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Regeneration

Sustainable landscapes at meaningful scale

A 5-year project funded by the
Natural Environment Research Council

Cambridgeshire Fens
Cairngorms
Lake District



Collaboration partners: RSPB; NIAB; UK-CEH; Cambridge Conservation Initiative;
Endangered Landscapes Programme

Regenerating the Fens

.....*what are the challenges?*

Fenland is full of potential	But.....
4,000 km ² ancient wetland	95% <u>drained</u>
Rich, fertile, deep peat	Dry peat blows away, emits CO ₂ <ul style="list-style-type: none">• 4m depth of <u>peat lost</u> since 1670• UK's largest land-use source of greenhouse gases
30% England's vegetable and salads. This takes a lot of water	Summer water shortage, winter surplus. Most of Fens below sea-level – and it's rising
£3bn contributor to UK economy	Fenland farming's key role in UK <u>food security</u> and carbon footprint
13,000 fenland plant and animal species	<u>Tiny remnants</u> pushed to edges
Market towns and small rural communities	Poor transport & digital connectivity, below average attainment, prospects & health.

How to this tackle this
multi-faceted challenge?



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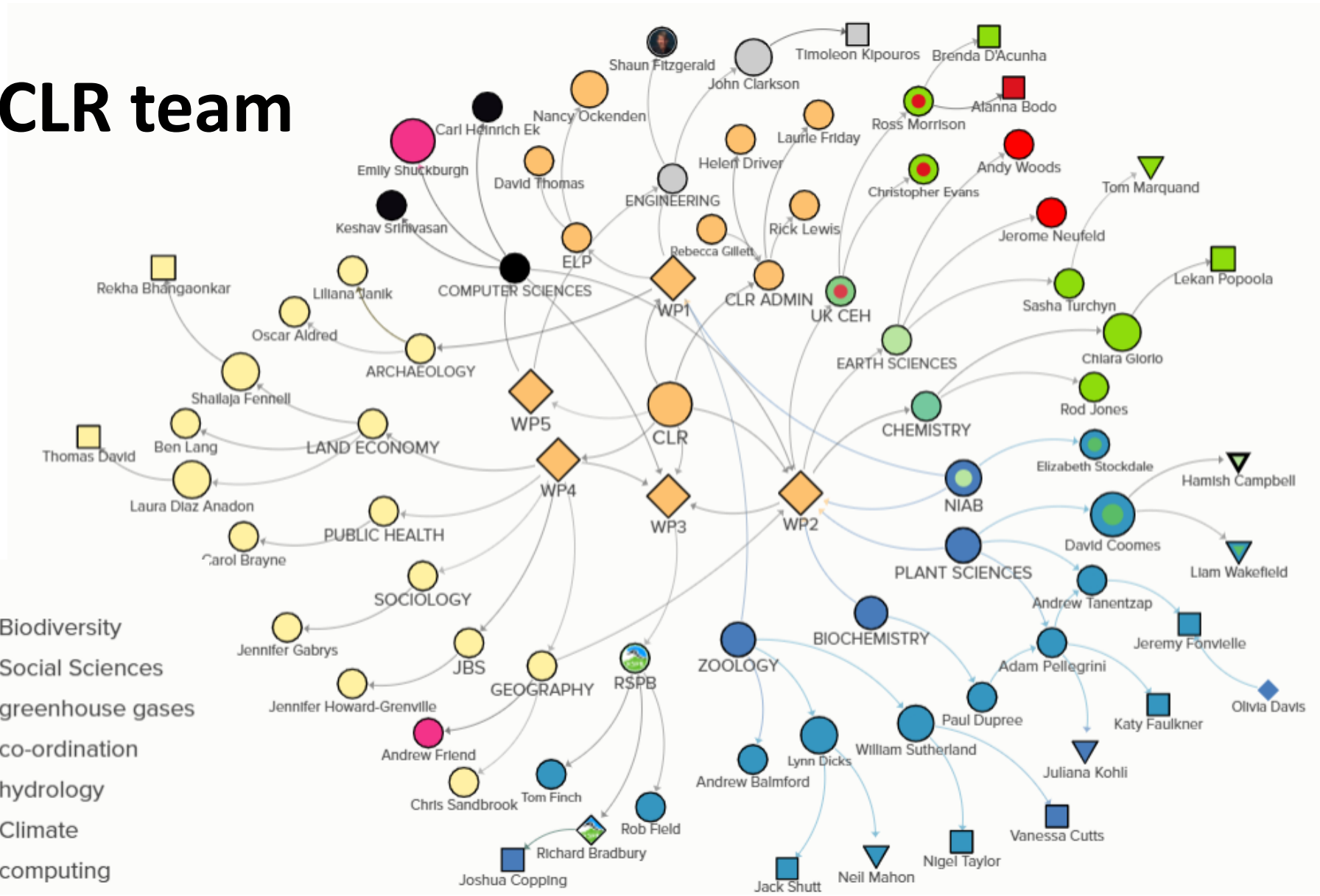
You'll need a multi-faceted team...

who can be persuaded to work together....

The CLR team

Legend

- Biodiversity
- Social Sciences
- greenhouse gases
- co-ordination
- hydrology
- Climate
- computing

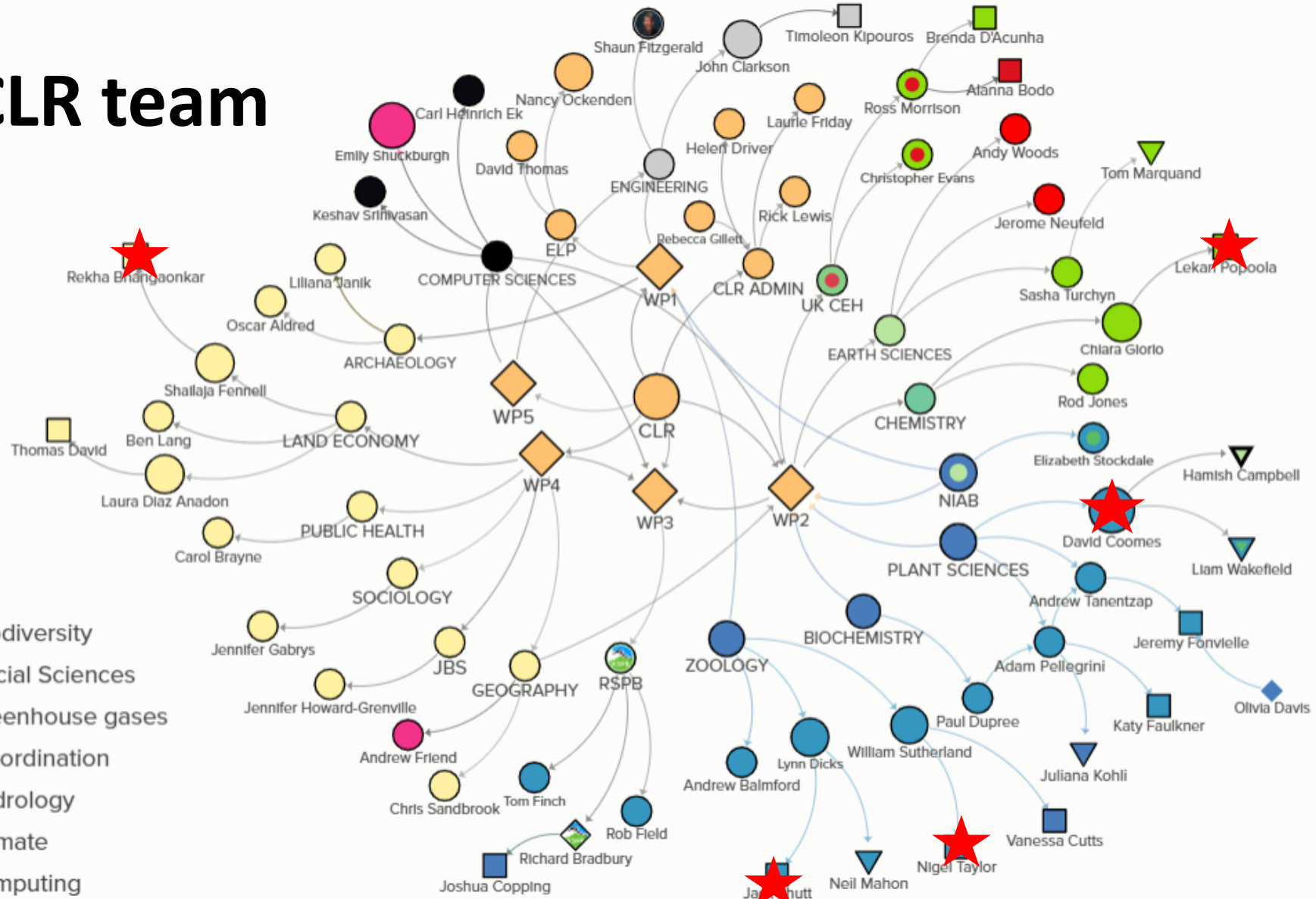


<https://kumu.io/LaurieFriday/clr-team>

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Dr Olalekan Popoola

New ways to measure
greenhouse gas emissions

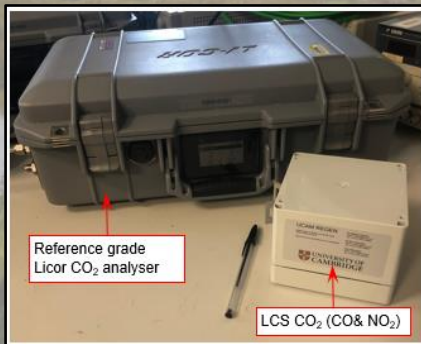


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Atmospheric observations: tools and methodologies



1. Network of low-cost CO₂, (CO, NO_x) sensors, reference grade CO₂/CH₄ analysers & inversion model (atmospheric emissions & footprints)

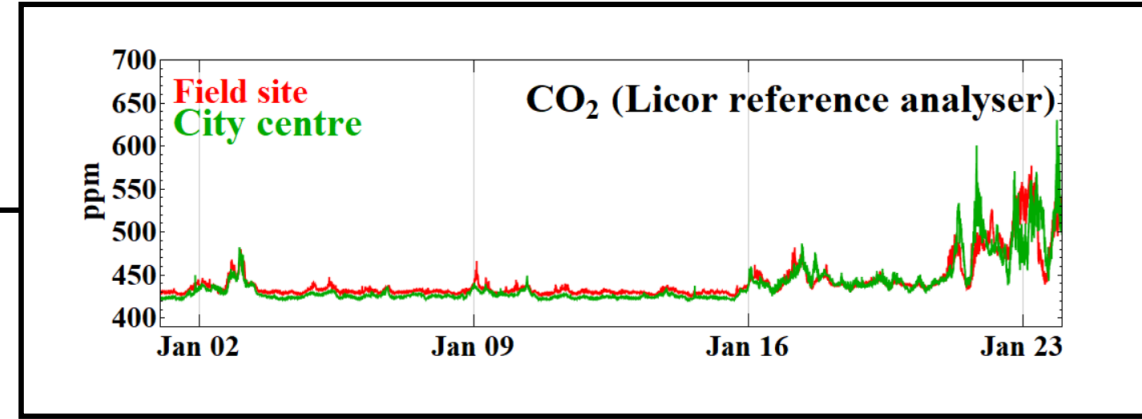
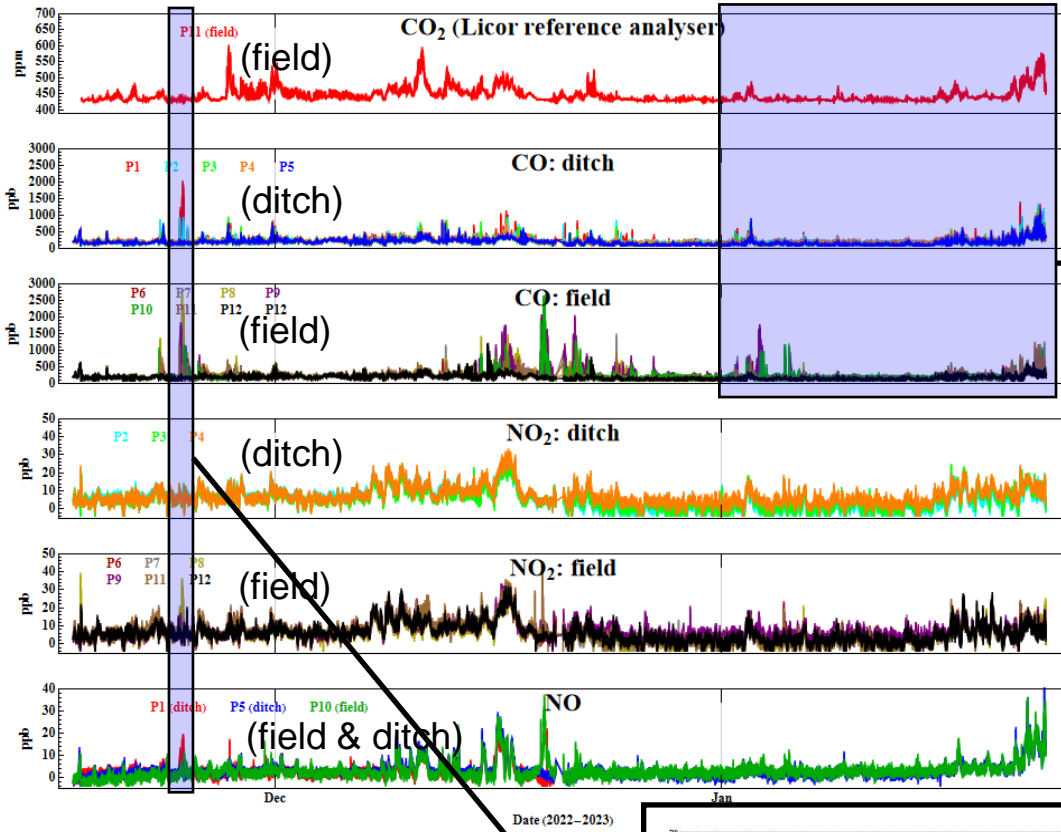
⇒ ongoing monitoring

2. Prototype relaxed eddy accumulation device (atmospheric flux emissions CO₂)

⇒ imminent



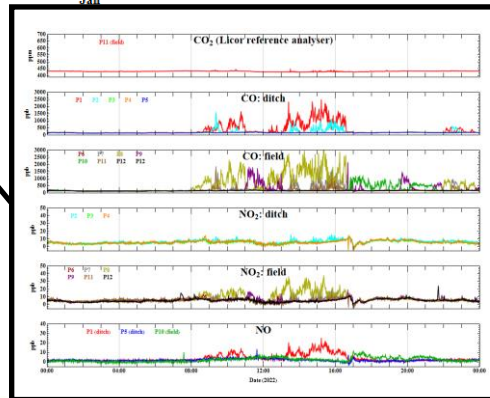
Early results of atmospheric observations (farm)



- Similarity between local and remote CO₂ signals shows signal is dominated by *regional signature (10s km)*
- Additional A/Q pollutant events visible (*source apportionment*)

Network of sensors detects intermittent emissions (CO₂, CO, NO_x)

⇒ offering additional insights into *(local) sources*



Dr Jack Shutt

How changes in land use
will affect biodiversity



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Biodiversity recovery

- UK biodiversity in freefall, one of the most nature depleted countries on earth
- Important for pollination, pest control, soil fertility, water conservation, disease resistance, weed control, mental health etc, as well as for own sake
- Nature recovery a key strand of new policies



Biodiversity recovery



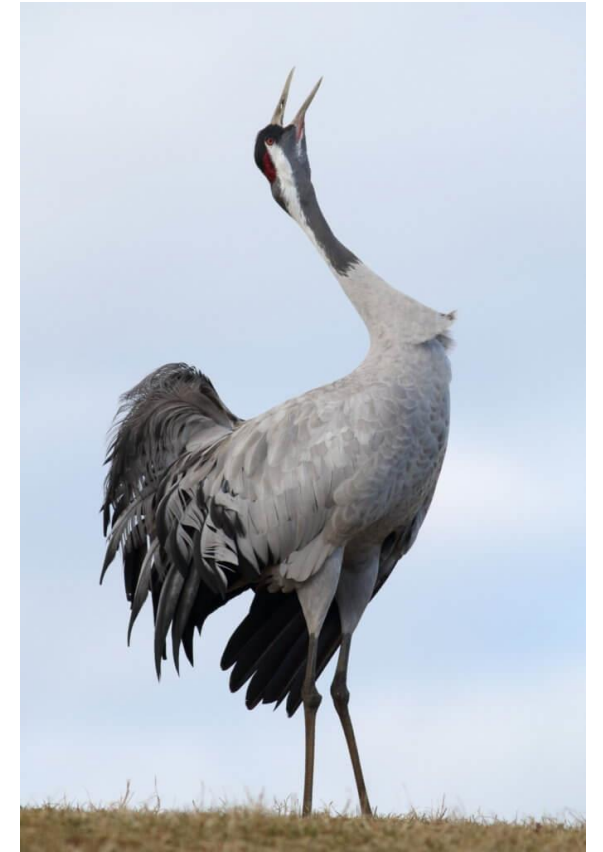
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Biodiversity recovery

- Does soil type influence communities?
- Can land management practices co-benefit greenhouse gas emissions and biodiversity?
- Can regenerative agricultural techniques co-benefit soil health and biodiversity?
- How can predatory insects be encouraged?
- Do ditches provide connective links between nature reserves?



Dr Nigel Taylor

Restoring biodiversity:
what approaches work?

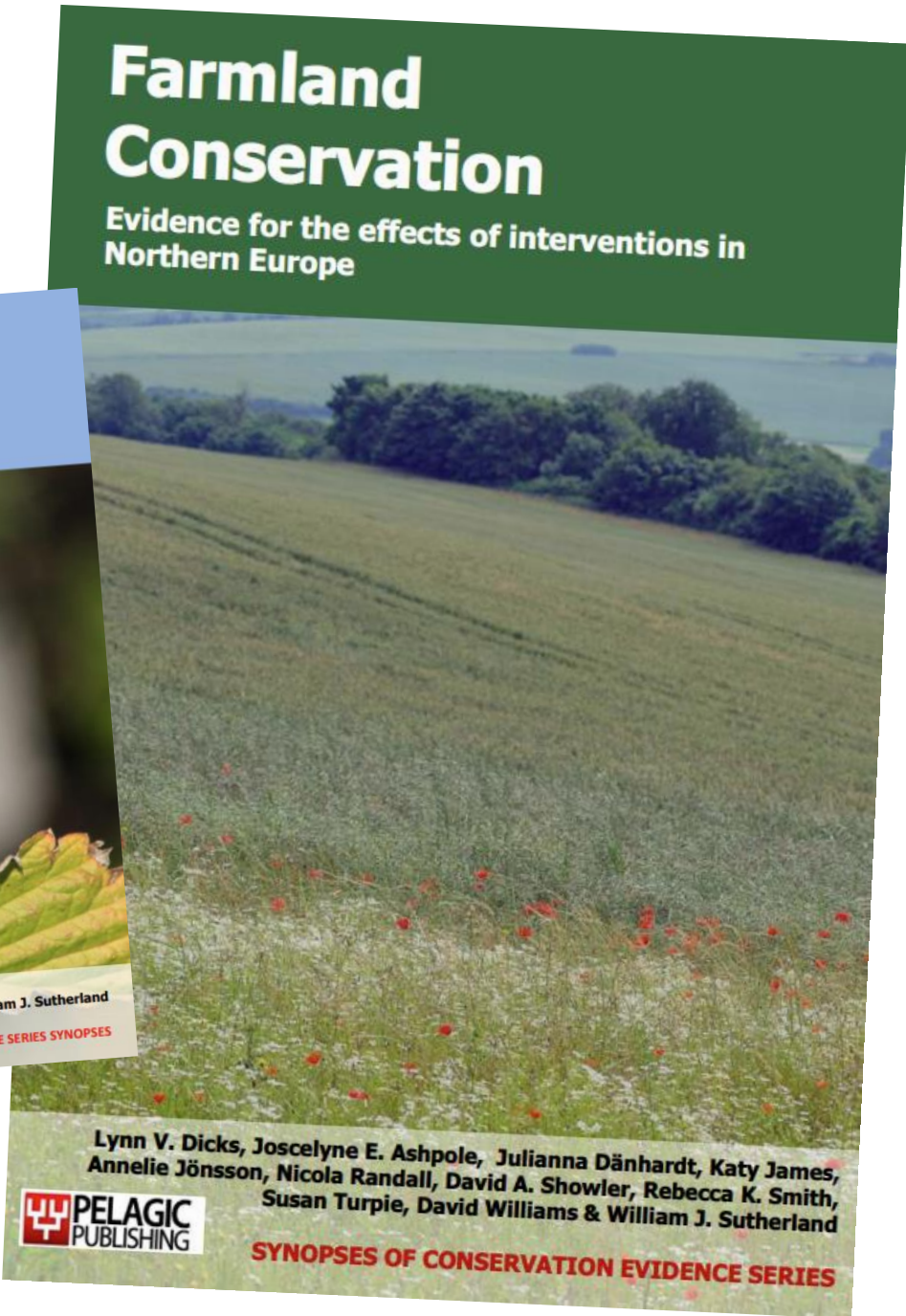
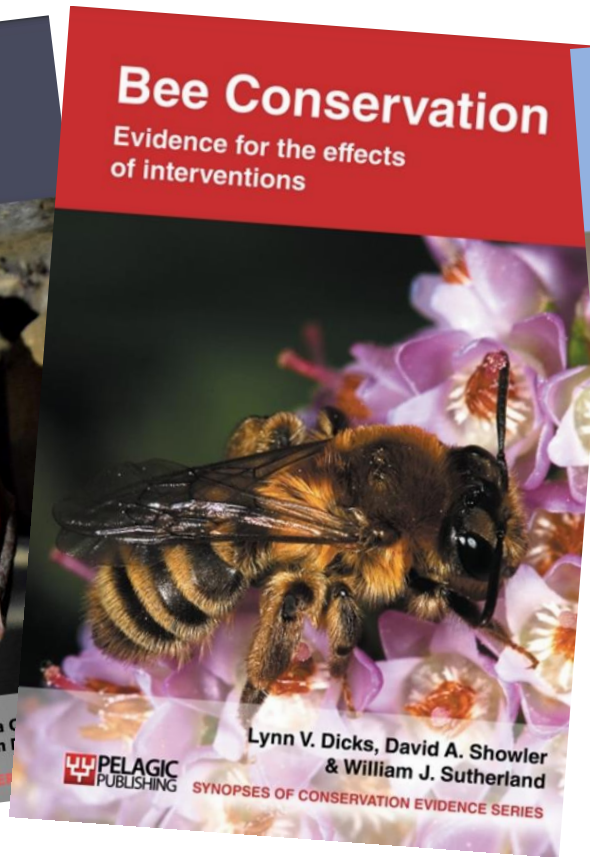


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1. Conservation Evidence



We summarise the documented evidence for the effectiveness of conservation actions

This resource is designed to support anyone making decisions about how to maintain and restore biodiversity.

[Learn more about us](#)

Search Actions by keyword or species



Studies

A short summary of a specific scientific study, providing background context, the conservation action(s) taken and their consequences.

[View all 8568 studies](#) >

Actions

A particular action you could take to benefit wildlife or ecosystems, with a summary of evidence for its effectiveness.

[View all 3689 actions](#) >

Synopses

A synopsis of evidence reviews the effectiveness of all actions you could take to conserve a given species group or habitat or to tackle a particular conservation issue.

[View all 25 synopses](#) >

Action

Action Synopsis: [Farmland Conservation](#)

[About Actions](#)

Create beetle banks



Overall effectiveness category

Likely to be beneficial

Number of studies: **24**




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[How is the evidence assessed?](#)

Background information and definitions

Beetle banks are grassy mounds, about 2 m-wide, that run across the middle of large arable fields. They may be created using two-directional ploughing and sown with a mix of grass species (HGCA 2008). They are intended to provide habitat, especially during winter, for predatory insects such as beetles and spiders. They may also provide foraging habitats for birds and habitat for small mammals.

HGCA (2008) *Beneficials on farmland: identification and management guidelines*. ADHB-HGCA, London.

Action

Action Synopsis: [Farmland Conservation](#)

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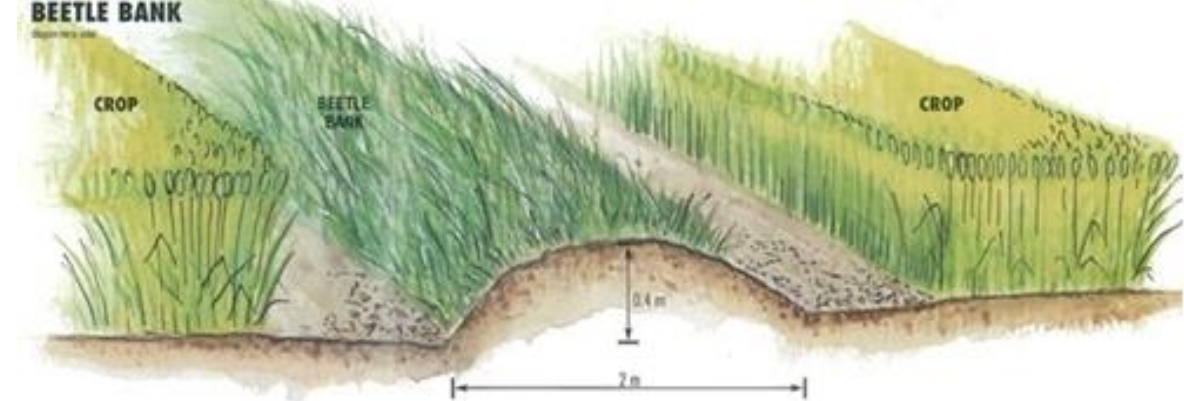
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CROSS SECTION OF BEETLE BANK



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Study locations



2. Key conservation questions



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3. Wetland conservation workshops



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Photo: WWT Welney Facebook Page

Dr Rekha Bhangaonkar

Understanding the changing
funding landscape



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Agricultural Policy Transition (DEFRA)

Environmental Land Management Policy

Consultation: Feb – Apr 2020; Jun – Jul 2020

Lump Sum Exit Scheme; Delinking Direct

Payment Consultation: May – Aug 2021

Ending retail sale of Peat in Horticulture

Consultation: Dec 2021 – Mar 2022

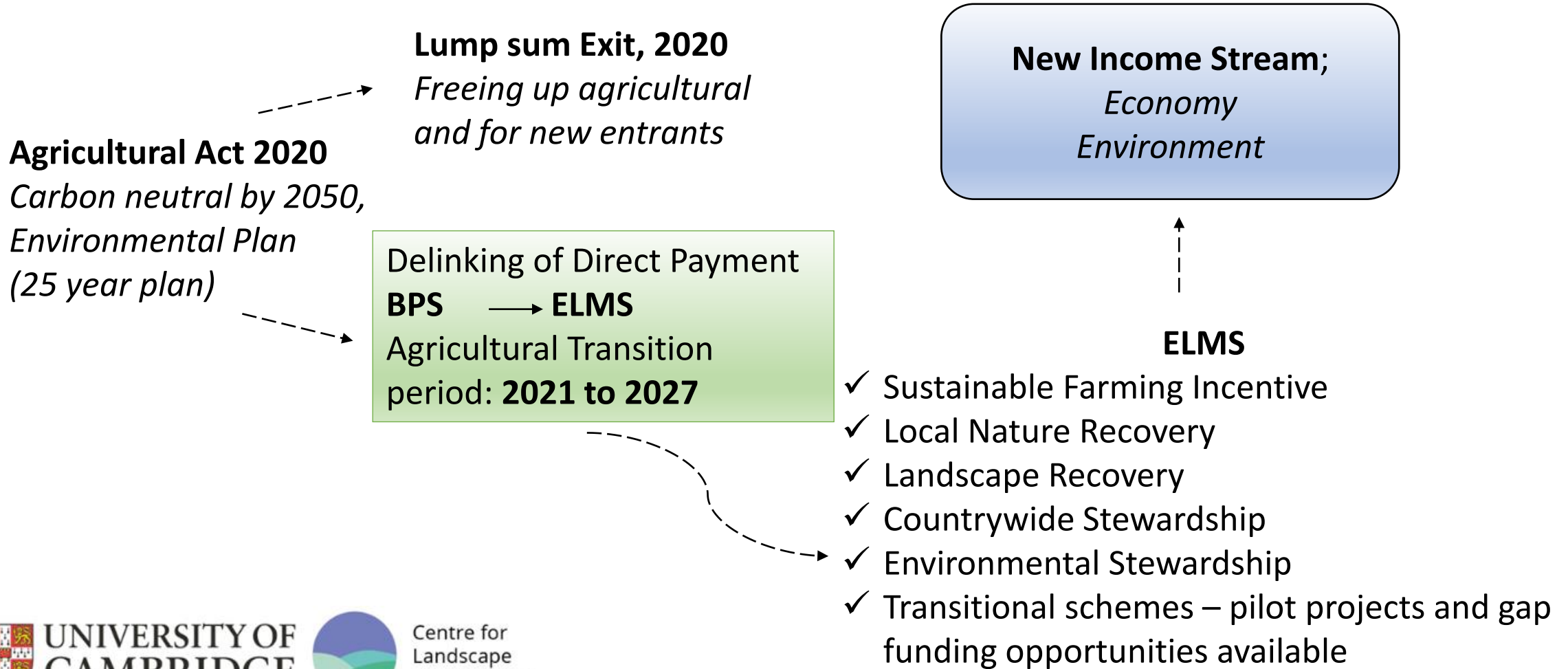
Multi Annual Financial Assistance Plan
for 2021 to 2027; Published Nov 2020

First Phase of Piloting **Sustainable**
Farming Incentives; Published Mar 2021

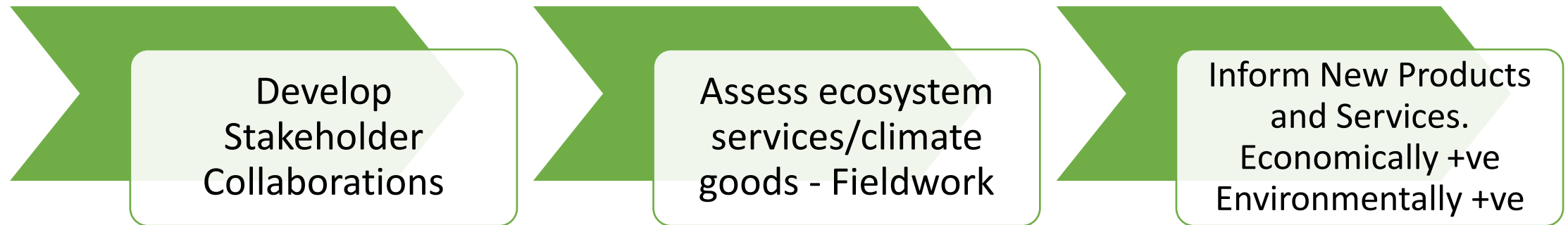
Environmental Land Management Schemes:
Payment Principles; Published Jun 2021

ELMS update: Land based environment and
climate goods and services;
Published Feb 2023

Agricultural Policy Transition (DEFRA)



Study Objective



Working with and through stakeholders

Working with and through stakeholders

or how to avoid reinventing the wheel ...

and really annoying people.....



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Why Cambridge University?

- Convening power
- Excellent research
- Resources
- Interdisciplinary working
- Recognised honest broker
- Influence & reach into policy



We have an 800-year-old reputation....

..... we have to live up to it.

Where else?

- Transferable techniques
- Transferable new technologies
- Transferable skills
- Transferable ideas

*If it works in the Fens,
with its many entwined issues
.....could it be applied in other landscapes?*

