EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY

Coppice: services, protection and nature conservation

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Coppice services?

- **Provisioning**: fuelwood, timber, food (fruit, nuts, fungi, game), other NTFPs, genetic resources. Attracts resources for BAPs, agri-environmental schemes, wildlife reserves
- **Regulating**: low carbon accumulation rates; prevention of soil erosion and avalanches; reduced fire risk; conservation of young growth specialists; pollination
- **Cultural**: aesthetic value of woodland field layers, historical archaeology, birdsong, butterflies, etc.
- **Supporting**: soil formation and retention, nutrient/water cycling, habitat for biodiversity

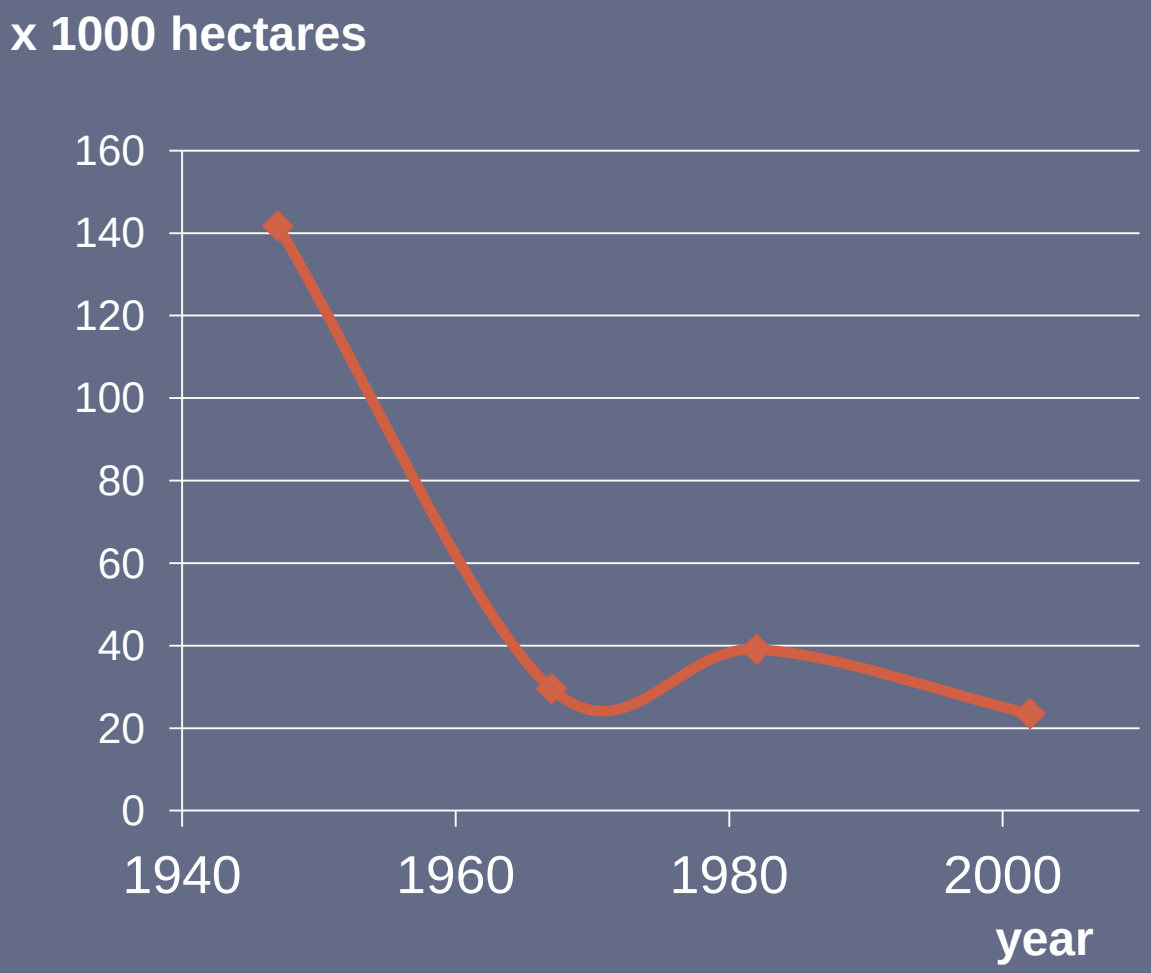
Estimated coppice areas in Europe

	Forest area	Coppice area	% coppice of forest area
	x 1000 ha		
Countries with >1% coppice area*	**107,033**	**28,021**	**26**
Total, Europe (FRA 2010)	188,523		15
State of Europe's Forests (2011)		2,800	2

* Includes Turkey, but excludes the Russian Federation

Post-war decline in coppice area, Britain

(Forestry Commission census data)



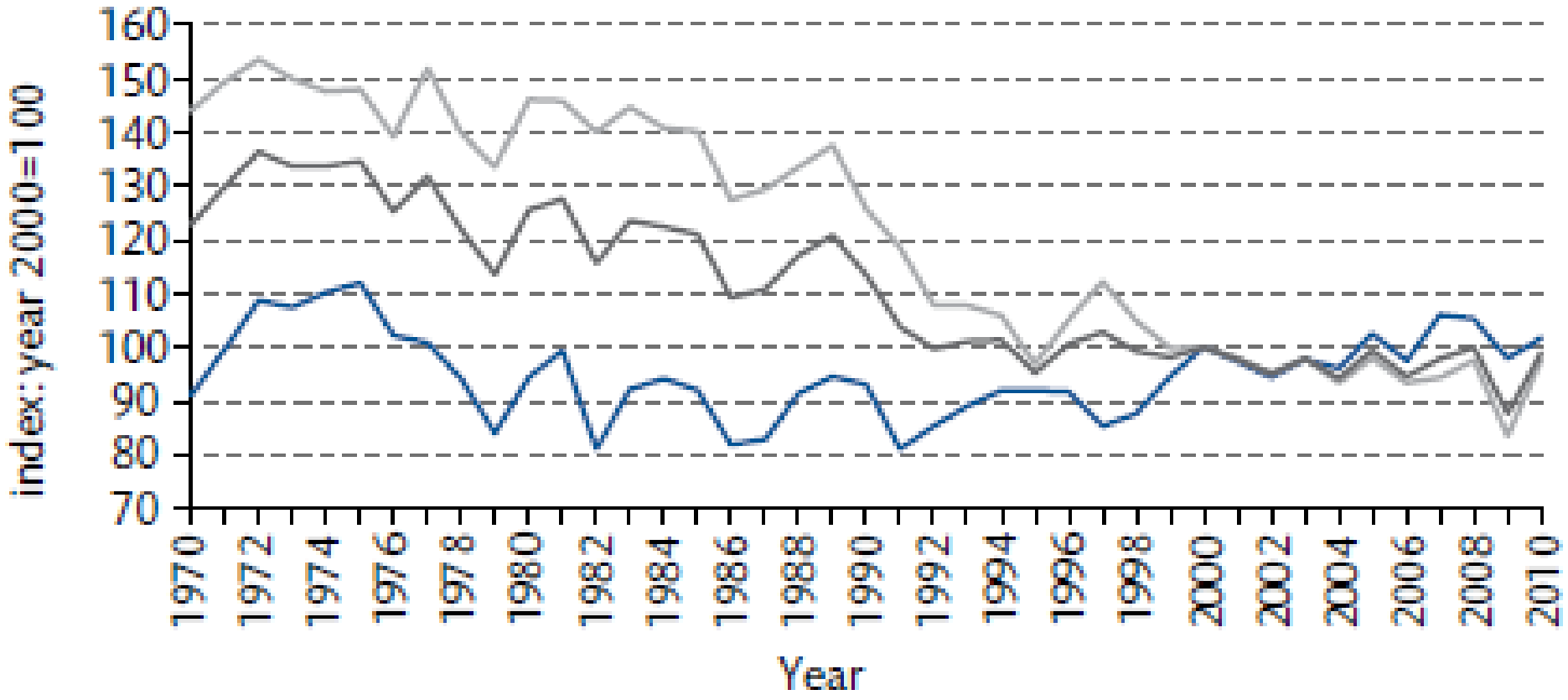
Loss of open space: required by nearly 80% of woodland Priority Species

Silvicultural management and % temporary open space

Age (years)	Growth phase	Short-rotation coppice	Simple coppice[1]	Coppice with standards[1]	High forest[2]
<5	Open space	100	17	12	4
6-30	Young growth	0	83	62	21
31-100	Thicket to mature	0	0	20	58
>100	Mature	0	0	6	17

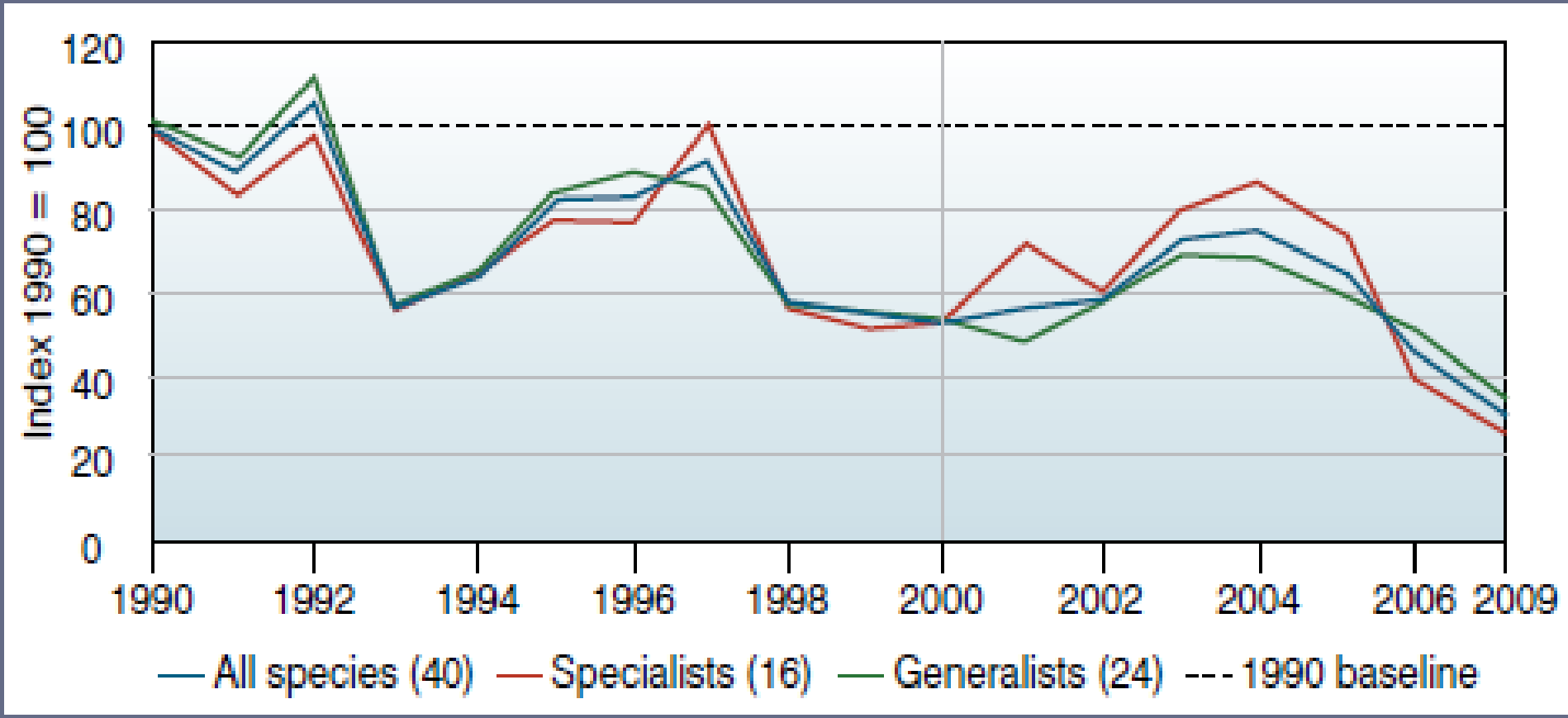
[1] based on 30-year coppice rotations, with standards covering 30% of area
[2] based on 125-year rotations (after Hopkins and Kirby, 2007)

Trends in woodland bird populations, UK



Wild Bird Populations statistics release (Defra, January 2011).

Trends in woodland butterflies, England



Butterfly Conservation / Centre for Ecology and Hydrology (2011)

Winners and losers

Coppice management

- + open space/young growth
- + seedbank replenishment
- + heliophilous plants
- + small mammals
- + reptiles and amphibians
- + migrant warblers
- + thermophilous lepidoptera

Neglect / high forest management

- - homogenised field layers
- - lowered β-diversity
- - declining open space
- - declining litter quality
- + shade tolerant species
- + leaf-mining Lepidoptera
- +saproxylic invertebrates
- + hole-nesting birds, bat roosts
- + fungi, mosses and lichens

Euphorbia amygdaloides

erick.dronnet.free.fr

Scrophularia nodosa

calphotos.berkeley.edu

Persistent seedbanks

Digitalis purpurea

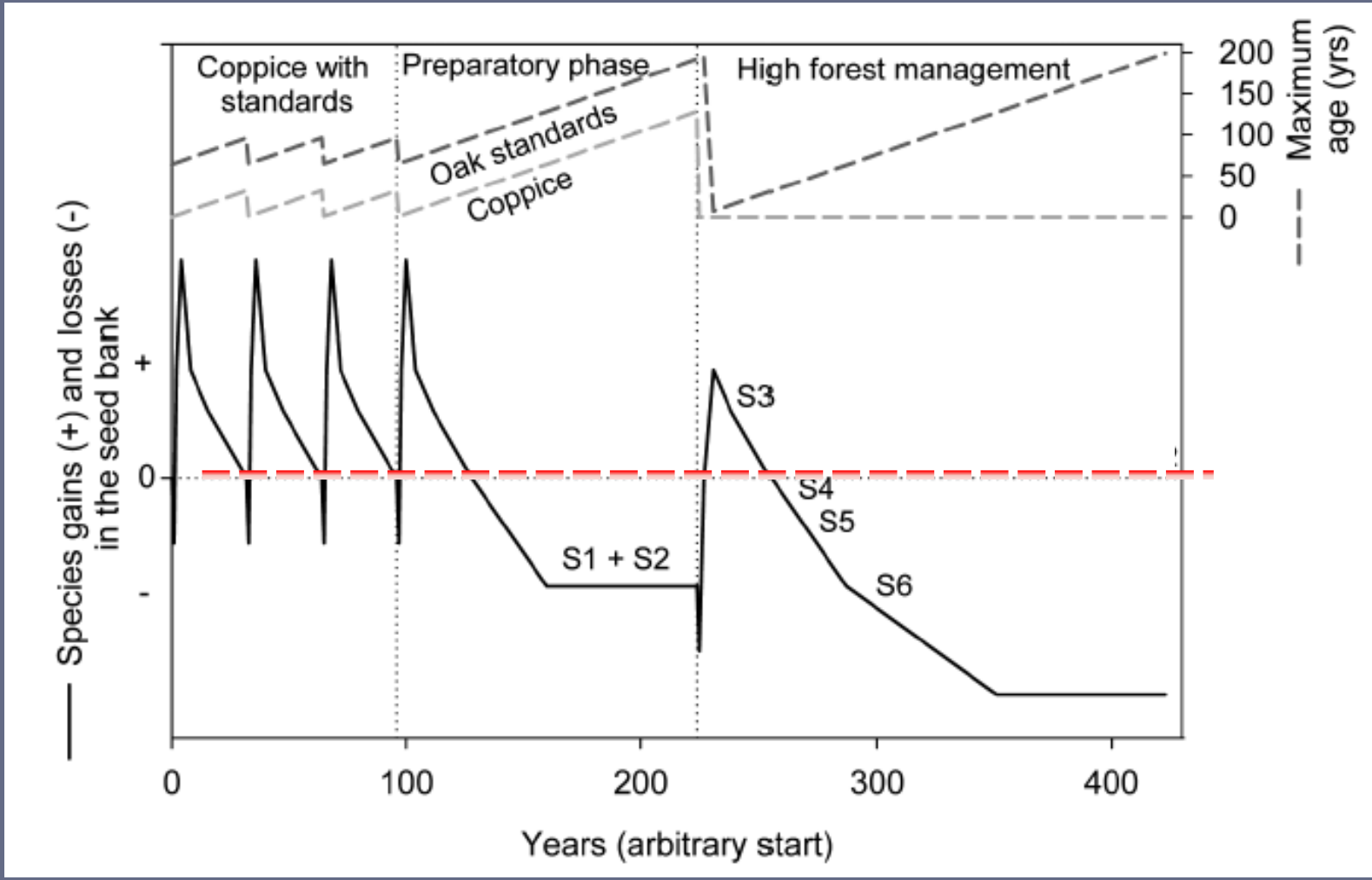
Silene dioica

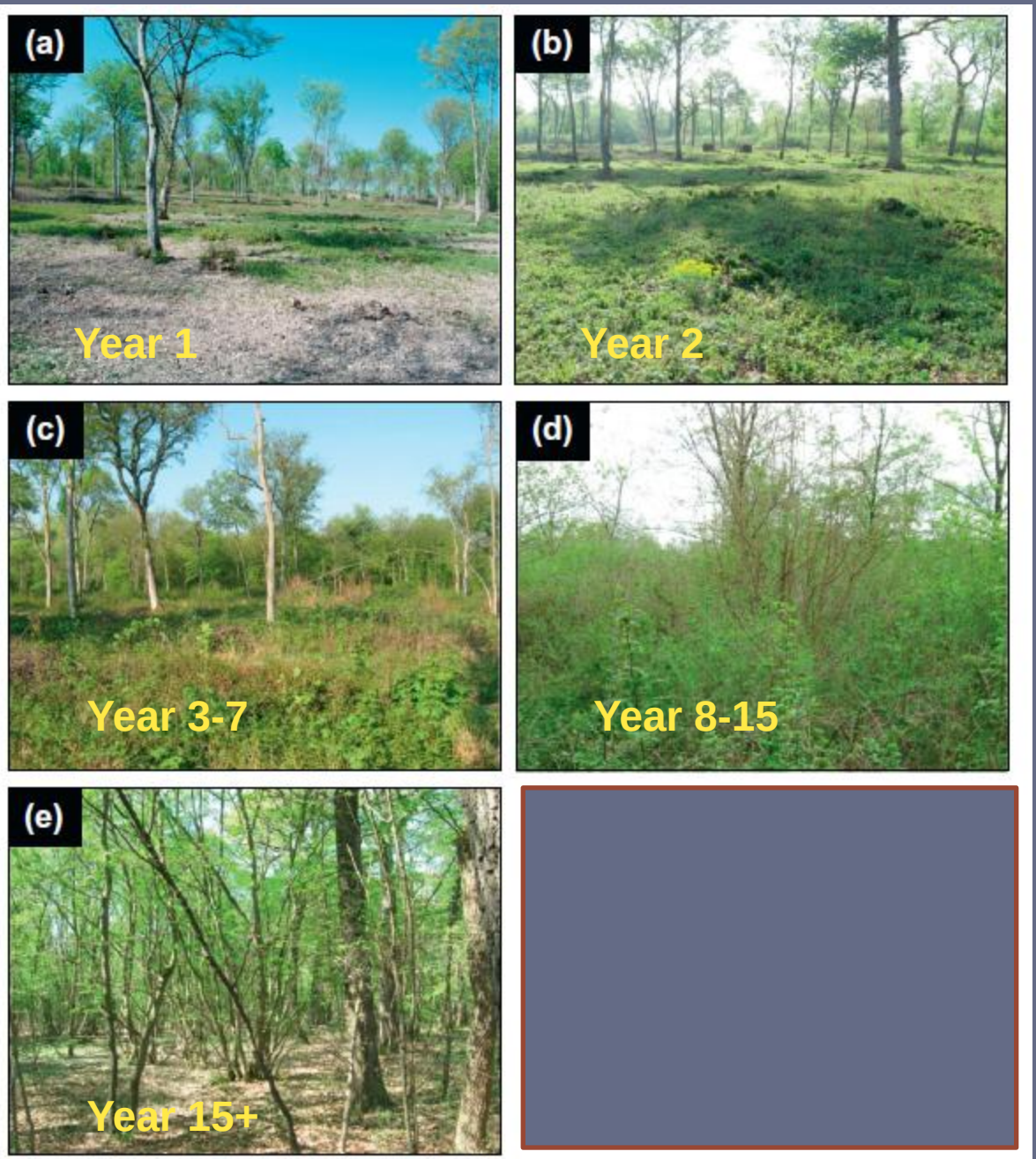
commons.wikimedia.org

Juncus effusus

www.wisenurseries.com

Declining seed banks Van Calster et al., 2008

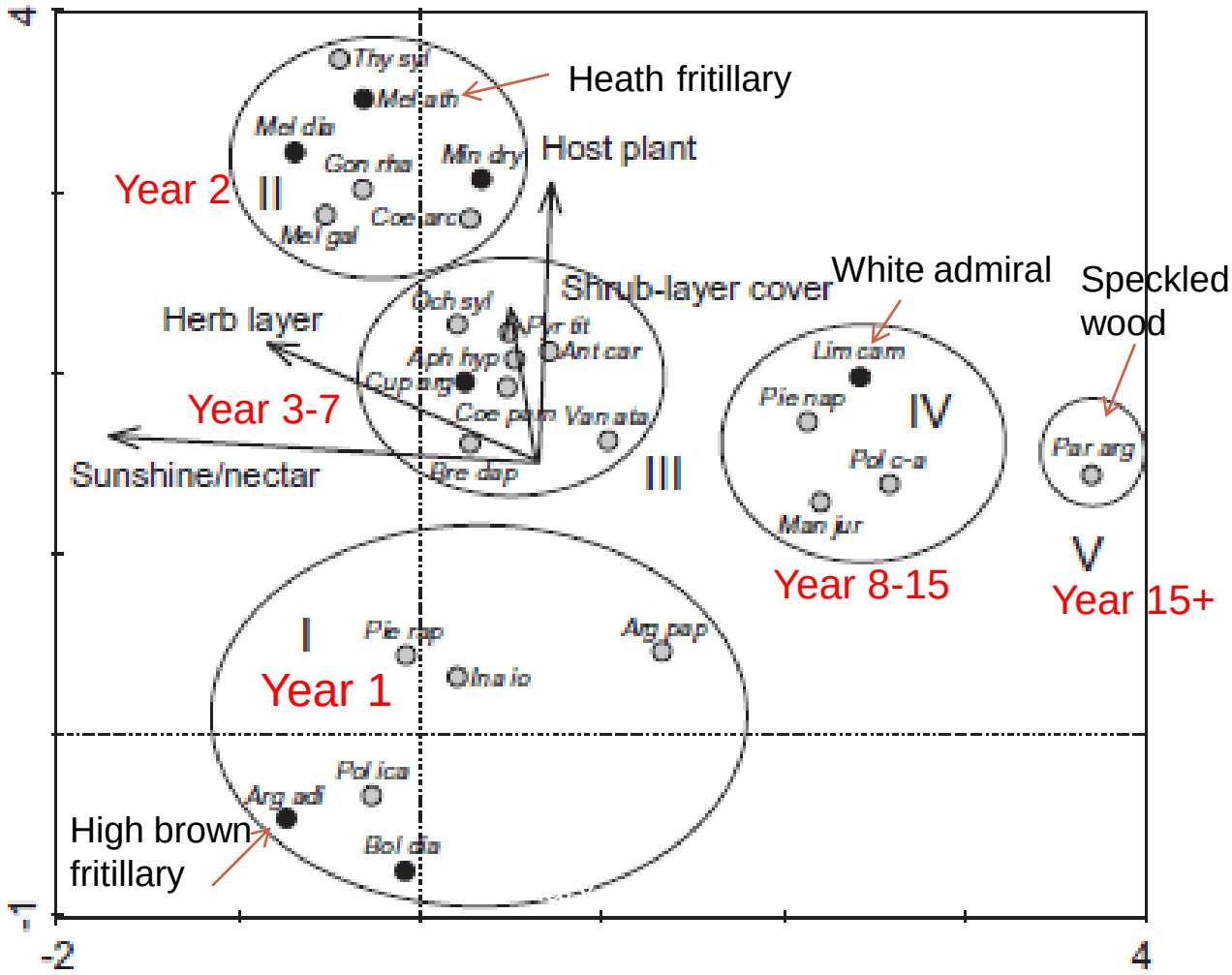




Coppice management in the Alsacian Hardt

Fartmann et al, 2013

Ordination of the most frequent butterfly species in coppice-with-standards, French Alsace (Fartmann et al., 2013)




Argynnis adippe
http://www.luontoportti.com/suomi/en/perhoset


Melitaea athalia

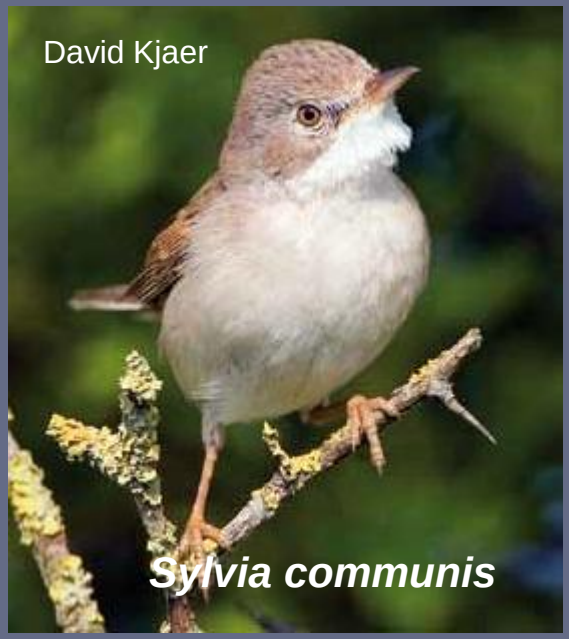

Butterfly Conservation
Ochlodes sylvanus


Pieris napi


Limentis camilla


Pararge aegeria

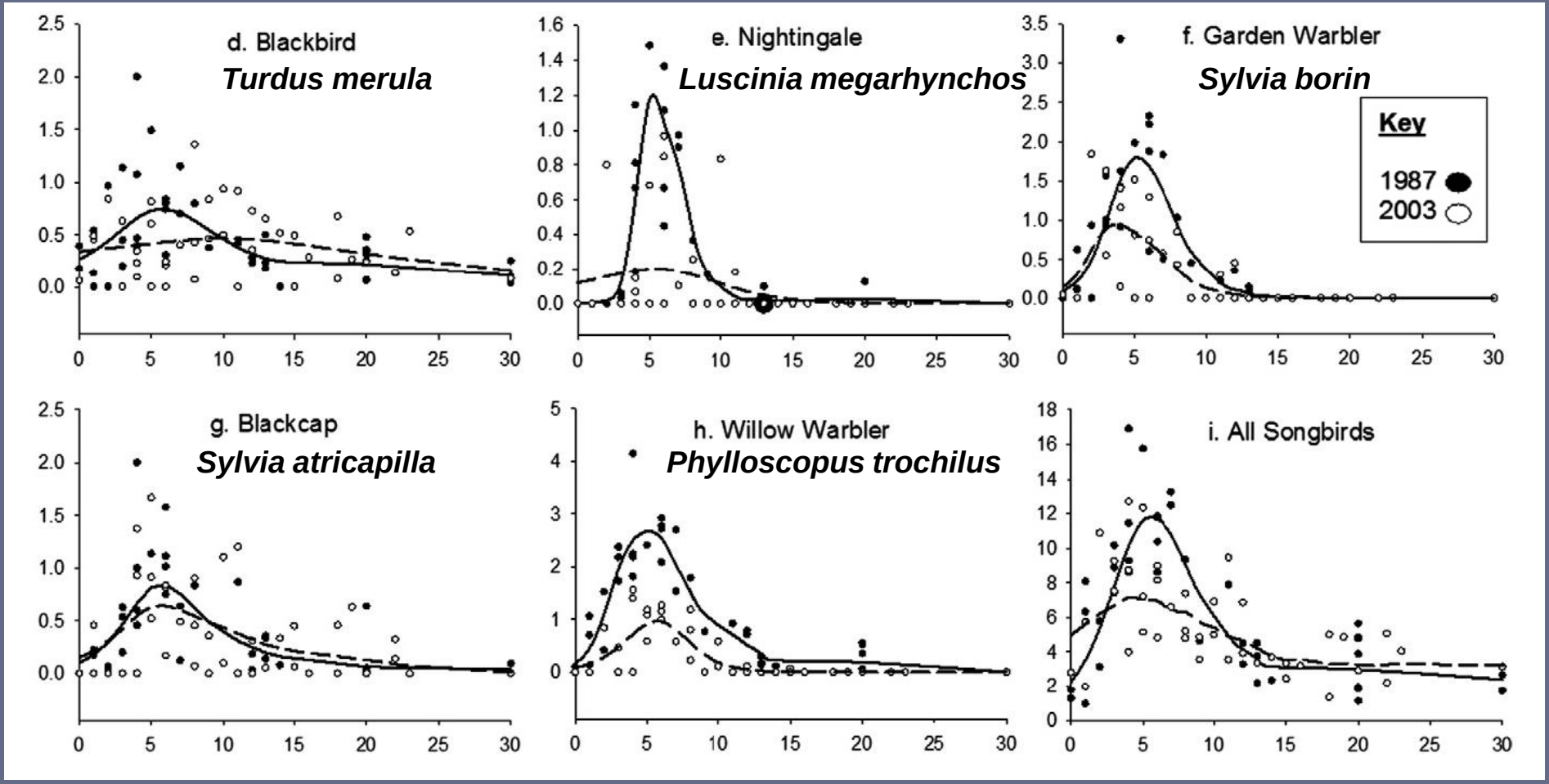

Sylvia borin
http://www.flickr.com/photos/billyboysfotocolection/4843548058/in/photostream/


David Kjaer
Sylvia communis


Luscinia megarhynchos
Andy Hay rspb-images.com


Phylloscopus trochilus
Nigel Blake rspb-images.com

Trends in bird densities (territories ha$^{-1)}$ in relation to age of coppice regrowth (Fuller and Rothery, 2013)



Age (years of regrowth)


Muscardinus avellanarius
David Kjaer

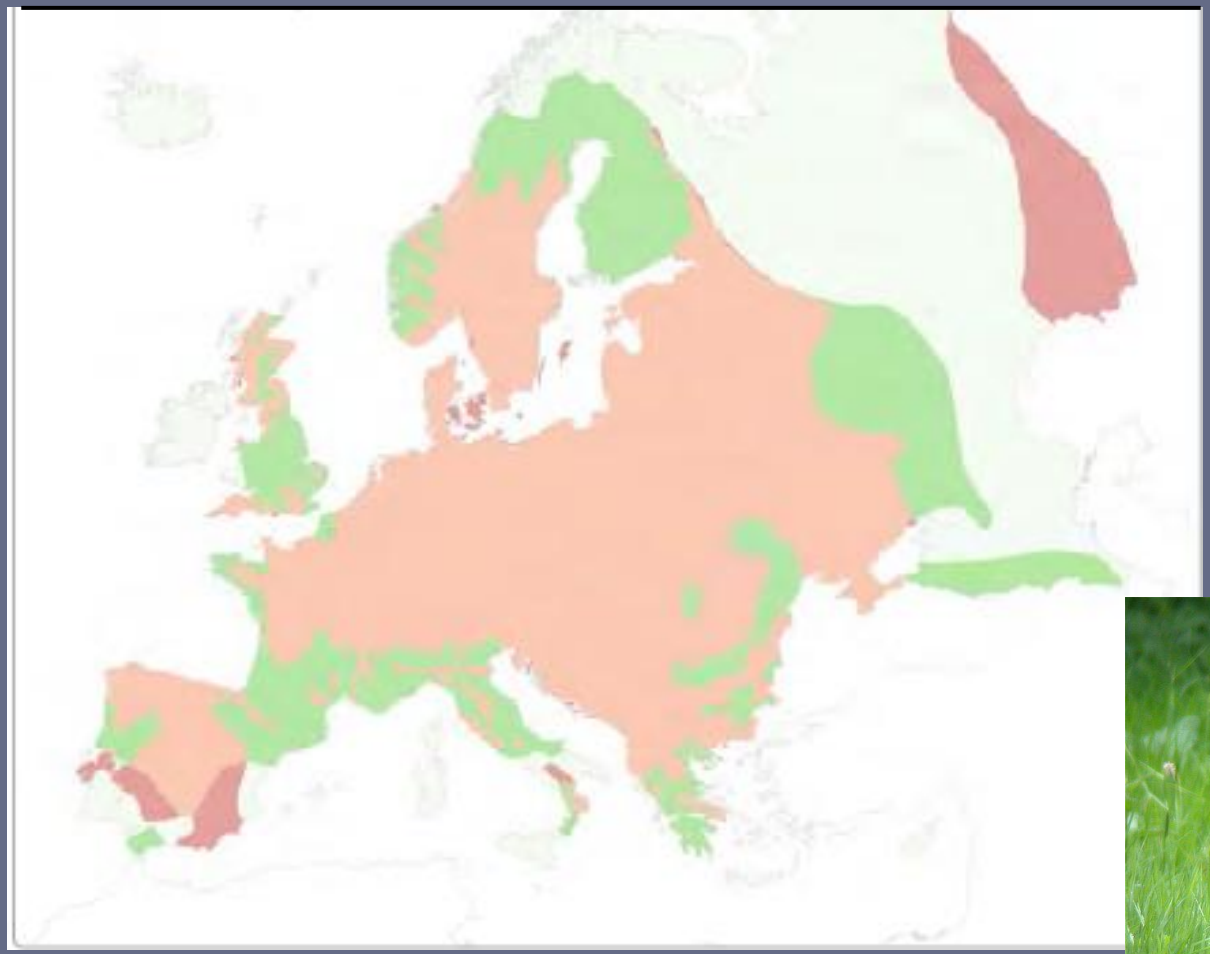

ARKive
www.arkive.org
Eliomys quercinus
© Jose Luis Gomez de Francisco / naturepl.com


Myodes glareolus
dphotgrapher.co.uk


Apodemus sylvaticus
Hans Hillwaert

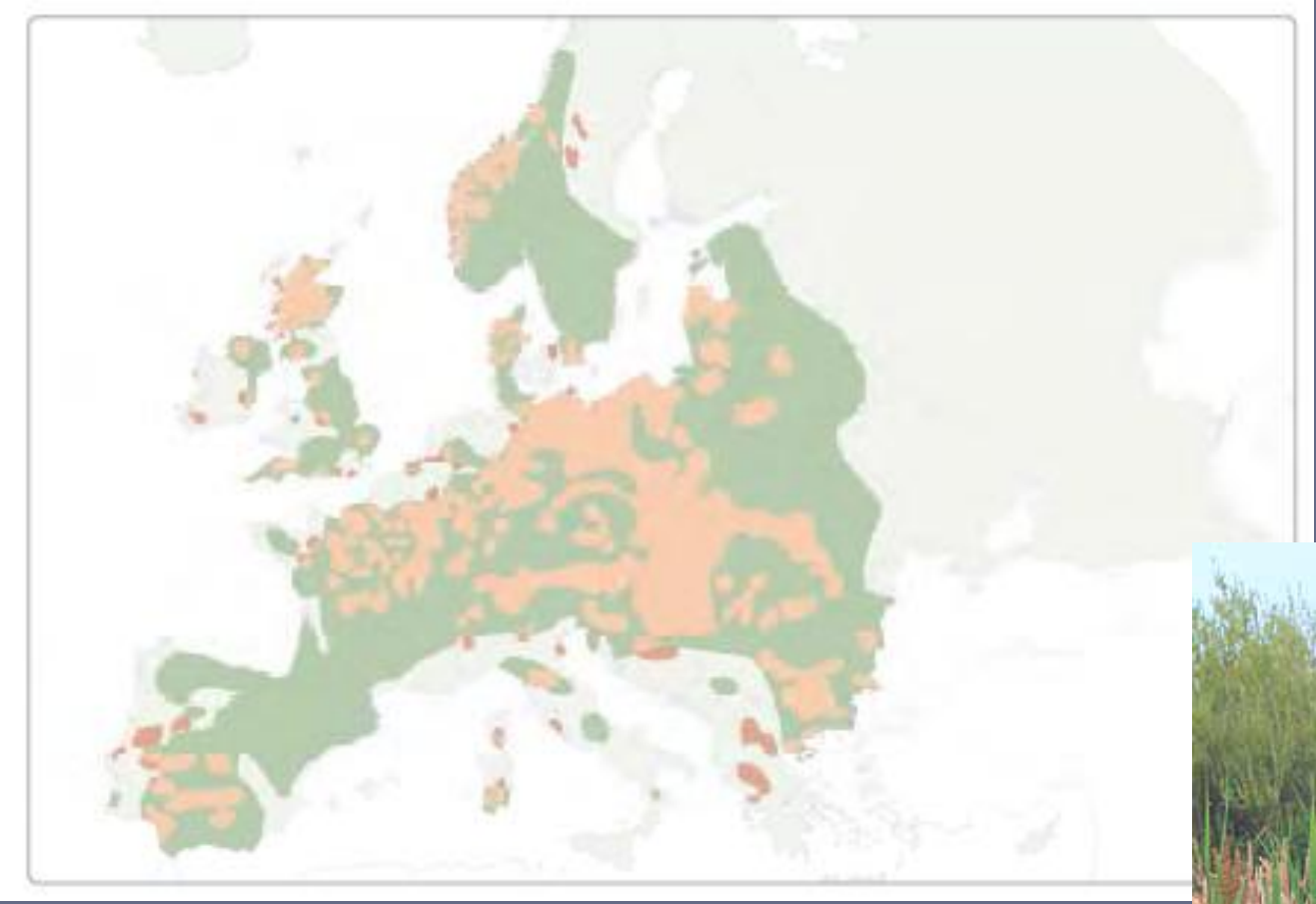
Roe deer expansion 1967-2008

Deinet et al, 2013

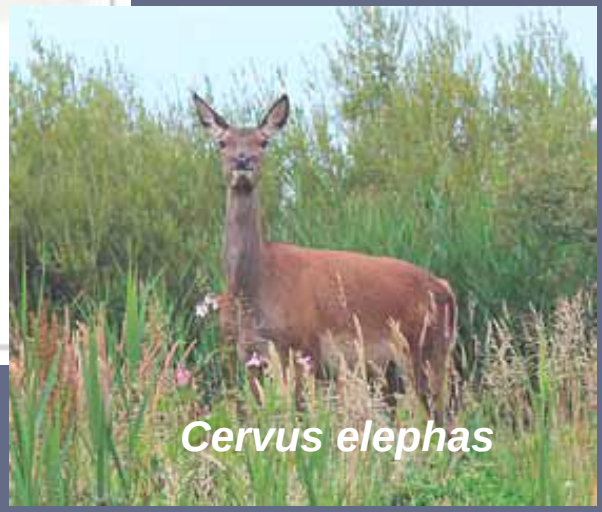


+ 240%, 1960-2005

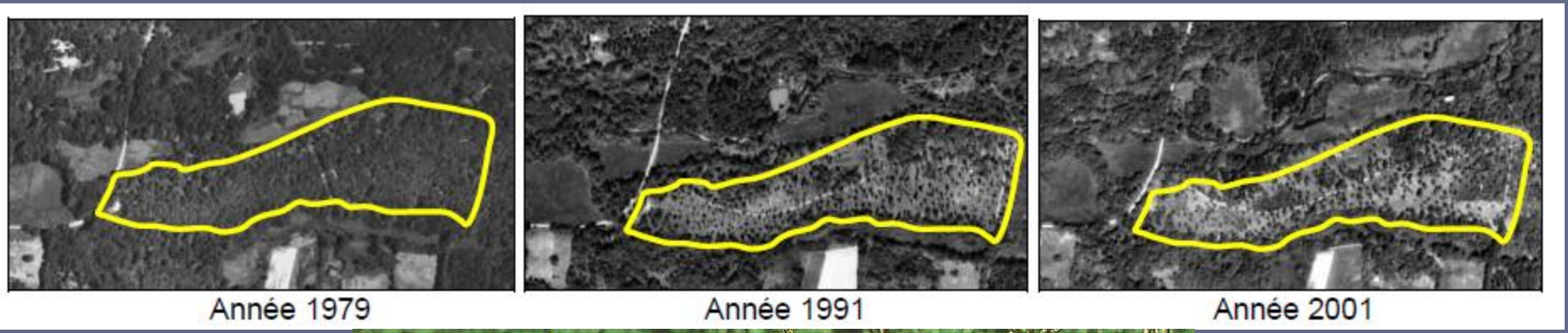
Red deer expansion, 1955-2008



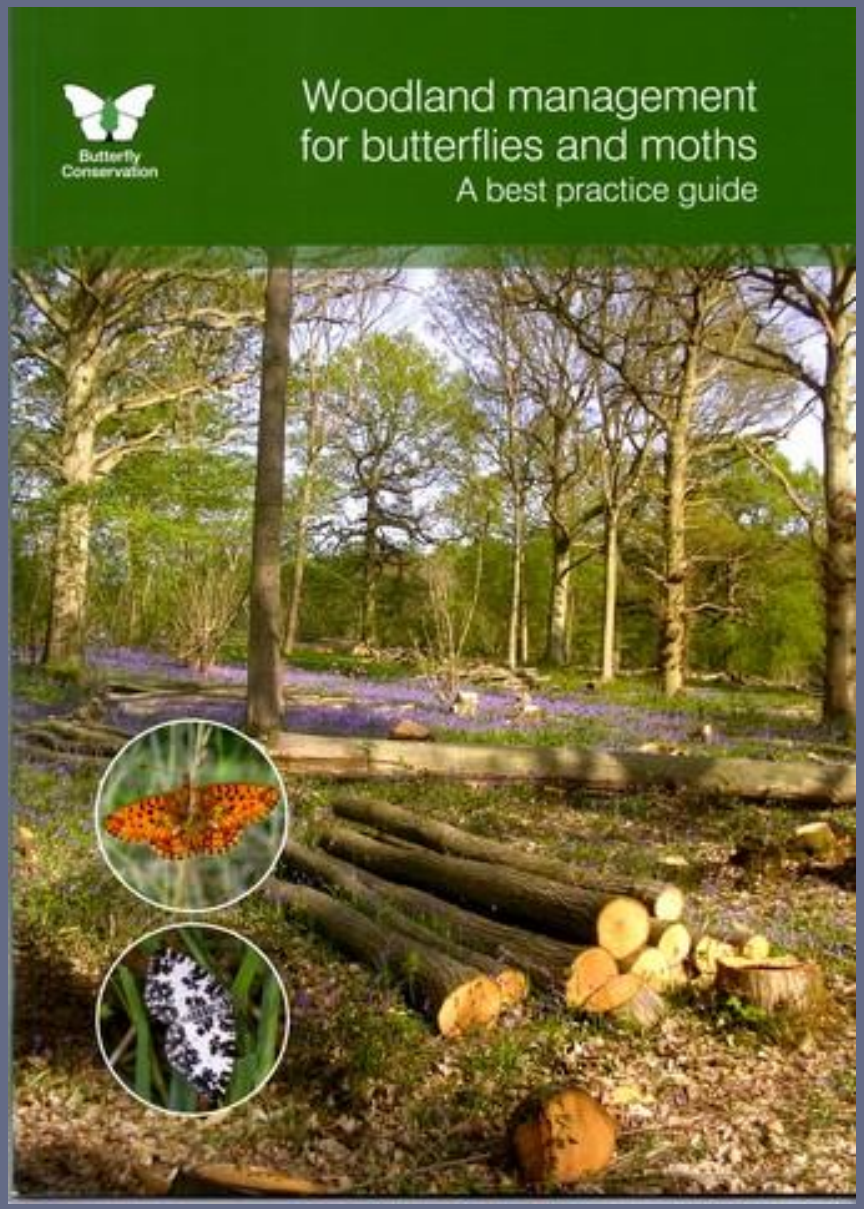
+400%, 1960-2005

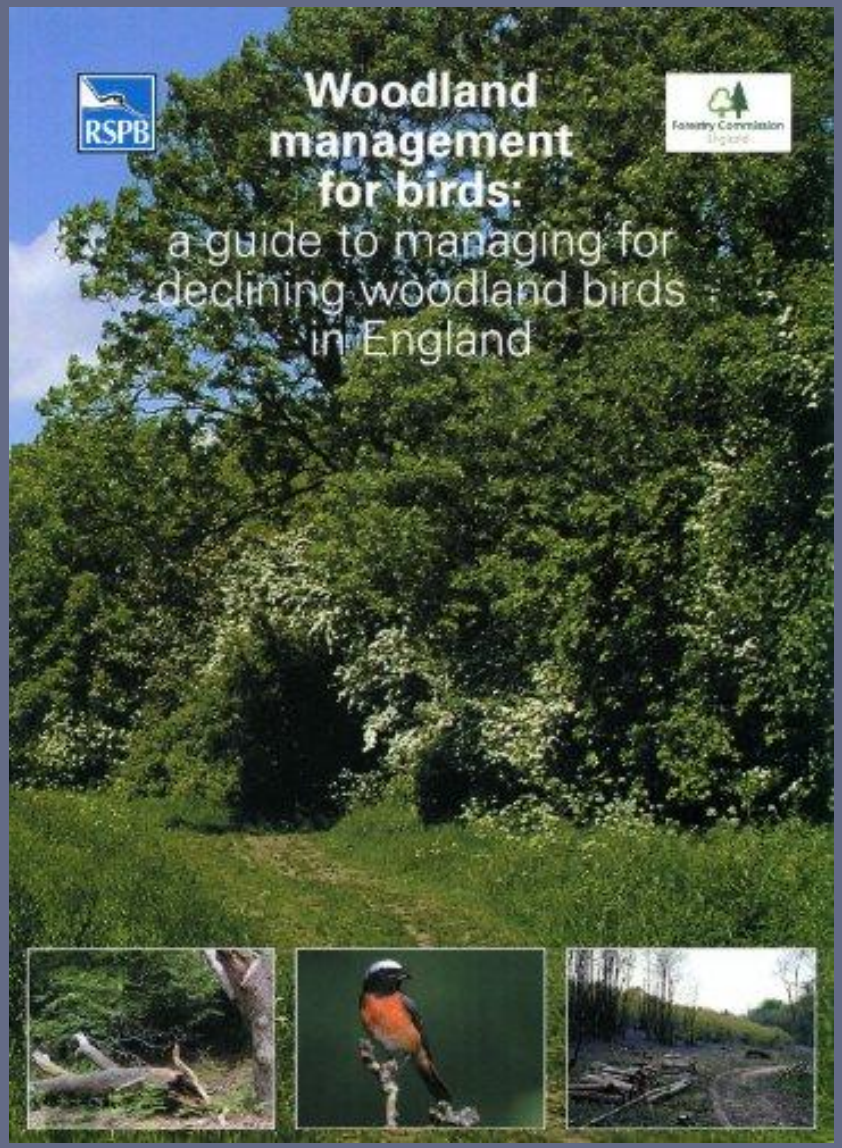


Degradation of coppice-with-standards in the Cosson massif, France, through browsing pressure of roe and red deer (Ballon and Hamard, 2007)

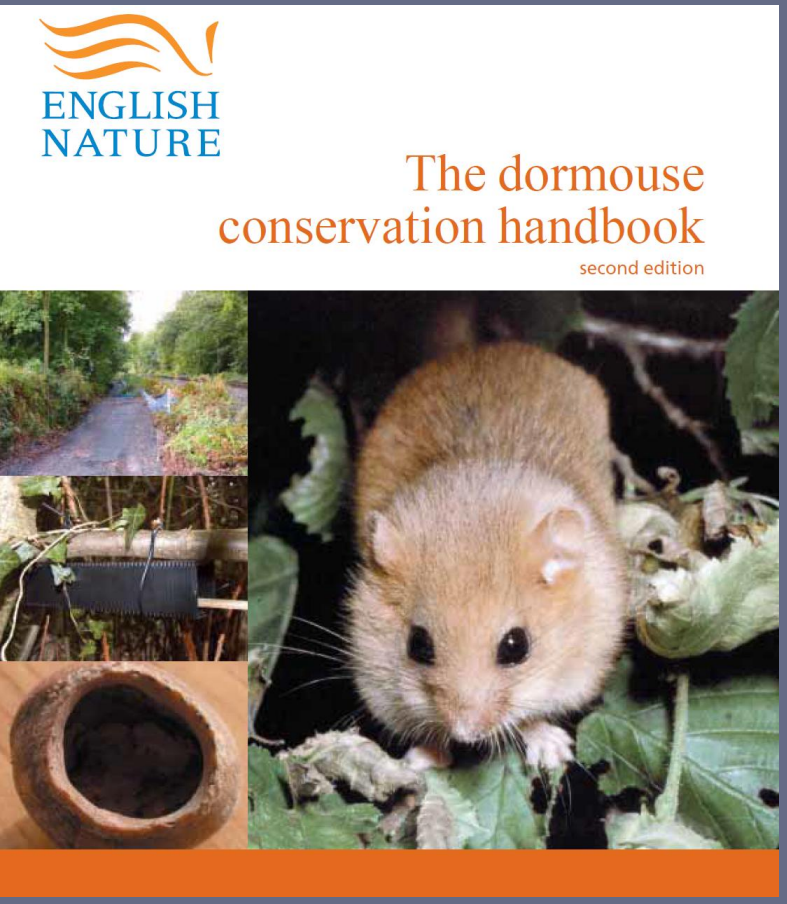


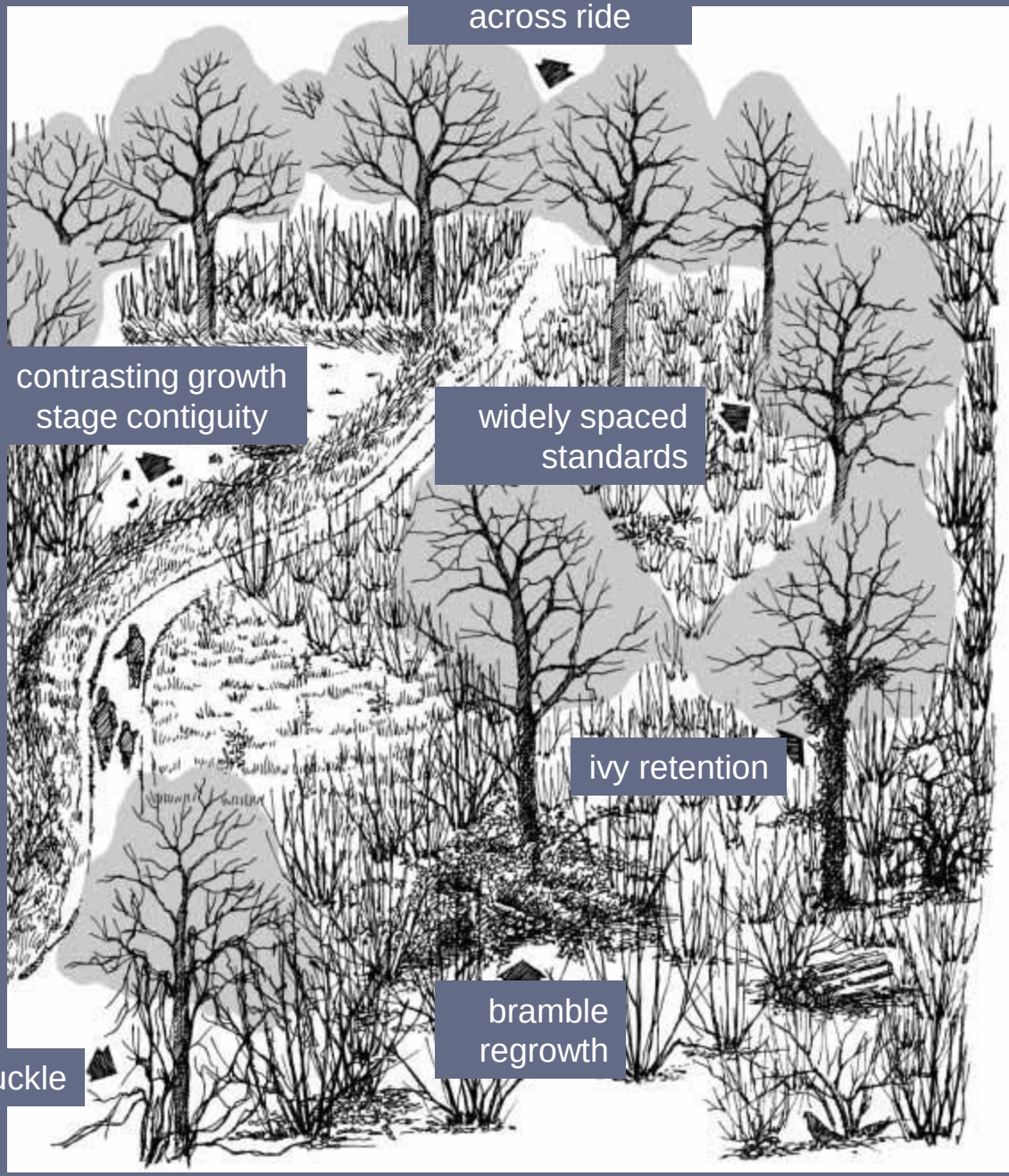
Good Practice guides



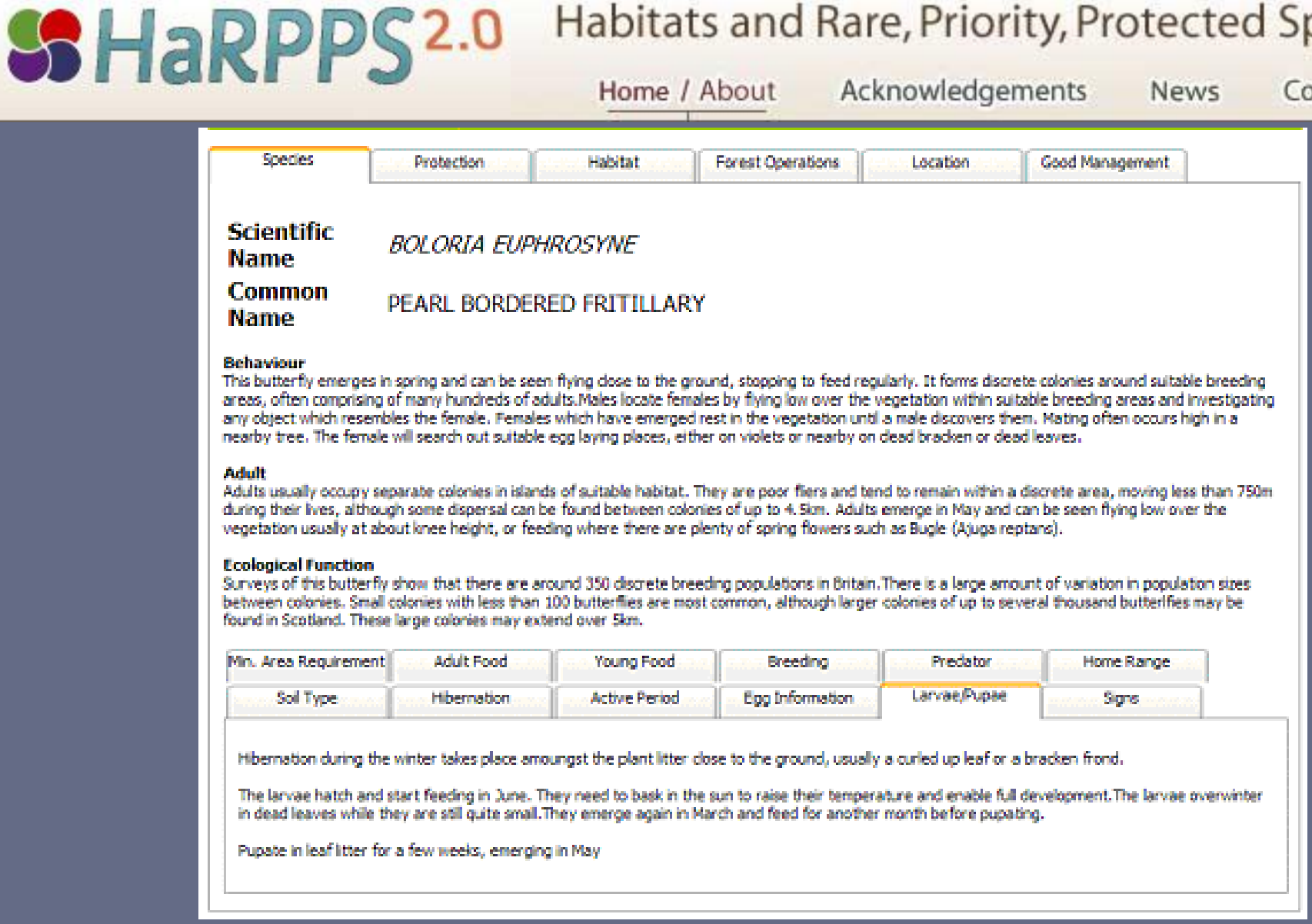


Features of good dormouse habitat management





Bright *et al*, 2006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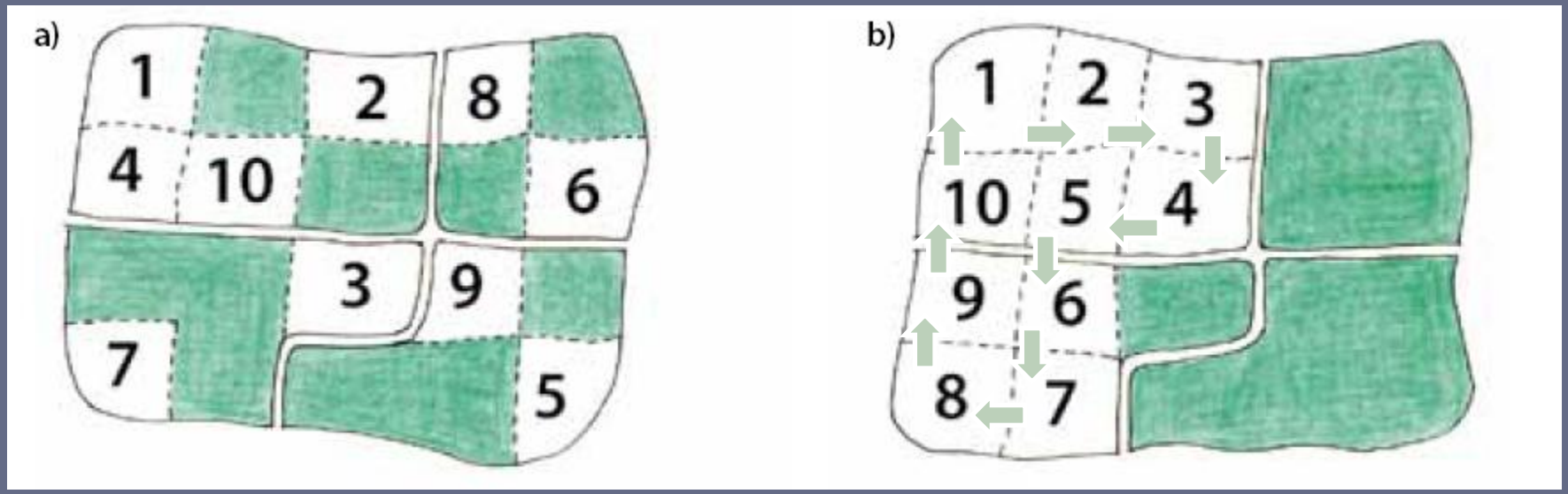
Location
Good Management
Scientific Name
BOLORIA EUPHROSYNE
Common Name
PEARL BORDERED FRITILLARY
Behaviour
This butterfly emerges in spring and can be seen flying close to the ground, stopping to feed regularly. It forms discrete colonies around suitable breeding areas, often comprising of many hundreds of adults.Males locate females by flying low over the vegetation within suitable breeding areas and investigating any object which resembles the female. Females which have emerged rest in the vegetation until a male discovers them. Mating often occurs high in a nearby tree. The female will search out suitable egg laying places, either on violets or nearby on dead bracken or dead leaves.
Adult
Adults usually occupy separate colonies in islands of suitable habitat. They are poor fliers and tend to remain within a discrete area, moving less than 750m during their lives, although some dispersal can be found between colonies of up to 4.5km. Adults emerge in May and can be seen flying low over the vegetation usually at about knee height, or feeding where there are plenty of spring flowers such as Bugle (Ajuga reptans).
Ecological Function
Surveys of this butterfly show that there are around 350 discrete breeding populations in Britain.There is a large amount of variation in population sizes between colonies. Small colonies with less than 100 butterflies are most common, although larger colonies of up to several thousand butterflies may be found in Scotland. These large colonies may extend over 5km.
Min. Area Requirement
Adult Food
Young Food
Breeding
Predator
Home Range
Soil Type
Hibernation
Active Period
Egg Information
Larvae/Pupae
Signs
Hibernation during the winter takes place amoungst the plant litter close to the ground, usually a curled up leaf or a bracken frond.
The larvae hatch and start feeding in June. They need to bask in the sun to raise their temperature and enable full development.The larvae overwinter in dead leaves while they are still quite small.They emerge again in March and feed for another month before pupating.
Pupate in leaf litter for a few weeks, emerging in May

Differing habitat requirements among specialist species

Species	0-1 years	2-5 years	6-10 years	11-15 years	16-20 years	Standard trees
Nightjar						
Nightingale						
Spotted flycatcher						
Dormouse						
Bank vole						
Barbastelle bat						
High brown fritillary						
Heath fritillary						
Waved carpet moth						
‘seedbank’ plants						
Hydnellum tooth fungi						
Foliose lichens						

Sequential or staggered age classes?



staggered

sequential

Alternative strategies to promote early-successional species

- Group felling
- Variable density thinning (e.g. creating 20% gaps)
- Reducing densities of standard trees
- Wider rides and scallops

NOT

- Individual tree selection
- ?Continuous cover forestry
- ‘Singling’ of coppice stools

Finally ….

- Landscape approach: is there adequate young coppice growth within the region?
- For poorly-dispersed species, target coppicing operations within their centralised zone of distribution
- Encourage ‘generalist’ coppice species by increasing connectivity between patches
- Can emerging markets for biofuels rejuvenate the coppices?

Grazie