ENVIRONMENT DAY 2026

FENS 2100+

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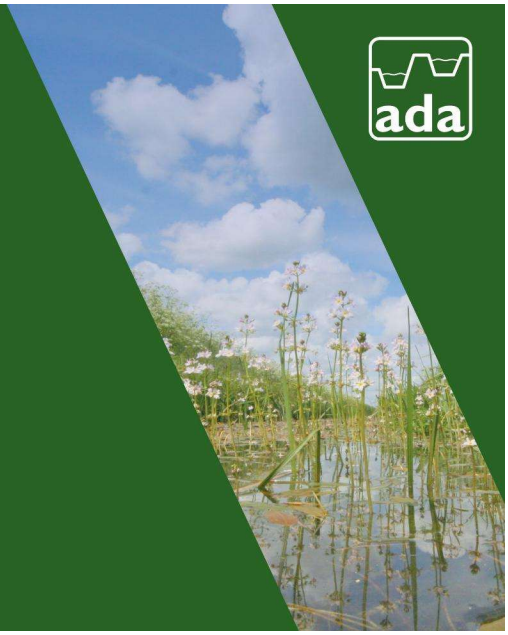
Fens Flood Risk Manager
Environment Agency



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PARK FARM

Fens 2100+

Enabling partnership investment in critical coastal, flood and water management infrastructure

Environment Agency ARUP RIVELIN BRIDGE

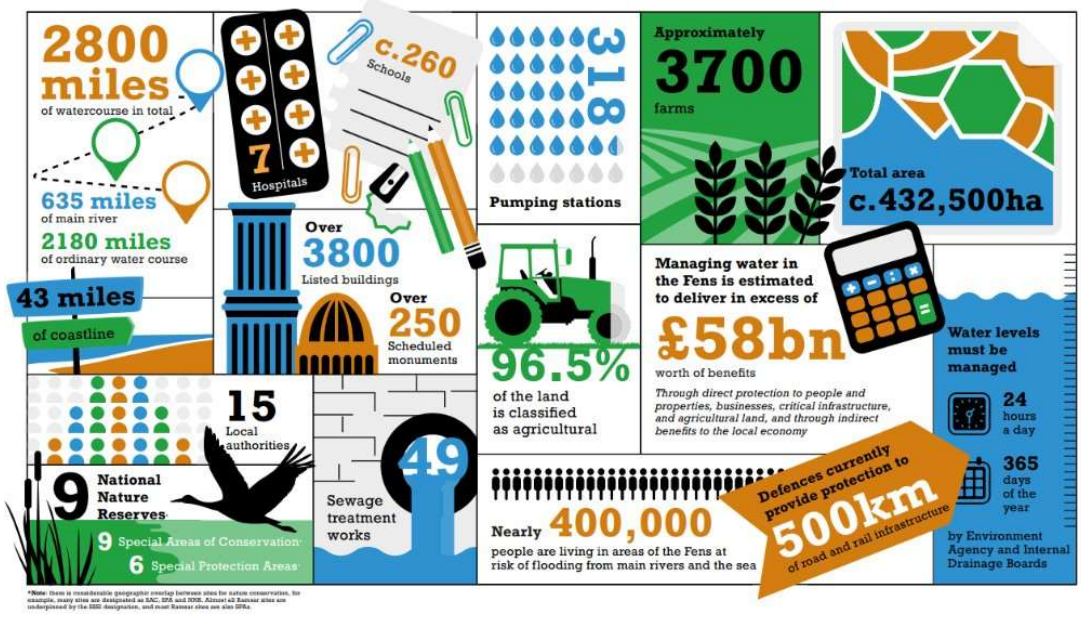
The Fens 2100+ Partnership

- Environment Agency
- Association of Drainage Authorities (ADA)
- Internal Drainage Boards (IDBs) - represented by MLC, BlackSluice, Well.&Deepings
- NFU
- Natural England
- Anglian Water
- Lincolnshire County Council
- Norfolk County Council
- Cambridgeshire County Council
- Cambridgeshire & Peterborough Combined Authority
- Anglian Northern & Great Ouse RFCCs

National Flood & Coastal Erosion Risk Management Strategy

Climate Resilient Places measure 1.5.4:

"By 2025 the Environment Agency will work with farmers, land managers, water companies, internal drainage boards and other partners to develop a long-term plan for managing future flood risk in the Fens."



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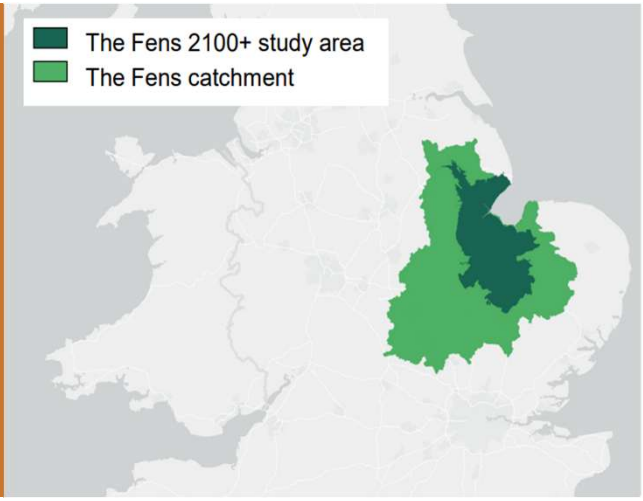
Our premise

…The following is not questionable and not negotiable:

- The Fens are a **valuable landscape** both nationally and regionally
- The FCERM assets that underpin the fens **are critical** in securing its value
- But **sustaining them** is getting more and more **challenging**
- There is a need to **act now (urgency)** to ensure we maintain this valuable landscape
- **No single organisation** can solve this challenge alone



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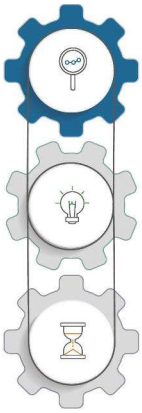
Our journey to date

Building the Case for Change



JULY 2020
Fens measure included in the national Flood and Coastal Erosion Risk Management (FCERM) Strategy.

JUNE 2021
Tidal River Nene Baseline Evidence Report published.

SPRING 2023
Fens 2100+ began work, including stakeholder interviews which influenced setting up a partnership board and programme governance.

APRIL 2024
Outcomes workshops collaboratively developed for four plausible and possible futures for the Fens, underpinned by investment in flood risk infrastructure.

OCTOBER 2024
The Fens Climate Change Risk Assessment outlined key climate risks in the Fens and the urgency for change.

NOVEMBER 2025
Catchment baseline reports produced the first complete picture of the asset sytem.

DECEMBER 2020
Future Fens: Flood Risk Management Baseline Report set an evidence baseline for the Great Ouse catchment.

NOVEMBER 2021
Future Fens Integrated Adaptation Manifesto was launched at COP26, setting out ten key strategic outcome ambitions of the Taskforce.

DECEMBER 2023
Site visits during winter 23/24 revealed impacts of flooding during this period, including meetings with flood-affected farmers.

SUMMER 2024
Lived experience workshops and site visits across the Fens to better understand the reality of challenges and operations of the assets.

JANUARY 2025
System Insight Stories set out landscape-scale insights and understanding of the system, wider context of the area, and how to work together.

DECEMBER 2025
The Case for Change. Our plan for immediate actions over the next two years.

Catchment Baselines

Catchment Context and History

Current and Future Flood Risk

Flood Risk Management Assets

Environmental and Agricultural Natural Capital

Flood Economic Damage

Economic Damages

Benefits of Flood Protection

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History of the Fens

Natural wetlands and early settlement

Pre-10,000 BC

The area was forested.

43-410 AD

Romans constructed the first artificial channels and the raised Fen Causeway.

600-1000 AD

Monastic foundations were created on some of the raised fen 'islands'

Local drainage and monastic influence

1287

A disastrous tidal surge affected Boston and South Holland. Spalding Monastery was destroyed.

1530s

New laws were passed supporting sewerage and draining, which led to the cutting of new drains.

Water which had once flowed into the Steeping River from the East Fen was now diverted towards the River Witham

'The Great Draining'

1600

Windmills started to be used to drain the Fens.

1630

Cornelius Vermuyden designed a scheme to drain the Lower Nene and Great Ouse catchments.

1632

Approximately 100km2 of land in South Holland was reclaimed from the sea for agriculture.

1630s

The River Welland was widened and deepened to improve navigation and drainage.

1664

Crowland and Cowbit Washes were constructed.

1700s

Drainage of Deeping Fen began, and the River Witham was straightened to improve navigation.

1799

Drainage of the East and West Fens begins.

Emergence of pumping

1820s

Steam powered engines began to replace windmills.

1851

Whittlesey Mere finally vanished due to drainage. It had once been the largest lowland lake in England.

1899

Wicken Fen became the National Trust's first nature reserve.

1930

The Land Drainage Act created Internal Drainage Boards (IDBs) and Catchment Boards.

1934

The first St. German's Pumping Station was constructed, after it was realised that gravity alone was insufficient for draining the Middle Level.

Post-war investment

1937

Dog-in-a-Doublet Sluice constructed.

1940s

Following severe flooding on the River Welland in 1947, construction of the new Coronation Channel began.

1953

The North Sea tidal surge was the UK's worst natural disaster of the 20th Century.

1956-1957

Large pumping stations were commissioned at Pode Hole and Hobhole to boost drainage of Deeping Fen and the East and West Fens.

1960s - 1970s

Embankments were raised along highland carrier drains, and relief channels were constructed in the Steeping River catchment to increase the capacity of the river network.

1973-1993

Further investment in diesel and electric pumps. Ten new diesel and electric pumping stations were constructed in the North Level District.

Modernisation

1990s-2000s

A new telemetry system was installed in the East and West Fens, enabling remote monitoring of water levels and automated adjustment of assets.

1998

Following heavy rainfall, St. German's Pumping Station ran continuously for 12 days. This prompted construction of a new pumping station in 2010 – the largest pumping station in England.

2013

A tidal surge breached embanked defences at Wrangle and Boston, and damaged Black Sluice Pumping Station, which led to its closure.

2018

5.8km of sea defences at Wrangle were raised to a height of 7.2m.

2020

Construction of Boston Barrier completed to provide tidal surge protection for the town, with allowance for sea level rise.

Now and next

2020

FCERM national strategy measure 1.5.4 led to the Fens 2100+ Partnership.

2023-2024

The wettest winter on record for the UK pushed flood risk assets in the Fens to their limits and beyond.

January 2025

Water levels in the South Forty Foot Drain were the highest ever recorded.

2040

31% of flood risk assets in the Fens will come to the end of their foreseeable design life. By 2075, this rises to 89%.

2080s

Peak flows in rivers across the Fens could be between 4% and 21% higher than those recorded currently.

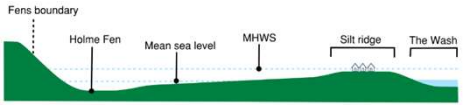
2125

1.2-1.6m of sea level rise projected under the UK Government's 'Upper End' allowance

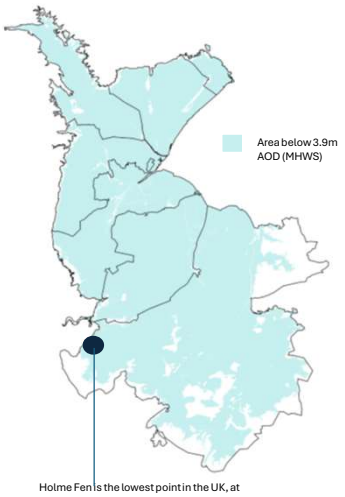
For more information about the Fens 2100+ Programme contact Fens2100@environment-agency.gov.uk

The Role of Critical Infrastructure

- Without critical flood risk management assets, the Fens would quickly flood and become uninhabitable.
- The flood risk management system we have today was inherited from previous generations and made possible by substantial investment.
- Many of the largest drainage features such as channels and embankments were dug by hand, at huge financial and human cost.
- Projects of this scale are unlikely to be feasible under current conditions; at the time, they required several Acts of Parliament to proceed
- In today's terms, replicating a similar system from nothing would cost in excess of £25 billion.



Illustrative diagram showing the cross sections of the Fens from Holme Fen to The Wash. NOT TO SCALE.



Holme Fen is the lowest point in the UK, at 2.75m below mean sea level, located approximately 47km from the sea.

Flood risk asset system

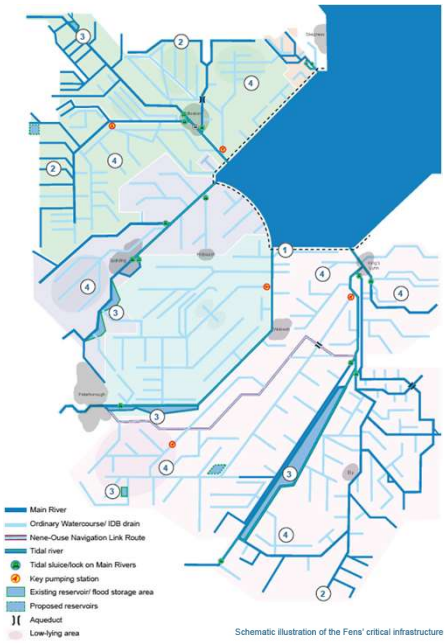
This schematisation illustrates key flood risk management assets which protect the Fens from flooding:

1. Coastal defences
2. Main River defences
3. Flood storage areas
4. Pumped and gravity drainage systems

Plus dual-purpose assets

Thousands more assets exist to support flood risk reduction, navigation and the maintenance of water resources.

Responsibilities for different assets are split across multiple organisations with varying priorities. This adds further complexity to the system.



Schematic illustration of the Fens' critical infrastructure

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Asset understanding

- The asset system is complex
- People and skills are vital
- Assets are ageing
- Pumped systems are at capacity
- Gravity discharge is becoming more difficult
- Embankments are vulnerable
- Better data about asset condition is needed
- Strategic coordination and governance is essential
- Assets are carbon intensive
- Climate change will exacerbate asset vulnerability
- There are gaps in investment
- Multifunctional assets present an operational challenge

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Considerations from each catchment

The **Steeping** and **East & West Fens** risk of tidal flooding will increase ten-fold and seventeen-fold respectively under climate change.

300km of embankment assets have medium to high risk of failure, with 7% at very high risk in the **Lower Witham** catchment.

In the **South Forty Foot Drain** there is potential to rationalise the number of pumping stations to reduce the number of assets which need to be inspected and maintained.

The Crowland and Cowbit Washes in **Lower Welland** are currently under-utilised. There is potential to unlock greater volumes of flood storage to alleviate fluvial flood risk.

A decision about the future of Dog-in-a-Doublet Sluice is required now. The choice of location for the tidal limit of the **Lower Nene** will affect the wider asset system.

The Denver Sluice complex in the **Great Ouse** is critical for controlling water across the catchment and affects the security of King's Lynn. All structures at the site need to be modernised, with better capability to monitor what is happening across the catchment in real time.

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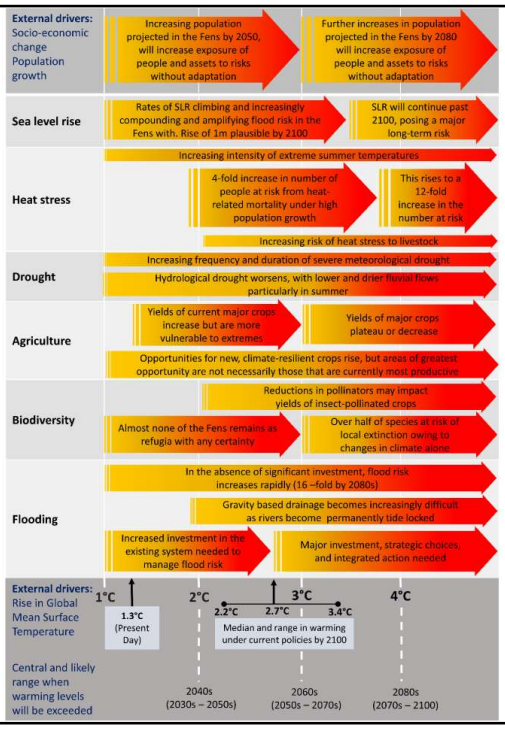
Climate related risks are increasing across the Fens

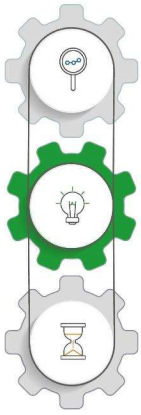
Multiple climate related risks and challenges

- The Fens is highly vulnerable to multiple climate related risks, including sea level rise
- Many risks interact leading to compound and escalating impacts across sectors.
- In a 2°C world serious management challenges emerge
- In a 4°C future the challenge will be considerably greater – demanding radical action.
- Both significant and early adaptation choices and continued progress in mitigation will be important in determining the future of the Fens



Transforming our approach

Securing a climate resilient and vibrant future for the Fens



Fens 2100+

A TURNING POINT
Business as usual is no longer an option. Urgent change is needed.

SHARED COMMITMENT
The Fens 2100+ Partnership

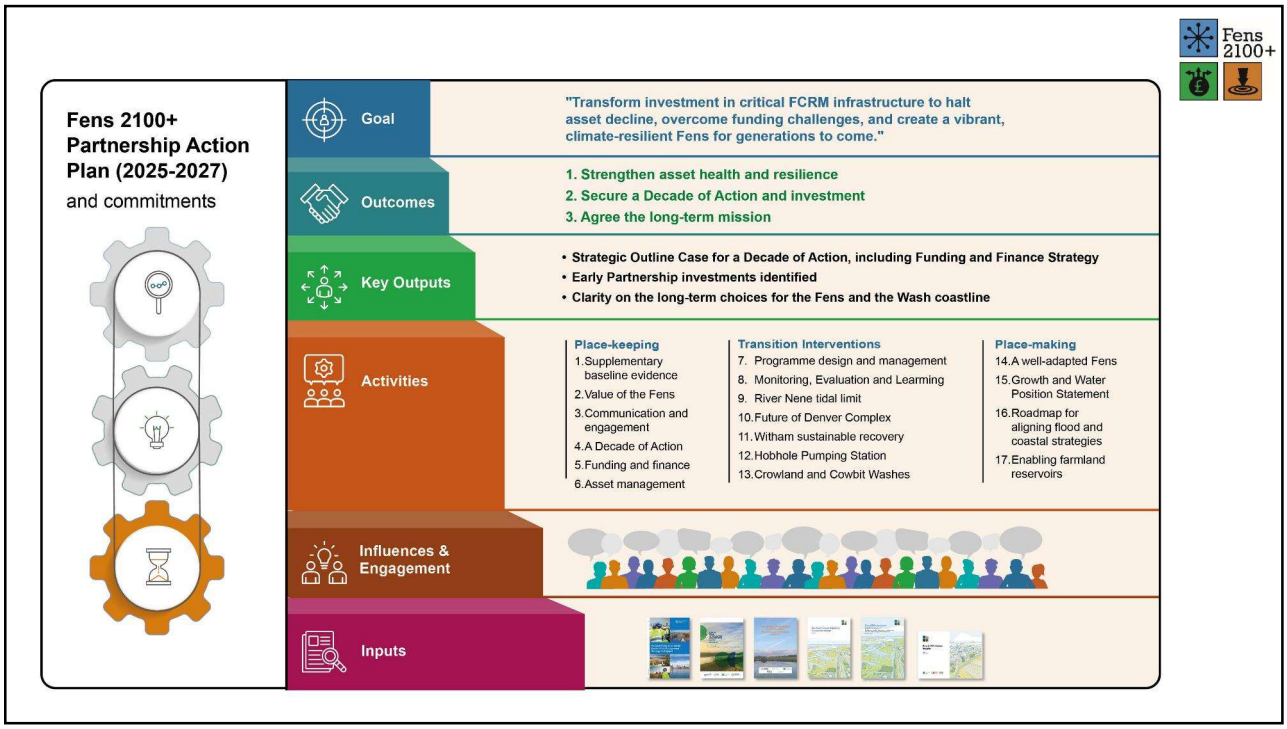
SECURING THE RIGHT INVESTMENT
The right money, at the right time, in the right places, on the right things, and in the hands of the right people.

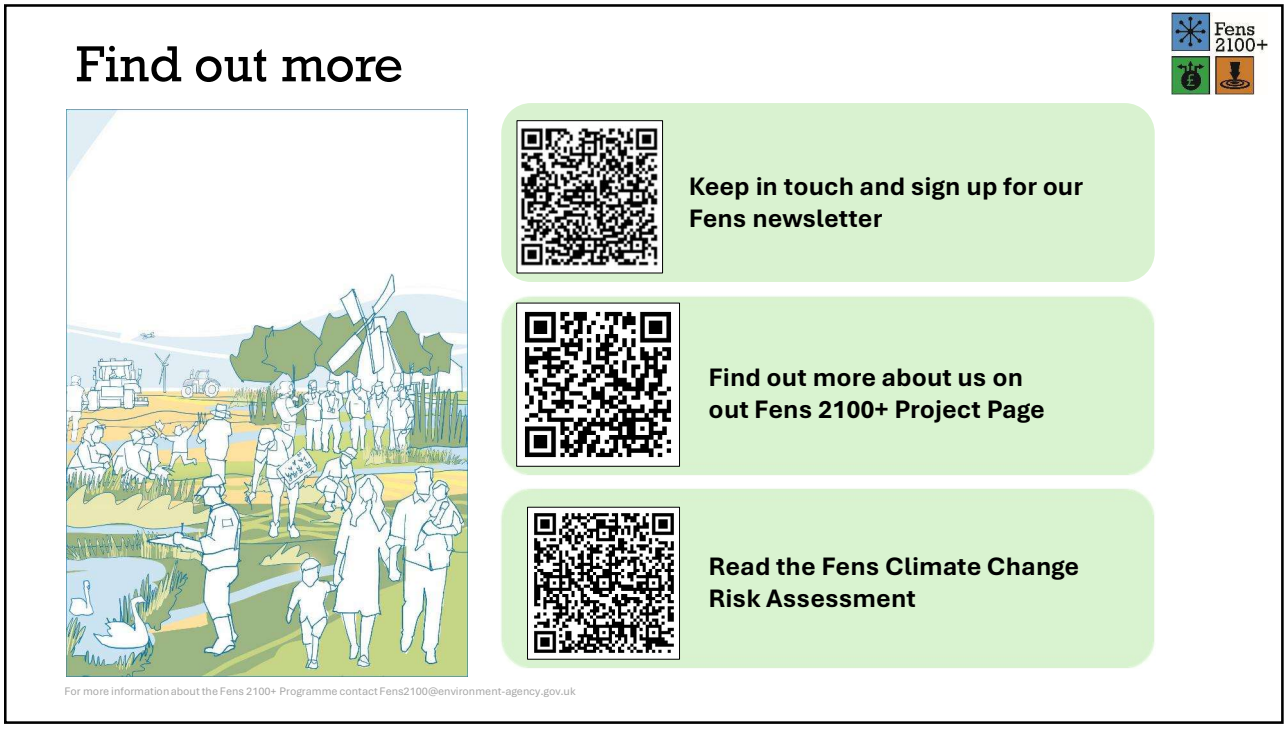
DRIVERS FOR CHANGE
Responding to evidence and insights to deliver benefits for current and future generations.

SHIFTING THE PARADIGM
- Asset health and resilience - System-level investment

PLACE-KEEPING & PLACE-MAKING
A bold programme of actions to halt asset decline and deliver regional growth and prosperity.

A DECADE OF ACTION
17 point Partnership Action Plan


Fens 2100+
Fens 2100+ Partnership Action Plan (2025-2027) and commitments
Goal
"Transform investment in critical FCRM infrastructure to halt asset decline, overcome funding challenges, and create a vibrant, climate-resilient Fens for generations to come."
Outcomes
1. Strengthen asset health and resilience
2. Secure a Decade of Action and investment
3. Agree the long-term mission
Key Outputs
• Strategic Outline Case for a Decade of Action, including Funding and Finance Strategy
• Early Partnership investments identified
• Clarity on the long-term choices for the Fens and the Wash coastline
Activities
Place-keeping
1. Supplementary baseline evidence
2. Value of the Fens
3. Communication and engagement
4. A Decade of Action
5. Funding and finance
6. Asset management
Transition Interventions
7. Programme design and management
8. Monitoring, Evaluation and Learning
9. River Nene tidal limit
10. Future of Denver Complex
11. Witham sustainable recovery
12. Hobhole Pumping Station
13. Crowland and Cowbit Washes
Place-making
14. A well-adapted Fens
15. Growth and Water Position Statement
16. Roadmap for aligning flood and coastal strategies
17. Enabling farmland reservoirs
Influences & Engagement
Inputs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