

Paludiculture: Paludifuture for the UK's fen peatlands?

Col key topic review:
Lowland peatlands & wet agriculture

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Peatlands: Investing in the Future



Peatland Programme



'Wasting' of peat soils.

Drainage-based peatland use cause peat oxidisation, soil degradation, nitrate losses to surface water



The lowering of the peat surface necessitates a continuous deepening of drainage ditches, again increasing peat oxidisation and further lowering the surface



Ultimately subsidence leads to loss of productive land when peatlands can no longer be drained, and is frequently inundated

Paludi-what?

Paludiculture - from the Latin '*palus*' for swamp + '*cultura*' for cultivation

What it is not...

- ▶ Paludiculture *is not* nature protection: it is agriculture with clear production goals



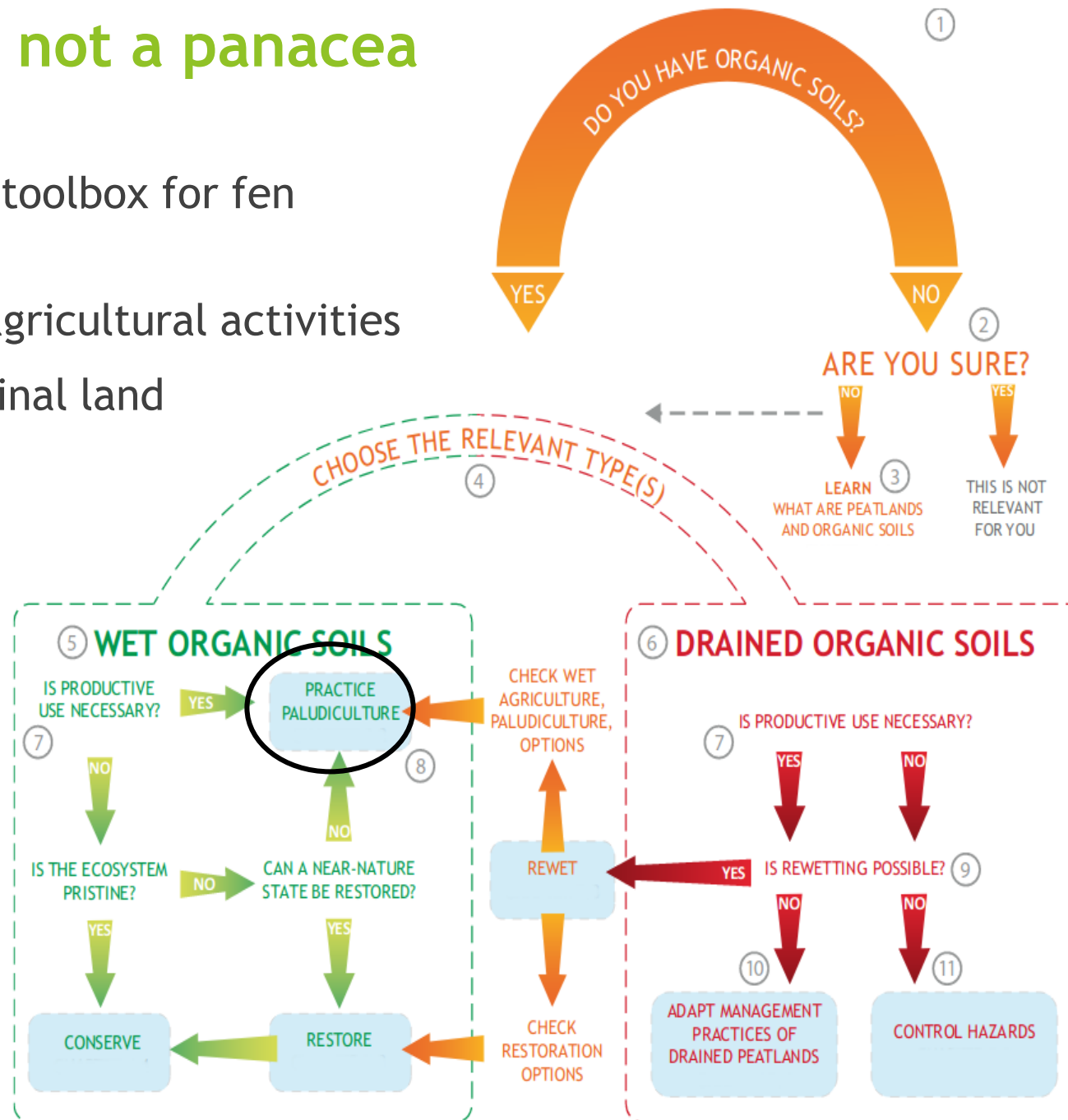
What it is...

- ▶ It is the wet cultivation of peatlands
- ▶ A wetter way of farming on peatlands, that does not degrade the peat layer and even adds to peat accumulation



Paludiculture is not a panacea

- ▶ Part of the farming toolbox for fen peatlands
- ▶ About diversifying agricultural activities
- ▶ e.g. targeting marginal land



Paludi-why?

Restoration or wet agriculture?



Paludiculture is the only form of land use that can

- ▶ Maintain the peat body
- ▶ Provide sustainable economic assets
- ▶ Sustain other vital provisioning and regulating ecosystem services

Paludi-why? An inclusive solution

Utilisation	Aim	Farming and Food Production	Biodiversity Conservation	Climate Change mitigation	Water storage / regulation	Water quality
Paludiculture		Synergy	synergy	synergy	synergy	synergy
Conservation		Conflict	synergy	synergy	synergy	synergy
Rewetting		conflict	synergy	synergy	synergy	synergy
Conventional Agriculture		synergy	conflict	conflict	conflict	conflict
Abandonment		conflict	conflict	conflict	conflict	conflict

(adapted from FAO and Wetlands International, 2012)

Paludi-why? Climate regulation

Key



Crops, high intensity grassland



Low intensity grazing



Low intensity grassland



Reed canary grass



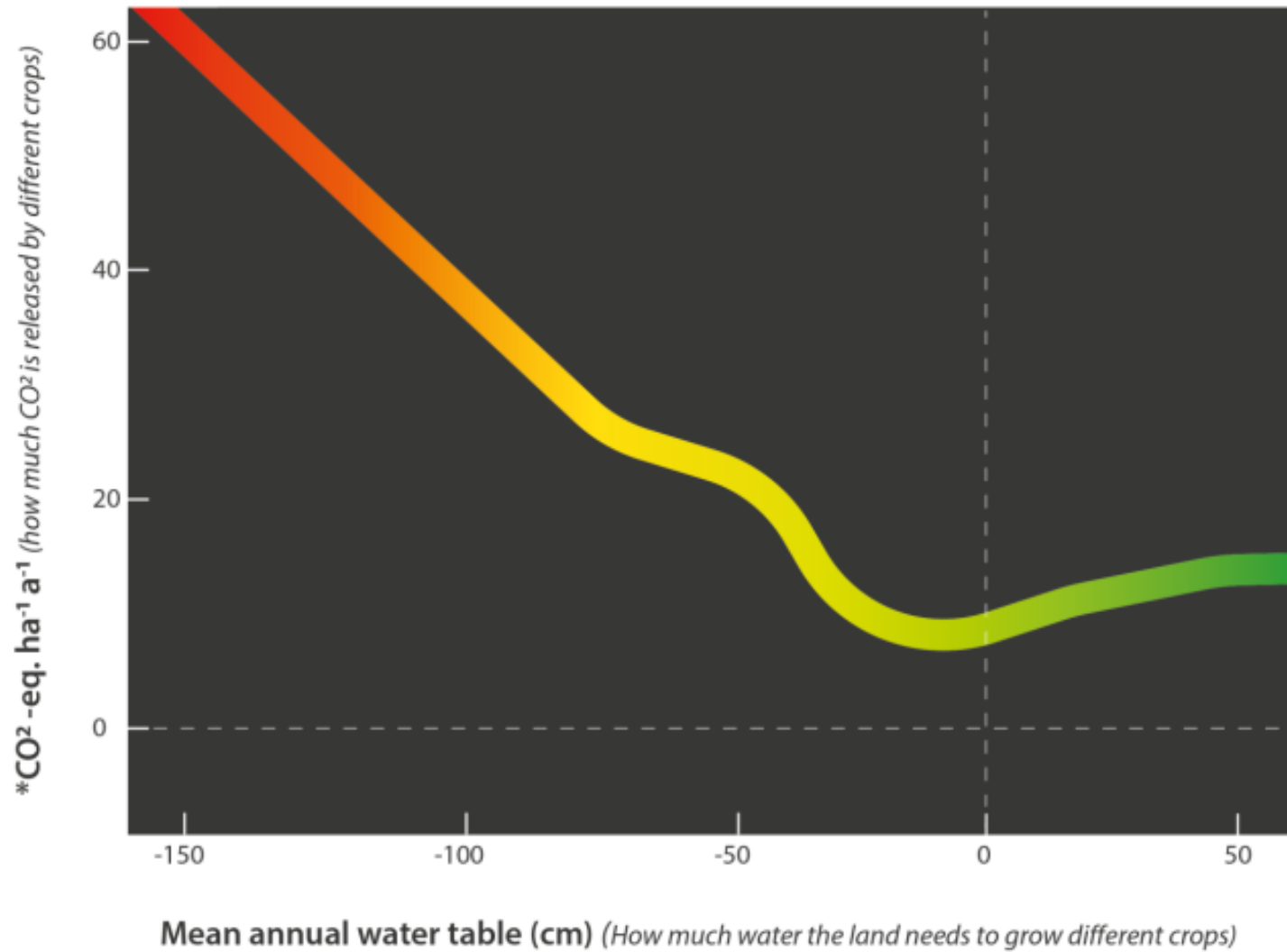
Alder



Reed, sedges, reedmace



Peatmoss



(Jurasinki et al, 2016)

What are the main types of paludiculture crops, products and markets?



Food



Fodder



Medicines & supplements



Raw materials



Biomass/
energy



Agricultural
conditioners

Cattail (Typha spp.)

- ▶ **Production** is low cost and suitable for large areas, also suitable for nature conservation areas.
- ▶ **Frequent harvest:** Typha is harvested annually and therefore has a greater harvest volume per hectare than timber.
- ▶ **Ecosystem services:** Water purification potential (Phosphates and nitrates removal), Avoided C losses, biodiversity etc.
- ▶ **Sustainability:** attractive Cradle-to-Cradle characteristics.
- ▶ **Key product:** Typhaboard and Typha fill insulation - provides structural support and insulation in buildings.



Paludi-where?

- ▶ Fen biomass heating plant in Malchin, Peene Valley, Germany
- ▶ Integrates an adapted biomass boiler powered by wet fen vegetation into the existing heating grid
- ▶ The plant produces ~4000 MWH heat/ yr from hay produced on 300ha re-wetted fen peatlands
- ▶ By substituting natural gas, the use of the biomass mitigates about 1000 t of CO₂ annually



Paludi-where? UK Paludiculture projects

Project Name	Project Dates	Main UK Partners	Areas Investigated
Sphagnum Farming UK - A Sustainable Alternative to Peat in Growing Media	2018 - 2019	<ul style="list-style-type: none"> • Micropropagation services Ltd. • Manchester Metropolitan University, • University of East London, • Lancashire Wildlife Trust 	Sphagnum cultivation.
Waterworks Project	2019-2021	<ul style="list-style-type: none"> • The Wildlife Trusts of Bedfordshire, Cambridgeshire and Northamptonshire • Cambridgeshire Acre, • University of East London 	Typha, Reed, Sphagnum, Glyceria and other cultivation
Wetland Conservation Biomass to Bioenergy	2013 - 2015	<ul style="list-style-type: none"> • RSPB 	Biomass production for energy – Reed, Typha, Fen biomass. Machinery and Harvest methods
CANAPE project	2014 - 2020	<ul style="list-style-type: none"> • The Broads Authority 	Converting surplus materials from conservation management into commercial products – reed and sedge.
Bolton Fell Sphagnum farming	2018 - ongoing	<ul style="list-style-type: none"> • Natural England • Barker and Bland 	Sphagnum cultivation



Water Works

PEAT PEOPLE SCIENCE

- £1,000,000 awarded by people's Postcode Lottery through the Dream Fund - *Sustainable Systems Funding Stream*.
- The Project is called *Water Works*
- runs 1st April 2019 – 31st March 2021



Supported by players of



Awarded funds from



Paludi-challenges and solutions

- ▶ **Lack of policy, legal framework and funding support**
- ▶ **Socio-economic barriers**
- ▶ **Machinery and logistics challenges**

Policy, legal framework and funding challenges

- ▶ Uncertainty about the status of paludiculture activates and crops in agricultural policy
- ▶ Current agricultural legislation supports drainage-based agriculture
- ▶ Apparent lack of policy coherence and consistency across different departments.
- ▶ There is lack of confidence in long term support of paludiculture
- ▶ Current water management systems are not favourable for paludiculture
- ▶ Uncertain financial flows due to niche market...

Economic feasibility: is it profitable?

Paludiculture vs conventional farming

- ▶ Running costs of a paludiculture business may be lower
- ▶ Re-wetting of peatlands is cost-effective climate change mitigation
- ▶ Potential economic incentives - public or privately financed payment for ecosystem service schemes.

But....

- ▶ Harvesting costs are likely to be higher than conventional harvesting
- ▶ Lack of market demand and acceptance
- ▶ Legal and policy regulations (lack of)
- ▶ Not easy to calculate a monetary value of ecosystem services at individual enterprise level
- ▶ Drainage-based agriculture supported by subsidies

Recommendations - setting a new course

- ▶ **Identify** suitable (perennial) crops and develop markets
- ▶ **Overcome** technical challenges for harvesting and processing wet biomass.
- ▶ **Establish** more pilot projects and demonstration farms
- ▶ **Adapt** laws, rules and regulations to accommodate wet peatland agriculture.
- ▶ **Remove** market distortions.
- ▶ **Develop** incentives, such as payments for ecosystem services
- ▶ **Facilitate** paludiculture implementation paludiculture task force and facilitation hubs.

