

**Open Report on behalf of Environment Agency**

Report to:	<b>Flood and Water Management Scrutiny Committee</b>
Date:	<b>20 September 2021</b>
Subject:	<b>Environment Agency Update</b>

**Summary:**

This paper provides an overview of the work being undertaken in Lincolnshire to deliver the vision of the national Flood Risk Management Strategy - A nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100.

It is intended to be a quick guide and reference document to the strategic work being carried out in the area.

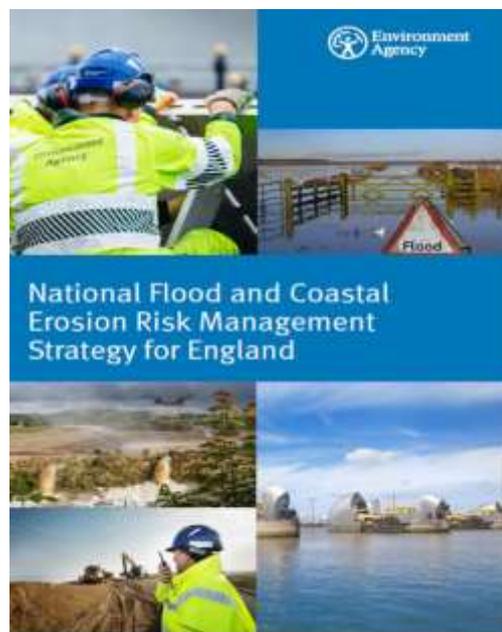
**Recommendation(s):**

Members of the Flood and Water Management Scrutiny Committee are invited to consider and comment on any aspects of the report and to highlight any recommendations or further actions for consideration.

**1. Background**

1.1 The 2020 Flood and Coastal Erosion Risk Management Strategy’s long-term vision is for: a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100. It has 3 long-term ambitions, underpinned by evidence about future risk and investment needs. They are:

- **Climate resilient places:** working with partners to bolster resilience to flooding and coastal change across the nation, both now and in the face of climate change
- **Today’s growth and infrastructure resilient in tomorrow’s climate:** making the right



investment and planning decisions to secure sustainable growth and environmental improvements, as well as infrastructure resilient to flooding and coastal change

- **A nation ready to respond and adapt to flooding and coastal change:** ensuring local people understand their risk to flooding and coastal change, and know their responsibilities and how to take action

1.2 This paper is intended to be a quick guide and reference document to the strategic work being carried out in the area by the Environment Agency. Our strategic work helps to define the interventions needed to reduce flood risk particularly where there are many interdependencies, stakeholders and a range of potential options available.

## 2. Humber 2100+

### The Challenges

2.1 The Humber area is of huge importance both regionally and nationally. Home to approximately half a million people, it contains the largest trading estuary in the UK, important industrial centres and also internationally significant natural assets. Whilst the bulk of the study area lies outside of Lincolnshire, the tidal influence extends into the county on tributaries including the River Trent and the River Ancholme.



Figure 1: Humber 2100+ Strategy Area

2.2 The area of low-lying land around the Humber Estuary is particularly vulnerable to the impacts of climate change and sea level rise with the risk of tidal flooding extending surprisingly far inland. Although communities have benefitted from flood defence improvements in recent years, there is still an ever-present risk of tidal flooding, particularly due to the possibility of a tidal surge overwhelming existing defences.

2.3 The latest information suggests that the Humber could experience as much as 1.3m of sea level rise in the next 100 years, increasing the risk of more frequent and widespread tidal flooding both along the coast and further inland along tidal rivers.

### Flood Risk Management

2.4 Tidal flood risk on the Humber is currently managed via the Humber Flood Risk Management Strategy 'Planning for the Rising



Figure 2: The Humber Bridge

Tides’ which has improved the standard of protection to 70,000 properties. However, since the publication of the existing Strategy (2008), new evidence (e.g., climate change impacts, policy changes, 2013 tidal surge) means that a change in approach is needed to manage tidal flood risk in the future. As a result, the Environment Agency were asked to work in partnership with local authorities to review the way flood risk is managed around the Humber estuary in the future. This is being done alongside continued delivery of projects under the existing strategy, which are being developed with consideration for the future direction of travel.

Partnership

2.5 The Humber 2100+ Partnership aims to re-define the strategic approach to managing tidal flood risk on the Humber and is made up of the Environment Agency and twelve local authorities, along with support from other organisations. The project is also seeking input throughout the process, engaging with stakeholders, businesses and the wider public.



Figure 3: Humber 2100+ Partners

2.6 Since 2015 when the partnership was established, we have been developing technical evidence (such as modelling) and engaging with key stakeholders and the public. This included awareness raising and gaining local understanding of flood risk management needs for the estuary. We are working in partnership to develop an integrated long-term approach to managing tidal flood risk and increasing resilience, which is sustainable and adaptable, responds to climate change and supports present and future health and wellbeing of communities, the environment and sustainable economic growth.

An Adaptive Approach

2.7 The Strategy will need to ensure that the right decisions are made as a place now, whilst remaining adaptable and flexible to future change – known as an ‘adaptation pathway’. By taking an adaptive approach, the strategy will take into account predicted climate change impacts and be able to respond to changes, such as economic, social and political circumstances, as they arise, and bring in new science and technological innovations. The advantage of an adaptive strategy is that it provides a framework of technically feasible ways of managing flooding, which allows for priorities to shift if different funding mechanisms become available over time.

### 3. Middle River Ancholme – Catchment Management

- 3.1 Our South Humber & East Coast Partnerships and Strategic Overview Team (PSO) is progressing with the delivery of the shoreline projects of the South Humber together with finding a way forward with the fluvial issues of the River Ancholme catchment. The Middle River Ancholme - Catchment Management is set up to deliver the policies within the Ancholme Catchment Flood Management Plan (CFMP). A new approach aims to build a partnership with the landowners and Ancholme IDB to develop a more affordable, sustainable and flood resilient approach.
- 3.2 This will mean apportioning the available economic benefits to justify a range of investments to existing Main River, surface water and land drainage networks, and potentially adjust the governance to some of the watercourses. This collaboration will also involve the newly formed Ancholme Catchment Partnership and considers the need for water storage for both public/industry water supply and irrigation purposes. This is a long term and phased approach which complements the catchment modelling and forward planning being undertaken by Ancholme IDB.

### 4. East Coast

#### The Challenge

- 4.1 The tidal flood plain stretches up to 15km inland along the Lincolnshire Coast and flood defences stretching 26 miles from Saltfleet to Gibraltar Point prevent inundation of this land for more than half the 'high tides' in any year. The defences were improved following the tidal surge of 1953 when 43 people lost their lives and were then improved and protected by a man made beach during the 1990's. Whilst beach nourishment remains a successful solution for now, climate change and aging hard defences means that we need to consider the long term future of flood risk management.



Figure4: Map of the Saltfleet to Gibraltar Point Strategy area

#### The Future

- 4.2 We will continue to manage flood risk to the existing standard over the coming years to protect 30,000 homes and businesses, 19,000 static caravans, and 35,000 hectares of land through beach nourishment. The Saltfleet to Gibraltar Point Strategy identified a strong business case to continue to invest and we are now

working with Partners to consider the most appropriate investment to adapt to climate change to deliver safe and sustainable communities.

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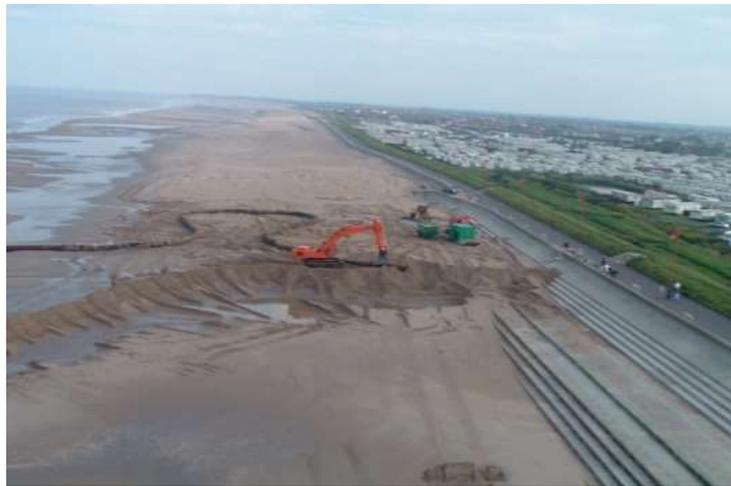


Figure 5: Beach nourishment along the East Coast

## 5. Steeping River Catchment Action Plan

### Steering Group

- 5.1 Following the flooding in June 2019 in which 75 homes and businesses, and over 2000 acres of agricultural land were flooded, the Lincolnshire Floods and Water Management Partnership set up a Catchment Steering Group.
- 5.2 This partnership made up from representatives of community, Environment Agency, Lindsey Marsh Drainage Board, Lincolnshire County Council, National Farmers Union and East Lindsey District Council.
- 5.3 The Steering Group, supported by a resilience group has overseen the development and subsequent continued delivery of the Steeping River Catchment Action Plan under the themes below.

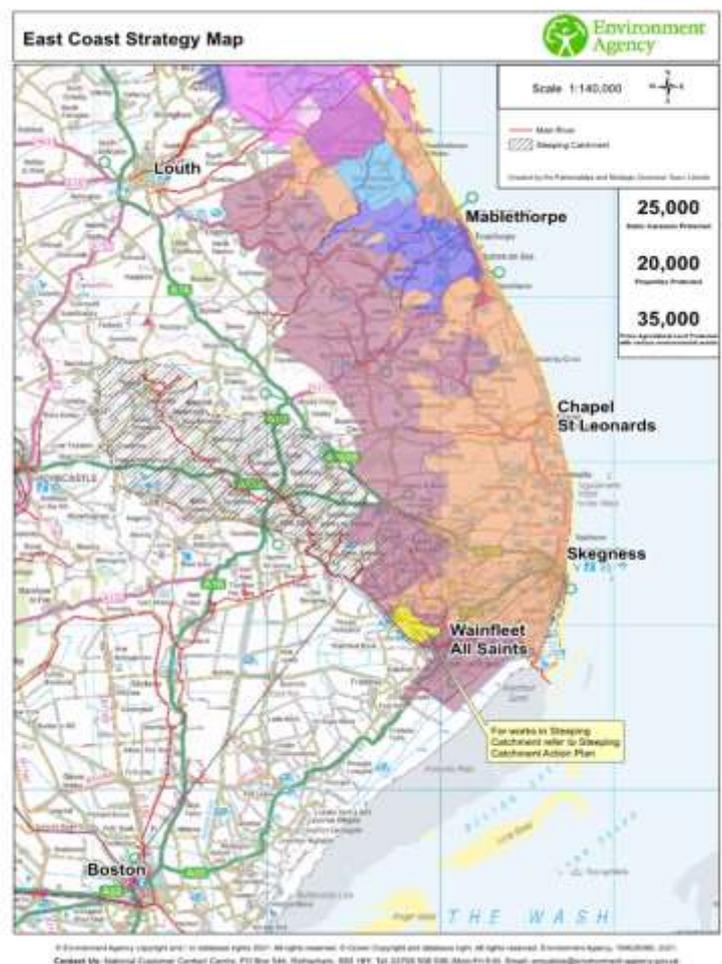


Figure 6: Steeping River Catchment within the East Coast Strategy Map

### Improving the flow through the system

- 5.4 Continued effective weed management including the use of targeted dredging. To date 7.5km have been dredged, and over 56000m<sup>3</sup> silt have been removed and stored in local lagoons ready for reincorporation onto local agricultural land. With more planned in early 2022.



*Figure 2: A dredger in operation*

### A resilient community and infrastructure

- 5.5 Working with communities, Parish Councils, Farmers, and local businesses to help them understand the risks, and how they can be better prepared for any future events. The impacts of the pandemic mean progress in this area has been limited. However, we have continued to improve the EA Flood Warning Service by updating the catchment and flood forecasting models. This will improve the timeliness and accuracy of flooding warnings and enable work towards a community-based flood warning service.

### Strengthening and maintaining defences

- 5.6 We are continuing with regular inspections and maintenance of flood defences and have an extensive and ongoing programme of prioritised repairs. A strategic outline case study is underway to determine how best we can improve these defences in the future including an update of the existing hydraulic flood model.

### Flood Water Storage

- 5.7 We are currently investigating the use of Natural Flood Management techniques across the upper catchment of the Steeping. Working with landowners to find practical schemes that will not only to slow the flow of water entering the lower river system and improving biodiversity.

## **6. Witham Catchment Strategic Work**

### Lower Witham Flood Resilience Project

- 6.1 The Lower River Witham Fenland in Southern Lincolnshire has had a 50-year flood risk management strategy in place since 1997. Now at the halfway point of this strategic approach, the Environment Agency is starting a project to update and

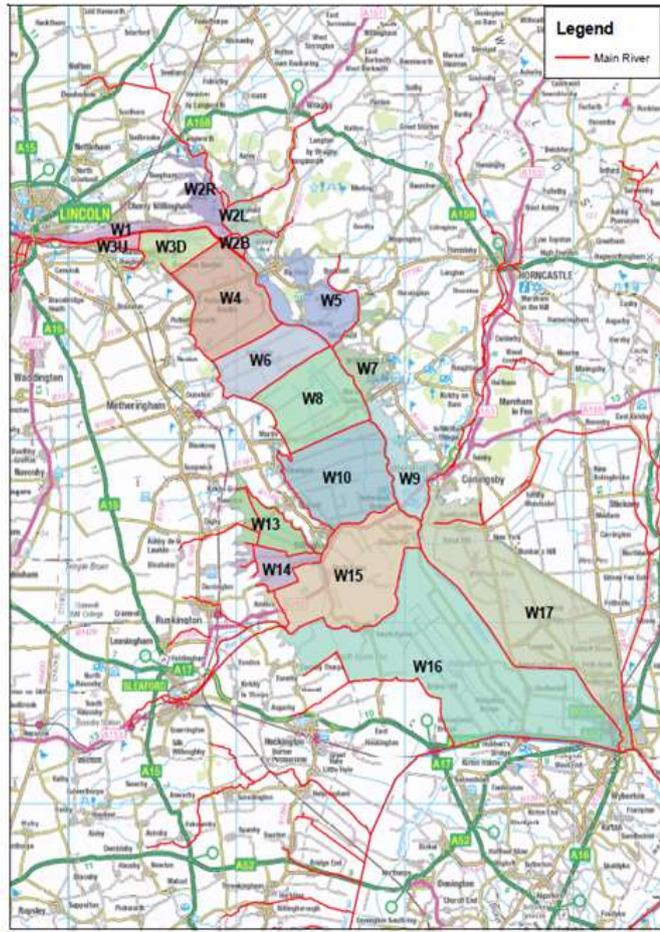
review the original strategy, and finish what was started back at the turn of the century.



*Figure 3: Short Ferry Road in December 2019, following a breached embankment*

- 6.2 The Lower River Witham catchment's 300km of embankments are of significant age now (in excess of 200 years old) and increasing flood risk is testing these structures more than ever before, putting at risk the communities and economy of the area.
- 6.3 In 1997 the Lower Witham Strategy recommended reinforcement of key embankments whilst allowing some areas to flood, in order to relieve the pressure on the system. Since then 30km embankments have been reinforced, but repeated high flows (the most recent in 2019) have damaged more. Storage options were not previously implemented, due to availability of suitable sites and difficulties in meeting HM Treasury funding rules of the time. The works in the 2000s included the creation of Fiskerton Nature Reserve, as environmental mitigation. Now these types of works are seen as offering a real alternative to hard defences, providing room for flood water as well as having a lower carbon footprint and enhancing the local environment. With revised partnership funding rules, allowing more projects to proceed, and a new interest from land owners in providing public goods such as flood storage, it is hoped that the original vision can now be realised.

6.4 The Environment Agency project team have commissioned consultants Arup to undertake new surveys of the channels and embankments on the Lower Witham and build a state-of-the-art hydraulic model, taking into account the latest thinking on climate change. The surveys are due to begin this summer, with the new modelling delivered during 2022. Arup will also be bringing their expertise in stakeholder engagement to the project and will prepare a comprehensive plan to ensure that everyone living and working in the area can express their views.



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*Figure 9: Map showing the Lower Witham Flood Resilience Project Area, and individual flood compartments*

6.5 The Lower Witham is one of six river catchments within the East of England Fens that will come together under the Future Fens: Flood Risk Management programme.

This work will contribute towards the ambitions for Climate Resilient Places within the National Flood & Coastal Erosion Risk Management Strategy where there is a specific measure focused on the Fens.

6.6 It is anticipated that a significant capital investment programme will start on the ground in 2025, and in the meantime the Environment Agency’s operational teams will continue to maintain and manage the flood risk assets where resources allow.

## 7. Billingham Skirth System Review

7.1 During the 2019/20 flooding in the catchment, particular issues were highlighted on the smaller sub-catchment of the Billingham Skirth tributary. In response a strategic review into the management of water levels, led by the Environment Agency and involving RMA partners, is being undertaken. The review is considering an agreed maintenance baseline for the watercourse, a partnership approach, and short- and long-term recommendations for managing flood risk taking into account funding constraints, flood risk priorities and environmental considerations. This work will feed into both the Lower Witham Flood Resilience Project and shorter-term maintenance and water level management planning.

## 8. Upper Witham Review

- 8.1 Although the Upper Witham System 72 (left) is identified as 'low consequence' it does have several assets (particularly embankments) which if they failed could have major consequences for transport infrastructure. With the accelerating effects of climate change, problems such as this will manifest themselves more frequently.
- 8.2 The current management of these systems is in need of review and reform to understand how effective and sustainable water level management can be take forward.
- 8.3 The review has so far highlighted several opportunities for a system wide reappraisal of the current constraint of the watercourse through embankments, moving toward reconnecting natural flood plains and utilising/promoting natural flood management in tributaries.

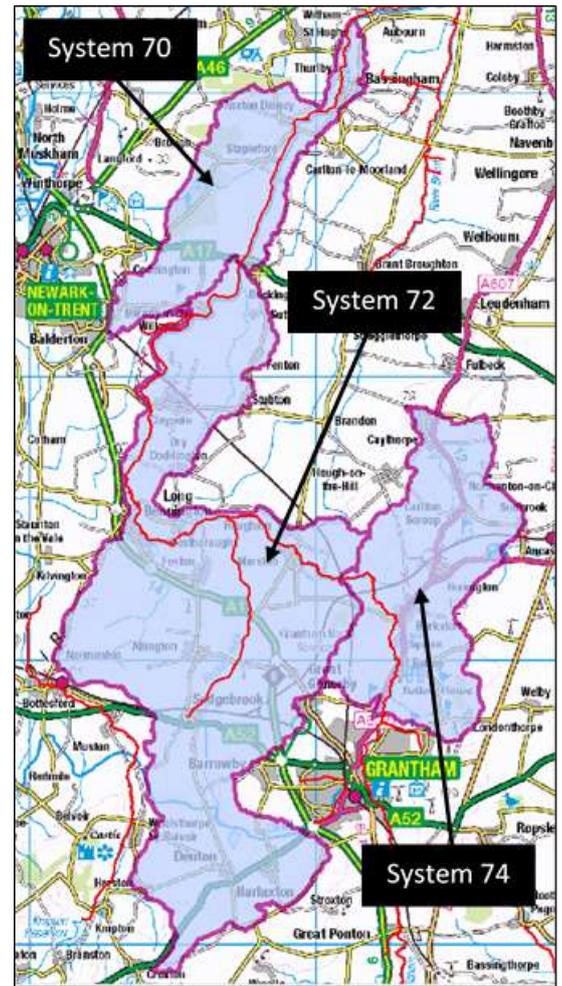


Figure 4: The Upper Witham System

9. Welland and Nene Strategic Work

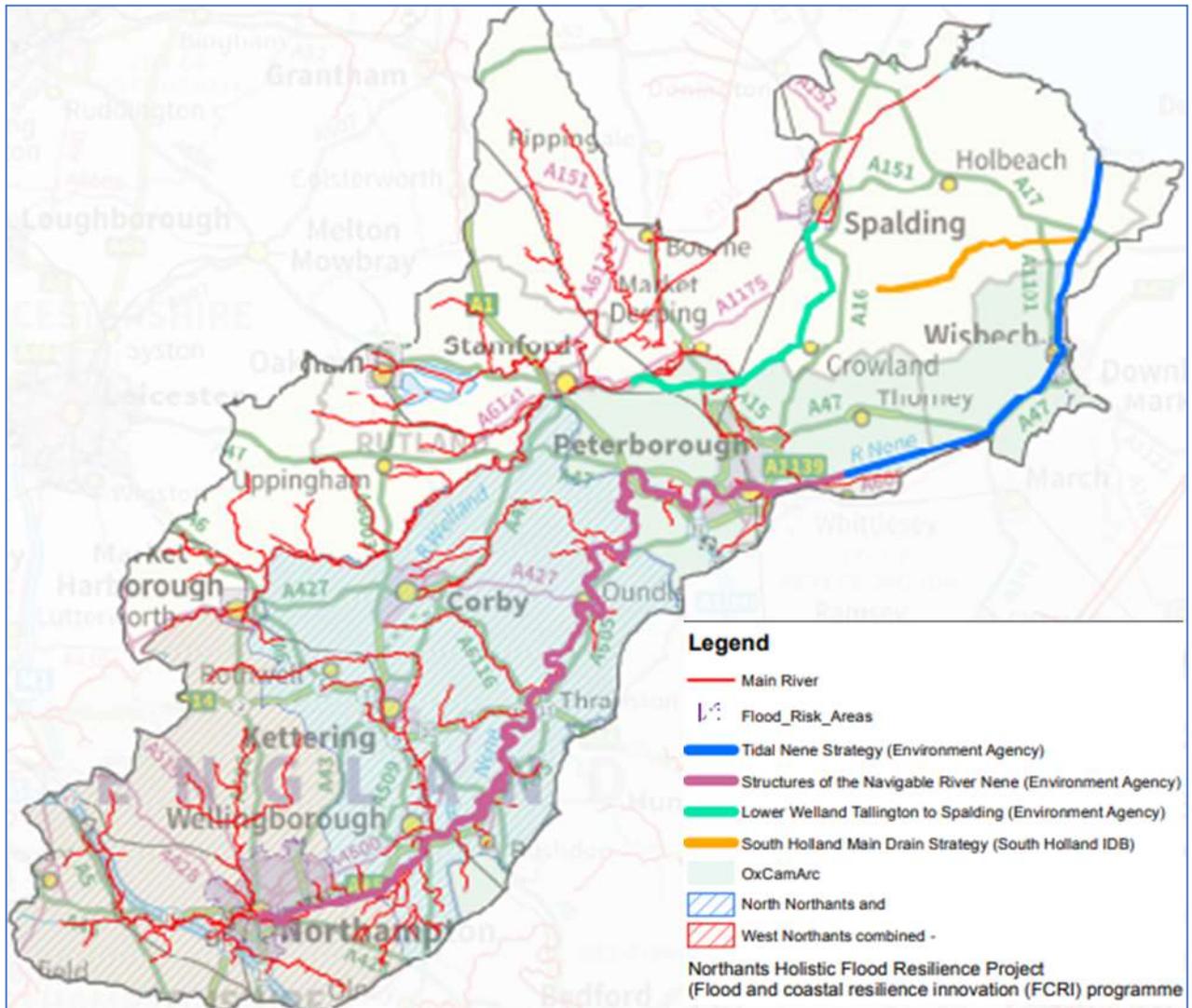


Figure 5: The Welland and Nene area, including associated strategies

## Structures of the Navigable River Nene Strategy

- 9.1 Structures along the navigable stretch of the River Nene provide both water level management and flood risk benefits. The design life of the majority of the structures will come to an end in the next 40 years, and investment in refurbishment is a key priority for the region. The EA's whole life asset management will be applied to identify long term investment options. The RFCC has committed £1.5M local levy funding to support the future capital programme. A further £100k was committed by the RFCC in 2018 for the recruitment of a Funding and Strategy Senior Advisor dedicated to strategy development.
- 9.2 Advice from LPRG has brought confidence in bringing forward the Full Business Case assurance to October 2021. The business case will identify the need for investment based on the cost-effectiveness analysis, to fulfil legal requirements of the Anglian Water Authority Act 1977, avoiding structure failure risk and subsequent reputational and financial risk. LPRG are in support of an FBC for approval of £3M FDGiA over three years resulting in development of a strategy glossy, full public consultation, and delivery of a number of supporting products. Work undertaken to date to evidence the holistic benefits of investment above the 'do minimum' maintenance option will be further developed using these funds. Holistic benefits include flood, waterways, water resource, environmental, health & well-being & growth, quantified and described with partners and stakeholders across all sectors.
- 9.3 To date appraisal of asset condition and residual life for structures across the navigation have built an indicative 50 year investment programme, to inform the proactive whole-life management approach. The structures requiring investment in the first ten years have been identified, and the £1.1M local levy not profiled for strategy delivery has been allocated to these structures in several lines of the programme. Pilot modelling of structure failure scenarios will produce results at the end of June, to inform the approach to quantify the holistic benefits and to provide points prompts in discussions with stakeholders.

## Tidal Nene Strategy

- 9.4 As part of the Collaborative Delivery Framework, Arup was commissioned to draw together a holistic baseline of knowledge relating to current and future flood risk management of the Tidal River Nene System. Arup have completed hydraulic modelling and a condition assessment of the Tidal Nene defences to support this. The updated evidence base is used to inform a suite of reports which seek to understand flood risk management now and in the future, considering a whole system approach and working with stakeholders. A clear understanding of collective aims and ambitions for the Tidal Nene system, coupled with the knowledge of the latest contextual information will provide a solid foundation for making sustainable investment choices. This will lead to outcomes that are mutually beneficial for all stakeholders.

## Lower Welland Strategic Approach – Tallington to Spalding

- 9.5 Crowland and Cowbit Washes
- 9.6 The Crowland and Cowbit Washes (the Washes) have not been utilised in recent years and the Welland system has been significantly altered since their construction. The banks of the Washes are coming to the end of their design life, overtopping is possible and seepage is occurring.
- 9.7 Modelling and mapping is being carried out to provide a better representation of flood risk associated with the operation (or non-operation) of the Washes. Understanding how the Washes function, which communities benefit (currently estimated as 663 properties) from their existence and whether any improvements can be made to utilise them more effectively and reduce flood risk along with the implications of failure to store water will help us to determine how to continue maintain the standard of protection for Lower Welland catchment in line with the Welland CFMP recommendations.
- 9.8 The Welland Rivers Trust are also conducting a feasibility study and investigating local community and landowner interest in storing water on this land, restoring wet grazing.

### **10. Using Nature to Help Climate Resilience 2021-2027**

- 10.1 Working with nature and natural processes is embedded across all three long term ambitions of the FCERM Strategy 2020, and covers, amongst many other things:
- 10.2 Making greater use of nature-based solutions that take a catchment led approach to managing the flow of water to improve resilience to both floods and droughts;
- 10.3 Maximising opportunities to work with farmers and land managers to help them adapt their businesses and practices to be resilient to flooding and coastal change.

## Floodplain storage – re-connected paleochannel with storage ponds



*Figure 6: Pictures showing a re-connected palaeochannel, with storage ponds, in use*

- 10.4 This Anglian Northern Regional Flood and Coastal Committee (RFCC) strategy for using nature to help climate resilience has five main objectives to help the RFCC meet the specific aims, associated with nature based solutions, of the National Flood and Coastal Erosion Risk Management (FCERM) Strategy 2020.

The objectives are:

- 10.5 **Slowing the flow of water in the upper catchment and upstream of settlements.** This will be done through measures including Natural Flood Management (NFM) and better land management, to reduce peak flows at places at risk of flooding further down the catchment.
- 10.6 **Promoting forward-looking, collaborative schemes with multiple benefits.** We will seek to work with different teams across all RMAs and make the most of philanthropic, private, public and charitable sector opportunities that can provide wider catchment benefits across the RFCC area; providing maximum benefit for our local communities.
- 10.7 **Promoting collaborative thinking in the maintenance of flood risk assets.** This especially applies to assets that have come to the end of their economic life and offer an opportunity for change. We will balance the management of our

biodiversity obligations to help meet biodiversity net gain targets and carbon net zero aspirations.

- 10.8 **Make greater use of nature-based solutions that take a catchment led approach.** To managing the flow of water to improve resilience to both floods and droughts.
- 10.9 **Supporting Risk Management Authorities in meeting the nature based objectives of the FCERM strategy 2020.** This includes direct support, sharing good practice and training, including through continued funding of our work and the resources needed to deliver it.
- 10.10 Specific measures to be undertaken across the next six years for each of the above objectives have been identified.

## 11. Future Fens

### Background

- 11.1 The lowland 'Fens' systems that are prominent across much of the RFCC landscape have unique characteristics that will present challenges in delivering the National Flood and Coastal Risk Management Strategy. Flood risk management is currently delivered in a large and complex landscape that includes many different assets and organisations. Limited state funding has often meant that repairs to assets has often been reactive, to repair damage after a flood. There is a large partnership funding challenge and carbon reduction is difficult in the pumped systems.
- 11.2 The National Flood and Coastal Risk Management Strategy ambition for 'Climate resilient places' includes objective 1.5; By 2030 risk management authorities will work with farmers and landowners to help them adapt their businesses and practices to be resilient to flooding and coastal change. Within this objective, the Fens specific measure below will help partnerships to plan investments to maximise benefits, adapt to a future climate and influence the policies that will be required to make this happen.

### Strategy Measure 1.5.4

- 11.3 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.

### 11.4 Agreed Actions

- 11.5 **Action 1:** Fens in the Anglian Flood Risk Management Plan

- 11.6 The Fens will be identified as a strategic area within the 2nd generation Anglian Flood Risk Management Plan. This will provide the strategic context for Risk Management Authorities to engage with a wide range of partners across the Fens

including farmers and land owners to develop the Fens strategic plan (see action 4 below).

11.7 (The FRMP action plan will be continually updated to reflect the work needed to develop the strategic plan and capture other opportunities that may fall outside of the scope of the Fens strategic plan)

11.8 **Action 2:** Using Gt Ouse work, adopt a consistent approach to Tactical Planning & Baselineing



11.9 Using the work pioneered within the Great Ouse Fens, Flood Risk Management Authorities across the whole Fens will adopt a consistent approach and methodology to tactical planning and base-lining. This doesn't necessarily need to mean consistent 'products' or vehicles, but there will need to be consistent data, evidence and guiding principles.

11.10 **Action 3:** Test alternative approaches to valuation of agricultural land

11.11 The FCRM base-lining of knowledge and evidence Fens will include working with the NFU and others to test an alternative approach to valuing agricultural land values within FCRM appraisal alongside the traditional method.

11.12 **Action 4:** Involve NFU and CLA in Future Fens: FRM Phase 2 scoping (ie adaptive plan/strategy)

11.13 Representative bodies for farmers and land managers to be involved in the scoping of the Fens strategic plan (Phase 2 of FCRM in the Fens). This will likely be a long term strategic appraisal, a collaboration between all Flood Risk Management Authorities in the Fens.

11.14 **Action 5:** 'Heat mapping' and plans for asset failure and recovery

11.15 Using the FCRM base-lining of knowledge and evidence alongside the tactical plans for FCRM infrastructure, a 'heat-map' will be developed to highlight the areas of the Fens where sourcing funding for investment in flood infrastructure will be most challenging. Using this the Environment Agency will work with landowners, farmers, other Risk Management Authorities and Local Resilience Fora to develop plans for asset failure and recovery.

11.16 **Action 6:** Inform and influence government policy and/or organisational approach

11.17 To enable the businesses and land practices of farmers and land managers to become resilience to flood and coastal change. The Environment Agency, with IDBs, Local Authorities and representative bodies for farmers and land managers

will use the knowledge and evidence gained through the previous actions under this measure, to provide advice to government on suggested areas for policy review and/or policy implementation approach.

## **12. Conclusion**

Members of the Flood and Water Management Scrutiny Committee are invited to consider and comment on any aspects of the report and to highlight any recommendations or further actions for consideration.

## **13. Background Papers**

No background papers within Section 100D of the Local Government Act 1972 were used in the preparation of this report.

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