MERIT

Merit based income from sustainable land management in mountain farming

SEVENTH FRAMEWORK PROGRAMME

RURAGRI ERA-NET

Biodiversity is a complex concept

In the case of MERIT the biodiversity indicators

- have to be adapted to the complexity and the should be scientifically accepted
- they have to be comprehensible and implementable for farmers
- should be adaptable to individual farms with different levels of ecological quality
- should enable a collection and assessment of the cultural landscape quality in regional / international context.

Bases for indicators: surveys in Pilot areas

- Pre-selection of indicators and definition of essential data
- Selection of farms (44 of the 79 farms): full range of intensities
- Field studies and mapping
- Final indicators definition and discussion with farmers
- Deduction of result - orientated measures

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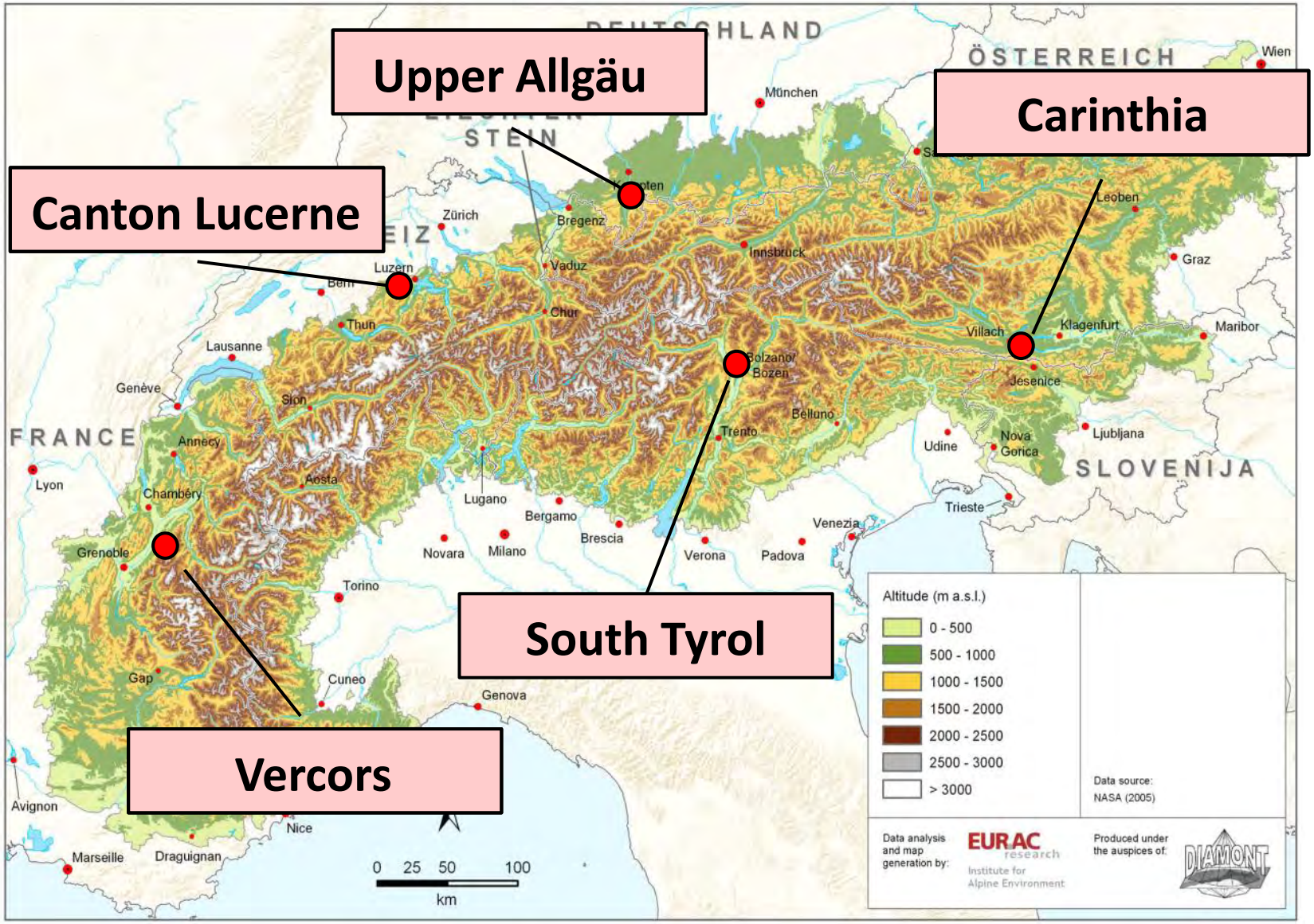

MERIT

EURAC research

umwelt büro gmbh

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Methodology

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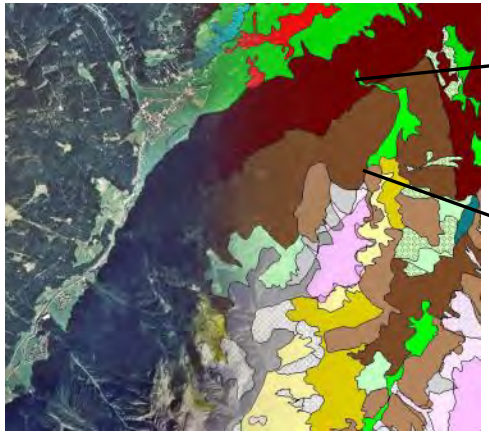
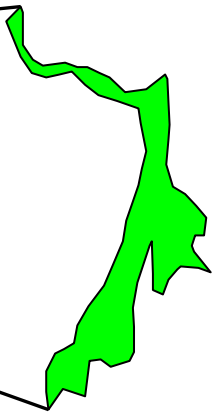
Land survey - methodology

Landscape quality



Scale: 1:5000

Habitat quality

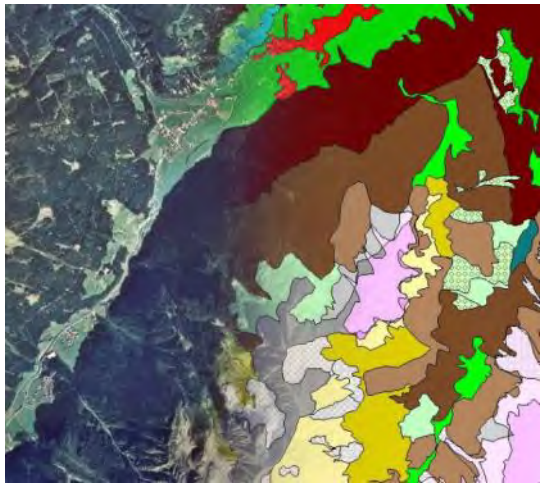


Habitat (50x50 or >0.25 ha)

Land survey - methodology

1. Landscape quality

- Habitat diversity
- Landscape structuring degree

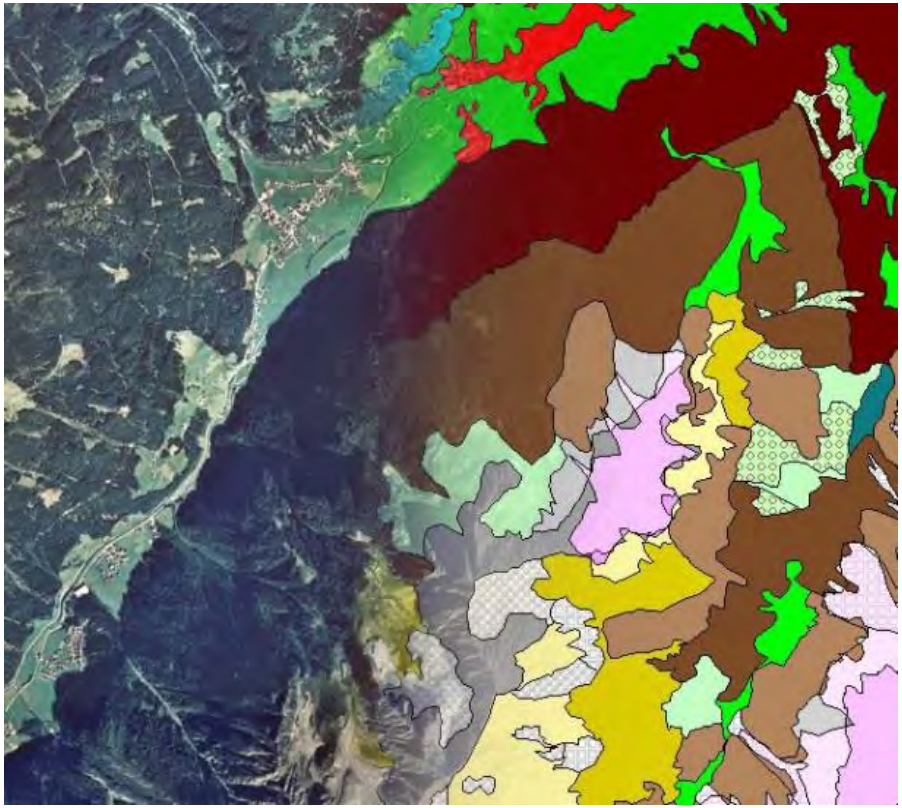


2. Habitat quality

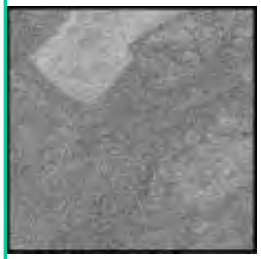
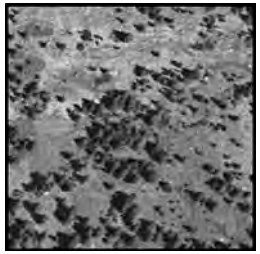
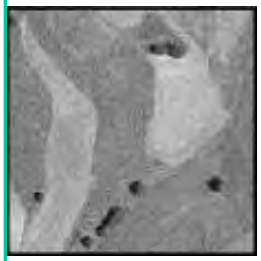
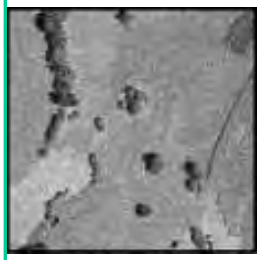
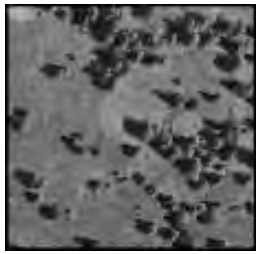
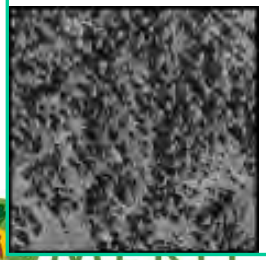
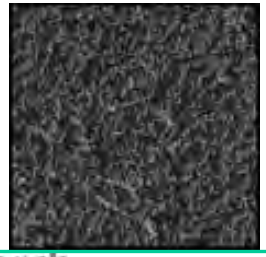
- Number of vascular plants / characteristic species
- Variety of flowering plants
- Variety of diurnal butterflies

Landscape quality: habitat diversity

- Phytosociological survey after the method of Braun-Blanquet (1964)
- Derivation of characteristic plant species



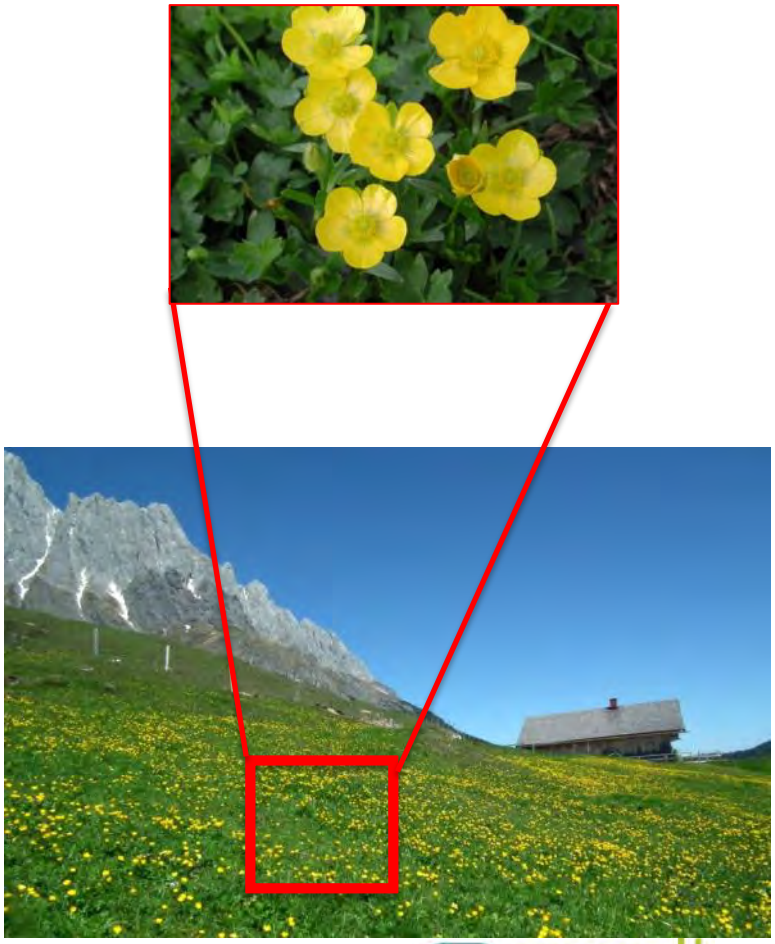
Landscape quality: landscape structuring

	Structure types	Feature		Structure types	Feature
	(1) Woodless areas, not or scarcely structured	0-1 objects in the area		(4) Wooded grassland and pasture	>20 single trees in the area, but <30% crown closure
	(2) Woodless areas, structured	2-9 objects in the area		(4-1) Wooded grassland and pasture, share of young trees >70%	>20 single trees in the area, but <30% crown closure
	(3) Woodless areas, richly structured	>10 objects in the area		(4-2) Wooded grassland and pasture, share of old trees >70%	>20 single trees in the area, but <30% crown closure
	(5-1) sparse forest stock	crown closure 30%-70%		(5-2) dense forest stock	crown closure >70%

Habitat quality: number of vascular plants

1. Vegetation records

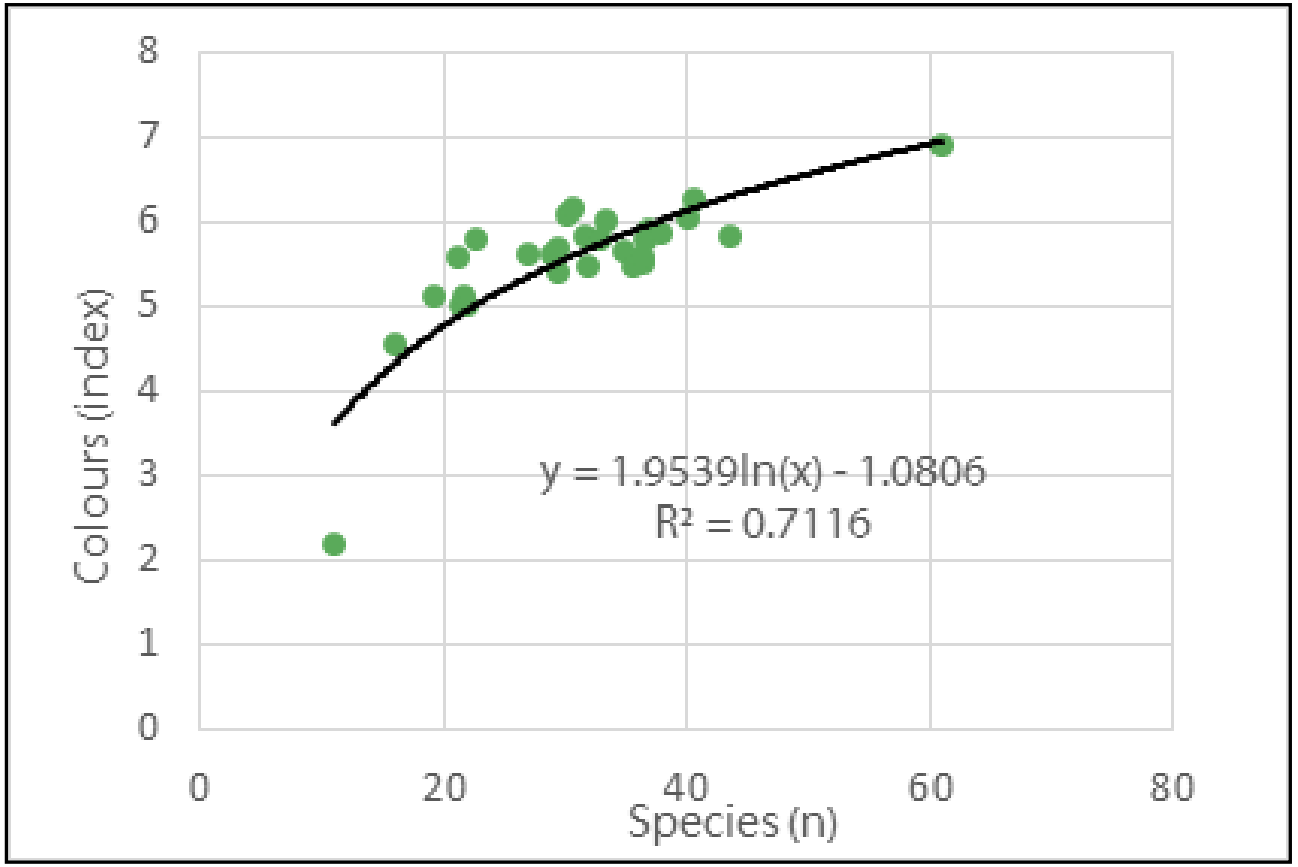
- Plots of 4 x 4 m
- Each type of grassland will be recorded
- Analysis:
  - Total species list
  - Dominant species
  - Plant community
  - Vegetation cover



Habitat quality: variety of flowering plants

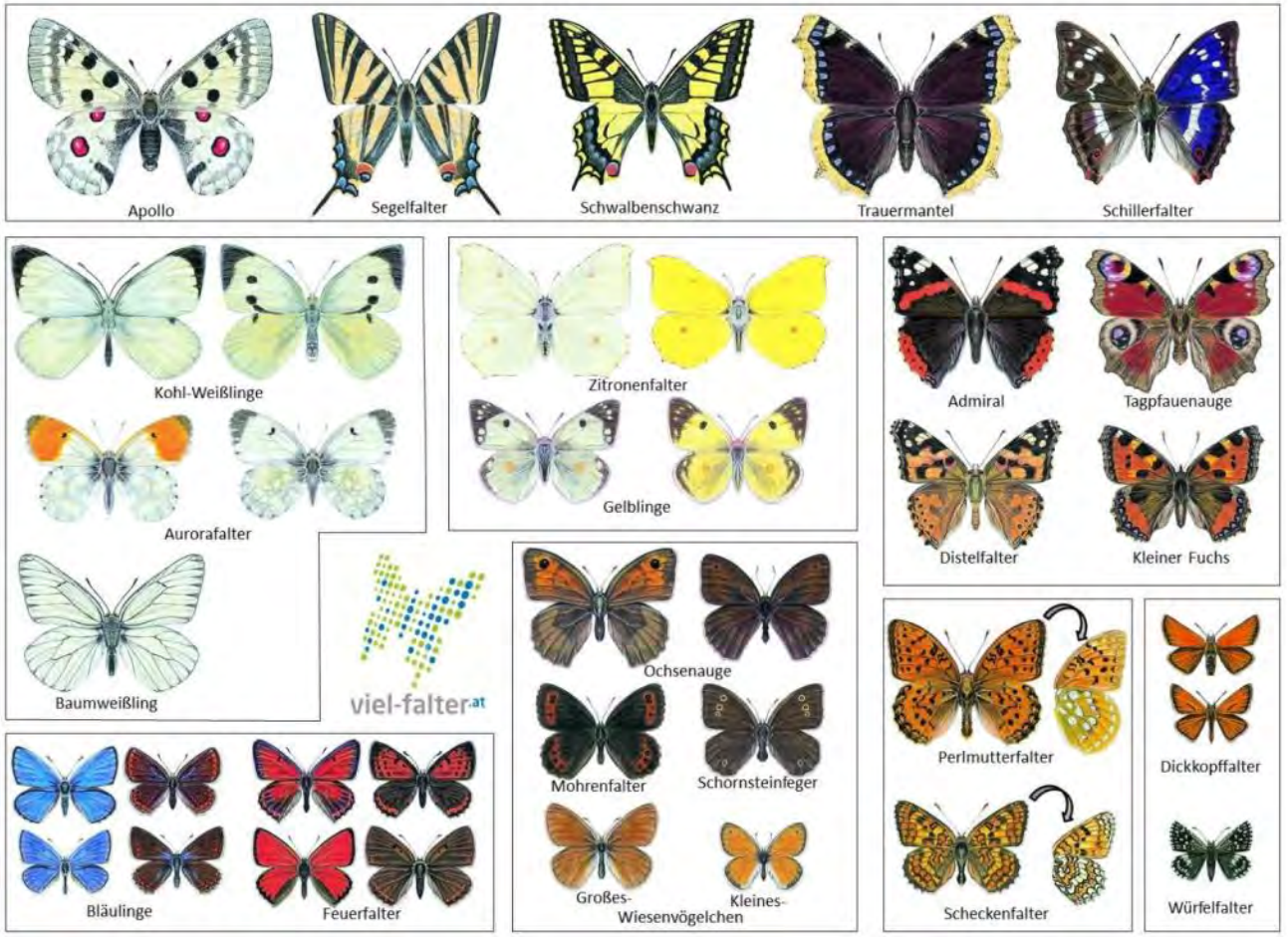
	Individuals per 16m²			
Flower colours	0	1-5	6-20	>20
white				
yellow				
orange				
pink				
red				
purple				
blue				

Habitat quality: variety of flowering plants



Correlation of flower colour diversity index and plant species on 44 pilot-farms in the MERIT project.

Habitat quality: variety of diurnal butterflies



Summary

- Single areas: **1222** habitats / structure
- Phytosociological surveys: **935**
- Colour surveys: **770**
- Butterfly surveys: **172**

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Results

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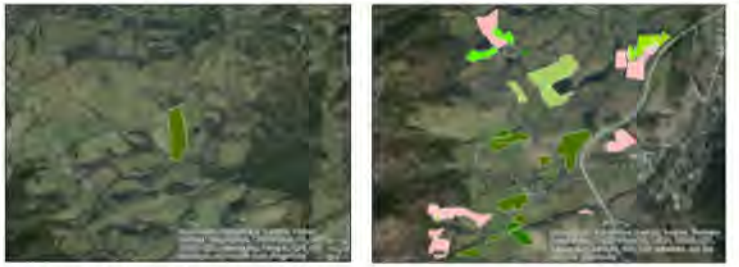
Land survey - results

Habitat diversity

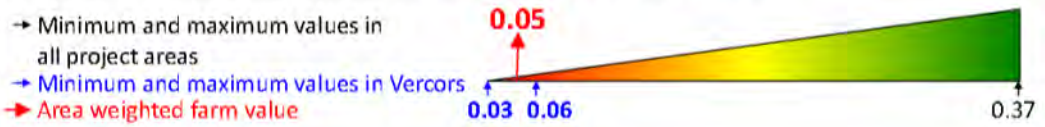


Phytosociological communities

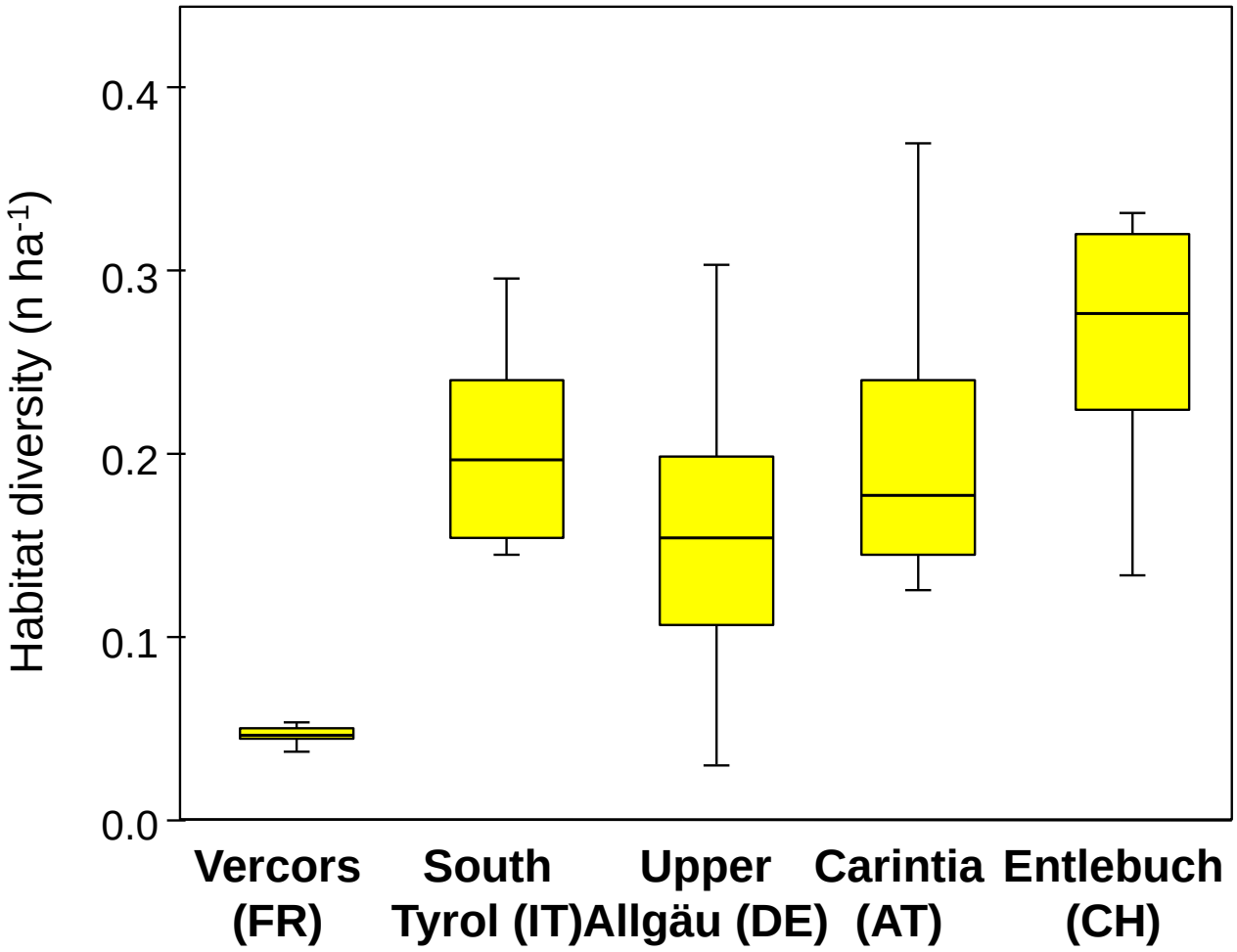
- Selino-Molinetum caeruleae
- Arrhenatheretum montanum
- Astrantio-Trisetetum
- Poo-Trisetetum
- Poo pratensis-Loiletum perennis
- Lolio perennis-Arrhenatheretum elatioris
- Carlino acaulis-Brometum erecti

Distribution of vegetation

The farm surfaces display a low habitat diversity (0.05 plant communities per ha, see graphic below). This low value is due on one hand to the large extension of the agricultural land and on the other hand to a very uniform land use. Intensive meadows consist mainly of sowing meadows (*Lolium* meadows), tall oat grass and yellow oat grass meadows. In small wet meadow areas we could find some typical wetland species, such as *Molinea caerulea*, *Sanguisorba officinalis* and *Geranium pratense*. On the pastures species rich calcareous grassland (Carlino acaulis-Brometum erecti) was also detected.

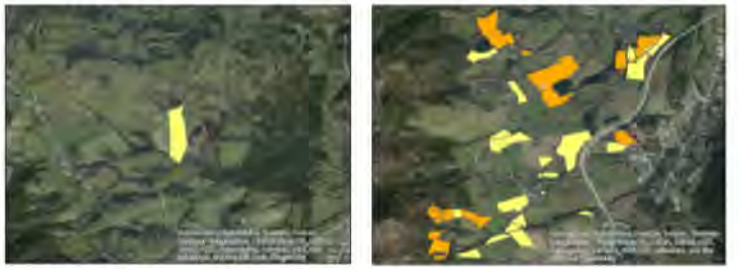


Land survey - results



Land survey - results

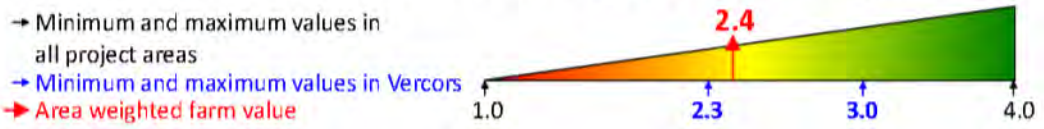
Landscape structuring



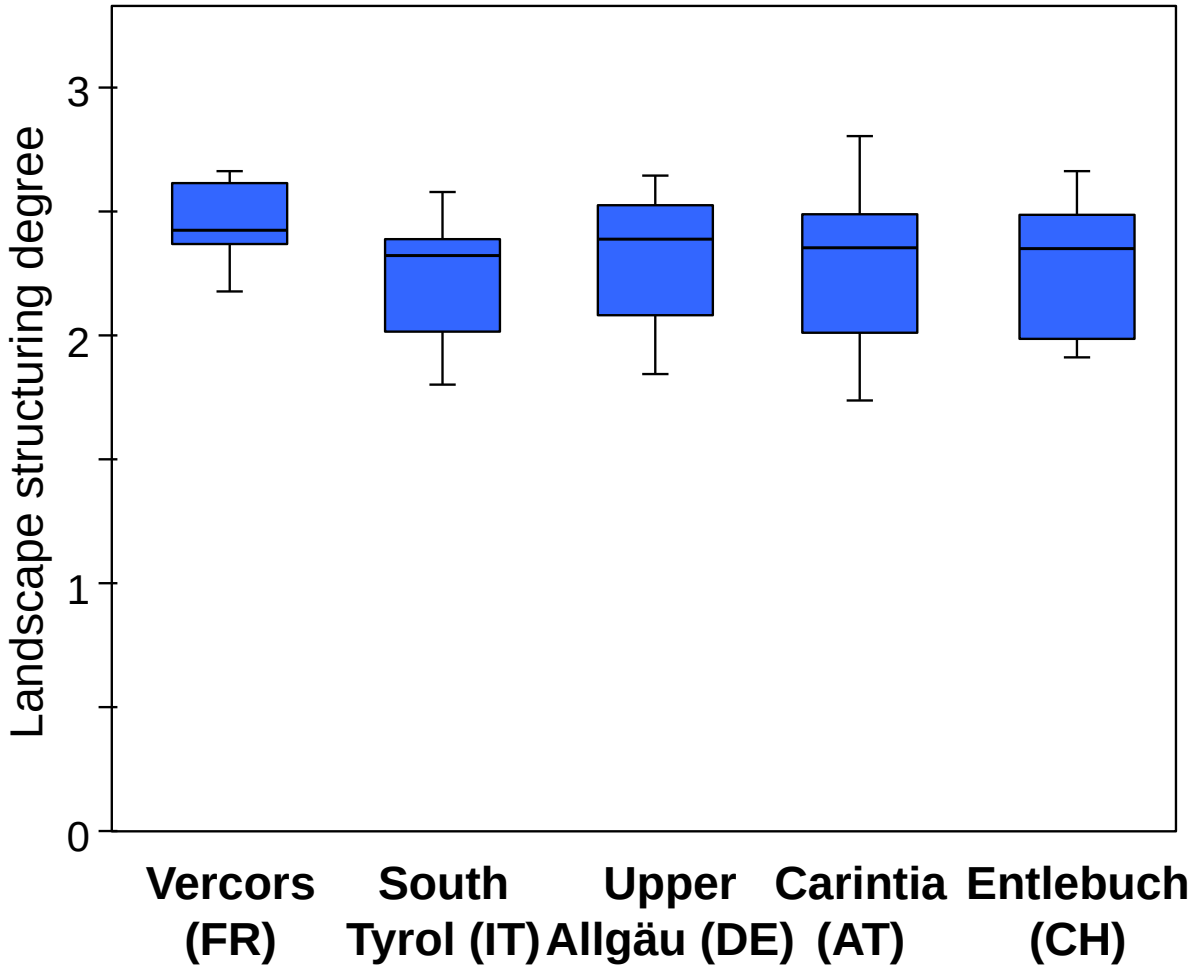
Structure diversity

Trees groups, hedges, single trees, slopes, banks and smaller habitats (i.e. moors, rocks, scree areas) will be considered as structural elements. Their value is given by their function: they are able to break the monotony of intensive cultural landscape, to act as refuge for small animals and contribute to the landscape enrichment.

Jean Arpinpont farm surfaces can be assessed as structured to richly structured. With a value of 2.4 they lie at the lower end of all ranked farms in Verocors but still in middle average of all MERIT-farms.

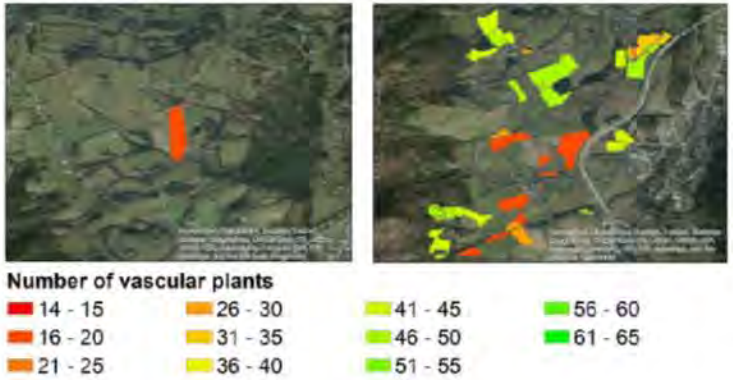


Land survey - results



Land survey - results

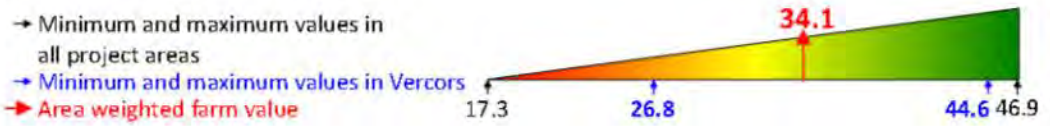
Number of vascular plants



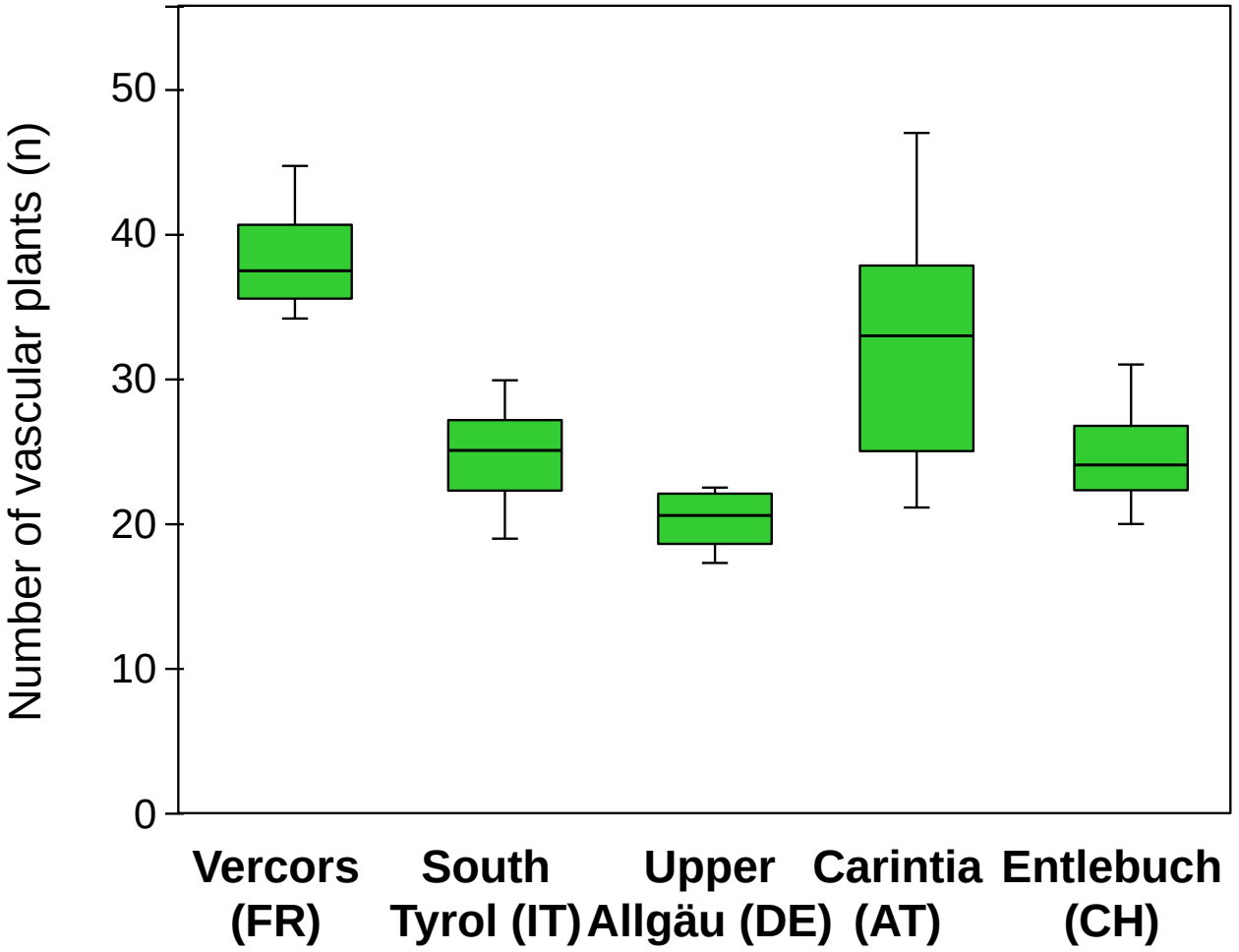
Vascular plants richness

The number of vascular plants in a meadow is significantly influenced by land use and site conditions. Intensively used hay-meadows show a far lower species richness than any other extensively used meadow. Thereby the increasing mowing and fertilizing regimes have negative consequences on the species richness.

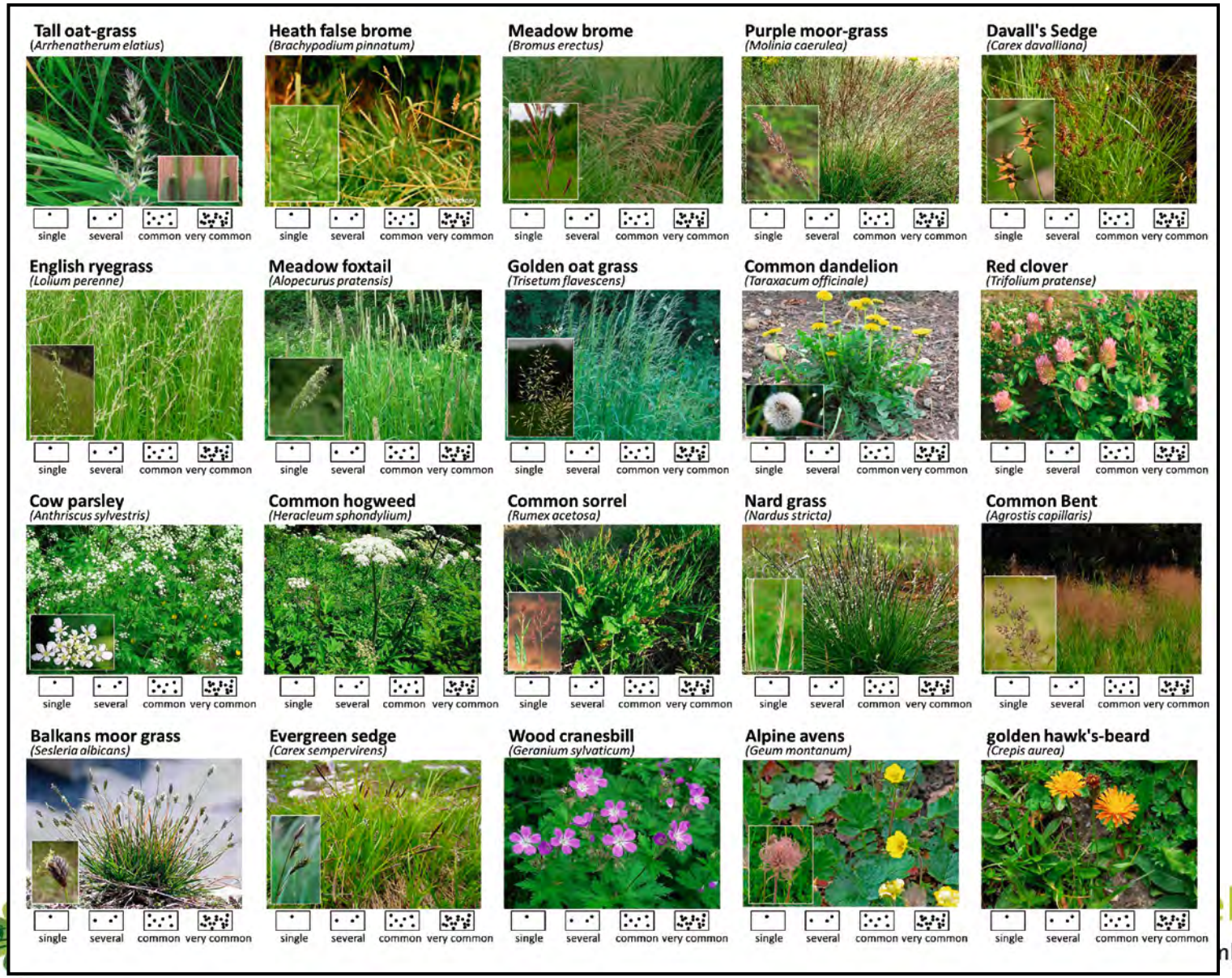
Also the species richness of wet meadows is quite low, but the species detected here are in the most cases very rare. According to that, we could find few species (16-25 species) in the intensive hay-meadow, whereas on extensive hay meadows the number of species is far higher (36-50 species). With a value of 34.1 the farm is in a middle average of all ranked farms in Vercors.



Land survey - results



Characersitic species for monitoring

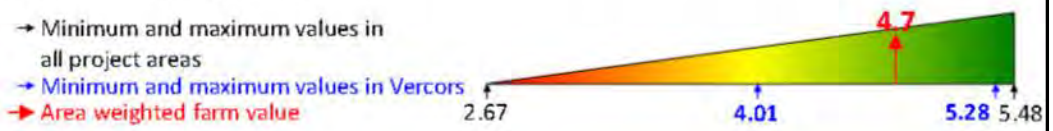


Land survey - results

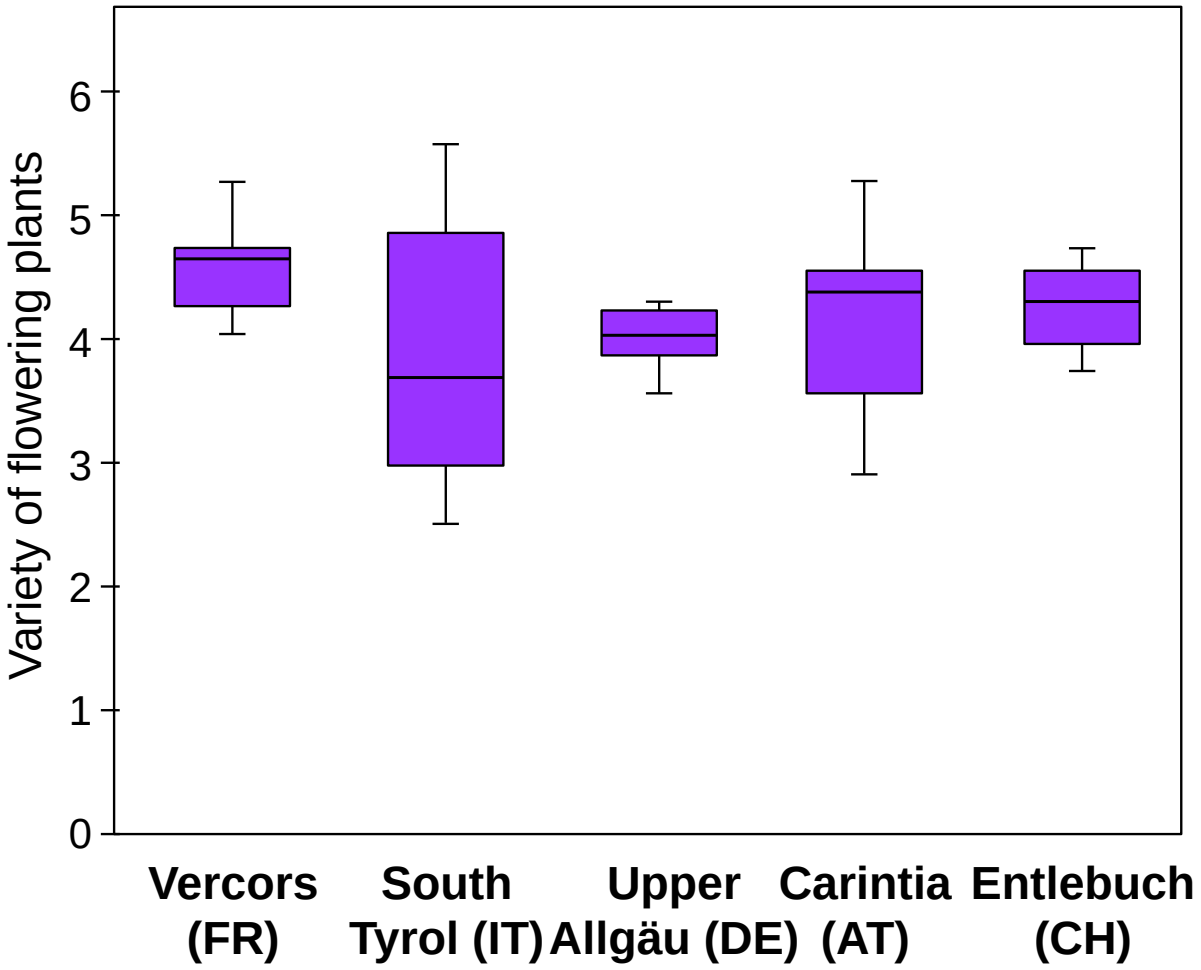
Variety of flowering plants

Flower colour diversity

The flower colour index delivers further information on the species richness of a meadow. Meadows with a high index score are more colourful, and therefore also richer in species, than those with a low index score. The considered farm shows an above-average value of 4.7. It means that the species richer parts of the whole surface are also particularly colourful.

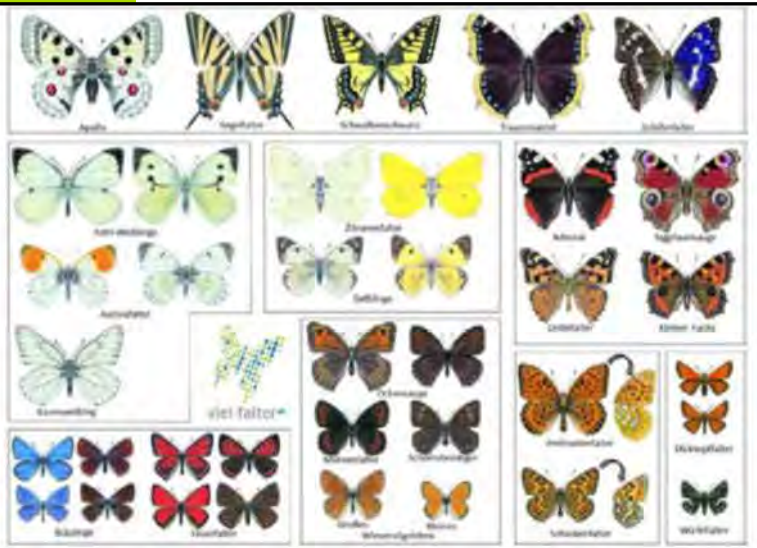


Land survey - results



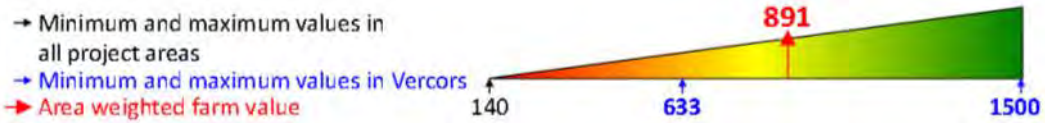
Land survey - results

Variety of diurnal butterflies

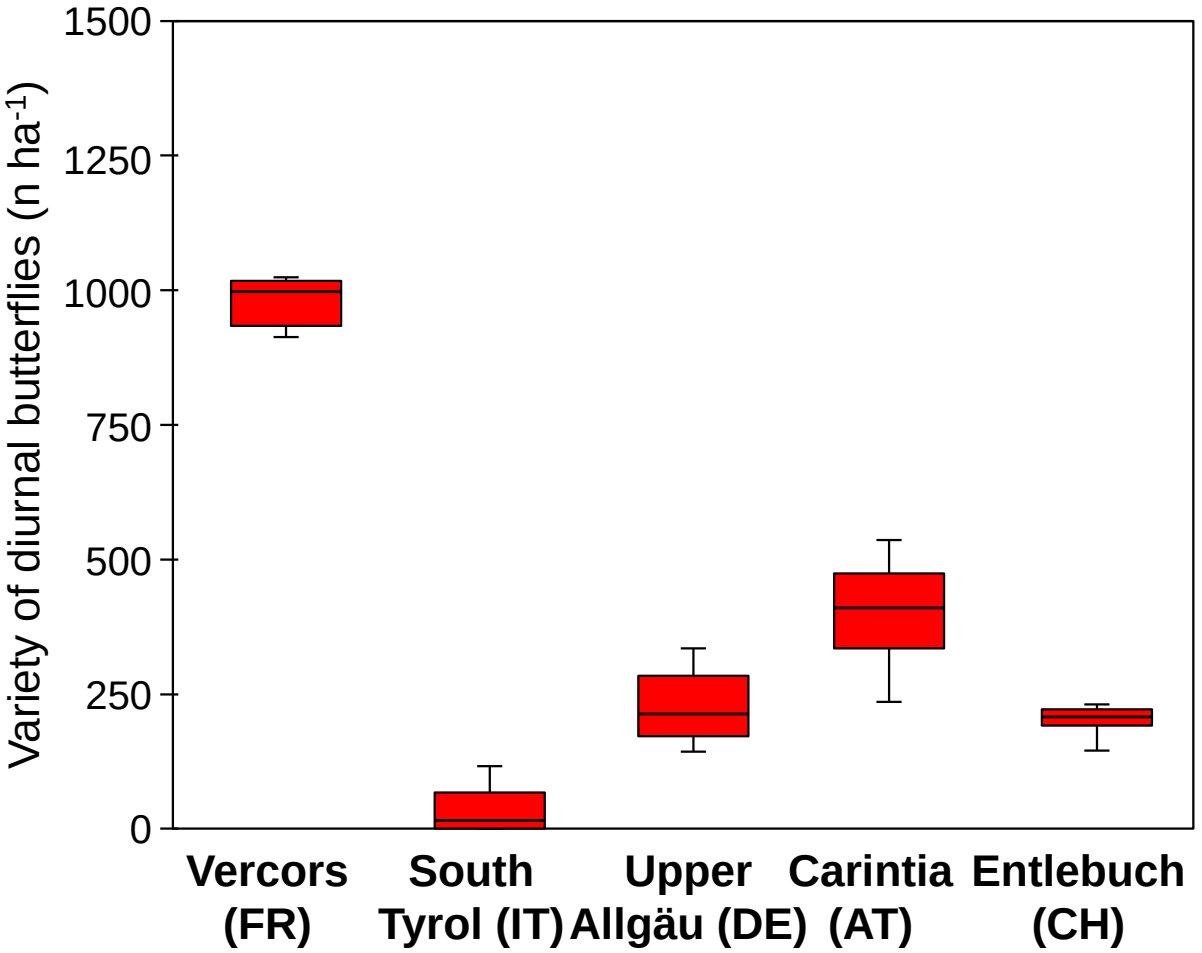


Butterfly number and diversity

Not only the plants species richness contributes to the farm assessment but also the faunistic diversity. Meadows with a high butterfly diversity and number has a higher ecological value than those with lower numbers. Butterfly surveys are deeply influenced by weather and season, for this reason they have to be carried out regularly over one vegetation period. The value shown here is only a snapshot and just give us an idea about the meadow quality as butterflies habitat. In this context the farm is, with 891 butterflies, in middle average of all ranked farms in Vercors.



Land survey - results



Land survey - results

General evaluation

General status

- valuation criteria incomplete
- Biodiversity low, potential for improvement very large
- Biodiversity moderate, potential for improvement large
- Biodiversity high, improvement desirable
- Biodiversity very high, preservation of current status desirable

The farm evaluation is based on aspects and indexes described above (except on the butterfly indicator). 25% of the whole analysed surfaces (red areas) show the lowest species richness value, whereas the green ones represent the surfaces with the highest biodiversity value.

The farm surfaces show many different quality levels. Intensive hay-meadows diversity is to be graded as moderate: measures to increase the biodiversity on these areas (orange ones) would be very reasonable. Some extensive hay meadows and pastures diversity is to be graded as high and very high and from the point of view of a result-oriented environmental program they would be worthy of financial support.