Paludiculture Exploration Fund

NATURAL ENGLAND

Case Study

Developing the business case: Building markets for wetland crops through whole chain innovation

Overview

The Paludiculture Exploration Fund (PEF) is helping transform how the UK manages, values and commercialises wetland crops grown on rewetted peat. By supporting projects that span crop establishment through harvesting, processing and end use, PEF bridged the gap between environmentally beneficial peatland management and viable, resilient markets.

This case study explores how PEF-funded projects identified and developed market opportunities for paludiculture crops, with a particular focus on Typha (reedmace), reed and sphagnum. It highlights how whole-chain working has enabled innovation in textiles, construction and horticulture, while also tackling the practical barriers that must be addressed to scale these solutions.

Context: new crops, new markets

Paludiculture offers a route to reducing carbon emissions, supporting nature recovery and maintaining livelihoods on peatlands. However, new crops alone do not create viable businesses. Markets, processing infrastructure, quality standards and buyer confidence must develop in parallel.

PEF projects have helped de-risk this transition, enabling collaboration across the entire supply chain and recognising that innovations will only succeed if growers, processors and end users move forward together.

Typha: from rewetted peat to high-value textiles

Establishing an integrated supply chain

PEF has supported the UK's first integrated supply chain for Typha, covering crop establishment, harvesting and processing. Working with Lancashire Wildlife Trust on Chat Moss in Great Manchester – once one of the UK's largest lowland raised peat bogs – biomaterials start-up Ponda has demonstrated field-scale Typha production on rewetted agricultural peat.

A major milestone came in 2025 with the UK's first machine harvesting of Typha seed heads, using custom-built harvesters developed through PEF support. These seed heads were processed into BioPuff®, a warm, lightweight, plant-based insulation designed to replace synthetic fibres and goose down in padded clothing.

In collaboration with outdoor brand Berghaus, BioPuff® was used to produce a concept insulated jacket, showing how peatland crops can feed directly into high-value manufacturing supply chains.

Scaling processing and production

Alongside crop trials, PEF-backed work is addressing bottlenecks further down the chain. This includes:

- Development of fibre-cleaning machinery integrated with Ponda's fibre extraction process
- Research into Typha crop science, including planting depth, density, and water-table management
- Exploration of processing by-products and seed pellet production to support scaled planting

The ambition is to develop processing capacity of up to 400 tonnes of BioPuff® per year – equivalent to insulation for around one million jackets – illustrating how paludiculture can move beyond niche pilots towards commercial scale.

Building with wetland crops: construction and bio-based materials

FibreBroads: innovation in the Broads National Park

In the Broads National Park, a PEF-funded project has explored how wetland crops such as Typha and reed can be used in bio-based construction. The FibreBroads project has delivered:

- A full-scale insulated wall section using wetland fibres
- Prototype acoustic panels;
- New economic models for traditional thatching reed, 97% of which is currently imported into the UK.

Additionally, FibreBroads has gone beyond materials development to establish a network linking reedcutters, growers, thatchers, developers and architects. This network approach recognises that technical innovation will fail without aligned skills, trust and commercial relationships.

Andrea Kelly, Environment Policy Adviser at the Broads Authority, explains:

"Bio-based construction is expanding rapidly, but innovations fail without whole-chain collaboration. By working with peatland farmers and reedcutters to share knowledge and develop viable business networks, we can connect growers with construction businesses and help support carbon reduction, nature recovery and rural livelihoods in the changing floodplain of the Broads."

Hybrid panels and acoustic products: reducing risk through integration

PEF has also enabled experimentation with hybrid construction products through the FibreBroads project. These combine reed harvesting waste with miscanthus fibres. Working with ESG Natural Capital and Woolley Shepherd, these fibres have been used to develop acoustic panels.

This approach demonstrates several advantages:

- Higher-value reed enhances aesthetics and strength, while lower-cost miscanthus provides bulk.
- Waste materials are upgraded into commercial products.
- Co-location of harvesting, drying, storage and panel production reduces costs and risk.

ESG Natural Capital/ Woolly Shepherd

Reed thatching: lessons from a fragile but vital industry

An existing paludiculture market

Reed thatching is one of the UK's longest-standing paludiculture industries, yet it is fragile. Around 97% of thatching reed is imported, often from thousands of miles away, with associated carbon emissions and biosecurity risks. Domestic supply is constrained by higher winter water levels, availability of reedbeds for cutting, skills and labour shortages, and weak economic resilience among cutters.

Reedcutters are typically contractors who do not own land or control water levels. They have limited access to machinery grants and formal training, even though becoming a competent cutter can take several years.

What reed tells us about whole-chain needs

PEF-supported activity in the Broads has highlighted several essential requirements for a successful whole-chain approach:

- **Quality standards:** Agreed standards developed by the Broads Reed and Sedge Cutters Association are consistently applied by practitioners operating in the Broads.
- **Local market preference:** Many thatchers and homeowners value locally sourced Broads reed for its excellent quality standards; however, some thatchers continue to favour imported reed despite the absence of comparable standards, reflecting the influence of cost sensitivity and established practice.
- **Climate-aware harvesting:** Harvest windows are increasingly shaped by weather variability, placing greater emphasis on flexibility and adaptive management.

Expanding commercial reed-cutting across the east of England

The Broads Authority is also working to expand traditional reed harvesting.

- Assessing reedbeds across Norfolk and Suffolk to determine which sites are suitable for harvesting high-quality thatching reed and advising landowners what actions may be required to restore the beds for future thatching harvest.
- Preparing management plans with landowners and Natural England for future cutting schemes
- Funding new machinery and training of reed-cutters.

Alongside commercial exploration, the Authority has run projects focused on restoring and expanding reedbeds for wildlife. The aim is to increase carbon storage, prevent peat loss, and improve wetland habitats. At Hickling Broad, for example, dredged sediment has been used to rebuild reedbeds that had eroded and working with Norfolk Wildlife Trust water and other landowners to expand reedbeds.

This work has helped strengthen connections between cutters and landowners, and contributed to improved economic modelling, building on work such as the ADAS report The Economics of Reed and Sedge Cutting. For the first time, stakeholders can explore how targeted investment in reedbed creation, machinery or storage might affect profitability and long-term viability.

Broads Authority

Diversifying peatland farm businesses

Willow on wet peat

In Somerset, Coates English Willow is leading a PEF-supported project on the West Sedgemoor wetlands, exploring willow production on peat soils under high water levels. The project combines peat-friendly management with market analysis for products including kindling, activated charcoal for pharmaceutical and cosmetic uses, and innovative packaging materials.

Farmer-focused business cases

PEF has also supported farmer-led business case development. In Cumbria, Vitagrass Farms (Holker) Ltd, working with Savills, combined on-farm trials with commercial analysis to identify six ‘champion crops’, including: - Sphagnum moss for horticulture and peatland restoration - Typha for textile fibres and insulation - Biomass for energy.

Overcoming financial barriers

A PEF project led by the Centre for Hydrology and Ecology (CEH) project shows that integrating biochar into paludiculture can strengthen the business case for peatland rewetting by enabling long-term carbon removal and additional carbon finance, especially when low-cost, locally produced biochar is used.

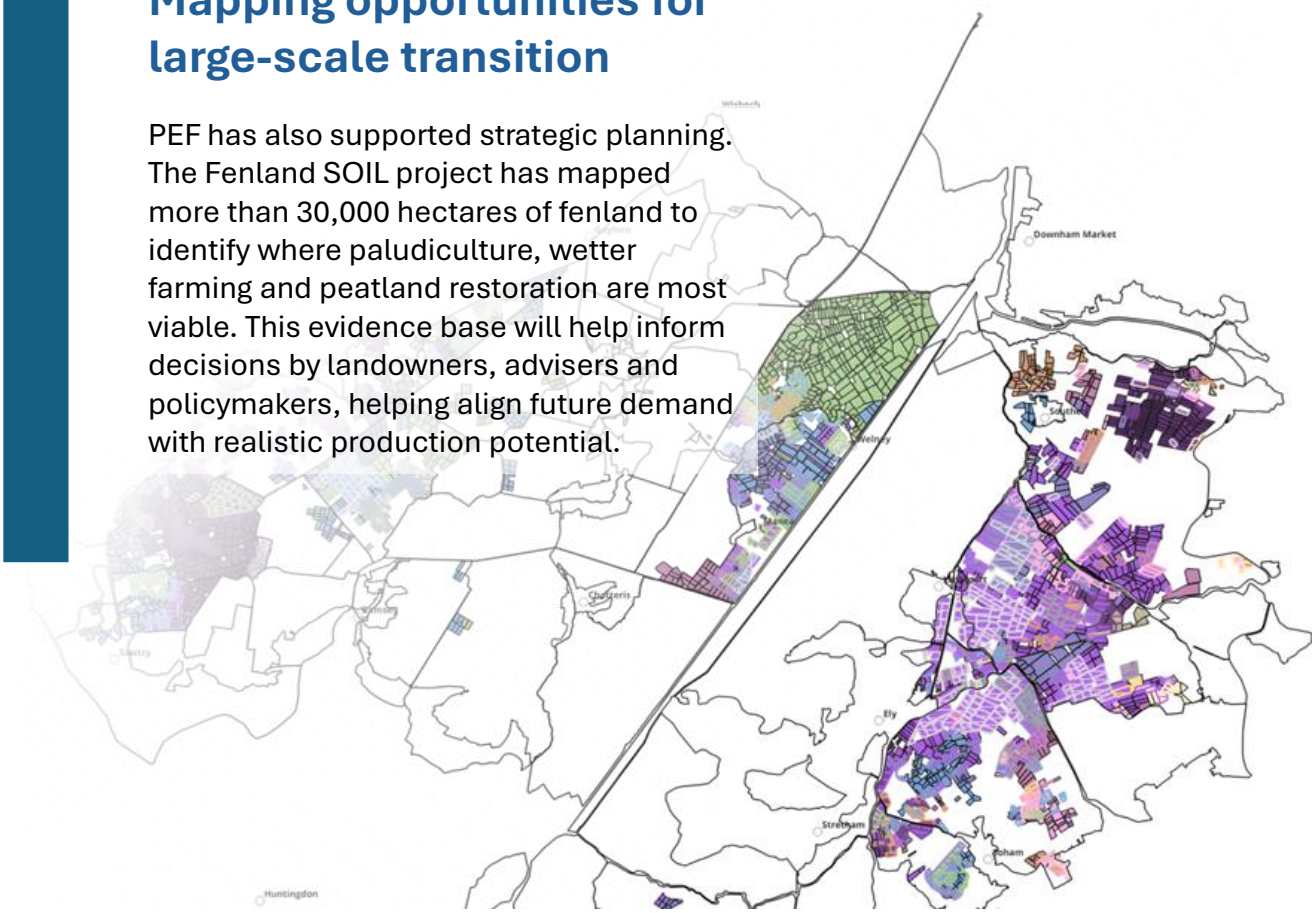
Sphagnum farming: replacing peat at scale

Through support from PEF, Beadamoss® has accelerated the commercialisation of sphagnum farming. Working with Wrights Farm in Lancashire and Melcourt as an end producer, the project is establishing field-grown sphagnum to supply sustainable growing media for the English horticulture sector.

PEF funding has enabled rapid testing and refinement, resulting in two scalable planting systems. The BeadaGel® planting machine has evolved from proof of concept to a tractor-mounted system capable of planting several acres per day. The project aims to create a commercially sustainable demonstration farm and address supply-chain barriers from propagation through to market-ready products.

Mapping opportunities for large-scale transition

PEF has also supported strategic planning. The Fenland SOIL project has mapped more than 30,000 hectares of fenland to identify where paludiculture, wetter farming and peatland restoration are most viable. This evidence base will help inform decisions by landowners, advisers and policymakers, helping align future demand with realistic production potential.



Key barriers and the role of whole-chain working

Across the projects, common barriers have been identified:

- Inconsistent biomass supply and quality
- A need for investment in harvesting and processing equipment
- Limited UK processing facilities and regional hubs
- Uncertainties around specification, certification and investor confidence.

As Will Barnard of FWAG South West summarises: *"The entire chain can only move at the speed of the slowest link. If one element runs ahead without the rest, bottlenecks emerge, confidence is lost, and markets fail."*

PEF projects are helping address these barriers by addressing technical challenges, encouraging coordinated progress, and engaging end users early.

Conclusion: reducing risk, accelerating uptake

Paludiculture Exploration Fund projects demonstrate that the transition to paludiculture is not just an agronomic challenge, but a market and systems challenge. By supporting whole-chain innovation - from peatland field to finished product - PEF has helped reduce risk, build confidence and accelerate the uptake of paludiculture.

Through case studies in textiles, construction and crop production, PEF projects are demonstrating how climate benefits, rural livelihoods and commercial opportunities can be aligned to scale paludiculture across the UK, ensuring that environmental restoration goes hand in hand with resilient, market-led solutions.

Natural Building Systems

Project Links

https://www.paludiculture.org.uk/boggybulrushes
https://www.paludiculture.org.uk/drone-repeat
https://www.paludiculture.org.uk/fwagsw
https://www.paludiculture.org.uk/fibrebroads
https://www.paludiculture.org.uk/biocharintegration
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