

## Executive Summary

### PARRETT ESTUARY FLOOD MANAGEMENT STRATEGY STRATEGIC PLANNING REPORT

#### NON TECHNICAL EXECUTIVE SUMMARY

We aim to produce an integrated, sustainable, management strategy for the tidal flood defences of the Parrett Estuary

#### Background

The Estuary of the River Parrett between its mouth at Burnham-on-Sea upstream to Bridgwater has raised tidal defences. These embanked defences extend along both banks of the Estuary and a short distance along the Brue Pill, which joins the Parrett just south of Burnham-on-Sea.

More than 11,000 properties and 3000 hectares of agricultural land are located within the River Parrett tidal floodplain. This low lying, relatively flat area stretches up to 3.5kms inland. Bridgwater, Huntspill, Pawlett and Comwich are the main areas of population within the estuary floodplain

#### Flood Risk

The tidal defences have been overwhelmed in the past, resulting in rapid, widespread flooding. On 13th December 1981, a 1.45m surge occurred close to the peak of a spring tide. Tidal defences overtopped over long lengths of Somerset's north and west facing coastline. Sea water flowed back to the M5 motorway, flooding communities and hundreds of hectares of open land. Hundreds of livestock, both in open fields and under cover, drowned but miraculously no people died during the event.

A programme of sea and tidal defence improvements followed, which typically provided defences with a 0.01% probability of failure, or overtopping, in any year. Since then overtopping events on the tidal Parrett have been limited to relatively small local areas.

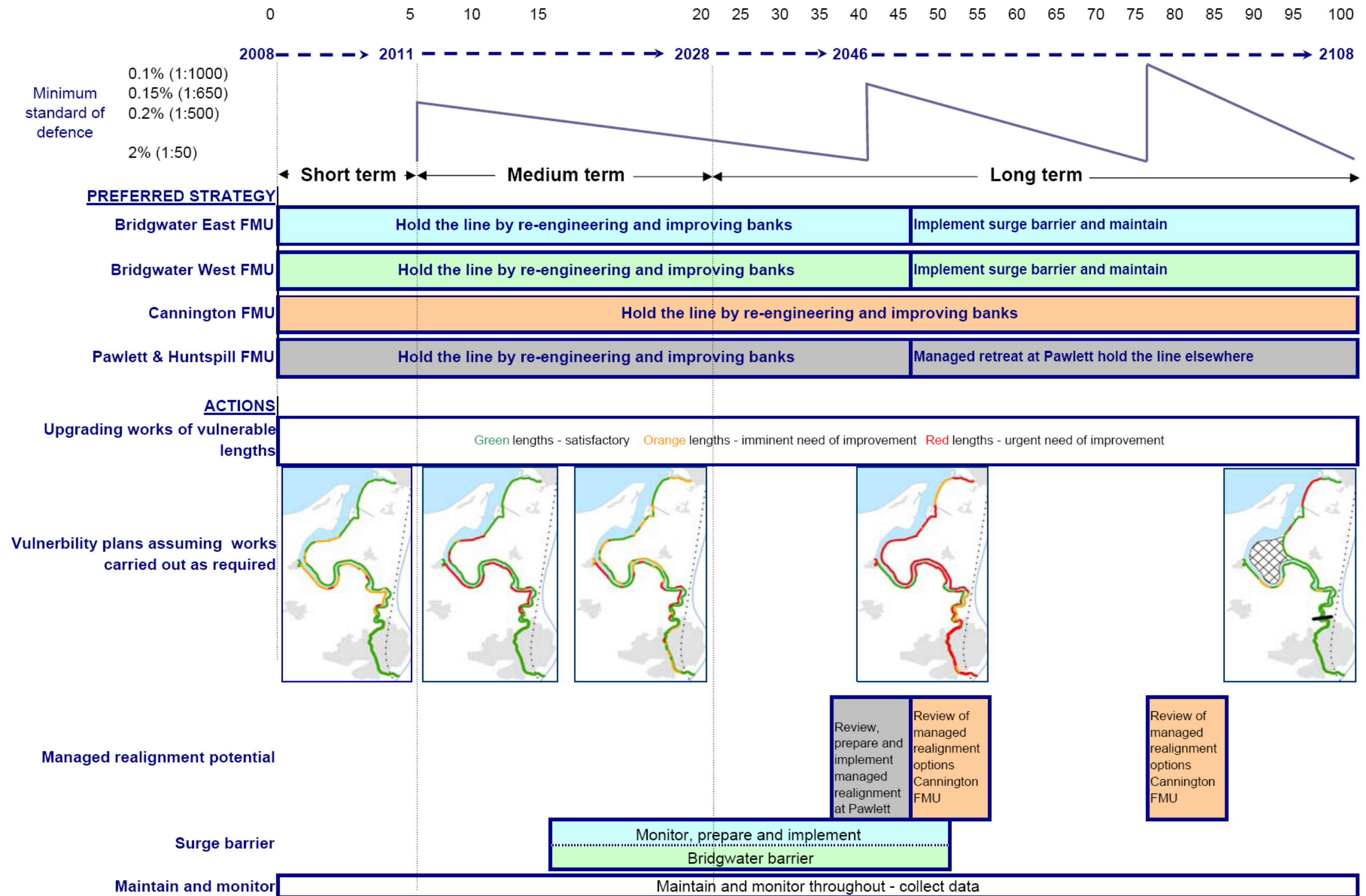
The strategy aims to manage the increasing risks posed by sea level rise, increased storminess and future degradation of the defences expected over the next 100years.

The scope of this report is to detail the proposed flood defence strategy for the area.

#### The Strategy

The strategy considers the Estuary as being made up of Flood Management Units (FMUs). The figure on the following page illustrates a summary of the proposed strategy for each Flood Management Unit (FMU).

### Summary of our preferred strategy plan



Our proposed strategy is based on a thorough review of the technical, environmental and financial factors for each option, and combinations of options.

### Principal Options Considered

The options considered fall into the 5 groups listed below. Our strategy accepts that the current defences will come under increasing pressure through the 100 year strategy period, but we will intervene at points in time, to ensure that risks do not become unacceptable

- **Do nothing** – High risk to human life, property & infrastructure due to unpredictable failures in defences;
- **Do minimum** – Patch and mend the flood banks and outfalls i.e. provide a reactive response. Uncontrolled breaches could still occur so the risk to life, property and infrastructure remains.
- **Set-back banks/Managed realignment** – Rebuild the floodbanks further back from the edge of the estuary to make them more robust and avoid the risk of erosion. This can bring environmental benefits but can also lead to increase in flood levels upstream, i.e. in Bridgwater. **This is the preferred long term option in the Pawlett Hams area.**
- **Re-engineer existing defences** – we would put in place a programme of improvement works to restore outfalls and raise and widen banks. We would realign structures slightly (no more than 50m) where necessary to reduce erosion pressure and ensure bank stability and sustainability. This proved to be the **preferred** option for each management length downstream of Bridgwater with the exception of Pawlett Hams in the long term.
- **Surge Barrier** (A structure, which excludes only surge tides) – sited just downstream of the new road bridge in Bridgwater is the **preferred long term option for Bridgwater** to be implemented between 2030 and 2050. The defences in Bridgwater become vulnerable in this period, if sea level rise is as currently predicted.

## How will the strategy affect the environment?

### Positive impacts and environmental opportunities

- Higher level of flood protection to the surrounding residential properties, infrastructure, public amenity, designated sites and reduce risk of saline intrusion to groundwater.
- Reduced flood risk and ease of access leads to reduced health and safety risk.
- River Parrett Trail would be unaffected by realignment option and re-engineering the banks will improve its protection and offer opportunities to enhance it.
- Realignment at Pawlett Hams will allow up to 387 ha of inter-tidal saltmarsh habitat to be created.
- Populations of protected/RDB/BAP species may increase following habitat creation.
- Reduced risk of contamination from agricultural, sewage works and consented discharge sources following construction of surge barrier.
- Minor set back of existing line of defence allows the estuary to fall into a more natural form.
- Navigation of the Parrett Estuary and operation of Dunball wharf would be maintained.
- Improved flood protection to 6 Scheduled Monuments, 59 listed buildings and a number of sites in the historic monument record.

### Negative impacts

- Productivity of up to 387 ha of agricultural land at Pawlett Hams would be reduced to create compensatory habitat.
- Public Rights of Way at Pawlett Hams would be lost or more likely re-routed.
- Regular inundation of up to 387 ha of the Severn Estuary SPA and Ramsar site to create compensatory BAP habitat, although this could be offset by creation of similar ditch networks at nearby sites.
- Visual amenity of the landscape may change due to wider and taller banks. Potentially adverse impact of surge barrier on visual amenity.
- Power lines within the realignment area would need to be protected from flooding.
- Navigation would be restricted when the surge barrier is closed.
- Loss of 6 statutory historic records following realignment, such as peats and trackways (refer to the accompanying Strategic Environmental Assessment for details). Potential for erosion of unknown sites.

## Way Forward

### Years 0 to 5

We will carry out urgent works to re-engineer and carry out minor realignment of lengths of defence primarily in the Cannington FMU and a short length in the Huntspill FMU. This work will relieve the pressure on these defences from rapid erosion.

We will arrange monitoring to provide information needed for detailed design and to support decisions about tidal defences in Bridgwater. We have recommended this programme of monitoring throughout the strategy and it will be targeted at providing information regarding the changing environment and its sensitivities, climatic factors and the dynamic form of the estuary and its sediments.

Update flood warning and awareness procedures in line with flood risk areas indicated in this document.

### Years 5 to 100

We will continue to monitor and the strategy proposals should be reviewed every 5 years against the new data sets arising from the monitoring programme.

The programme of bank re-engineering will progress from phase to phase as shown on the strategy Summary Diagram.

#### *Reviews*

In approximately 2020 we will need to decide whether a surge barrier to defend Bridgwater in the long-term and in 2025 if managed realignment at Pawlett Hams remain the preferred options. Factors which will influence the decision and alter the balance of the preferred option will be actual climatic factors, environmental and land use policy at that time and improved estuary data derived from the monitoring programme (including environmental).

*Summary of Option Appraisal\**

<b>FMU</b>	<b>Preferred Option</b>	<b>No of Residential Properties at Risk  All property and (residential)</b>	<b>Net Present Value Cost (£m)</b>	<b>Benefit /Cost</b>
Cannington	Hold the line/Re-Engineer Banks	1674	£29m	11.8
Bridgwater West	Hold the line/Re-Engineer Banks Surge Barrier 2046	1138	£32.6m	95.4
Bridgwater East	Hold the line/Re-Engineer Banks Surge Barrier 2046	7266		
Huntspill & Pawlett	Hold the line/Re-Engineer Banks managed realignment Pawlett Hams 2046	786	£17.8m	5.6

\*It will also be beneficial for us to upgrade and continue to provide flood warning and raise flood awareness throughout the strategy area.