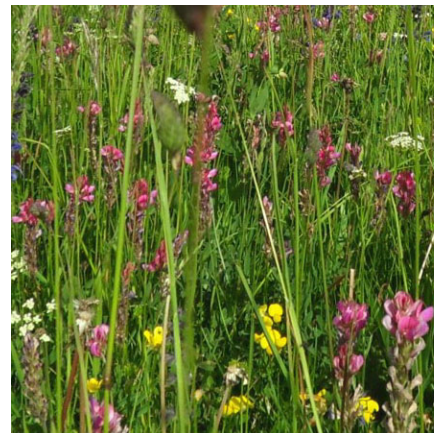


***Sustainable farming
and environment
conservation
in Protected Areas***



IPROMO 2016
Managing mountain
resources and
diversities: the role
of protected areas

Ormea
12 July 2016



Mauro Bassignana

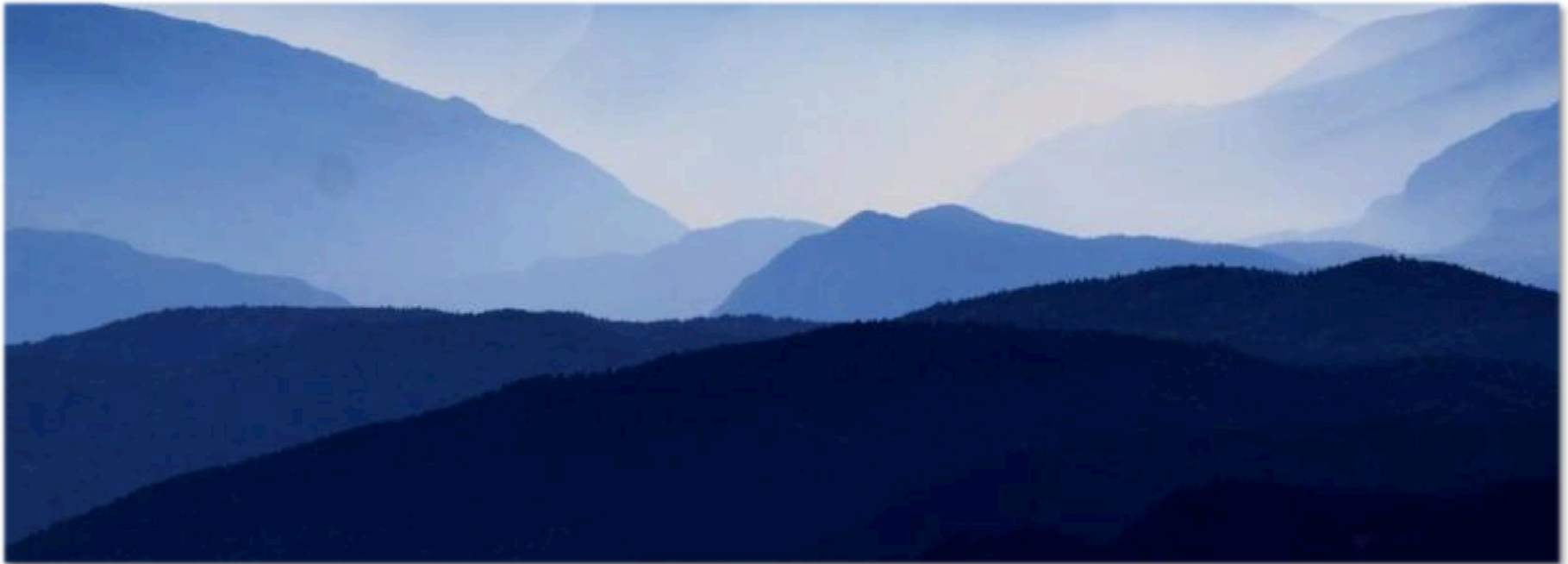
Institut Agricole Régional



What is a PA?

A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.

(International Union for Conservation of Nature)



PA Categories

Ia: Strict nature reserve

Ib: Wilderness area

II: National park

III: Natural monument or feature

IV: Habitat/species management area

V: Protected landscape/seascape

VI: Protected area with sustainable use
of natural resources



Source: Dudley, N. (Ed.), 2008. *Guidelines for Applying Protected Area Management Categories*. Gland, Switzerland: IUCN. x + 86pp

Strict nature reserves

Category Ia are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphological features, where **human** visitation, use and impacts are **strictly controlled and limited** to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring.

National Parks

Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible **spiritual, scientific, educational, recreational** and **visitor opportunities**.

Wilderness areas

Category Ib protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence, **without permanent or significant human** habitation, which are protected and managed so as to preserve their natural condition.

Natural monuments or features

Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have **high visitor value**.

Habitat/species management area

Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many category IV protected areas will need **regular, active interventions** to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.

Protected areas with sustainable use of natural resources

Category VI protected areas conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under **sustainable natural resource management** and where **low-level non-industrial use** of natural resources compatible with nature conservation is seen as one of the main aims of the area.

Protected landscapes/Seascapes

Category V consists of protected areas where the **interaction of people and nature** over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.

Natura 2000 is a network of PA established by the EU across all Member States. It is made up of Special Areas of Conservation (**SACs**) and Special Protection Areas (**SPAs**) designated respectively under the Habitats Directive and Birds Directive.
787,767 km² (304,159 sq mi) are terrestrial sites
251,564 km² (97,129 sq mi) are marine sites.
Overall, 18 percent of the EU land mass is designated.

SCI - Site of Community importance

A site that contributes significantly to the maintenance of a **natural habitat** type or a **species** and that may also contribute significantly to the **coherence** of Natura 2000 and the maintenance of **biological diversity**.

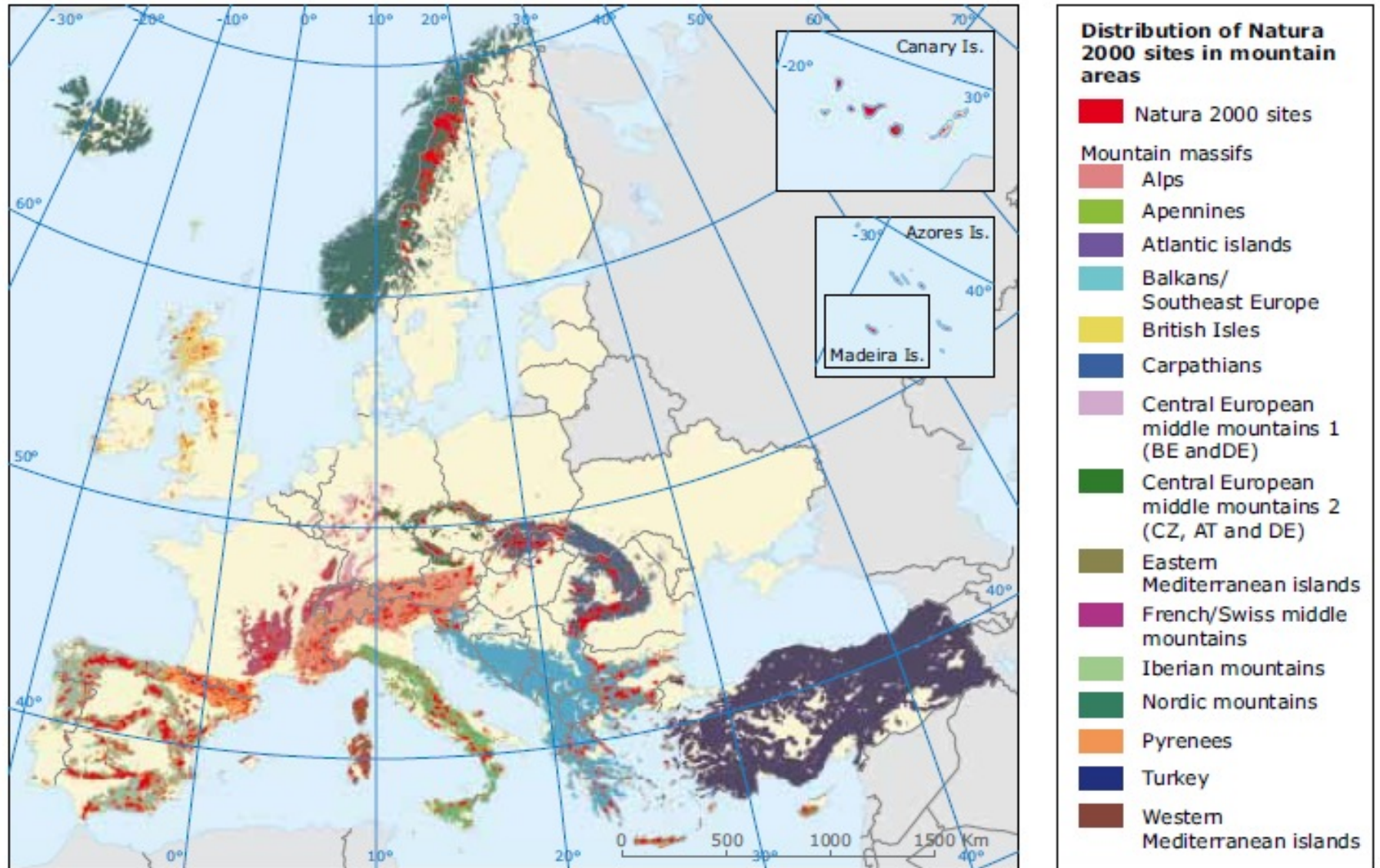
SAC - Special area of conservation

A SCI in which **conservation measures** are applied to maintain or restore, in a favourable preservation status, natural habitats and/or species populations for which the site is designated.

SPA - Special protection area

Protection area, identified by the State, which contributes to the maintenance of suitable habitats for wild bird populations

Natura 2000



Source: EEA, 2010.

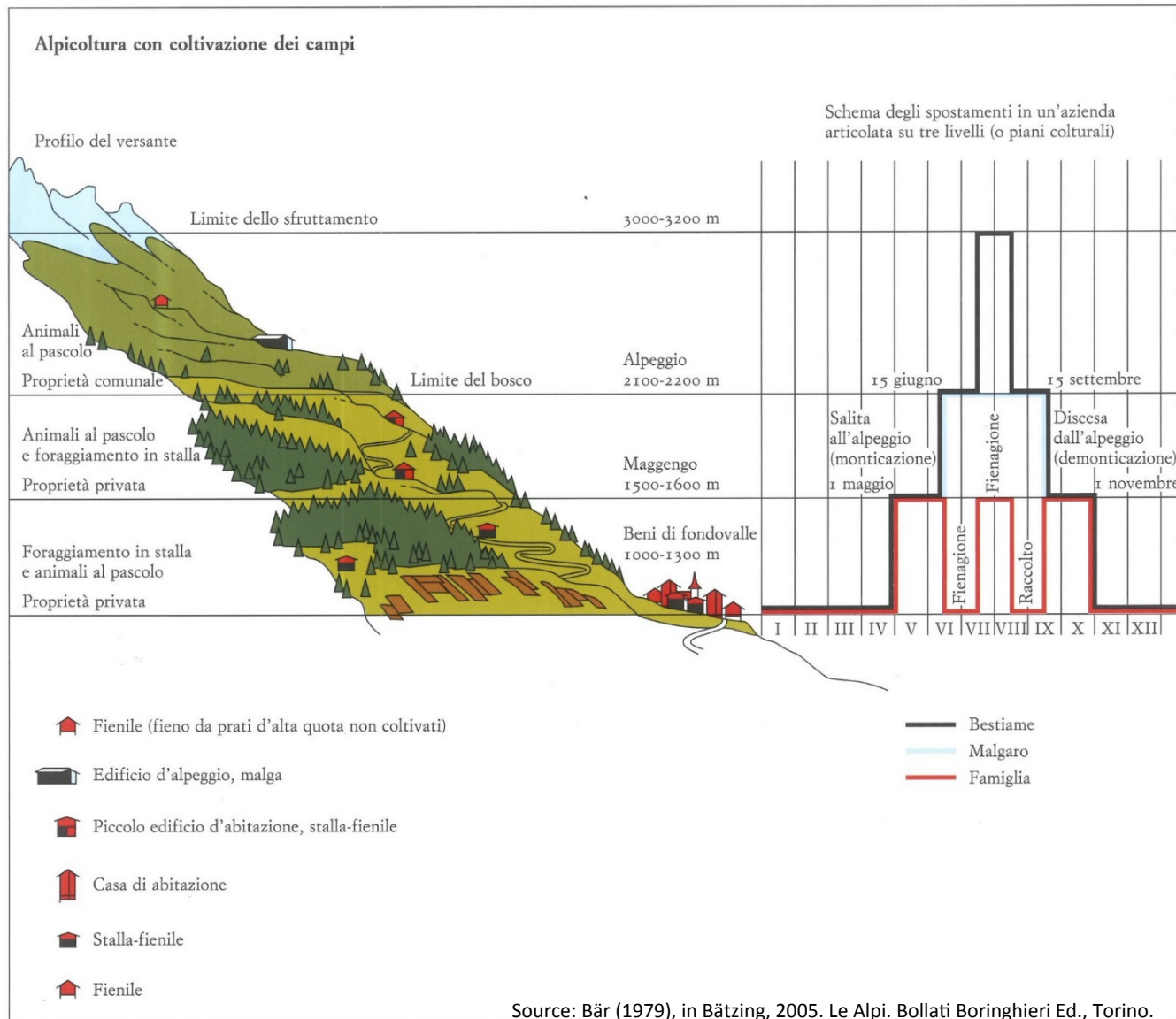
Landscape...

...an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.

European Landscape Convention (2000)



Scheme of a traditional farming system in the Alps



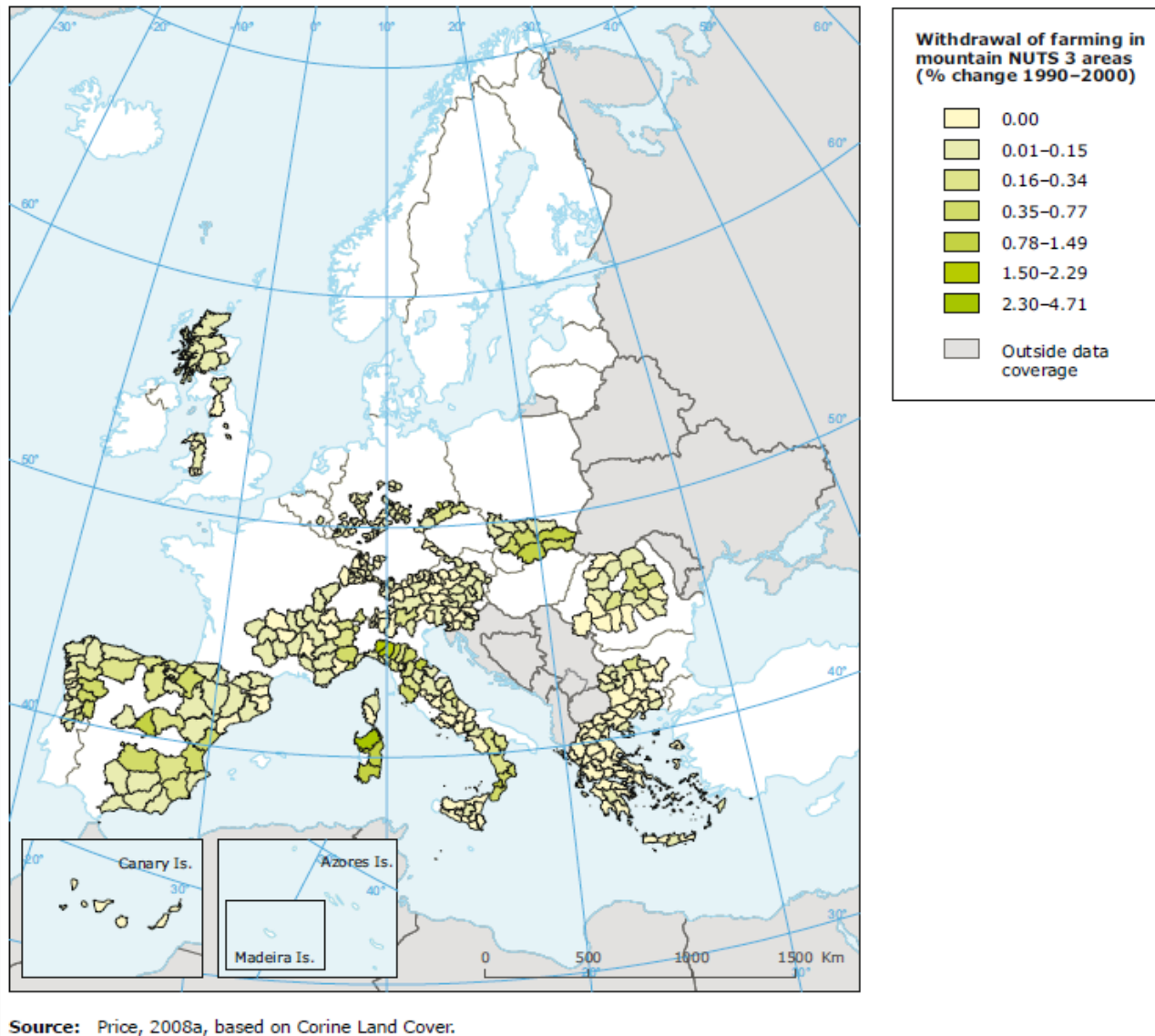
Marginalization and abandonment: threats to mountain ecosystems



Marginalization and abandonment: threats to mountain ecosystems



Withdrawal of farming in mountains (1990-2000)



Withdrawal of farming in mountains : municipality of Fontainemore 1970-2013

1970

99 cattle farms

927 cattle

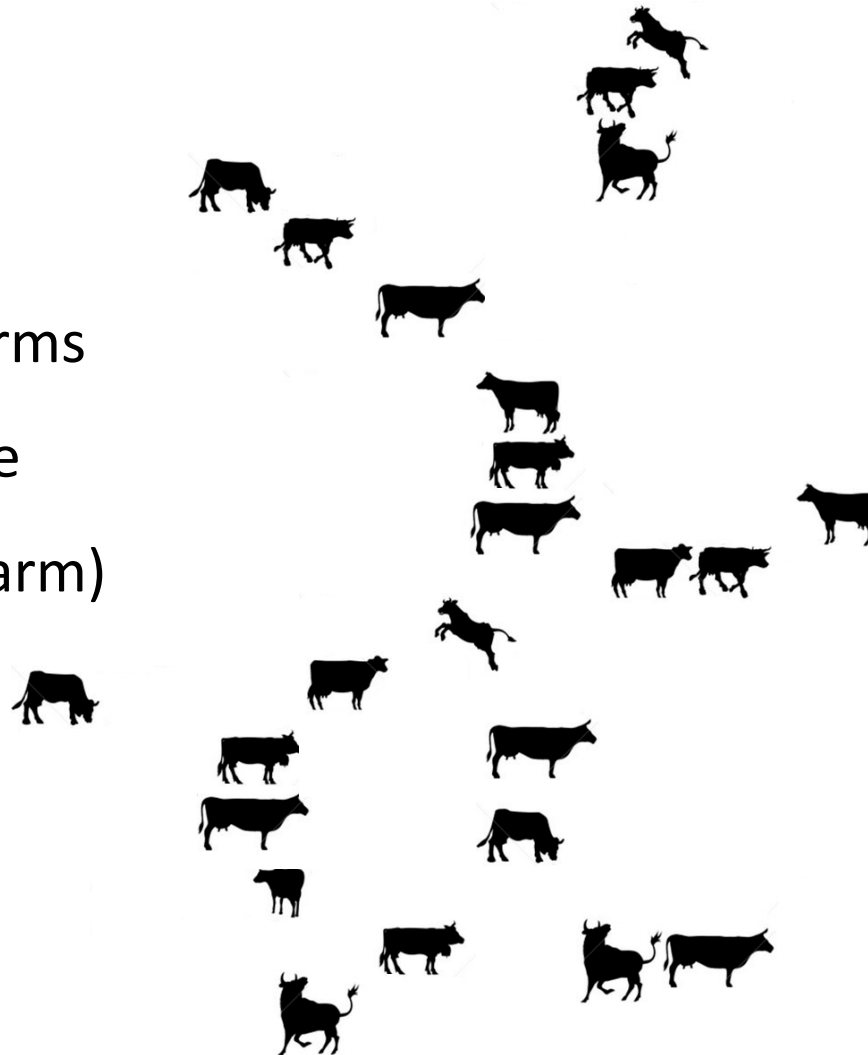
(9,4 cattle/farm)

2013

24 cattle farms

640 cattle

(26,7 cattle/farm)



LIFE ON THE EARTH

ECOSYSTEM SERVICES

SUPPORTING
nutrient cycling
soil formation
primary production
...

PROVISIONING

food, wood and fibre, fuel, genetic resources
natural medicines, fresh water, air ...

REGULATING

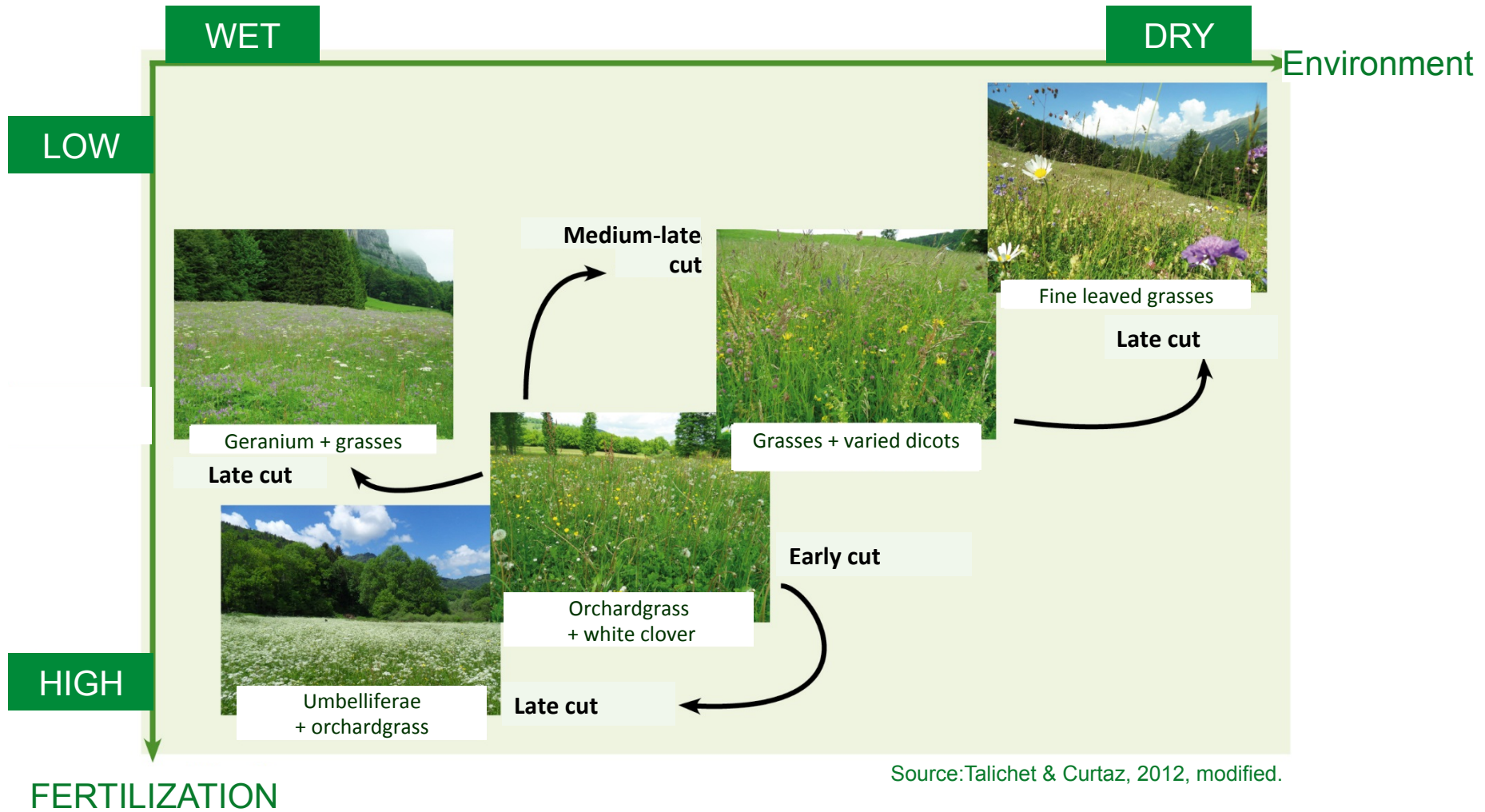
climate, floods, water and air quality, health,
waste decomposition, pollination ...

CULTURAL

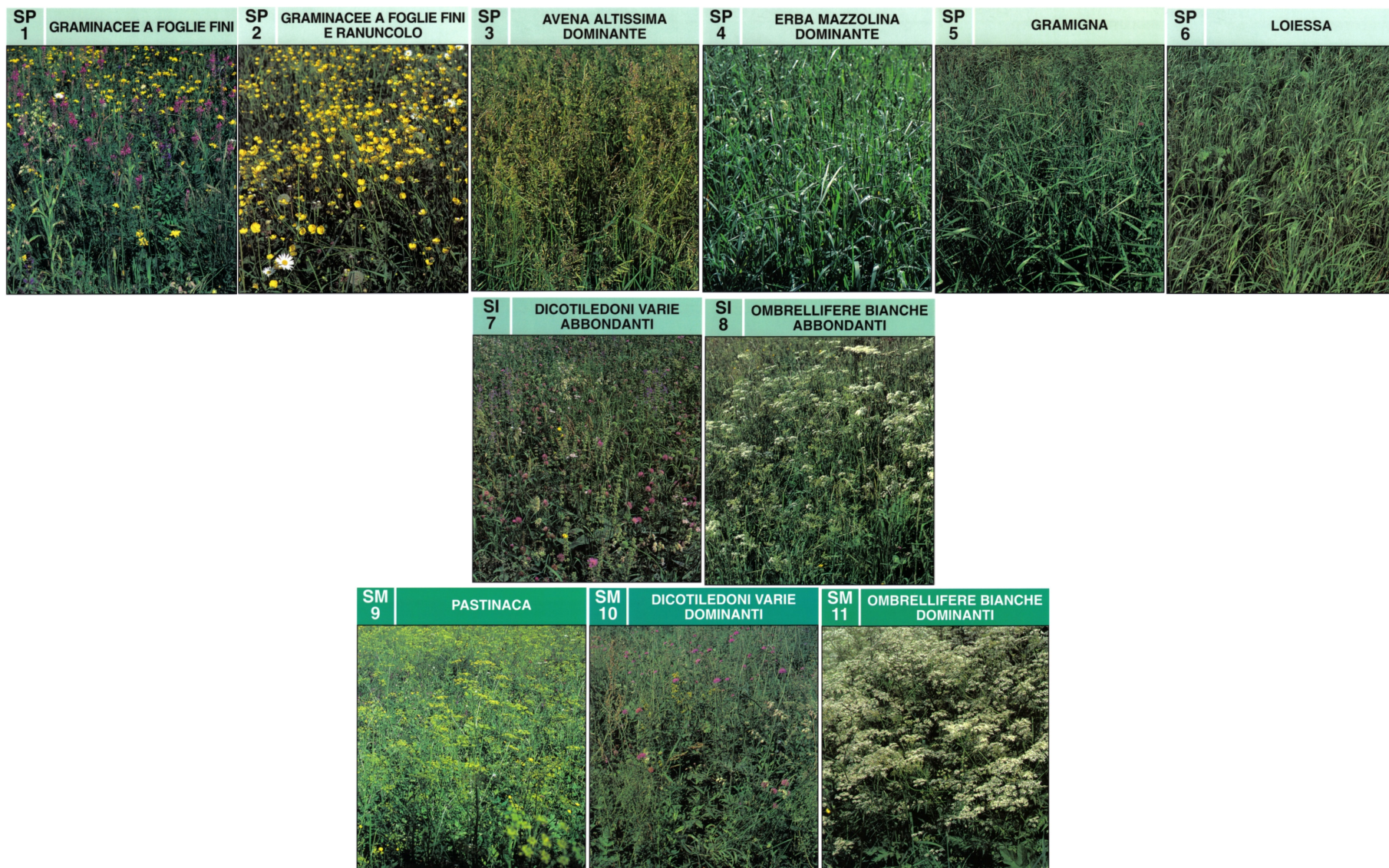
aesthetic, spiritual, educational, recreational ...

Millennium Ecosystem Assessment, 2005, modified.

Diversity of permanent meadows



Tipology of the permanent meadows of Aosta Valley-1



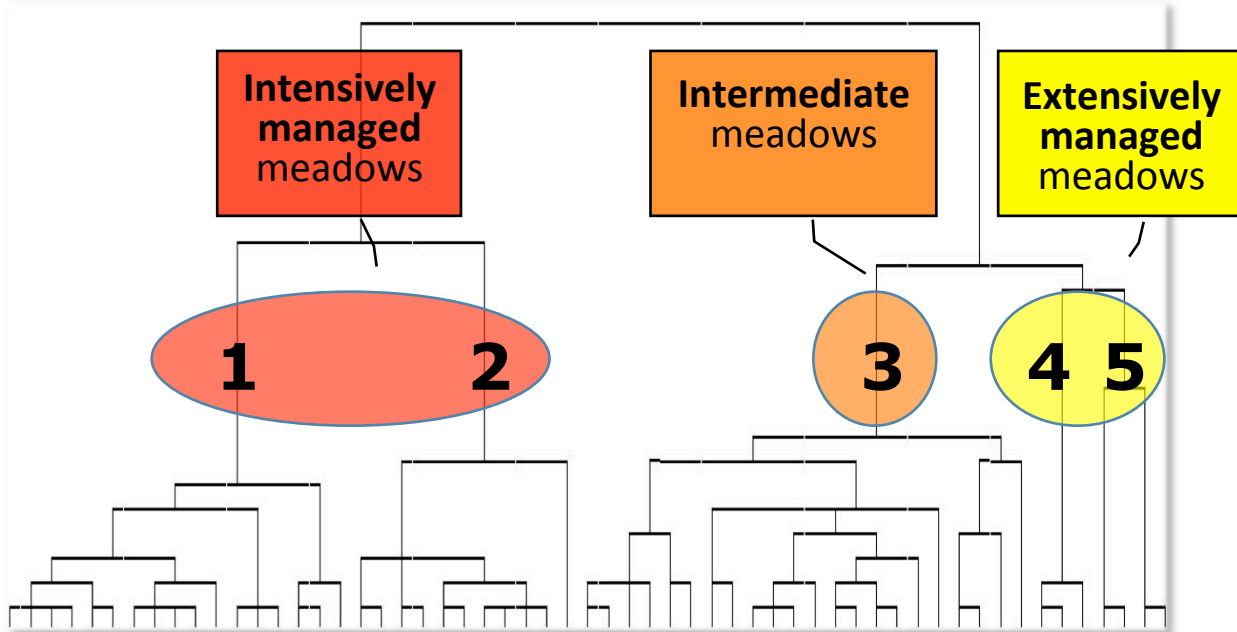
Roumet et al., 1999

Tipology of the permanent meadows of Aosta Valley-2

Type	Production		Species richness	Contribution to landscape diversity
	Quantity	Quality		
Fine leaved grasses	+	+++	+++	+++
Fine leaved grasses + buttercups	+	+	++	
Tall oat-grass dominant	++	++	++	+
Orchardgrass dominant	+++	+++	+	++
Couch grass	+++	+	+	+
Italian ryegrass	+++	+++	+	+
Varied dicots - abundant	++	++	+++	++
White <i>Umbelliferae</i> - abundant	++	++	++	++
Parsnips	++	+	+	+
Varied dicots - dominant	++	++	+++	+++
White <i>Umbelliferae</i> - dominant	+++	+	+	++

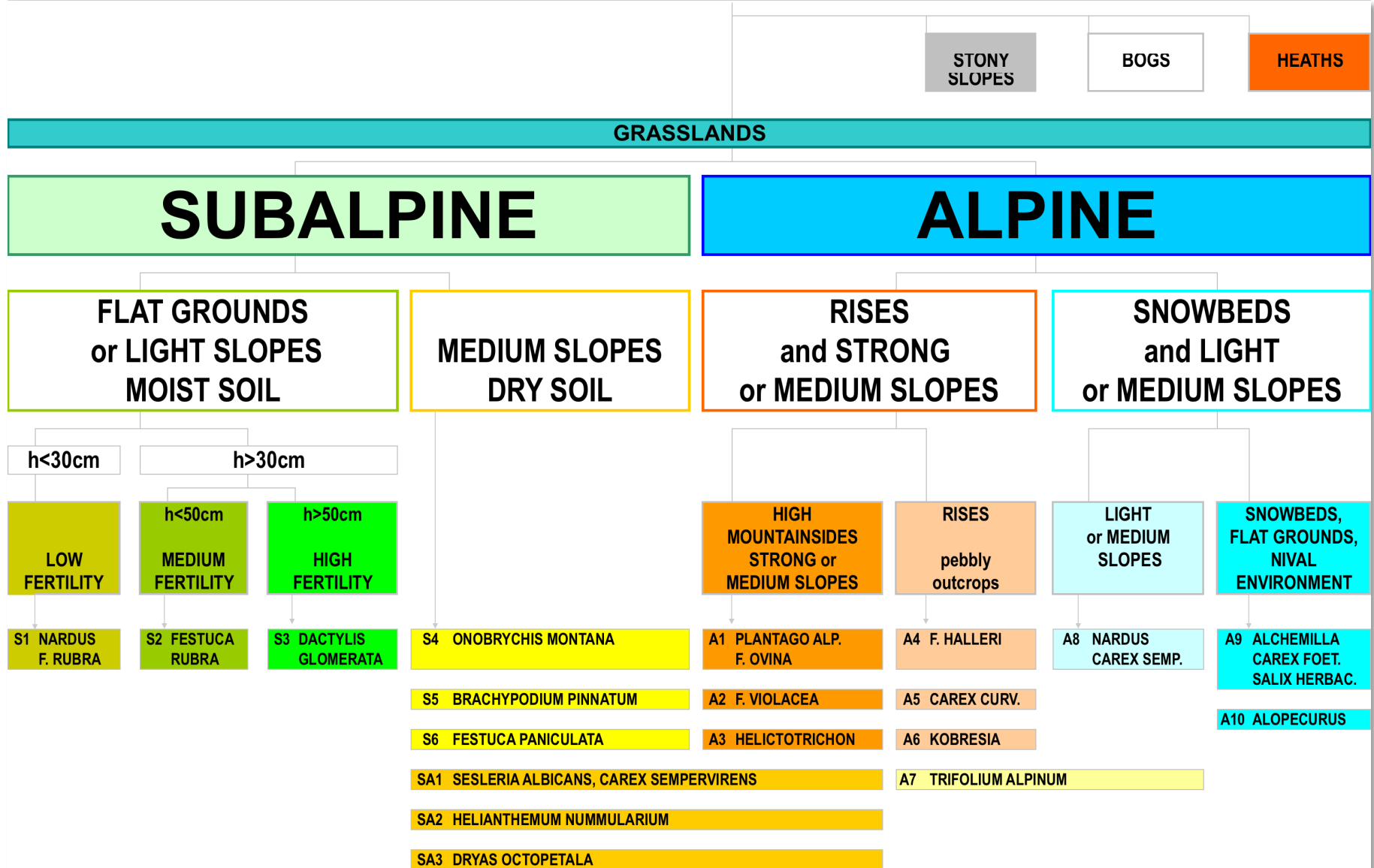
Source Tarello et al., 2000, modified

Biodiversity of the permanent meadows of Aosta Valley

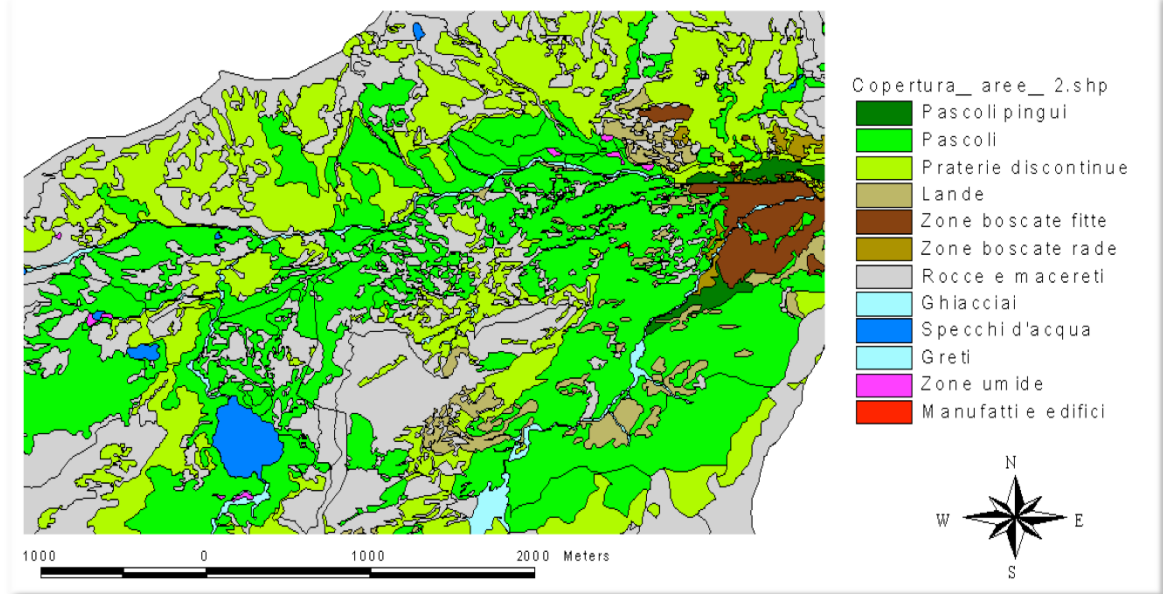
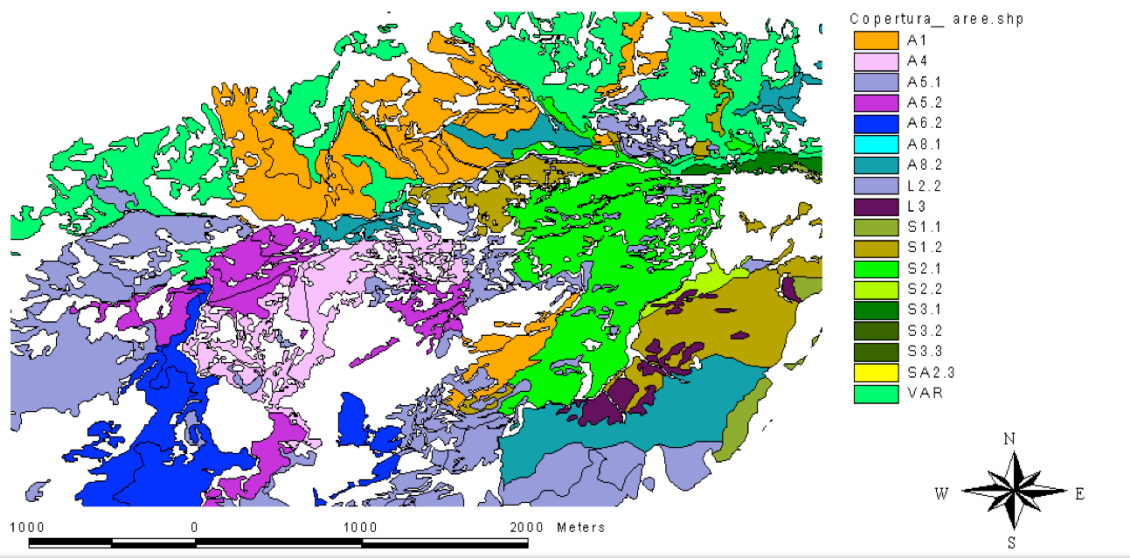


Type	Main species	Shannon's I	Equitability
1	<i>Dactylis glomerata</i> , <i>Trisetum flavescens</i> , <i>Arrhenatherum elatius</i>	3,49 ab	0,66 ab
2	<i>D. glomerata</i> , <i>T. flavescens</i> , <i>A. elatius</i> , <i>Trifolium repens</i>	3,22 b	0,60 b
3	<i>D. glomerata</i> , <i>A. elatius</i> , <i>Festuca pratensis</i> , <i>Poa trivialis</i> , <i>Lolium perenne</i> , <i>Silene</i> <i>vulgaris</i> , <i>T. flavescens</i> , <i>Anthriscus</i> <i>sylvestris</i> , <i>Anthoxanthum odoratum</i>	3,81 a	0,71 a
4	<i>Bromus erectus</i> , <i>D. glomerata</i> , <i>Plantago</i> <i>lanceolata</i> , <i>Medicago sativa</i>	3,50 ab	0,67 ab
5	<i>Festuca arundinacea</i> , <i>Onobrychis viciifolia</i> , <i>Poa pratensis</i> , <i>Phleum pratense</i>	3,30 ab	0,61 b

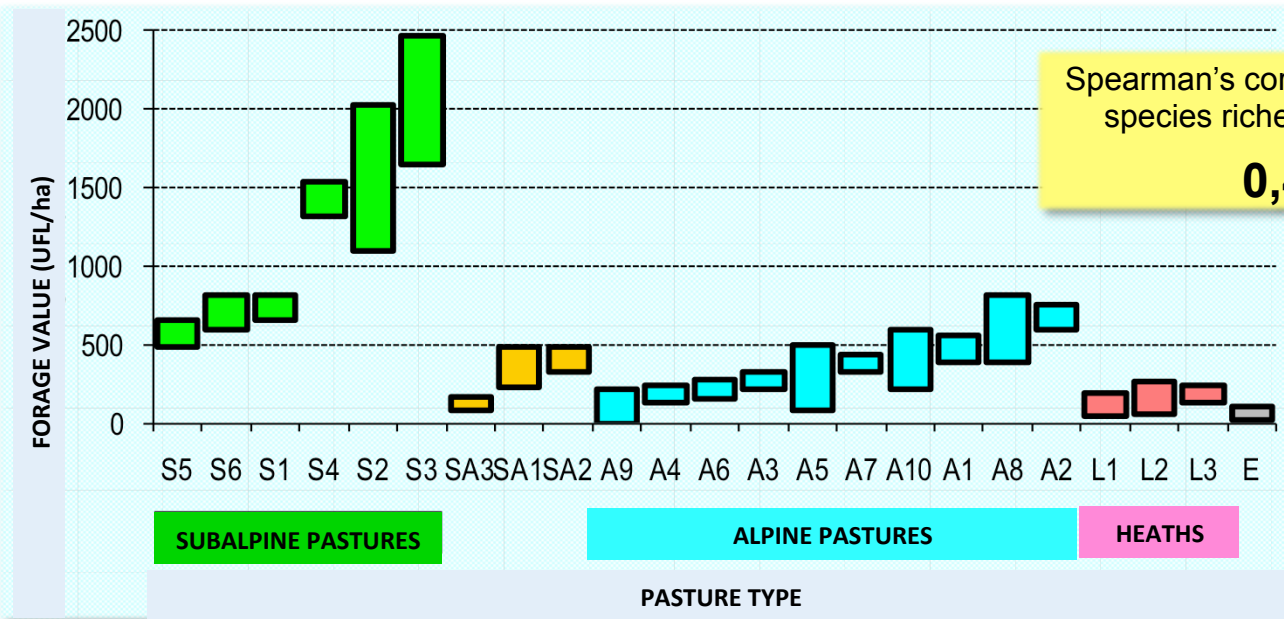
Vegetation of the summer pastures of the inner Alps-1



Vegetation of the summer pastures of the inner Alps-2

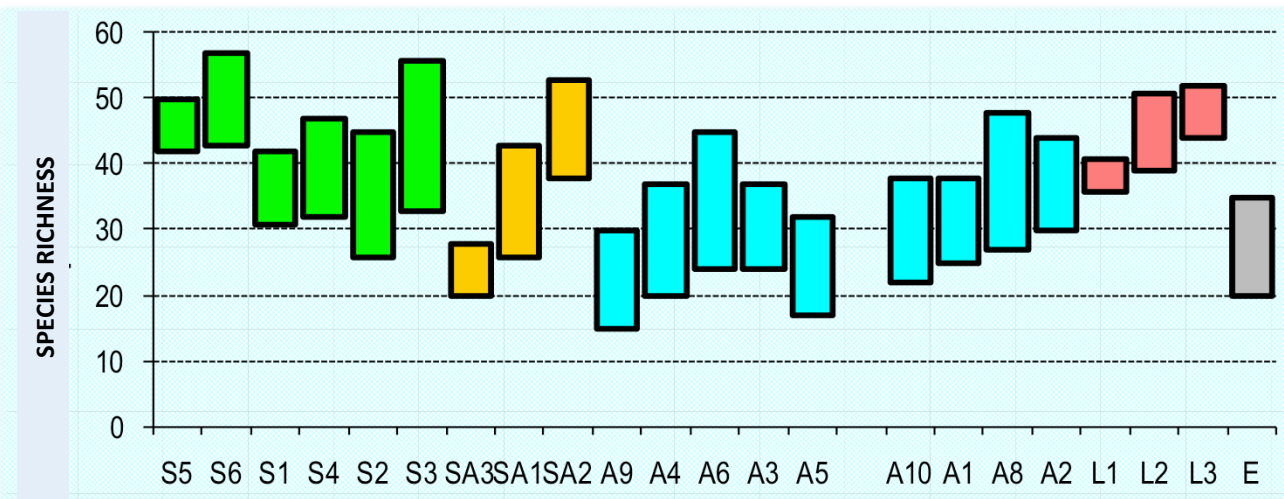


Productivity and biodiversity of the summer pastures



Spearman's correlation between forage value and species richness is positive and significant:

0,460 $p=0,031$



Objectives

Environment conservation:

- biodiversity
- fodder for wild ungulates
- landscape value

Sustainable farming:

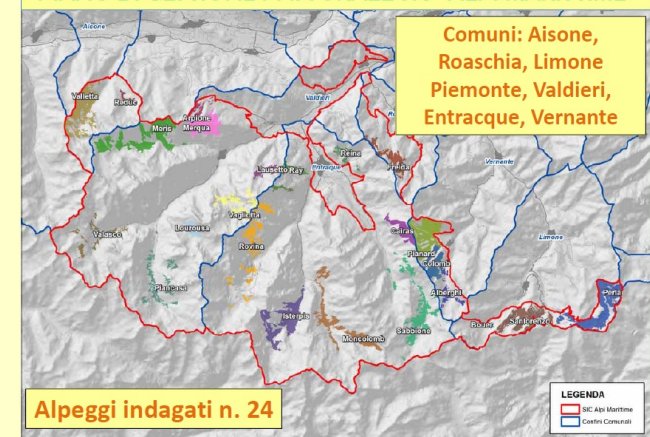
- balanced use of natural resources
- reduction of management costs
- increased quantity and quality of animal products

ESEMPIO DI PIANIFICAZIONE A SCALA TERRITORIALE

PIT - Programma Integrato Transfrontaliero
Spazio Transfrontaliero Maritime Mercantour 2007-2013
Sottoprogetto A4 - Pianificazione e gestione del territorio
Attività 3) Gestione sostenibile di territori interessati da attività agro-silvo-pastorali
Piano di Gestione Pastorale del SIC "Alpi Marittime"



PIANO DI GESTIONE PASTORALE SIC "ALPI MARITTIME"



Source: Bruno, 2013.

Native seeds for the ecological restoration in mountain zone



Partners



Institut Agricole Régional (I)



Irstea (F)

Collaborations

- Conservatoire Botanique National **Alpin**
- **Grand Paradis** National Park
- **Mont Avic** Natural Park
- **Vanoise** National Park
- **Agriculture and natural resources** Regional Dept., Aosta Valley
- **La Plagne** ski resort
- **Mont Blanc** cableway
- Water distribution syndicates **Chavacourt, Fénis** and **Jovençon**
- **Coldiretti** (Farmers' association) Aosta Valley
- **Farmers, consultants** in landscape management, **firms**

Context

- Lower income for farms
- Multi use of agricultural surfaces (production, tourism, nature conservation etc.)
- Quality of mountain grasslands and products
- Frequent earth moving works (farming, ski resorts etc.)
- Lack of local seeds

Objectives

- Income integration for farmers
- Meet an increasing demand for local seeds
- Offer local seed to PA administrations and “green” professionals
- Improve the results of reseeded in mountains



Activities

- Legal framework assessment
- Market analysis
- Technical feasibility trials
- Establishment of demonstration plots
- Economic profitability evaluation



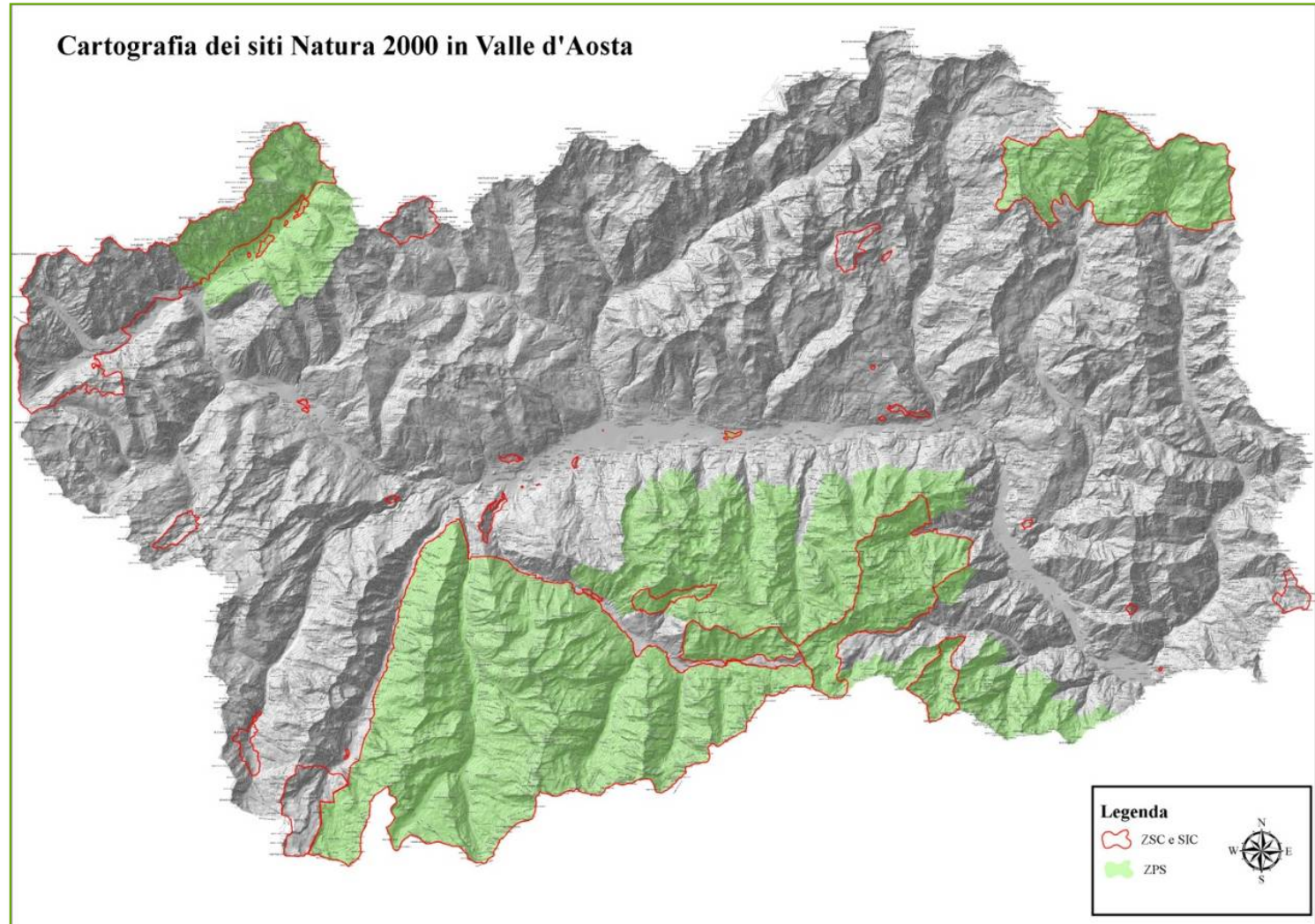
Directive 2010/60/EU - Source areas

SCI - Site of Community importance (Directive 92/43/EEC): a site that contributes significantly to the maintenance of a natural **habitat** type or a species and that may also contribute significantly to the coherence of **Natura 2000** and the maintenance of biological diversity.

SAC - Special area of conservation (Directive 92/43/EEC): a **SCI** designated by the State, in which **conservation measures** are applied to maintain or restore, in a favourable preservation status, natural habitats and/or species populations for which the site is designated.

SPA - Special protection area (Directive 79/409/EEC): a protection area, identified by the State, which contributes to the maintenance of suitable habitats for **wild bird populations**

Directive 2010/60/EU - Source areas



Harvesting equipment



**Pull type
seed harvester**



**Self-propelled
outdoor vacuum**



**Hand-held
vacuum shredder**

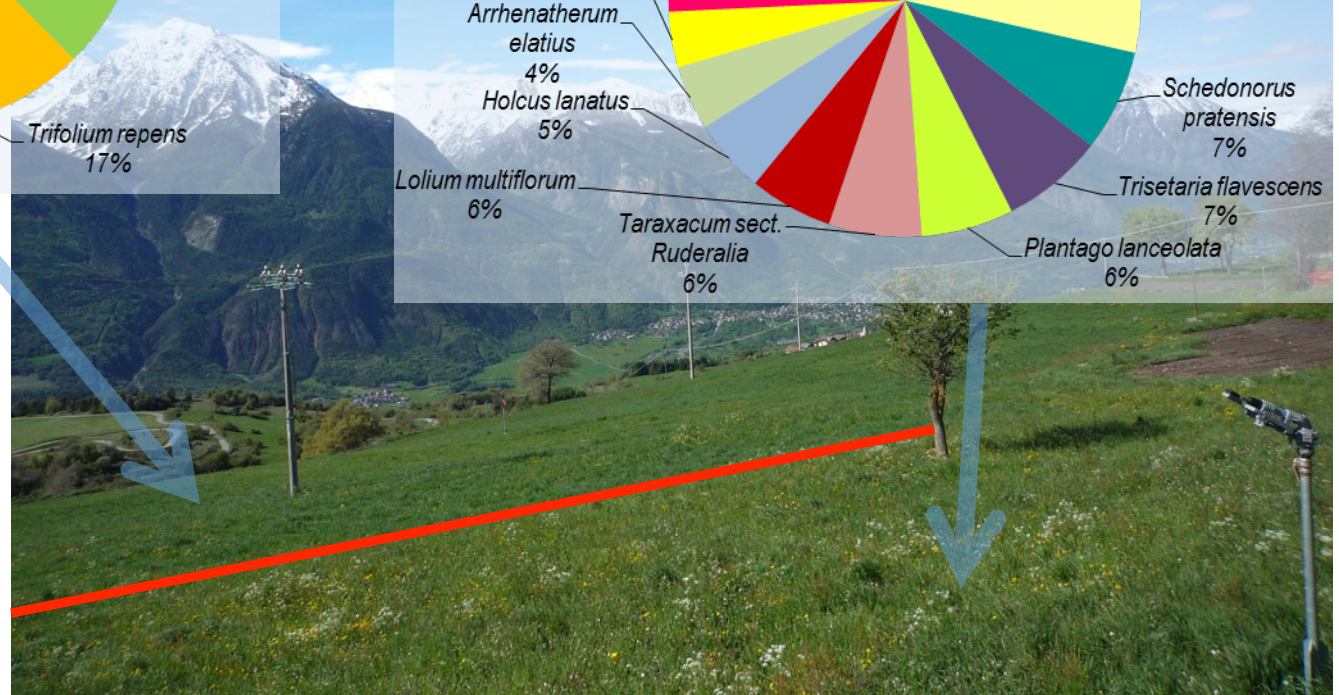
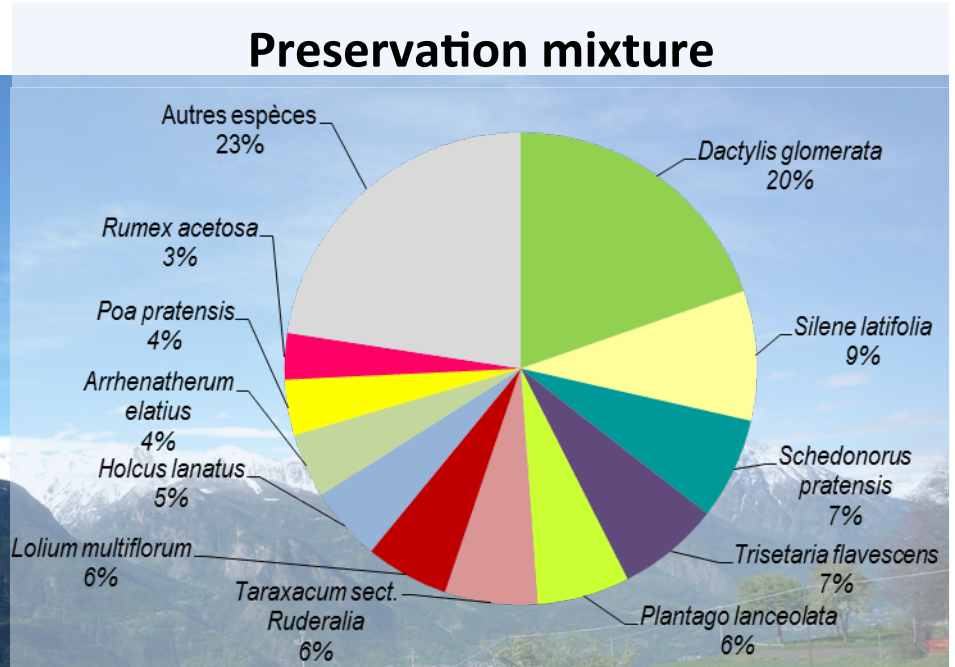
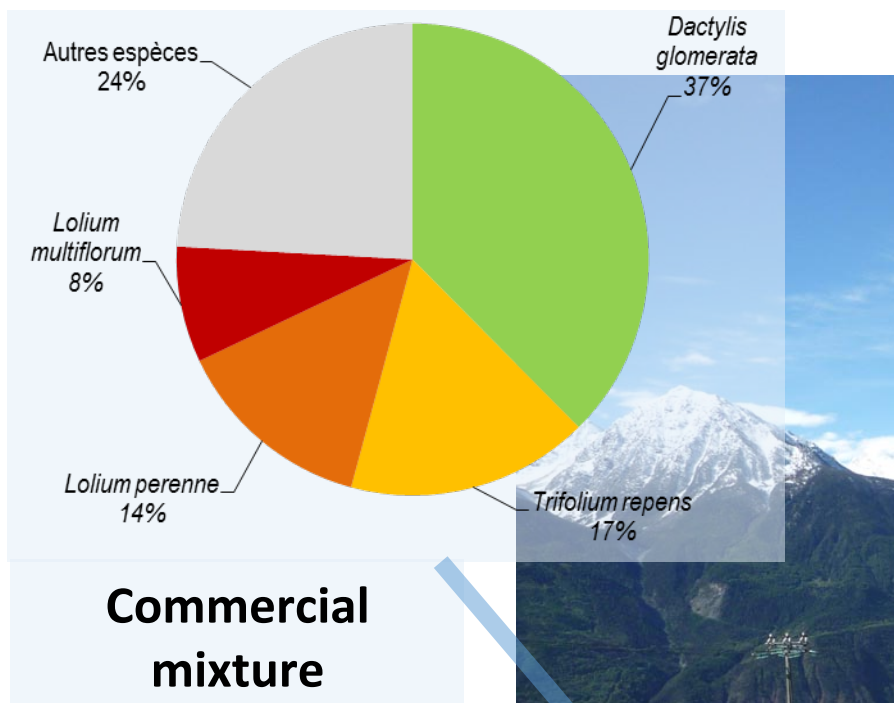


**Hand-held
seed harvester**

Pull type seed harvester



Reseeding results



Economic results, example

Dairy farm of medium-size (25 ha of grasslands), livestock at the farm all year long, milk processing plant, forage self-sufficiency, suitable machinery and family labour forces; 3 ha of permanent grassland for the production of local seed.

Harvesting seeds on its own: net income **+300 €**

Harvesting seeds within a farmers' organisation: net income **+1100 €**

Native seeds for the ecological restoration in mountain zone



Le sementi locali in montagna

Produzione delle miscele per la preservazione dell'ambiente naturale

Cosa sono le miscele per la preservazione

Le miscele per la preservazione sono composte da sementi raccolte in prati permanenti e pasco d'alpeggio ricchi di specie.

Sono destinate a mantenere habitat che meritano di essere conservati (per esempio, siti Natura 2000 e aree agricole ad alto valore naturale).

Perché è interessante produrle

Una parte dei prati e pascoli aziendali potrebbe essere utilizzata per la produzione di sementi locali, andando ad integrare e a diversificare il reddito e l'offerta delle aziende agricole che operano in montagna e nelle aree protette.



Le sementi locali in montagna

Utilizzazione delle miscele per la preservazione dell'ambiente naturale

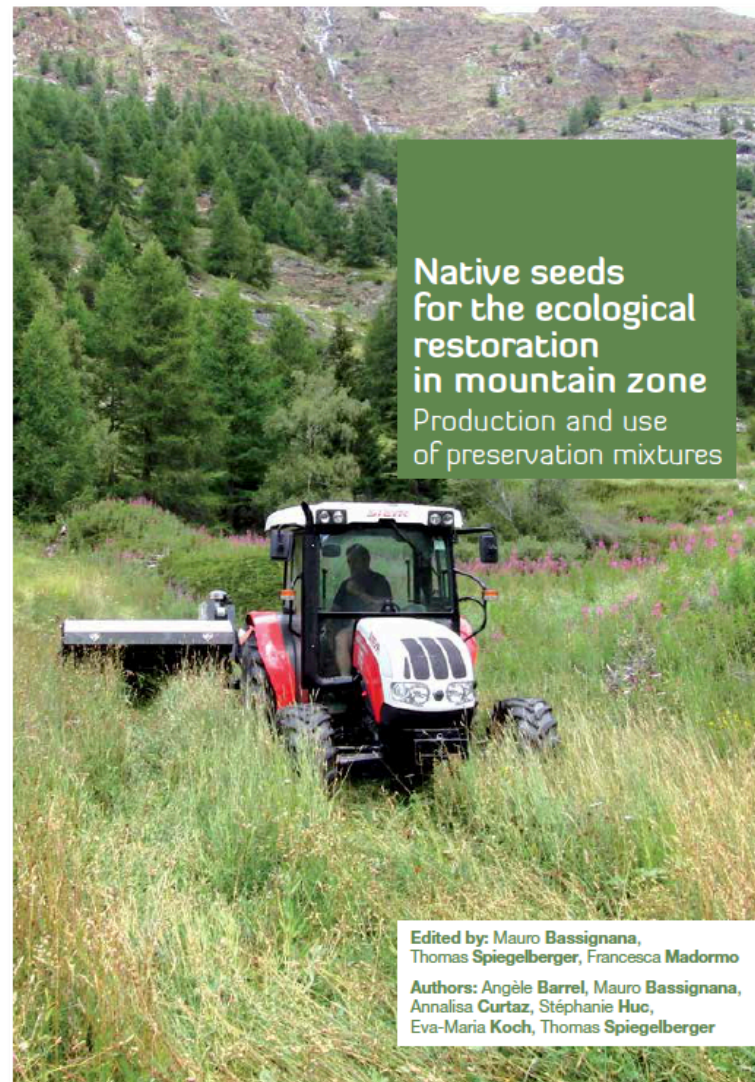
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Perché è interessante usarle

La provenienza locale delle sementi è la migliore garanzia del loro perfetto adattamento all'ambiente in cui sono reseminate.



Native seeds for the ecological restoration in mountain zone

Production and use of preservation mixtures

Edited by: Mauro Bassignana, Thomas Spiegelberger, Francesca Madorno

Authors: Angèle Barrel, Mauro Bassignana, Annalisa Curtaz, Stéphanie Huc, Eva-Maria Koch, Thomas Spiegelberger

http://www.iaaosta.it/wp-content/uploads/2015/12/Agronomia-AlpGrain_ENG.pdf