Fenland Agricultural Analysis Report

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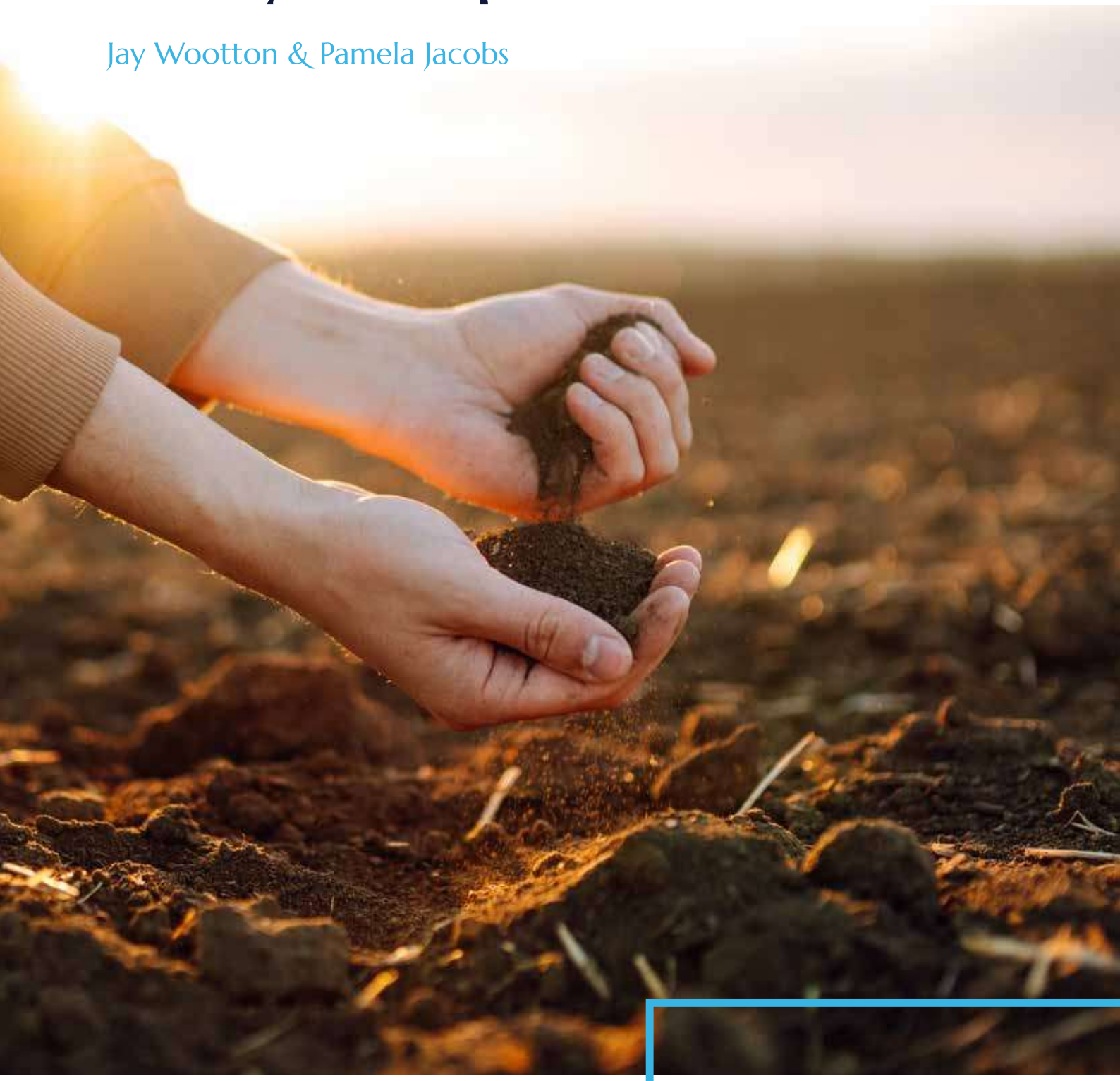
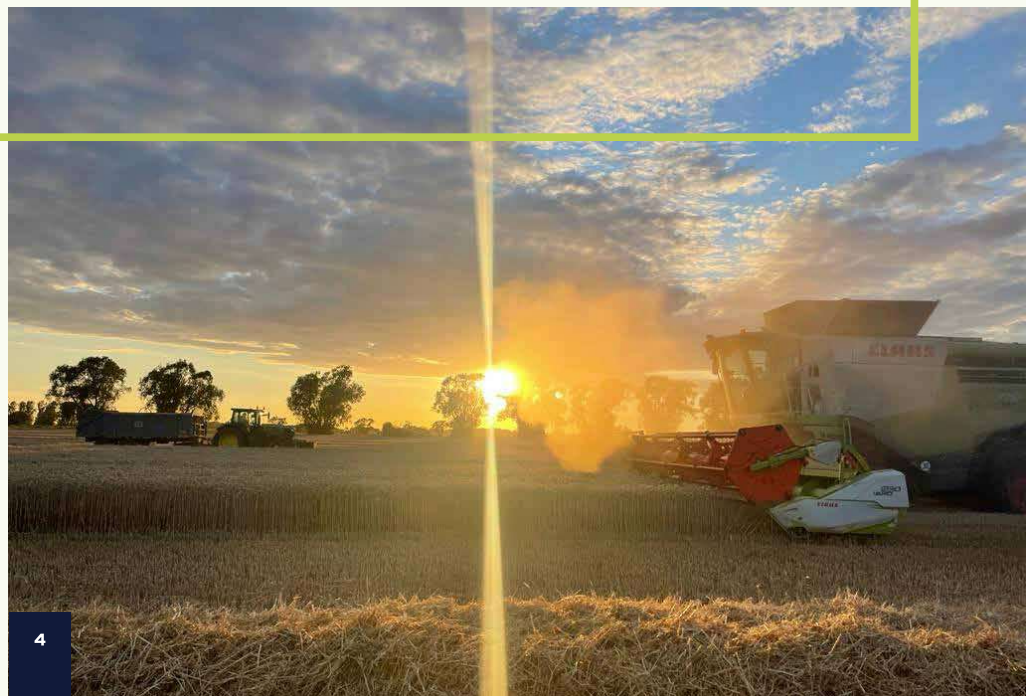


ANDERSONS EASTERN

Foreword: Fenland SOIL response to the Andersons Report

Past government sponsored research has suggested a very large range of possible measures that farmers could take to mitigate carbon emissions and soil loss from lowland peat. This prompted Fenland SOIL to commission Andersons Eastern to consider the economic implications of some of these via conceptual case studies based on real world farm situations.

Andersons Eastern's initial discussions with farmers led to a narrowing down of the potential options to be looked at in detail, since many of the original ideas put forward in previous research were deemed to be impractical or more recent empirical research has shown certain options did not deliver the originally hoped for carbon mitigation benefits. The final case study specifications also benefited from knowledge of the direction of travel being taken by the Lowland Agricultural Peat Task Force.



FOREWORD: FENLAND SOIL RESPONSE TO THE ANDERSONS REPORT

Practical Considerations

In arriving at plausible real-world scenarios to model for the case studies, the discussions between Andersons Eastern and farmers relied on farm knowledge and reasoning akin to the process developed in the Fenland SOIL farm level opportunity mapping work developed in conjunction with NIAB.

The rolling out of this approach to three IDB districts was made possible by a Defra Peatland Discovery grant. Fenland SOIL is expanding this through a Defra Paludiculture Exploration Fund grant as this type of mapping exercise is becoming recognised as best practice for identifying where and at what scale potential mitigation measures could be taken. The 'mosaic approach' allows for farmers to identify a range of possibilities depending on their relative appetite to contemplate land use change.

As the LAPTF report has made clear, the Andersons Eastern report also confirms that the main mitigation opportunities involve making the peat wetter and securing the water to do this will require major capital investment.

The availability of water is the starting point followed by the ability to direct and hold it in the landscape. As the Fens are not flat different areas will be more or less suitable with corresponding levels of complexity in the water control structures that will be needed.
Water tables and irrigation can then be managed for the desired degree of change – for existing cropping, alternative cropping, paludiculture or conservation objectives.

This suggests a pathway of the steps necessary to effectuate changes in the landscape: opportunity mapping – feasibility studies – farm level and IDB infrastructure investment coupled with revenue support.

Policy Considerations

Fenland SOIL welcomes Defra's vision to recognise the major investment required to support this pathway in its identification of the need to plan out the requirements as part of the 2024 comprehensive spending review. The swift response to set up pilot programmes in response to the LAPTF is positive but these programmes are small in relation to the overall needs of the sector.

Future grants need to be sequenced and coordinated relative to the pathway identified above. This needs to start with a full-scale roll-out of the opportunity mapping across the whole of the Fens, which could be achieved with a budget of the order of £2million.

This is a third of the budget that Defra made available following the LAPTF report and is an essential building block and pre-requisite to make the investments from the Defra ADA and EA administered grants effective. (Natural England acknowledge that the England Peat map will not provide this level of detail).

The completion of these opportunity maps will then enable farmers to look at what they might be prepared to do themselves and then see whether this can be joined up with neighbours to do either farm level, hydrological unit or catchment level feasibility studies. It will be important for government to make any new rounds of the feasibility planning grants flexible enough to deal with varying level of scale at which farmers want to act.

With feasibility plans completed it will then be possible to make detailed investment plans. These must be backed by government funded capital grant programmes that build on current agri-environment scheme capital grants, the Defra ADA administered pilot and an expansion of farm level water storage and movement infrastructure grants.

Where farmers are making changes to their cropping regimes in conjunction with these capital investments funding needs to be available to incentivise this. It is likely that this could be a combination of public and private finance.

It is evident that current agri-environment scheme incentives are too limited in their scope. Recent indications from Defra lowland peat workshops suggest that Defra thinking is not moving at sufficient pace to encompass the scale of change opportunities envisaged in the LAPTF report and examined in the Andersons Eastern case studies.

It is hoped that policymakers will take heart from the farmer-led initiative shown by Fenland SOIL in leading the development of a framework and pathway for farmers to consider change and support that change through providing the necessary scale of investment required. Fenland SOIL will welcome the opportunity to work with government to put more detail into the concepts outlined here.

Prof Tina Lorraine Barsby OBE
CEO Fenland SOIL

FENLAND SOIL

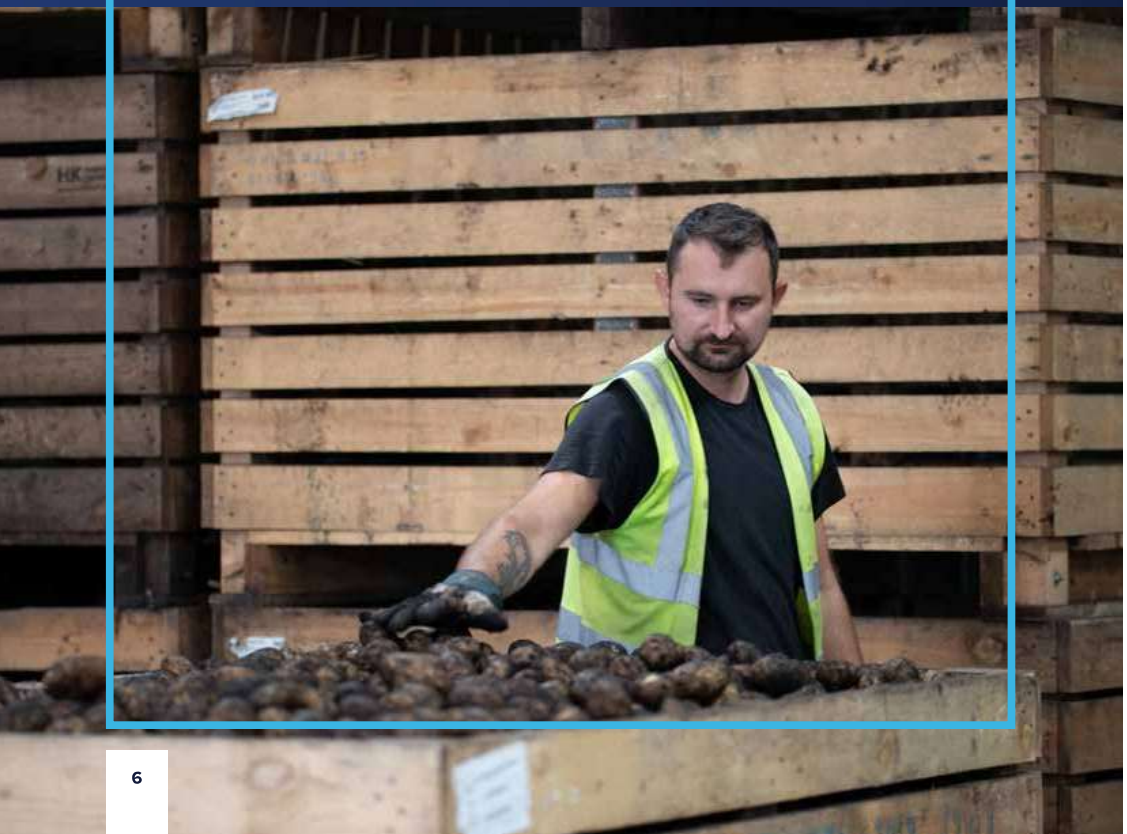
1) Introduction

This project originated from the Cambridgeshire and Peterborough Independent Commission on Climate Change Report by the Combined Authority's Climate Commission, and the subsequent Fenland SOIL Committee discussion of the need to review the economic background of the challenges facing agriculture and the related supply chain to meet carbon emission targets and mitigate the emissions arising from cultivation of peat soils.

The Committee of Fenland SOIL requested proposals from potential Consultants in January 2022.

The commissioning of this report was confirmed in February 2022, and whilst the general thrust of the study remains unchanged, the intervention of other reports, and the timing of other related announcements has influenced the detail of the structure of this report, along with the information from the initial review, and contact with the Fenland SOIL Farmer Group.

This report is necessarily a signpost to further development and study of this considerable subject.



2) Terms of Reference

2.1 The project was approved and Andersons Eastern Ltd (AEL) instructed in April 2022, and Terms of Reference (TOR) agreed.

Andersons Eastern were provided with the following Project Brief:
To assess the potential for changing farming practices to mitigate carbon and soil losses, it is necessary to understand what the possible interventions are and the impact these changes will have on farm profitability. This will then allow for discussion of the level of government support that will be required to incentivise these changes.

2.2 The Terms of Reference were updated to reflect developments principally arising from the first stage of the work, having completed Phase 1 and Phase 2, it became clear that there were a number of issues which rendered the original plan unworkable.

2.3 The fundamental issue is that of complexity, which cannot be underestimated: the fens are not level, peat depth is far from uniform, and, at present, there is no up to date mapping of where peat is and of what depth. Having reviewed the work to date in 2022, it was clear that:

2.3.1 There were few viable conventional farming options identified.

2.3.2 The Farmer Group was clear that the main solution to GHG mitigation was rewetting, but there are significant issues related to continued crop production.

2.3.3 Fen land is not level enough to give a consistent rewetting across field scale operation.

2.3.4 The ability to access adequate water is a critical concern, and present legislation relating to Drainage Board responsibilities facilitates drainage as opposed to water management.

2.3.5 The optimum water levels for the protection of deep peat do not coincide with practical crop production using existing technology and machinery: 10 cm below soil surface is recommended versus a practical operating level for present machinery of 60cm.

2.3.6 It is clear that adequate subsurface rewetting can only be practically achieved in defined hydrological areas, which allow consistent water management.

2.3.7 The mapping of the present extent of peat land is under way but has yet to cover all the areas involved. The extent of deep peat is significantly less than was the case when many currently available maps were prepared. A significant effort is required to build the mosaic of mapping to give a clear impression of the existence of peat of varying depth and quality. This is being covered by the Discovery Grant programme, an example of which can be found at Appendix 1-4.

2.3.8 Depleted peat areas represent a significant geographic area, and cropping has already changed significantly on these soils, but with pockets of intermediate and possibly deep peat mixed in. The emission level is believed to be significant, meriting the deployment of measures to assist in preserving these areas, although the effectiveness of this has yet to be established.

2.3.9 After significant discussion, and a meeting held on 18th November 2022, with representatives of the Fenland SOIL Committee, it was agreed that the final stage of the project should be redesigned to better reflect the priorities identified. It was agreed to proceed with the key revised study areas as the most practical approaches identified.

3) The Revised Study Areas

3.1 **Hydrologically Isolated Area:** Develop a case study example to identify the practicalities and outline of costs related to the creation and operation of a hydrologically isolated area. Using estimates to evaluate the works required to hydrologically isolate the area proposed. Identify the cost to rewet in order to allow crop production, and assess the economic impact in this specific example, and summarise total cost implications at an indicative level.

3.2 **Top-Down Rewetting:** Identify and investigate the cost of sprinkler systems and drip irrigation, and the infrastructure required to successfully implement systems to keep topsoil wet on deep peat. Assess the economic impact of this approach and summarise the total cost implications at an indicative level, and highlight key issues e.g., water/irrigation source.

3.3 **Non-Agricultural Rewetting:** Develop a case study example to identify areas of deep peat for biodiversity rather than agricultural purposes. Assess the income foregone and summarise the cost implications.

3.4 **Depleted Peat Measures:** Work to identify what data is available to provide a basis for the outline assessment of the likely area/carbon emissions data on carbon emissions to understand the critical considerations on depleted peat areas. Identify and cost prescriptions which may be effective, and whether there is data to support this.

4) Executive Summary

4.1 This report is intended to signpost key considerations in respect of farming on peatland, the preservation of peatland and the mitigation of carbon emissions.

4.2 It has become clear from the work done over the past eighteen months that the level of knowledge surrounding emissions from peatland, and the practical technology required to facilitate implementation of the most likely approaches to changing land management is still at a relatively low level.

4.3 The Discovery Grant Programme, undertaken by Fenland SOIL, is identifying the areas of peatland and the relative depth and extent, through mapping. This is crucial to determine priorities and cost benefit analysis.

4.4 The Drainage Boards are presently ill equipped to respond within the legal framework and there needs to be a reworking of priorities, legal powers and water charging to facilitate the measures proposed to mitigate carbon emissions.

4.5 A recognition that the areas involved will be limited in scale by virtue of topography, depth of peat, water management and availability, will be central to planning a realistic programme of intervention.

4.6 A thorough review of the detailed economic consequences at farm level is essential to the evaluation of the level of support required and the length of time the programmes will need to be in place.

4.7 The impact of policy on both food production and employment in ancillary industries has to be thoroughly investigated, by socio economic study to assess the consequences of the changes proposed and the likely results in the fenland district.

4.8 It is highly likely that project timescales involved will go well beyond any present measures, and would need to account for the longer-term changes in land use and production technology alongside the considerations of landowners and operators committing to such schemes.

4.9 The evidence to date suggests that any changes which successfully mitigate carbon emissions from peatland would lead to a significant change in cropping and farming system, with for example, the elimination of cereals and root crops. This is for a variety of practical reasons and relates to the need to rewet the peat. Accordingly it is likely that the main crops would be high value vegetable and salad crops.

4.10 The change in farming system is likely to displace production. Bearing in mind the productive capacity of Fenland Peat, particularly related to the vegetable crops still grown on deep peat, it is unlikely that suitable alternative land (with available irrigation water) could be found in the UK. The soils most likely to be capable of growing these crops would require higher inputs and significant availability of irrigation water. The displacement is highly likely to lead to further imports.

4.11 The infrastructure required for rewetting is relatively straightforward, but the provision of sufficient water to maintain the peatland in a wet condition, will lead to the requirement for substantial water storage facilities, which is likely to form the greatest part of any capital works. It will be necessary to decide how best to approach the facilitation of this through capital or revenue funding.

4.12 There are competing interests to consider in relation to the farming of Fenland Peat, including environmental imperatives to reduce carbon emissions and the maintenance of peatland ecosystems. The balance has to take in to account the considerable change that will be required and the means by which this can be successfully achieved.

10) Summary and Conclusions

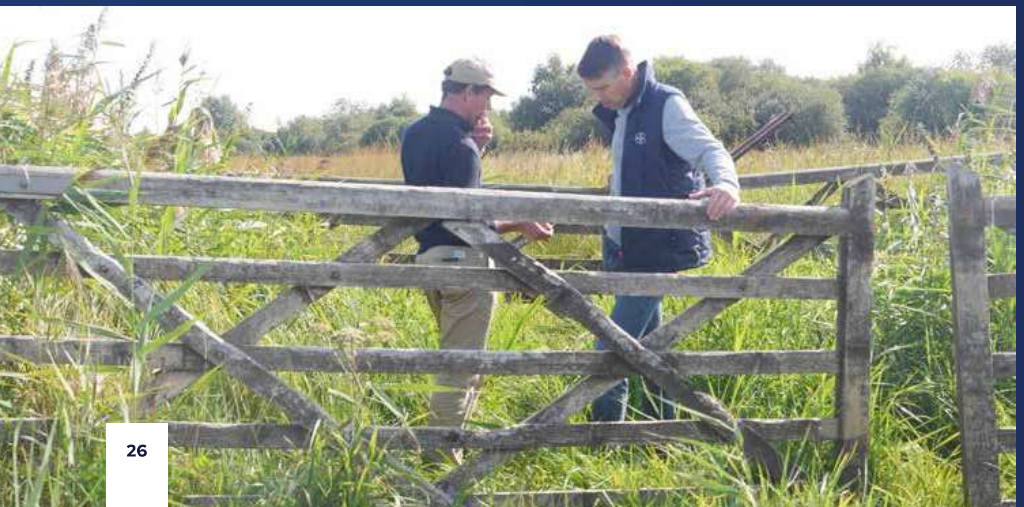
10.1 The present approach to the mitigation of peatland carbon emissions does not address the strategic criteria which should form the background of any policy in terms of a ranking of priorities, and therefore provide a clear understanding of what will or will not fulfil the criteria of successful implementation.

10.2 There are competing interests between farming the Fenland Peat, environmental imperatives to reduce carbon emissions and the maintenance of peatland ecosystems. The need for further research into the emissions status of various land types and cultivation policies stands alongside the need for socio economic study of the impact of further reduction in the production of food in the fens – both from a food supply, employment and local economy perspective.

10.3 This report has identified short, medium and long-term actions for land managers to undertake initiatives to focus on practical measures and to facilitate research to collect further data to accurately determine which mitigation measures produce the best outcomes and direct the provision of funding accordingly.

10.4 In terms of the approach to mitigation of carbon emissions, the science is still developing, particularly in respect of the emissions from different approaches to cultivation, however there is a need to understand the degree to which deep peat should be the focus of the majority of work and funding to preserve the scarcest and most carbon rich soils.

10.5 A conflict exists between continued cultivation and the proper mitigation of carbon emissions, the availability of water to assist mitigation and the present constraints on Drainage Boards. There is a vital need for priorities to be assessed and policy direction clarified, in order to assess the support levels which can be attached to the rewetting programme.



10) SUMMARY AND CONCLUSIONS

10.6 Without significant grant aid, the rewetting programme will be uneconomic at a crop production level, which would limit the uptake of this approach. In addition, there would be a requirement for a significant increase in water availability for fenland during the summer period, which highlights the need to build winter storage reservoirs to secure supply.

10.7 The nature of the actions which are likely to be carried out will give rise to truly long term projects and the need for associated funding. The land use prescriptions will require complex legal and practical consideration, and may well lead to significant constraints which some land owners may not be prepared to countenance.

10.8 There is a significant issue to consider in the rewetting of fenland soil, as between food cropping, non-food cropping or other land use, and therefore the potential displacement of food production at both farm, packhouse and ancillary industry levels.

10.9 It is not apparent that there is a straightforward alternative location for the high value cropping which would be displaced. The most likely alternative of mineral soils requires more artificial fertiliser, (with associated carbon emissions), water and associated infrastructure in order to perform, and even then, at a lower level than would have been achieved from Fenland Peat.

10.10 Displacement of production is unlikely to be practical in the UK to any significant extent bearing in mind the available productive capacity of soils, and associated irrigation water. This leads to a greater likelihood of increasing the amount of imported product.

10.11 The work that has gone in to producing this report has highlighted the need for significant further investigation and research around both the technical issues relating to the management of peat in wetter state, and the related reductions in carbon emissions. It is expected that this will add to the debate and further development of understanding in respect of the challenges facing Fenland Peat.