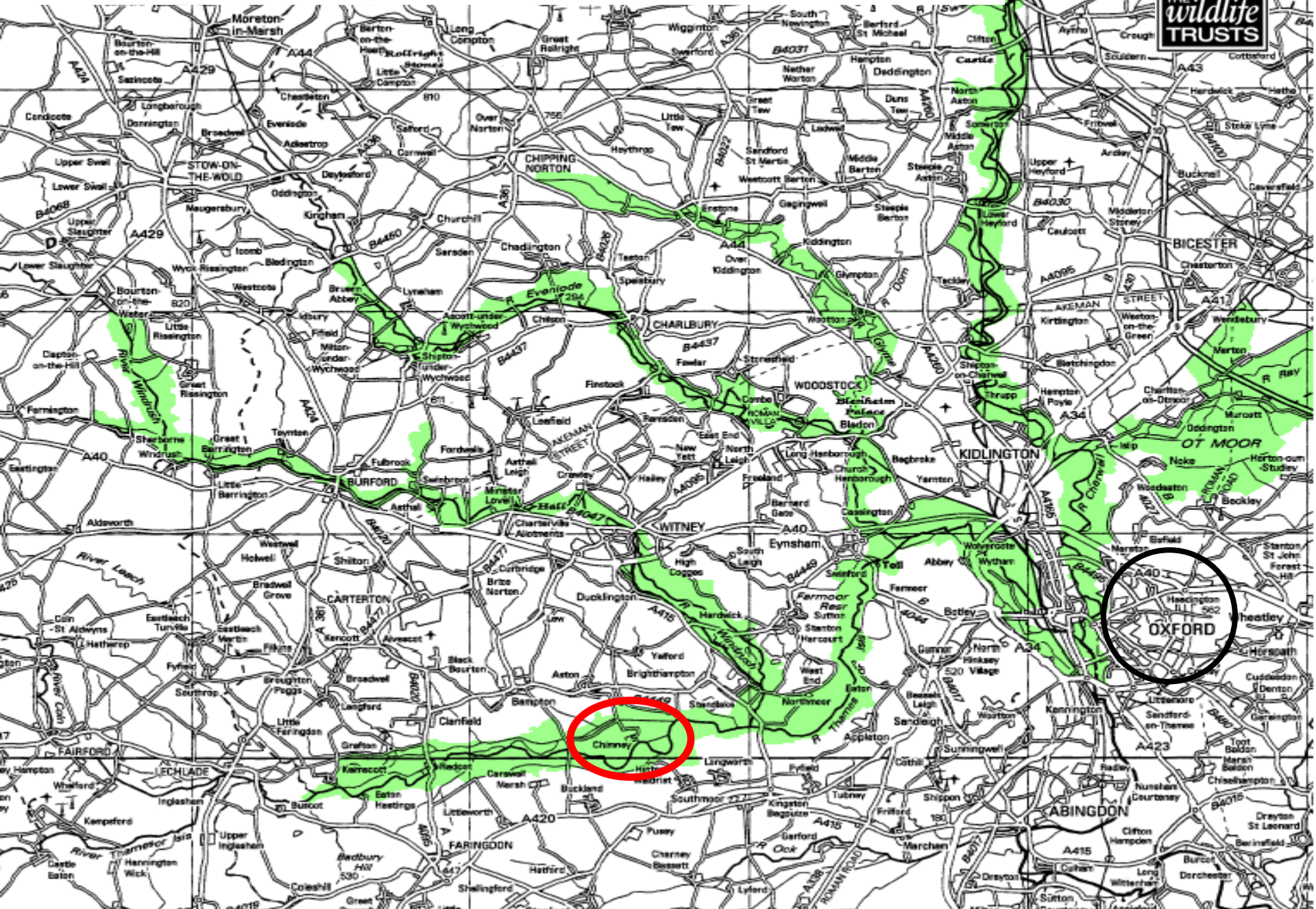


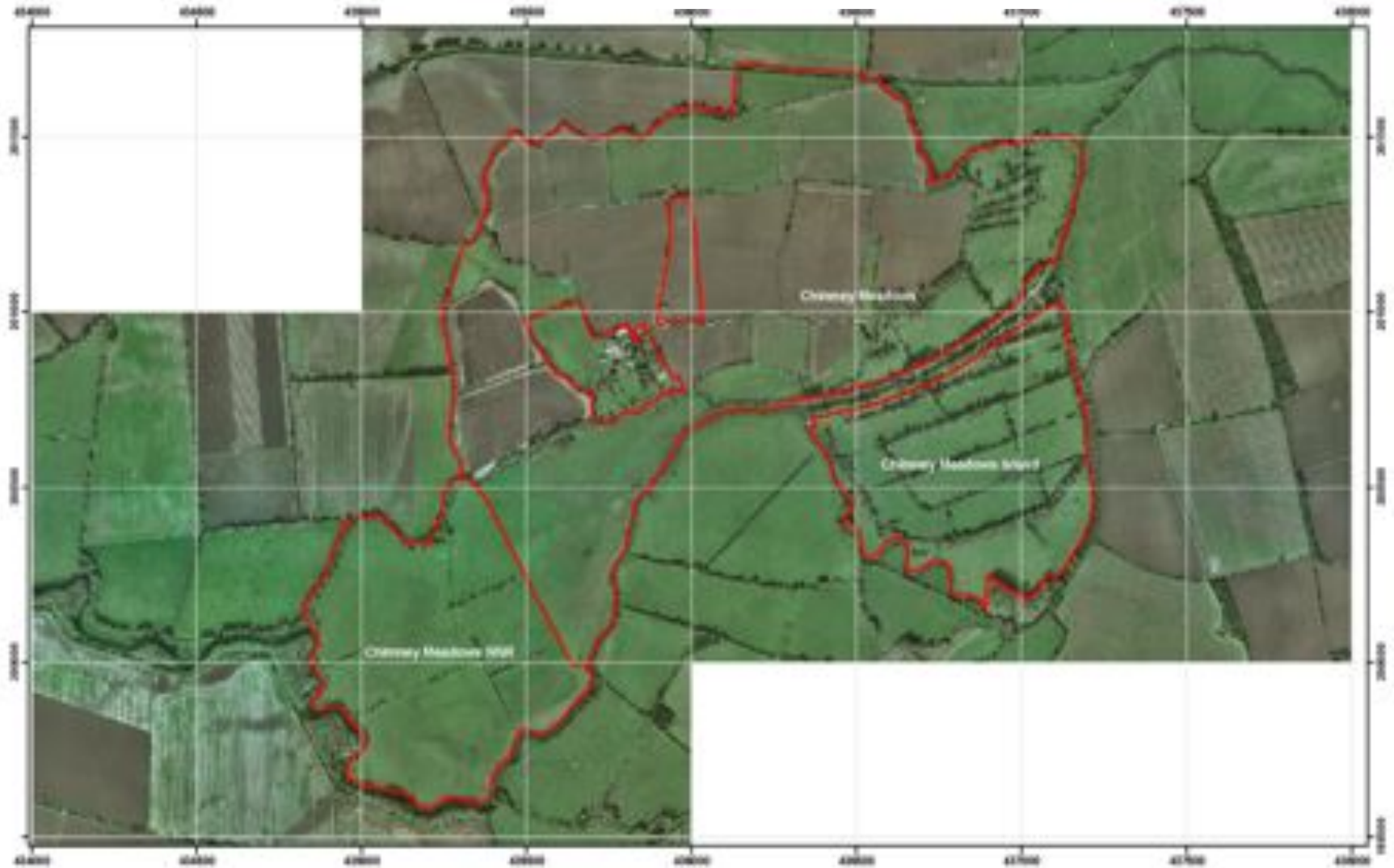


Restoring floodplain hay meadows: a case study of Chimney Meadows nature reserve in Oxfordshire.

Dr Kerry Lock
Berkshire, Buckinghamshire and Oxon Wildlife Trust.

Upper Thames Floodplain: 1700km²





Chimney Meadows National Nature Reserve SSSI (NVC MG4)
National Vegetation Classification (NVC) Rodwell 1992



Mesotrophic Grassland 4 – Flood plain meadows; Meadow foxtail and Great Burnet grassland

Mesotrophic Grassland 5 – Dry neutral grassland; Crested Dogstail – Black knapweed grassland

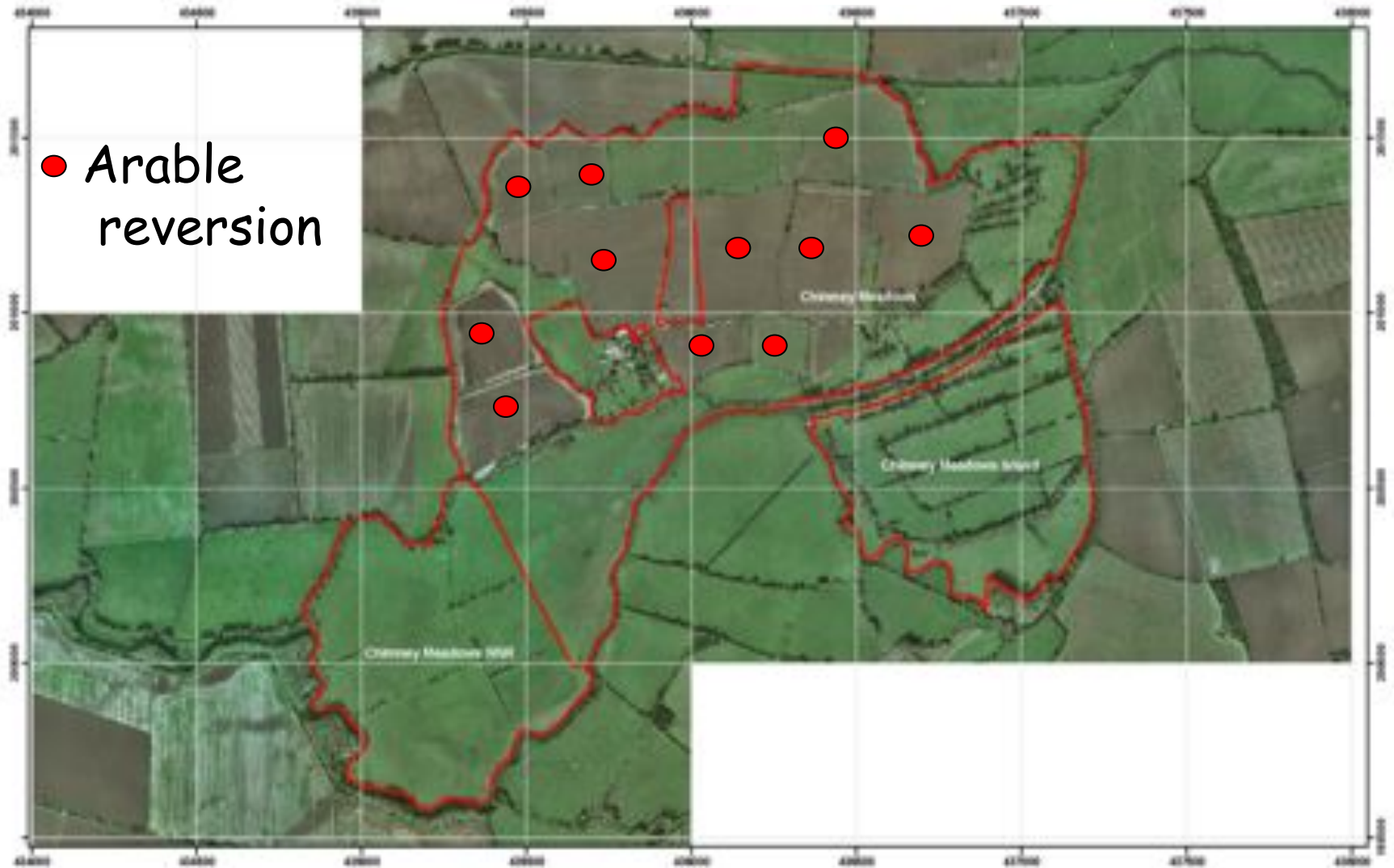


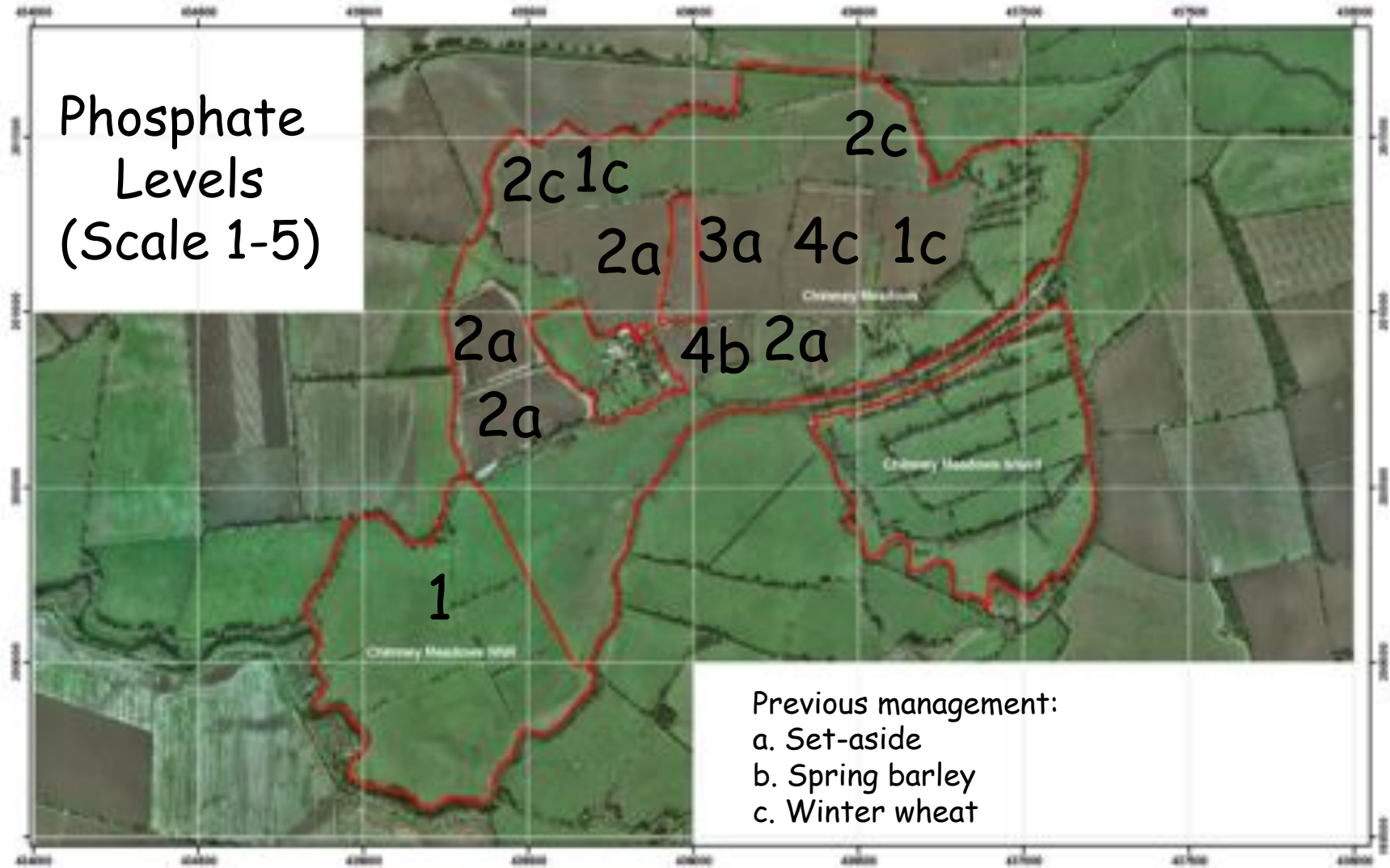
Key Objectives




To conserve, expand and enhance key grassland habitats of the floodplain:

- Species rich floodplain hay meadows
- Floodplain grazing marsh
- Reedbeds





Ex-arable field preparation 2004

- Existing vegetation sprayed off using a Glyphosate based herbicide
 - Dead vegetation topped 2 weeks later
 - Disc harrowed to turn the dead vegetation into the soil
 - Seed bed ready
- 
- A wide-angle photograph of a large, flat field under a cloudy sky. The field is covered in dense, green vegetation in the foreground, transitioning to a lighter, yellowish-brown color in the middle ground. A single, large, rounded tree stands in the distance on the right side of the field. The horizon is flat and distant.

35ha of green hay cut at the National Nature Reserve.



A double chop harvester cut the hay into 5cm sections and blew the hay onto a tractor drawn trailer.



- Green hay then transferred to recipient fields
- A grab transferred the hay into 2 tractor drawn Muck spreaders with rear mounted beaters.



Green hay spread across the field at a ratio of 1:2 donor to recipient site then rolled.



Early Topping (End April – Early May)



Yellow Rattle
*(Rhinanthus
minor)*

Westbury, D.B. *et al* (2006) Seeds of change: The value of using *Rhinanthus minor* in grassland restoration *Journal of Vegetation Science* 17: 435-446

Hay cut (July/August)

Aftermath grazing by sheep



Monitoring Management Effects

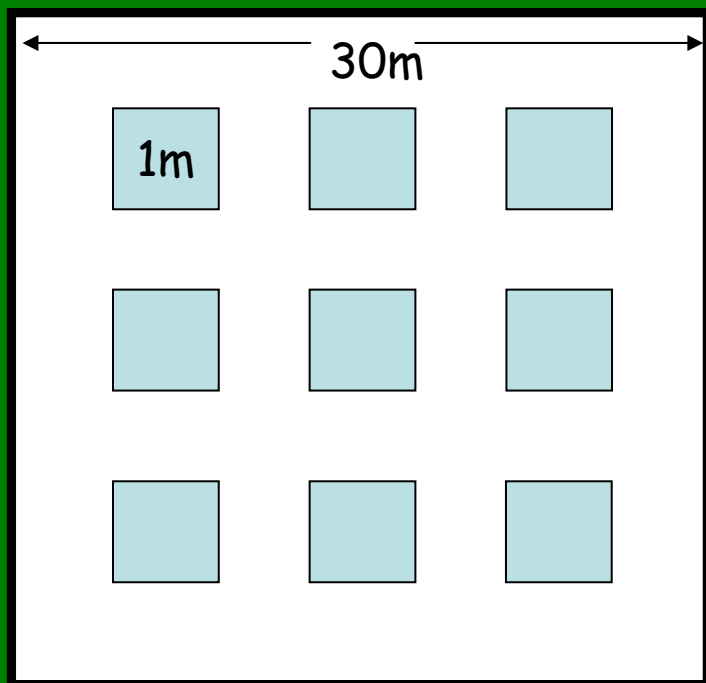
Two 30x30m plots – Control and Treatment

Contrast plots at the NNR



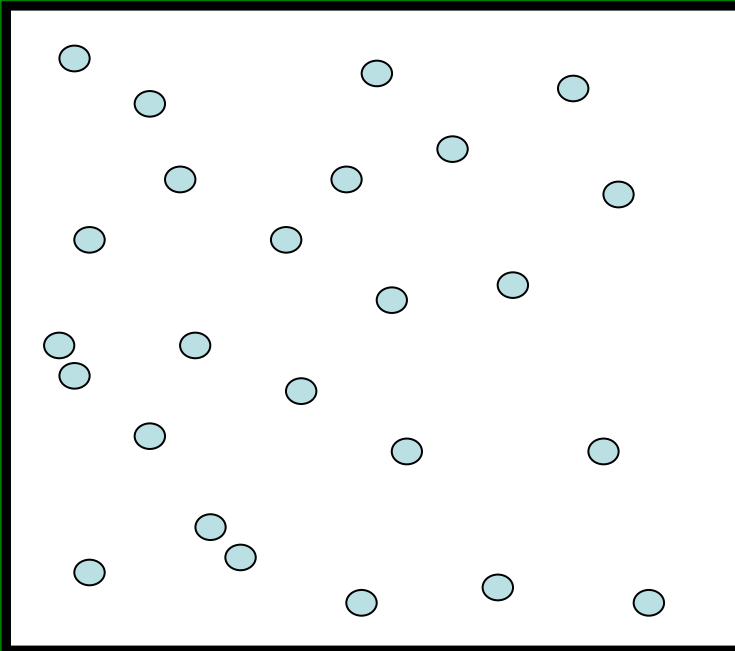
Surveying the Arable Reversion fields

- 9 Permanent quadrats
- NVC botanical survey



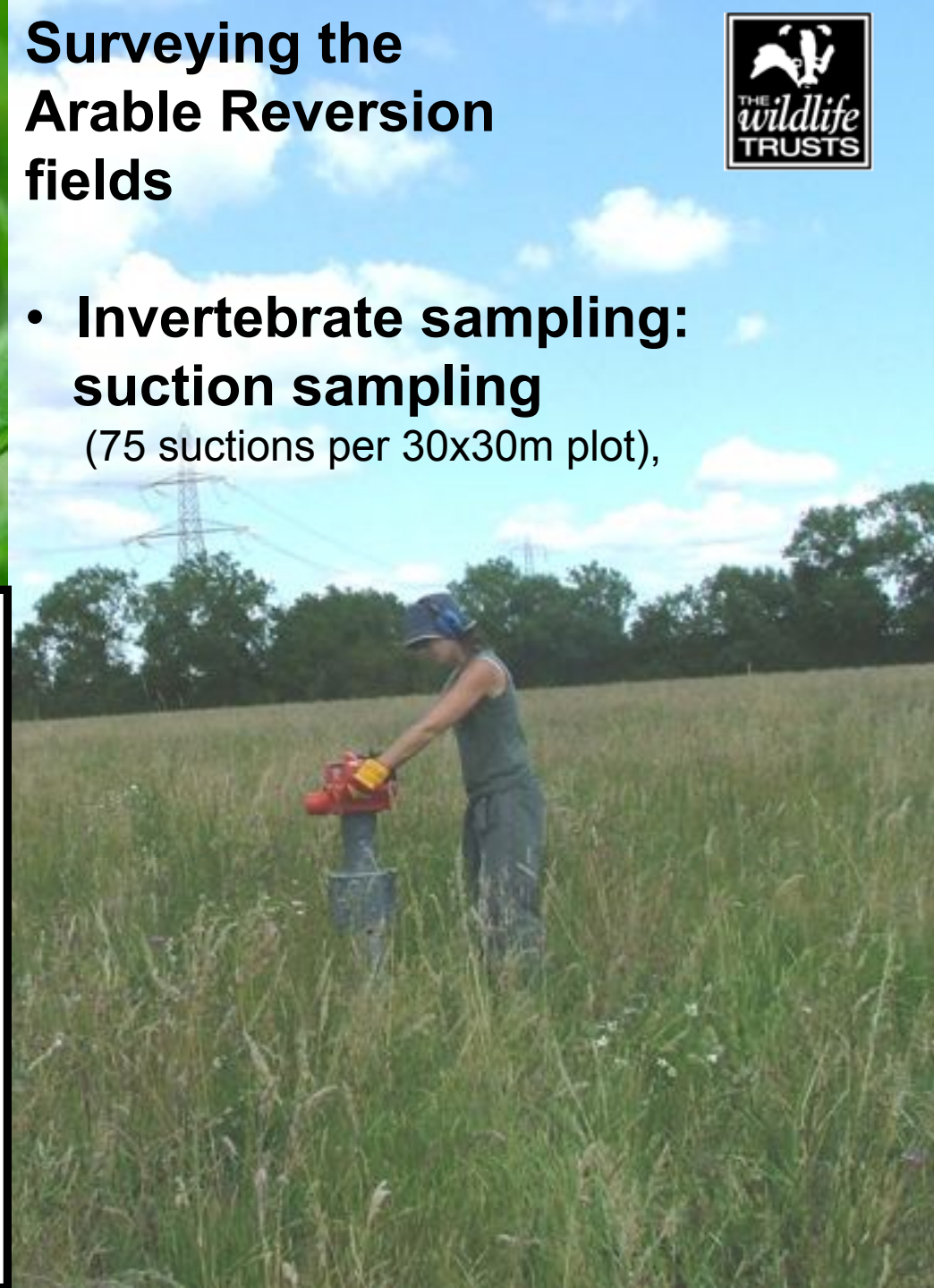
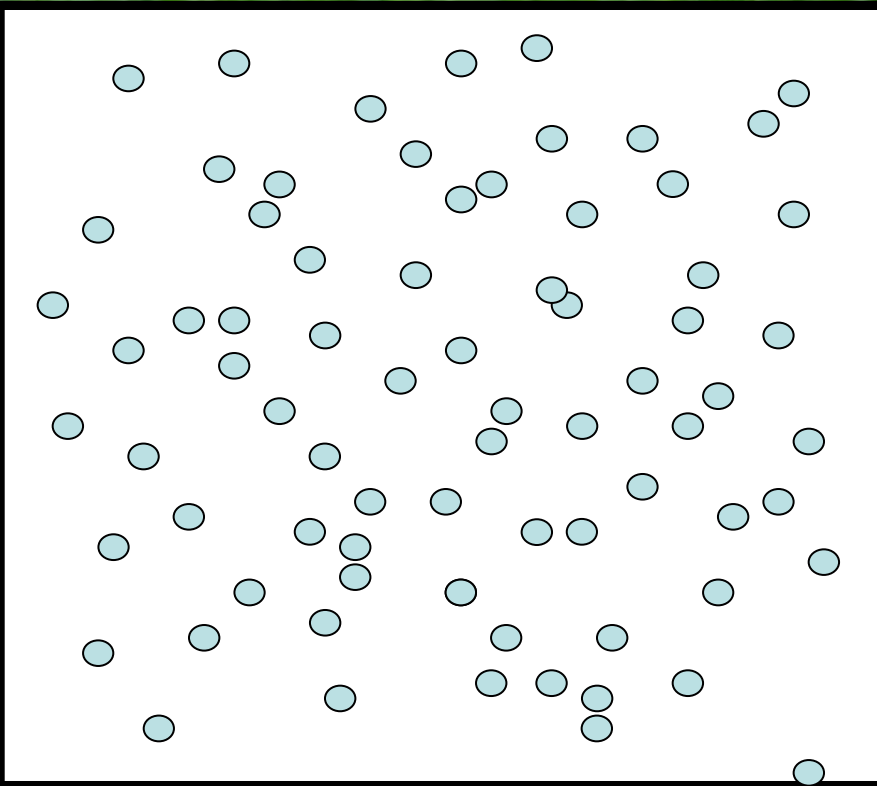
Measuring sward structure

- Drop disc measure of sward height
 - % cover of grasses, forbs, bryophytes and bare ground



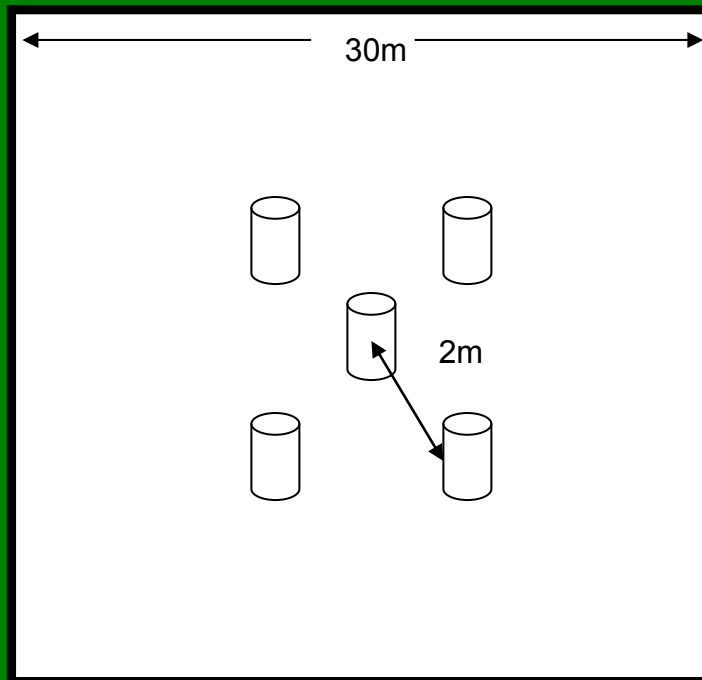
Surveying the Arable Reversion fields

- **Invertebrate sampling:
suction sampling**
(75 suctions per 30x30m plot),



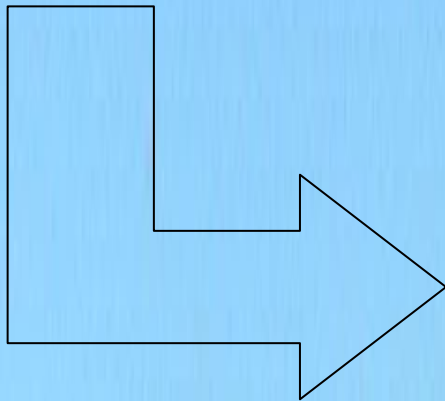
Surveying the Arable Reversion fields

Invertebrate sampling: pitfall trapping





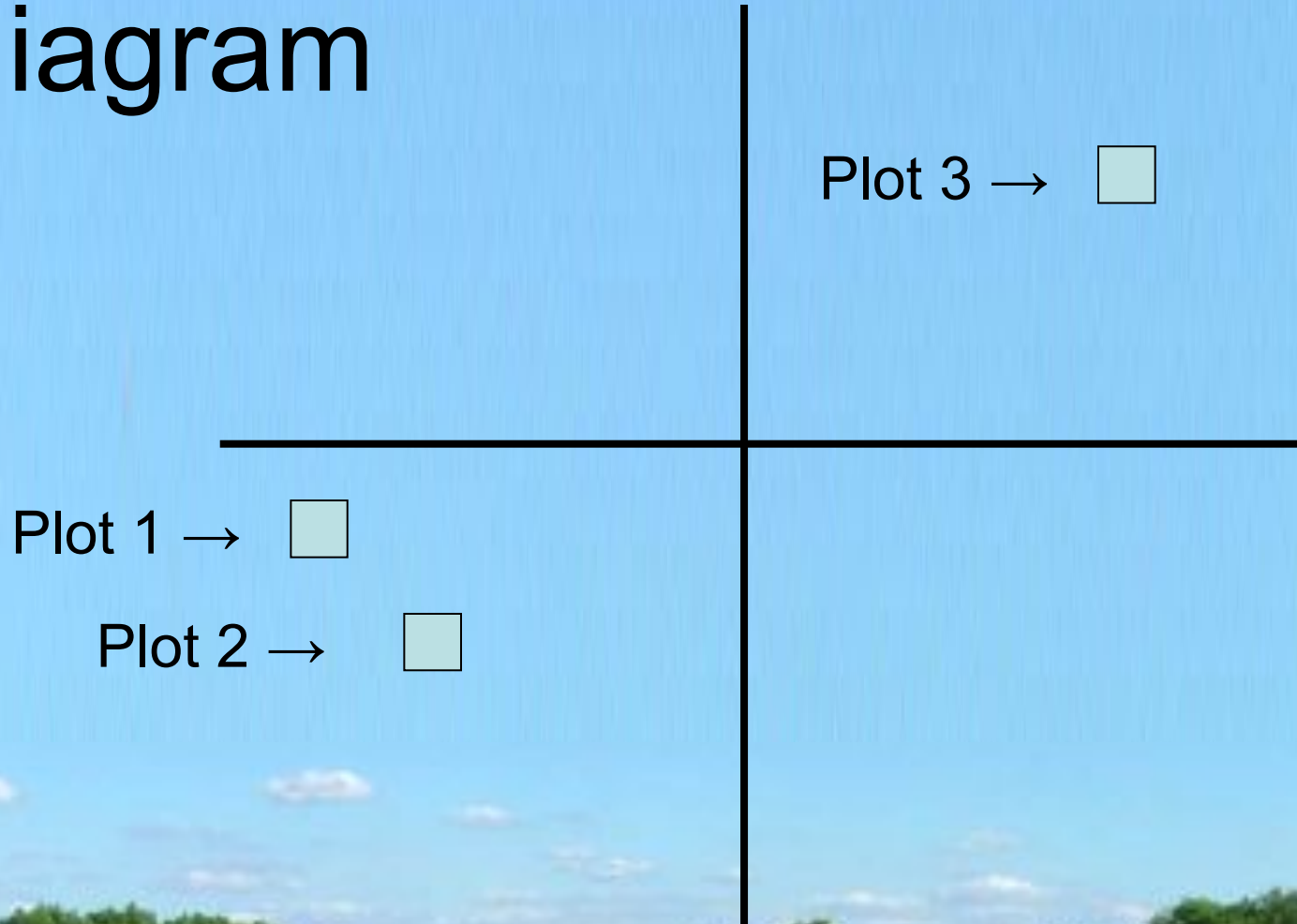
How we can look at community structure

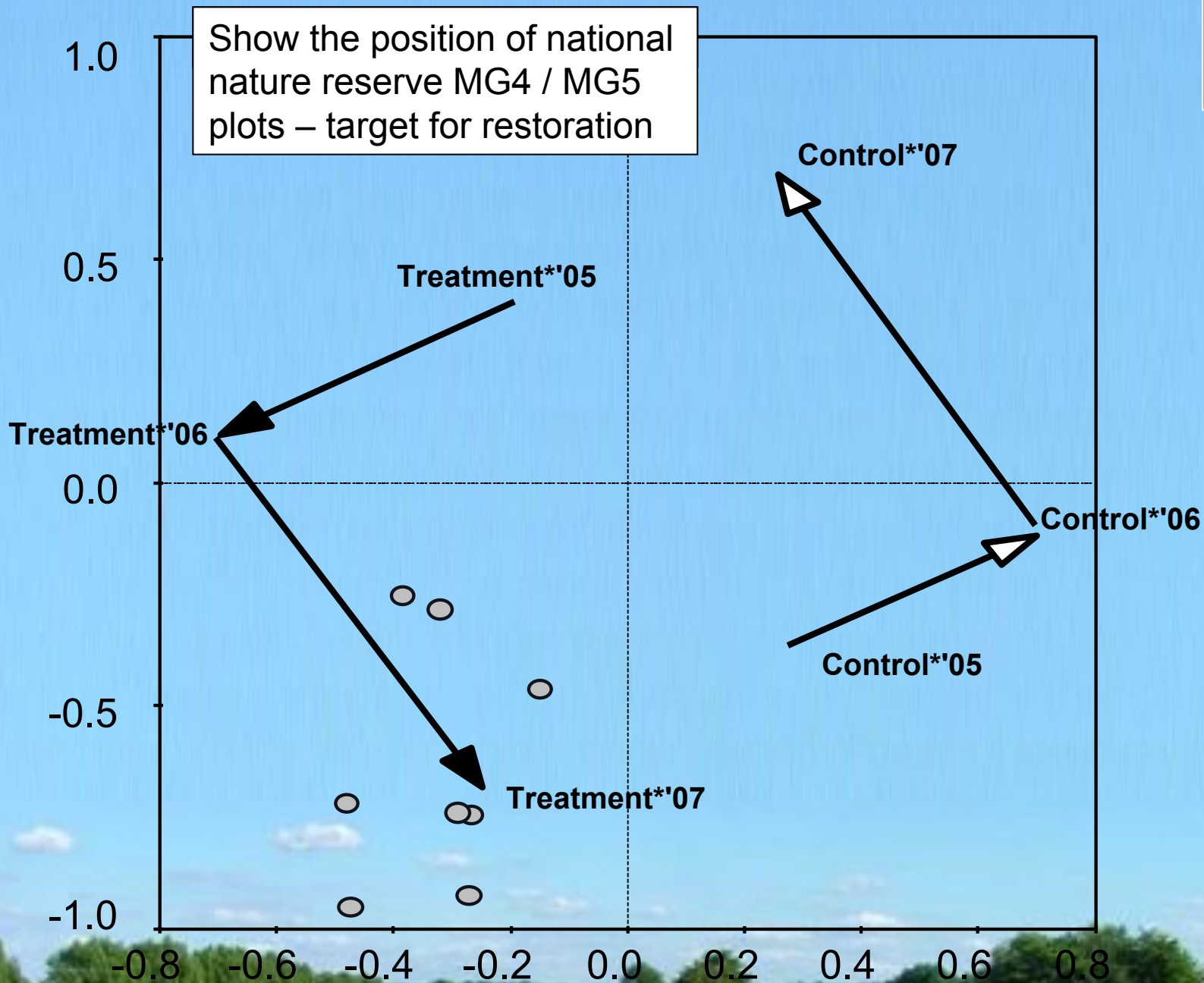


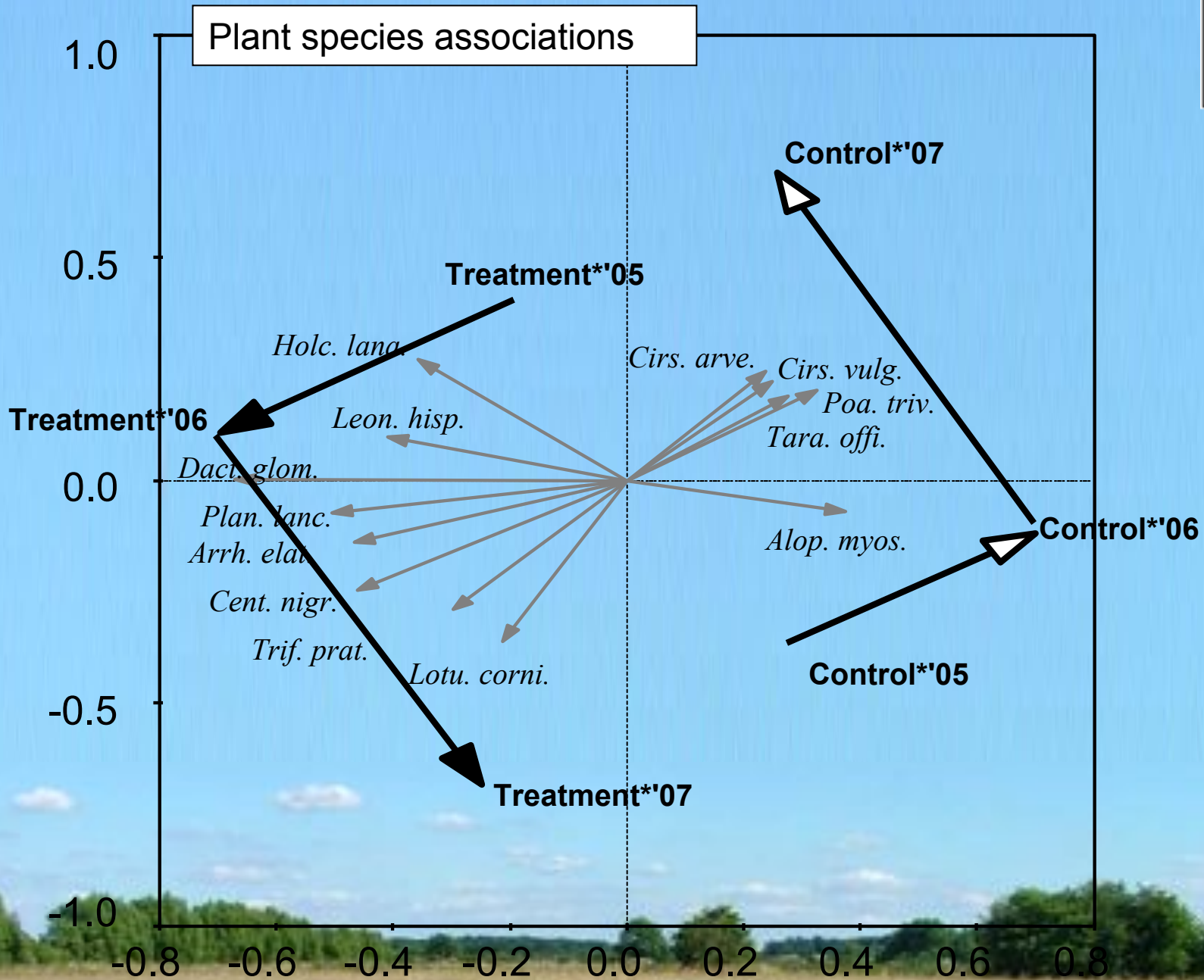
Ordination statistics

Redundancy Analysis (RDA)

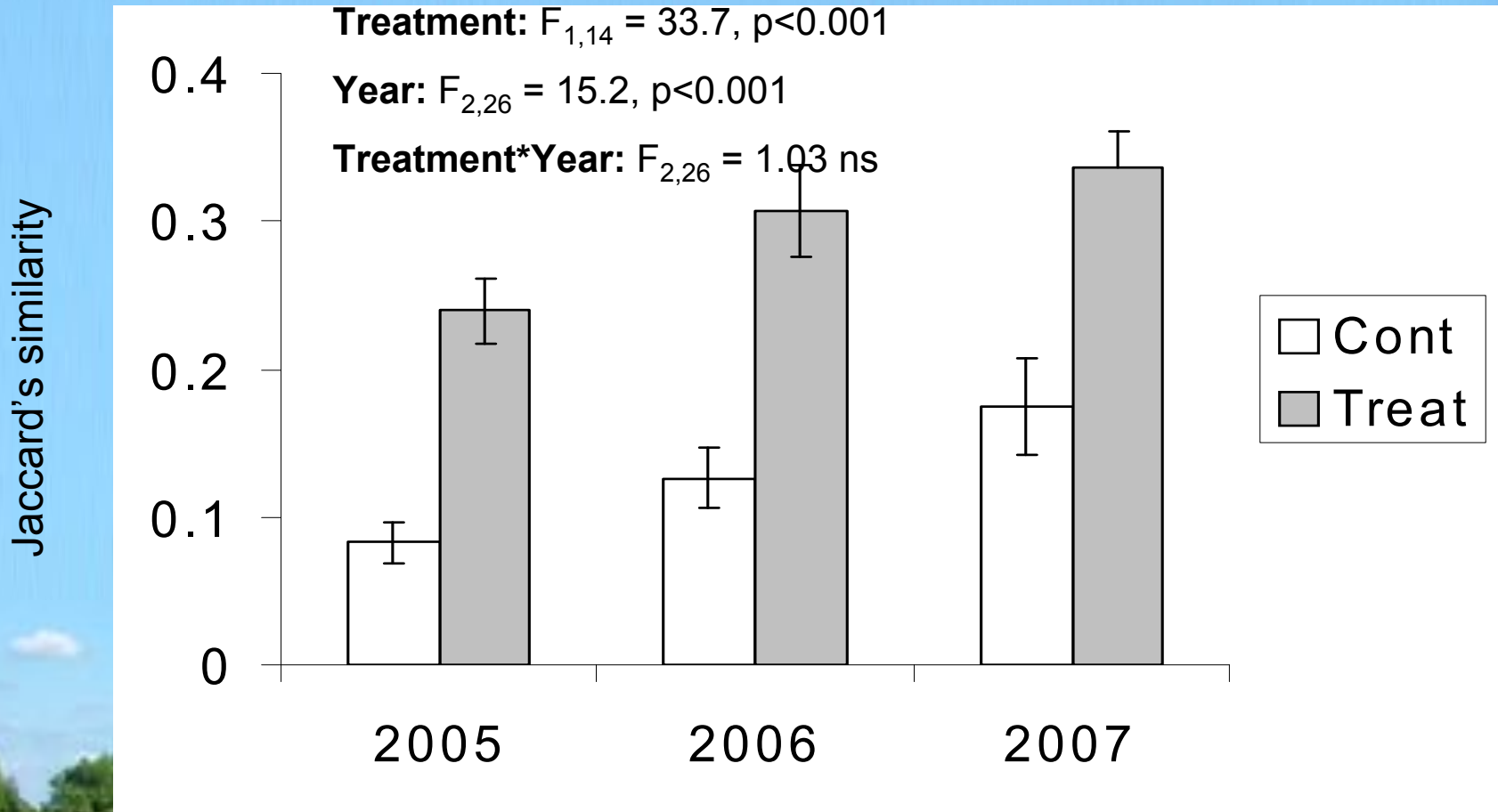
Example RDA diagram







Similarity of experimental treatments to the nature reserve MG4 / MG5 target



* Jaccard's similarity is a binary similarity coefficient

Vulnerability of floodplain meadow communities:

Conservation of MG4 grassland relies on a balance of:

1. Water regime

2. Nutrient regime

3. Vegetation management

1. Water Regime: depth zones MG4

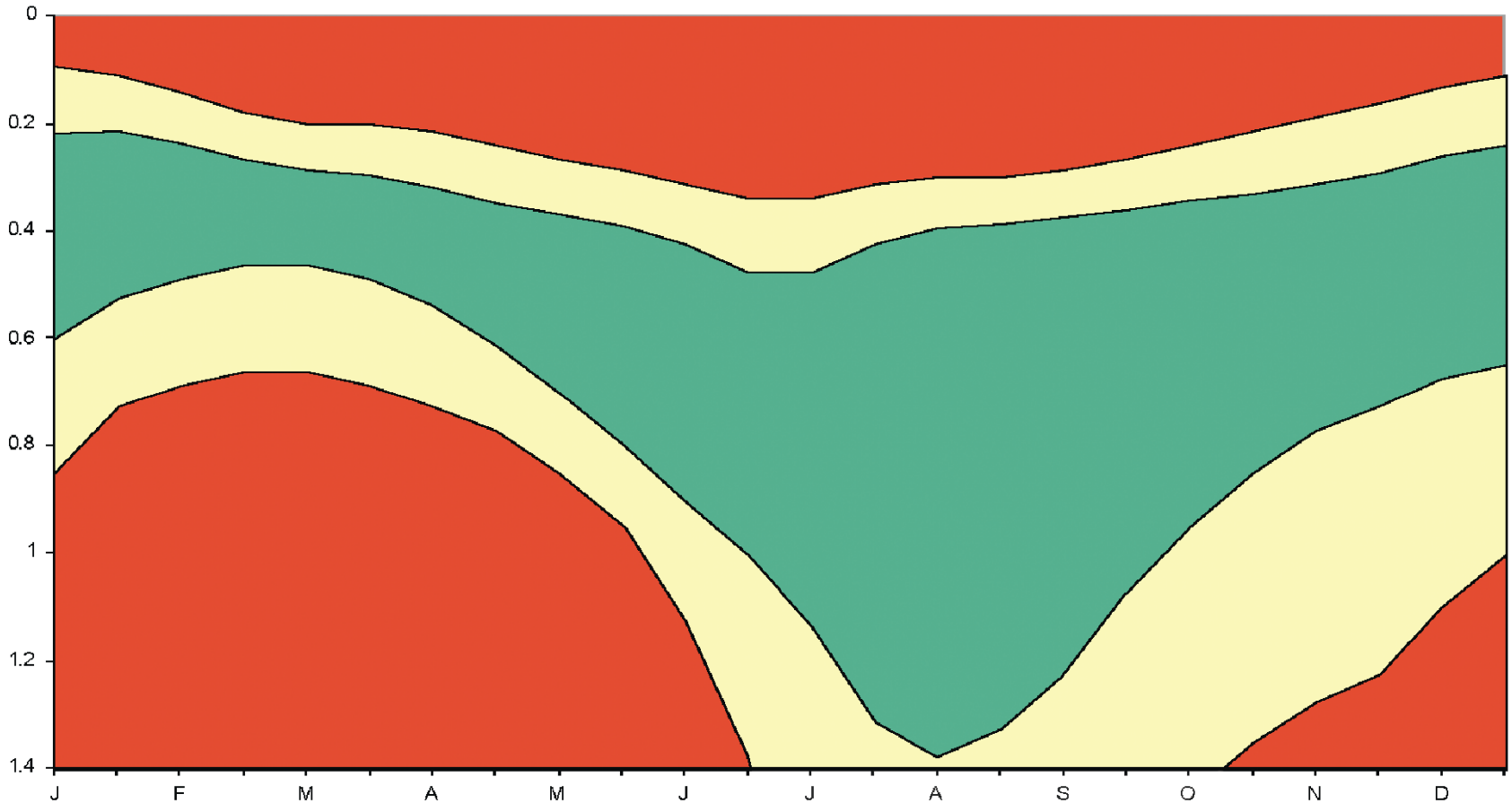
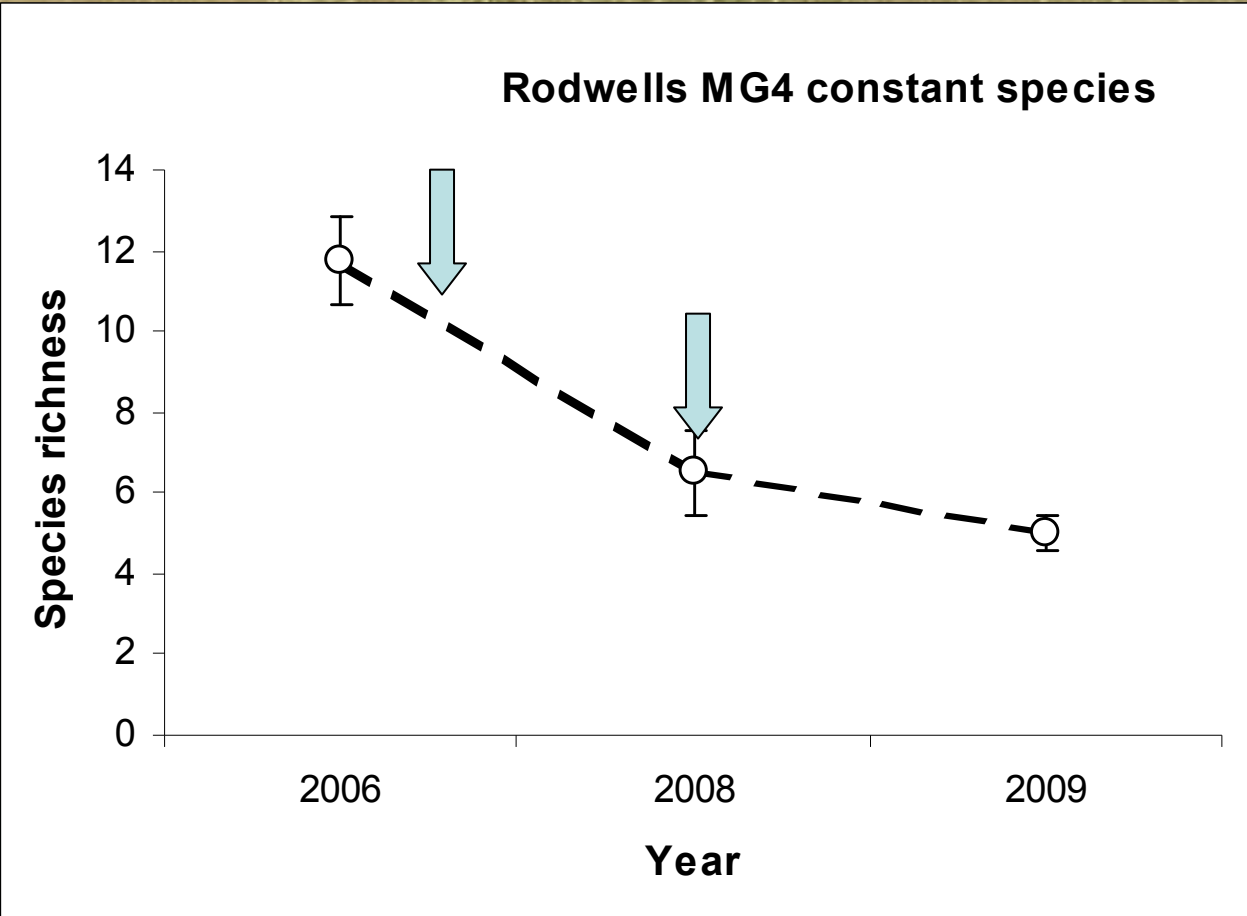


Diagram from 'Ecohydrological guidelines for Lowland wetland plant communities' (2004)

Chimney Summer Flooding July 2007 & June/August 2008





2. Nutrient regime: acceptable nutrient deposition rate

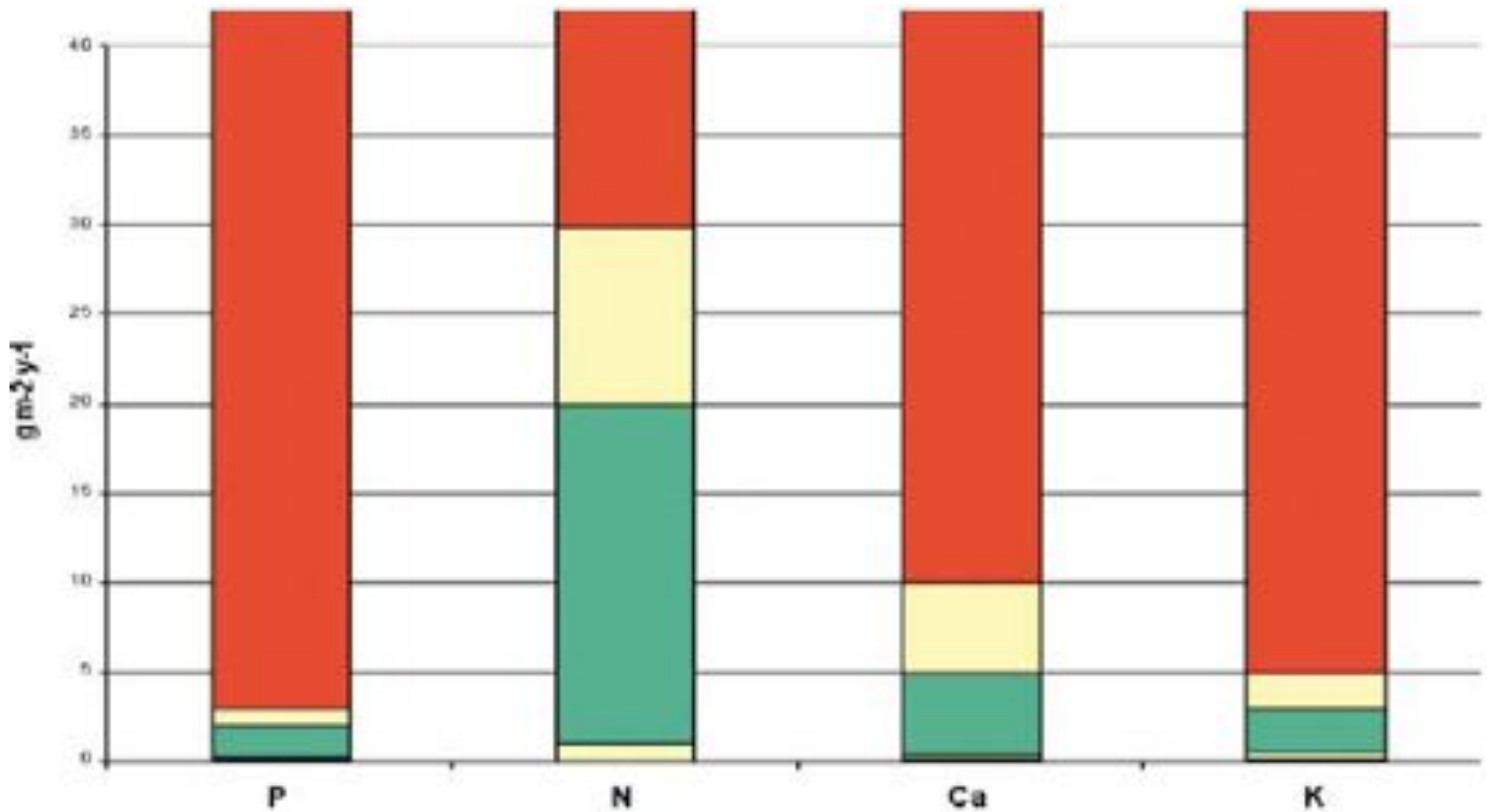
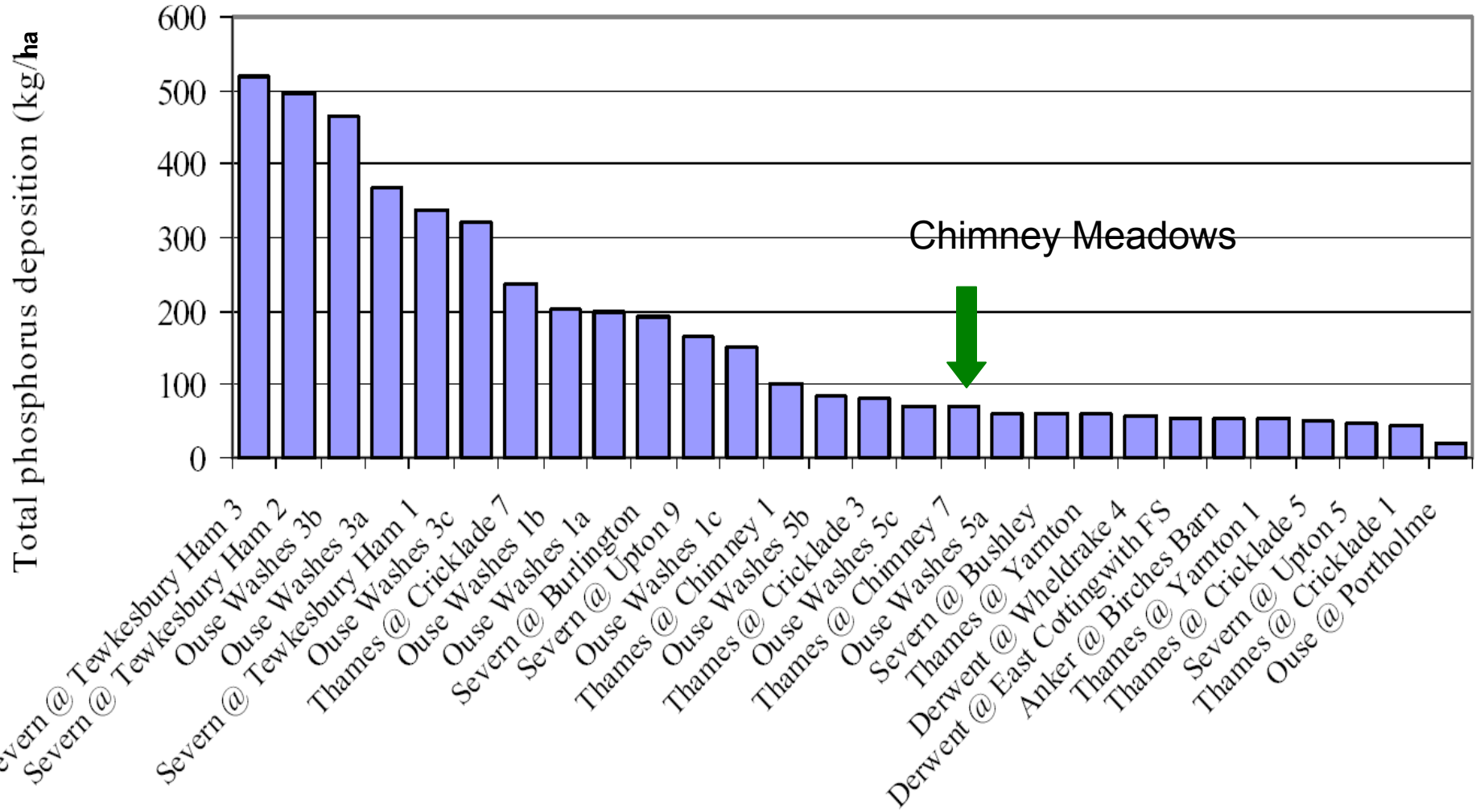


Diagram from 'Ecohydrological guidelines for Lowland wetland plant communities' (2004)



Nutrient Deposition 2007

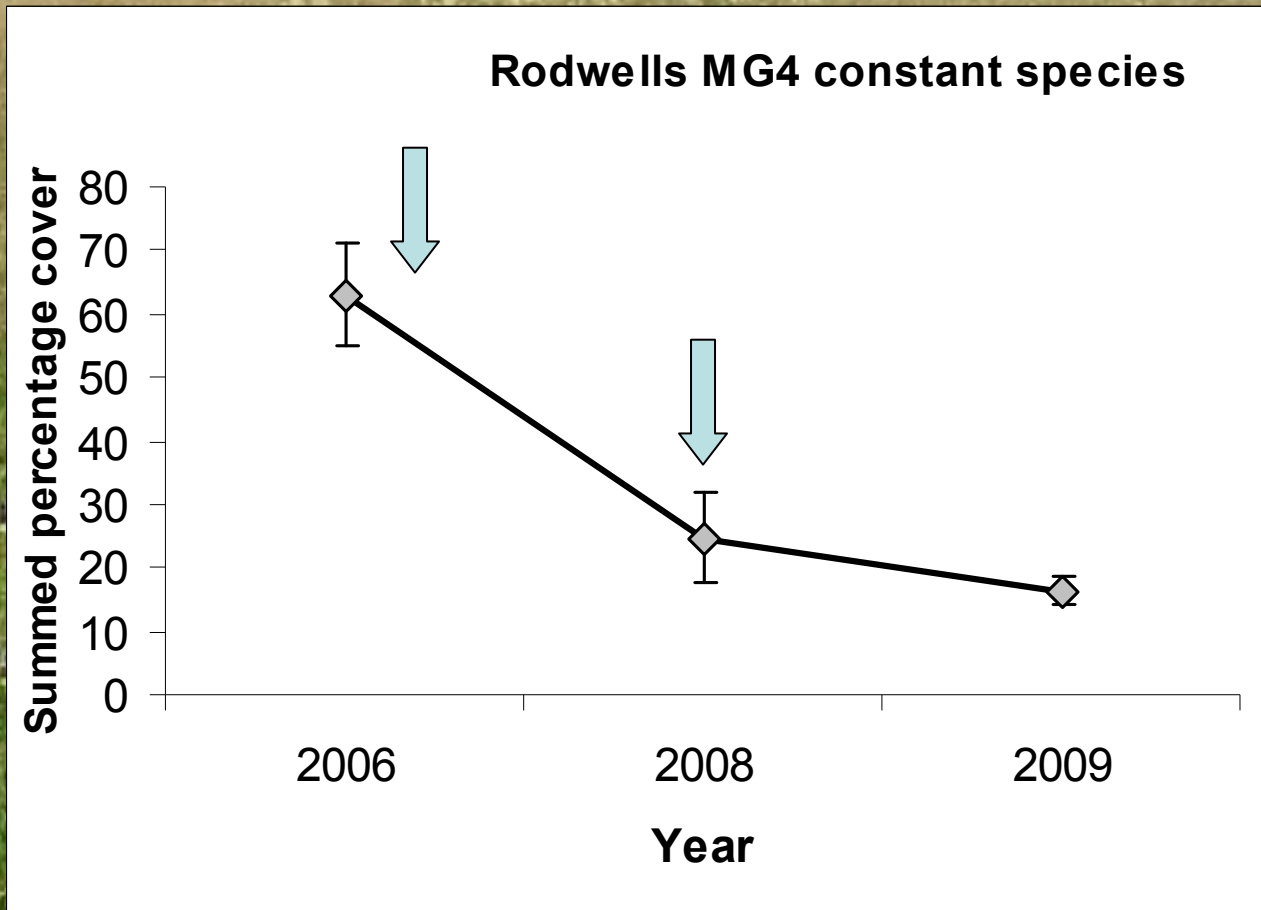


3. Vegetation management (NNR)

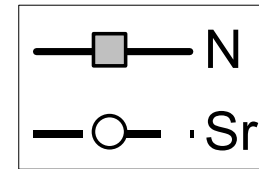
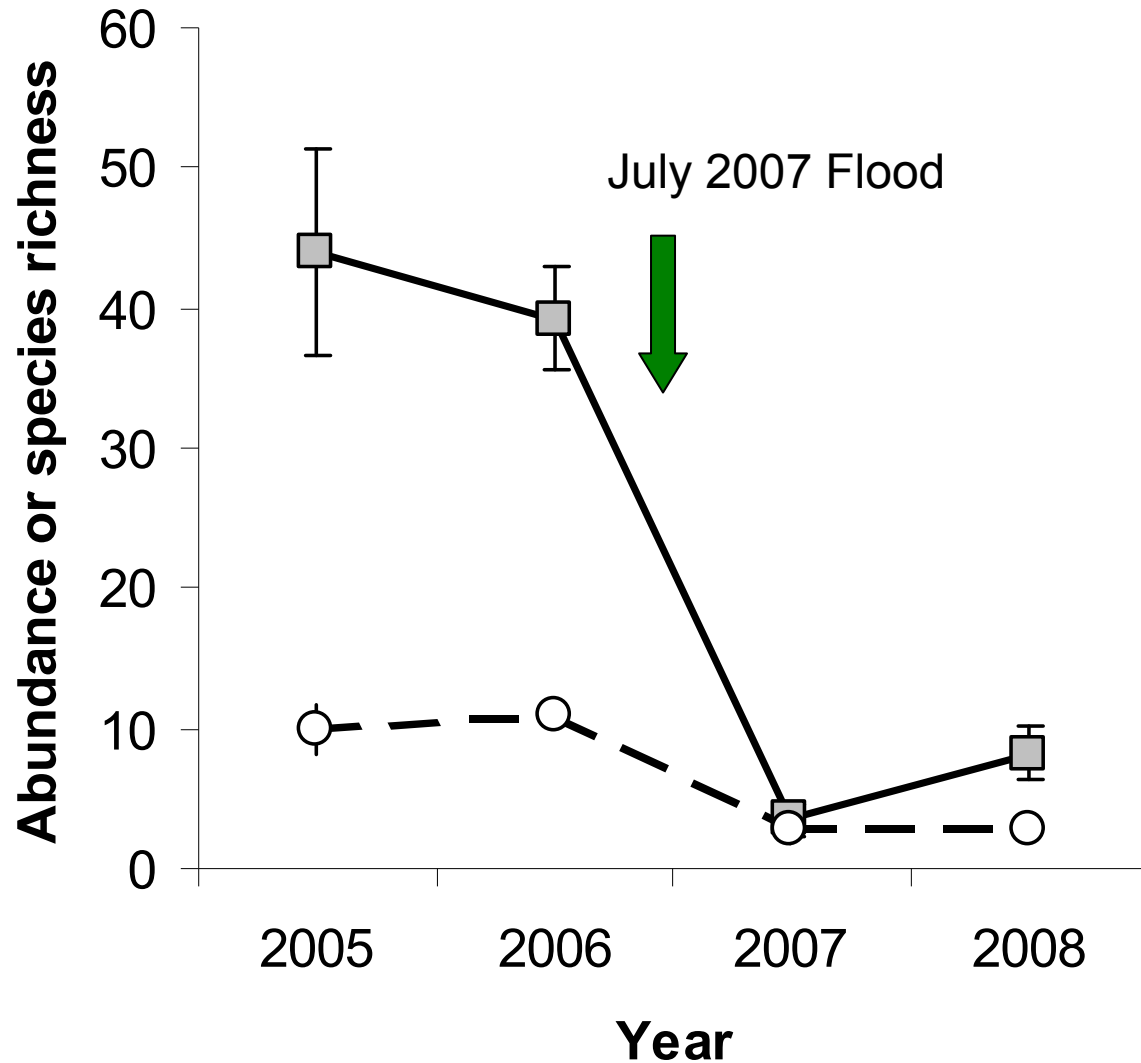
- Hay cut (July/August)
- Aftermath grazing by cattle







Ground Beetle and Rove Beetle data from pitfall trapping



Further Species reductions:

63% decline in worm density across the National Nature Reserve

100% decline in breeding curlew numbers across the NNR and lower wetland area

Key Objectives



- To restore and enhance the capacity and quality of the wetland area by:**
- Creating integrated wetland features including ponds/scrapes
 - Enhancing ditches/rivers
 - Creation of flood flow channels

Integrated wetland features

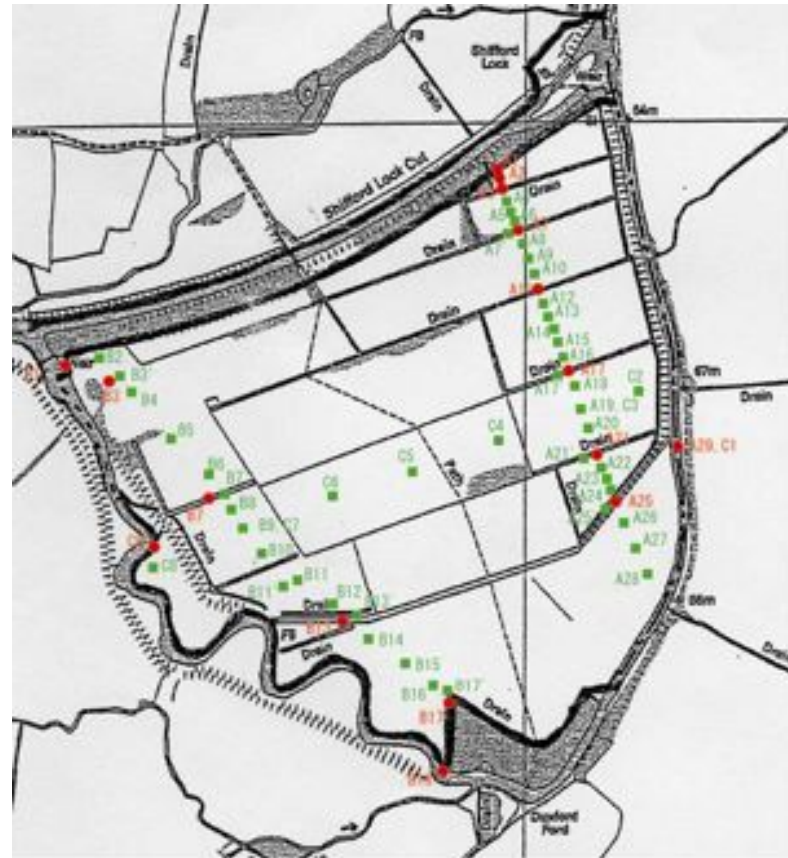
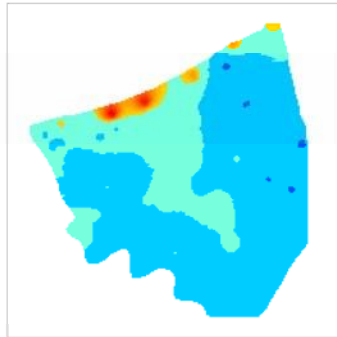
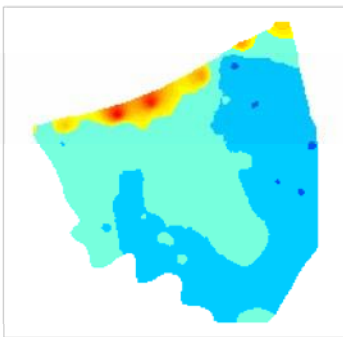
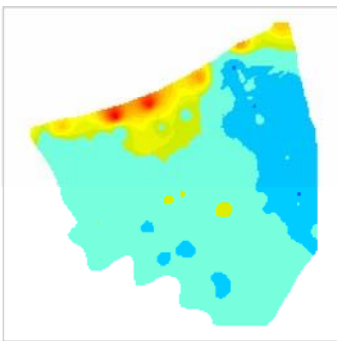
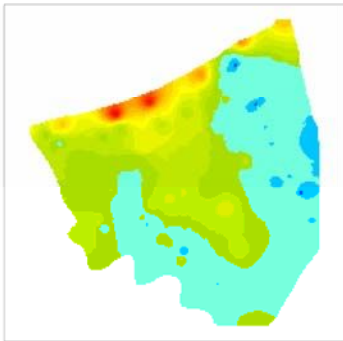
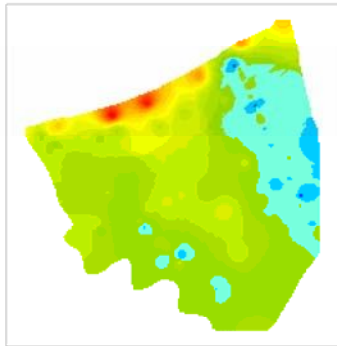
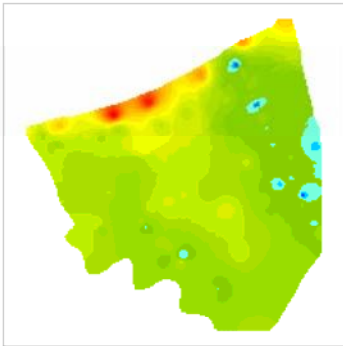


Integrated Hydro-Ecological Research



**Centre for
Ecology & Hydrology**

NATURAL ENVIRONMENT RESEARCH COUNCIL



- Dipwell
- Stage board

Key Objectives



- To maintain, enhance or encourage colonisation of key floodplain species:**
- Curlew, snipe, redshank and bittern
 - Grass snakes and great crested newts
 - Meadows foxtail, great burnet, Black poplar, Fen violet

Acknowledgements



Dr Ben Woodcock Centre for Ecology & Hydrology (Wallingford)

Charlie Stratford Centre for Ecology and Hydrology (Wallingford)

Professor David Gowing Open University

Ashmolean Natural History Society

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