High Nature Value farmland

Overview

Irina Herzon, Traci Birge, Riina Koivuranta, Milka Keinänen

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Notes for instructors and users

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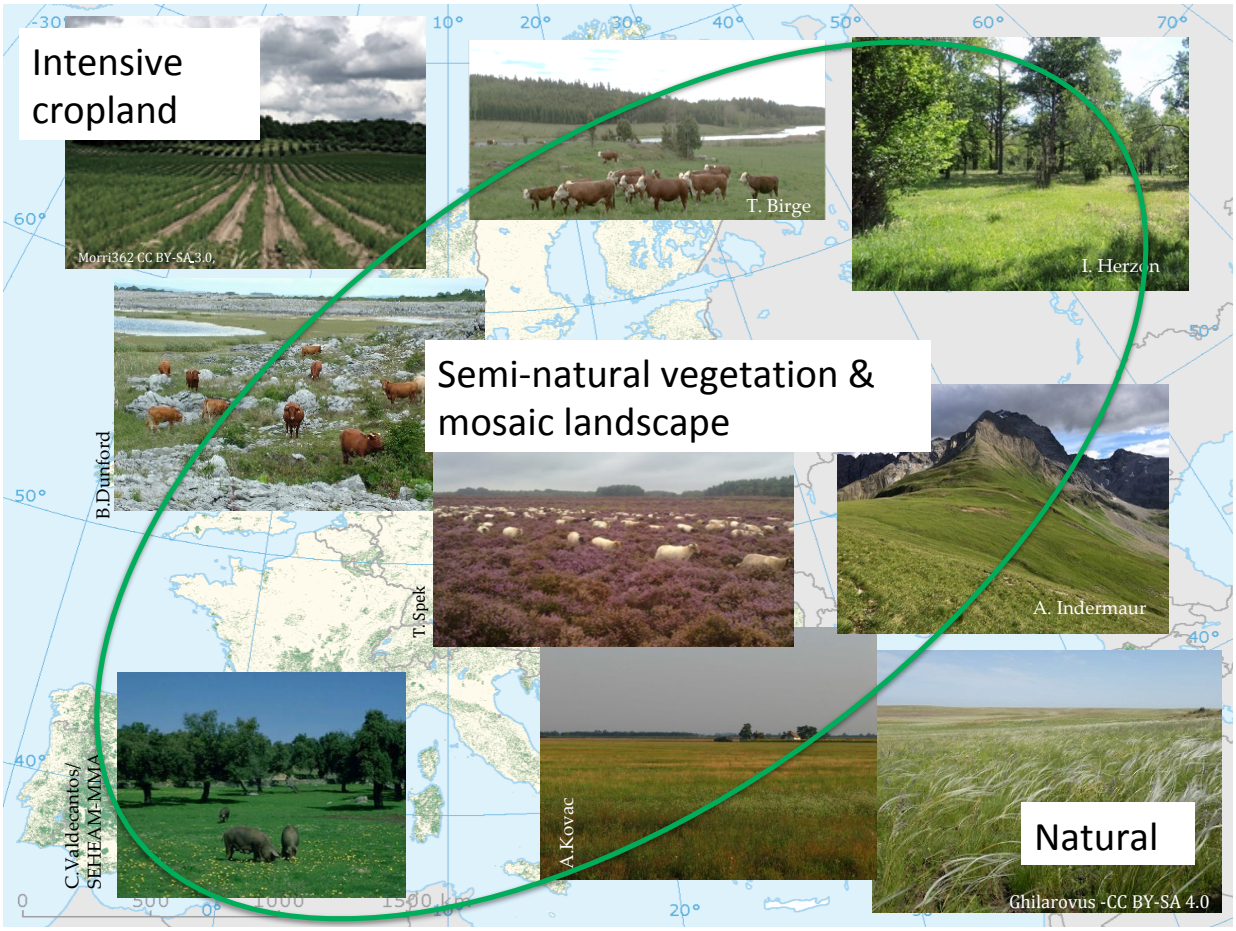
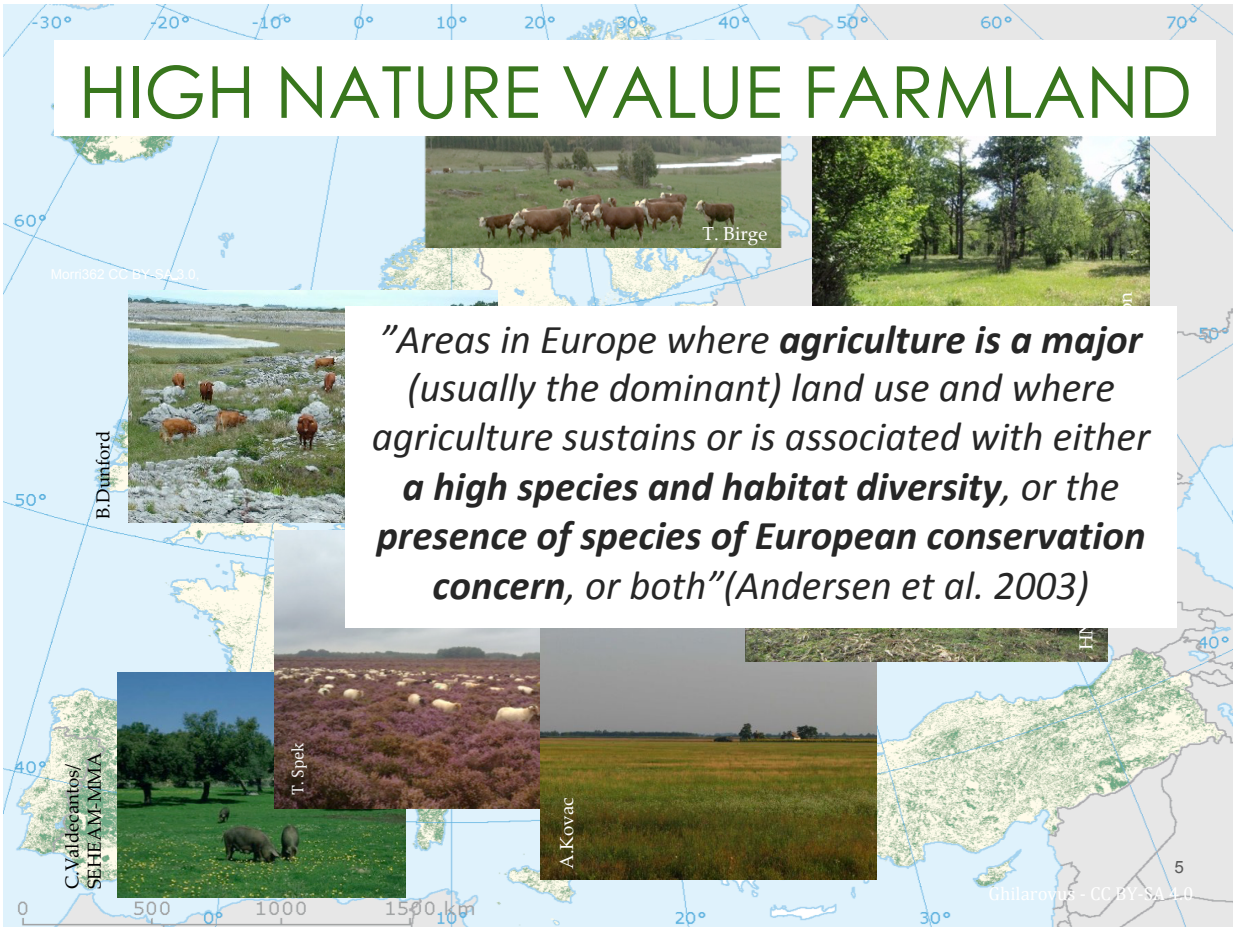
Learning objectives

- To become acquainted with the concept of High Nature Value farmland
- To appreciate the scope of biodiversity in farmland
- To understand that this diversity is largely endangered
- To become familiar with socio-economic dimensions of HNV farmland and current challenges
- To recognize that the concept provides exciting opportunities for research and development



HIGH NATURE VALUE FARMLAND



*"Areas in Europe where **agriculture is a major** (usually the dominant) land use and where agriculture sustains or is associated with either **a high species and habitat diversity**, or the **presence of species of European conservation concern**, or both"(Andersen et al. 2003)*

HNV farmland concept

- Developed in the early 1990s to encompass the rich diversity present on much of Europe's farmlands and ensure its conservation.
- "The Nature of Farming" by Beaufoy et al. (1994) - benchmark for the identification and mapping of HNV farmland
- Andersen et al. (2003) - report for the European Environmental Agency, 1st European assessment of farmlands with High Nature Value

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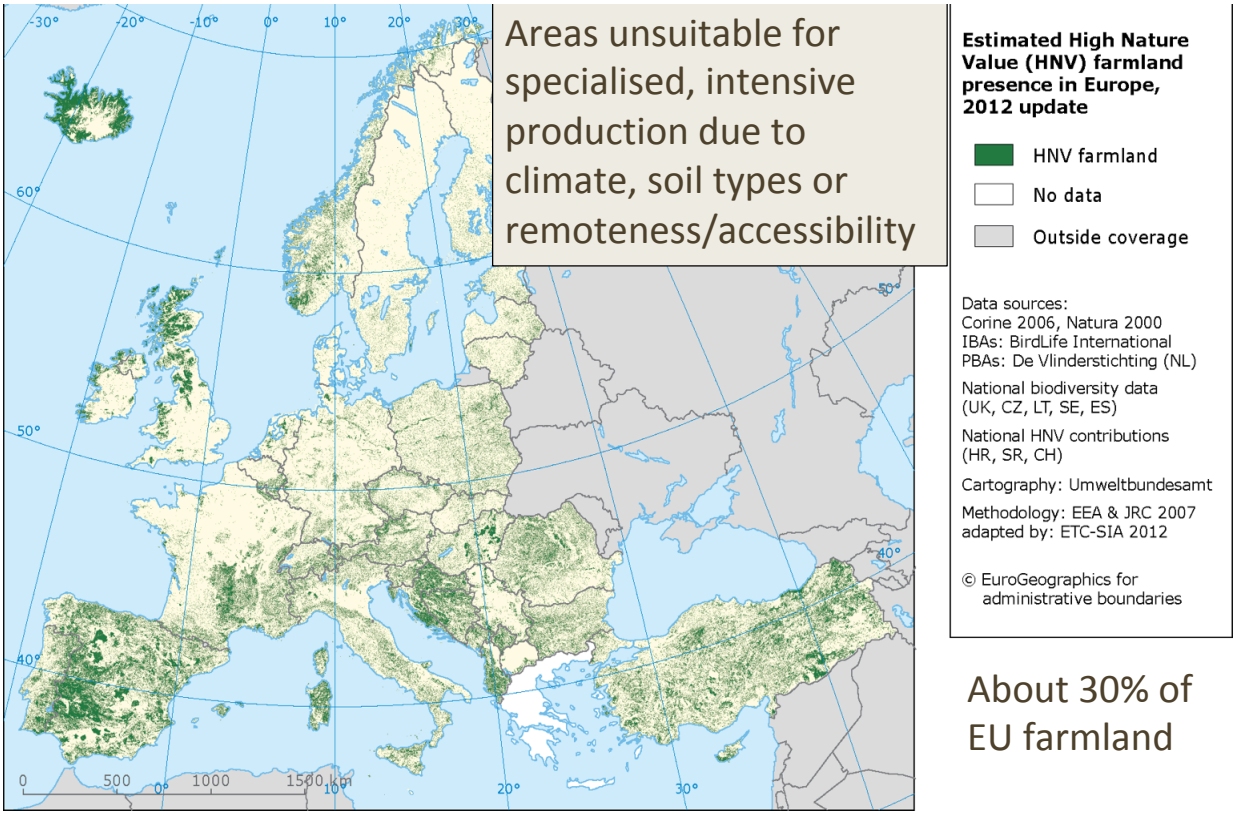
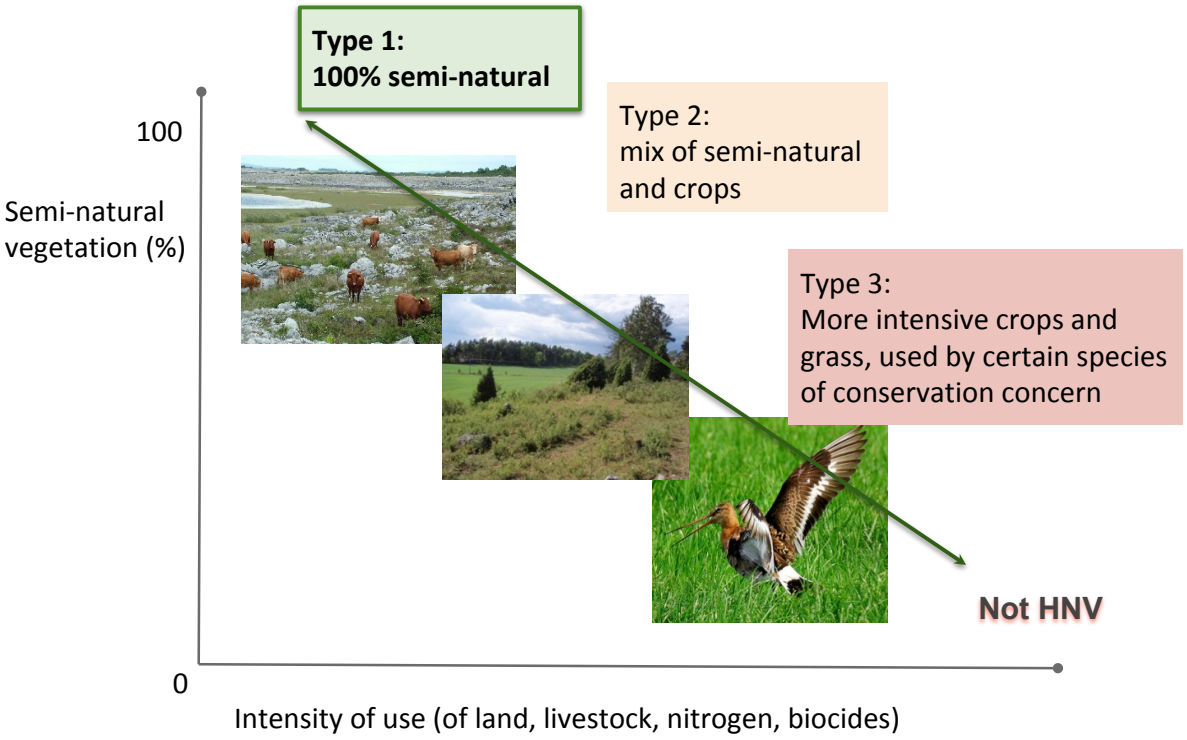


High Nature Value Farmland:



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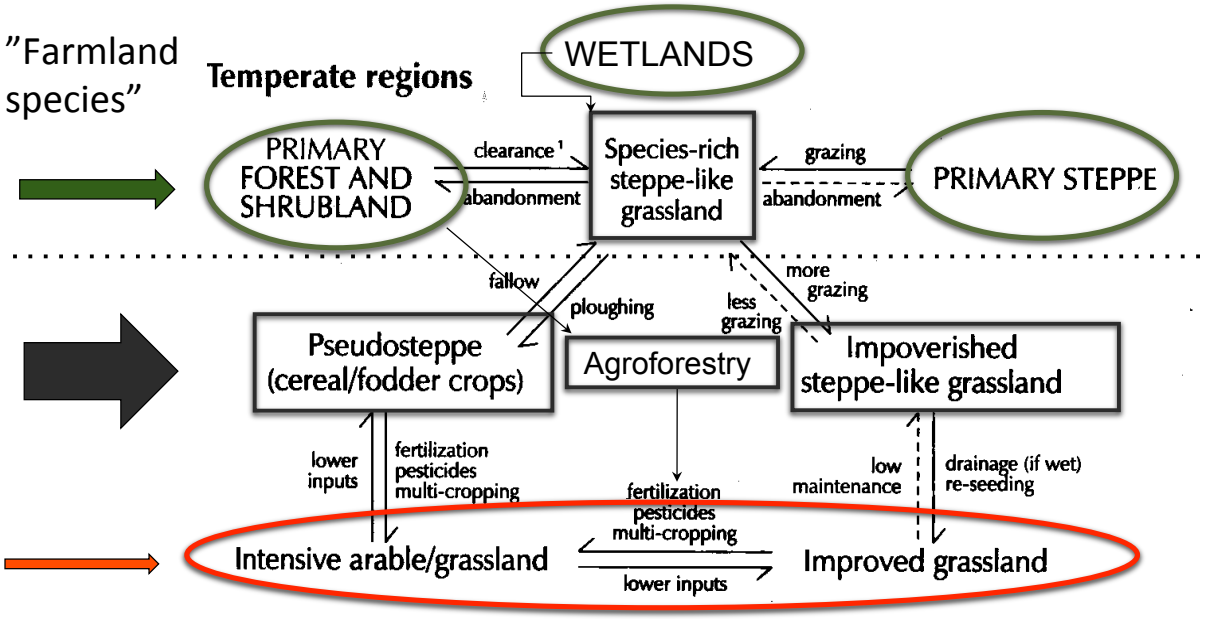
Origins of biodiversity in farmland



Adapted from Goriup, 1988. Ecology and Conservation of Grassland Birds. ICBP

Grasslands in Europe:

1. **Natural grasslands**: zonal grasslands (on large-scale) in regions too dry for forests, but sufficiently humid to allow for a closed vegetation:
   - basically non-existent in Europe

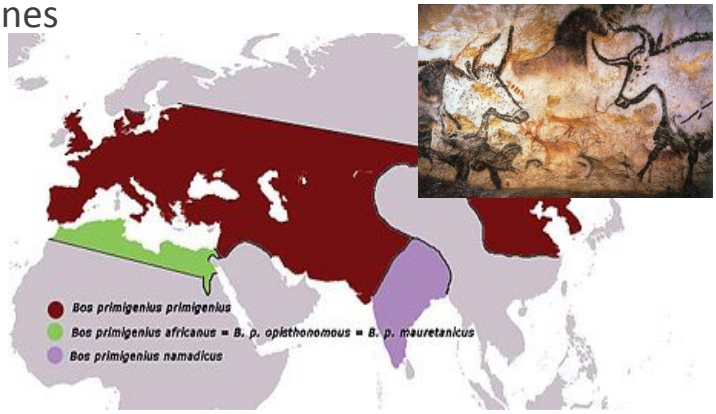
jrscience.wcp.miamioh.edu

Grassland = land covered with herbaceous plants with less than 10 % tree and shrub cover (UNESCO)

Grasslands in Europe:

2. **Azonal and extrazonal grasslands**: naturally at small scale within the forest on soils unsuitable for trees or resulting from floods, fires or grazing by wild bovines

✓ **HNV farmland:** kept open by some form of human activity



By Prof saxx [GFDL (http://www.gnu.org/copyleft/fdl.html), CC-BY-SA-3.0 (http://creativecommons.org/licenses/by-sa/3.0/) or Public domain]

✓ HNV farmland

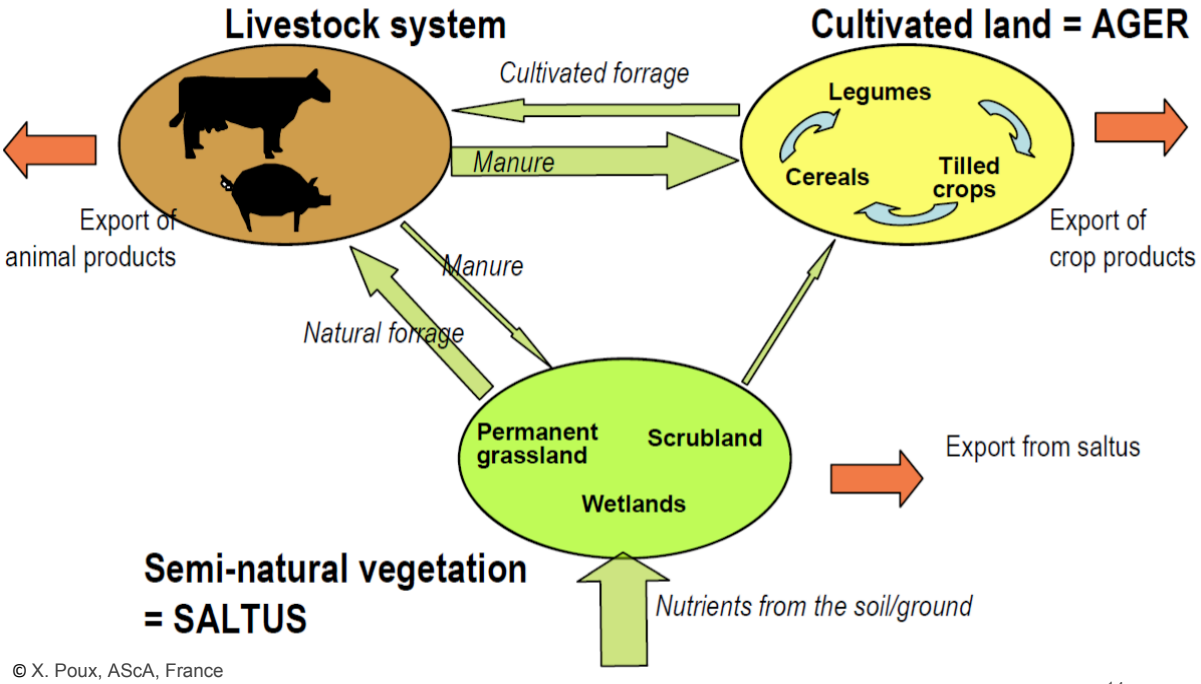
Grasslands in Europe:

3. **Semi-natural grasslands:** secondary (= anthropogenic) but (usually) unimproved; kept open by long-term grazing, haying, clearing, burning.


Extensive pasture in Bulgaria © Bilgin Asanov


Hay meadow in Romania © HNV-Link

Cultural origins of semi-natural vegetation



© X. Poux, AScA, France

Mountainous regions

Sevenne, France
© S.Gerardin

Switzerland
© A. Indermaur

Sardinia, Italy
© E. Farris

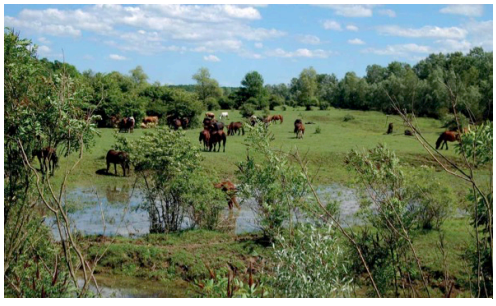
Large areas in **Switzerland, Austria**, **Bulgaria**, **Romania**, **Scotland**, across **Mediterranean**

Coasts and floodplains

Rough grazing along the Atlantic
© J. Moran

Salt meadows: The Netherlands
© T. Spek

Machair © HNV-Link



Floodplains
www.pp-lonjsko-polje.hr; permission for this use only

Dry grasslands

- Highest percentage are in the Mediterranean zone
- many types are in the EU Habitat Directive

Estimated 20 million ha*; mainly under extensive grazing

Dry pasture with *Festuca indigesta* and *Caluna vulgaris* shurb, Italy © E. Farris

*Oppermann et al. 2012

Temperate heath and scrub

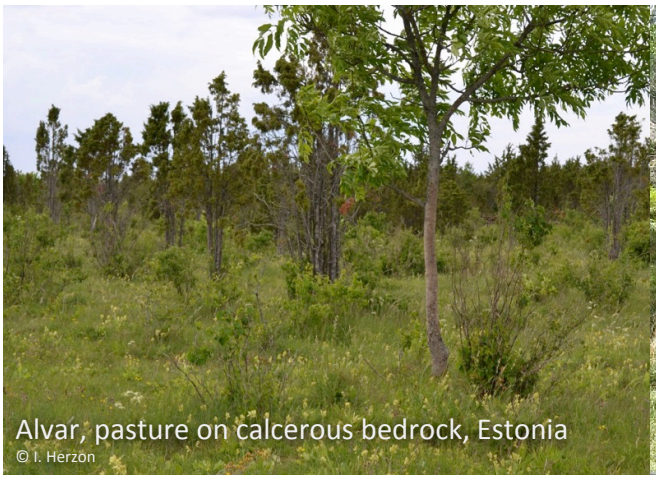
Dominated by *Erica* spp. on wet and dry areas.

In nearly all EU countries but large areas only found in the western oceanic fringes.

© T. Spek

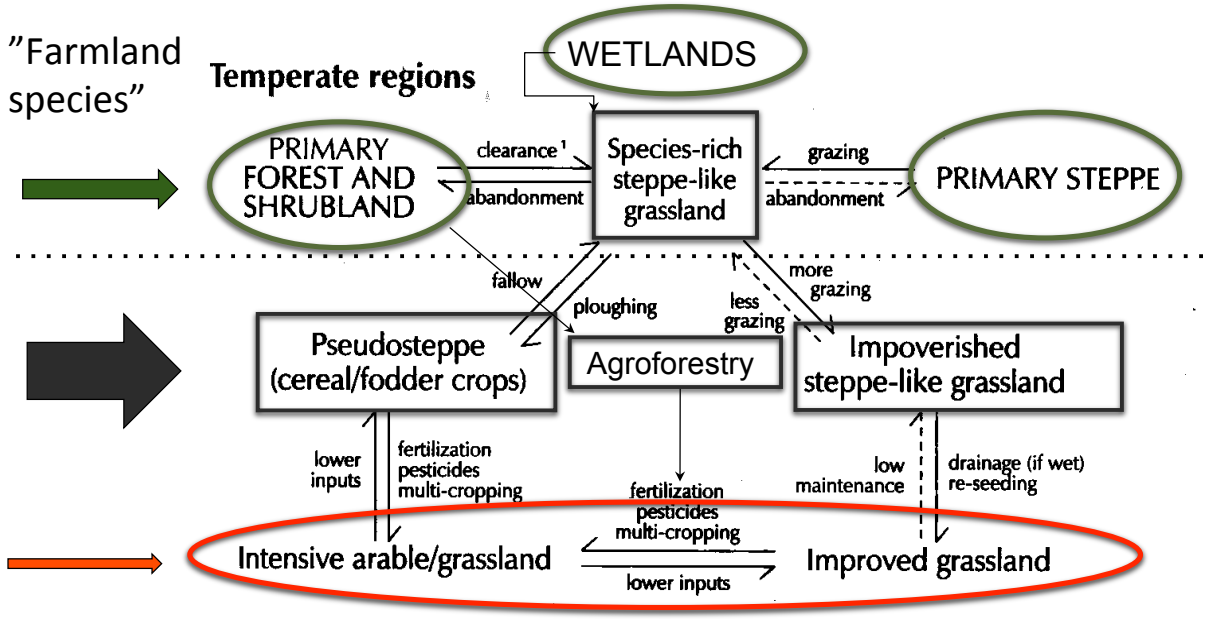
Wooded pastures and grazed forest

- Mostly across the boreal zone and in Eastern Europe
- Previously more multifunctional but nowadays grazing is the sole or predominant agricultural use


Alvar, pasture on calcerous bedrock, Estonia
© I. Herzon


Grazed forest, Finland
© T. Birge

Origins of biodiversity in farmland



Adapted from Goriup, 1988. Ecology and Conservation of Grassland Birds. ICBP

Pseudosteppe

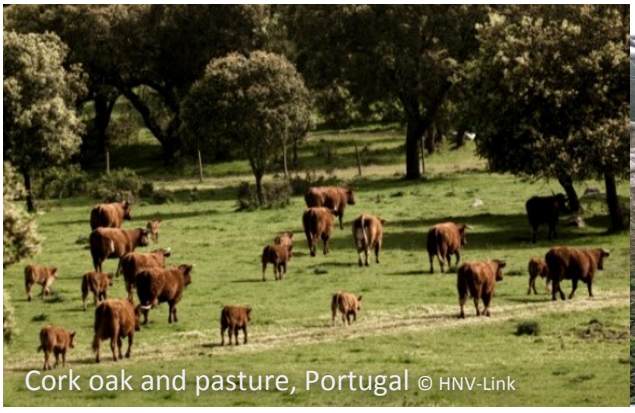
- Non-irrigated cereal/ fodder production on plains of Iberian peninsula, Italy and Greece
- Permanent grassland, cereal crops, fallows, scrub
- Resembles true steppes in Russia and Asia

Pseudosteppe
© G. Beaufoy

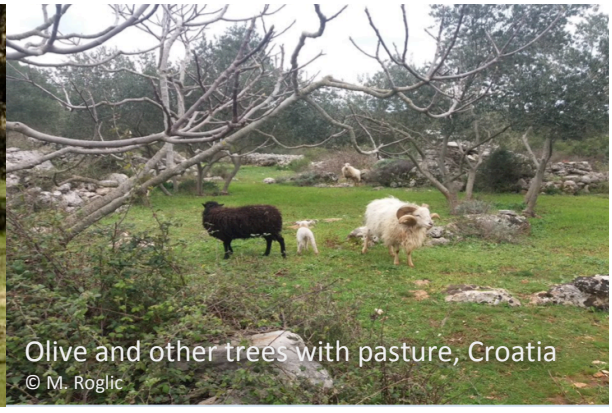
Great Bustard
Otis tarda

Agroforestry

- Traditional systems integrating trees with grassland and arable
- Perennial crops: olive groves, cork and oak -based systems, vineyards, fruit and nut orchards

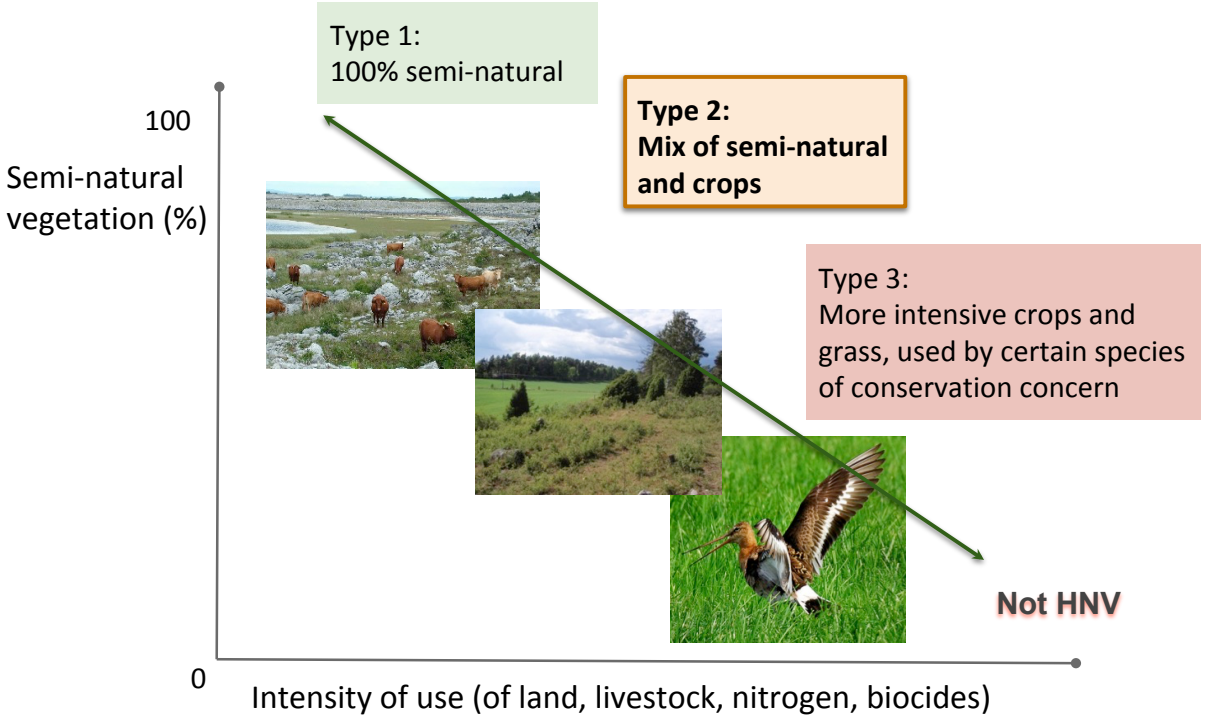


Cork oak and pasture, Portugal © HNV-Link



Olive and other trees with pasture, Croatia
© M. Roglic

High Nature Value Farmland:



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Type 2: Mosaic

Of low intensity agriculture and structural elements (margins, hedgerows, stone walls, patches of woodland or scrub, small rivers)

Stonewalls, Dalmatian Islands, Croatia
© HNV-Link

Extensive mixed production, Croatia
© HNV-Link

HNV definition requires a combination of BOTH high diversity of land cover AND low intensity farming

Mosaics, including improved grassland

Improved grasslands = fertilized, seeded or re-established, drained

- Permanent grasslands
- Rotational grasslands
- Fallows

Improved grasslands

Permanent grassland in a mosaic farmland, Ireland © C. Sullivan

Species-rich fallow, France
Jebulon [CC0]

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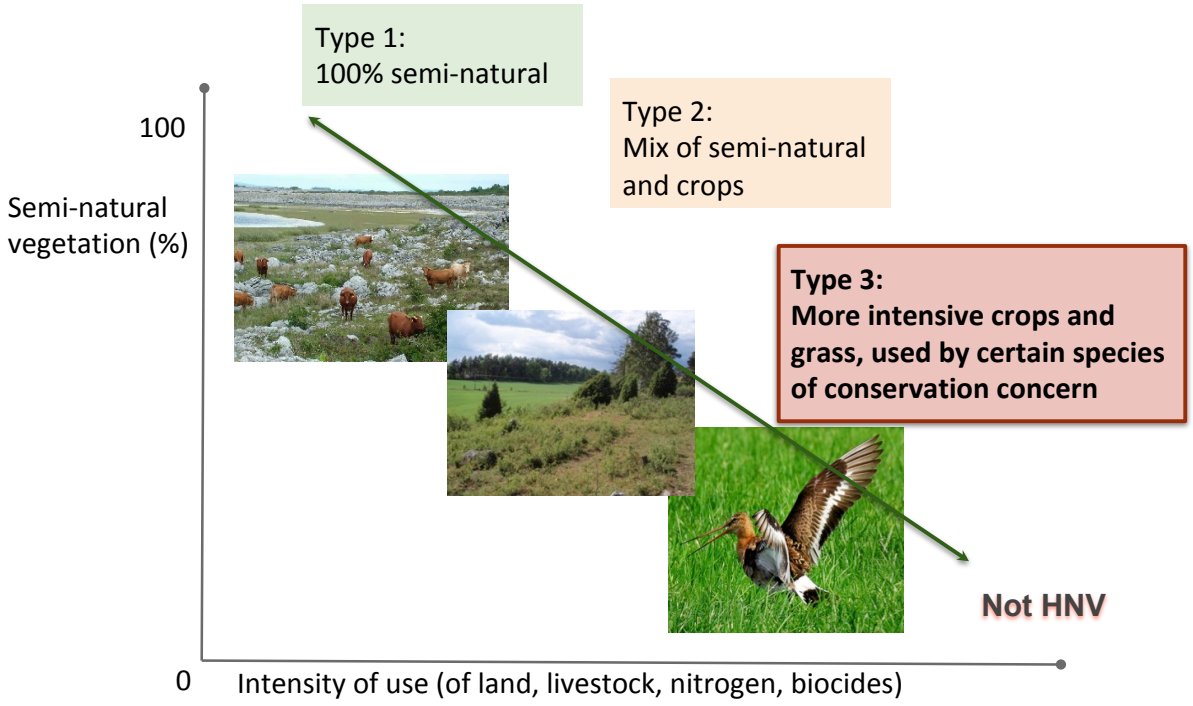
High Nature Value Farmland:



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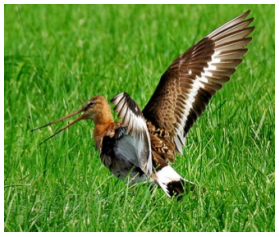
Type 3: Farmland supporting species of conservation interest

- **Arable:** Montagues harrier (*Circus pygargus*), Corn bunting (*Emberiza hortulana*), Little Bustard (*Tetrax tetrax*)
- **Extensive cereals:** European Hamster (*Cricetus cricetus*) and E. Souslik (*Spermophilus citellus*)
- **Grasslands:** Black-tailed Godwit (*Limosa limosa*), Great Bustard (*Otis tarda*)

European hamster

Marsh Gladiolus



Black-tailed Godwit

Contents

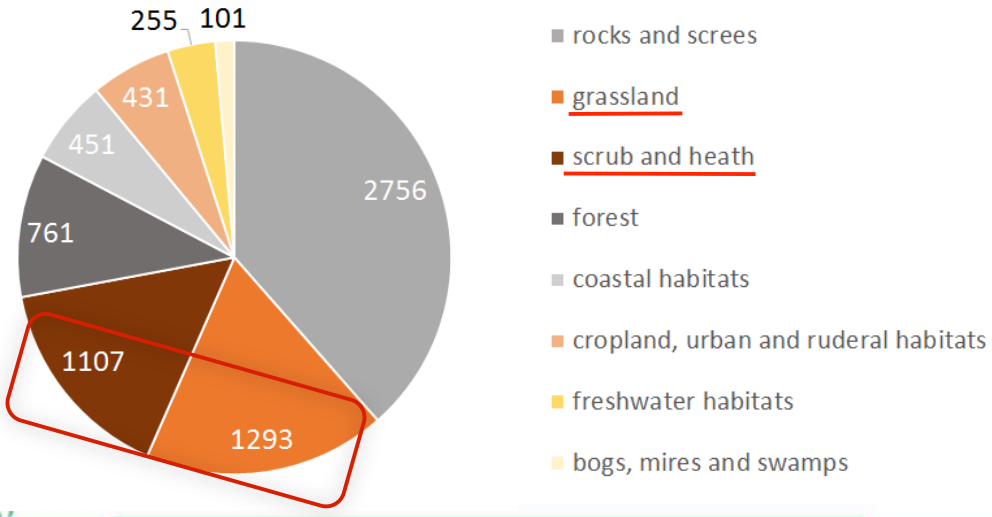
Diversity in farmland

- **Birds:** agricultural lands in Europe - the primary habitat for 173 species; greater than for any other habitat type (Tucker, 1997)
- **Plants:** Over 2000 species occur on grasslands, about 50% of the total flora in Central Europe (Briemle 2003)
- **Butterflies:** farmland - the main habitat for over 75% of the species in the UK

In Finland 30% of known species are associated with farmland occupying 7% of land area (www.luonnontila.fi)

Diversity in farmland

- Number of endemic vascular plant taxa in different habitat types of Europe



Based on Hobohn & Bruchmann 2009, 2010, 2012

Grasslands - hotspots of diversity

- Wooded meadows traditionally used for hay in Estonia: **74 species** of vascular plants / m² (Estonian Wooded Meadows and Wooded Pastures)
- Semi-dry grassland in Romania: **44 species** / 0.25 m² (WallisDeVries et al. 2002)

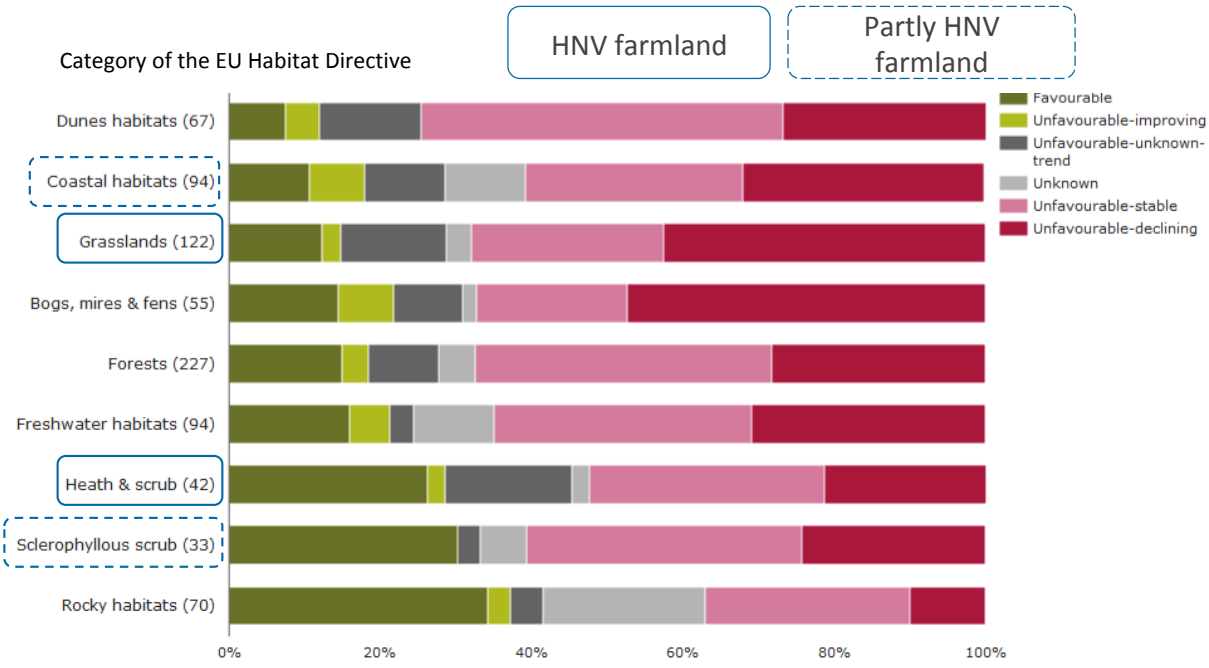
In comparison, a lowland tropical forest in Costa Rica may have 233 rooted vascular spp. / 100 m² (WallisDeVries et al. 2002)

Drivers of exceptional diversity

- The sheer **diversity** of farmland systems across the continent
- Long continuity of **grasslands** (centuries and millennia)
- Soils poor in the key **nutrients** (P and N) but may be rich in others (Ca)
- **Unimproved state**: site conditions wet / hot / stony or mosaic
- No or **low-level fertilization**
- Infrequent or **low disturbance**: mowing once-twice a year / no supplementary fodder
- **Diverse elements** (forests, scrubs, fens)

Contents

Conservation status and trends of habitats



eea.europa.eu/data-and-maps/indicators/habitats-of-european-interest-1/assessment

Increasingly endangered diversity

Grasshopper, cricket and bush cricket species (*Orthoptera*):
28% are threatened in the EU, mainly due to agriculture
(IUCN, 2017)

Butterflies:
30% of Europe's 435 species have declining populations, most live in natural & semi-natural habitats
(the European Red List, 2010)

Plants:
Of 870 species on the red data list in Germany, 500 are characteristic of semi-natural grasslands
(Briemle 2003)

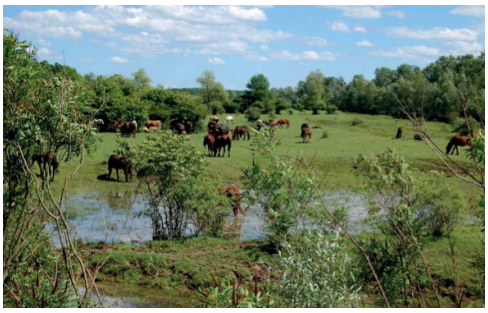
Habitat types:
50% of grassland habitats have an unfavourable conservation condition (EEA, 2013).

High diversity + risk of extinction = **need for action!**

Contents

Socio-economic aspects

Employment: often more labour-intensive due to the low level of chemical inputs, difficult terrain.



Floodplains
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Shepherding, Spain
© EFNCP

Productive role: areas that cannot be tilled: mountain pastures, floodplains, arid areas.

Economics, example from Belgium

	Forage maize	Cut grass	Grazed grass	Species-rich hay
Yields, t DM	17	14	10	4
Costs, € per ha	1275	1309	375	345
per 100 kg DM	7,5	9,4	3,8	8,6
per Fodder Unit Milk	0,08	0,72	0,27	0,12

Deprez et al. 2007

Unique products

Preserved chestnuts from Cevennes, France

HNV farms produce products of **Protected designation of origin** (PDO)

© HNV-Link

Feta cheese from Thessaly, Greece

France: 65% of the endangered breeds of sheep and 42% of cattle are from HNVf areas

- *Lacaune* dairy sheep: milk mainly for Roquefort cheese

Cultural (heritage) importance

- HNV farmland & traditional practices are part of the **identity** of many famous regions

Other public services:

Provision of public goods by HNV farmland

agricultural landscapes	farmland biodiversity	water quality	water availability	soil functionality	climate sustainability
💧💧💧	💧💧💧💧	💧💧💧	💧💧💧	💧💧💧/💧💧	💧💧

air quality	resilience to flooding	resilience to fire	rural vitality	animal welfare and health	food security
💧💧💧	💧💧💧	💧💧💧	💧	💧💧💧💧	💧

environmental goods

social goods

low 💧

💧💧

💧💧💧

high 💧

💧💧💧

modified from Cooper et al., 2009

Fire prevention

- Grazing of scrub and forest undergrowth reduces wildfire risk by preventing fuel load buildup
- Particularly important near settlements, valuable property and conservation areas

Wildfires, Estremadura, Spain

Contents

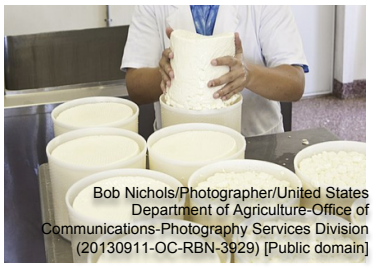
Challenges for supporting HNV farmland

1. Economic vulnerability
2. Pitfalls in public support & regulations
3. Rural depopulation and aging farmer population
4. Changes in consumption patterns
5. Lack of public awareness of HNV farmland benefits
6. Lack of training and advisory support, low R&D
7. Polarised agricultural use

Challenges

1. Economic vulnerability

- Coupling of the value of HNV management to marketable goods is a challenge
- HNV products (incl. traditional foods) not always differentiated in the distribution chain
- Pricing systems frequently unfavourable to low-input & traditional products
- Strict and expensive hygiene rules



Bob Nichols/Photographer/United States Department of Agriculture-Office of Communications-Photography Services Division (20130911-OC-RBN-3929) [Public domain]

Challenges

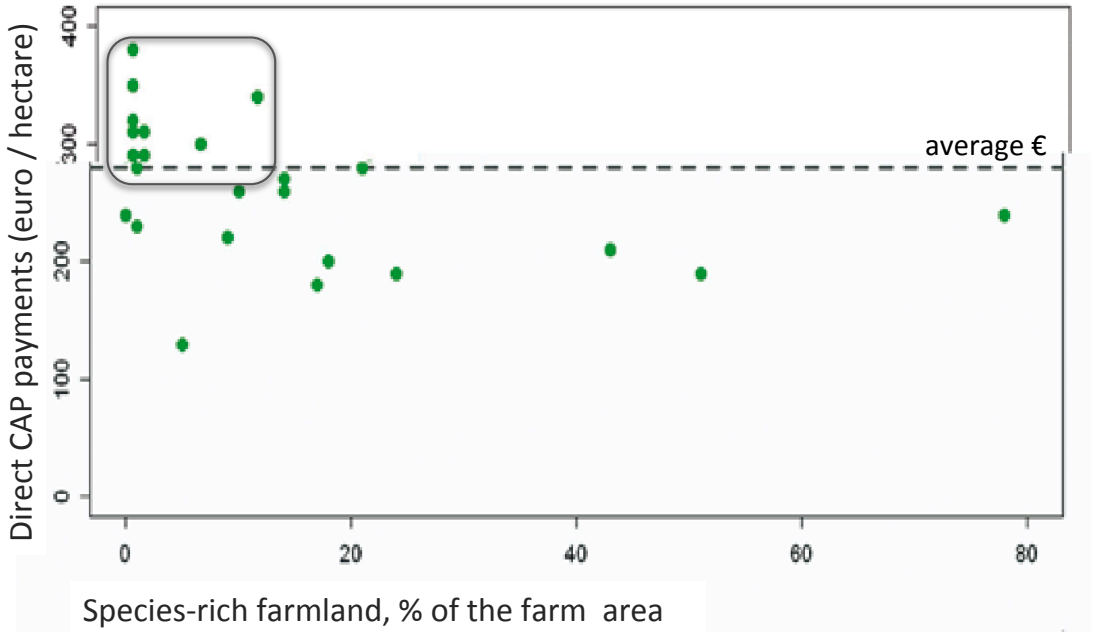
2. Pitfalls in public support

- Direct support under Common Agricultural Policy (CAP) based on ”historical production”
  → favours high yielding farming systems, disadvantages HNV farming systems
- *e.g.*: currently 20% of farmers get 80% of CAP money: http://capreform.eu/focus-on-the-distribution-of-direct-payments/?platform=hootsuite
- Payments for afforestation & irrigated crops
- A central task for the HNV concept: to balance support for HNV farming across extensive areas of landscape

  → should 30% of HNV farmland = 30% of CAP?

Challenges

Example Germany



Source: BirdLife, Reality Check, 2010

Challenges

3. Depopulation & aging farmer populations

Abandonment risk of high nature value grasslands in the UK results from:

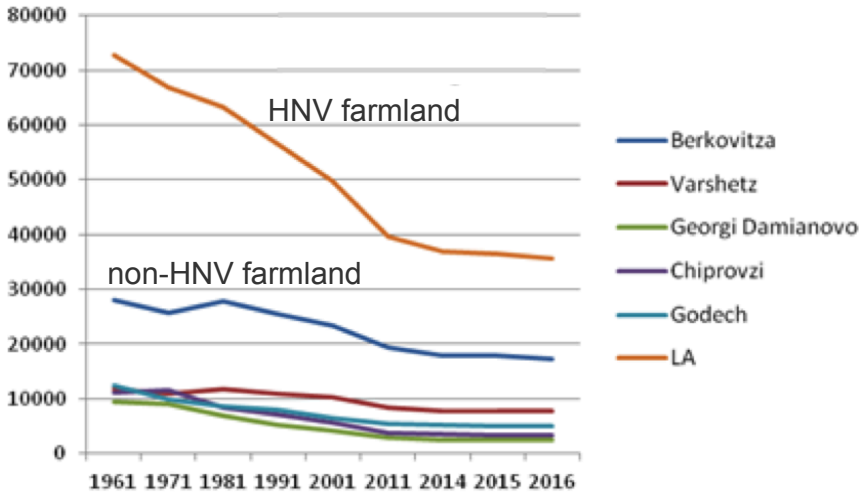
- Difficulty in recruiting and retaining farmers.
- They tend to be smallholders and near or over retirement age.
- Farmers' motivations are limited by marginal economic benefits.

McGinlay et al. (2017) Environmental Science & Policy, 69: 39–49.

3. Depopulation

Challenges

Population in a HNV farmland region, as compared to other regions, Bulgaria (HNV-Link)



4. Changing consumption patterns

Challenges

- Many chefs would choose ”Argentinian beef” over nationally produced on semi-natural grasslands (pers. comm. cooperative Liivimaa Lihaveis, Estonia)
  - Sheep replacing traditional pig or cattle in Iberia
  - Chicken replacing beef in northern Europe


Iberian pigs in Spain © Valdecantos/SEHEAM-MMA


Cattle in Finland © I. Herzon

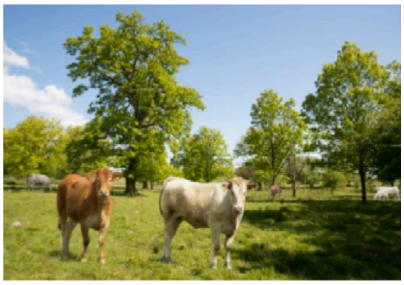
5. Awareness about semi-natural grasslands

Challenges

...may depend on their prevalence

Sweden: 500,000 ha remain

- Kumm 2017: Survey (n=1000)
  - c. 60 % are important, mainly for their biodiversity
  - 40 % of meat consumers willing to pay 20 % premium
  - positive impact on surrounding property prices



5. Awareness about semi-natural grasslands

Challenges

Finland: 45,000 ha remain, mainly small and fragmented

- Kaljonen et al. (2018): Interviews with producers of meat from animals grazing semi-natural grasslands and their consumers
  - Customers value 'an overall wellbeing of animals'
  - Consumer are not ready to say "oh wow, they are grazing natural pastures!"
  - Producers: too much effort to explain
    → labelling of "natural pasture meat" may be difficult nationally

Challenges

6. Lack of training and advisory support, low attention in R&D

- The mainstream agronomic education, advisory, research and development focuses on intensive “modern” production systems
- HNV farming systems need attention

  → empowerment of HNV farmers

  → transformation of the HNV farming systems into viable

EIP-AGRI Focus Group High Nature Value (HNV) farming profitability. 2016

Training on ecological results on pastures, Ireland

Challenges

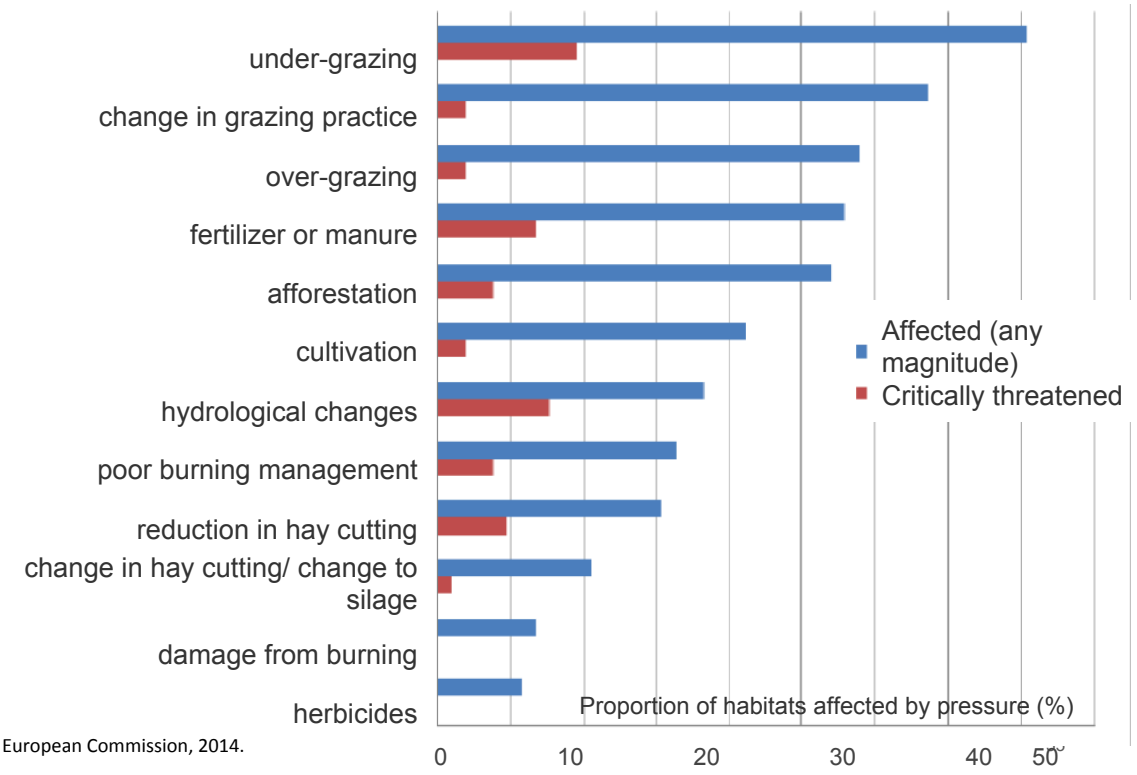
7. Polarised land-use

- Intensification vs abandonment/afforestation:
  - 60% of the newly afforested areas in the EU are former permanent grassland (European Commission, 2008).


A semi-natural grassland replaced by maize, Germany
© R. Oppermann


Abandoned semi-natural grassland, Estonia
© I. Herzon

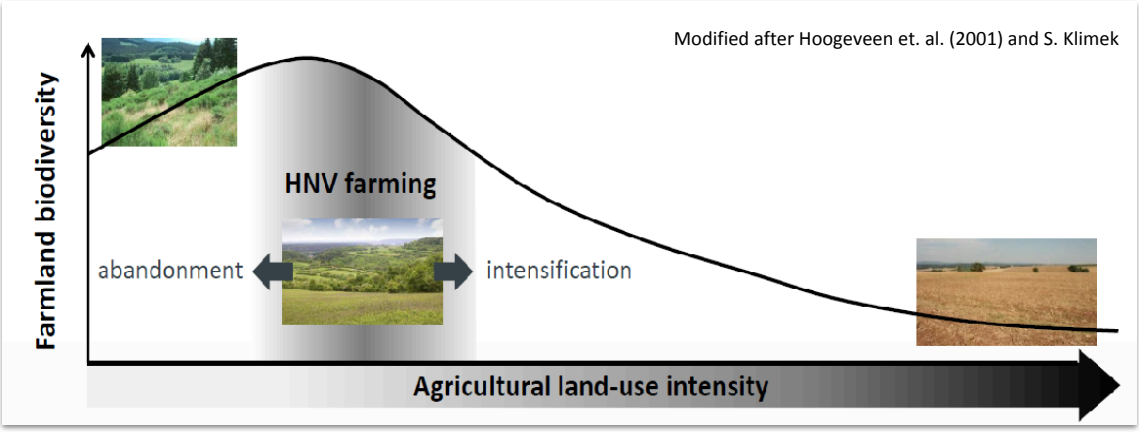
Reasons for unfavorable status of protected habitats in the EU by % of affected habitats



European Commission, 2014.

A narrow path for HNV farmland

Challenges



Conservation of species-rich agricultural habitats and landscapes is, to a large extent, linked to the continuation of low-intensity farming systems - High Nature Value farming systems

HNV farmland as a policy tool

- To address the challenges above, the concept is used:
  - to target policy and funding, in particular the Common Agricultural Policy (CAP)
  - to monitor changes in order to assess the impact of policies and to provide evidence for future policy
- Since 2007: HNV farmland indicator is obligatory for all EU Member States

Keenleyside et al. 2014. High Nature Value farming throughout EU-27 and its financial support under the CAP

Institute for European Environmental Policy

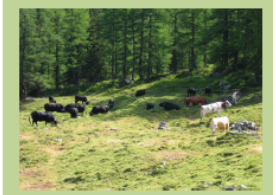
March 2014

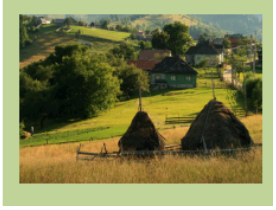
High Nature Value farming throughout EU-27 and its financial support under the CAP

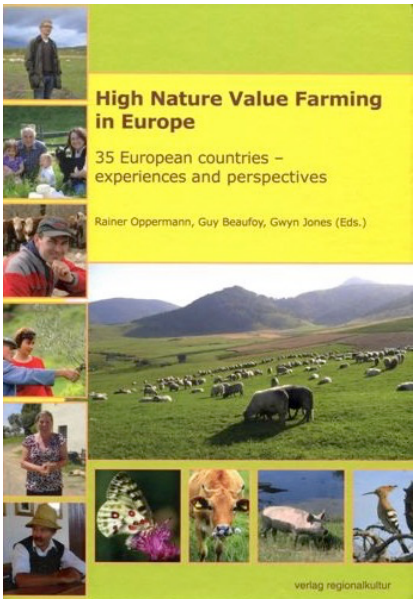
Executive summary

Funded by:
DG Environment, European Commission
Project ENV.B.1/ETU/2012/0035

European Forum on Nature Conservation and Pastoralism







Project HNV-Link:
High Nature Value farming: Learning, Innovation and Knowledge

Contents

Agricultural sciences

Improving resource use efficiency

- Adapting strategies for low input arable cropping to HNV farming systems
- Optimising nutrient flows in the mixed HNV farming systems
- Using functional biodiversity in low input arable cropping
- Managing soil fertility sustainably
- Developing and implementing novel solutions for targeted mechanical plant control, incl. toxic and invasive species

Agricultural sciences

Product development

- Use of biomass from semi-natural grasslands for other products than fodder (eg energy, bedding, pet pellets)
- Influence of species-rich biomass and specific species on quality of products
- Regional ”meadow meat” labelling

Ecological research

- Indicators to define the ecological state of HNV farming and to facilitate monitoring
- Ecological requirements of typical/characteristic species
- Community change under climate change vs. change under eutrophication/poor management etc.
- Restoration of HNV farmland values

Socio-economics

- Improve identification of HNV farming systems and typology:
  - part/full-time, degree of subsistence/market integration,
  - use of family labour, sources of farm and non-farm income,
  - access to land and capital, tax and social security status
  - etc.
- Motivation (interests and priorities) of HNV farmers and their potential successors
- Social dynamics:
  - demographic trends, patterns of migration, prevalence of new entrants and fate of young farmers

Socio-economics

- Economic performance of individual HNV enterprises and farming systems:
  - key performance indicators
- Coupling of public goods and services to marketable goods and services (farm products and rural tourism)
- Policy mechanisms that target the HNV farming systems
- Trends occurring in specific HNV farming systems
- How educational and advisory systems can better meet the needs of HNV farmers for action, cooperation and innovation

Policy research

- Novel ways of policy support for HNV farming:
  - farmer-centered,
  - outcome-based and
  - collaborative support modes.
- Experimental policy that allows adaptive management for solving complex challenges.

Systems approach

- Facilitation of transformation of HNV farming systems through participatory approaches
- Novel ways of integrating HNV farming businesses with active biodiversity conservation
- Identifying acceptable trade-offs between economic and ecological performance at farm and landscape level
- Determining and measuring public goods of HNV farming systems

Technology development

- Remote sensing for easy inventory and monitoring
- Drones and GPS in monitoring animals and pastures
- Mowing equipment for difficult terrain
- Mobile processing of raw materials from smallholders (e.g. mobile abattoirs, cheese making, fruit processing)
- Tracking of products for origin certification
- Development of seed harvesting equipment for collecting biodiversity-rich seed mixtures
- IT use in education, extension and engagement

High Nature Value Farming: *Learning, **In**novation and* ***K**nowledge* **HNV-Link**

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