Habitat Restoration for Butterflies:

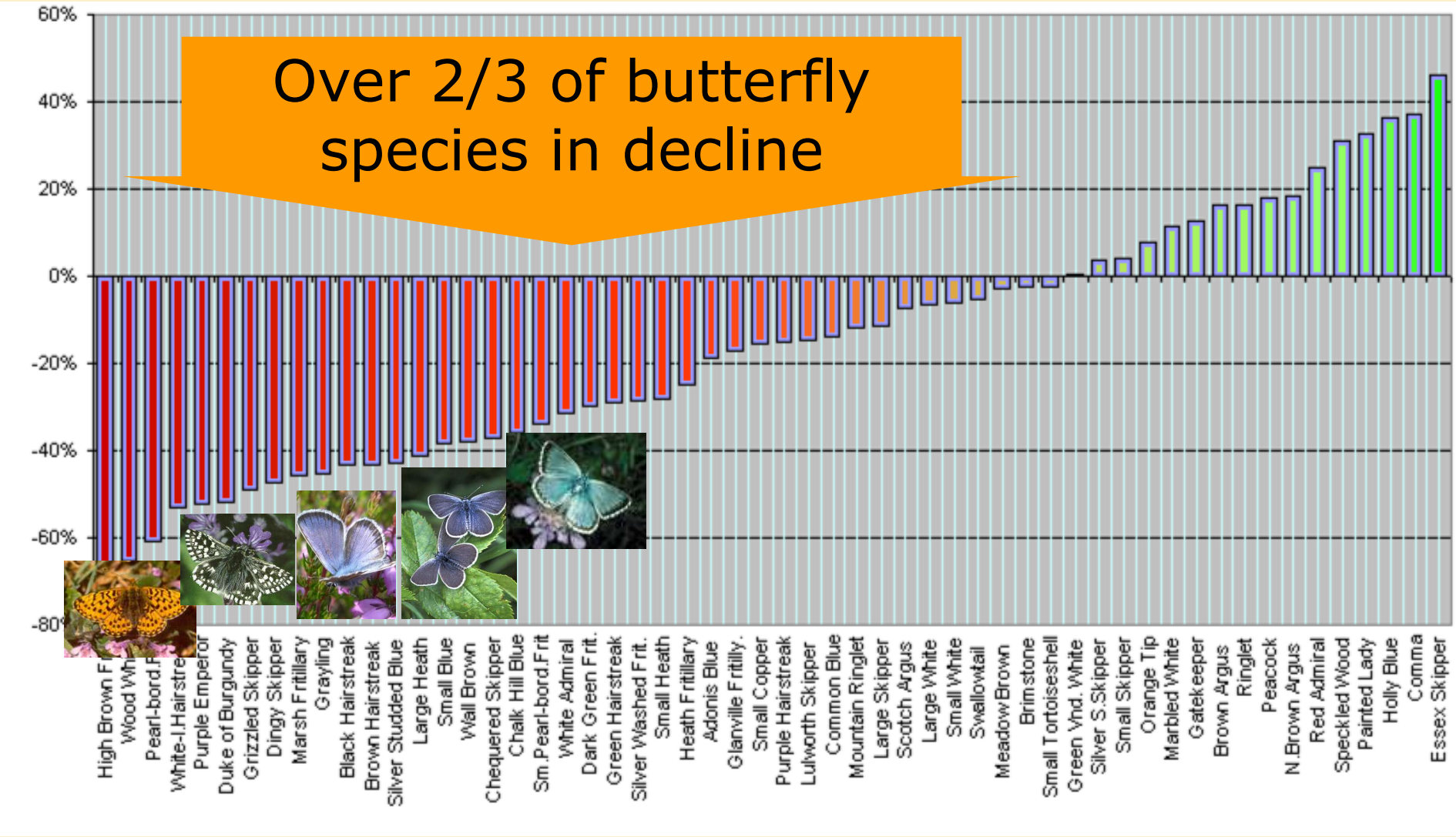
Case studies from Butterfly Conservation reserves in the UK

Martin Warren

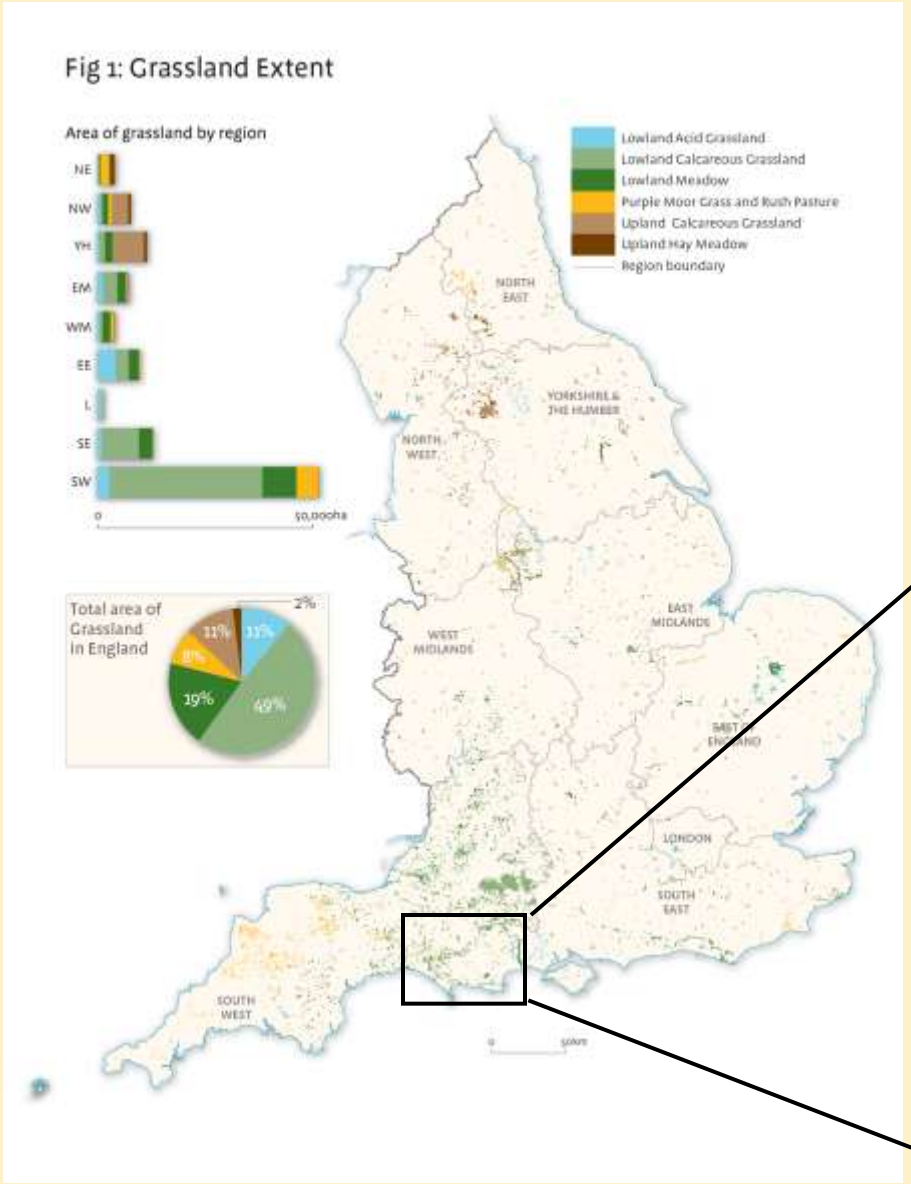
John Davis

Butterfly Conservation

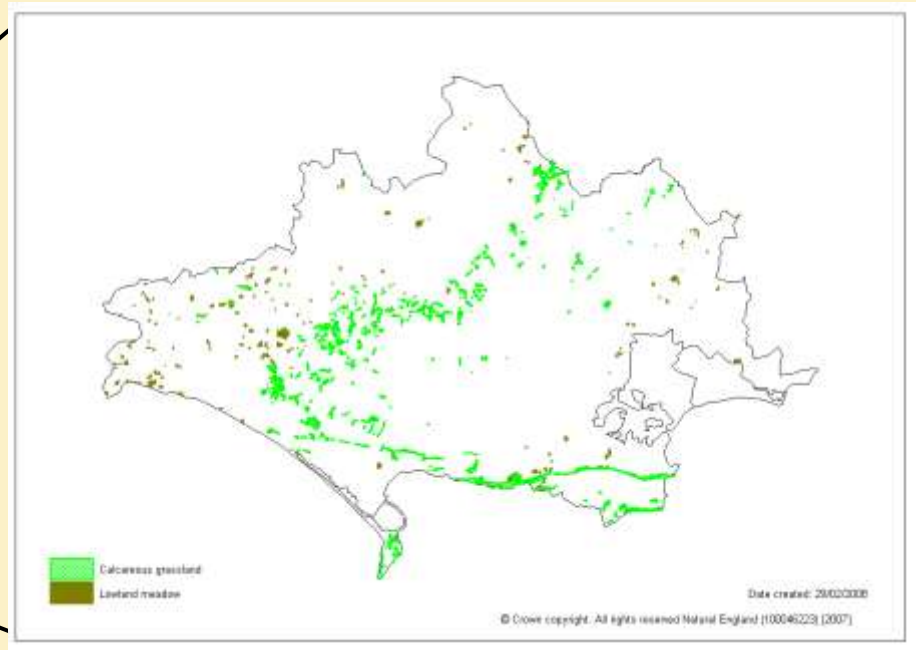
Decline of butterflies



Habitat loss and fragmentation



Flower-rich grassland = 3% land area



New EU target for 2020

"Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020,

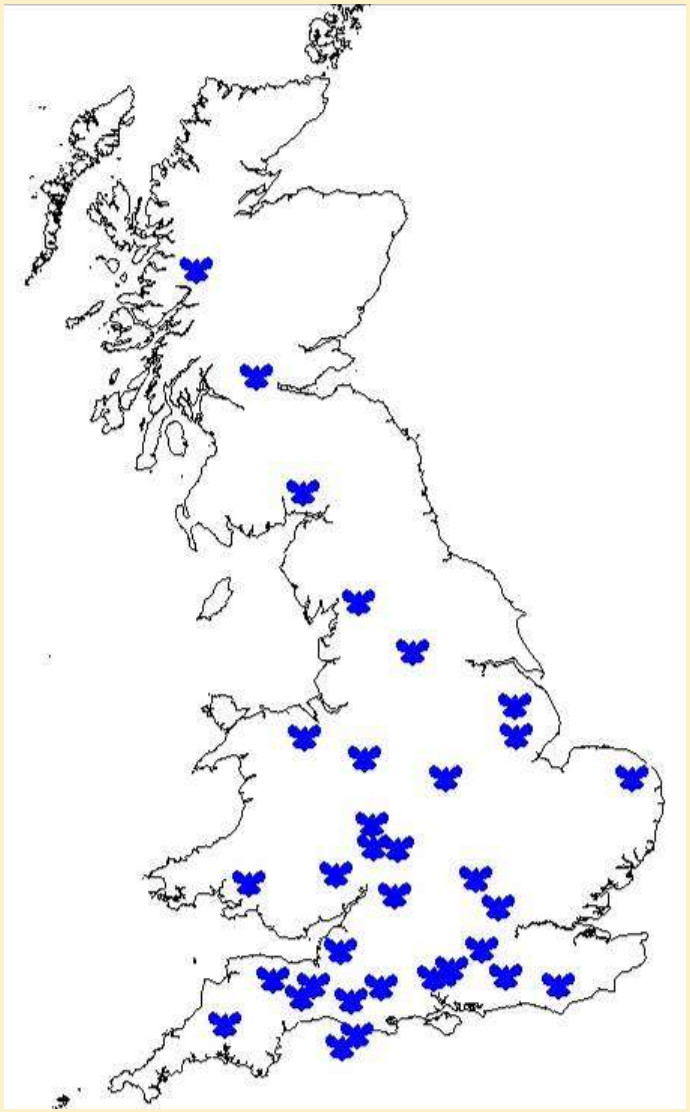
and restoring them in so far as feasible,

Habitat restoration for butterflies

1. Restoring breeding conditions within existing habitats (following neglect or unsuitable management)

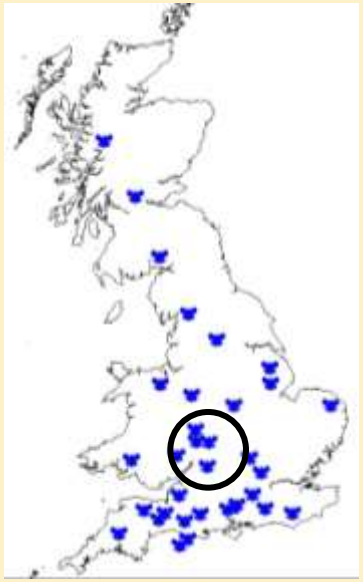
2. Restoring habitats from other (intensive) land uses – typically on sites where the original habitat has been destroyed

Butterfly Conservation Reserves



- 33 sites in UK
- 750 ha
- Managed for butterflies, moths and other wildlife

Restoring existing habitats: Grafton Wood (56ha)



Grafton Wood management

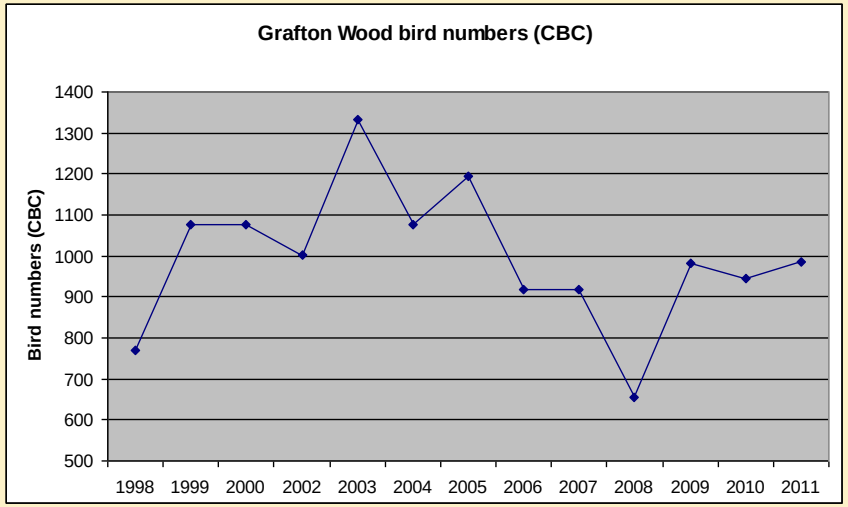
Grafton Wood Butterflies increasing

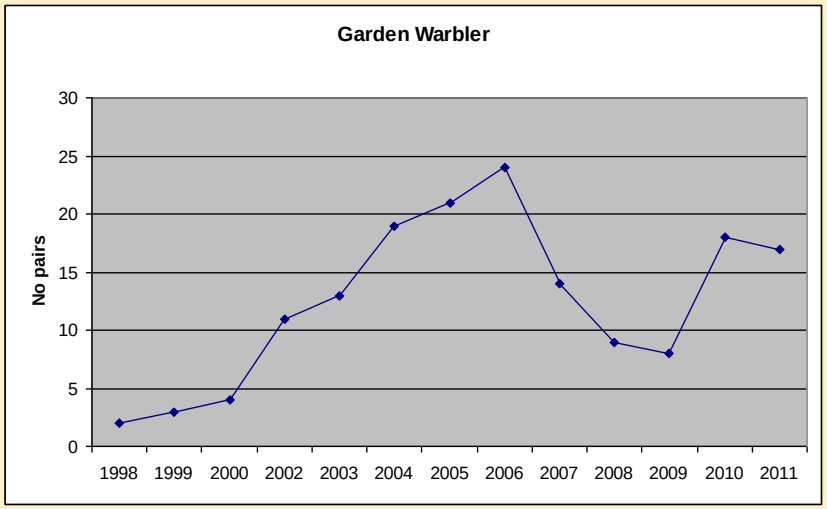
Thecla betulae

Argynnis paphia

Boloria euphrosyne

Bird numbers in Grafton Wood

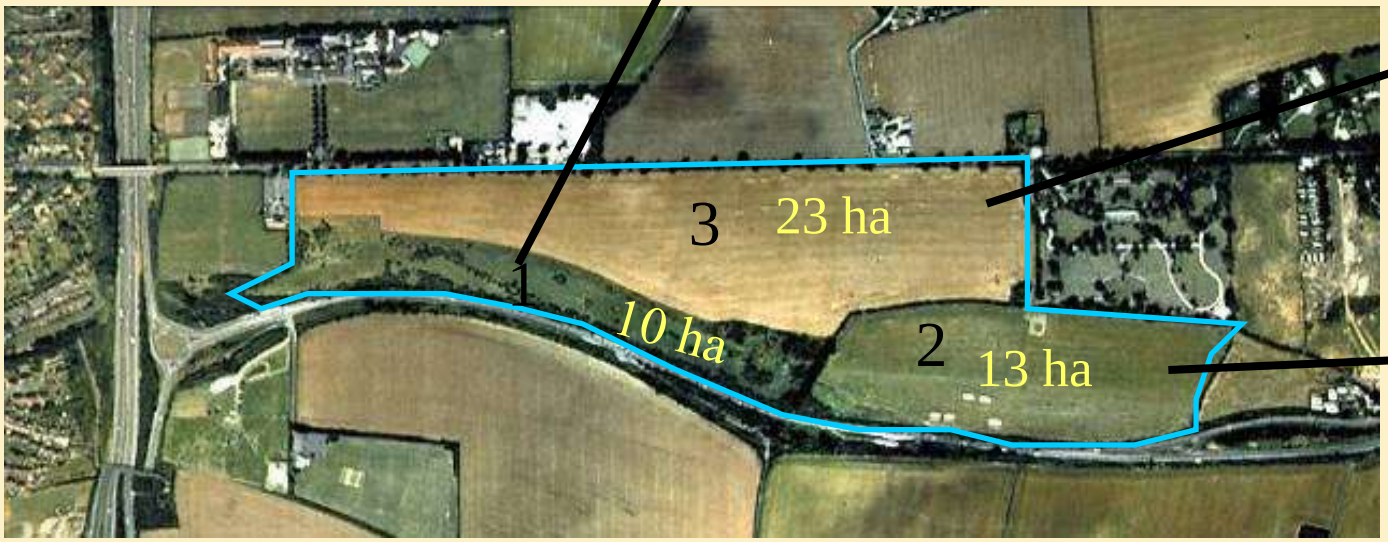




Wood warbler *Sylvia borin*

Magdalen Hill Down: restoration from arable

1991
Original
reserve



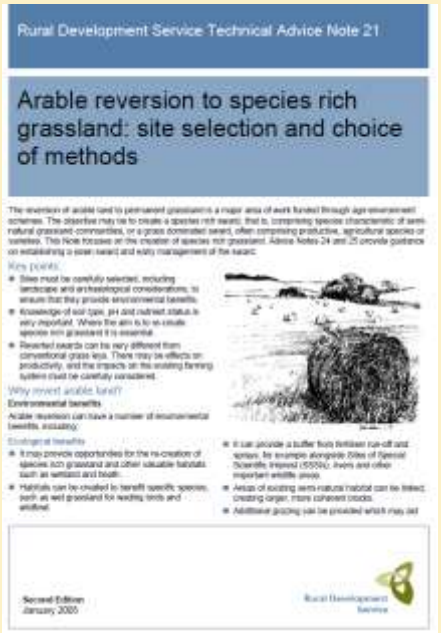
North
Extension
2005

Extension
1997

Magdalen Hill Down: restoration from arable

Rural Development Service Technical Advice Note 28

Sward enhancement: diversifying grassland by spreading species rich green hay



Rural Development Service Technical Advice Note 21

Arable reversion to species rich grassland: site selection and choice of methods

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Review

The restoration and re-creation of species-rich lowland grassland on land formerly managed for intensive agriculture in the UK

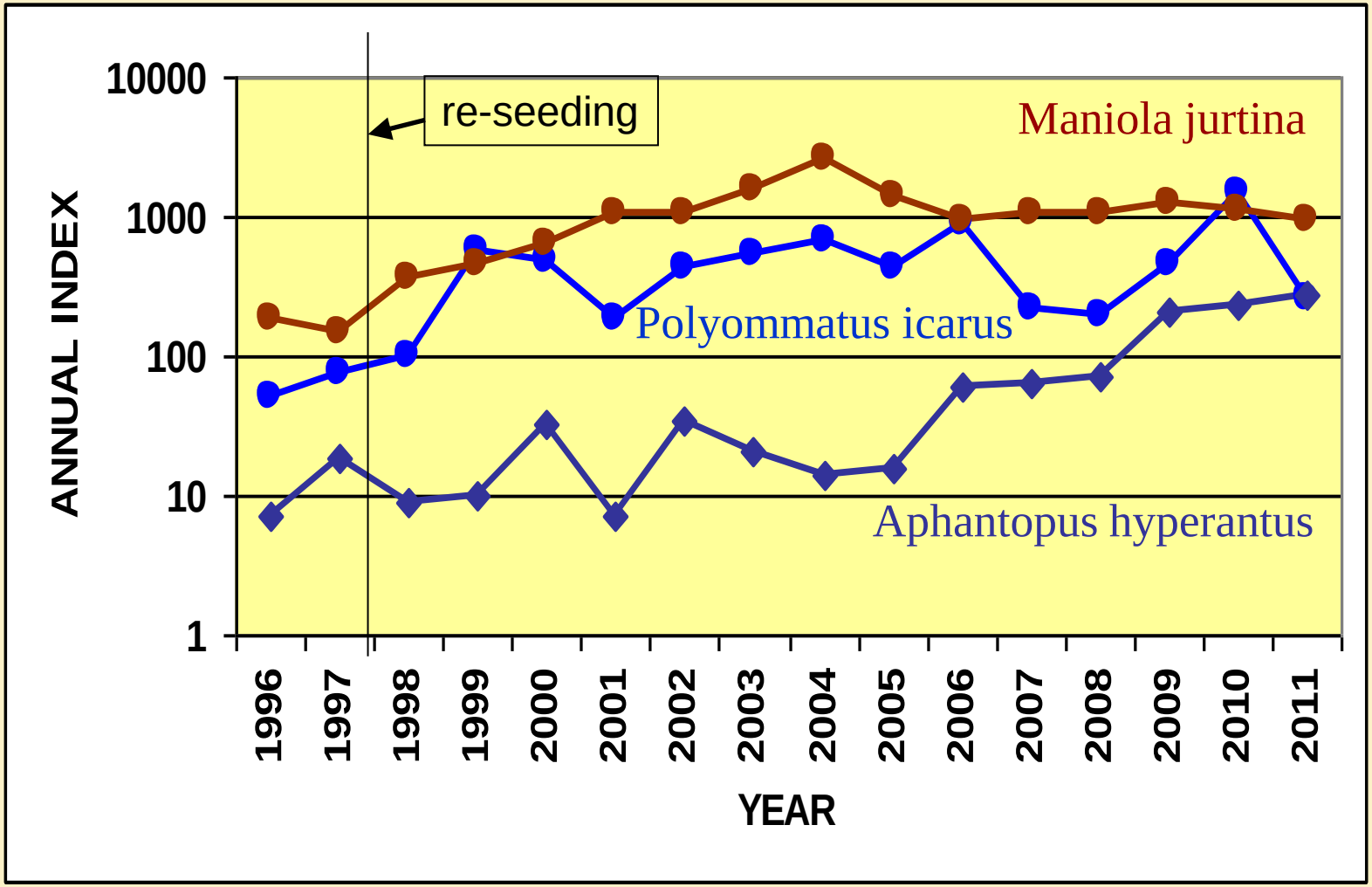
Kevin J. Walker [a,*], Paul A. Stevens [b], David P. Stevens [c], J. Owen Mountford [a], Sarah J. Manchester [a], Richard F. Pywell [a]

Magdalen Hill Down extension: 1997

Magdalen Hill Down extension: Year 1-3

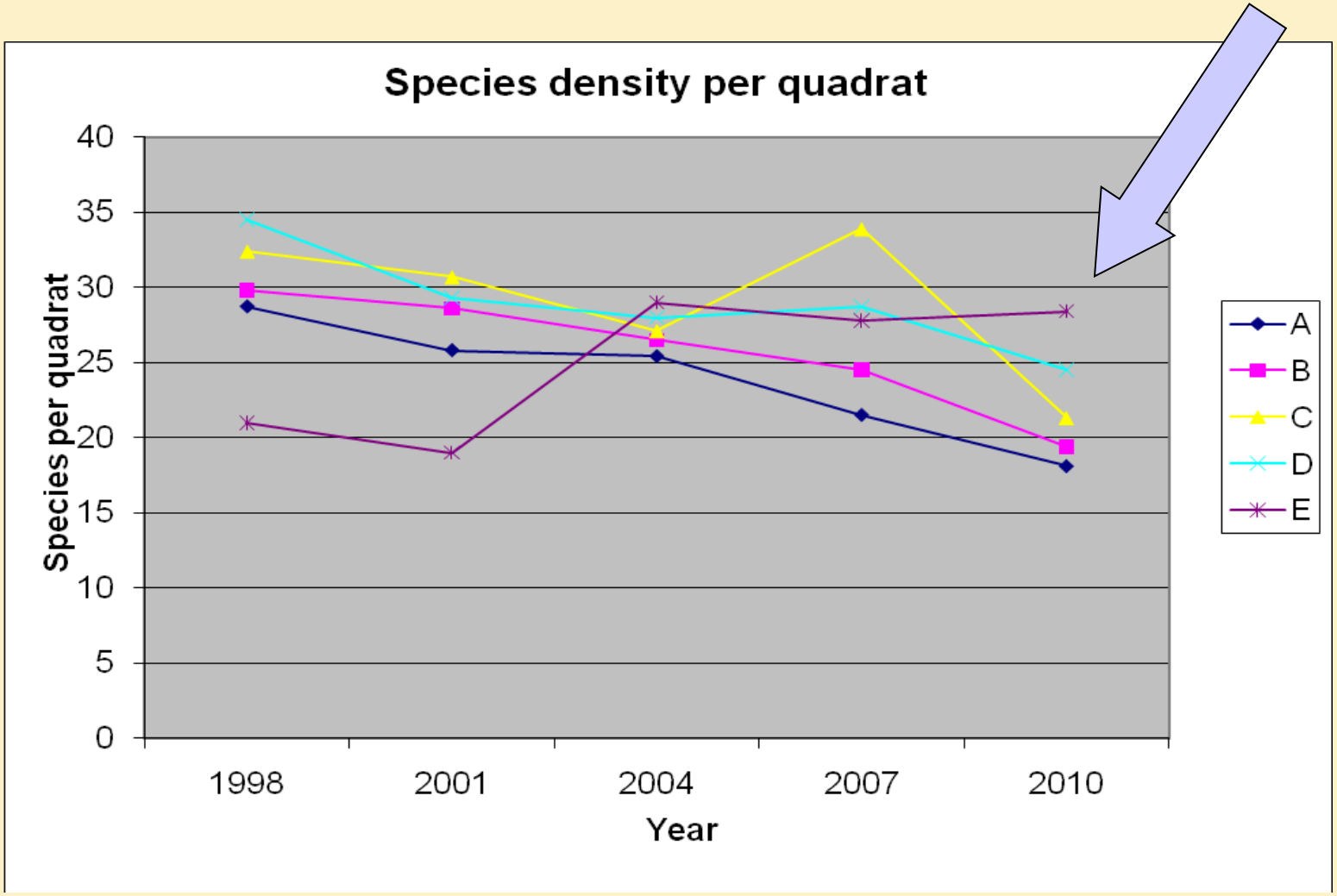
Magdalen Hill Down: 2010

Magdalen Hill Down Extension: Butterfly response



Magdalen Hill Down: Plant diversity

Remnant downland

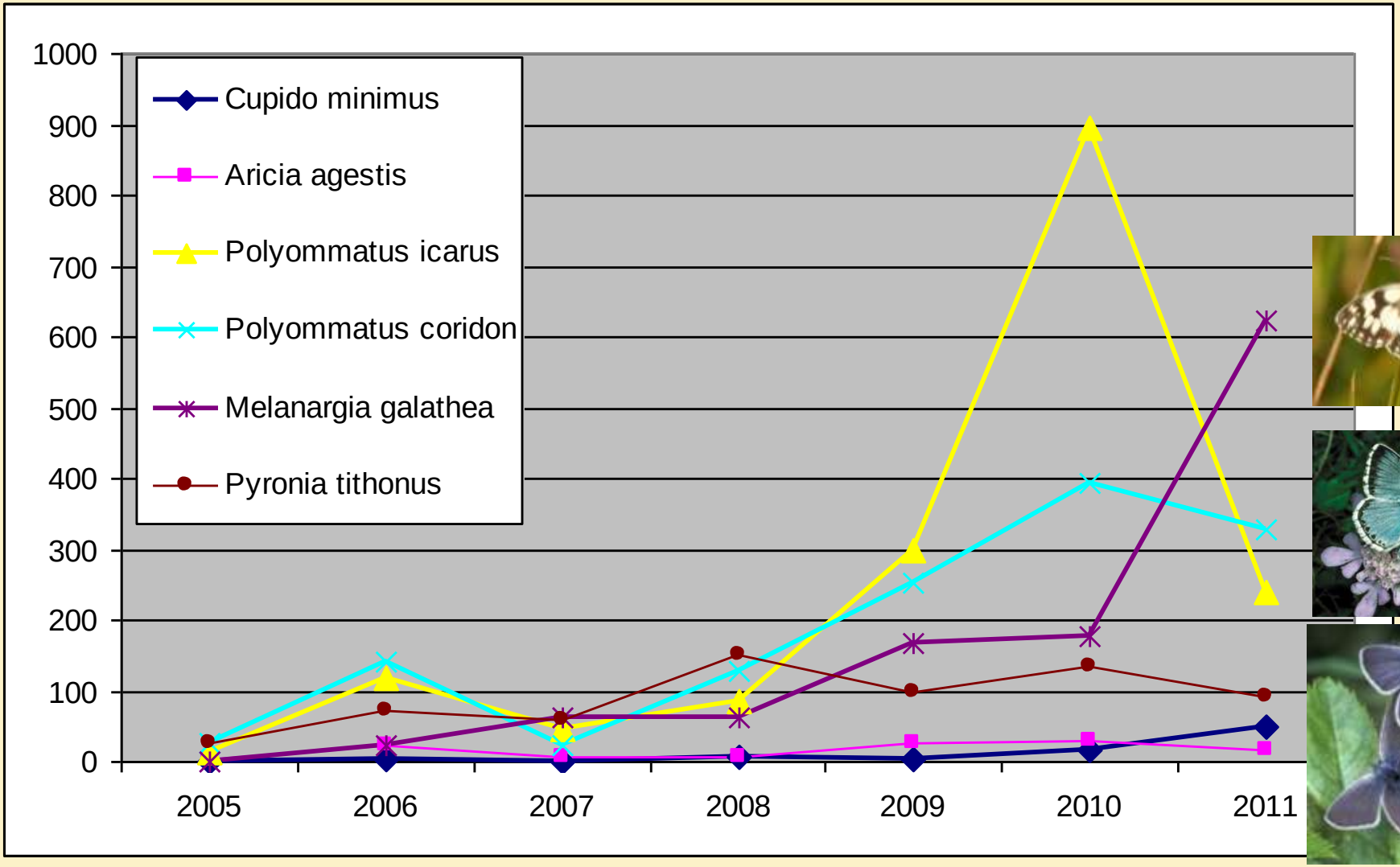


Magdalen Hill Down North: seeded 2005

Topsoil removal & seeded 2005: sward in 2008

Magdalen Hill Down North: seeded 2005

Magdalen Hill Down North: butterfly response



Magdalen Hill Down: successes

Downland area increased from 10 ha to 34 ha

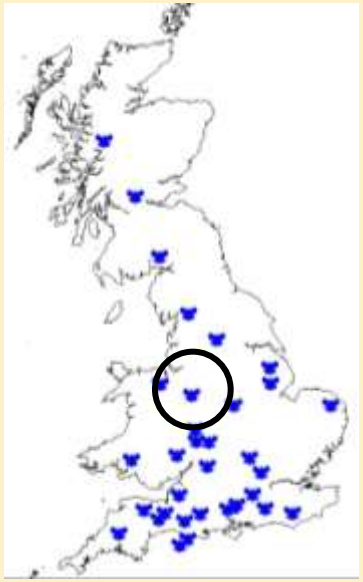
Original reserve:

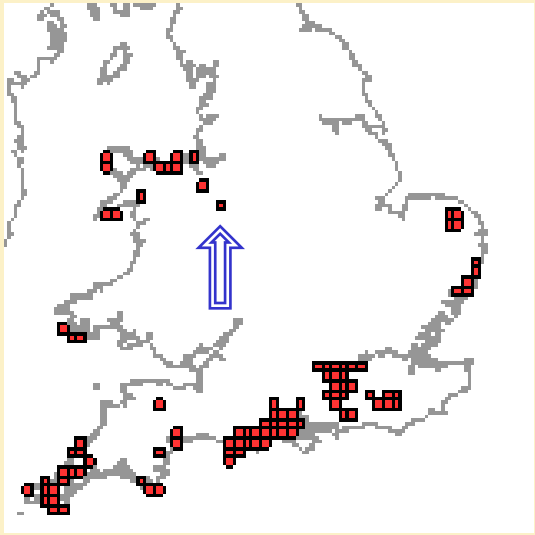
New large population of *Pyrgus malvae*

Restored habitats:

Over 30 species including *Cupido minimus*

Prees Heath (60ha)





Last site for *Plebejus argus* in Midlands

Prees Heath - History


THE wildlife TRUSTS
SHROPSHIRE
URGENT APPEAL
Butterfly Conservation
Please help us to make
a Prees Heath Reserve

Prees Heath challenge (2006)

Prees Heath: Soil Analysis

- Very high nutrient levels
- Soil Ph = 7
- Target Ph = 3-4

Prees Heath: restoration from arable

Options

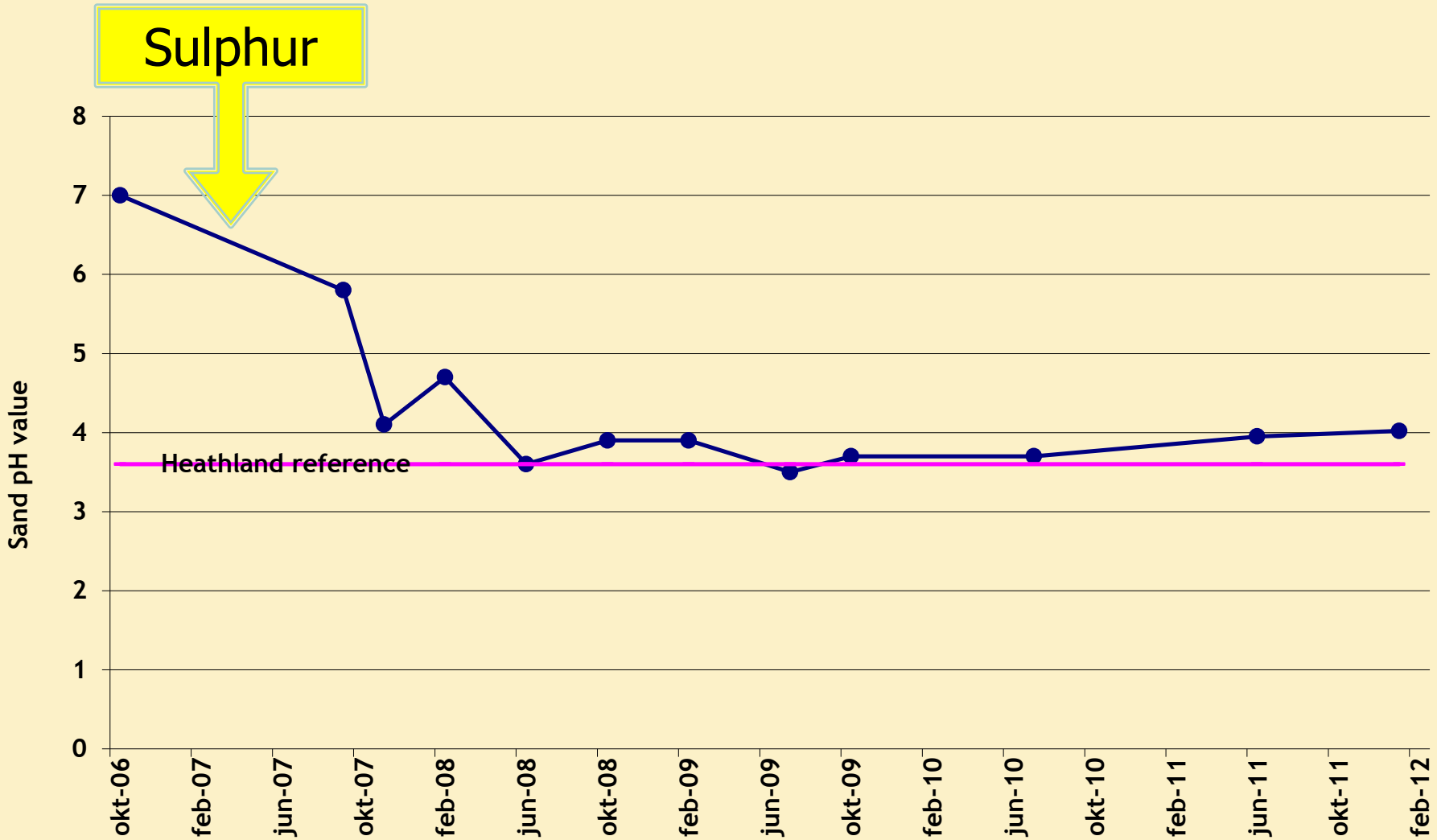
- Do nothing except mow and remove
- Cropping
- Soil stripping
- Soil inversion

Prees Heath: Deep Ploughing

Prees Heath: restoration process 2007

Prees Heath: restoration process, 2007

Prees Heath: reducing soil Ph

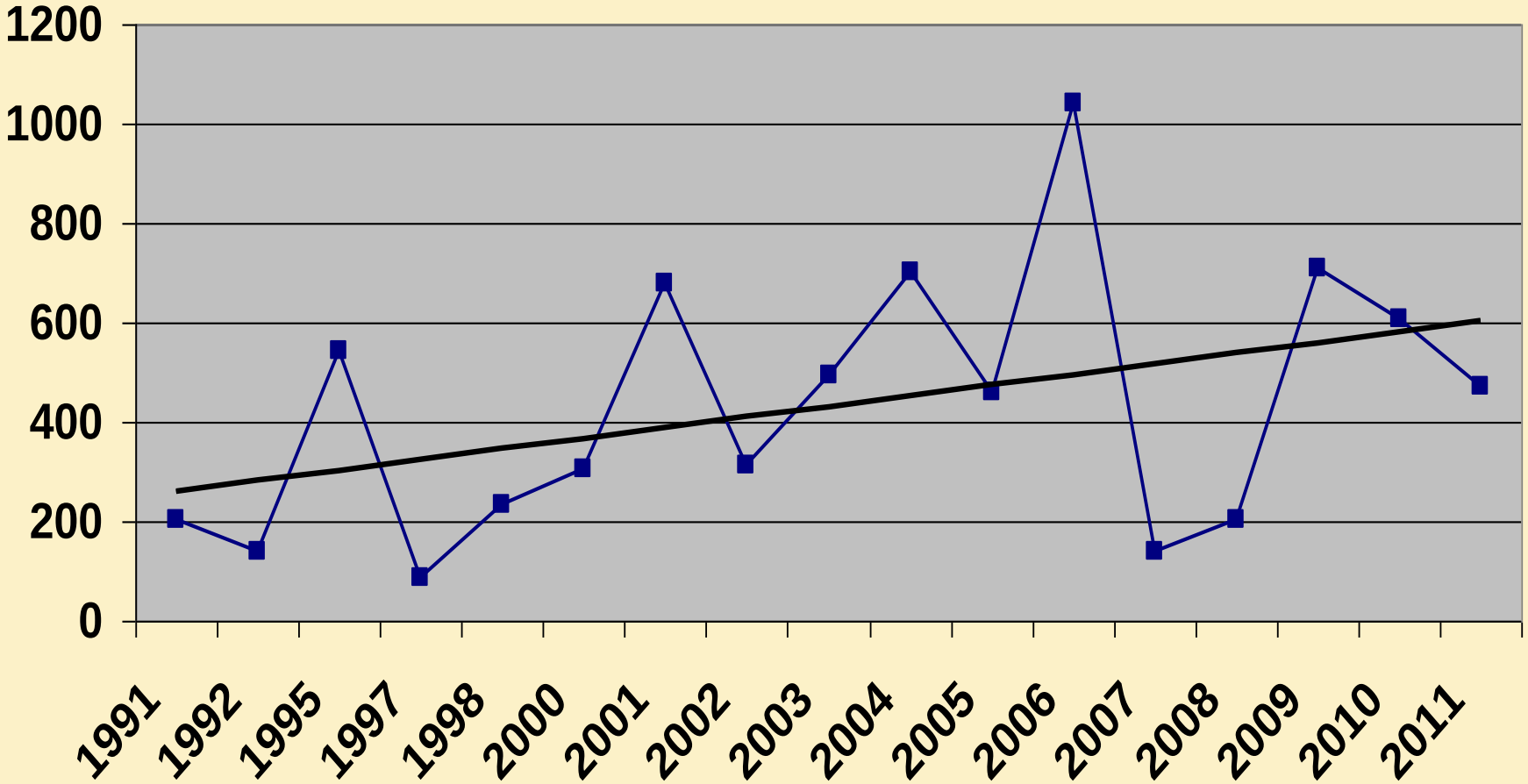


Heather germination

Plug planting of bell heather Erica cinerea

Plebejus argus and Lasius niger

Plebejus argus: Prees Heath Transect Counts



Prees Heath: soil analysis

Soil parameters	Before ploughing, Oct 2006	8 months after ploughing, June 2007	31 months after ploughing, Oct 2009
Percentage organic matter	4.3	0.12	0.97
Phosphorus mg L^{-1}	58	11.8	23.3
Calcium mg L^{-1}	1588	118.5	32.7
Ammonium – nitrogen mg kg^{-1}	3.8	0.21	3.3

Davis et al (2011) Aspects Appl Biol 108, 247-254

Habitat restoration costs

Chalk grassland = c. £2,000/ha (~ € 2,400)

Prees heath = £3,120/ha (~ € 3,700)

+ Staff costs……

- These costs can sometimes be provided by developers or even by agri-environment grants

Conclusions

- Habitat recreation is possible for several habitats
- It is expensive and takes a lot of time
- It needs specific techniques and expertise
- We have a lot of experience now to draw on
- The results are unpredictable`
- It is an important tool to achieve 2020 targets, especially in regions with highly fragmented/degraded habitats

- **It is always better – and cheaper - to conserve existing habitats**

Thanks

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- Funders: Hampshire County Council, Grantscape, Natural England, individual donors





Invitation

Butterfly Conservation

Saving butterflies, moths and our environment

Seventh International Symposium

Southampton University, UK

3-6 April 2014