

# LAND ABANDONMENT AND ANIMAL COMMUNITIES: WINNERS AND LOSERS

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# Aims of this talk

Main points dealt with taken from a recent ms prepared for AVEC

- 1) To illustrate some examples on the impact of land abandonment on wildlife
- 2) To examine the conservation implications of this phenomenon
- 3) To identify gaps in knowledge and potentially important future research

Tropical regions : recent review by Dunn (2004). *Conservation Biology* 18: 302-309.

This presentation will concentrate on examples from Europe

**Land abandonment : shift from a given pattern of land use (often extensive/traditional farmland) to a less intensive one caused by the reduction of human activity, leading to a recovery of scrubland and eventually forest (but alternative patterns possible)**

# Why is traditional agriculture important to animals?

Provides suitable habitats to open-habitat specialists

Meets the requirements of species using multiple habitats

Improves resource availability

Further advantages by subtle mechanisms linked with human activity

# **AN EXAMPLE :**

## **THE GREATER HORSESHOE BAT**

Woodland important in early spring, but...

- 1) ...pastures bordered by treelines and woodland preferred summer foraging sites
- 2) Dung beetles important prey
- 3) Cattle-browsed hedgerows provide optimal perches
- 4) Hedgerows used for navigation

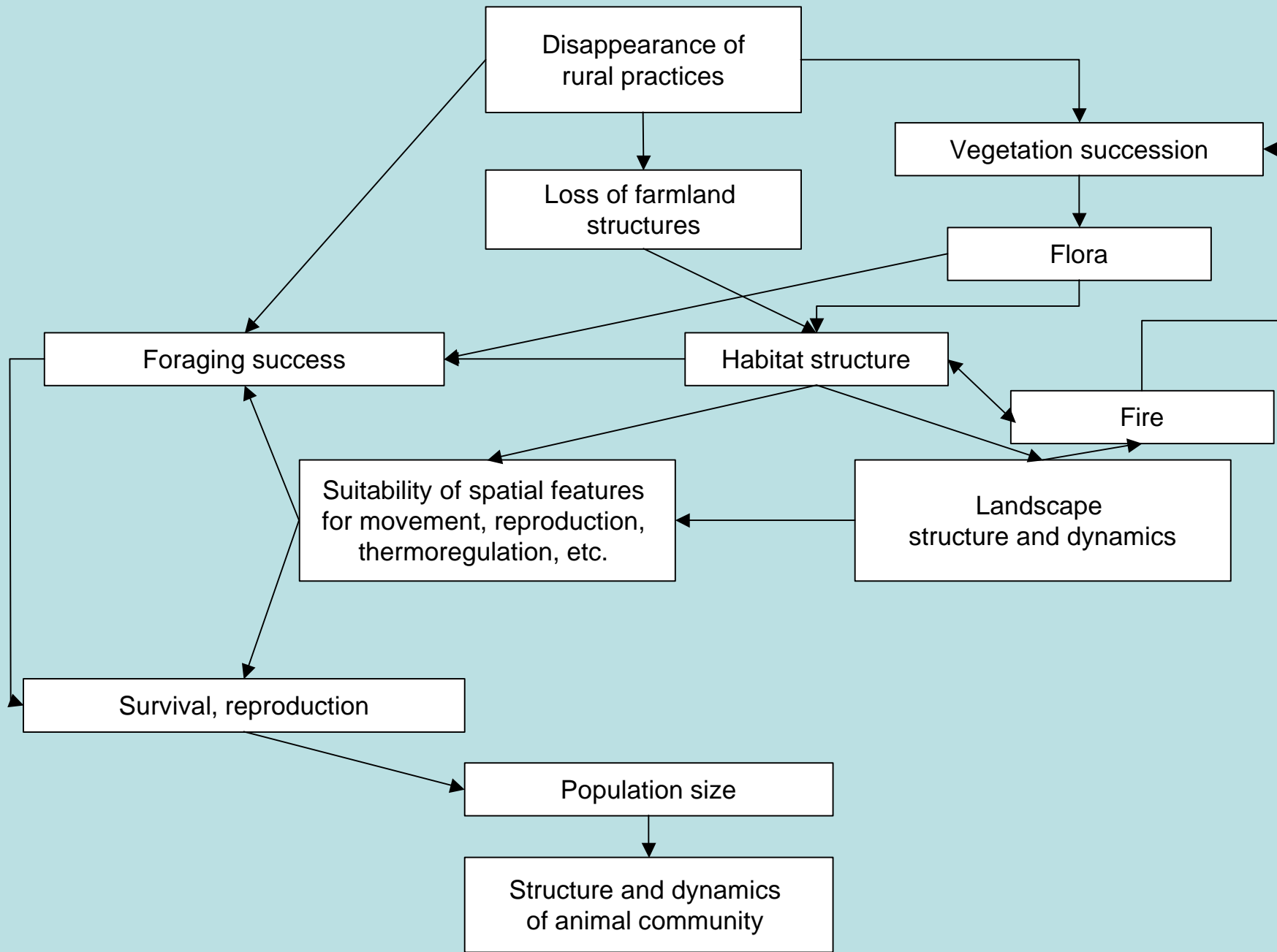
Advice and support given in England to farmers in order to favour the presence of these features in the landscape

## **OTHER, SUBTLE EFFECTS**

Snails passively dispersed by sheep

Effects on population genetic structure

Fischer, S., Poschlod, P., and Beinlich, B. (1996). Experimental studies on the dispersal of plants and animals by sheep in calcareous grasslands. *J. Appl. Ecol.* **33**:1206–1222.



# The effects of land abandonment: habitat/landscape structure

Loss of open habitats

Scrubland/forest expansion

Fragmentation of open habitats

Increased forest connectivity  
(corridors, stepping stones)

In general, loss of landscape heterogeneity, but this does depend on the original landscape composition

*We can predict that this situation will favour forest species and harm open habitat specialists*

# Land abandonment and bird decline

Loss of suitable foraging/breeding habitat for open habitat specialists

## Loss of foraging grounds for birds of prey

### ***Aquila chrysaetos***

Pedrini and Sergio (2001). *Bird Study* 48: 194–199

Central-eastern Italian Alps:

Nearest-neighbour distance correlated positively with the amount of woodland within the potential hunting range.

At current rates of forest expansion, data suggest a 5–9% density decline in the next 20 years.



# Eagle owl *Bubo bubo*

In central Italy, decline also due to disappearance of cleared areas in beech forests and reduced prey availability.

Two nearby areas of Mediterranean France

- 1) an upland, abandoned area;
- 2) a lowland area with croplands, pastures and fallow lands (Penteriani *et al.* 2002. *J. Zool., Lond.* 257: 365-372 )



Switch to smaller prey following large rabbit mortality

In the upland less efficient foraging, less diverse diet

As a result, owl density and productivity fell and egg-laying was delayed.

## Disappearance of key resources linked with human activity

Griffon vulture (*Gyps fulvus*)

# Invertebrates and changes in habitat structure

Less investigated – data available for a few groups

Replacement of open habitat, sun-loving taxa and ecotone dwellers with dense vegetation, shade-loving species recorded in several invertebrate groups

e.g. Gastropods

Isopods and Myriapods

Orthopterans

Ants

*In several cases, species diversity increases*

*Importance of a multi-scale approach*

## Disappearance of micro-habitats in farmland



Value of ponds, cattle troughs

*Natrix maura* in Spanish dehesas

*Discoglossus sardus*, *Discoglossus pictus* in Mediterranean areas

Dry walls and stone quarries offer shelter to many reptiles and to both hibernating and aestivating amphibians

# The winners

In both invertebrates and Vertebrates, land abandonment has been found to favour forest species

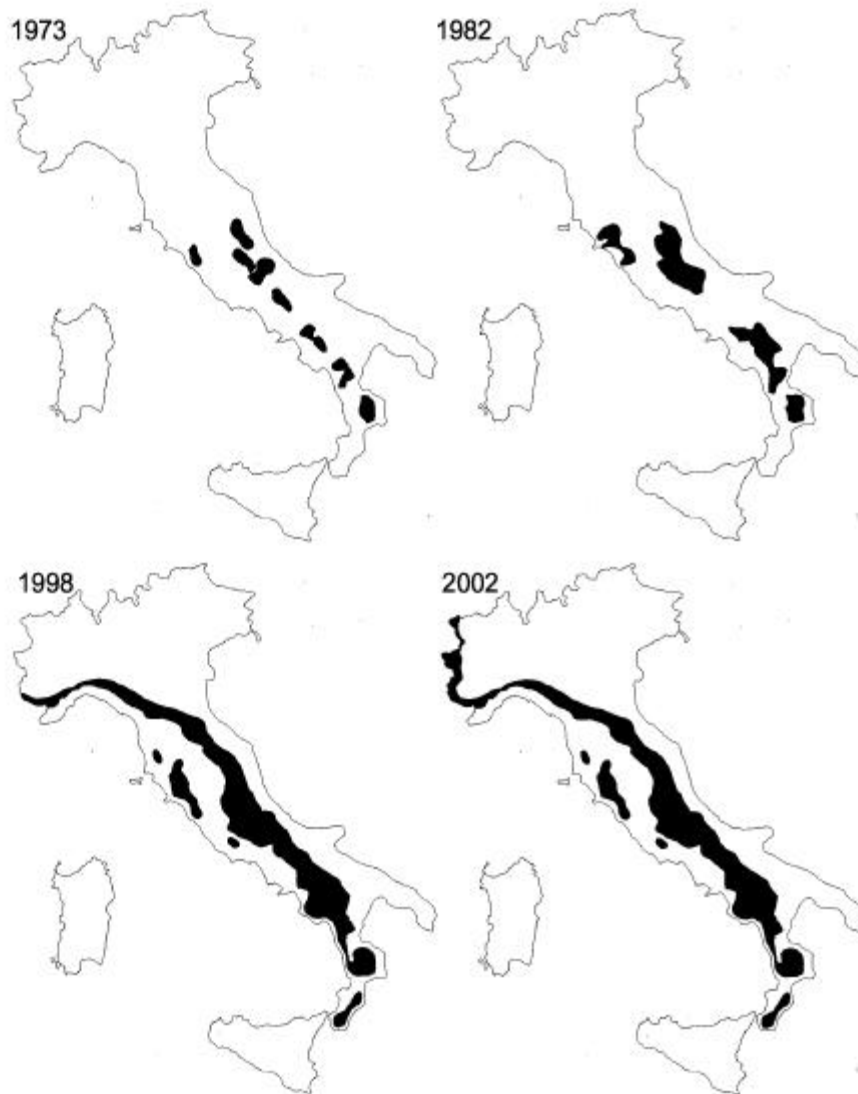


More forest species  higher diversity for several groups  
(earthworms, land snails, birds)

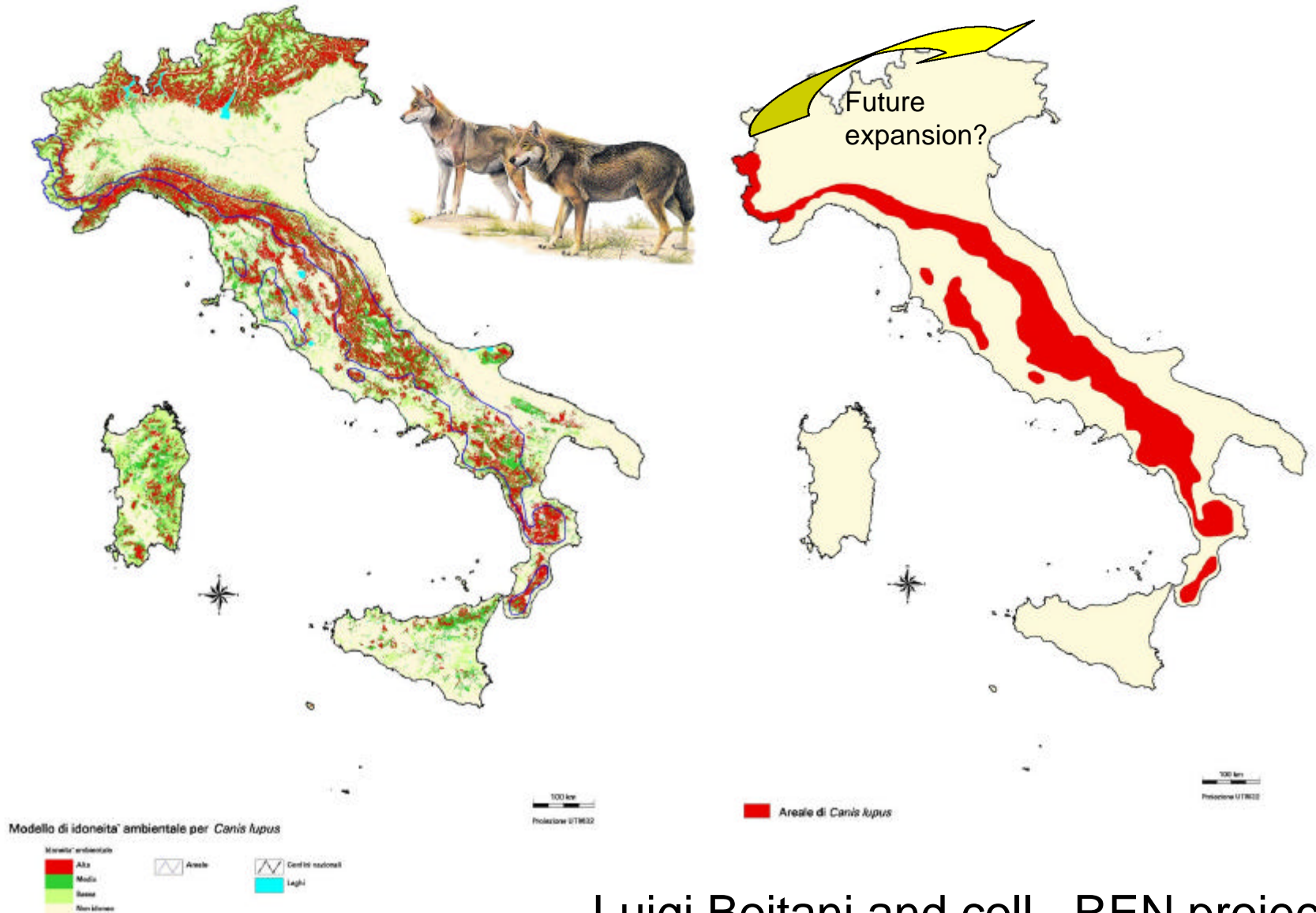
In the Mediterranean, most increasing forest birds are Eurosiberian, widespread taxa (Suàrez-Seoane *et al.*, 2002. *Biological Conservation* 105: 333-344)

Forest species are often generalists with a favourable conservation status

## Wolf expansion in Italy



# Habitat suitability model



Luigi Boitani and coll., REN project

# The return of large predators: a big challenge for conservationists

Damage compensation not enough

Importance of wild ungulates

Value of traditional prevention



# Species selecting mature forests



*Some forest species need mature forest stages: will they ever be reached in abandoned regions?*



# Species selecting intermediate vegetation stages

Temporary benefits from  
abandonment

Finally harmed by woodland  
expansion

***Human action necessary to maintain scrubland***

## **Diplopoda**

*Cilindroiulus caeruleocinctus*

*Glomeris annulata*

*Leptoiulus belgicus*

## **Ants**

*Aphaenogaster senilis*

*Tetramorium caespitum*

## **Reptiles**

*Podarcis hispanica*

## **Birds**

*Sylvia* spp. In the Mediterranean

# Iberian lynx *Lynx pardinus*

Habitat disturbance maintains the scrubland-woodland mosaics harbouring rabbits.

In the past, traditional farming in mountain areas preserved such mosaics.

Increase in scrub density has reduced suitable habitat.

Populations of both rabbits and their feline predator are shrinking.

# Pyrenean grey partridges (*Perdix perdix hispaniensis*) select scrubland

Novoa *et al.* (2002). *Wildlife Biology* 8: 99-108.

Successful breeders use a mosaic of dense and open scrubland, with seasonal differences: sparse (20-40%) and open (40-60%) scrublands important in spring

To maintain the mosaic of dense and open scrubland required by the species in the long term, grazing and management are needed (Novoa *et al.*, 2002).

# Managing abandoned areas

In many cases land abandonment is harmful to animal species having a direct conservation value (threatened taxa) or play a key role in ecosystems (e.g. lagomorphs)

*Grazing and prescribed fire may be used to counter vegetation encroachment*

Fire favours the survival of open habitat specialists, but some suitable patches must persist in the landscape to allow colonisers to reach newly available patches

Small-scale fires reduce the risk of large-scale ones which lead to massive habitat loss for forest species too

More data necessary on impact of fire on certain groups (e.g. fire may be detrimental to reptiles and amphibians)

**Is it realistic to manage a significant number of abandoned areas?**

# Preserving traditional farming: the most promising approach

*The “optimal” heterogeneity patterns found in extensive farmland, so important for conservation, are extremely difficult to reconstruct.*

Preservation of traditional land use outside parks is an excellent way to enact the ‘Benefits beyond boundaries’ approach (2003 IUCN World Parks Congress)

Niche production, eco-tourism

*Extensive farming should be encouraged both within parks and in their surroundings to ensure its complementary role in biodiversity preservation at a regional scale*



# Research: the way forward

Not all animal groups have received equal attention: risk of a bird-biased approach to landscape management.

A broader focus needed to reveal between-group interactions as well as identify coherent responses in different animal taxa; community-level aspects deserve attention.

Surrogate taxa for rapid assessment of faunal trends in abandoned landscapes

Multi-scale analyses should be encouraged

Development of models to predict population trends following abandonment

# Interactions with other global change phenomena

Land abandonment and spread of alien taxa

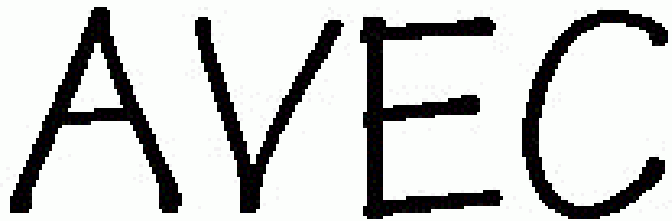
Land abandonment and global warming



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Gareth Jones, Valentino Mastrella and Abruzzo, Lazio and Molise National Park for their photographs

The word "AVEC" is displayed in a large, black, hand-drawn font. The letters are thick and slightly irregular, giving it a sketchy or artistic appearance. The 'A' has a simple triangular shape with a horizontal bar. The 'V' is formed by two diagonal strokes meeting at a point. The 'E' has three horizontal bars of varying lengths. The 'C' is a simple, open curve. The entire word is set against a white rectangular background.