

Action plan for zone 6 – table A.6.

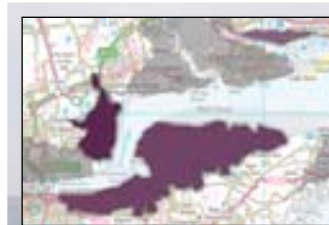
Seven actions identified

Description of the policy units

- East Tilbury & Mucking Marshes
- North Kent Marshes
- Hadleigh Marshes

Table A.6. describes the seven actions for zone 6 – lower Estuary Marshes which have been identified through the TE2100 Plan. The actions are described under the following headings:

- TE2100 recommended actions (and whether or not costs for this have been included in the TE2100 Plan)
- Implementation partners
- How this will be achieved
- How your response can help us finalise the TE2100 Plan



Do you consider that we have identified the right strategic options for managing tidal flood risk in the Thames estuary, and do you agree with the final preferred options?



Do you agree with the actions identified in our action plans and the timing of those actions?

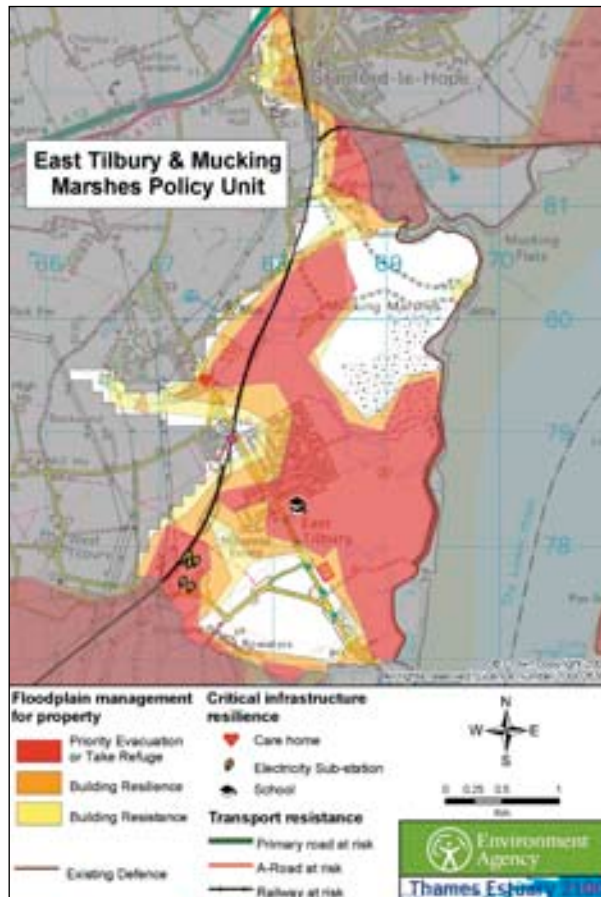


Do you agree with the mechanisms we have set out to deliver the action plans?



Have we identified the right partner organisations to deliver our action plans and are you, or your organisation, able to contribute to these actions?

Policy unit – East Tilbury & Mucking Marshes



At risk in East Tilbury & Mucking Marshes policy unit

Policy: Our recommended policy for East Tilbury & Mucking Marshes is policy **P3** to continue with existing or alternative actions to manage flood risk at the current level (accepting that flood risk will increase over time from this baseline).

Description

East Tilbury & Mucking Marshes consists of an area of marshes to the west of the Lower Hope reach of the estuary. There is an important area of designated intertidal habitat which runs along the frontage parallel to the defences. Much of this area of freshwater marsh is being used for landfill and gravel extraction. As a result, the landscape is in transition and will look very different in the future.

Sources of flooding

- Tidal from the Thames downriver of the Thames Barrier (probability 0.1% per annum or greater), flood depths up to 4 m.
- Fluvial from local watercourses including Mucking Creek (West bank) and the marsh drainage systems on East Tilbury marshes (probability >1% per annum), flood depths up to about 2 m.

The existing flood risk management system

- Tidal flood defences on the Thames.
- Drainage system outfalls including Mucking Creek and East Tilbury marshes.



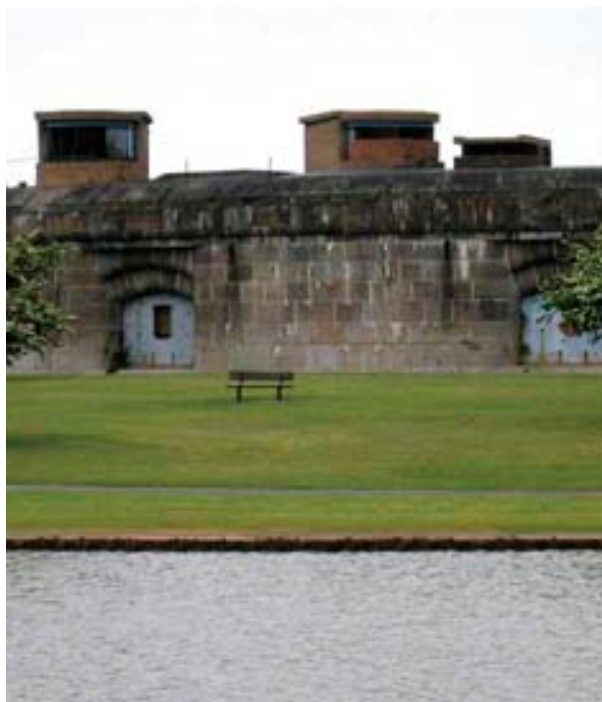
East Tilbury

Policy context

The main residential development is East Tilbury. The area to the north-east of this town is designated as community parklands in the Thames Gateway Parklands (TGP) vision. This includes a major landfill area that provides an area of high ground. There is public access along the defences to the south of the landfill area, and it is envisaged in the TGP vision that continuous public access will be provided in the future.

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Much of the remainder of the freshwater marshes has been or is being used for gravel extraction. As the land is being restored after gravel removal, it is likely that the marshes can be used for compensation freshwater habitat in the future.



Coalhouse Fort

Coalhouse Fort is an important historical feature which provides a focus point for public access to the estuary. It is recognised in the TGP vision as a key feature of the historic estuary environment.

Vision

Whilst the policy unit is dominated by landfill and gravel extraction, it presents important opportunities because:

- There is a tidal SPA along the foreshore, and managed realignment could extend this area.
- The Thames Gateway Parklands vision proposes that the much of this area including the landfill becomes a community parkland.
- The floodplain will be restored after completion of gravel extraction.

The replacement of defences can make an important contribution to the improvement of this area, particularly by providing better public access.


Local issues and choices


It may be difficult to justify replacing the defences when they come to the end of their lives because of the low value of assets in this area. Local defences for important assets (including East Tilbury) may be a more appropriate solution.

As the tidal flood defences will not be raised, flood risk will increase. The Plan includes a secondary defence for East Tilbury and the adjacent railway line, although this will require appraisal and justification. New and improved defences should be designed so that all defences have continuous public access, including adequate access points.

There is a fluvial drainage system for the marshes. Fluvial flood risk is likely to rise as the sea level rises and fluvial flows increase. Potential mitigation measures include outfall improvement, flood storage and local flood defences.

Choices for local flood risk management have not been designed or assessed in detail, and will be the subject of consultation and subsequent appraisal.

 Do you understand our assessment for the East Tilbury & Mucking Marshes policy unit?

 Do you agree with it?

Policy unit – North Kent Marshes

Policy: Our recommended policy for North Kent Marshes is policy **P3** to continue with existing or alternative actions to manage flood risk at the current level (accepting that flood risk will increase over time from this baseline).

Description

North Kent marshes consists of two extensive areas north and west of the village of Cliffe. This is the landscape evoked by Dickens and its

preservation is strongly promoted by groups such as the Friends of north Kent Marshes.

Much of the area consists of freshwater grazing marsh and has designated freshwater habitats. There are also designated intertidal habitats along much of the estuary frontage.

There is little development apart from the east end of Gravesend. There is an industrial area at Cliffe with its own secondary defence to a >0.1% standard and an important railway line across Shorne Marshes.

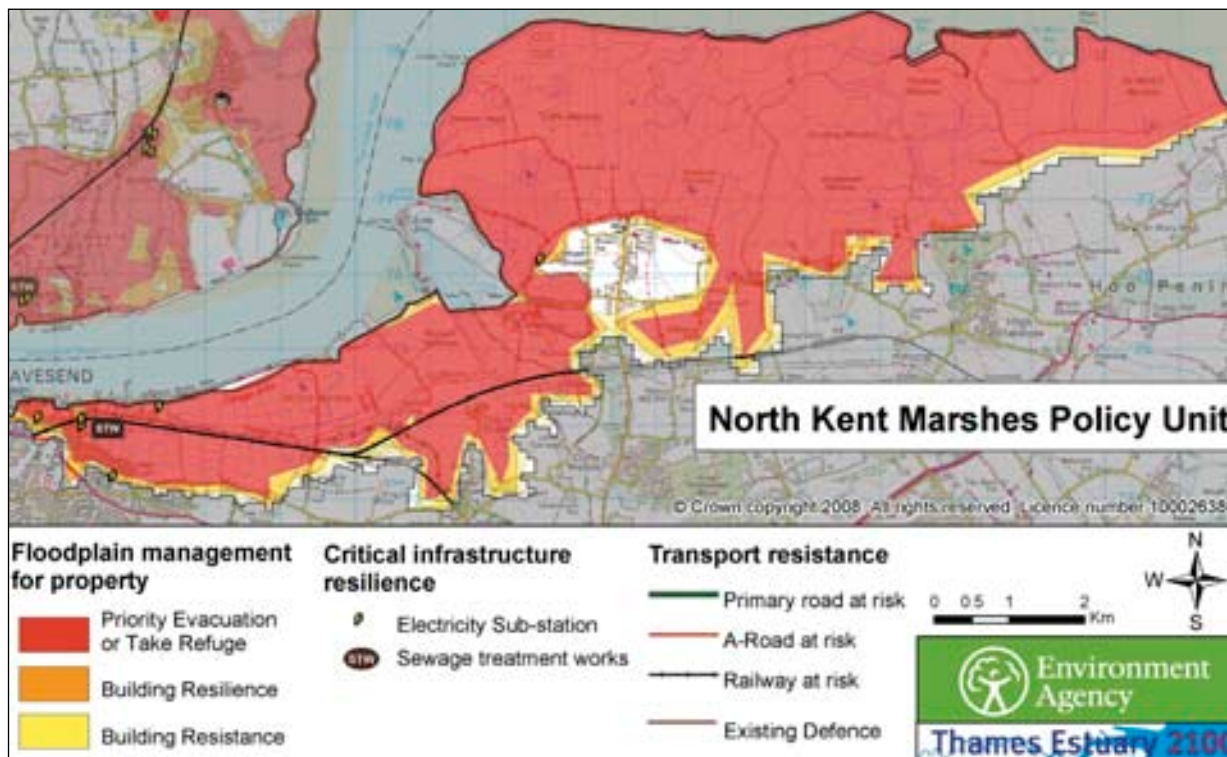
There is public access along the defences, and the area forms an important rural landscape.

Sources of flooding

- Tidal from the Thames downriver of the Thames Barrier (probability 0.1% per annum (Shorne Marshes) and 1% per annum (Cliffe & Halstow Marshes), flood depths up to 4 m.
- Fluvial from local watercourses including the marsh drainage systems on Shorne, Higham, Cliffe & Halstow Marshes (probability >1% per annum), flood depths up to 1 m.
- Groundwater from rock aquifers.

The existing flood risk management system

- Tidal flood defences downriver of the Barrier on the Thames.



At risk in North Kent Marshes policy unit

- Drainage system outfalls including Shorne, Cliffe & Halstow Marshes.

Policy context

Shorne Marshes and Cliffe Pools are designated as community parklands in the Thames Gateway Parklands vision, including restoration of the marshes. In addition, there are some historic villages on the edge of the marshes including Cliffe.

Shorne Marshes has also been identified as a potential area for flood risk management (flood storage) or replacement intertidal habitat. No new development should therefore be permitted in the marsh areas in order to maintain this important landscape and associated habitats.

Vision

The vision for this policy unit is to conserve and enhance this important marine and freshwater environment, in cooperation with local stakeholders.

The main changes to the North Kent Marshes policy unit are likely to be caused by the need to create replacement intertidal habitat as the sea level rises and enhancement of existing freshwater and grazing marsh habitats as potential compensation for loss of designated habitat.

Local issues and choices

The existing tidal defence system is likely to be retained except where the defences are realigned to create intertidal habitat, or because of erosion. However justification for maintaining the line may prove difficult in the eastern part of this policy unit, and the alternative would be to provide secondary defences for the communities on the edge of the floodplain.

New defences and improvements to existing defences should be designed so that public access along the estuary is improved, including paths which provide views of the estuary and access points. The Thames Gateway Parklands vision includes path and cycleway access along this entire frontage.

Defences should be in keeping with the rural landscape. This is currently achieved by the existing grassed embankments, but opportunities should be taken to enhance the landscape including, for example, different embankment profiles and earthworks that break up the generally straight lines of the defences. Any defence improvement provides opportunities to enhance both tidal and freshwater habitats.

The marshes have extensive open drainage systems. Severe problems have been encountered in the past with siltation of outfalls, particularly at Cliffe marshes. There is an important need to provide drainage outfalls that are more sustainable under conditions of erosion and accretion along the estuary frontage.

As the sea level rises and storm rainfall increases, there will be a greater need for an efficient drainage system. The drainage system will therefore require upgrading as the sea level rises to maintain a satisfactory level of storm drainage.

Erosion is occurring on the Cliffe & Halstow marshes including Lower Hope Point, and Higham Marshes. It may be necessary to set the defence line back in some locations.

Choices for local (non tidal) flood risk management have not been designed or assessed in detail, and have been identified in our action plan for further investigation, consultation and subsequent appraisal as part of a local scheme.



Do you understand our assessment for the North Kent Marshes policy unit?



Do you agree with it?

Policy unit – Hadleigh Marshes

Policy: Our recommended policy for Hadleigh Marshes is policy **P2** to reduce existing flood risk management actions (accepting that flood risk will increase over time).

Description

Hadleigh Marshes policy unit consists of an open area of freshwater marshes crossed by a railway line. There is a car parking area at the eastern end, and a separate island (Two Tree Island) which also has flood defences.

The western part of the marshes is an SPA (Special Protection Area), and the policy unit is adjacent to extensive areas of designated intertidal habitat.

The policy unit also includes Two Tree Island, which is a small undeveloped island connected to the mainland by a road bridge. This island contains contaminated material.

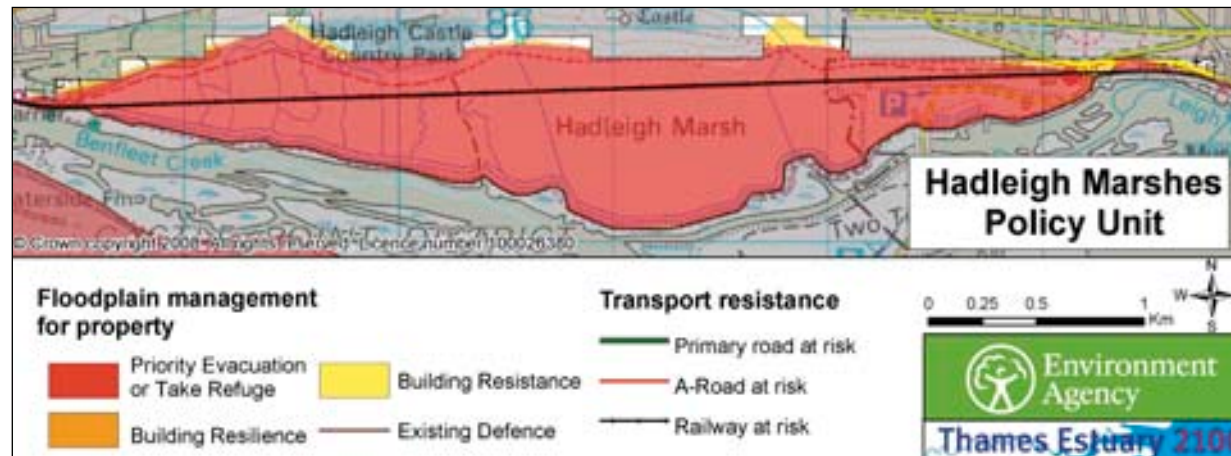
Sources of flooding

- Tidal from the Thames downriver of the Thames Barrier (probability 0.5% per annum or greater), flood depths up to 4 m.

- Fluvial from local watercourses including the drainage systems on Hadleigh Marshes.



Hadleigh Marsh



At risk in Hadleigh Marshes policy unit

The existing flood risk management system

- Tidal flood defences.
- Drainage outfalls for the marsh drainage system.
- There are also tidal flood defences around Two Tree Island.

Policy context

The land to the north of Hadleigh Marshes includes Hadleigh Castle, and the overall area provides an important open rural landscape with public access along the entire estuary frontage.

The City to Sea railway line crosses the marshes at just above ground level, although the overall impact that this has on the landscape is relatively small, it is at risk of flooding. The marshes are designated as community parklands in the Thames Gateway Parklands vision, and development in this area should therefore be avoided as far as possible.

Vision

This policy unit presents important environmental opportunities, partly because there is already an

SPA along the foreshore and partly because it has been designated as an area of community parklands. Opportunities exist for freshwater and grazing marsh habitat creation.

Local issues and choices

There are flood defences on Two Tree Island adjacent to Hadleigh Marshes. Our Plan assumes that these will be abandoned. However further study is needed because there is a potential contamination issue on the island.

Measures will be needed to manage fluvial flood risk from the marsh drainage system and watercourses that drain into the marshes. This would consist of improvements to channels and outfalls as the needs arise.

Floodplain management

The need for floodplain management responses will be limited because the policy unit is largely undeveloped. There are no communities apart from visitors to the marshes and Two Tree Island.

However flood warning will be needed for the railway line (which continues through Leigh-on-Sea & Southend-on-Sea policy unit to the east and Bowers Marshes policy unit to the west).

Choices for local flood risk management have not been designed or assessed in detail, and are included in our action plan for investigation, consultation and subsequent appraisal.



Do you understand our assessment for the Hadleigh Marshes policy unit?



Do you agree with it?



Looking across Hadleigh Marshes to the castle


Table A.6. – Policy units


East Tilbury & Mucking Marshes P3
 North Kent Marshes P3
 Hadleigh Marshes P2

[Note that all dates are based on government’s current guidance on climate change – the TE2100 Plan will be reviewed and updated if these predictions change]




	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	<p>A.6.1. Management of Defences.</p> <p>No defence raising is envisaged in the Plan, but defence maintenance and repair will be needed. In some areas this may involve realignment of defences that are threatened by erosion, for example in Shorne Marshes and near Lower Hope Point.</p> <p>Maintain the existing defence alignment but provide secondary defences for key assets including East Tilbury, as flood risk would otherwise increase.</p> <p>Some frontages are accreting and therefore erosion at the defences is not a problem, for example at East Tilbury & Mucking Marshes. However there may be opportunities to further enhance the intertidal habitats by setting back the defence line rather than repair existing defences.</p>	<p>Environment Agency</p> <p>Gravesham District Council</p> <p>Medway Unitary Authority</p> <p>Thurrock Unitary Authority</p> <p>Castle Point District Council</p> <p>Landowners</p> <p>Developers</p> <p>Essex SMP (shoreline management plan) Client Steering Group</p>	<p>Our Planning Liaison and Development Control staff will promote these works as part of ongoing development applications.</p> <p>Our Asset System Management teams will promote these schemes. However, the method of managing the defences is different from the present day approach. It involves greater maintenance and repair work in addition to replacement. Promotion of schemes through the capital programme may not be appropriate for maintenance and repair, and a different way of working may be required.</p>	<p>This is the work which the Environment Agency does now. We will continue with our programme of operations, maintenance and replacement but we are looking for ways of working better and more effectively.</p> <p>We are also seeking opportunities for environmental and recreational enhancements which will create a better place, and for partnerships which will help us achieve this.</p> <p>We would welcome any comments that you or your organisation can provide which assist us in these aims.</p>

TE2100 action plan: action zone 6 – lower Estuary Marshes



	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	<p>A.6.2. To agree a programme to provide localised flood protection and resilience to vulnerable key sites in the Lower Estuary Marshes zone.</p> <p>This will include the City to Sea Railway line and East Tilbury.</p> <p>Providing the secondary defences are built at Tilbury there are no large settlements at risk in the marshes. Local infrastructure will be affected (e.g. railway across Hadleigh Marshes), we recommend replacement with resilient or protected assets during normal maintenance cycle.</p> <p>No defence raising is envisaged in the Plan, but defence maintenance and repair will be needed. In some areas this may involve realignment of defences that are threatened by erosion, for example in Shorne Marshes and near Lower Hope Point.</p> <p><i>(Cost of implementing this action not included in TE2100 Plan, but TE2100 data and information will be available to assist)</i></p>	<p>Gravesham District Council</p> <p>Medway Unitary Authority</p> <p>Thurrock Unitary Authority</p> <p>Castle Point District Council</p> <p>Kent Resilience Forum, Essex Resilience Forum</p> <p>Landowners, site managers</p> <p>Essex SMP (shoreline management plan) Client Steering Group</p>	<p>Roles & responsibilities to be agreed. Programme to be agreed.</p>	<p>Implementation partners: Are you aware of the risks and particular vulnerability of people and property to flood risk in this area?</p> <p>Do you have arrangements in place for the scope of works required for the properties/areas in which you have an interest?</p> <p>Can the Environment Agency assist with this through implementation of Action A.6.2?</p> <p>Landowners, the public, business and other interested groups: We would be interested to hear your views to assist us in planning the implementation of this action A.6.2. particularly if you live, work or have interests in this area and are concerned about flood risk. This has not been designed or addressed in detail in TE2100 but a number of areas have been identified as requiring further study at local level:</p> <p>Our TE2100 Technical Report and out local choices documents provide further information on these matters and the choices which are available to assist with problems. If you would like to comment on these in more detail, please contact the project team.</p>

	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	<p>A.6.3. Habitat Creation site 1 of 4.</p> <p>In 2020 the first of four intertidal habitat creation sites will be implemented. Valuable habitat is being lost because our defences are preventing it from migrating landwards as sea level rises and over the 100 year life of our Plan, 1,200 hectares of new habitat will be needed. We have identified seven sites which have the right characteristics for habitat creation. The location of the sites are shown on the estuary-wide option maps. The potential site in this policy unit is:</p> <ul style="list-style-type: none"> • St. Mary’s Marsh. <p>By 2022 groundworks may need to be started to compensate for the loss of designated freshwater and grazing marsh interest features as a result of potential loss as a result of intertidal habitat creation. The following sites in this policy unit have been identified as having the potential to support the interest features that could be lost, either through enhancement of existing features or creation of new habitat:</p> <ul style="list-style-type: none"> • Shorne Marshes West • Cliffe Marshes • Cooling Marshes • Hadleigh Marsh East 	<p>Environment Agency Natural England Land owners Local Authorities Public and local interest groups RSPB Wildlife Trusts</p>	<p>Planning and groundworks will commence 10 years before implementation of the managed realignment. This preliminary work includes construction of a new line of defence to protect people and properties from the risk of flooding from the new intertidal zone. It also includes – in some cases, recharging the land levels so that the correct habitat develops. It may take up to 10 years after the realignment is implemented before the habitat is fully established at the site.</p> <p>We will be looking for partnership arrangements to manage these sites and get the best for the natural environment, for the local population and for visitors.</p>	<p>We would like to hear your views on our 2020 intertidal habitat creation proposal and the freshwater habitat creation that will follow.</p> <p>It is important that we use this consultation to have a proper and effective airing of information and views regarding any land use change. In the Environment Agency, we see habitat creation as a positive step toward the goal of sustainability and supporting the habitats and species that make the Thames Estuary internationally important. As managers of flood defences we also have an obligation to maintain the ecological integrity of internationally designated habitats where it is determined our defences are having a detrimental effect. This habitat must be replaced.</p> <p>There will be no increased tidal flood risk to the public as a result of the intertidal habitat creation schemes as they will always include a new defence construction on the landward side of the new habitat to protect people and property. This provides major opportunities for improving the reliability of the defence system. It also provides opportunities for enhancements for recreation, key infrastructure, visitors centres and other facilities. In order to finalise our plans, we need to hear what you think – in general terms, or at a local level.</p> <p style="text-align: right;">(continued)</p>


TE2100 action plan: action zone 6 – lower Estuary Marshes

	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	<p>A.6.3. (continued)</p> <ul style="list-style-type: none"> High Halstow. <p><i>(Cost included in TE2100 Plan)</i></p>			
	<p>A.6.4.</p> <p>Investigate contamination issues.</p> <p>There are flood defences on Two Tree Island adjacent to Hadleigh Marshes. Our Plan assumes that these will be abandoned. However further study is needed because there is a potential contamination issue on the island.</p>	<p>Environment Agency</p> <p>Natural England</p> <p>Land owners</p> <p>Local Authorities</p> <p>Public and local interest groups</p> <p>RSPB</p> <p>Wildlife Trusts</p>	To be agreed	Do you have any views or interests in this area which you would like to be taken into consideration during this consultation?
	<p>A.6.5.</p> <p>Habitat Creation – site 2, 3, or 4.</p> <p>In this period the remaining habitat creation sites will be implemented in 2040, 2050 and 2065. Further sites will be realigned to make up the necessary 1200 hectares of intertidal habitat creation required this century. As before St Mary’s Marsh is a site that is proposed as an option for consideration.</p>	<p>Environment Agency</p> <p>Natural England</p> <p>Local Authorities</p> <p>Land owners</p> <p>Public and local interest groups</p> <p>RSPB</p> <p>Wildlife Trusts</p>	<p>Monitoring and review will be required to confirm actual loss of intertidal habitat compared to that which was projected. Adjustment may need to be made to planned replacement activities.</p> <p>A.6.3. for additional considerations</p>	<p>We would like to hear your views on our 2040, 2050 and 2065 habitat creation proposals. If you views cover all the sites, or are generally about habitat creation, then please respond to this action (A.6.5.). If you have views about specific sites, please respond to the relevant local action plan in the tables which follow.</p> <p>See A.6.3. for additional considerations.</p> <p style="text-align: right;">(continued)</p>

TE2100 action plan: action zone 6 – lower Estuary Marshes

	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	<p>A.6.5. (continued)</p> <p>Further freshwater habitat compensation may be required. The same sites described in A.6.3. are proposed as options that could support the nature conservation features that may be lost.</p> <p><i>(Cost included in TE2100 Plan)</i></p>			
	<p>A.6.6.</p> <p>To maintain, enhance and replace the river defence walls and active structures through the Middle Estuary zone over the first 25 years of the Plan from 2010 to 2034.</p> <p>[Note: This is a continuation our current activities to ensure that confidence in the Thames tidal flood risk management system is maintained and that opportunities for environmental enhancements and partnership through planning are actively sought and carried out].</p> <p><i>(Cost of implementing this action is included in TE2100 Plan)</i></p>	<p>Environment Agency</p> <p>Land Owners</p> <p>Developers and local authority planning teams</p> <p>Thames Strategy East</p> <p>Parklands vision</p>	<p>Our Planning Liaison and Development Control staff will promote these works as part of ongoing development applications.</p> <p>Our Asset System Management teams will promote these schemes. However, the method of improving the defences is different from the present day approach. It involves greater maintenance and repair work in addition to replacement. Promotion of schemes through the capital programme may not be appropriate for maintenance and repair, and a different way of working may be required.</p>	<p>This is the work which the Environment Agency does now. We will continue with our programme of operations, maintenance and replacement but we are looking for ways of working better and more effectively.</p> <p>We are also seeking opportunities for environmental and recreational enhancements which will create a better place, and for partnerships which will help us achieve this.</p> <p>We would welcome any comments that you or your organisation can provide which assist us in these aims.</p>

TE2100 action plan: action zone 6 – lower Estuary Marshes

	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	<p>A.6.7. To operate, maintain and enhance the defence walls and active structures through the middle estuary zone the 35 year period of the Plan from 2035 to 2069.</p> <p>[Note: Continuing our activities to ensure that confidence in the Thames tidal flood risk management system is maintained and that opportunities for environmental enhancements and partnership through planning are actively sought and carried out]</p> <p><i>(Cost of implementing this action is included in TE2100 Plan)</i></p>	<p>Environment Agency</p> <p>Land Owners</p> <p>Developers and local authority planning teams</p> <p>Thames Strategy East</p>	<p>Our Planning Liaison and Development Control staff will promote these works as part of ongoing development applications.</p> <p>We will promote schemes through capital programme and they will form part of strategic and investment plans subject to replacement/repair working arrangements as A.6.6. above.</p> <p>There are major opportunities for reshaping the local landscape as part of these works.</p>	<p>During this period, there will be a major programme of refurbishment of the river walls and defences through the Lower estuary zone – although levels will not be raised. This provides many opportunities for creating a better place and to plan for a better riverside environment. If you would like to help shape the future environment in this area, then please let us have your views.</p>

TE2100 action plan: **action zone 6** – lower Estuary Marshes



Caravan park at Allhallows