

Broads National Park

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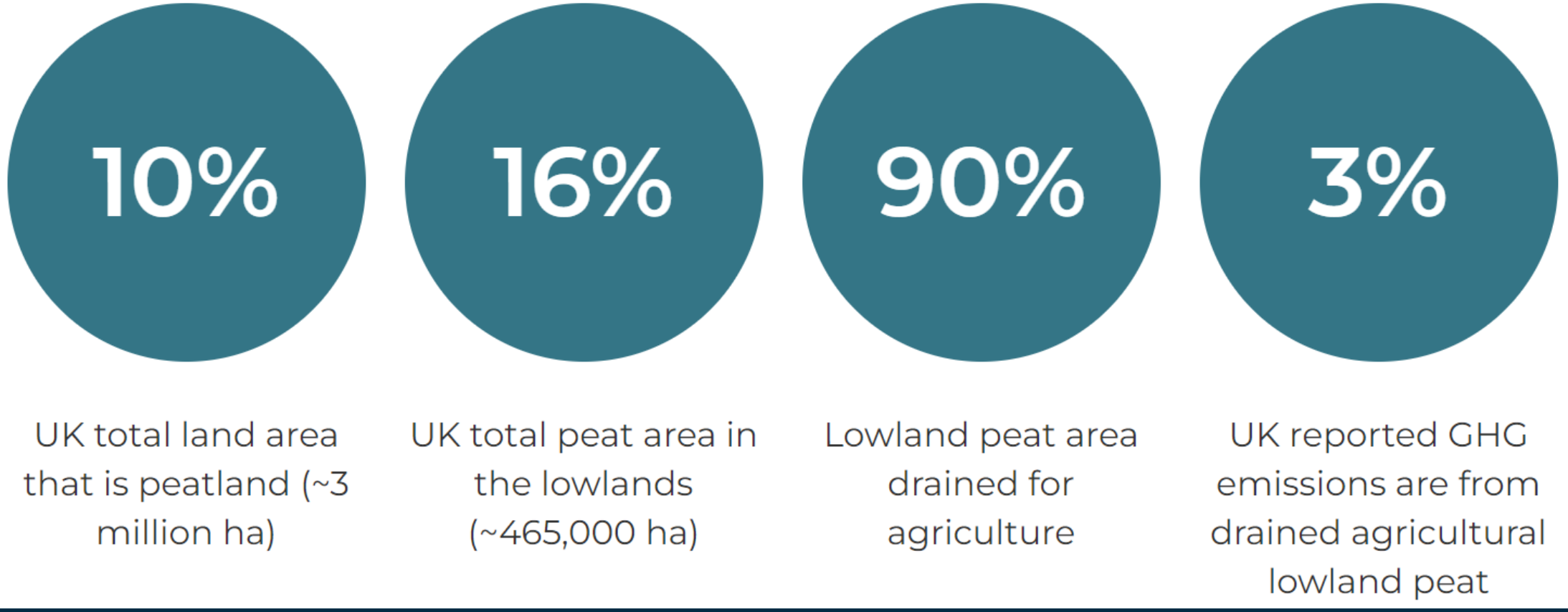
Thursday 2nd May 2024

Water Resources webinar

Content

1. Lowland Peat Context
2. Broads National Park, Nature for Climate Projects
3. FibreBroads Project
    - Crops
    - Water
    - Farm options assessment
    - Finance

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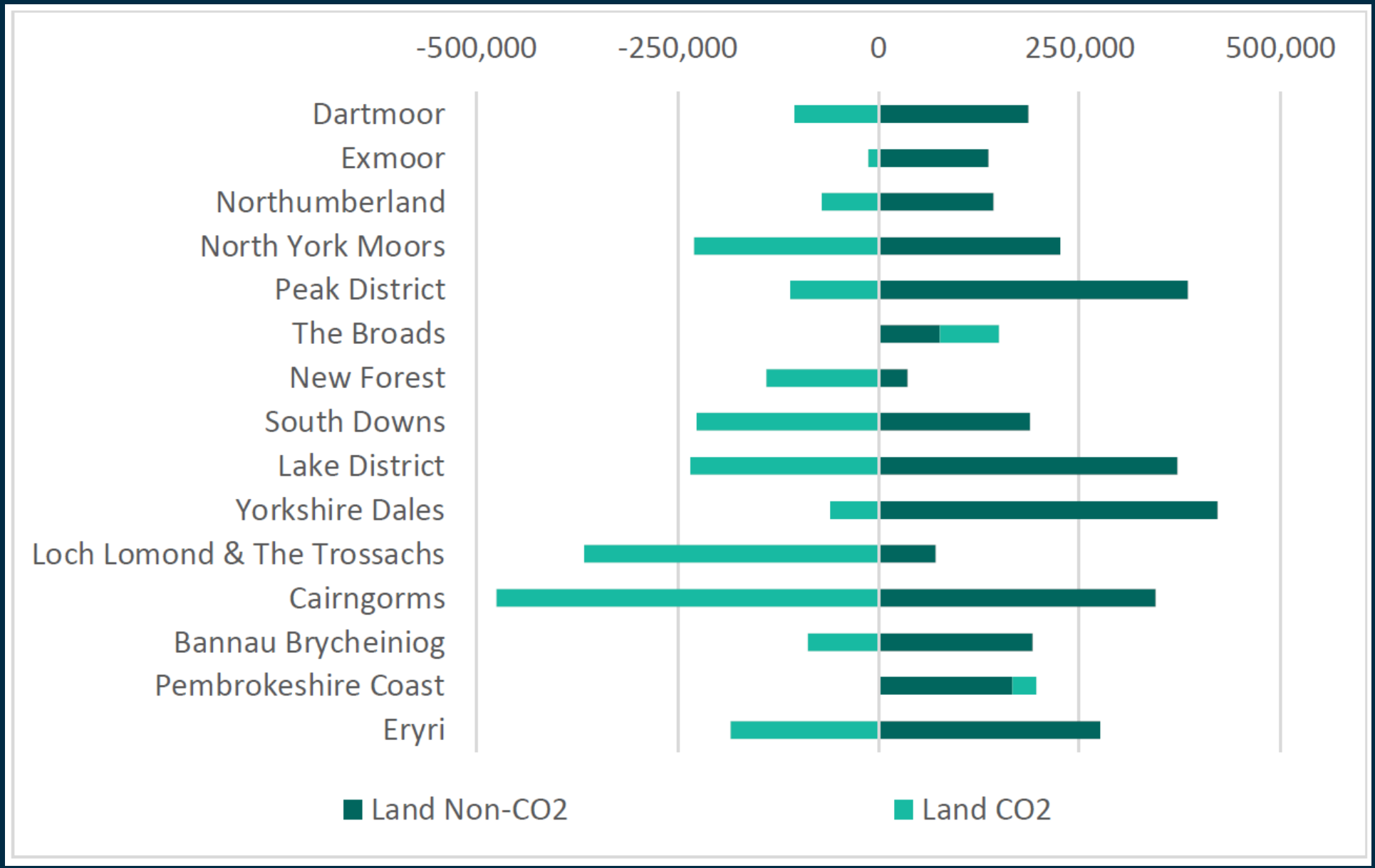


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Lowland peatlands are distributed across much of the UK

Most lowland peatlands have been drained, creating some of the highest grade arable and horticultural land in the UK, however drainage also exposes previously waterlogged organic matter to decomposition and compaction, leading to long-term subsidence and sustained CO2 emissions.

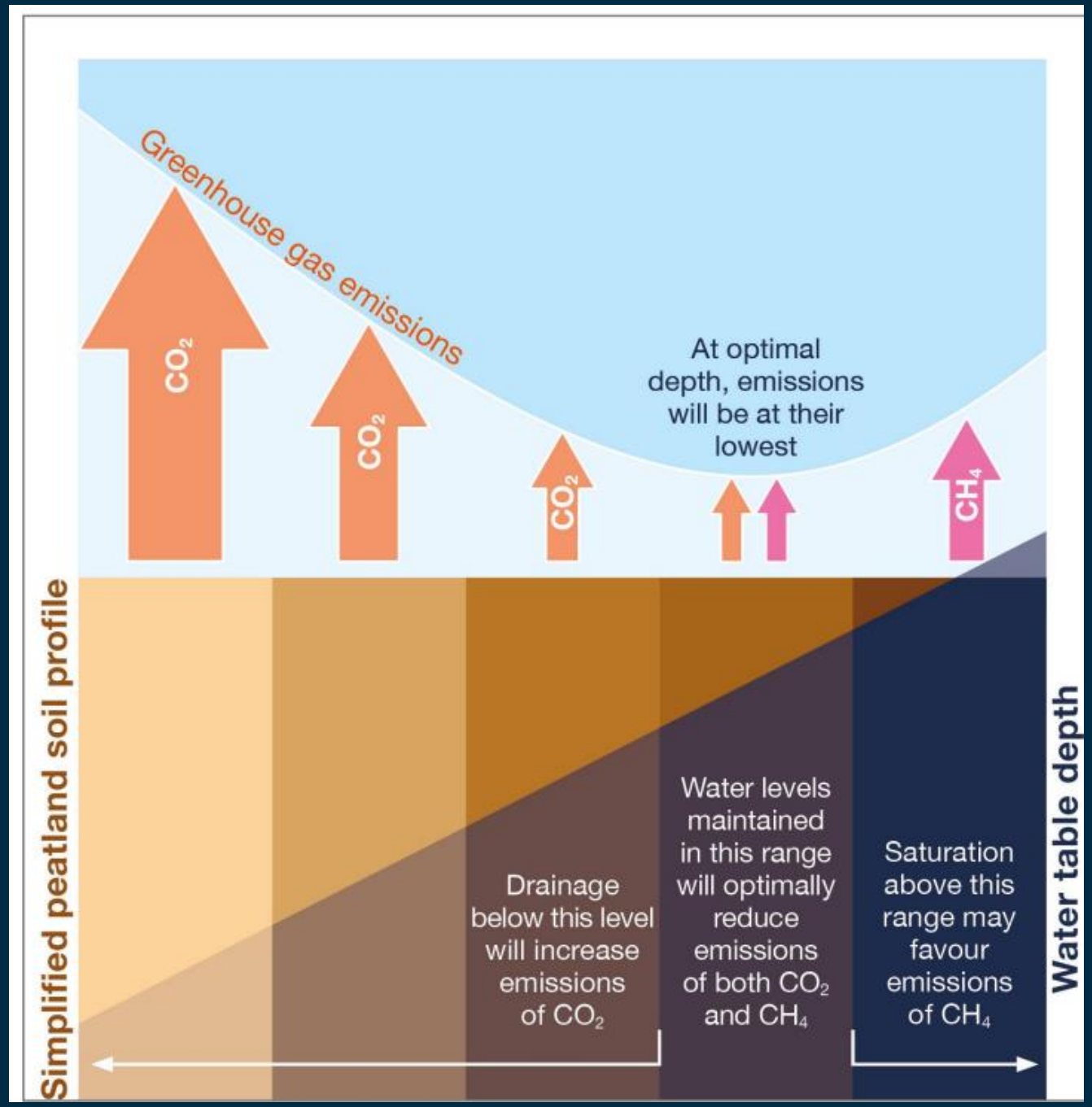
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Estimated land-based CO_2 and non-CO_2 emissions for the National Parks in 2019 derived from the 2023 update of UK's GHG inventory.

Units: tCO_{2e} per year. Negative values imply net carbon sequestration.

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Relationship between watertable depth and emissions from peat, where CO2 is carbon dioxide and CH4 is methane.

Source: Lowland Agricultural Peat Task Force Chair's Report

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Policy

DEFRA, Natural England and Environment Agency are exploring ways to fund better management of peat soils, through water management and alternative cropping (Paludiculture).

The aim is to reduce carbon emissions from peat soils.

Mitigation for this change may include water level management changes; alternative cropping; and changes to livestock farming.

Funding for this kind of change could come from:

- DEFRA ELMs schemes
- Private or Green finance initiatives

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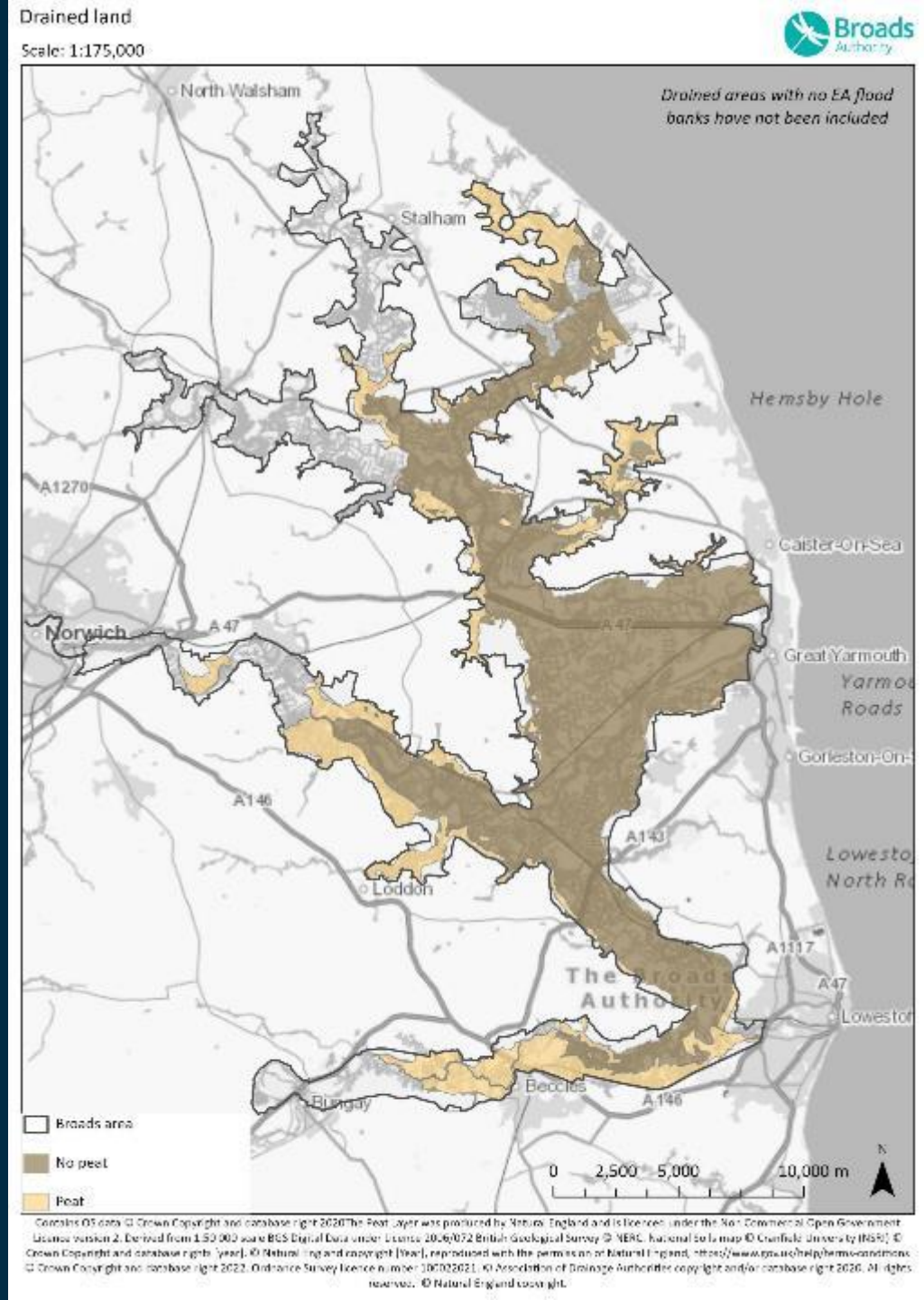
Policy

DEFRAs Nature for Climate and Paludiculture Exploration Fund helps understanding and how best to encourage, incentivise, and invest in change.

A lowland peatland task force made the following recommendations:

- New investment in water storage, management and control
- Public money for wetter modes of farming on peat soils
- Technical advice on keeping peat soils wetter
- Creating viable opportunities in private finance
- Raising the profile of lowland agricultural peat soils
- Adopting the task force's roadmap to commercially viable paludiculture (farming on rewetted peat)

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FibreBroads

Nature for Climate Funding

Drained land

surface peat in yellow

2000ha of drained grass on peat

Drained area outside EA flood banks are not included

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Flooding in 2023
November – December

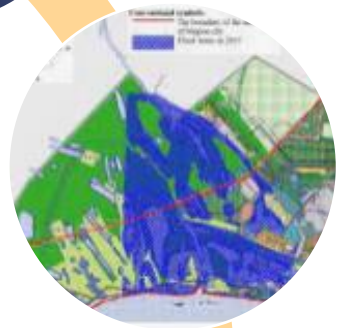
FibreBroads

Lead Partner: Broads Authority
Partners: Palladium, Norfolk FWAG, Norfolk County Council, Norwich University of the Arts, Hudson Architects, Wetland Products
Supported by: Defra, Natural England, Environment Agency, Broads IDB, NFU, Horsey Estate , Fenland Soil

Work packages



Horsey wet farming & filtration demonstrator



Test case for Wetland Water & Spatial Planning



Farming options development



Product engagement & development

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Paludiculture Crops

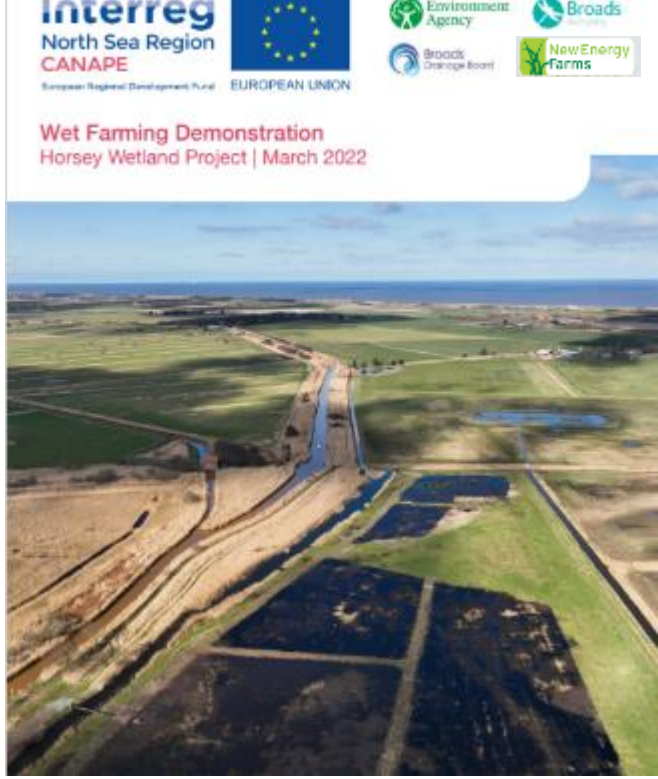
Planting complete

Testing CEEDS & seeding

Engaging

- Minister Rebecca Pow
- Minister Mark Spencer











Paludiculture Crops

Sprouted seedlings







Paludiculture Crops





Test Case for Water Management

Challenge: The availability of additional water resources to raise and support higher watertables, particularly in summer and during dry years.

Water Resources East Regional Plan:
'More water needs to be stored and managed in the landscape to sustain wetter peatland soils. However, **shortages of water should not be seen in general as a barrier** to more sustainable peatland management. The implications for water resources, water quality and local levels of flood risk will need to be assessed on a site by-site basis. In some cases, if for example the peat soils sit within a natural depression, this will be a simple matter of **penning water at higher levels** within the local drainage system.'

Environment Agency Permitting**:**
'This impoundment will work all year, with abstraction occurring all year from the source of supply in which it sits. **The drawdown in the drain during summer will likely impact upon flows downstream** in the River Ant through removing available water, and flows that would otherwise flow down the drain and support the River Ant.'

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Test Case for Water Management

Task group (EA, NE, BA, Stantec)

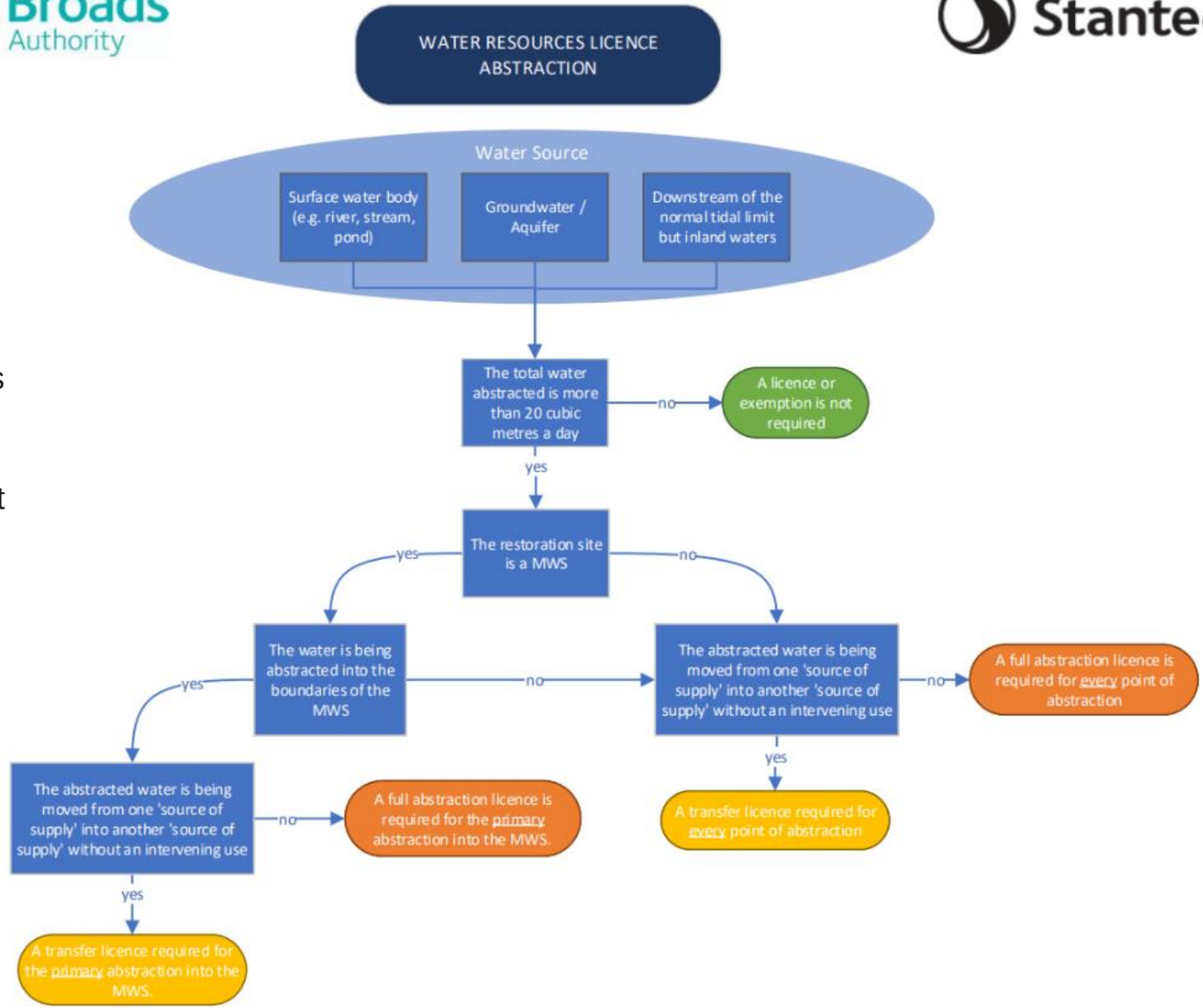
Outputs we are creating in collaboration:

- Decision tree for water permission licences
- Toolkit / Guide including:
  - high level scenarios for typical engineering solutions
  - current potential licenced water availability for different peatland areas of the Broads

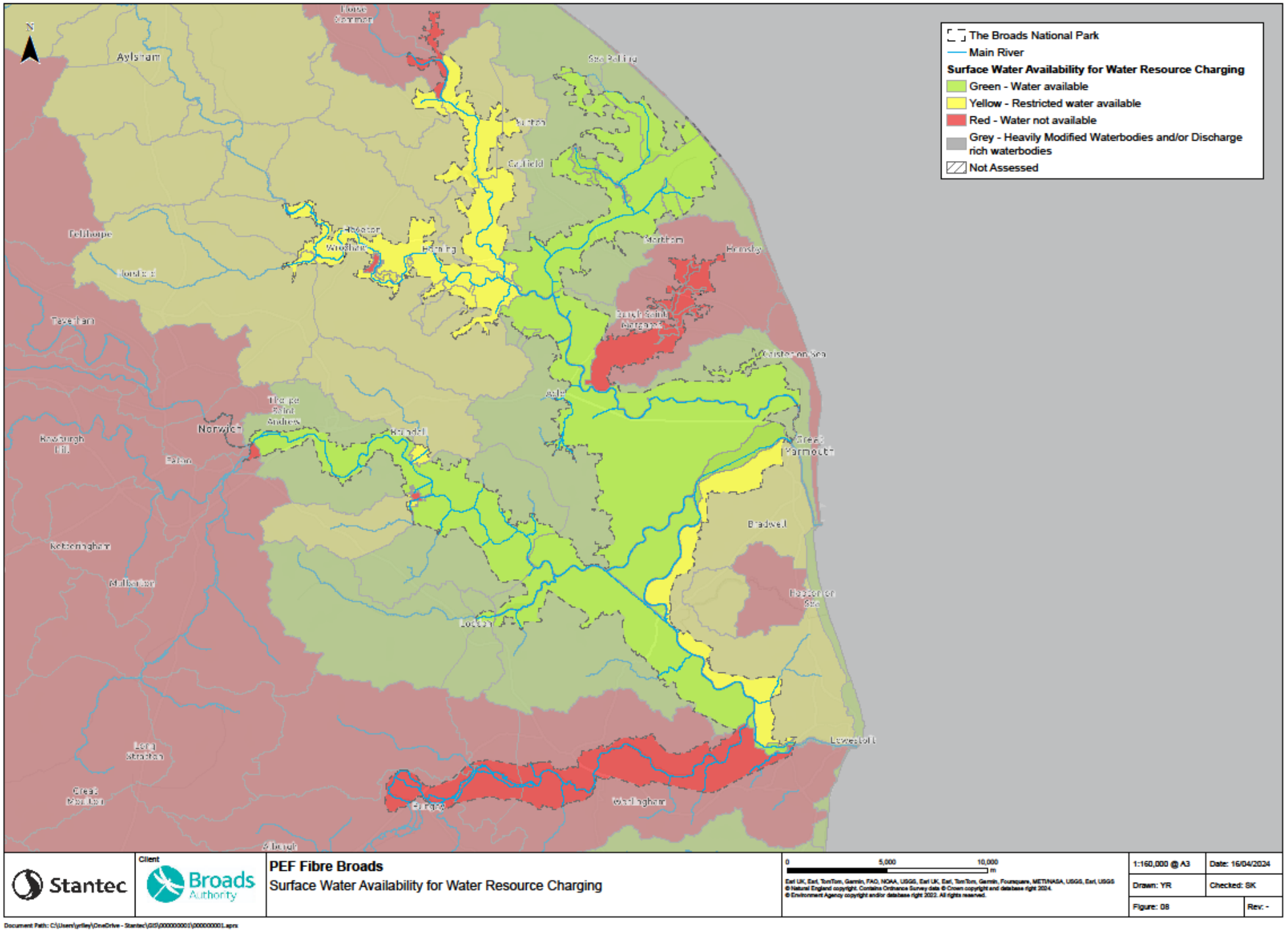
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Water Resources Licence Abstraction

- EA Pre-Application is recommended at early stages
- Determine your Water Source
- Need to consider and include details if Eels or Fish, water voles and other protected species are present.
- Boundary for your MWS is important and for the applicant to inform the EA on.
- Water used from Flood Alleviation could be exempt.
- Licence is generally required for the Water Source Point – whether additional licence is required is subject to the remaining system.
- Exemption's can apply.

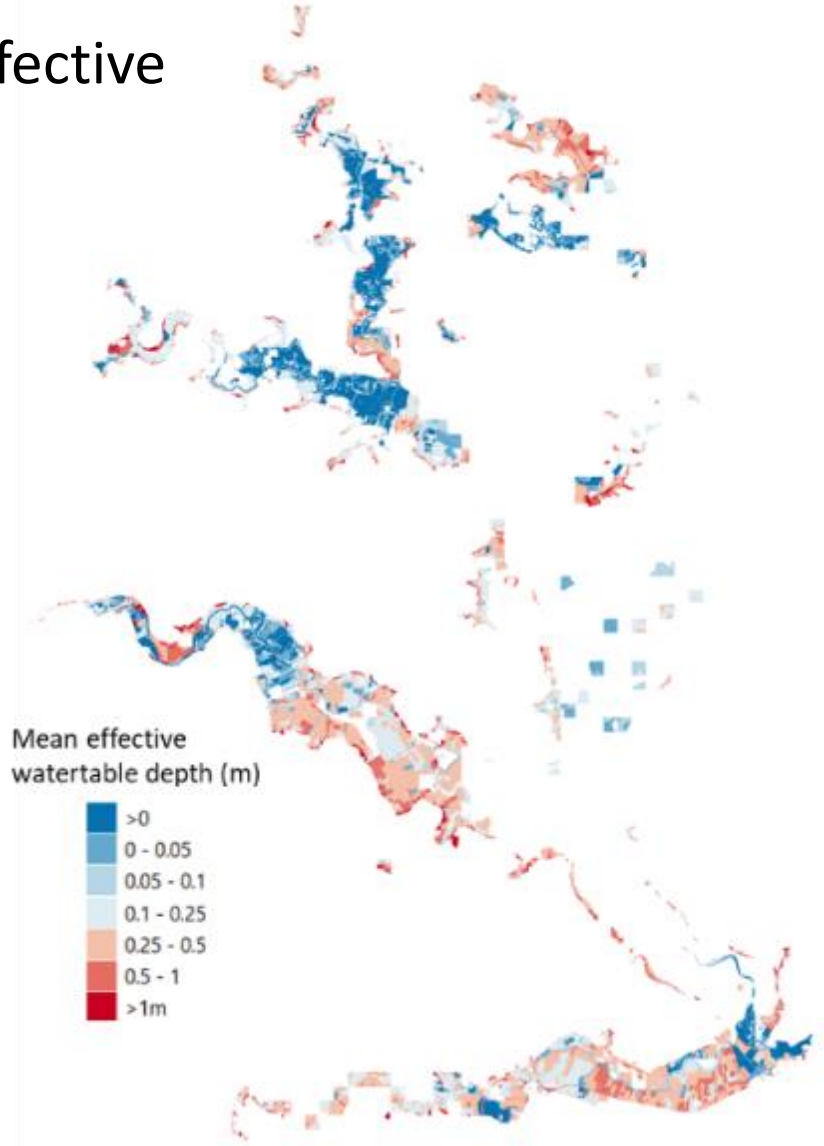


Surface water availability

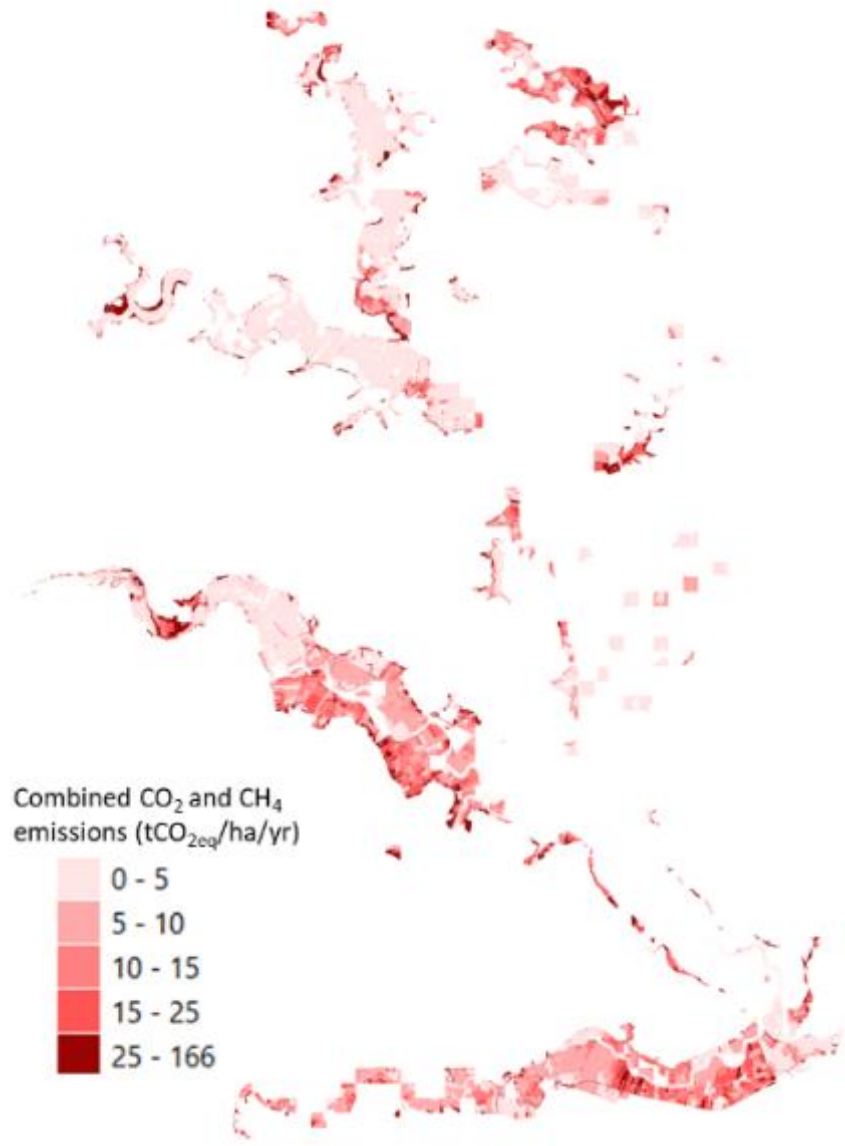

The Broads National Park
Main River
Surface Water Availability for Water Resource Charging
Green - Water available
Yellow - Restricted water available
Red - Water not available
Grey - Heavily Modified Waterbodies and/or Discharge rich waterbodies
Not Assessed
N
Aylsham
Cromer
Holt
Fakenham
Dereham
Wroxham
Reepham
Hornsby
Norwich
Great Yarmouth
Lowestoft
Bradwell
Hellesdon
Costessey
Taverham
Mulbarton
Loddon
Acle
Stalham
Wymondham
Attleborough
Thetford
Swaffham
Watton
Downham Market
Wisbech
King's Lynn
Sheringham
Cromer
Mundesley
North Walsham
Aylsham
Reepham
Wroxham
Hoveton
Acle
Loddon
Beccles
Bungay
Halesworth
Southwold
Lowestoft
Great Yarmouth
Caister-on-Sea
Gorleston-on-Sea
Belton
Burgh Castle
Haddiscoe
Thorpe St Andrew
Norwich
Hellesdon
Costessey
Taverham
Drayton
Hevingham
Coltishall
Horstead
Wroxham
Hoveton
Stalham
Martham
Hemsby
Winterton-on-Sea
Bradwell
Hopton-on-Sea
Belton
Haddiscoe
Burgh Castle
Reedham
Acle
Loddon
Brundall
Strumpshaw
Postwick
Thorpe St Andrew
Rackheath
Salhouse
Wroxham
Hoveton
Horstead
Coltishall
Hevingham
Reepham
Aylsham
Cromer
Sheringham
Holt
Fakenham
Dereham
Wymondham
Attleborough
Thetford
Swaffham
Watton
Downham Market
Wisbech
King's Lynn
Mundesley
North Walsham
Stalham
Martham
Hemsby
Winterton-on-Sea
Caister-on-Sea
Gorleston-on-Sea
Great Yarmouth
Lowestoft
Southwold
Halesworth
Beccles
Bungay
Harleston
Diss
Long Stratton
Great Melton
Mulbarton
Kett's Country
Kirby Cane
Ditchingham
Bungay
Wainford
Ellingham
Earsham
Bedingham
Shipmeadow
Ringsfield
Weston
Barsham
Beccles
Worlingham
Carlton Colville
Oulton Broad
Lowestoft
Gunton
Corton
Hopton-on-Sea
Belton
Burgh Castle
Haddiscoe
Reedham
Acle
Loddon
Brundall
Strumpshaw
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Mulbarton
Kett's Country
Kirby Cane
Ditchingham
Wainford
Ellingham
Earsham
Bedingham
Shipmeadow
Ringsfield
Weston
Barsham
Worlingham
Carlton Colville
Oulton Broad

Spatial Opportunity Mapping

Simulated average effective **water table depth**



Combined emissions of CO2 and CH4

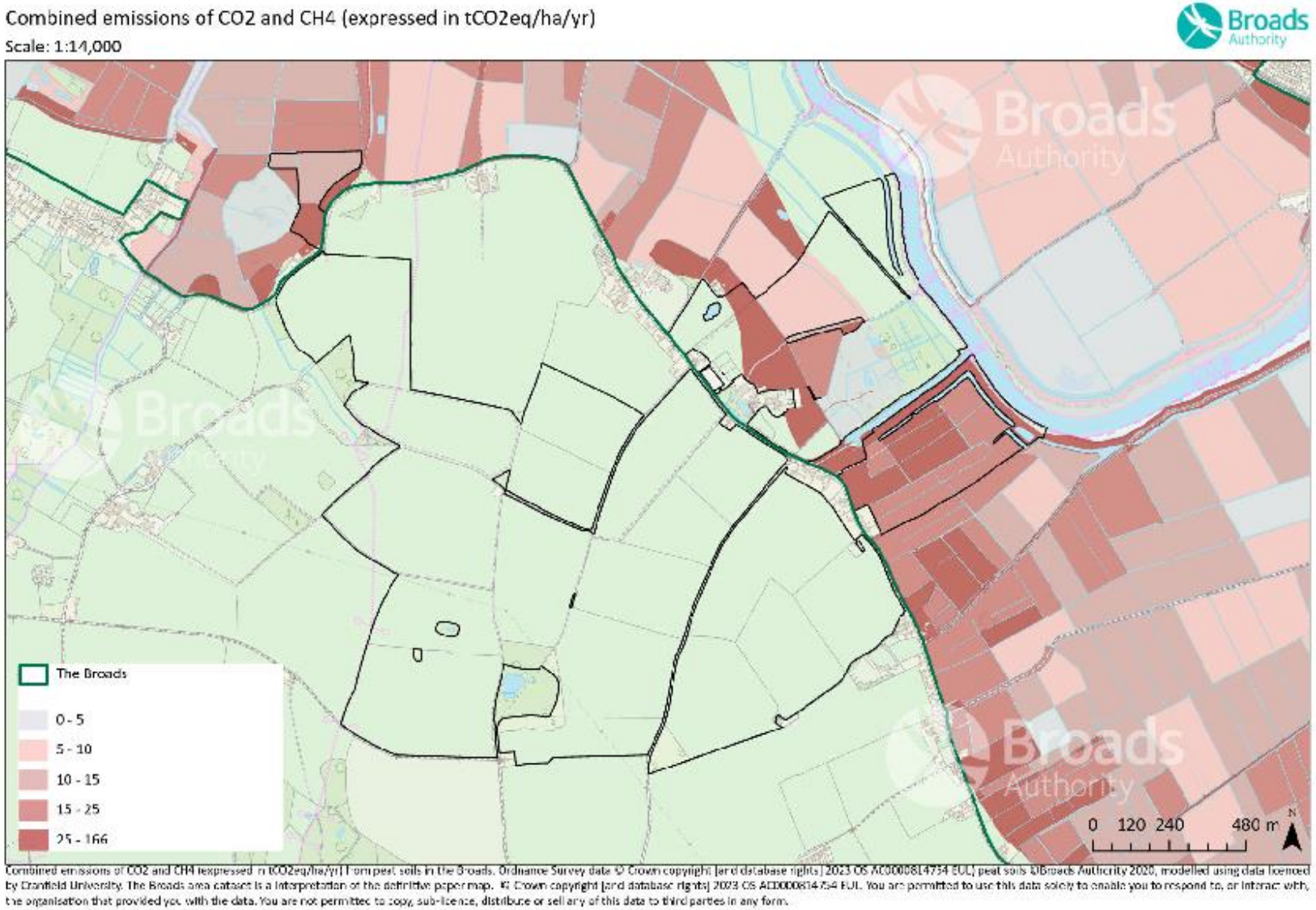


Cranfield Water

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Farm options development

- 12 Farmer interviews, testing maps.
- Advisers workshop spring 2024
- Planning an autumn workshop



Combined emissions of CO2 and CH4 (expressed in tCO2eq/ha/yr) from peat soils in the Broads

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Economics

We require an economic model that supports a long-term transition from privately owned economically productive agricultural landuse (including high value horticultural production) to lower intensity or unmanaged systems such as seasonal grazing, Paludiculture or natural wetlands

Existing funds:

- Government funding (including Nature for Climate)
- Agri-environment
- Private Finance: Carbon, BNG
- Products (including thatching materials, insulation boards, growing media)

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Possible Agri-environment Options

Option code	Option/Action	Payment rate	Length
SW15	Flood mitigation on arable reversion to grassland	£740 p/ha	5 yrs
SW16	Flood mitigation on permanent grassland	£330 p/ha	5 yrs
New	Raise water levels in cropped or arable peat soils (31-50cm below field surface)	£892 p/ha	10 yrs
New	Raise water levels in permanent grassland peat soils (31-50cm below field surface)	£840 p/ha	10 yrs
SW17	Raise water levels in cropped or arable peat soils to near the land surface	£1,409 p/ha	10 yrs
SW18	Raise water levels in permanent grassland peat soils to near the land surface	£1,381 p/ha	10 yrs
WT6/8	Management of reedbed/fen	£920 p/ha	10 yrs
SP2	Rewetting supplement (for GS6/GS7/GS8/GS13/GS14)	£181 p/ha	--
New	Manage grassland for flood and drought resilience and water quality	£938 p/ha	10yrs

Capital works items

Capital item	Payment rate
PA1 Implementation plan	£1,200 p/plan
PA2 Feasibility study	100% of costs
FM2 Major preparatory works for priority habitats and priority species	100% of costs
WN2 Creation of scrapes and gutters	£2.23 p/sqm
WN3 Ditch, dyke and rhine restoration	£5.72 p/m
WN4 Ditch, dyke and rhine creation	£13.63 p/m
WN8 Timber sluice	£451.50 p/sluice
WN9 Brick, stone or concrete sluice	£2,901.40 p/sluice
WN10 Construction of water penning structures	100% of costs
RP6 Installation of piped culverts in ditches	£376 p/culvert
RP9 Earth banks and soil bunds	£195.61 p/unit

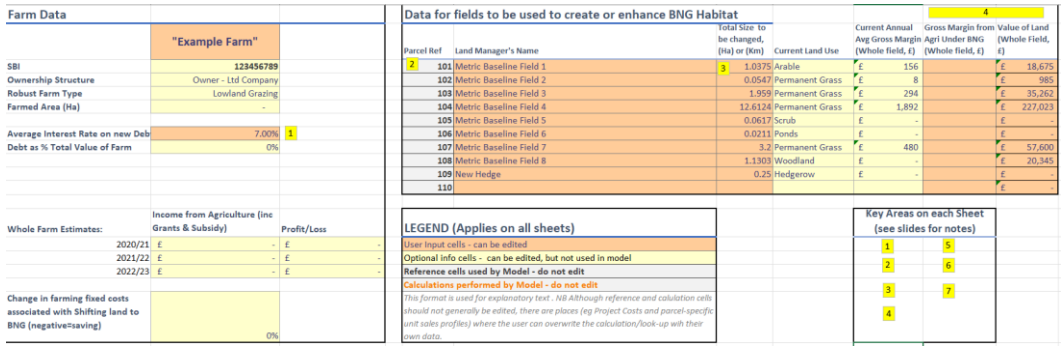
The BNG Model

The model has several data entry worksheet tabs, with data entry cells, hidden formulae and look-up tables. The cells are colour coded to enable you to know which ones you can change.

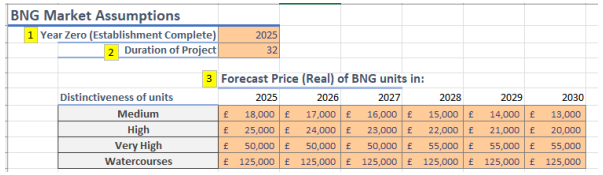
The Legend is highlighted below, alongside a snapshot of each of the four Tabs.

LEGEND (Applies on all sheets)
User Input cells - can be edited
Optional info cells - can be edited, but not used in model
Reference cells used by Model - do not edit
Calculations performed by Model - do not edit
This format is used for explanatory text . NB Although reference and calulation cells should not generally be edited, there are places (eg Project Costs and parcel-specific unit sales profiles) where the user can overwrite the calculation/look-up wih their own data.

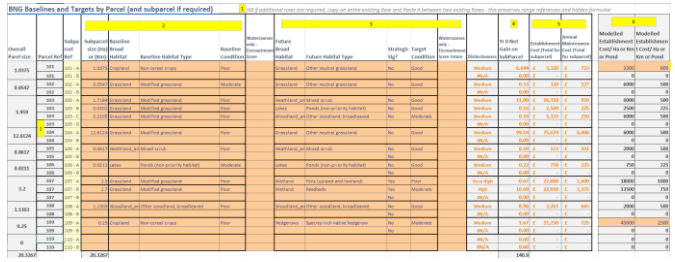
Tab 1 – Farm Data



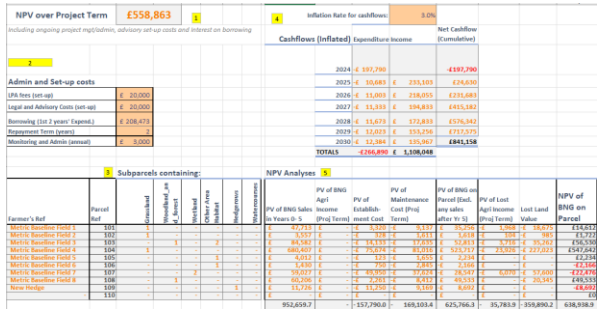
Tab 2 – Market Assumptions

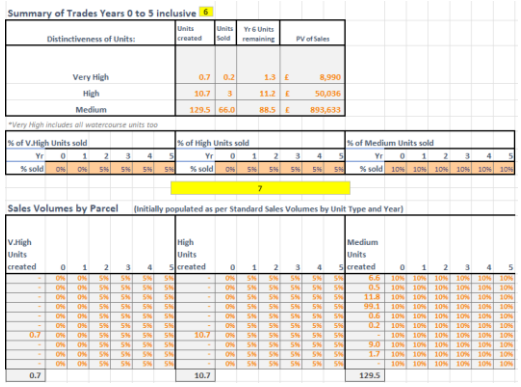


Tab 3 – Habitat Creation Plans



Tab 4 – Investment Analysis





David Baxter ENVIRONMENTAL

Product development testing

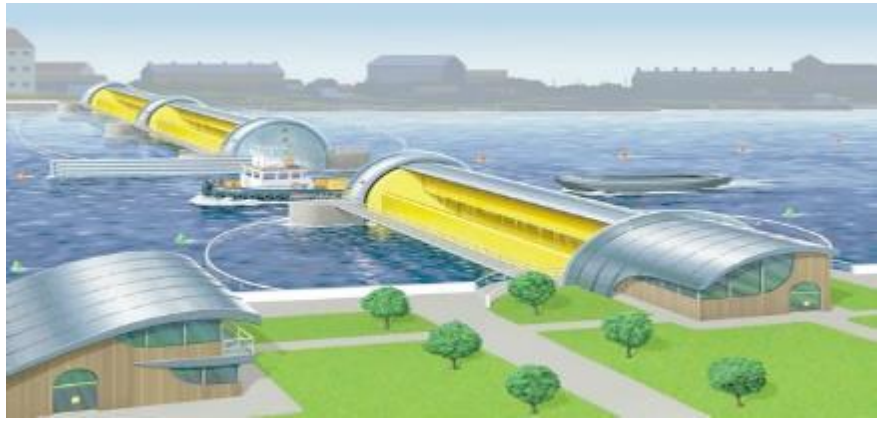
- Cutters harvesting samples
- Architecture students testing products
- Networking with UK manufacturers



Broadland Futures Initiative

A working partnership for flood risk management in the Broadland area






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