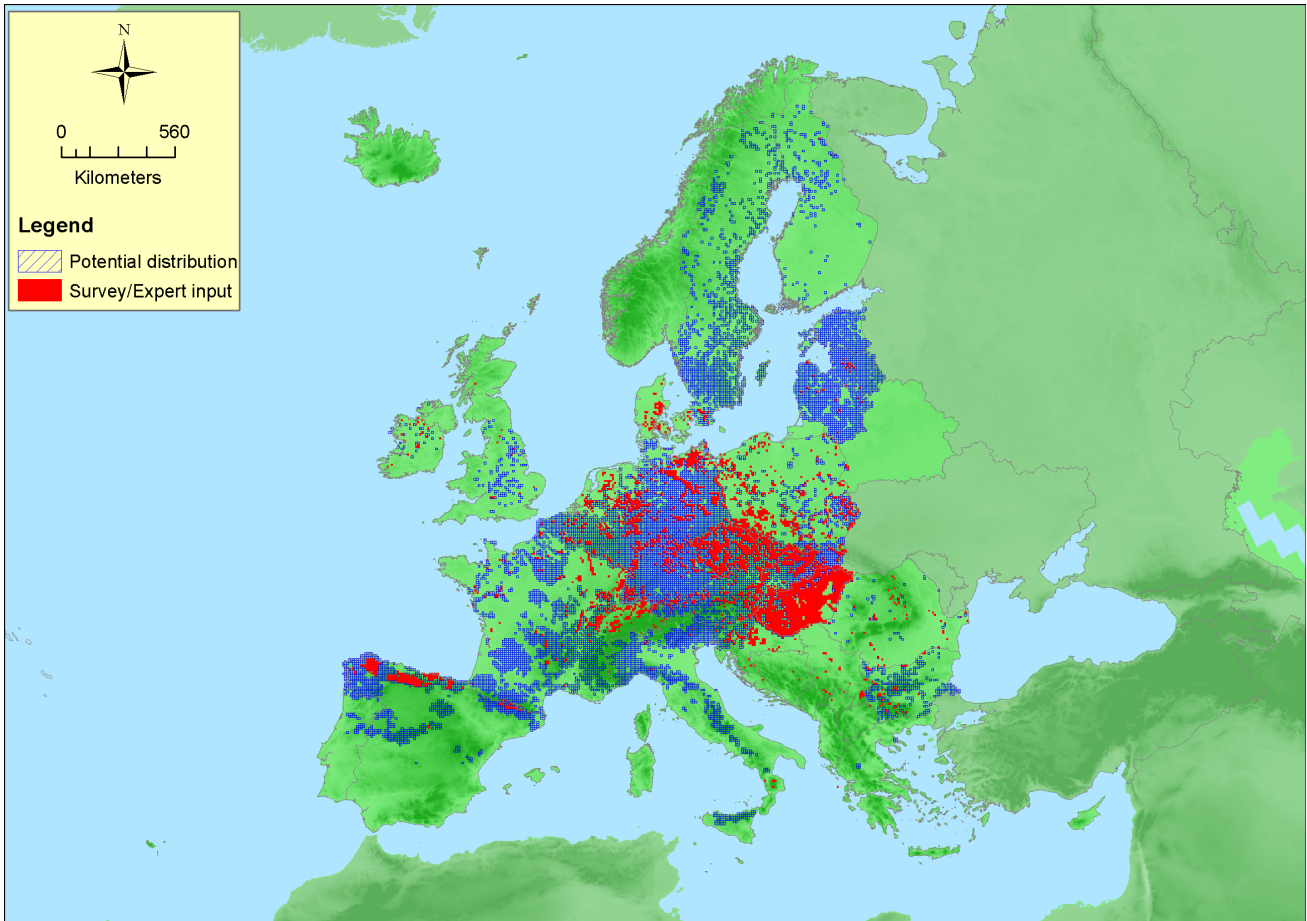
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Poland</i>	Present	5250 Km ²	Decreasing	Decreasing
<i>Romania</i>	Present	Unknown Km ²	Decreasing	Decreasing
<i>Slovakia</i>	Present	300 Km ²	Decreasing	Decreasing
<i>Slovenia</i>	Present	Unknown Km ²	Decreasing	Decreasing
<i>Spain</i>	Spain mainland: Present	128 Km ²	Decreasing	Unknown
<i>Sweden</i>	Present	Unknown Km ²	Decreasing	Decreasing
<i>UK</i>	United Kingdom: Present	90 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)
<i>Bosnia and Herzegovina</i>	Present	40 Km ²	Decreasing	Decreasing
<i>Former Yugoslavian Republic of Macedonia (FYROM)</i>	Present	50 Km ²	Unknown	Decreasing
<i>Switzerland</i>	Present	300 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
<i>EU 28</i>	7410650 Km ²	16552	9600 Km ²	AOO and EOO incl. potential distribution
<i>EU 28+</i>	7410650 Km ²	16711	10000 Km ²	AOO and EOO incl. potential distribution

Distribution map



The map is very incomplete due to large data gaps, and it is reflecting mainly availability of data in the EVA database. Especially the Atlantic countries Ireland and United Kingdom are strongly underrepresented. Therefore distribution of Annex I type 6510 has been added as potential data. Data sources: EVA, Art17.

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

80%

Trends in quantity

Recent trend EU28: -54.3% Recent trend EU28+: -53.7%. The calculation is based on almost 98 % of total area reported. Future trend (EU28 and EU28+): probably decrease will continue, but at lower rate than over the last twenty years. Historical trend (EU28 and EU28+): few quantitative data are available, but reported data show a large decrease in the past.

- 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

The EOO is larger than 50,000 km²

- Does the habitat have a small natural range by reason of its intrinsically restricted area?

No

Justification

The type has a wide distribution throughout Europe (it has been recorded from 32 countries). The surface of the sites can be up to several hectares, so quite large.

Trends in quality

Within EU28: 43.2% is degraded with a weighted severity of 49%. Within EU28+: 42.3% is degraded with a weighted severity of 49%. Calculations are based on average values.

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

Pressures and threats

The main threats are changes in farming practice and land-use in the EU as well as in the wider Europe. The moves in farming practice mainly imply intensification (fertilisation and drainage) and abandonment (lack of mowing). Other major losses are due to changes in the natural hydrological systems and habitat destruction by urbanisation and expand of infrastructure (e.g. road construction). A large extent of the present extent of the habitat is found in nature reserves and involve some form of financial subsidy. Especially in the eastern European countries, where traditional hay-making has ceased over large areas, it is unclear how this will work out in the future.

List of pressures and threats

Agriculture

- Cultivation
- Modification of cultivation practices
 - Agricultural intensification
- Mowing / Cutting of grassland
 - Intensive mowing or intensification
- Fertilisation
- Irrigation

Urbanisation, residential and commercial development

- Urbanised areas, human habitation

Conservation and management

Continuation of these meadows is directed towards the maintainance of traditional hay making in combinatin with safeguarding the appropriate hydrological conditions. This applies to both the site and the landscape level. Where damaged, restoration programmes can be set up, but - especially in the European lowlands - the nowadays scattered occurrences of this habitat types will cause problems for recolonisation of the aimed species.

List of conservation and management needs

Measures related to agriculture and open habitats

- Maintaining grasslands and other open habitats

Measures related to wetland, freshwater and coastal habitats

- Restoring/Improving the hydrological regime

Conservation status

6440: ALP FV, ATL U2, BLS FV, CON U2, PAN U1, STE FV

6510: ALP U2, ATL U2, BLS FV, BOR U2, CON U2, MED U2, PAN U1, STE FV

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

The habitat type needs human intervention for restoration, by re-introducing traditional mowing regimes and improving the hydrological conditions. The latter may take a relatively long period to become effective. The presence of relict populations of key species is crucial for success, so restoration programmes will have more success in areas where species rich meadows still do occur. Specific management measurements like the spread of hay derived from still intact (preferably nearby) nature reserves may be considered to overcome the 'dispersal problem'.

Effort required

20 years
Through intervention

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-54.3 %	unknown %	unknown %	unknown %
EU 28+	-53.7 %	unknown %	unknown %	unknown %

The values from A1 are calculated from the territorial data sheets. No data (%) available for A2a, A2b and A3.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50000 Km ²	Unknown	Unknown	unknown	>50	Unknown	Unknown	unknown	unknown
EU 28+	>50000 Km ²	Unknown	Unknown	unknown	>50	Unknown	Unknown	unknown	unknown

EOO and AOO are above thresholds for evaluating Criterion B.

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	43.2 %	49 %	unknown %	unknown %	unknown %	unknown %
EU 28+	42.3 %	49 %	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%

The values for C/D1 are calculated from the territorial data sheets, which we obtained from 32 countries. No data available for C/D2 and C/D3. The degradation in quality refers to both biotic features and abiotic circumstances.

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	EN	DD	DD	DD	LC	LC	LC	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	EN	DD	DD	DD	LC	LC	LC	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Endangered	A1	Endangered	A1

Confidence in the assessment

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

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References

Balátova-Tuláčková, E. (1994). Alopecurion- and Molinion-Gesellschaften NW-Böhmens. *Acta. Sci. Nat. Brno* 28 (6): 1-52.

Botta-Duktá, Z, M. Chytrý, P. Hájková, & M. Havlová (2005). Vegetation of lowland wet meadows along a climatic continentality gradient in Central Europe. *preslia* 77: 89-111.

Dierschke, H. (1995). Syntaxonomical survey of Molinio-Arrhenatheretea in Central Europe. *Colloques Phytosociologiques* 23: 387-399.