



# **Floodplain Meadows and the Floodplain Meadows Partnership**

**David Gowing, Emma Rothero**



**Species rich grasslands in the river floodplain that have a hay cut (lowland).  
Arisen as a result of traditional management and have historic associations  
(Lammas meadows, Hams, Ings etc)**

**National Vegetation Classification (NVC)**

**MG4** *Alopecurus pratensis* – *Sanguisorba officinalis* grassland (Meadow foxtail – Great burnet)

**MG8** *Cynosurus cristatus* – *Carex panicea* - *Caltha palustris* - (Marsh marigold - carnation sedge grassland)



# The meadow map

**2980 ha remain**

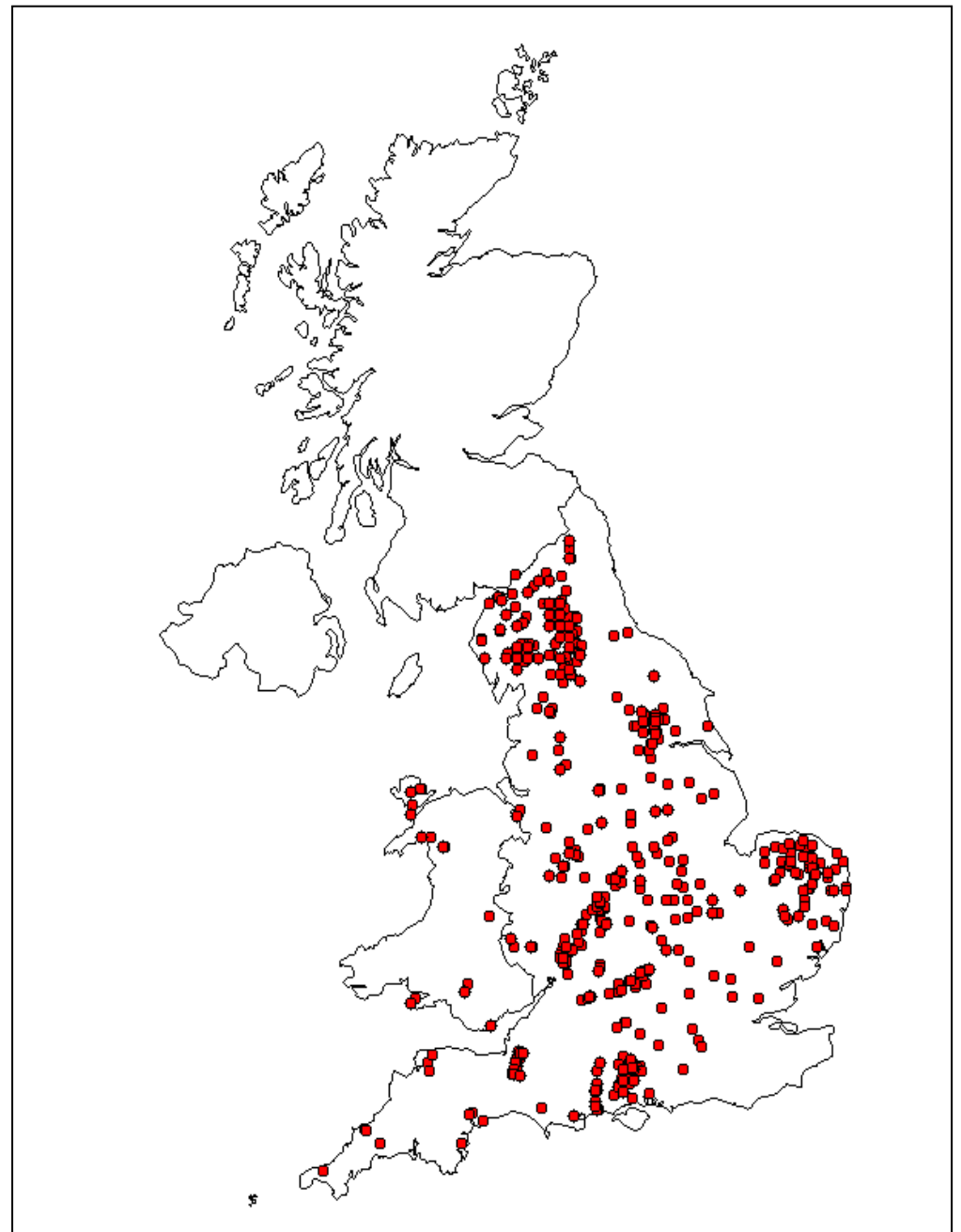
**1350 ha MG4**

**1160 ha MG8**

**500 ha\* the rest**

Lower Derwent	190 ha
Lugg	132 ha
Portholme	104 ha
Oxford	85.6 ha
Clattinger	60.3 ha
Upton Ham	56.6 ha
Chimney	49.4 ha
Mottey	44.6 ha
North Meadow	44.4 ha

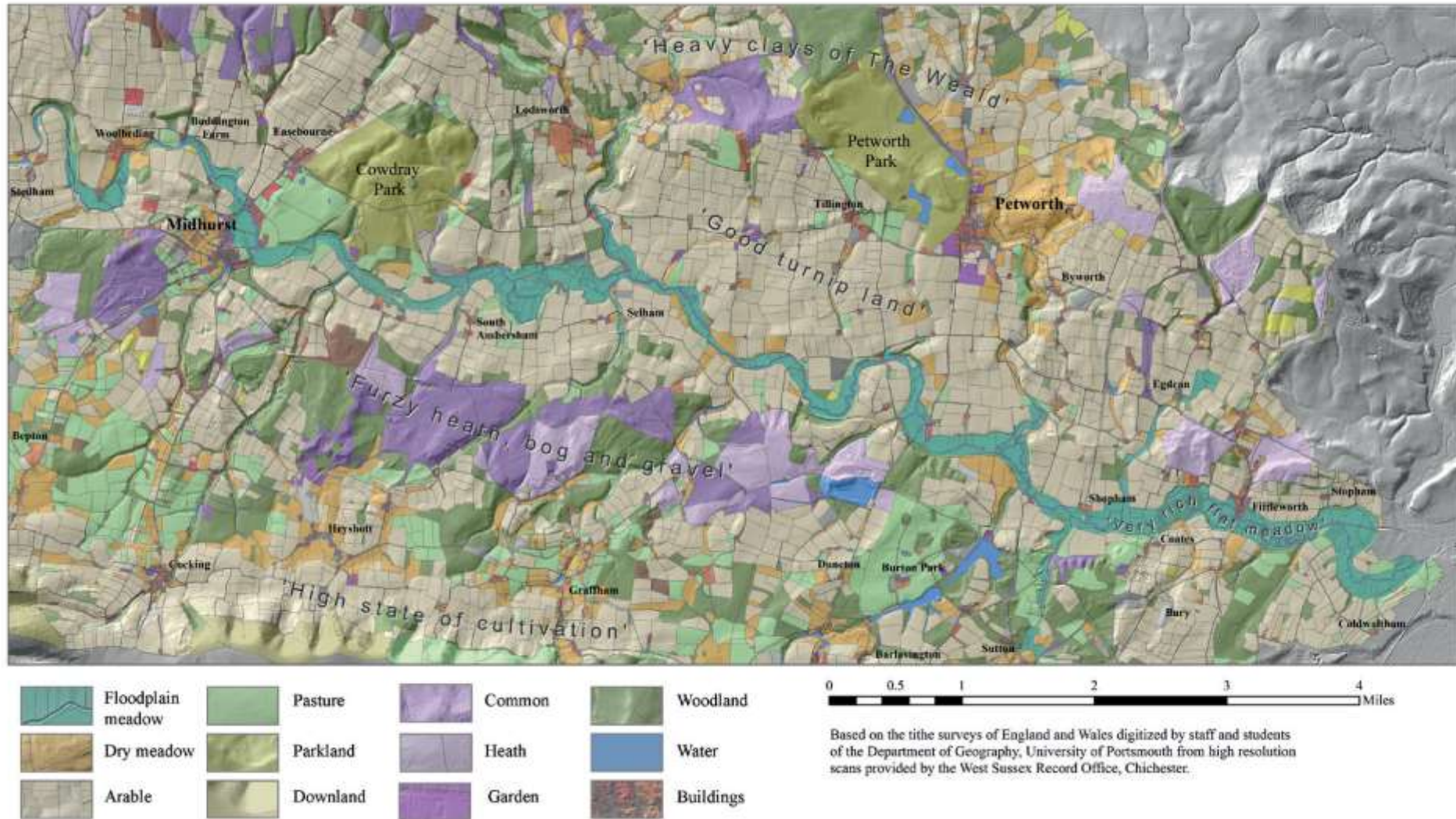
\*MG14, MG15 and MG6d



An agricultural crop!  
High productivity – flooding  
Aftermath grazed



# Archive research suggests floodplain meadows were the main floodplain land use in many catchments 1000 – 50 yrs ago



Land use of the western Rother c. 1840 based on tithe surveys' from Pearson and Soar 2018.

**Highest value land use in Domesday Book**



## The extent (km<sup>2</sup>) of different land uses within the floodplain (Flood zone 2).

Land Use	England*		Wales#		Total	
	extent	% cover	extent	% cover	extent	% cover
<i>Arable and Horticulture</i>	2350	35.6	114	9.3	2464	31.5
<i>Improved Grassland</i>	2200	33.3	613	49.9	2813	35.9
<i>Broadleaved, mixed and yew woodland</i>	450	6.8	130	10.6	580	7.4
<i>Coniferous woodland</i>	30	0.5	12	1.0	42	0.5
<i>Neutral Grassland</i>	200	3.0	19	1.6	219	2.8
<i>Fen, Marsh and Swamp</i>	20	0.3	25	2.0	45	0.6
<i>Urban &amp; suburban</i>	650	9.8	98	8.0	748	9.6
<b>Total floodplain</b>	<b>6600</b>		<b>1229</b>		<b>7829</b>	

Land use categories are from the CEH Land Cover Map 2015.

\* Data from England is based on 2007 data, from Heritage & Entwistle, 2017.

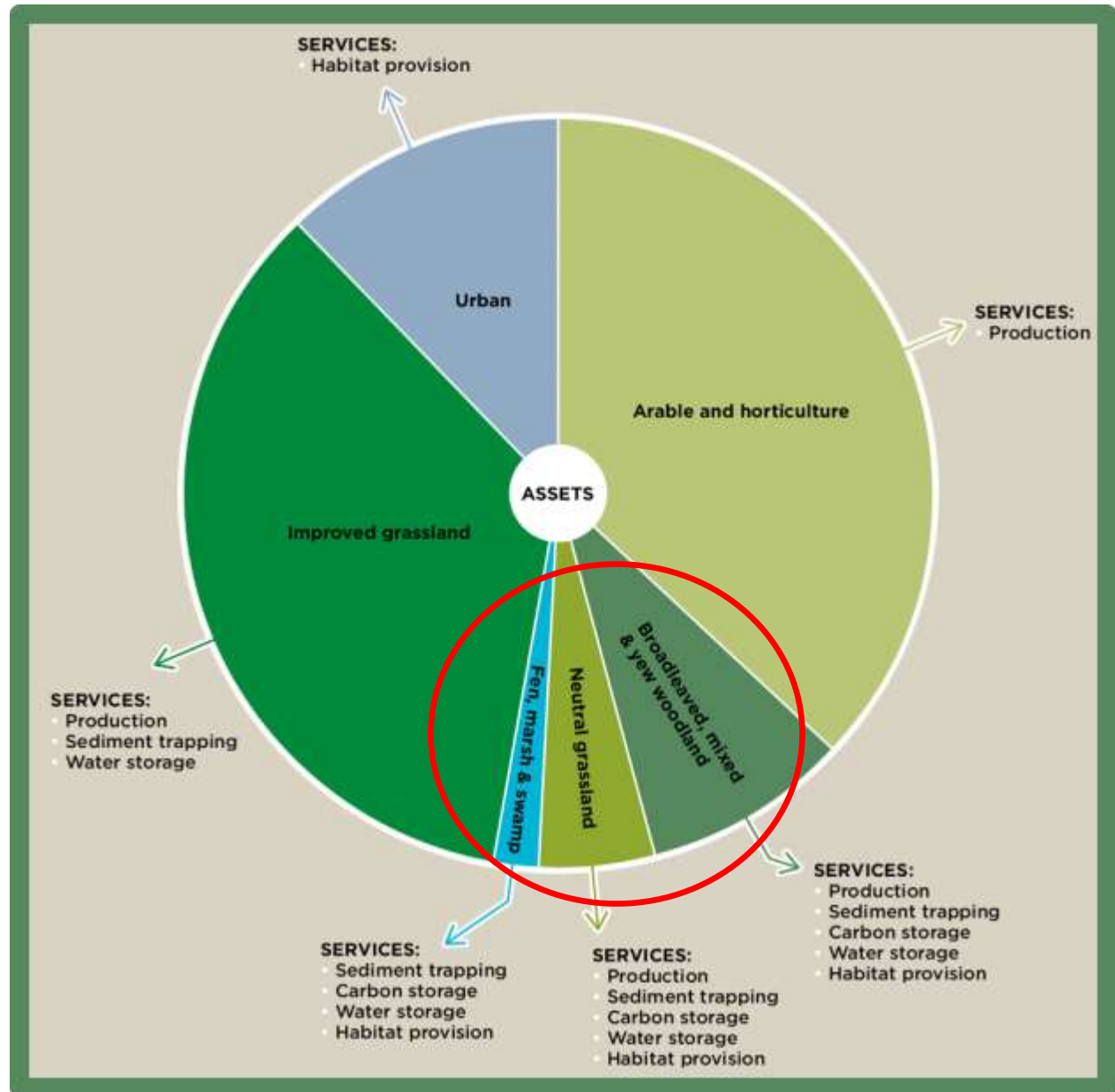
# Data from Wales, unpublished data, Floodplain Meadow Partnership.

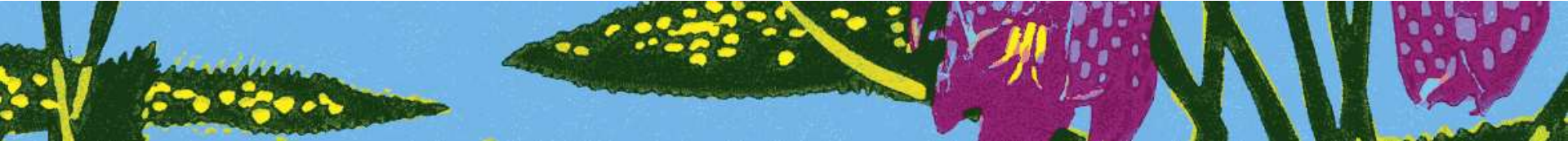


Extent of delivery of different services is dependent on extent of land use

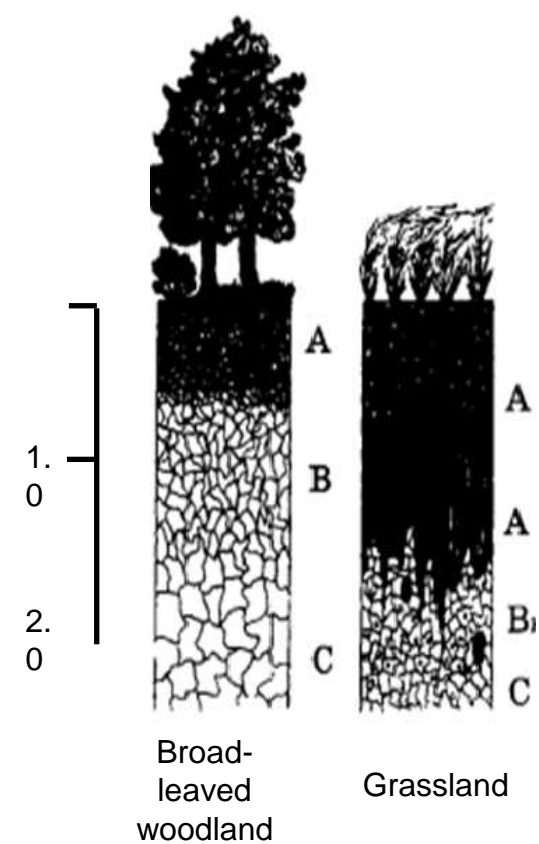
(chart shows England figures)

A good argument for restoration of 'higher value habitats'





Broad Habitat	Mean C density (t ha <sup>-1</sup> )	Area of land use with Floodplains (000 ha)*	Carbon Stock in Floodplains (Tg C)
Arable & horticulture	47.3	246.4	116.5
Improved grassland	67.2	281.3	189.0
Neutral grassland	68.7	21.9	15.0
Broadleaved, mixed and yew woodland	73.0	58.0	42.3
Coniferous woodland	89.8	4.2	3.8
Fen, marsh & swamp	82.8	4.5	3.7



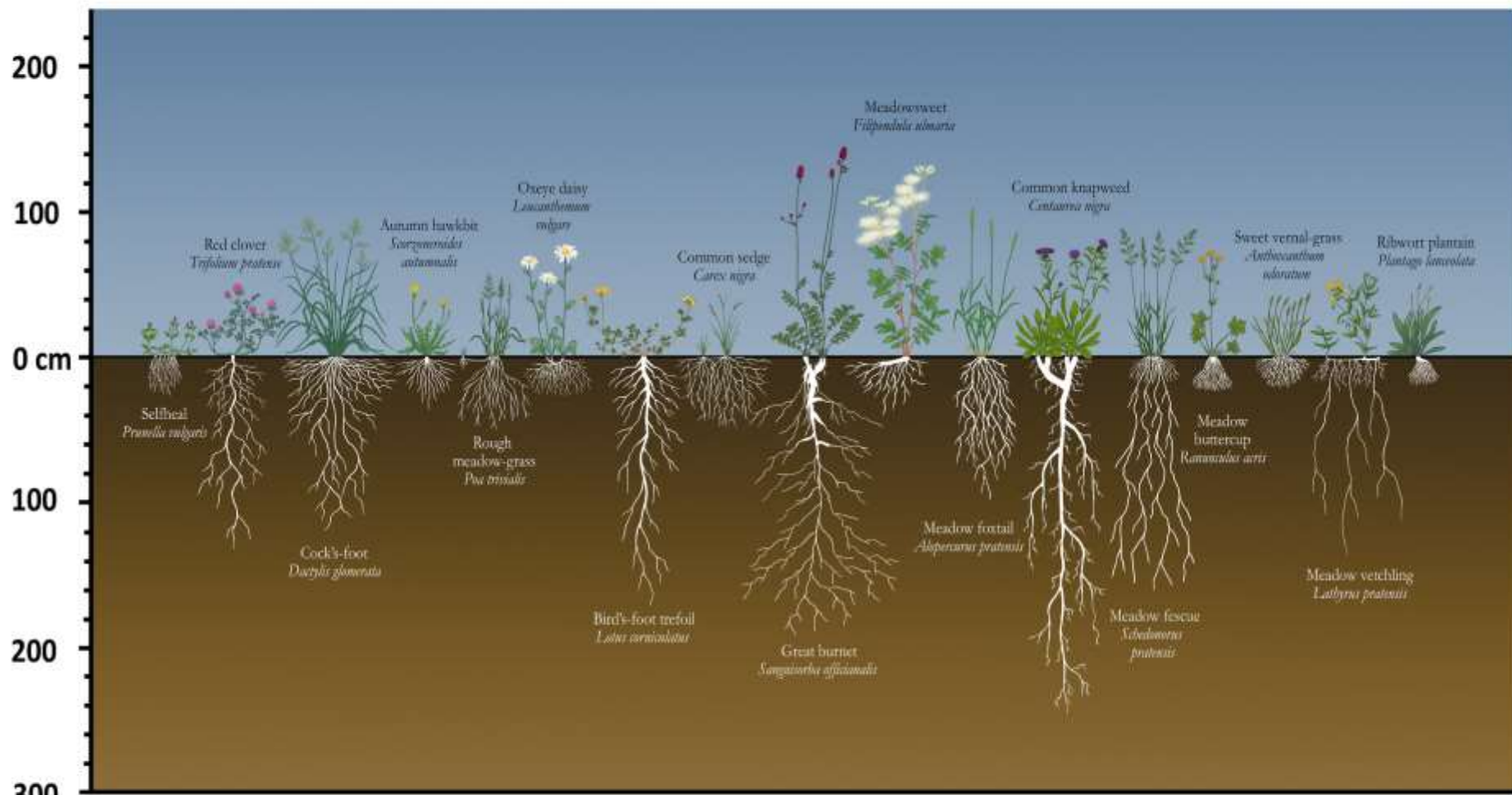
Distribution of humus along the soil profile of different ecosystems (Rozanov, 2004). Dark areas show density and depth of humus.

Species-rich floodplain meadow **109.4 t ha<sup>-1</sup>**

(Lawson & Gowing, unpublished data)

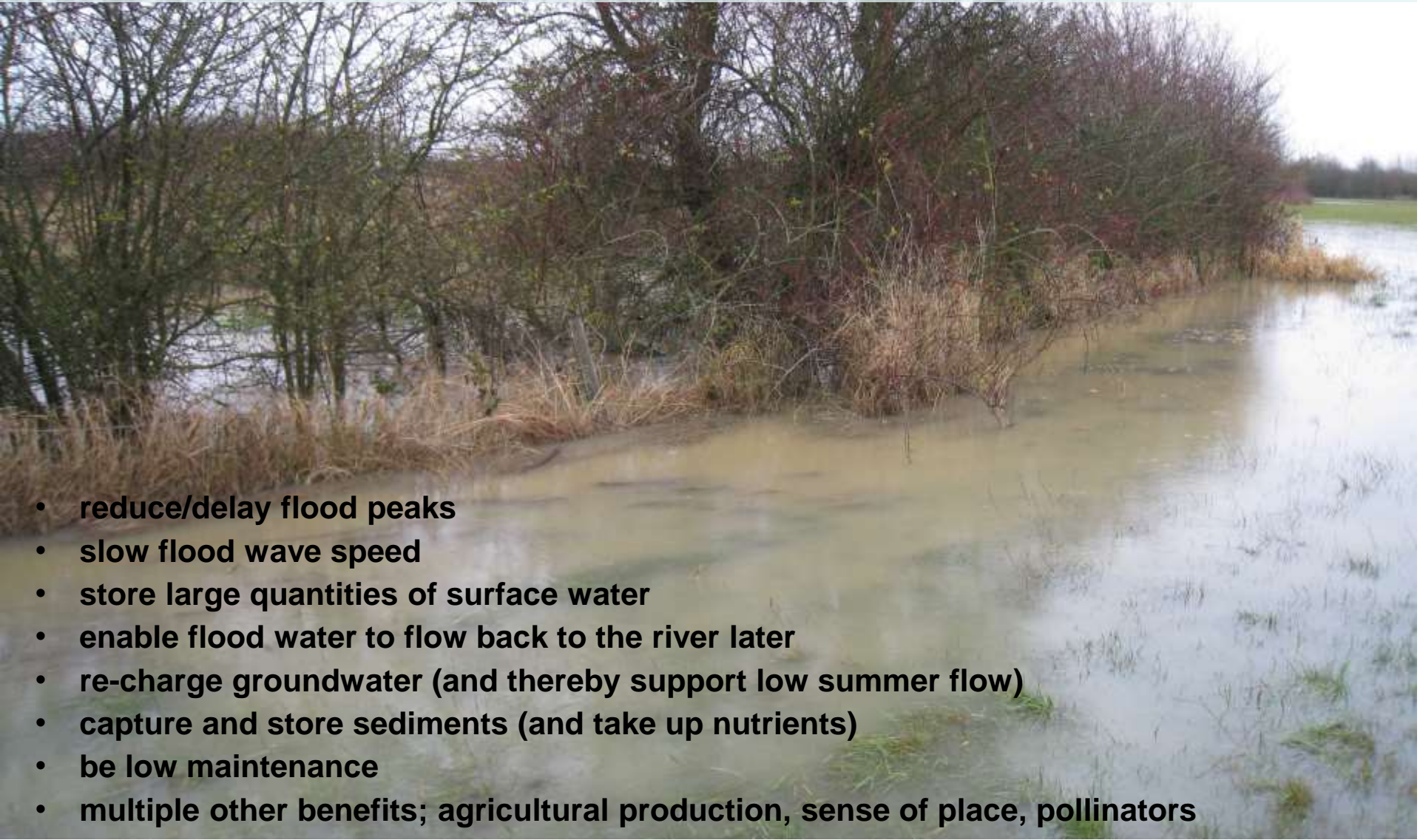
(Mean carbon density data from the Countryside Survey 2007 reported in Chamberlain *et al.*, 2010). \* Estimated area of England and Wales.

# From Shoots to Roots: revealing the above and below ground structure of meadow plants



# Floodplain Meadows and NFM

Environment Agency statement 'Working with natural processes: our role in natural flood management' (2018)

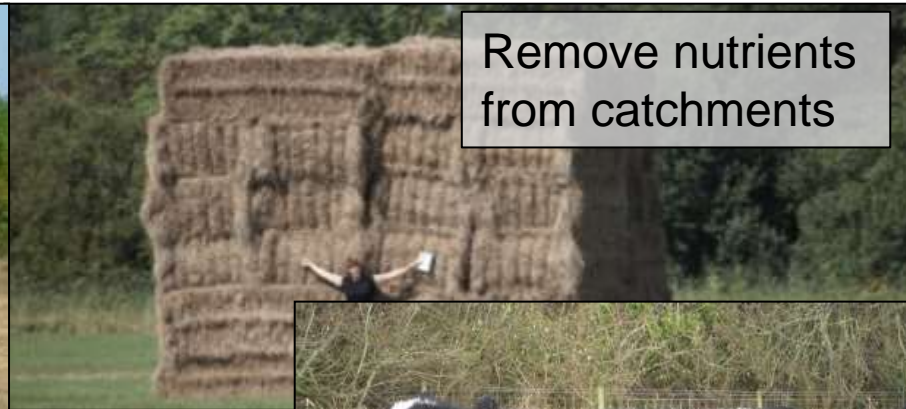


- **reduce/delay flood peaks**
- **slow flood wave speed**
- **store large quantities of surface water**
- **enable flood water to flow back to the river later**
- **re-charge groundwater (and thereby support low summer flow)**
- **capture and store sediments (and take up nutrients)**
- **be low maintenance**
- **multiple other benefits; agricultural production, sense of place, pollinators**

# Natural Capital of floodplain meadows



Productive crop – no inputs  
LOW CARBON AGRICULTURE



Remove nutrients  
from catchments

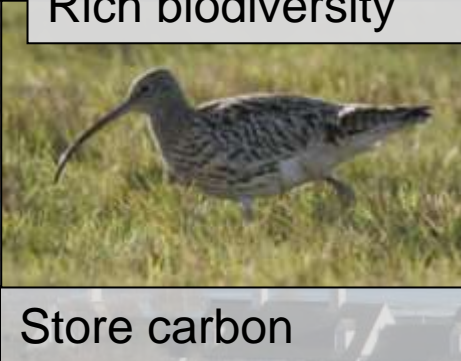


Rich biodiversity

Most sustainable  
and productive  
use of a  
floodplain...



Extensive grazing



Store carbon



Absorb flood water  
No artificial inputs – fertility from flood sediment



**Centre for Ecology & Hydrology**

NATURAL ENVIRONMENT RESEARCH COUNCIL



**Environment Agency**



**The Open University**

**FSC**

BRINGING ENVIRONMENTAL UNDERSTANDING TO ALL

**Floodplain Meadows Partnership**



**National Trust**



**Cyfoeth Naturiol Cymru  
Natural Resources Wales**



**giving nature a home**



**pnn  
people need nature**





# Partnership Objectives

We seek to demonstrate the value of functioning meadows, to increase public appreciation of them and to advocate for their restoration as a tool for tackling the climate and biodiversity emergencies.

Our strategic priorities are:

- A.** To promote the benefits of floodplain meadows to relevant stakeholder groups, including policymakers, through effective partnership working.
- B.** To facilitate the management and restoration of floodplain meadows, enabling them to deliver beauty and utility.

**We believe a target of 70,000 ha of floodplain meadows is appropriate given the significant benefits they deliver and the scale of their loss**

# Outreach activities

To try and communicate findings to relevant groups AND get feedback on direction of research and useful tools

- [www.floodplainmeadows.org.uk](http://www.floodplainmeadows.org.uk)
- Professional and public workshops
- Newsletter (twice a year)
- Leaflets/brochures
- Conference (one every 3 years- 24-25<sup>th</sup> May 2023 Oxford)
- Site visits/advice
- Guided walks/hay festivals/open days
- Publicity/media
- Citizen science (Flight of the Fritillary volunteer project)

**FMP Ambassadors – a more in-depth training course**





# The Team and Funding

## Project Staff

Project Director

Prof. David Gowing.

Research Manager

Dr. Irina Tatarenko

Project Manager

Emma Rothero

Key contractor

Hilary Wallace

Senior Lecturer

Dr Clare Lawson

Research Associate

Caroline O'Rourke

Mike Dodd

## PhD students

Vicky Bowskill

## Ambassadors

46 Ambassadors – 33 counties – 38 organisations

## Funding

Esmee Fairburn Foundation (2008-2023). Other philanthropic grants e.g. John Ellerman Foundation

Consultancy and contract work; Environment Agency, Natural England, Gravel Companies, Development companies, Wildlife Trusts, RSPB

Research grants





White clover



Hard rush

# Compaction



Perennial rye grass



Creeping buttercup

# Waterlogging



Creeping bent grass



Tubular water dropwort



Reed canary grass



Marsh foxtail



Amphibious bistort



Common spike rush

Comfrey



Nettle



Reed sweet grass



Broad-leaved dock



Cleavers

High nutrients – intolerant of cutting

# High nutrients – tolerant of cutting/grazing



Perennial ryegrass



Creeping bent grass



Meadow foxtail



Hogweed



Creeping buttercup



Curled dock

Floodplain meadows in  
the Domesday book  
(preliminary research,  
not published)

## Lower Ham/Lords Meadow at Kempsey

Lower Ham marked on OS 25" Epoch 1 and tithe map shows the lower half has an area of doles marked as Lords Meadow. Recorded in tithe records as "common meadow". There is a drove/lane from Kempsey, that joins the slight funnel shaped entrance to the meadow. The drove continues across the meadow to Pixham Ferry., which is shown on both the earliest and latest maps.

The Bishops Palace, a former medieval site, is situated directly to the north of the meadow.

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Upham and Twynning Meadow, Twynning, Gloucestershire

Floodplain  
meadows in the  
Severn and Avon  
Vales as identified  
from 1800 tithe  
maps and early OS  
maps



Berkshire  
Buckinghamshire  
Oxfordshire



**FERTILISE THE FUTURE**

# **THE LOWDOWN ON NATURE-BASED SOLUTIONS**

Floodplain  
Meadows  
Partnership



## **Ecover Fertilise the Future**

- Network of farmers, community, care farm, practitioners, researchers
- Brings 3 longer term projects together for 3 years.
- Includes research
- Commercial company funding

# Flourishing Floodplains

- GCRF2 18 months
- Farmer group in the Severn Vale
- Restoration based around HLF and CS
- Picked up longer running projects and facilitated them.
- Volunteer survey



Survey  
**1,000 ha**  
of floodplain  
meadows on the  
Severn and Avon

Restore  
**20 ha**  
of species-rich  
floodplain  
meadow

Analyse  
**300**  
soil samples from  
different grassland  
types to quantify soil  
carbon storage

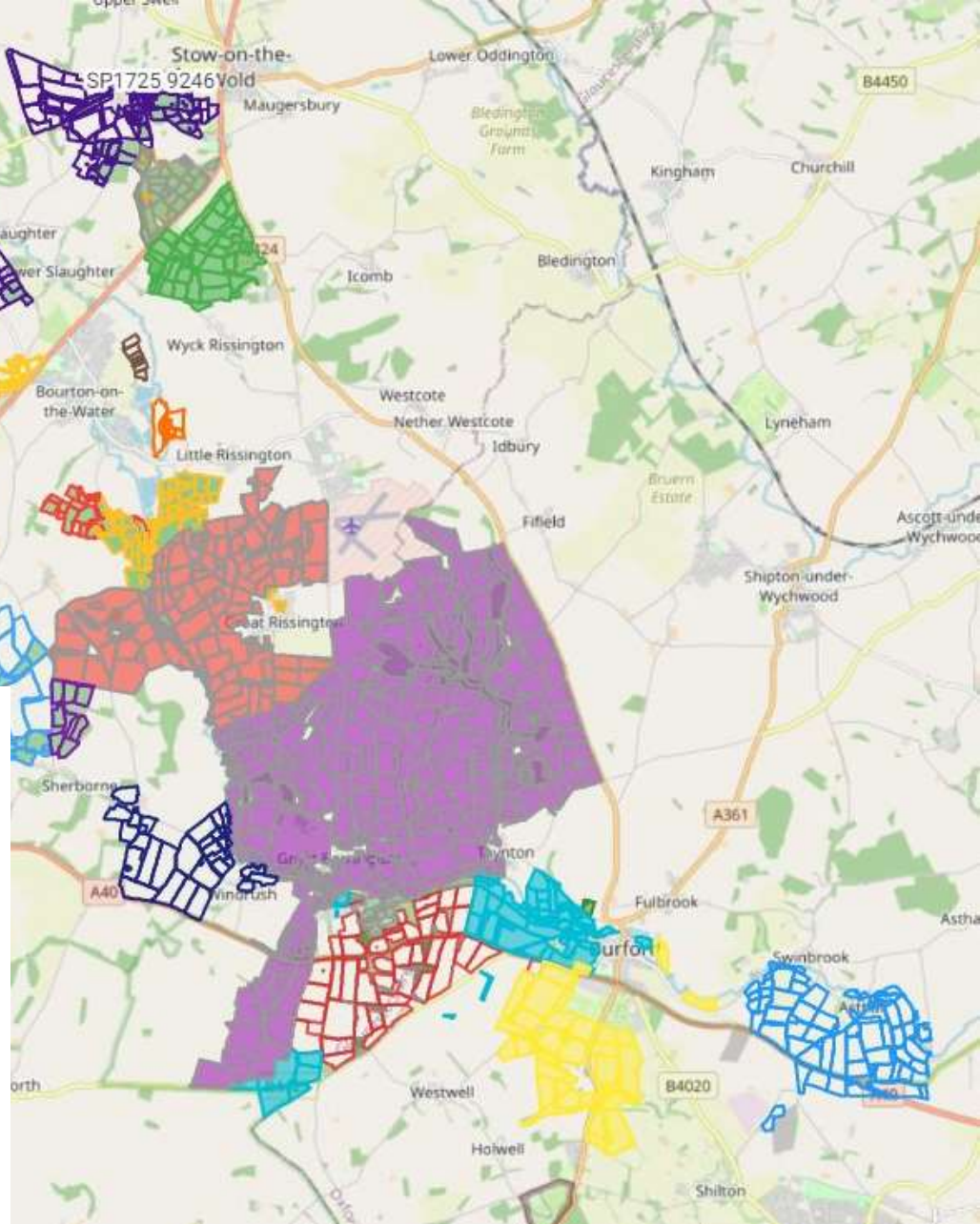
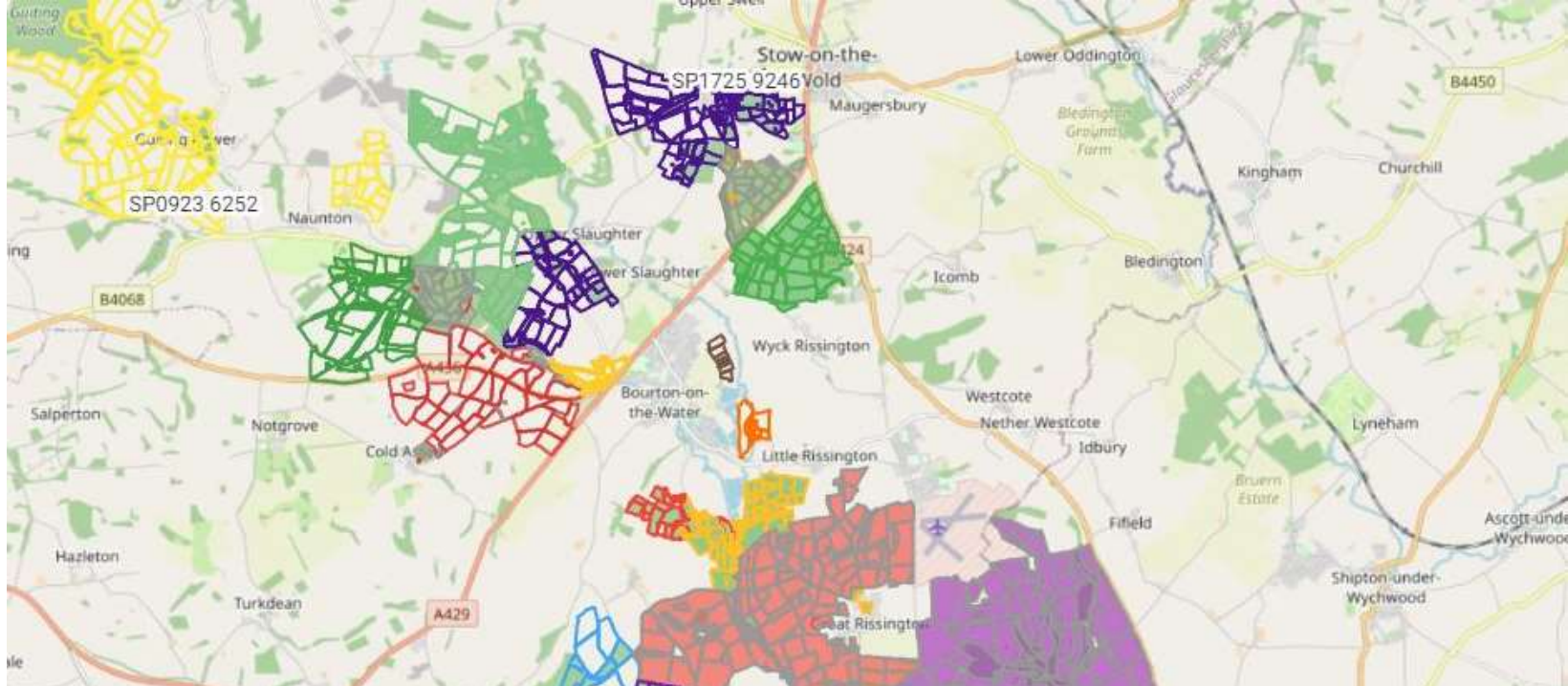


Farming &  
Wildlife  
Advisory  
Group



The  
National Lottery  
Heritage Fund





# Windrush Floodplain Meadow restoration Project

- 12 months
- North East Cotswold Farmer Cluster/FWAG-SW/Cotswold Rivers Trust
- Survey
- 5 sites for restoration strategy
- Sedimat analysis
- 20 year restoration plan
- Longer term landscape recovery project?