



Delivering for Britain

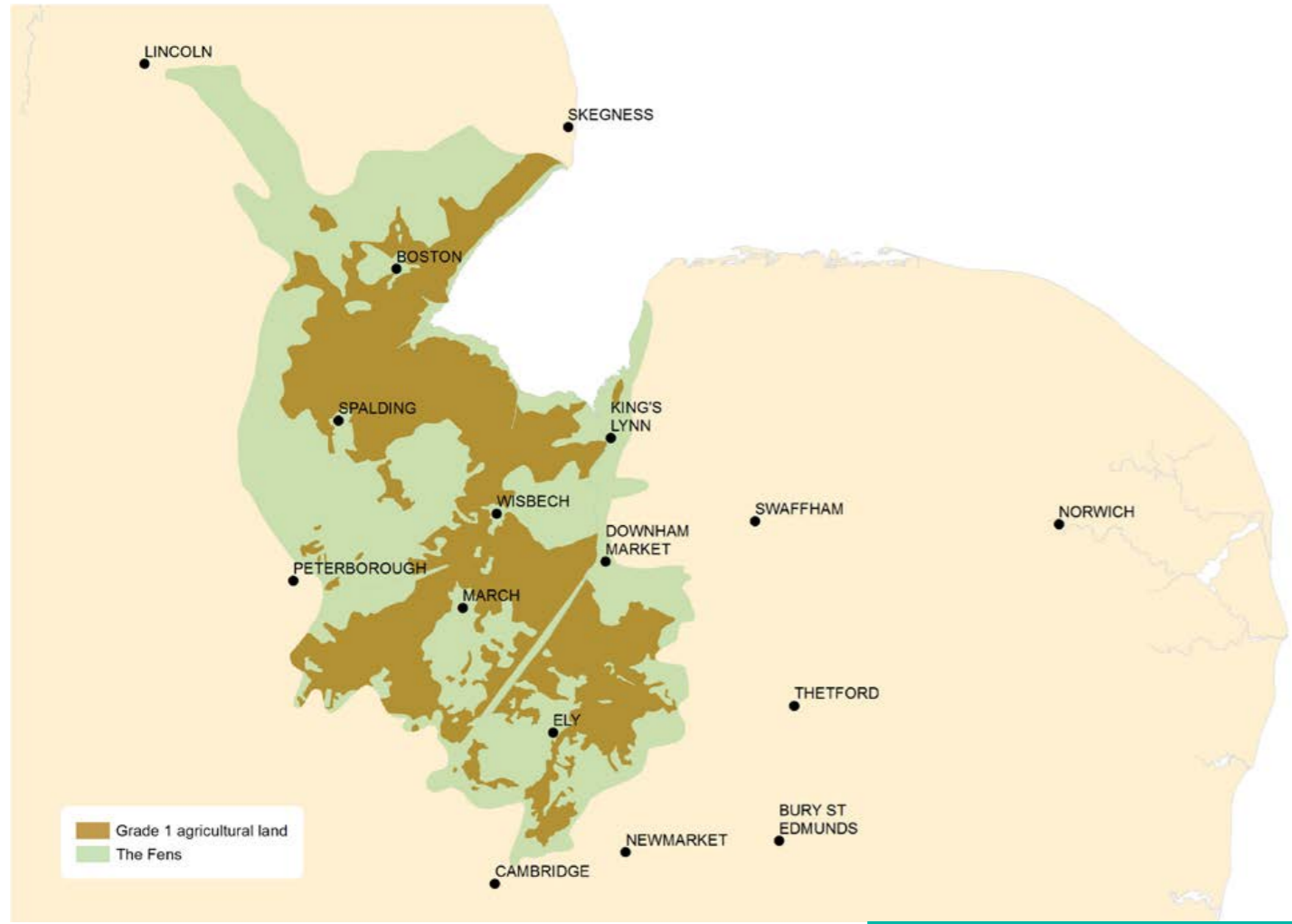
Food and farming in the Fens



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The Fens - a powerhouse of British food and farming



Map by Naomi Stevenson, Natural England

Food and farming in the Fens has been delivering for Britain for hundreds of years. It was the prize of farming its fertile soils that first led to the Fens being drained, transforming it into the powerhouse of productive agriculture and horticulture it is today.

The Fens begins its life in the surrounding 'uplands' where four rivers – the Witham, Welland, Nene and Ouse – start their journeys. These rivers carry water from the uplands and surrounding areas down through the Fens and into the Wash.

The Fens, as we know it now, started to take shape in the 17th century, when drainage of the wetlands began in earnest. It was

systematically drained under the supervision of Dutch engineer Cornelius Vermuyden.

The drainage changed the Fens from a series of wetlands, which provided fish and waterfowl for the local population, plus living space on higher ground, to a place where its high quality soils could be used for farming.

This report highlights the huge contribution Fenland farming makes to Britain today. It outlines how the farmers who live and work here can meet the challenge of producing more food for a growing population, while minimising disruption to, and enhancing, this unique and treasured environment. And it sets out the role Government and local policymakers need to fulfil to enable this to happen.

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Why the Fens delivers for Britain

By East Anglian farmer and television presenter **Jimmy Doherty**



A major food revolution is underway in Britain, with people increasingly making the connection between what they eat and who produces it.

As a farmer and food fanatic, it's a passion of mine to spread the word about the relentless hard work put in by farmers across this country to help serve up safe, affordable and traceable food, while conserving our stunning natural landscape for future generations.

The Fens plays an enormous role in all of this. It's the engine room of British agriculture and horticulture, and a unique farming hub.

Blessed with superb, nutrient-rich soil, which helps us grow and sustain an abundance of high quality produce that is the envy of the world, the Fens provides everyone from top restaurants and supermarkets to home cooks with the best possible raw ingredients for their dishes.

Modern-day Fen farmers are cultivating what the Romans realised was a vital, food-growing centre of their empire, centuries before the great engineer Vermuyden made it one of the most productive farmlands on the planet.

And they're helping to conserve the rich heritage of birds, fish, insects and flowers by working with nature in a sustainable way, as well as producing family favourites like vegetables, salad, chips and crisps and boosting the local economy as employers.

The Fens is a crucial chapter in the British food story. Its work must be allowed to carry on, not just for now, but for the future.

Food and farming in the Fens

‘THE FOOD CHAIN EMPLOYS 80,000 PEOPLE AND GENERATES MORE THAN £3 BILLION A YEAR FOR THE FENS’ ECONOMY’

The Fens is the beating heart of British food and farming. Although it covers less than 4% of England’s farmed area, the Fens produces more than 7% of England’s total agricultural production, worth a staggering £1.23 billion.

The whole food chain, from farm to fork, employs 80,000 people – equivalent to the population of Peterborough – and generates more than £3 billion a year for the Fens’ economy.

The Fens is often referred to as the breadbasket of Britain, due to the amount of cereal crops grown here. However, it is also the linchpin of vegetable, salad, flowers and bulb production.

CROPS PRODUCED HERE INCLUDE:

- One third of England’s fresh vegetables
- One fifth of England’s potatoes
- More than one fifth of England’s flowers and bulbs
- One fifth of England’s sugar beet
- A significant percentage of the country’s cereal, oilseed rape and protein crops.

The Fens is famous for its celery production, which has protected name status, and more than half of the beetroot grown in the UK is produced here. In addition, all of the farmers growing mustard for Colman’s English Mustard are in the Fens.



Harvesting potatoes in the Fens.

All of this is built on the foundation of England's most productive farmland, including about half the grade 1 soil nationally. Overall, nearly 90% of the farmland in the Fens is either grade 1 or 2.

There are significant pig and poultry businesses within the Fens and cattle and sheep play an important role in maintaining traditional Fen landscapes. These include the Nene and Ouse Washes and recreated landscapes such as the Great Fen, Wicken Fen and Willow Tree Fen.

Alongside the 13,400 people employed directly on farms, the supply chain generates additional economic value and supports jobs in areas from machinery manufacturers to livestock feed companies and a wide range of allied trades.

Farm produce underpins two key sectors – the commercial food chain (processing, packaging and distribution) and food retailing and catering.

The Fens has the largest fresh produce logistics hub in the UK and a large and sophisticated commercial food chain, closely linked to its strong farm production base. This sector employs 26,040 staff, and generates £1.63 billion for the economy (expressed as Gross Value Added, GVA).

The combined agriculture and food chain employs nearly 44,000 staff, producing £2.3

THE FOOD CHAIN IN THE FENS		
Stage of chain	Employees	GVA £m
Agriculture	13,414	432
Agricultural supply industry	2,968	170
Professional services	1,288	49
The commercial food chain	26,040	1,634
Food retailing and catering	36,000	800
Total	79,710	3,085

The food chain, from farm to fork, employs 80,000 people and generates more than £3 billion for the Fens economy. (Compiled by Collision & Associates for NFU).

billion for the economy. Retailing and catering is worth an additional £800 million and employs an estimated 36,000 staff.

Adding to the Fens' strategic importance, it is home to national industry bodies in Peterborough including AIC (Agricultural Industries Confederation) and the AEA (Agricultural Engineers Association).

The southern end of the Fens includes

Cambridge, which hosts the headquarters of research organisation NIAB and a rapidly expanding range of food chain related research and agri-tech start-up businesses, as well as established multinational input suppliers.

The National Centre for Food Manufacturing, the UK's largest provider of education for the food chain, is based in Holbeach, as part of the University of Lincoln.

Water and farming in the Fens

Growers of crops including potatoes, vegetables, flowers and fruit are dependent on access to water to sustain the Fens' hugely important irrigated crops sector.

More than one fifth of England's water-intensive crops are grown in the Fens, worth £750 million (see table).

Not all crops are routinely irrigated but, without access to secure water supplies, growers are likely to relocate their businesses elsewhere, probably overseas, given the lack of suitable alternative sites in the UK.

This would have major economic impacts for the Fens, the national food chain and the rural economy.

The agricultural drought of 2018 highlighted this vulnerability, with restrictions and irrigation bans coming into force in parts of the Fens, including the Middle Level.

In its lessons learnt document, drawn up after the drought, the NFU called for several measures to help ensure growers can access water for food.

WATER INTENSIVE CROPPING IN THE FENS		
Crop	% of England	2016 £m
Potatoes	20%	112
Sugar beet	20%	30
Vegetables	32.8%	357
Plants and flowers	21.4%	232
Fruit	3.1%	19
Total crop output	21.5%	750

(Figures from Collision & Associates, based on Defra farm survey statistics)

These include:

- contingency planning among farmers to better understand the risks of water supply disruption and how to manage them
- long-term, multi-sector collaborative plans for managing water scarcity in food-production centres such as the Fens
- Deliver maximum and timely flexibility in the application of water abstraction rules. The NFU would also like to see incentives, through the tax system, to encourage investment in farm reservoirs and water efficiency measures.

CASE STUDY

PRINCES LTD AT WISBECH AND LONG SUTTON

Princes sources and manufactures high quality food and drink and is a supplier of private label products to supermarkets in the UK and across the world.

In addition, it supplies millions of UK shoppers with branded products every week.

With large production facilities at Wisbech and at Long Sutton, Princes is a large purchaser of some locally grown Fenland products. For example, it buys around 5,000 tonnes of its total requirement of garden peas from Fenland growers for production of Batchelors brand (produced under licence from Premier Foods) and own label for all the major UK retailers.

The peas supplied from Fenland growers equate to approximately 2,250 acres of farmland, harvested as part of a 24/7 operation during the summer season.

At Long Sutton, around 37 million cans of garden peas are produced. Up to five million of these can be produced in a single week during the season.



Quality assessment of peas at Princes' Long Sutton site before they are released for sale.

Charlie Stowe, Senior Buyer for Princes, said: "We are proud to support British farmers and the success of our products depends on our suppliers' passion for the crops they produce and their dedication to exceptional quality. "Princes will always try to support farms from which we source ingredients

and we're proud to have long-standing and successful relationships across Fenland."

Significant investment at both East Anglian sites has already, and will continue to, increase capability and capacity overall, which will lead to wider economic benefits for the region.



Irrigating salad crops in the Lincolnshire Fens.



A view of the Fens near Thorney.

rivers and waterways in the Fens is mostly either good or moderate. Water quality is improving, through factors including technological improvements and the Catchment Sensitive Farming initiative.⁴

Initiatives to boost productivity, while protecting and enhancing the environment, are being developed with the help of Championing the Farmed Environment (CFE), the RSPB, and farmer-led nature friendly farming groups.

Farming in an area so vulnerable to climate change, farmers are committed to greater action to help achieve the NFU's ambition of net zero agriculture by 2040.

The Fens is already a major centre for renewable energy, providing the ideal landscape for solar energy generation, onshore wind farms and a growing number of anaerobic digestion plants.

It is also home to the UK's first straw-fuelled power station, near Ely, which converts straw and miscanthus into electricity.

Government figures show that, at the end of 2017, solar and wind had a combined installed capacity of 1,111 MW in the Fens.⁵ This provides enough energy annually to power the equivalent of 428,000 homes, a city the size of Birmingham.⁶



THE FENS IS ALREADY A MAJOR CENTRE FOR RENEWABLE ENERGY

Delivering for the environment in the Fens

Alongside food and horticultural production, farmers in the Fens play a vital role in managing, protecting and enhancing its unique and fragile environment.

The Fens is internationally recognised for its biodiversity. A recent biodiversity audit identified more than 13,000 different species here, including 1,932 priority species.¹

Areas of the Fens have been designated as Special Areas of Conservation and Special Protection Areas because of their importance for species including the spined loach, a freshwater fish threatened in the UK.

The Fens also includes the Wash coastline, which covers more than 153,000 acres and is one of the most outstanding coastal wetlands in Europe. Together with the Nene and Ouse Washes, these Fenland habitats provide a key staging post for a myriad of migrant wildfowl and wading bird species.

These habitats are protected by livestock farmers who graze cattle and sheep, reducing the height and increasing the diversity of vegetation to the benefit of birds and other wildlife. Migrating birds such as Bewick's swans also feed on sugar beet tops and small potatoes left in fields after harvest.

Across the Fens, farmers look after hundreds of miles of ditches, providing important habitats for aquatic life, invertebrates, birds, mammals and rare flora and fauna.

These include the water vole, a species in long-term decline across the UK but which, having found the perfect refuge in the ditches that

criss-cross this farmland, is staging a significant recovery in the Fens.

A 2015 survey found stable numbers in the Middle Level. Researchers concluded that ditch maintenance by internal drainage boards was critical for water voles.²

Another threatened species making a comeback is the common crane, which until recently had not bred in the UK for over four centuries. In 2016, the Cambridgeshire Fens had a recorded population of eight pairs and seven young at locations including RSPB reserves at the Nene Washes and Lakenheath Fen.³

Water quality is an essential component of a healthy ecosystem. Steps to protect ditches and other waterways from excess nitrates, phosphates and pesticides in the Fens include buffer zones to reduce the risk of contamination from farming operations.

According to the Anglian River Basin Management Plan, the ecological status of

MORE THAN 13,000 DIFFERENT SPECIES ARE FOUND IN THE FENS

CASE STUDY THE ELY NATURE-FRIENDLY FARMING ZONE

Neighbouring Fen farmers are working together to ensure that farming is environmentally sustainable, delivering landscape-scale improvements as well as being productive and profitable.

A group of 22 farmers has formed the Ely Nature-Friendly Farming Zone. The farmers are committed to enhancing the environment within the farmed landscape, while producing good quality, healthy, sustainable food.

They do this by pooling their collective knowledge and expertise, helping to restore lost farmland wildlife across a wide area of the Fens, and by promoting the initiative to the public and fellow farmers.

To qualify for membership, a farm must dedicate at least 3% of its area for birds, bees and wildlife. Most of the current members have much more in place, with up to 25% of some farms dedicated to conservation agriculture.

That already accounts for more than 400 acres of winter wild bird

seed, 285 acres of pollen and nectar strips, hundreds of bird boxes, nearly 31 miles of hedges and many newly created ponds, scrapes and reed beds.

One of the farmers involved is Tom Clarke, who took over his family's farm business in 2009.

He said: "Many farmers are already doing a lot for the environment, but to really make a difference within the Fenland landscape we need to work together. It is fairly straightforward to make a big difference by each of us making small changes, and by promoting and spreading our approach.

"The typical stereotype of the Fens, and farming in the Fens, is of flat, 'boring' fields, intensively farmed with no room for wildlife. It is up to us to show the public and other farmers otherwise, and demonstrate that farming can, and must, go hand in hand with enhancing nature."





Planting little gem lettuces in the Fens.



Managing soils in the Fens

It was the prospect of farming the Fens' nutrient-rich soils that led to the area being drained centuries ago and turned it into the centre of food production that it has become.

These rich, fertile calcareous and silty soils over the coastal and central Fens, and the dark Fen peat further inland, provide an excellent resource to nurture high value crops.¹

The Fens is the largest contiguous area of lowland peat in the UK and lowland peatland is one of the most carbon-rich ecosystems in the country.²

The past use of peatland for improved pasture, arable and horticultural production has led to losses of this valuable peat resource.

But modern farming systems are evolving to better manage peat and optimise the potential of varying grades and classes of soil, including skirt, silt and clay soils.

Vegetation cover provides good mitigation for wind-blown soil losses. To safeguard peat resources and high value vegetable crops, farmers have planted tree shelter belts around fields and are utilising cover crops.

Cover crops are non-harvested crops grown for the purpose of protecting and enriching soil between periods of regular crop production. They can help add organic matter to the soil, reduce erosion and run-off in otherwise bare soil, conserve soil moisture and protect water quality.

There is also increasing interest in, and

adoption of, soil conservation practices such as minimum and no-till technology, subterranean irrigation and precision farming, which uses machinery guided by satellite technology.

While Defra research has established that lowland peats in England and Wales are large sources of greenhouse gas emissions, it concludes that major emissions reductions appear achievable through changing the management of agricultural peatlands.³

In 2019, the Government is due to publish an England peat strategy, which will set out a 25 year plan for improving the condition of peatlands. Farmers are already demonstrating the building blocks of the new land management techniques required to achieve these goals.

CASE STUDY

WHITTLESEY FARMER PHILIP BRADSHAW



No-till farming prepares the land for crops without mechanically disturbing the soil.

One Fenland farmer using this system is Philip Bradshaw, a Cambridgeshire County Council farms tenant at Whittlesey. After investigating the concept for several years, he bought a new direct drill in 2016 with the help of a Rural Development Programme LEADER grant.

The machinery arrived in time for autumn drilling, heralding a new system of almost no cultivation on his arable farm.

There were some initial challenges, including slug control, but the benefits have included productivity savings in time, fuel and machinery wear.

Environmental benefits include reduced greenhouse gas emissions and the farm's worm population is increasing. Mr Bradshaw has identified five different worm species that are helping to improve the soil.

He accepts that no-till cultivation is not suitable for every farm business, or every crop, but he is continuing with the system. He hopes to see increasing crop yields in the future, alongside cost savings and soil improvements.

CASE STUDY

CHARLES SHROPSHIRE, G'S

G's is an international family business established by Guy Shropshire in 1952 with just 100 acres, which now employs more than 7,000 people in peak season and farms 45,000 acres across Europe and west Africa.

Its head office is at Barway near Soham and the Fens is integral to its farming operations.

The business grows a wide range of crops including lettuce, spring and bulb onions, leafy salads, celery, radish, beetroot, organic salads and vegetables and potatoes.

It also operates a 3MW anaerobic digestion plant, fed by crops including locally-grown maize.

Third-generation farmer Charles Shropshire said the business was taking a whole-farm approach, looking at how to farm more productively while also managing soils and the environment.

The business employs a full-time sustainability manager and works closely with conservation groups such as the RSPB and research organisations including NIAB. Employees also attend national

and international workshops to learn more and share best practice.

It is using drones and other new technology to help it understand the varying soil structures around the Fens, which can include peat, silt, sand and clay. Soil tests for macro and micro nutrients are undertaken and an in-depth soil management plan is being produced for each field.

Techniques employed include cover crops, managing water levels and applying the liquid digestate from the AD plant back onto the land. The less productive areas of farmland are put into environmental measures.

Trickle irrigation has been introduced for celery, potatoes and



Third generations farmer Charles Shropshire.

lettuce production and this has produced up to 50% savings in water usage.

Charles said: "We are here to farm. Our primary job is to produce crops and progressive farm management will be at the forefront of what we do."

"Our main aim is to become far less dependent on agrochemicals and fertiliser."

The Fens: Delivering for Britain



500,000
PEOPLE LIVE IN THE FENS


80,000
PEOPLE ARE EMPLOYED,
FROM FARM TO FORK,
WITHIN THE FENS




£3.1 billion
THE VALUE OF THE FOOD
CHAIN IN THE FENS




21%
OF ENGLAND'S BULBS
AND FLOWERS ARE
GROWN IN THE FENS



3,800 miles
OF WATERCOURSES
ARE MAINTAINED BY
INTERNAL DRAINAGE
BOARDS


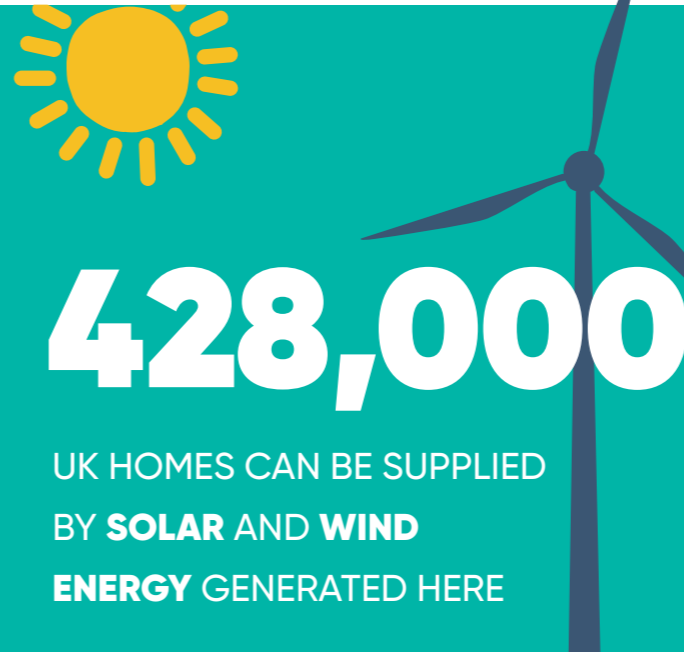


286
PUMPING STATIONS PROTECT
THE FENS FROM FLOODING




33%
OF ENGLAND'S FRESH
VEGETABLES ARE GROWN HERE

90%
OF FENS' FARMLAND IS
GRADE 1 OR 2

428,000
UK HOMES CAN BE SUPPLIED
BY **SOLAR** AND **WIND**
ENERGY GENERATED HERE

13,000
DIFFERENT ANIMAL AND
PLANT SPECIES ARE
FOUND IN THE FENS



Promoting the Fens

Tourism plays an increasingly important role in the life of the Fens, providing leisure and recreational activities for millions of visitors each year and a vital contribution to the rural economy.

People come to enjoy its market towns, iconic landmarks such as Ely Cathedral, but also its breath-taking countryside, wildlife and the local food and drink produced here.

Farmers manage and protect many of the areas that are so popular with tourists. They have also diversified their businesses to provide leisure activities, retail opportunities and visitor accommodation.

Figures for the economic value of tourism relating specifically to the Fens are difficult to find. However, according to the 2012 report *Fens for the Future*, Lincolnshire tourism was responsible for £972 million of local spending in 2009, supporting 17,175 FTE (full-time equivalent) jobs.¹

In Cambridgeshire, including Peterborough, in 2010 total tourism value was almost £1.9 billion, with 18,131 FTE jobs.

A 2016 report by the Greater Lincolnshire Nature Partnership looked at the value of nature-related tourism. It estimated the potential value of all countryside-based recreation and leisure across Greater Lincolnshire at £325 million.²

The report states: "Locally-sourced food, including foods and recipes based on traditional crops and farming practices, is important to visitors to Lincolnshire now and will continue to grow in importance in years to come."

Waterways are an integral part of the Fenland landscape and an ambitious project is under way to maximise their tourism potential. The Fens Waterways Link aims to connect more than 150 miles of waterways, linking up the cathedral cities of Ely, Peterborough and Lincoln with Boston, Spalding, Crowland, Thorney and Ramsey.

New locks will be constructed, drains opened up to navigation and canals cut. The opening of Boston Lock in 2009 marked the completion of phase one, with phase two and three set to improve connections with the South Forty Foot Drain.

More is also being done to cater for the walkers who come to the 'big sky country' to enjoy the dramatic landscape, unique character of the Fens and its easy accessibility.

The Fens Edge Trail is a project from the Cambridgeshire Geological Society that aims to provide a walking route around the Cambridgeshire Fens, roughly following the land that lies five metres above sea level. It is designed to link the landscape of the Fen Edge to the local geology, history, culture and wildlife.³

Natural England's Natural Character Area profile of the Fens states that access to wildlife is of major importance for recreation and tourism.⁴

CASE STUDY AN AMAZING FARM ATTRACTION

One farming business that has recognised the value of tourism is Skylark Events, part of a farm enterprise at Wimblington in Cambridgeshire, owned and operated by the Gowler family.

In 2005 they grew one of the UK's first maize mazes on a 12-acre site, making it one of the largest in East Anglia at the time. The maze, based on the outline of a JCB digger, proved a huge success, both with young children and adults.

Since then they have continued to develop the leisure side of the business, with more complex maze designs and additional attractions such as a go-kart track, inflatables and new tractor rides, operating alongside their farm shop and restaurant.

They have also extended their season by including events themed around Halloween and a Santa's Grotto and now have more than 15,000 visitors a year.



Pick-your-own potatoes at Park Farm, Thorney.



Farmers near Peterborough are also building on the public's interest in Fenland food and farming with an annual Open Farm and Vintage Weekend at Park Farm, Thorney in June. Farmer Michael Sly works with local farmers on the annual free event, held as part of LEAF's national Open Farm Sunday initiative.

Alongside other activities such as pick-your-own potatoes, visitors are taken on a farm safari to find out about the crops grown and the environmental measures in place on the farm. More than 65,000 people have visited the event since it started in 2006.



The maize maze at Skylark.



The G's display at Ely Cathedral Harvest Festival 2018.



Supporting communities in the Fens

Alongside producing quality food and plants, and managing the environment, farm businesses play a central role in community life within the Fens.

Their involvement includes donating surplus produce to food charities, holding free open days to promote food and farming, and forging links with local schools. And, when communities come under pressure, farmers are there to help.

One example is TH Clements, a business that has been farming high quality vegetables within a 30 mile radius of Boston for more than 50 years. When the 'beast from the east' struck in 2018, the company played a fundamental role in overcoming the chaos that was caused as the country came to a halt.

Harvest manager Andy Blair said: "The high wind speeds and snowfall meant there was a lot of drift on roads in the surrounding areas to our base. We realised some of our 400 workers would not make it into work without additional help.

"Because we are committed to supplying our produce, and this is reliant on our workforce, we sent out fleets of our 4x4 vehicles to collect staff and help any struggling members of the public en route too.

"We achieved 70% of staff numbers on the worst few days of the beast from the east through these efforts, which allowed us to meet demand despite the very challenging circumstances."

But that isn't where the hard work of TH Clements ended.

Andy said: "We realised the roads were in a bad way and there were many abandoned cars.

"We made the decision to send out snow ploughs, loaders and teleporters from 6am for most of the second day to help the local community who couldn't get home.

"We also called the police to let them know if they needed additional resource and help we could provide this. This offer was taken up when we received a call asking for an ambulance escort, as well as rescuing stranded police cars."

As a result of its hard work in the treacherous conditions, the public nominated TH Clements for a Snow Heroes Award, where it was placed as runner up.

"In times like these the community really has to come together and farmers are equipped, willing and able to help in some way, shape or form," said Andy.



Protecting the Fens



Ever since the first attempts to drain the Fens a millennium ago, there has been an ongoing battle to protect its soils from sea and river flooding.

To maintain water levels in the Fens, and mitigate the risk of flooding, water must be pumped into the rivers and out into the Wash.

The watercourses and pumps are maintained by internal drainage boards (IDBs). Members of each board include elected farmers and local councillors, who represent the interests of people living and working in the Fens.

The Fens is home to 500,000 people and covers an area of almost 1,500 square miles, encompassing 12 districts, four counties and 11 groups of IDBs.¹ The IDBs maintain 3,800 miles of watercourses and 286 pumping stations with a combined capacity to pump the equivalent of 16,700 Olympic swimming pools of water in 24 hours.

The Fens is well protected, with more than 60 miles of coastal sea banks and 96 miles of fluvial embankments. However, climate change poses a serious threat.

Predictions of sea level rises of up to one metre by 2080, together with an increase in



The Wrangle sea defences protect Lincolnshire homes and farmland.

the frequency and intensity of storm surge events, mean it is crucial flood defences are both maintained and improved.

One major piece of work to Fenland sea banks is at Wrangle, where these defences were damaged and breached in the storm surge of December 2013. Since then, four miles of sea

bank have been strengthened and raised to a height of seven metres.

At Boston, work is in progress to raise the banks of the River Witham, currently at 6.1 metres to 6.5 metres, and install a barrier to protect the town in a tidal surge event. This is designed to cope with future climate change.

The Environment Agency's assessment differs, depending on the coastline in question. The 6.5 metre banks will suffice for the next 40 years of climate change in some locations but not others, where better protection will be necessary.

The question is who pays for this vital work? No individuals or businesses, apart from port authorities, have the money to part-fund flood or coastal defence work, but government support is inadequate.

The HS2 rail project will get full government funding, with a benefit-to-cost ratio of 1.5 to one. Yet major flood defence projects get very limited funding, even if their return is 20 to one.

Agricultural land and production is also undervalued within the calculations used to work out the benefit-to-cost ratios of capital projects. Therefore, agricultural land is not given the priority it should receive when assessing how much government funding can be spent on Fenland sea and fluvial defences.

If farmland is flooded from the sea it will be out of production for at least five years because of the effect of salt. Freshwater flooding will damage crops if they are underwater for a week or more.

To get the resources required to properly protect the Fens we need to change the way

farming and the coast is looked at in the calculations of benefits from undertaking fluvial and coastal defence work.

Decisions to invest in flood defences should be based on the true value of the assets produced and the supply chains they support. The NFU is involved in Environment Agency-led discussions on developing a long term funding strategy for future Fenland flood defences.

We also need to use the most economical way of strengthening the defences, by utilising local contractors and locally-sourced material wherever possible.

CASE STUDY

STAFFORD PROCTOR OF PROCTOR BROTHERS



This 5.4km-long buffer to hold back tidal surges from the North Sea was bolstered using 50 acres of quality arable land to widen it, with its height increased from 6 metres to 7 metres, at a cost of £1.8 million.

The project was led by the Witham Fourth Internal Drainage Board and involved a wide array of partners.

"The amount of people and infrastructure we are protecting in the Fens is considerable," Stafford said.

"That's 500,000 people, their homes, rural communities, villages and towns, businesses and road and rail infrastructure. There's considerable renewable energy generation that is within the internal drainage board district too.

"And, of course, we are the major centre for food production in the UK. It is vital for our food supply and the employment this brings."

Stafford Proctor's family has been farming in Long Sutton, Sutton Bridge and Wisbech since the 1840s. He grows potatoes, oilseed rape, wheat, pulses, sugar beet, mustard and vegetables.

The sense of camaraderie among farmers in this part of the Fens is well established, and a group of them cooperate in storage, marketing and purchasing.

And with his land's proximity to the Wash, Stafford is also heavily involved

in the Wash Frontages Group. The team promotes and encourages improvements to the coastal and river flood defences around the Wash to protect people, towns, businesses, farming and food production.

Its biggest project to date is the Wrangle Sea Bank. This is the first major improvement to sea defences in more than 30 years, made even more crucial in light of the devastating flooding around the Wash in 2013.

THE SENSE OF CAMARADERIE AMONG FARMERS IN THIS PART OF THE FENS IS WELL ESTABLISHED



A thriving future for the Fens

"Farming is a forward looking and progressive industry that has always been an early adopter of technology. As the world's population continues to grow, ways have to be found to produce more food on the same amount of land, while reducing farming's environmental footprint."

NFU President Minette Batters, The Future of Food 2040

The overall challenge for the Fens is to produce more food for a growing population, while minimising disruption to, and enhancing, the environment.

It is predicted that, over the next 35 years, there will be an additional two billion people on the planet. Diets are also changing, with individuals' calorific intake increasing. One recent report claimed the world could be facing a 214 trillion calorie deficit by 2027.¹

How can this challenge be achieved against a background of climate change, increasing population and a new agricultural policy for the UK? The answer lies with the next generation.

The future of the agricultural industry is reliant on young, pioneering, forward thinking

individuals who can take the reins and maximise innovation, technology and efficiency.

Agriculture today is a high-tech industry. The past few decades have seen unprecedented advancements, introducing drones to aid soil mapping, GPS to guide tractors, robots in pack houses and data sharing platforms that boost cross-industry efficiency.

Data is key to the future. Machinery distributors, input manufacturers, seed breeders and other firms are developing sophisticated software packages that provide informed analytics to improve the final product.

And these advancements are set to continue. Research centres based in the Fens are leading the way by delving into new resilient crop varieties and techniques that will produce

more food with fewer resources in the face of extreme weather.

But whatever technological advances are made, Fen farmers will always need people with the right skills and abilities to drive their businesses forward.

A new crop of farmers are armed with skills in IT, data analysis, land agency, agronomy and employment law to prepare for their careers. This is why it is vital that government policy encourages investment in future technology, skills and training.

These farmers of tomorrow must also have access to affordable housing, close to their place of work, along with improved transport and communication links to address issues around social and economic isolation in rural areas.

CASE STUDY

CAMILLA STACEY AND WILL VEAL

Camilla Stacey and Will Veal are next-generation farmers looking to build a new farm business in the Fens.

The couple took over a 300 acre Cambridgeshire County Council tenancy at Doddington near March in October 2016. They also rent land nearby, farming a total of 400 acres.

They grow feed wheat, sugar beet and oilseed rape and also have a flock of 30 breeding ewes plus lambs. The farm is in a Countryside Stewardship scheme as well.

Both are holding down other jobs within agriculture while they grow the business. Camilla, 26, is self-employed, working for other farmers, while Will, 29, works with his father, Edward Veal.

"Without the council-owned lease we would be struggling to farm in our own right. This is what these holdings are brilliant for," said Camilla.

"At the moment we're working for other people and farming here in the evenings and at weekends.

"The first year was very hard and we just had to cut back on things. You have to sacrifice your spending on leisure activities and build up slowly."

The couple are on a five year tenancy but are hoping to move on to



a longer-term agreement to increase their security of tenure.

Will explained that they were hoping to grow the business by renting additional land and investing in more farm machinery. They are keen to make the most of new

technology and have bought a drone to carry out aerial surveys of the crops.

They are also looking to grow stubble turnips to try and control blackgrass and provide a source of food for their sheep over the winter.

CASE STUDY

THE LINCOLN INSTITUTE FOR AGRI-FOOD TECHNOLOGY



Dr Iain Gould, a soil scientist at LIAT, teaching short-course students

Academics and farmers are joining forces to tackle the challenges that the agri-sector faces.

One example is the work undertaken at the Lincoln Institute for Agri-food Technology (LIAT), part of the Riseholme campus at the University of Lincoln.

Its key objective is to work with industry to undertake crucial research and introduce a successful knowledge exchange programme. There is a clear focus on improving productivity, efficiency and sustainability through innovation.

The Saline Farming Project aims to provide solutions to the threat climate change poses to the North Sea region. The research looks towards the sustainable production of food by maximising land that has the potential to grow saline-tolerant crops.

Natural flood management is another area high on the agenda for Riseholme to tackle, including encouraging water transfer from land back to aquifers or storage in the landscape.

Research being undertaken at Lincoln is at the forefront of automation and robotic research. It has secured funding to develop robots for the soft fruit sector, creating a 24/7 labour pool.

Professor Simon Pearson, director of LIAT, said: "The future will change the landscape of the Fens.

"We will see more energy crops, as this provides a sustainable income, more contract farming and livestock in rotations. We may see increased biodiversity and agroforestry, but the Fens is resilient."

CASE STUDY

NIAB AND THE CAMBRIDGE CENTRE FOR CROP SCIENCE

NIAB has been helping to feed the planet, through crop science innovation, for 100 years from its base in the heart of Cambridgeshire. It provides world class research, information and advice to support the sustainable intensification of crop production through improved genetics, precision agronomy and digital tools to support decision making.

Technical director Bill Clark said: "A central objective for us is to bridge the gap between the basic understanding of plant genetics and the ability to apply that knowledge in practice. We

only engage in research that we feel will provide beneficial impact."

NIAB's large farmer and industry membership base allows for efficient communication from research to action. It works on more than 100 farms in the Fens alone.

Part of NIAB's research focuses on creating genetic diversity in modern wheat, with the ultimate goal of breaking the current yield plateau.

Mr Clark said: "There have been drastic improvements and breakthroughs in yields in the past but we are ready for the next step change.

"Some of the highest yielding wheat in the world can be found in the Fens. The land has enormous potential."

NIAB's pre-breeding platform has recently accelerated genetic advances in wheat, including ground-breaking research into re-synthesised wheat.

It is also working to combat the impact of climate change on crops, posed by extreme weather patterns and new pest or pathogen populations thriving in new climates.

Collaboration is essential to overcome the stiff challenges farming

faces and NIAB is serious about strengthening it through investment.

One example is an exciting initiative with the University of Cambridge. They have formed a joint initiative, 3CS, the Cambridge Centre for Crop Science, opening in 2020.

Led by a professor in crop science, the centre will house senior academics, PhD and postdoc students and NIAB plant breeders and geneticists, all working in unison to generate new ways to grow crops for food, fuel, industrial feedstocks and pharmaceuticals.





What's needed now for the Fens

The NFU calls for the following actions to secure a successful and sustainable future for the Fens:

Plan

- Develop policies that support the sustainable growth and productivity of profitable food and farming businesses
- Develop long-term collaborative approaches to managing water availability and flood and coastal risk management that prioritises farmers and food manufacturing
- Decisions should be made at local and catchment level
- Develop best practice in the management of soil and water to maximise the resources available and adapt to climate change
- Develop policies that support and encourage investment in new technology, skills and training
- Develop and fund affordable housing provision throughout the Fens

Protect

- Create policies that support farm businesses in managing climate and market volatility
- Remove regulatory barriers that impede the construction of on-farm reservoirs and restrict food business expansion
- Flood defence investment should be based on the true value of protected assets and the supply chains they support
- The Fens needs better transport links, improved broadband and mobile coverage to help reduce social and economic isolation
- Immigration policies should ensure food and farming businesses can continue to access a skilled workforce

Pay

- Provide payments and financial incentives that encourage business investment in productivity improvements, water management and the farmed environment
- Ensure a fair return throughout the supply chain to enable the sustainable and managed use of natural Fenland resources
- If agricultural land is used for flood alleviation or water storage, any scheme needs to be agreed, paid for, and managed locally
- Reward the provision of public goods through a well-designed Environmental Land Management Scheme that reflects the unique landscape of the Fens

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Delivering for the environment in the Fens

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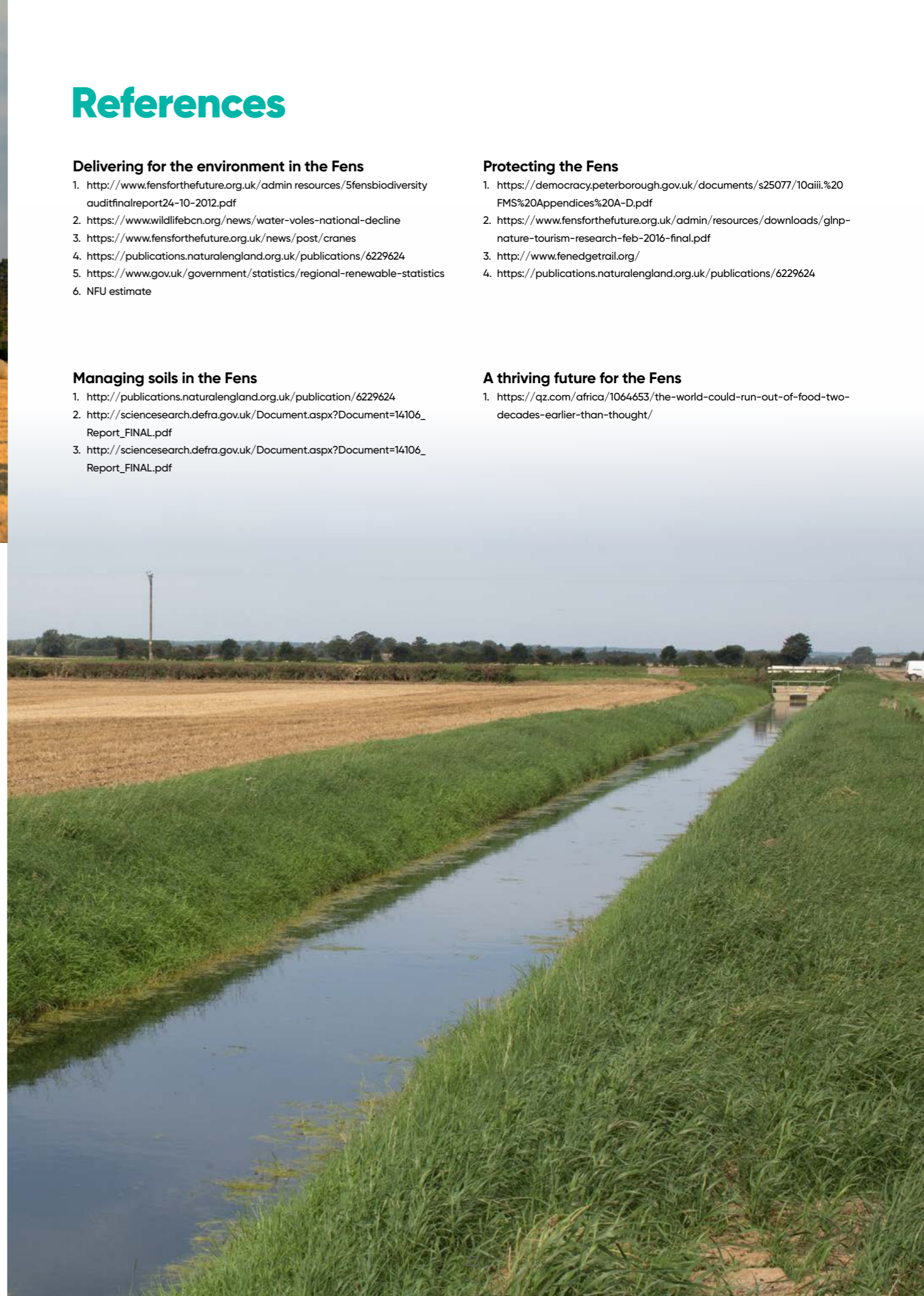
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A thriving future for the Fens

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