

# Where are the interesting plants, the hollow oakes and the stone walls?



## TUVA | Survey of permanent grasslands in Sweden

by  
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Pastures may be rich in biodiversity, cultural heritage as well as landscape amenities

Environmental qualities of Swedish permanent grasslands.  
Results 2004 (selected) from the national survey

Environmental quality	Quantity	Environmental quality	Quantity
Traditional hay meadows	6,700 ha	Traditional wooden fences, N° of grasslands	2,800
Semi-natural pastures (besides restorable)	229,000 ha	Stone walls, N° of grasslands	18,000
- Fen. lowland grassl. (N-2000: 6270)	35,800 ha	Grasslands with ponds, N°	5,300
- Molina meadows (N-2000: 6410)	27,600 ha	Grasslands along lakes or streams, N°	5,200
- Fen. wooded p. (N-2000: 9070)	27,300 ha	Valuable grassland trees, N°	130,000
Permanent, cultivated grassland	16,700 ha	- Coppiced trees, N°	53,000
Grasslands requiring restoration	34,500 ha	- Coarse trees, N°	22,900
Traditional hay barns, etc. N°	19,290	- Hollow trees, N°	29,700



### The TUVA survey

- The 305 000 hectares ecologically and culturally most valuable grasslands of Sweden are surveyed (50 000 objects).
- The survey results are freely and publicly available on the internet ([www.jordbruksverket.se](http://www.jordbruksverket.se)), and will continuously be supplemented and updated.
- The TUVA information serves the national or regional authorities in planning, day-to-day decision-making, evaluation and policy revision, but also farmers and the public.

### Declining environmental services

- Swedish semi-natural grasslands have been reduced drastically since the late 19<sup>th</sup> century, in quantitative as well as qualitative terms:
  - Traditional (hay) meadows have declined from 2 million ha to 9,600 ha in 2009.
  - The permanent pasture area has declined to c. 490,000 ha from many millions ha.
- 204 of the 402 red-listed vascular plant species in Sweden belong to the agricultural landscape.

### Methodology

- Field surveying. Each grassland object was field surveyed at least once in 2002-2004.
- Survey data was processed together with digitalized GIS data.
- The survey method was first developed, tested and revised before 150 surveyors were trained by courses and coordination exercises.
- The survey is updated every year by resurveying objects or surveying additional grasslands.

### Results: large variation and many high environmental qualities

The environmental qualities are structured into the variable classes: management type and status (good, poor, none), habitat (Natura-2000 types), cultural heritage qualities (type of historical environment, landscape elements, etc.), flora (presence of 69 indicator species), fauna, trees and bushes (species and qualities), water (presence of wetlands, springs, sea shores, etc.), and restoration potential.

### Conclusions

- TUVA describes the environmental state of grasslands with reasonable precision by variables reflecting their general environmental quality.
- TUVA contains information from a high structural level (nature type, substrata etc.) down to individual species.
- TUVA experience shows that the choice of survey variables and the design of the survey method are of decisive importance and need to be optimised considering available resources as well as current and potential future use.
- TUVA experience shows that it is useful to survey both structural factors and significant species or cultural elements.
- Good GIS and map inputs significantly reduce costs and increase usability.
- It is important that the survey is updated and developed continuously.



Survey data was recorded in the field using handheld computers and reported to a central database.

