



# Alde & Ore Estuary Partnership

*Document as endorsed  
by Suffolk Coastal  
District Council at  
Cabinet meeting on  
7th June 2016*



A partnership set up by the community for the community to protect homes, businesses and our environment from flooding



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## EXECUTIVE SUMMARY

Over the last 10 years consultancy plans by Posford Duvivier and Royal Haskoning and others on future options for managing the Alde and Ore Estuary failed to command the confidence of the community. The Alde and Ore Futures Consultation (2010) about the community as a whole had suggested, among wide ranging recommendations, letting some river defences fail in the near future or be re-aligned. This could adversely affect the economic and leisure life and current environmental special characteristics of this unique area. A clear outcome of the Futures community consultation was an overwhelming ambition among local people for an estuary-wide plan to sustain the current economic, environmental and community life as it now is, for as long as that is feasible, by maintaining the existing shape of the estuary.

The response to the Futures consultation by both the government agencies and the local community working together was the establishment of the Alde and Ore Estuary Partnership (AOEP). It has now prepared a local strategy to keep the integrity of the area, the landscape and all that this supports, with new solutions for creating more resilient flood defences throughout the estuary. A 'resilience' approach, to ensure river walls can resist breaching even if overtopped, is considered by the AOEP as the preferred management approach for river walls in the medium term (i.e. next 20-50 years). This is not currently reflected in a recognised plan.

Statutory partners are keen to support the AOEP but would welcome a plan that documents the new way forward and which can be assessed for economic and environmental outcomes. A revised plan would also assist the AOEP in planning and funding approaches.

In essence the plan will seek to achieve the protection of the local economy, including agriculture, tourism and leisure pursuits, housing and the unique environment and flora and fauna of the area and

- Include all parishes containing land which would be affected by flooding from the estuary.
- Seek to manage the estuary and its river defences as a whole, taking account of the impact of changes affecting one flood cell on other flood cells, as well as river flows, property, economic factors, environmental considerations, including habitat needs and saltmarshes, and regulations against the background of sea level changes resulting from climate change and isostatic rebalancing.
- Where defences require upgrading, rather than altering to meet a changed management approach, seek to upgrade these to a standard to withstand overtopping in a 1 in 200 year event, given likely sea level in 2050 (the December 2013 surge was a 1 in 20 year event) with provision for timely removal of water after a surge event. The approach would allow for overtopping from time to time but recovery from overtopping should be very quick unlike the longer term damage which would arise from breaches in the walls.
- Set priorities for upgrading or changing or modifying defences over a ten year, but hopefully shorter, period. The wall stretches in greatest need of repair will be upgraded first, prioritised by high Benefit Cost Ratio (BCR) flood cells, and linking in with Environment Agency funding where it is available.
- Monitor the state of the estuary, review the plan in the light of results including considering adjustments needed to meet environmental needs.
- Seek to secure the necessary locally-raised funding primarily through Enabling Development, i.e. securing development value from land donated by landowners and receiving exceptional planning permission (SCDC have set very strict criteria to safeguard local interests).
- The Draft Estuary Plan was subject to a full public consultation, Sustainability Appraisal and Strategic Environmental Report, Habitats Regulations Assessment and Water Framework Directive Assessment. This final draft reflects amendments and changes to meet the issues raised in the consultation and by the Assessment process.

## MAP SHOWING FLOOD CELLS IN THE ALDE AND ORE ESTUARY



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**Project:**  
Alde & Ore Futures - Managing the Coast

**Title:**  
All Flood Cells

Defence chainage per 1 km (1000m) and location of cross sections

**Legend**

- Cross sections
- Flood Cell Extents

0 0.5 1 2  
Kilometres

**Drawn By:** H. Braddock  
**Date:** Mar 2011

**Checked By:** A. Moon  
**Date:** Mar 2011



## 1. BACKGROUND

1.1 The Alde and Ore Estuary sits within the nationally designated Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB). It is a centuries old landscape which has evolved as an economic focus, a local community and a mosaic of wildlife habitats. The very first flood defences, clay walls with protective grass cover, were built in the 12th century principally to provide new grazing marshes for sheep to feed the workers building Orford Castle. In the 16th century the river walls were built further up the estuary, again to provide marshes for pasture. In 1515 a Mr Dobby rented the Aldeburgh Town marshes for grazing on the condition that he built a ditch or dyke to keep the pasture drained: that channel is still there today running at right angles to the river wall.

1.2 The creation of this landscape, of which the 44 kilometres of river walls are a defining feature, over the centuries has given rise to a number of natural features and important habitats. On the river side of the walls, the saltings and mudflats at low tide provide environments for the bird species which have led to the many national and international habitat designations. The saltings also provide an important habitat supporting fish populations, particularly with feed and nursery areas. Saltings are an important tool in flood defence, breaking up the wave action which would otherwise pound the walls directly. On the landward side, the marsh pastures which owe their continued existence to the river walls are habitats for a wide range of wildlife including amphibians, hares, moles, and otters. The borrow ditches or dykes, used for mining the clay to build the walls, provide reed bed habitats, home to many birds such as reed warblers, sedge warblers, reed buntings, kingfishers.

1.3 The estuary also forms the backbone to, and provides a focus for, economic and community activity. Fishing was a key industry in the estuary. While it is of lesser importance today, the estuary still provides a suitable habitat for oyster farming. In more modern times the primary use of the river, which was for trade as well as fishing, has changed. Now the key focus is on leisure, tourism and wildlife habitats. The estuary is home to three sailing clubs with over 500 moorings, water-skiing, canoeing, river trips, three boat yards and moorings all providing employment and the walls themselves provide over 30 km of walks.

1.4 Maintaining the river walls has protected the local economy, employment, the community and environment with its unique landscape, features and designations. If the walls fall into disrepair and eventually breach, over time the river would widen or change in depth, and develop the huge mudflats similar to the Blyth Estuary, substantially altering the ecosystem of the Alde-Ore. The consequences would include:

- Between 300 and 1400 houses would be flooded depending on how high the water rose.
- The majority of safe sailing activities would cease as the tidal velocities in the river would in parts be difficult if not impossible to sail against, and in other parts the river would become sluggish and shallow, both aspects giving rise to the consequential loss of the boat building industries and loss of employment the sailing clubs provide, not to mention an income of in excess of £1.4 million a year from the sailing community.
- Changes in features which have contributed to the several designations for environmental/wildlife features. Loss of flood defence walls would lead to the loss of wildlife dependant on the 3878 ha of freshwater habitats behind them. The saltmarshes in front of the walls which breach would be lost, though new ones might come into being over the long term. There would continue to be wildlife habitats, some different, but a considerable part of the 3878 ha. of defended floodable pasture and arable land would become intertidal mudflats.
- There would be a loss of nationally-valuable vegetable production. Over 3000 ha. of currently valuable land outside the flood zone is irrigated for vegetable crops from water abstraction points within the flood zones. If the point sources became salinated, rendering the water unusable, the land would only support cereals or livestock, with a product value of some £6-8 million less a year. This excludes the multiplier effect of loss of employment and haulage services industries which arise because of the production, and higher energy costs of bringing vegetables in from abroad. It would also adversely affect the national trade balance of payments.

- Significant changes in the estuary conformation could affect tourism which is a key local industry. According to a local survey, visitors contribute some £80-90 million or more to the local economy, a part of which arises from the attractive landscape and accessible river walls, birds, wildlife and the river activities.
- Without defences the Snape Maltings Concert Hall and Business complex, which alone generates £12 million in turnover a year, could be inundated.
- Paths providing access to and along the river walls are also likely to be considerably reduced if the land became flooded. Residents and visitors report that among the top activities are walking and birdwatching.

1.5 The Alde and Ore Futures was the last of a series of consultations on the river and the coast over the previous 15 years or more. It covered all aspects of the local economy including employment, communications, transport, culture and the natural environment. A significant outcome of the consultation was the community's prime concern to keep the estuary as it is now. It was recognised that over time with climate change and isostatic rebalancing, water levels may rise by 0.6 m over the next 100 years and that may lead to more overtopping of the walls, but the consensus was that the area need not lose its landscape features for many decades. The means to sustain the local housing, economy, place of leisure and tourism and the existing unique and designated array of freshwater and saline habitats and their wildlife was to manage the estuary as a whole adapting with nature as necessary.



## 2. RECENT APPROACHES TO MANAGEMENT OF THE ESTUARY

2.1 Since the early 1990s the Environment Agency (EA) has been developing a strategic approach to managing flood risk within the Alde and Ore Estuary. This has involved a series of plans which have examined options for management including retaining walls and managed realignment. See Appendix 1 for details. Many residents and landowners were in disagreement with these plans because of assumptions on timescale, gaps in local knowledge, lack of reflection of the wider aspirations of people living and working within the estuary and local people felt that the plans did not include viable options for wall management.

2.2 The most recent consultation was the Alde and Ore Futures project ran from 2009 to 2011. The Alde and Ore Futures consultation document suggested, among the several themes it dealt with, that based on government funding policy at that time, letting some walls decline and eventually breach but funding substantial and expensive new river defences closer to significant settlements such as Aldeburgh and Orford. This approach did not take account of the interrelationships between the different flood cells and the human and wildlife habitats and activity arising from the estuary as a whole. The wide and in depth community consultation demonstrated a strong majority view that the current shape of the estuary should be maintained for as long as was feasible and practical. This stems from two main characteristics of the estuary. The current features give rise to and support much of the economic and leisure activity of the estuary area. Equally, the estuary is a unique environment with a large number of special features and ecological niches all resulting from the shape of the estuary as it is. It is part of a wider Area of Outstanding Natural Beauty, and the estuary area as a whole has designations as Ramsar, SPA, and SSSI sites and also contains a number of sites with special designations in recognition of particular features including two SACs, and some 30 other features classified as small SSSIs. (See Appendix 2)

### 2.3 TAKING PLANS FORWARD

Following the Alde and Ore Futures process, the Alde and Ore Estuary Partnership (see Appendix 14) was formed in 2012 as a ground-breaking initiative involving the local community working in partnership with various branches of government to deliver a strategy which met all needs. It had the express purpose of ensuring ‘...the development and maintenance of a safe, secure, productive, biologically diverse and pleasant estuary’. The AOEP comprises representatives from key stakeholders in the estuary, representing parishes, landowners, farmers, river users, environment expert and businesses, with members of statutory bodies taking advisory and, where possible, facilitative roles.

2.4 From the outset, taking forward and building on the findings over the years on aspects of estuary management, as outlined in Appendix 1 mentioned above, the AOEP saw the need for a new way of managing the estuary that allowed sustainability, rather than piecemeal maintenance. However, inter alia, delivery costs of managing or realigning walls needed to be significantly cheaper than traditional defence improvement projects. Building ever higher walls or helping communities and land recover from damaging floods from inadvertent breaching, arising partly from inadequately maintained walls, is hugely costly. The resilience approach is therefore proposed. This ensures that walls are of an appropriate height with good back slopes and so able to survive overtopping. While walls may be overtopped on large surges, this method would significantly reduce the risk of a breach and minimise impact should any flooding occur. The damage from breaches and the cost of repairing them far exceeds that from overtopping of walls. Further, the Partnership is keen to promote the resilience method in order that communities and landowners can recover from flood events more quickly.

2.5 It is recognised that the engineering plans need to build in changing sea levels whether from climate change or land sinkage over the next few decades. Further, the resilience approach and the full AOEP draft plan is subject to a Sustainability Appraisal by Suffolk County Council which includes the latest Habitat Regulations Assessment, Strategic Environment Assessment and Water Framework Directive Assessment. The Environment Agency and Natural England are important contributors to this assessment. The Sustainability Appraisal will consider the potential impact of the plan proposals on the environment and economy and will determine whether the proposed policy for strengthening most of the walls is sustainable. The Estuary Plan must also take into account policies and regulations of other government agencies such as the Suffolk Coast and Heaths Area of Outstanding Natural Beauty, The Marine Management Organisation, Historic England, Eastern Inshore and Fisheries Conservation Authority.



2.6 The resilience approach also requires a clear plan of the likely engineering approaches, costs and priorities to help partners support the AOEP in terms of both statutory roles on consenting and permissions as well as Partnership Funding approaches. Where possible, work will seek to enhance or at least maintain the existing features, or find adaptive measures. A possible example of this is the issue of coastal squeeze. The current environmental baseline assessments were based on the premise that in the A&O Futures Consultation document, walls would be maintained for the short-term but that coastal change would render some walls unmanageable and over time they would fail. Under the new resilience approach, most of the walls could instead effectively be held for the next few decades. In this case there may be implications for intertidal habitats (coastal squeeze) which will be recognised, addressed and managed within the plan (see paragraph 5.3-5.5).

2.7 Against this background, the AOEP has drawn up a plan to achieve the sustainability of the estuary. It is proposed that repairs and upgrading of the defences all around the estuary will be carried out according to a flood cell prioritization beginning with the most vulnerable river defences and working through to the least vulnerable to bring all defences to the same standard in a comprehensive plan. To keep the estuary protection as an integral whole, funds raised will generally be used across the estuary rather than by seeking local pockets of funding for individual flood cells. The aim is to complete the major defences works within 10 years of the start of the AOEP to provide, where needed, the target resilience standard in the year 2050. The plan will need to be reviewed regularly and a fundamental review will need to be undertaken on the future as 2050 approaches.

2.8 Additionally, the technical aspects of the plan will benefit from pilot projects undertaken in recent years. These have informed methods to be used to seek the most effective and cost efficient ways to deal with the range of repair challenges, such as wall profiles, drainage and robust footpaths, arising in different parts of the estuary. These projects include the Orford Chantry wall upgrade project, Butley wall refurbishment and four saltings regeneration projects at Ferry Point, Orford Beach, Slaughden Iona site and Aldeburgh Brick Dock (Appendix 3 Trials and projects) with a fifth extended site put in place in autumn 2015. In addition, trials have been in progress to monitor and compare the benefits of sheep grazed walls with mown areas as it is thought that sheep grazed walls provide a tighter grass-sward making the walls further resistant to overtopping. Appendix 4 sets out the very positive results of the trials.

2.9 This plan, which takes forward the conclusion from the Alde and Ore Futures to manage the estuary as a whole, has been the subject of consultation both in May 2014 at the AOEP annual meeting and full public consultation in November and December 2015. An overwhelming number of responses support the plan's approach to resilience, maintaining the area as far as possible with adaptations as necessary to meet changes in the environment. Overwhelming support was also received to use enabling development, with safeguards to protect the special nature of the area, as one of the key ways of raising the necessary funds since it is likely that Government funding would not cover much more than a third of that needed. Appendix 15 sets out the full summary of the consultation results. Individual responses with AOEP comments where necessary will be available on [www.aoep.co.uk](http://www.aoep.co.uk)



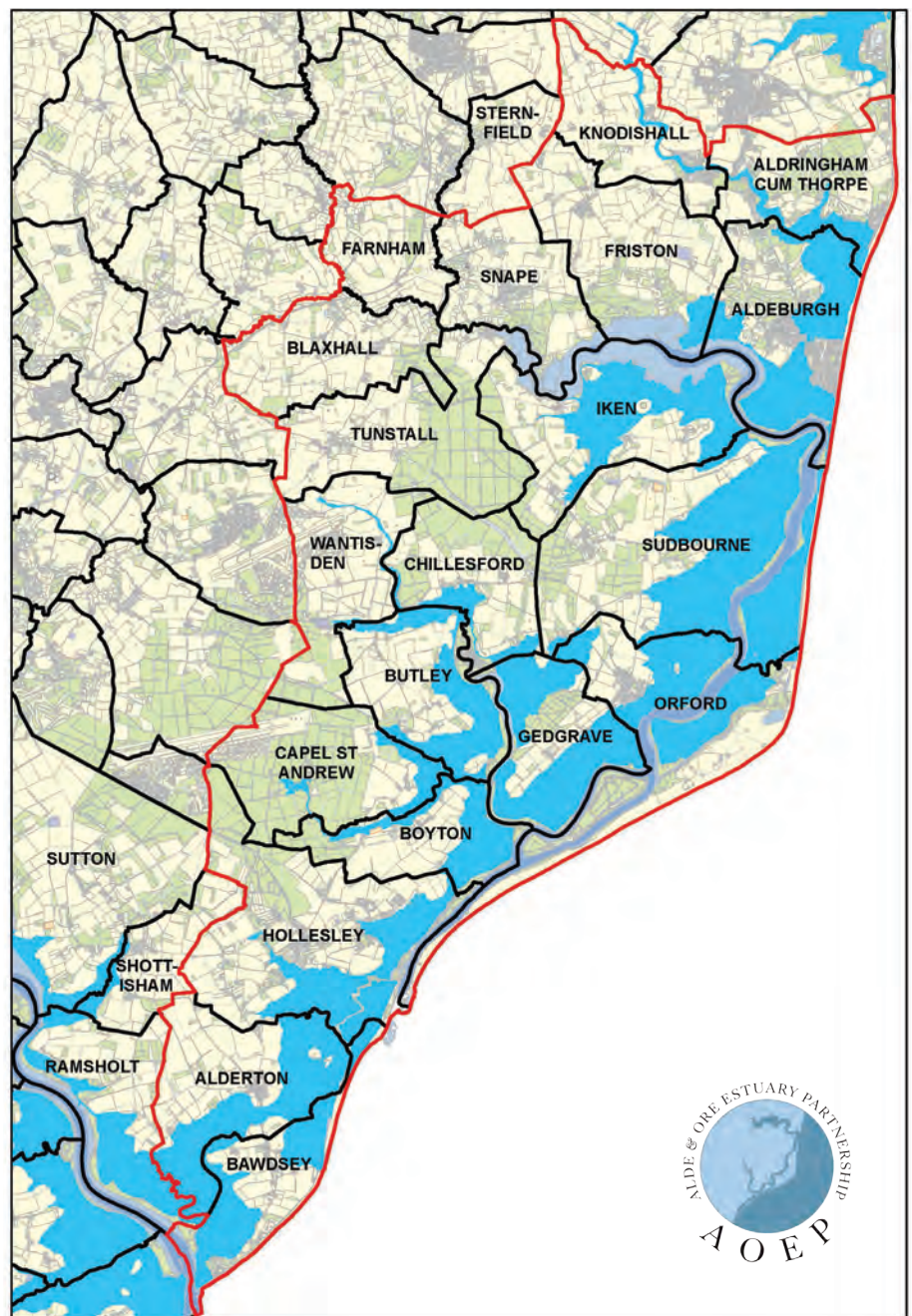
*Installing faggots for the saltings regeneration project at Iona site Aldeburgh.*

## 3. BOUNDARY OF THE ALDE AND ORE PLAN

3.1 The community wishes to sustain the unique Alde and Ore Estuary landscape and all that depends upon it. The AOEP Plan seeks to achieve this through a programme of works along the estuary shoreline but the need for, and benefit of, such works spreads wider than the flood cell areas. The land which is directly affected by flooding from the Alde and Ore is shown in the accompanying map in blue which could be flooded permanently if the walls fell in to disrepair (i.e. flood cells area is that below the 5 metre contour). There are also upland areas where agricultural production benefits from irrigation taken from the fresh water abstraction points in the flood cells. There are, also, roads crossing between or alongside flood cells which might be affected by flooding should the defences fail.

3.2 For this reason and to facilitate engagement with the relevant local administration and communities and to help gathering of necessary statistics, parish boundaries rather than geographical boundaries have been chosen to form the boundary of the area. All the parishes within the red line on the accompanying map have within their boundaries either flood cell areas (that flood) or land benefiting from the Alde and Ore estuary defences (that require irrigation) and are included within the plan to ensure clear communication.

3.3 The administrative area covered by this plan, shown in the map, covers the 20 parishes which contain part or all of the 14 flood cells and any parishes with land affected by the December 2013 surge. In the south, there are some overlaps with parishes named in the Deben Partnership and the Bawdsey Coastal Partnership, as some parishes lie astride the different catchment areas of the Alde and Ore and Deben and the coastal frontage. Parts of two parishes, Bawdsey and Alderton, are involved in the Deben Plan and three parishes, Bawdsey, Alderton and Hollesley are geographically involved with the Coastal Bawdsey Partnership plans as well as the AOEP plan. To deal with the pressing problems on the coastal strip, a separate community partnership, the Bawdsey Coastal Partnership, has been set up with the stated objective of “facilitating the renewal and management of the sea defences on the five miles of Suffolk coast from Shingle Street to the mouth of the Deben”. Nevertheless, the reference to the parishes of Alderton, Bawdsey and Hollesley in this AOEP plan is needed, as the three parishes, the Coastal Partnership and the AOEP will want to work in collaboration on estuary related issues arising in the marshes area behind the coastline and the west bank of the Ore.



## 4. AIMS AND OBJECTIVES FOR THE ESTUARY

4.1 The estuary plan is seeking to conserve and protect for the benefit of residents, visitors, businesses, culture and the unique environmental features:

- All residential properties liable to flooding if defences decline in effectiveness: of the numbers identified in the first EA assessment in the Futures exercise, 556 houses are in the flood cells, of which 298 are below current defence walls. A subsequent local survey picked up omissions and in total around 1400 properties in flood cells were identified plus the recently converted Maltings buildings at Snape which now account for some £35 million of properties in the form of residences, concert halls and shops.
- Business and working establishments in the flood cells number over 400 in addition to those in the big complexes of Snape Maltings and Aldeburgh High Street.
- Tourism for an area welcoming possibly around 300,000 day and overnight visitors each year spending, on the basis of voluntary survey returns, some £76 million, and the second homeowners and yachting and sailing members a further £3 million, plus additional spend at the major honey pots of Snape Maltings (music, shopping centre and eating places worth some £12m (given the sample size and the Maltings own accounts, this is only a small part of the spending there) and Aldeburgh Town.
- The nationally renowned cultural centre of Snape Maltings.
- A significant number of specially designated, both national and international environmentally important sites: a wide range of habitats, with a large number of local, national and international designations, to be preserved, protected or enhanced where feasible, from the river itself through saltings, freshwater marshes, and agricultural and wooded areas, all of which support a large number of different bird and animal species. See map Appendix 2.
- 5 wildlife reserves, attracting some 11,500 visitors a year, plus at least one private reserve built up over the last 20 years combining farming with wildlife conservation with lagoons and reed beds built behind and protected by the river wall.
- 60 licensed abstraction points responsible for 3 million cubic metres.
- A wide range of businesses whose returns depend in part on the existence of the estuary and the people and activity it attracts to the area. These include, sailing clubs, boat related businesses, fisheries, leisure pursuits including river trips and reserve visiting as well as many holiday rentals and all the service industries.
- 3878 Ha of defended floodable land.
- A further 3171 hectares of farmland irrigated with freshwater taken from abstraction points that depend on flood defences, see Appendix 5 for abstraction points and upland areas of irrigation, which in turn safeguards an important field vegetable production area of benefit to the UK's food supplies and reducing import bills.
- 101 km of public and permissive footpaths, including both those along river walls and some 24 km providing access to the river, see map (Alde and Ore Futures).
- Safe but varied sailing and water sport activities for all age groups for some 3000 sailing club members and visitors to the clubs plus opportunities for non-sailing visitors on river trips, and kayaking, see Appendix 6 for points of Access for waterborne craft.

- water quality, sluices and pumping stations including pumping of 11.2 million to control water levels on property behind the river walls.
- historic sites liable to flooding include Martello Towers, archaeological sites, and a number of listed buildings including the Moot Hall as well as three main conservation areas in Orford, Snape and Aldeburgh (see Alde and Ore Futures map) should all benefit from the improved level of flood defence. Orford Ness Lighthouse is also an iconic building in the area but is subject to erosion from the sea, not flooding from the river, so its defences do not fall within the AOEP remit.
- A number of public utilities such as electricity sub-stations and sewage or water treatment plants.
- Roads including 1.8 km of A road, 6.1 km of B road and 21.8 km of unclassified road.
- Footpaths that exist along a high proportion of the 44 km of river defence walls. In all 101 km of public footpaths in and around the floodplain depend on the existence of these flood defences.

4.2 The strategic aims and objectives underlying the plan to achieve sustaining or enhancing this vast range of features in the estuary area, which stem from the founding constitution of the Partnership drawn up by the community and government bodies, are:

1. To manage the estuary and adjoining land as a whole <sup>(1)</sup> so as to ensure, in so far as is reasonable, and in compliance with any mitigatory or compensatory measures set out in the sustainability appraisal, the maintenance of broadly the current configuration of the estuary and its significant contribution to the local economy, the environment, the community and the amenity value of the area, set as it is in the Suffolk Coast and Heaths Area of Outstanding Natural Beauty.
2. To ensure within the management of the estuary as a whole and, in so far as is lawful and reasonably practicable, flood and river defences of a standard that will withstand overtopping without breaching during a tidal surge of a 1 in 200 year frequency given the sea level rise predicted up to the year 2050 <sup>(2)</sup>.
3. In close association <sup>(3)</sup> with the EA, to develop a rolling <sup>(4)</sup> and prioritised programme of overall works for



*The Coastguard Cottages at Shingle Street at the entrance to the estuary.*

1 This phrase means an interrelated set of river defences and not as a collection of independent ones. It echoes the phrase in Terms of Reference 1 and footnote 18 of the AOEP constitution (dated May 2013).

2 This reflects the UK Climate Projections 2009 prediction for sea level rise which means that a 1 in 200 year flood in 2050 is expected to be higher than a 1 in 200 year flood in 2012.

3 This phrase respects the overarching statutory (albeit permissive) powers of the Environment Agency.

4 In the sense of being regularly reviewed and amended as appropriate.

5 Starting with the 2011 Survey of the state of the river walls (Hawes et al) and the 2009 Crest Level Survey to include slope, width, height and other key engineering features.



the estuary, including routine maintenance and minor repairs, maintaining and enhancing the current environment as far as is possible, consistent with the achievement of the above standard of flood and river defences by the year 2025.

4. To ensure that the rolling and prioritised programme of works takes fully into account the following key considerations:

a. Regularly updated assessments <sup>(5)</sup> of the impact on the estuary as a whole for each vulnerable section of the flood and river defences if that section were to be breached.

b. Priorities determined according to vulnerability, probable consequences including built or natural environmental, ecological, economic, social or cultural concerns and funding availability.

c. Respect for the implications of Government cost benefit analyses where central Government funding may be involved and respect for local priorities where funding other than from central Government may be involved.

d. The use, where appropriate, of local resources <sup>(6)</sup>.

5. To develop a partnership approach <sup>(7)</sup> to the management of the estuary and to consult <sup>(8)</sup> locally <sup>(9)</sup> in respect of individual projects or works and with the wider local community <sup>(10)</sup> at regular intervals on more general matters.

6. To co-operate with those responsible for emergency measures, and in particular support EA and SCC in raising awareness of flood risk issues in the estuary and in promoting emergency plans with parish councils that increase community resilience.

7. The plan will be reviewed every 10 years from the date of its approval.

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6 This echoes Terms of Reference 2 a ii of the AOEP interim constitution. It suggests where appropriate the use of local labour, contractors, materials, machinery or equipment etc as well of course as local finance.

7 This echoes Guiding Principle 4a of the AOEP interim constitution.

8 This echoes Terms of Reference 3 of the AOEP interim constitution.

9 This would include, where appropriate, consulting on the basis of an individual flood cell or group of flood cells.

10 This might include having a 'reference group' of a very wide range of communities of interest in the estuary area with which the AOEP might wish to engage periodically for their views.

## 5 STRATEGIC APPROACH

5.1 If forecasts of sea level rise are correct, possibly some 0.6 metres in the 21st century, holding the line indefinitely is not realistic in terms of either future sea levels or the costs of building high and strong enough walls to keep out all but the most extreme surges. The proposed AOEP's strategy is therefore one of resilience. This means accepting that overtopping will occur in surge events, but will not cause catastrophic damage (such as occurred in the 1953 flood) up to a 1:200 year event occurring in 2050, and recovery from a few hours overtopping should be relatively quick.

5.2 Under our proposed standard of defence, in 2050, the walls would be expected to overtop during a 1:75 year event. It would only be when they were overtopped by a depth of more than 300 mm for a period longer than two hours that they may be in danger of catastrophic failure: i.e. breaching. The AOEP's aim is therefore to achieve a level of defence that can survive undamaged an event with a return period of once in 200 years. This design standard being future proofed to the year 2050, using current EA sea level rise forecasts. By way of comparison the recent surge event of December 2013 had a return period of once in 20 years.

### 5.3 COASTAL SQUEEZE

The effect of the changing sea level on the natural environment and its many habitats will also be taken into account. In a worst case scenario sea level rise may be up to 0.33 m in the next 50 years. Salt marshes are estimated to build at a rate of 4-5mm a year (Saltmarsh Conference October 2015). As the Estuary is flood dominant (i.e. it has a greater tendency to drop silt) this rate of increase in saltmarsh height seems feasible. This can be confirmed by the successful development of salt marshes in the northern Lantern Marshes over a decade ago. Also, the evidence that this has been working over the centuries is that the level of the saltings in front of the river walls is significantly higher than the land on the landward side of the walls, some of which is well below sea level. Nevertheless, salt marshes are recognized not only as very useful to flood defences but are quite separately and very importantly unique habitats, valuable to wildlife, plant populations and fisheries. Other habitats including the intertidal mud flats, are also key to supporting the several species giving rise to the area's several high level environmental protection designations.

5.4 Intertidal habitat has been developing over some 60 hectares following the inadvertent breach of Hazelwood marshes in 2013. This new intertidal habitat will contribute to offsetting the potential coastal squeeze impacts of the Plan. In addition, ongoing and planned saltmarsh restoration work by the AOEP will contribute to mitigating squeeze impacts. However, there remains considerable uncertainty around the timing and degree of coastal squeeze effects. For this reason the Partnership proposes to engage with Natural England, the Environment Agency, Suffolk Coastal District Council, Suffolk County Council and other organisations, in a monitoring and review strategy (Appendix 7). This will involve clear benchmark data being established to provide a robust evidence base against which appropriate management requirements can be determined. If monitoring and review identify that there is likely to be a net loss of key features, (see Habitat Regulations Assessment (annexed to Plan), then replacement habitat will have to be provided. A baseline and monitoring requirements will be established in Year 1 and these will be fully reviewed on a five-year basis with the relevant authorities. Further, all projects arising under the Estuary Plan will be subject to Habitats Regulations and Water Framework Directive screening and assessment and other regulatory requirements and permissions.

5.5 The strategy also provides flexibility for possible changes in wall conformation to meet habitat or access needs. While plans designed for each flood cell are set out in this Plan, more detailed works plans will be made before works commence. An overview has been taken through the Sustainability Appraisal ensuring any estuary wide implications are assessed, including the impact of any areas upstream of defence works and for habitat balances. In addition a Habitats Regulation Assessment and Water Framework Directive Assessment have been completed. The Plan has been adjusted to meet requirements identified by these assessments. Further, it is also hoped that through partnership working, trials for good footpath surfaces can be combined, where appropriate, on defences which will not only provide a good walking surface on high footfall areas but also enhance the defence and avoid the path surface being washed away during overtopping.

## 6 PLAN APPROACH

The plan takes an overall estuary approach. The majority of flood cells contain a mix of farmers, property owners (both permanent and temporary residences) and businesses. Four flood cells, FC9, 11, 12 and 13 are under the ownership or responsibility of either The National Trust, RSPB, Suffolk Wildlife Trust, the Orford Ness Lighthouse Company Ltd and Cobra Mist Ltd (on FC 11.) As a result of the public consultation, it is agreed that, including the considerations for habitat mitigation/or protection per designations and condition assessments and flexibility in wall conformation, the AOEP plan works for the estuary as a whole.

6.1 The AOEP is fully aware that we live in a time of austerity. Government policy on funding is now to support works which protect housing and lives and in some cases fragile habitats. In practice this means that urban rather than rural areas are more likely to benefit. However, unlike the past, it is now possible for works to be done by other bodies or individuals with their own funding, and in some cases a contribution may come from Government where Government priorities are also being met. There are possibly some cases for which following the 2013/4 winter's surge and flooding some additional funding may now be forthcoming, but overall the new funding approach will apply.

6.2 The Estuary can be managed and have a full programme of works to protect the economy and local community of this area. But it does mean that significant private and local funding will have to be raised to supplement EA funding, which at best may be only a third of what is needed.

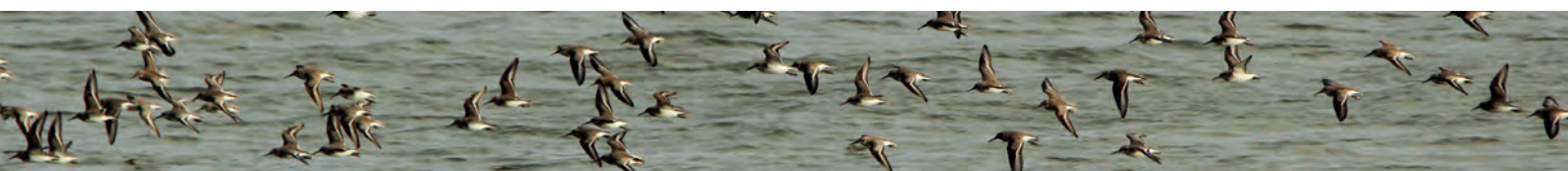
6.3 As a participant in the Alde & Ore Futures project, the EA produced an estuary-wide plan for the flood cells where funding would be available. This plan generated considerable concern about areas where little or no public funding would be available owing to the Benefit to Cost Ratio (BCR) being too low. The BCR is a function of Treasury criteria primarily concerned with life and property but taking no account of local economic and community values. Only two flood compartments in this estuary are currently judged to have a BCR less than 1, the threshold below which no public money can be spent. This applied to FC8 Ham Creek and FC9 Hazelwood Marsh but FC9 was seriously breached by force majeure in the December surge, so that reinstatement as a freshwater marsh was not required and adjustments to the new intertidal habitat are in process. However, most compartments have BCRs which, while showing that it is worth incurring some funding to maintain them, are unlikely ever to receive a high percentage of central Government assistance. Other more densely developed areas (Orford, Aldeburgh and Snape) will foreseeable receive the great majority of the available investment. Importantly, however, this EA plan has not said that works may not be carried out in places with low BCRs.

### 6.4 PLAN OF WORKS

Locally, there is now the opportunity to produce a fresh Whole Estuary Plan. The Partnership has access to a range of information on-

- Crest level surveys
- Flood defence wall angle surveys
- General condition of flood defences surveys
- Water flows and dynamics of the estuary
- Cost benefit analysis

This allows the Partnership to produce a programme of works alongside the EA's ten year programme drawn up early in 2012 which may need some updating. The intention of the Partnership is that the two approaches should be combined and work together to make the most effective use of resources.



## FLOOD CELL SURVIVABILITY ASSESSMENT

6.5 To build up plans for works, an assessment has been made of the current state of the defences using all information available. Flood cell plans have therefore been drawn up showing in detail the ability of the estuary walls to survive during storm surge events.

6.6 The plans take into account:

i) that a wall can survive a 300mm overtopping event undamaged. The surge event of November 2007 and December 2013 confirmed this level of resilience. The flood cell maps in Appendix 8 indicate predicted survivability in the year 2050 if no further work is carried out; this assessment allows for future sea level rise.

ii) Storm surges are forecast to increase in height and frequency due to the effects of global warming. The DEFRA climate projections guide lines have been followed, an allowance of 32.5 cm has been added to the surge heights provided by the EA (base date March 2011). Surge heights vary within the estuary due to the shape and length of the tidal channel. All data presented on the enclosed plans takes into account the variation in the surge heights along the estuary. This most recent modelling has been provided by the EA.

6.7 The assessment of the survivability of the defences is based on a 'Ski-Run' system i.e. the most urgent defences needing refurbishment or new design being BLACK, through RED and BLUE to the least urgent and currently most able to withstand a major event being GREEN. Survivability categories have been defined as:

**BLACK** Will overtop and may breach during a 1:20 year event in 2012 but **cannot** survive a 1:20 year surge event in the year 2050.

**RED** Will not overtop during a 1:75 year event in 2012. **Can** survive a 1:20 year surge event in the year 2050 but **cannot** survive a 1:75 year surge event in the year 2050.

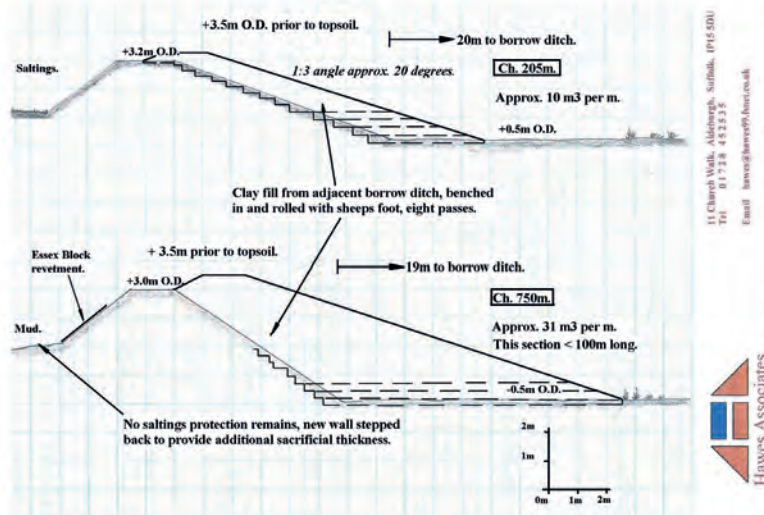
**BLUE** Will not overtop during a 1:200 year event in 2012. **Can** survive a 1:75 year surge event in the year 2050 but **cannot** survive a 1:200 year surge event in the year 2050.

**GREEN** Can survive a 1:200 year surge event in the year 2050.

Note: Flood cell defence designs enable walls to withstand overtopping to reduce the likelihood of flooding except in extreme (surge) conditions. They can also be adapted to meet specific management needs such as lower, but still resilient walls, as are now in place post the 2013 surge on Havergate Island.

### AOEP Flood Cell defence upgrade designs.

Flood Cell 03, Chillesford, Butley Creek.



H. Church Wells, Addborough, Salford, (P15 5DU)  
Tel: 01728 482435  
Email: hawes@hawesap.co.uk

Date: 5/5/2014  
Signed: A.D.H.

Project: Flood Cell 03, proposed upgrade Ch. 205m & Ch. 750m.





6.8 The flood cell maps (Appendix 8) should enable strategic decisions to be made as to how design upgrades can be prioritised. It should also be appreciated that in some cells opportunities may present themselves whereby a defence re-alignment will be the most practical and cost effective solution, particularly in situations where protection from saltings or revetment is likely to be compromised in the future.

6.9 It is envisaged that works on walls will essentially address the height, where necessary, width and back slope of the river walls, so the majority of upgrading work will be on areas above the high tide level. Should any particular cell plan require works which go below high water, the Marine Management Organisation will be consulted on the details.

## COSTS

6.10 The costs of upgrading to 1:200 year design flood survival in 2050 are set out in detail in Appendix 9. These vary as the existing condition of the walls defines what work will be required to achieve the design aim. Some parts may require only reinforced turf and soil nailing, some need levels raised, some more extensive raising to deal with settlement in softer base soil areas since the walls were redone in 1953. These costs for reinforcement, however, only apply to the top and rear of the walls. In the longer term, maintenance costs will also need to be covered. These will include maintaining the hard river frontage revetments, crests and landward slopes to include mowing, sheep grazing or other maintenance.

6.11 Built into the plans will be measures to enable immediate drainage of any water resulting from overtopping. Such measures will include the need for structures such as sluices, temporary mobile pumping equipment (as used on the Somerset levels during January 2014), and available funding. The issue of grass grazing/cutting and revetment maintenance are also to be addressed as will features such as footpaths. The benefits of cutting the grass need to be understood as well as alternative revetment solutions that may simplify maintenance. Trials on sheep grazing are already well underway and showed good results following the December 2013 surge. Appendix 4 provides a report on the trials up to September 2015 and show positive benefits.

6.12 To date, the policy adopted by the full scale trial works, at Butley and Orford, has been to improve to the 1: 200 year event (valid up to 2050). It is recognised that as the standard to which the wall is upgraded rises, the associated costs only increase marginally.



*Trial upgrading work on the Orford wall, west of the Quay.*



*Trial upgrading work on the Orford wall, west of the Quay before grass seeding.*

6.13 The programme of works will seek to ensure that no repeat visits to sections of defence for further reinforcement can be entertained, certainly in the short term, as this could add considerably to costs. Further, by tackling the defences in planned stretches, whilst there may be disruption to footpaths and wildlife for a single period of, at the most, a few months of work, the outcome should be that the walls are in reasonable state for the next 35 years requiring little other than some minor maintenance and so avoid frequent disturbance of habitats. However, there might be a need to revisit the sea/river front face of the walls.

6.14 There should also be an understanding of the inevitable long term changes time will bring to the estuary, however these changes can be significantly attenuated by adopting the design upgrades suggested.

## FUNDING

6.15 The AOEP aims to raise a proportion of local funds for the estuary as a whole rather than area by area, and to spend the funds in priority order set out in the strategic plan. To keep the physical integrity of the estuary it has to be managed as a whole because work on one flood cell can have repercussions for others or indeed the whole estuary.

6.16 Funding plans need to take into account the costings for upgrading all flood cell defences to the accepted level. In addition the AOEP will be taking a view on long term annual maintenance costs both for repairing refurbished walls should that be necessary, maintenance such as mowing and repair and maintenance of the riverside including revetments of the walls.

6.17 Funding sources for the capital works from the Government include any funds the EA may be able to contribute. The results from the calculator in turn depend upon the criteria set, the value of the elements to be defended and local landowner/IDB commitment to future maintenance. Other sources may come available such as a recent commitment to help deal with emergency works from the 2013 surge. The funding of each piece of work can be assessed according to the Cost Benefit Analysis for that area to assess the amount of EA funding that might be available. For some works the EA will fund a considerable proportion, others maybe jointly funded by the EA & private funding, and some may have to be completely privately funded with local money. In all cases the AOEP will seek to maximise the use of funds from any source by combining projects to meet as many aims as possible, such as flood defence, wildlife habitat or footpath renewal, should the need arise generally or for any England Coastal Path requirements.

## ENABLING DEVELOPMENT AS A SOURCE OF FUNDS AND POSSIBLE IMPACT

6.18 Substantial local funding will be needed. On the basis that Environment Agency might only provide £2-3 million of the £7-10 million needed to fund the plan, the bulk of the £7-10 million will have to be found locally. The plan is to raise some of this through Enabling Development.

The AOEP is identifying enabling development land i.e. undeveloped (usually agricultural land) donated by landowners for which exceptional planning permission is granted, on condition the uplift in value is donated to The Alde and Ore Estuary Trust (The Trust) for the benefit of the estuary as a whole. This approach was pioneered by the East Lane Project. It must be noted that development of this type must be subject to extraordinary justification, where directly related to the provision of essential infrastructure as identified within the 'improvement plan'. This Plan seeks endorsement by Suffolk Coastal District Council in support of Planning Policy SP 30, ensuring that it becomes a material consideration in relevant planning decisions and informs other relevant decisions in the area. It has adhered to the requirements set out in Suffolk Coastal District Council's Statement of Community Involvement for Supplementary Planning Documents.

The quality, type and quantity of development needed to raise funds for the AOEP plan is not likely to undermine the unique landscape and its communities. First, while enabling development permissions are given for areas not usually considered for development, but allowed because of the end use of the funds, the planning criteria are very carefully laid down by the Planning Authorities (see Appendix 10). Importantly, there is much in the criteria to ensure that the special nature of the area must be taken into consideration to preserve its character. Applications may also include viability assessments to demonstrate that any enabling development is essential to the delivery of the required infrastructure. Second, the limited amount of development needed should not damage the calm and tranquillity of the area. By estimating on the pessimistic side of a range of house plot values, say, £50,000 (on a site of say 5-10 houses), some 80 to 140 houses might be needed. Spread among the 18 parishes that are affected either directly (through flooding) or indirectly (i.e. those that benefit from irrigation) in the estuary it would mean on average 5 to 8 additional houses per parish. As a single exceptional plot might yield several hundreds of thousand pounds, the number of houses plots needed could well be lower. Also the criteria make it possible to re-use existing or redundant buildings. The impact on most parishes and central services is not therefore likely to be substantial, e.g. the Alde and Ore area has some 15,280 residents (2011 census) so the increased housing might lead to less than 4% increase in residents. Nevertheless in accordance with the Statement of Community Involvement, the AOEP will seek to engage the community at least via the Parish Councils at an early stage, before submitting any planning applications.

## OTHER FUND RAISING

It may not be possible to raise all necessary additional funding from enabling development, to meet the gap between Government flood defence funding and the total cost of works. Further funding sources need to be considered for capital works and longer term maintenance and these may be different. To tap into the community's wish to secure the foreseeable security of the estuary and all its features, the AOEP is also developing a funding strategy to secure and integrate funding both from other public sources, such as the EU or the Local Enterprise Partnership (LEP), special public funds or voluntary contributions from the community (as some members of the public have already said that they want to contribute), private sources, charities, legacies and individuals. The consultation responses also provided a range of ideas. These included eight advocating local taxes and five suggesting levies on the different types of local users such as holiday lettings and moorings. The AOEP will also look to maximise the opportunities provided by the availability of new tax relief for businesses that invest in or provide in kind support in those flood protection measures that can attract a contribution from FDGiA funding. More recently nationally there is a suggestion that that Local Councils might be able to increase local taxes in flood risk areas.



## THE ALDE AND ORE ESTUARY TRUST

6.19 The Alde and Ore Estuary Trust has already been registered with the Charity Commission to hold and distribute funds which are collected, including those from the uplift in land value realised on the sale of land for enabling development.

## SUMMARY OF FUNDING NEEDS

6.20 Overall, the upgrading alone is likely to cost £7-10million of which only a proportion would be met by government. It is hoped that the sale of enabling development land will meet a large part of the local raised funds needed. It is to be noted that the funding available from the Government may be affected by commitments for the future on where responsibility lies for funding and managing regular maintenance of the defences.

6.21 Managing funding sources in terms of both timing and amount is a further consideration. Any Flood Defence Grant in Aid (FDGiA) funding allocated per flood cell would first be channelled into upgrading the black areas and local funding would then pick up the remainder. It would nonetheless be important to gather all proposed works in a flood cell into one FDGiA application in order not to use up all the 'benefit' in the first work undertaken. The EA would make applications for capital funding major schemes that involve rebuilding and increasing the standard of protection and this would include Snape and Aldeburgh Town wall in the future.

## PRIORITISATION OF WORK

6.22 The prioritisation of works in the total scheme needed for the whole estuary is guided by an approach that cells with predominantly black areas should be upgraded or adapted first which would give an immediate and significant increase in protection everywhere. Next those cells with predominantly red areas would be tackled and, lastly blue, which would only require mesh and anchors and so be relatively less expensive. The exception to this will be where an otherwise sound defence (largely green or blue under our classification) has one or more limited very weak points (black). In such cases it would be sensible to put right those small defective lengths of defence in advance of upgrading the entire length of that defence.

The AOEP determined its prioritisation by assessing all the relevant factors for each flood cell, in addition to flood cell survivability, recognising that some of these would be financial, some numerical, some subjective, and has involved an exercise of our joint judgement looking at all the factors together.

The exception to this approach would be that, in principle, if independent funding were to be available to carry out flood defence work in a flood cell, then unless the work in that cell had a significant impact on other cells in the estuary, it should go ahead. This is irrespective of the status of the compartment under the AOEP's own prioritisation. Following that principle, as Ham Creek was relevant to only four landowners and farmers (and only scored 0.5 BCR so no FDGiA funding would be available), and as the financing could be agreed by the landowners/farmers, the work on this FC went ahead.



20 *Sea wall at Slaughden under pressure at high tide.*

6.23 Weighing all the factors in the balance, including the impact of the 2013 surge, the ranking of flood cells, by priority, as at October 2015 is:

- |   |        |   |
|---|--------|---|
| 1 | FC6/7  | Snape (a major capital scheme is being prepared at present, by EA)        |
| 2 | FC 10s | Aldeburgh   |
| 3 | FC4    | Orford  |
| 4 | FC5    | Iken  |
| 5 | FC1    | Boyton/Butley   |
| 6 | FC3    | Chillesford   |
| 7 | FC2    | Butley Mills (recent pre-plan works have already brought the standard up) |
| 8 | FC8    | Ham Creek (to be financed by relevant landowners)                         |
| 9 | FC9    | Hazlewood Marsh (see note 2 below)  |

Individual priorities. FCs 11,12 and 13. Works on these three flood cells will be compatible with the overall AOEP resilience approach. As the responsibility of particular landowning bodies and including few if any residential properties, the flood cells are not included in the list of priorities as they may be worked on separately, but nevertheless in discussion with the AOEP. Parts of FC 12 and 13 have already been made more resilient after the 2013 surge and in FC11 works are already in hand to deal with some damage from the 2013 surge, most immediately the breach of the American Wall which may be undertaken in March 2016 and Stoney Ditch later in the year.

More details on the prioritisation factors by flood cell are given in Appendix 11.

Note 1: **'Flood Cell 0'**: (coastal area south of Shingle Street) has decided to form its own partnership but the AOEP will need to liaise with it where there is interaction with the two partnership areas.

Note 2: **Hazlewood Marsh**: Following the damage in the December 2013 surge, considered government formal advice was that reinstatement of defences was not to be funded for Hazelwood Marsh (FC9) and nor was establishing a compensatory marsh elsewhere required. A small wall was built to protect some pasture and the golf course and works are being undertaken to make the intertidal habitat more attractive for key species.

## SLAUGHDEN AND SUDBOURNE BEACH SEA DEFENCES.

6.24 The Slaughden and Sudbourne beach boundary to the estuary, (the stretch of coast from Aldeburgh Town to the southern end of Sudbourne Beach), while not lying in a flood cell, is central to the continued course of the river between Slaughden and Orford. Responsibility for sea defences lies primarily with the EA. However the impact of the 2013/14 winter storms on the Slaughden sea wall defences has made what were thought to be reasonably secure defences for some time very much more vulnerable. The EA during the early part of 2016 are carrying out a substantial maintenance and repair programme but the issue of how to address this defence is absolutely crucial to the continuation of the estuary in its current form. Breaches at any point on this stretch could impact on the integrity of the estuary and the effectiveness of the Estuary Plan. The existing Shoreline Management Plan (SMP) provides for a policy to **Hold The Line** for the stretch of wall north of the Martello Tower (Policy Unit ALB14.4) until 2055 but for the stretch to the south, Policy Unit ORF 15.1 (Sudbourne Beach- south of Martello Tower) the current policy is **Hold The Line** only until 2025 and **No Active Intervention** subsequently. (See Appendix 12 for extracts from the SMP). However the policy refers directly to the open coast rather than the estuary. Further, the SMP recommendation states that

*'There remains uncertainty with respect to management to the area south of the Martello Tower through to Lantern Marshes. This needs to be resolved through an estuary management plan. There is a commitment by Suffolk Coast ICZM Initiative to develop with local communities and interested groups a Management and Investment Plan for Alde and Ore. This area will include the Alde and Ore estuary and its adjoining coastline. This plan will take account of the conclusions of the SMP, will review the recommended SMP policy and, if necessary, amend this accordingly.'*

Almost half those answering the Consultation's last question as to whether anything had been missed out, volunteered that the Draft Estuary Plan was just not specific enough about this vital stretch of the river's configuration. These respondents pressed for more than the recognition in the Draft Estuary Plan that addressing this defence was **absolutely crucial** to the continuation of the estuary in its current form. The AOEP consider that bearing in mind that the SMP recognised the development of an estuary management plan and that the final plan is nearing completion, the time has now come for **the SMP to be reviewed to ensure consistency between the stretches of the coastline north and south of Martello and with the overall estuary plan**. The AOEP is aware that the finalised estuary plan will be 'the management and investment plan'. There are other studies and works being undertaken on the open coast and all will need to be reviewed to determine if under the Framework for changes in SMP policy (as approved by the Suffolk Coast Forum) a change in SMP policy is to be considered.

6.25 The priorities of the flood cells are not set in stone and will need to be reviewed regularly to ensure that changes in factors affecting the estuary are properly addressed and taken into account. When the individual detailed project plans dealing with a particular part of the river defences are developed, there will need to be detailed assessments to ensure that compliance with all regulatory and statutory requirements are met. It has been recommended as part of the HRA, that an Environmental Action Plan (EAP) including standard precautionary method statements are produced in advance to guide the aspects of construction work and smooth the consenting process. Other factors that will be considered and may increase/decrease the priority level over time were:

- Length of public/permissive footpaths. These may be key generators of funding as they give public access which benefits the entire nation, not just this locality, and there would be a huge impact should they be lost. It is not known if/how the UK Marine and Coastal Access Act could influence this.
- High/medium/low impact on hydrodynamics and navigation.
- Sailing –high impact on tourist economy for Aldeburgh and Orford if reduced.
- Wildlife designations, SACs, SPAs, SSSI, and other non-designated sites.
- Volume of fresh water abstracted.
- Sewage plants.
- Critical infrastructure – roads/electricity/sewage and water supply etc.
- Pump stations.
- Cost of compensation/loss of insurance cover should damage result.
- Moorings (private owners +Crown Estate's income)/boat yards.
- Landscape and woodlands.
- See Appendix 11 Flood cell prioritisation data spreadsheet.

## PLANNING OF INDIVIDUAL WORKS ON FLOOD CELLS

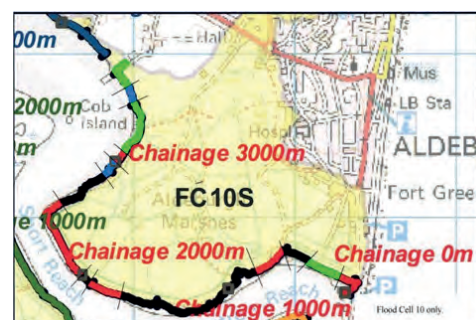
6.26 There will need to be flexibility in taking individual blocks of work forward both to allow for dovetailing with EA plans and funding availability and, as the recent surge in December 2013 has shown, there will need to be flexibility in upgrading plans to meet unforeseen changes and new priorities. Nevertheless, the intention is to continue with a whole approach to the estuary to ensure its integrity and sustainability whilst making changes in the order of priorities should the need arise. The flexibility will also apply to the timing of any works. While it is intended, funds permitting, to complete the programme in as few years as possible, clearly account must be taken of not only seasonal limitations on when such works can physically be done but also environmental and wildlife requirements.

When the individual detailed project plans dealing with a particular part of the river defences are developed, there will need to be detailed assessments to ensure that compliance with all regulatory and statutory requirements is met. Prior to individual projects being put forward, the HRA requires an Environmental Action Plan (EAP) to guide the aspects

of construction work. The EAP is subject to HRA in advance of applying for permissions. Preparation for individual projects will include (for AONB compliance) that proper regard is paid to the purpose of conserving and enhancing the area of outstanding natural beauty. This includes meeting the need for quiet enjoyment of the countryside and having regard for the interests of those who live and work there. Several environmental requirements are to be met in relation to habitats, species, water quality and for planning, all necessary aspects should be covered and permissions sought. Specific consideration may be needed in relation to footpaths in which case local consultation will also take place.

## FLOOD CELL APPROACH

6.27 The map (right) for Flood Cell 10 South (FC10s) illustrates the resilience approach. There may, in addition, be work needed in FC10s to resurface or structure the most heavily walked part of the wall near the Slaughden road. Detailed maps for every flood cell are contained in Appendix 8.



6.28 The features to be protected or sustained within every Flood Cell, including FC10 South, are shown in the tables contained in Appendix 12. The information has largely been drawn from the Alde and Ore Futures project, and been updated by local knowledge including the community consultation on 8th May, 2014. Briefly, to summarise using FC10s as an example, in FC10s by maintaining the river walls the river would continue to flow as now. If the river wall was permanently breached the river would flow into and inundate the marshes. As the marshes are significantly below sea level they would become mudflats not saltmarshes. Over 250 houses would no longer be habitable and some 180 ha of agricultural land would be lost. Sailing would not be possible up river and the additional volumes of water flooding the marshes each tide might also prevent sailing downstream. A significant element of the local economy, including possibly both boat building businesses, and the extensive walks close to the town including some 3½ km along the river wall, would be lost. Substantial sums would be needed for a new wall along the town edge to protect from future surges. Similar details on all other flood cells each with their own particular features are given in Appendices 8 and 12.

6.29 There are four flood cells where the leading considerations relate mainly to environmental management.

## FLOOD CELL 9

**The Suffolk Wildlife Trust (SWT)** is the major owner of the Hazlewood Marsh Flood Cell (FC 9). The SWT supports addressing issues on an estuary wide basis and the principle of resilience and would like to see flexibility allowing landowners to manage their land differently but, where it is appropriate, within the wider beneficial management of the estuary. It has commented that despite considerable investment by the EA over many years to repair the walls at Hazlewood Marshes, following the surge event in 2013, it was clear the breaches and significant damage in the walls at Hazlewood were financially unsustainable and therefore irreparable. Professor Ken Pye's report confirmed that Hazlewood marshes as an intertidal site would not cause a significant adverse impact on volume and flow within the estuary and indeed would reduce the risk of flooding at Snape. The SWT strategy to develop Hazlewood Marshes as an intertidal reserve is therefore in line with the resilience approach adopted by the latest AOEP. The breaches continue to deepen and widen and the reserve has now become fully intertidal. In the last year SWT has commissioned a wetland contractor to work with natural processes to create islands within the intertidal system to provide habitat for wintering wildfowl and breeding waders such as avocet. The reserve is becoming increasingly well known as a flagship reserve for birds on the estuary. SWT predict that the spectacle of large numbers of wintering and breeding waders and wildfowl will continue to attract large numbers of visitors in the future.



*Damage and breaches to Hazlewood Marsh wall after the surge tide December 2013.*

## FLOOD CELL 11

**The National Trust (NT)** are responsible for much of Flood Cell 11 on Orford Ness, stretching from south of the Martello Tower to the end of the Ness but part is now owned by The Cobra Mist Co. The ownership rights and responsibilities are complex. The National Trust are setting in hand, as part of a normal management process, a review of its plans for the area, having owned it for nearly 25 years, but recognise the importance of the integrity of the estuary to its wellbeing (and vice versa) and to the Orford community in particular. A substantial part of the site (including most of Lantern Marsh and Cobra Mist) also lies in Sudbourne parish. The private land owner finds the AOEP plan compatible with his aims and objectives for the property. Currently, the two owners are now collaborating with repairs of the breach in the American Wall. This will include an adaptive approach which is hoped will benefit habitat development in the Cobra Mist area as well. It will involve rebuilding the American Wall with a two way sluice and a sill which will be overtopped at times of exceptional surges so that that area can act as a flood relief area. The current aims are that the breach repair will also enable the area to be rapidly drained out through the sluice once the danger has passed. Deliberate flooding of the area through the sluice may also take place occasionally to manage the habitat including building up salt marshes and breeding or feeding areas. These approaches are welcomed and work with the AOEP plan.

## FLOOD CELLS 12 AND 13

**The RSPB** are responsible for FC 12 and 13, and recently took on ownership of part of FC1. Its current management approach is to ensure that walls are resilient but at a lower level than the rest of the estuary as the need is to keep habitats in appropriate condition, and more frequent flooding is acceptable than is desirable for residential areas. After the 2013 surge the southern Havergate Island walls were restored to have a stronger construction to avoid a breach but did not need to avoid frequent overtopping. This will ensure that the river and island retain their current shape. The RSPB have plans to upgrade the northern part of Havergate Island walls to a similar level. For the time being the RSPB are also looking to increase the marshy habitat within its part of Flood Cell 1 but there are no plans to remove the walls. The RSPB will provide such data as they can to assist with the AOEP's monitoring and mitigation strategy.

## ANGLIAN WATER AND ESSEX AND SUFFOLK WATER

6.30 Anglia Water and Essex and Suffolk Water are to be consulted on their protection needs in areas that could be affected by the plan. Freshwater abstraction points and protection of water from salination will be important. Responsibility for water and sewage provision in the estuary area during flood events needs to be agreed.







## 7 PRESSURES, RISKS AND OPPORTUNITIES TO BE TAKEN INTO ACCOUNT

7.1 There are a number of natural and economic issues which have been or will continue to need to be monitored or addressed should pressures, risks and opportunities in the development or roll out of details of the plan arise. These include:-

- **Natural forces** Climate change leading to rising sea levels, combined with land sinkage still carrying on following the rebalancing of the tectonic plate on which Great Britain sits by the loss of deep ice in the north. These effects have already been built into the engineering plans

- **Estuary processes** Following the December 2013 surge, the Environment Agency and Professor Pye, an independent consultant engaged on behalf of the partnership, have made two rounds of further studies, including acquiring additional data, to assess the impact of the 2013 surge on all aspects of the estuary flow, water volume and shape. The modelling studies were designed to be complimentary and fit together. Better data is now available to help the flood defences at Snape to progress. Other parts of the estuary plan do not need to be changed but the AOEP is aware that further modelling and research will be needed should landowners come forward with proposals to change the defences on the parts they own. There will need to be on-going communication to ensure all relevant parties are involved.

- **Natural environment** The estuary flanked to the east by a sea wall and very long natural shingle bar, but with the river flowing on the landward banks alongside river walls which are a substantially manmade but centuries old green environment, with some river walls built as early as the 12th century. During the centuries many different habitats, including saltings and intertidal areas, have developed and in the last century some walls have been left unrepaired, particularly in the upper estuary, mostly losing areas of pasture but resulting on more reed beds, channels and mudflats. The land in front of the defences and hinterland behind provide a number of varied habitats, witness the array of special site designations which the AOEP consider important to protect. In addition, work is already in hand on pilot projects in different areas to increase saltmarsh. A first phase of four saltmarsh sites was put in place in 2013/14 to test methods of increasing silt accretion. A further phase is in the process of being put in place during September 2015 to protect a higher salting bank from erosion. These projects are being regularly monitored but it may take 10 year for results to show, as it did where the National Trust sought to build up new saltings within the northern Lantern Marsh. Continued monitoring of the estuary's features will be important. The current well-loved landscape and environmental/wildlife attributes will all need to be borne in mind in the AOEP plan. The Sustainability Process and public consultation will, inter alia, help bring together the detailed flood cell plans and ensure that the estuary is considered as a whole, not only in relation to flood defences but also from the point of view of maintaining the where possible enhancing the current assembly of ecosystems that comprise it.

- **Estuary economics** The estuary, as it currently exists, provides the backbone for a number of businesses such as boat building, moorings, fishing, leisure and tourism. Any changes in the river shape or flow, such as increased currents, loss of navigable channels, flooding of business premises leading to a drop in customer presence, sailing and other water-based and leisure activities could be adversely affected. The maintenance of the sea wall near Slaughden is key both for river based activities and to the defence of the town of Aldeburgh from flooding.

- **Access and visitor pressure** The estuary provides some 101km of walks which are much valued by residents, and also by country-wide and foreign visitors. There is a balance to be had between enhancing public rights of way, considering requests to increase such access and not damaging sensitive habits. Should there be any changes in the infrastructure for access and sporting interests, they should meet the requirements of the AONB statutory purposes and comply with Habitats Regulation Assessments.

- **Engineering opportunities** It will be possible to take advantage of works necessary to repair defences to develop other benefits to the area. For example the opportunity of using the excavation of clay for the bank maintenance to create water reservoirs to hold freshwater which would otherwise be pumped out into the estuary and lost. Furthermore, new freshwater habitats can be created from borrow ditches and ponds dug to source clay. The possibility of using the freshwater which is pumped out regularly into the estuary could also contribute as an enhanced use of resources but this would require a change in regulations.

- **Funding possibilities** The AOEP will need to be alert to every funding possibility that might help secure the overall aims of the strategy without compromising the key elements.

- **Planning** The Plan has been drawn up as an Estuarine Plan in accordance with Strategic Policy SP30, The Coastal Zone in Suffolk Coastal's Local Plan. This states that *'the District Council will promote with partners Integrated Coastal Zone Management, including the preparation of a comprehensive management plan for the coast and estuarine areas, supported by plans for specific areas'*. These will take account of their economic, community and environmental needs as well as predicted changes in circumstances (including the consequences of climate change). The development and production of the Estuary Plan is also complying with statutory processes: as such, it is subject to the required Sustainability Appraisal/Strategic Environmental Assessment, Habitat Regulations Assessment and Water Framework Directive Compliance Assessment. It also seeks to follow the requirements set out in Suffolk Coastal District Council's Statement of Community Involvement, Supplementary Planning Documents. The Environment Agency will share the Plan with the Regional Flood and Coastal Committee and the East Anglian Coastal Group with a recommendation to recognise the Plan as the basis for future flood and coastal risk management decisions in the Alde and Ore Estuary. The Plan will also be presented to the Coastal Forum and to Suffolk Coast & Heaths Area of Outstanding Natural Beauty Partnership for endorsement.

- **Economic considerations.** When the detailed plans for some flood cells are made, it is more than likely that consideration will have to be given to factors such as improved or even further footpaths (including coastal access and other access points to the estuary), saltings restoration or enhancing other wildlife habitats and adjustments to improve the enjoyment of the estuary. All plans will need to bear in the mind the balance needed between conservation and new changes, preserving the quiet and tranquillity for which the area is so valued but also enabling new possibilities for enjoyment. Obviously, should new ideas be brought forward there would need to be consultation.

## 8 VALIDATION PROCESS

8.1 The people of the local area were last fully consulted during the Alde and Ore Futures study in 2011/2. An interim consultation took place at the AOEP's May 2014 Annual Meeting: this was attended by over 100 people and workshops stimulated discussion, views and ideas as to what was wanted by the community on a flood cell basis. This plan takes all those contributions a step further forward. During the Public Consultation (Nov/Dec 2015) a community wide consultation on the draft plan took place. This included open days, meetings with parishes and other key players who needed to meet directly (RSPB, Natural England, SCC and EA) and a full on-line consultation facility on [www.aoep.co.uk](http://www.aoep.co.uk)

8.2 The AOEP have now, taking all views into account, prepared a final draft plan for submission for endorsement by Suffolk County Council, Suffolk Coastal District Council and the Regional Flood and Coastal Committee. Once the Plan has been endorsed by Suffolk Coastal District Council in accordance with Local Plan Policy SP30, it will become a material consideration in relevant planning decisions and inform other relevant decisions in the area. This will help streamline the approval of the detailed projects to implement the AOEP Estuary Plan. The final plan will also be presented to the Coastal Forum and the Suffolk Coast and Heaths Unit (AONB) for endorsement.





## OPTIONS FOR MANAGEMENT INCLUDING RETAINING WALLS AND MANAGED REALIGNMENT

### Background on studies and reports over the last 15 years.

1. Since the 1990's there have been a number of reports in varying formats which have looked at the possibilities for managing the Alde and Ore Estuary. The most well known of these are the Posford Duviols Report (Suffolk Estuary Strategies) started around 1999, the Black and Veatch report of 2005, and the Alde and Ore Futures Consultation Document of 2011. In addition there have been several plans dealing with the shoreline, Coastal Habitat Management Plans, and Shoreline Management Plans I and II plus an EA study known as ACES. Also the Alde and Ore Association engaged Professor Pye for further professional and expert advice on those plans.

2. Further, a number of locations have been considered for managed realignment (MR) in the past and discussions between landowners and statutory bodies have taken place, including involvement of the EA Regional Habitat Creation Programme. These discussions highlighted that there are challenges in implementing MR within this estuary complex as many of the flood cells are large and low-lying presenting issues for both local and estuary-wide hydrodynamics, as well as **not necessarily creating the habitat required as the land is too low in the tidal regime**. Costs for building cross banks can make schemes prohibitively expensive at a number of locations and therefore MR at a number of locations has not been deemed economically or environmentally viable, that said the 1999 report set out where the most viable locations were thought to be.

3. The current AOEP estuary plan follows on from the Alde and Ore Futures project (2011) which was supported by monitoring and modelling studies by Black and Veatch. This follows on from the Suffolk Estuaries Strategies (1999) which was underpinned by studies by ABP MER in 1996 who collected and collated physical data from the estuaries. These two previous pieces of work undertook estuary modelling and economic and environmental appraisals of the options presented at the time.

4. These previous projects considered the effects of holding the existing defences in place as it is a requirement of the appraisal process alongside 'Do Nothing' and 'Managed Realignment'. As such the projects set out the likely impacts of retaining estuary walls *in situ* which is the policy option the AOEP is keen to employ for most of the estuary defence frontages. Economic calculations for these projects will have altered in terms of present day costs, but much of this modelling information on the impacts of holding defences or re-aligning defences is still relevant. Following the December 2013 surge there have been some changes to estuary hydrodynamics as a result of breaches at Hazlewood and on Orford Ness and changes in management at Havergate. However these can be viewed in the context of the modelling reports that already exist as these locations were recommended for managed realignment in the previous project reports.

### Analysis of options

5. To help appraisal and inform the public consultation, this annex will summarise the main findings on options in the key 1999 report, together with a brief description of the nature of each flood cell in each zone, taken from findings from the Futures project and subsequent consultation and research, and the proposed AOEP plan.

### The 1999 Suffolk Estuaries Strategy report

6. The 1999 report was underpinned by significant monitoring and modelling work by HR Wallingford which was interpreted by Posfords in terms of likely significant effect. It considered:

i. the various flood defence policy options for the estuary in the context of their potential impacts on other aspects of the area but for the purposes of this summary – most notably- estuary hydrodynamics and the intertidal environment.

ii. the strategic impacts of flood defence policy but then also looked at each flood compartment and considered the ramifications of holding the defence, allowing it to fail or undertaking managed realignment.

iii. in addition to each flood cell the 1999 report considered stretches or reaches of the estuary to look at wider impacts of changing flood defence policy on local hydrodynamics and flood risk. While it can be assumed that if there are increased flows there will be increased erosion rates of remaining saltmarsh and intertidal areas.

This would, in principle, be offset by managed or unmanaged realignment but some sites would not generate intertidal habitat for many years if they are very low lying. A similar case locally would be the Bulcamp and Angel marshes on the Blyth. It is therefore not a straightforward trade off.

7. This paper focusses on the constraints assessed from a hydrodynamic perspective and likely effects on the intertidal areas and remaining defences of implementing the recommended policies in each plan. It does not include any economic assessments which may well have changed.

8. The flood cells in the 1999 report do not directly correspond to those adopted by Environment Agency in the Futures project with its nomenclature of Flood Cells 1 -13 and which was subsequently adopted by the AOEP for its estuary plan. This paper therefore translates the locations by name with the approximate flood cell references.

### **Flood cell /zone analysis, taking in the 1999 report, the Futures and AOEP updated information**

9. Overall, looking at the estuary on a flood cell basis, several types of issues arise. Some flood cells contain substantial residential areas, i.e. Flood Cell 4 Orford, Flood Cells 6 and 7 Snape village and Maltings and Flood Cell 10 south Aldeburgh. All of these have long stretches of river walls but withdrawing to protect smaller areas and allowing for river incursion in the remaining areas would involve costly construction of new walls. Also some of the areas that might be left unprotected contain valuable resources such as freshwater bore supplies. As the international designations for habitats and species cover the whole estuary, the impact of changes in any one flood cell would need to be considered.

10. As the AOEP plan is to take the area forward to 2050, monitoring of the state of the estuary in relation to sea level rise will be undertaken regularly and plans may need to be reviewed. At this stage at the start of a 35 year period it is not possible to predict what changes, where they might be needed or what natural events may dictate or require a review of the policy.

### ***Zone 1 Snape /Flood Cells 6 and 7***

**Current position** FC6 and 7, Snape to Langham Bridge, contains a significant number of residential homes and a very important business and cultural centre. The area is the tidal end of the estuary and subject to all the special designations of SPA, SAC and RAMSAR. There are several nature reserves and extensive reed beds. Environment Agency are currently developing plans with a range of options to see how best to sustain the area.

**The 1999 report** recommended that these two compartments (Snape Maltings and Village) could be treated separately in terms of the tidal flood risk. However, following the 2013 surge it became apparent that there is a need to treat the 2 areas as a single unit due to freshwater flood risk and social and economic impacts that were not considered in 1999. That said, the 1999 report recommended HTL policies for both frontages but included the potential for MR on the Snape marshes due to a slight economic benefit of the MR approach (on the basis of economic assessments at that time) and no detrimental impacts of MR in this area on the rest of the estuary. The 1999 report then deferred the decision to a local level stating that whilst MR may lead to a more sustainable outcome in the longer term, it would need to have full local consultation.

**The AOEP plan** is treating the two flood cells together following the consultations for Alde and Ore Futures and further endorsed by the impact of the 2013 surge. The policy option for this frontage is currently being investigated by a more detailed appraisal by EA. The results of this will be consulted upon.

### ***Zone 2 Long Reach / Flood Cells 5, 8 and 9***

**Current position** FC 5, Iken Marshes, has internationally designated habitat in front of the river defences. The defences also currently protect the Stanny Farm reserve which over the last 20 years has built up special habitats encouraging many species such as bearded tits, nesting avocets and many winter and spring migrating birds. There are around 30 residential properties. Professor Pye estimated that a permanently flooded FC 5 would increase volumes of water in the river by 20% or more which could have a damaging impact on the defences lower down the river. There are also freshwater abstraction points for upland irrigation. Any changes would need to take account of these. There are no easy options for changes in the river wall structure.

FC8, Ham Creek, has a relatively short frontage to a long river tail back. The walls were repaired immediately after the December 2013 surge and protect at least two freshwater abstraction points.

FC9, Hazlewood Marshes, was originally thought to be worth retaining for a while because of the freshwater marsh habitat but the walls breached in the December 2013 surge. There was no environmental, river flow or economic case for substantial repairs to restore the walls so the cell now provides the basis to build up and enhance intertidal habitats.

**The 1999 report** said that in this zone the flood cells could be treated independently of one another. Ham Creek (Friston, Flood Cell8) was considered to be too small to have any significant effects on coastal squeeze and in situ retained valuable freshwater habitats. Hazlewood was recommended for unmanaged realignment and as such this has happened in 2013. Iken was recommended for unmanaged realignment on economic grounds with the recognition that this could create new intertidal marshes. However this report highlighted ‘repercussions’ for the rest of the estuary as the area was excellent freshwater marsh and the size of the site would increase tidal flows. As a result the recommended strategic options included holding Ham Creek and Iken with realignment at Hazlewood.

**The AOEP report** reflects the policy option recommended in the 1999 report. Hazlewood has realigned and the plan proposes holding the line in Ham Creek, FC 8, and Iken, FC5, bearing in mind the in-combination effects of further realignment at Iken or Ham Creek would have hydrodynamic impacts downstream in the estuary as well as the impact on habitats and property.

### ***Zone 3 Barbers Point to Home Reach/ parts of Flood Cell 5, all FC 10s and the northern parts of FC 4 and 11***

**Current position** FC4 is an extremely large flood cell stretching almost 12 miles with a varying width of around 2 miles. As well as containing Orford settlement, it has several important bore holes for upland irrigation. Partial retreat could only be managed by construction of new walls which would be costly but save little in overall maintenance and limited security for new habitats.

FC10s, Aldeburgh Marshes and Aldeburgh town frontage to Slaughden, has 3.8 km of river wall protecting Aldeburgh Marshes which is well below sea level, and containing a river channel suitable for moorings, safe sailing and edged in many places by saltings. If flooded, the marshes would become an extensive area of mudflats and might not fully empty each tide becoming more like the Blythburgh Estuary. Research would be needed to consider any impact on the rest of the river as well as Aldeburgh town and the adjacent coastline. The Futures consultation suggested retreating the line to Aldeburgh Town but that would involve costly new wall construction but the government would only provide a part of the funding.

FC10n, Thorpeness, would be connected to FC10s if there was extensive flooding of FC10s. Otherwise the main threat to the area comes from future coastal erosion.

**The 1999 report** This is a complex zone. The 1999 modelling and appraisal included options for Slaughden which will not be discussed here as the Alde and Ore Futures work and AOEP plan process have established a short term policy for this frontage and longer term solutions are under consideration.

The 1999 report concluded that loss of defences in this section could increase tidal volume by 50% throughout the zone and increase tidal volumes elsewhere in the estuary by 20%. This would clearly have a major influence on estuary regime and have consequences for the shingle ridge particularly at the mouth. The report suggested that holding the line was sensible throughout this section with the exception of the peninsula at the northern tip of Sudbourne.

The report also recommended a managed realignment policy for Aldeburgh town marshes to better defend the town at the rear of the marshes and create new intertidal areas to compensate for coastal squeeze in the future. This together with the northern tip of Sudbourne were considered hydro-dynamically viable in terms of wider estuary impacts. The report also suggested that if Aldeburgh Town Marsh is HTL along with the area between Iken and the tip of Sudbourne then a realignment on the tip of Sudbourne peninsula would be good for alleviating hydrodynamic pressure with minimum effect on the estuary. The 1999 report however concluded that MR was

the best economic option at Aldeburgh but stated that there would be increases in flows and a loss of freshwater habitat.

**The AOEP plan** for resilience is based on the Futures consultation conclusion that the estuary needs to be considered **as a whole**. The community's view that the criteria used by government to assess economic benefit, in terms of property and lives, overlooked the importance of the estuary's conformation which provides the economic activities of the area, special landscape and habitats. This was one of the key reasons for the Partnership being set up in order to have a management programme which balances all economic, environmental, cultural considerations, as well as costs, and looks at the estuary as a whole. Further, building new walls to protect Aldeburgh would be hugely more expensive at the back of the flood cell rather than the hold the line resilience approach for the coming 35 years.

The AOEP will however bear in mind possible options for managed realignment consistent with its policy to seek to manage coastal squeeze but would clearly seek to identify options which would deliver new habitat most effectively, affect the economics of the area less substantially and also produce the most beneficial adjustments to hydrodynamics of the estuary as a whole. Any changes would need to be discussed and agreed with the landowners but at this stage of the plan no options are being progressed.

### ***Zone 4 Sudbourne marshes to Orford/ Flood Cells 4 and 11, both their, northern and central parts***

**Current position** FC4 is an extremely large flood cell stretching almost 12 miles with a varying width of around 2 miles. As well as containing Orford settlement, it has several important freshwater abstraction points for upland irrigation. Partial retreat could only be managed by construction of new walls which would be costly but save little in overall maintenance and limited security for new habitats

FC11, Kings and Lantern Marsh, contains saltmarsh, intertidal flats, dry habitat along an extensive partly compartmented flood cell as well as buildings and telecommunications masts in the northern half.

**The 1999 report** noted the scale and impact that such a large defended area of floodplain presents to the hydrodynamics of the estuary. Holding the defence line in Sudbourne and Orford formed the basis of the strategy options for this zone because they are so strategically important to the estuary regime. At Lantern Marshes North there was a realignment in place from 1999. The report considered further realignment on Orford Ness of Lantern Marsh South and Kings Marshes and recognised that it was problematic. The areas were recognised for their environmental sensitivity and options were left open in the appraisal. It concluded that if Sudbourne was held then realignment along the Orford Ness Marshes would offer habitat enhancement to offset losses elsewhere.

**The AOEP plan** originally assumed the current defence line was in good repair and would remain for many years having been relatively recently repaired. The December 2013 surge however caused damage to some of the walls. Whilst the National Trust is responsible for much of Flood Cell 11, the Orford Ness marshes part are now in new ownership. The two owners are currently considering what repairs might be done post the 2013 Surge. The AOEP are maintaining dialogue with both landowners regarding their management of these areas as possible options could affect both habitats and flood relief and so the AOEP plan itself.

### ***Zone 5 Upper Butley /Flood Cells 2 and 3 and the northern part of Flood Cell 1***

**Current position** Flood Cell 1 contains an area now owned by RSPB. Current management includes the coastal grazing marsh for breeding waders with the creation of freshwater/brackish lagoons. In the longer term and which might one day, subject to the necessary permissions, including diverting public footpaths, scientific assessment on the impact on the estuary and funding, be converted to intertidal habitat or at least more regular inundation. Further up the Ore, the walls have already been returned to satisfactory levels in terms of what the AOEP proposes.

FC 2 has some of the best graduated saltmarshes in the estuary and this needs to be sustained. Elsewhere Environment Agency consider that raising the walls would offer a greater standard of protection for the community.

FC3 contains internationally designated intertidal habitat in front of the walls. While the number of houses requiring protection is small the flood cell extends deeply into the area, so that managed retreat might lose not just the special habitat but an extensive area of land and affect significantly volumes of water in the river.

**The 1999 report** concludes that ‘pressure on the defences in the Butley River are not significant’. Saltmarshes in this area are acting as a natural buffer to the walls. HTL was the recommended policy option locally with a view that MR in the north of Boyton at Stonebridge Marshes or at Chillesford Lodge would be helpful if compensatory habitat were required.

**The AOEP plan** recognises that Butley defences are under less pressure due to presence of marshes and the importance therefore of maintaining the marshes in situ for as long as possible. The AOEP has been informed by the RSPB, which recently became owner of the southern area on FC1, that at some point in the future managed realignment or a flood relief structure might be considered. This could lead to the creating of more intertidal habitat and possibly salt marsh but is not under consideration in the short term. If and when the land owner wishes to take this forward there will need to be full consultation, more hydro dynamic and habitat research as well as permissions sought under several regulations including planning law. The AOEP is aware that some time ago the land owners at Stonebridge were approached about MR but declined at that time.

### ***Zone 6 / Flood Cells 12, 13 and the southern part of Flood Cells 1 and 4.***

**Current position** Flood Cell 1 contains an area now owned by RSPB which might one day, subject to the necessary permissions, including diverted public footpaths, scientific assessment on the impact on the estuary and funding, be converted to intertidal habitat or at least more regular inundation.

FC4 is an extremely large flood cell stretching almost 12 miles with a varying width of around 2 miles. As well as containing Orford settlement, it has several important freshwater abstraction points for upland irrigation. Partial retreat could only be managed by construction of new walls which would be costly but save little in overall maintenance and limited security for new habitats

FC 12 and 13 are owned by the RSPB, and are already nature reserves. After the 2013 surge the river walls were repaired and redesigned to cope with more frequent but less damaging overtopping which has beneficial impacts for the habitats which are being maintained and developed there.

**The 1999 report** stated that, economics aside the unmanaged realignment of Gedgrave, Havergate and Boyton lead to a massive increase in tidal volume which would have the effect of weakening the shingle ridge resulting in substantial disruption of shingle drift in the open coast zone. This would lead to increase of potential for erosion and flood risk to the south at Hollesley. The report stated that Gedgrave would be best managed in situ as HTL. Havergate could be realigned and in doing so compensatory habitat would be required potentially at Kings Marsh or Lantern Marsh (south). The report recommends Boyton for MR.

**The AOEP plan** notes (see Appendix 4) that the new owner of part of Boyton may consider at some point in the future a different defence approach, possibly retreating the line or having a managed seasonal inundation over a sill. The AOEP plan takes account of the fact that following the tidal surge in 2013 Havergate defences (FC 12 and 13) were modified to allow for overtopping and therefore an adaptation approach has been employed which was not considered in the 1999 study.

## **CONCLUSION**

11. There is much in common between the 1999 report recommendations for management of the estuary and the AOEP plan with similar conclusions in all but two zones. Also the 1999 report considered raising defences while the AOEP plan proposes a resilience approach. The differences, which mainly centre around the river near Aldeburgh in Zone 3, reflect in part a different approach. The AOEP plan includes monitoring the impact of sea level rise and recognises that over time there may need to be changes to deal with intertidal habitat and saltmarsh loss but the amount, when and where will need to be decided taking account of quality of habitat and balancing the interests throughout the estuary to secure the best outcome for the estuary as a whole. In the case of Zone 4, plans for the future are still under discussion, given the impact of the December 2013 surge and new ownership. Ideas in the 1999 report are not necessarily ruled out.

22 October 2015



### ENVIRONMENTAL DESIGNATIONS IN THE ALDE AND ORE ESTUARY AREA

#### General character of the site

This estuary, made up of three rivers, is the only bar-built estuary in the UK with a shingle bar. This bar has been extending rapidly along the coast since 1530, pushing the mouth of the estuary progressively south-westwards. The eastwards-running Alde River turns south, at Slaughden, along the inner side of the Orfordness shingle spit. It is relatively wide and shallow, with extensive intertidal mudflats on both sides of the channel in its upper reaches and saltmarsh accreting along its fringes. The Alde subsequently becomes the south-west flowing River Ore, which is narrower and deeper with stronger currents. The smaller Butley River, which has extensive areas of saltmarsh and a reedbed community bordering intertidal mudflats, flows into the Ore shortly after the latter divides around Havergate Island. The mouth of the River Ore is currently moving south as the Orfordness shingle spit continues to grow through longshore drift from the north, although at the turn of the twentieth century the exit point south of the spit moved a mile back northwards and recent research has shown that there are longshore drifts going both north and south. There is a range of littoral sediment and rock biotopes (the latter on sea defences) that are of high diversity and species richness for estuaries in eastern England. Water quality is excellent throughout. The area is relatively natural, being largely undeveloped by man and with very limited industrial activity. The estuary contains large areas of shallow water over subtidal sediments, and extensive mudflats and saltmarshes exposed at low water. Its diverse and species-rich intertidal sand and mudflat biotopes grade naturally along many lengths of the shore into vegetated or dynamic shingle habitat, saltmarsh, grassland and reedbed.

The **Natura 2000** citation states that the area is;

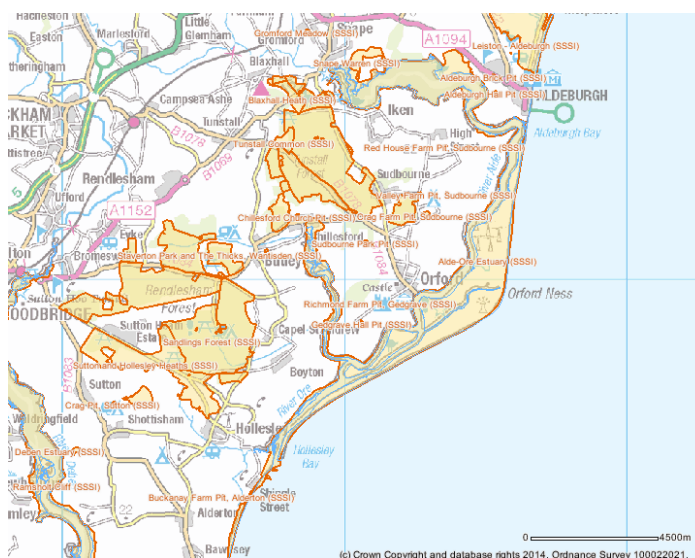
The estuary is considered to be one of the best areas in the UK for mudflats and sandflats not covered at low tide. The area is considered to support a significant presence of Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) and consists of 70% is tidal river, estuary, mudflat and lagoons, 25% is saltmarsh and salt pastures, 5% is seen as shingle and islets.

#### 1 THE ESTUARY IS WITHIN A DESIGNATED AREA

- 1.1 The estuary is contained within the **Suffolk Heritage Coast**, designated in 1973. The 1992 Heritage Coast Policy set national targets for all Heritage Coast, namely the provision of a semi-natural strip along the coast, accommodating a coastal path, the clearance of eyesores and meeting standards for water and beach cleanliness.
- 1.2. The estuary area is included within nationally designated **Suffolk Coasts and Heaths Area of Outstanding Natural Beauty**. The primary purpose of the designation is to conserve and enhance the natural beauty of the area and to protect its flora ad fauna, geological interest and landscape features: in pursuing this primary purpose account should be taken of the needs of agriculture, forestry and the economic and social needs of local communities. The two secondary aims of the AONB are meeting the need for quiet enjoyment of the countryside and having regard for the interests of those who live and work there. The estuary area contains five of the types of landscape characters contained in the Suffolk Landscape Assessment, namely coastal levels, coastal dune and shingle ridges, estate sandlands, rolling estate sandlands, and valley meadowlands.  
<http://www.suffolklandscape.org.uk/landscape.map.aspx>

#### 2 THE ESTUARY IS A DESIGNATED AREA IN ITS OWN RIGHT

##### 2.1 Alde-Ore Estuary Site of Special Scientific Interest (SSSI)



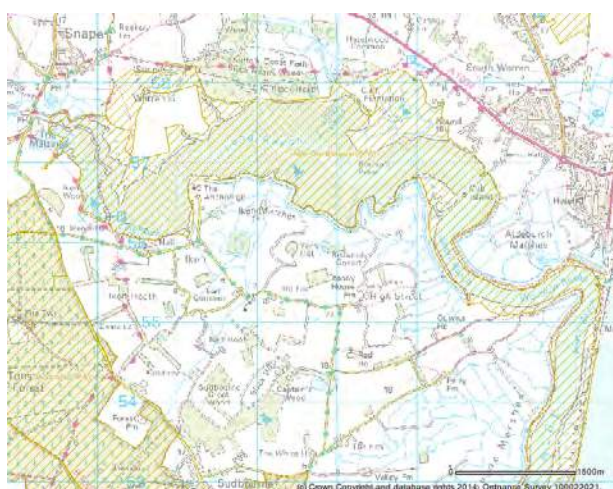
Alde-Ore Estuary SSSI is designated under the Wildlife and Countryside Act 1981 (as amended), for its diverse and outstanding interests including geology, geomorphology, breeding and wintering birds, estuaries, saltmarsh, mud flats, vegetated shingle, coastal lagoons, scarce plants and invertebrate features. The SSSI boundary includes the Alde, Ore and Butley Estuaries, Hazelwood Marshes Havergate Island, Orfordness and Shingle Street (the boundary is contiguous with the Alde-Ore Estuary Ramsar Site and Alde-Ore Estuary SPA)

## 2.2 Other SSSI designated sites:

There are several other SSSI within the AOEP Boundary Plan, many of these are small geological sites and some may be outside the final plan boundary. These could be identified on a map and include:

Aldeburgh Brick Pit SSSI	Sandlings Forest SSSI
Aldeburgh Hall Pit SSSI	Sandlings SPA
Bawdsey Cliff SSSI	Round Hill Pit, Aldeburgh SSSI
Buckanay Farm Pit, Alderton SSSI	Sudbourne Park Pit SSSI
Chillesford Church Pit SSSI	Sudbourne Park Pit SSSI
Crag Farm Pit, Sudbourne SSSI	Tunstall Common SSSI
Crag Farm Pit, Sudbourne SSSI	
Crag Pit, Aldeburgh SSSI	
Deben Estuary SPA	
Deben Estuary Ramsar	
Deben Estuary SSSI	
Ferry Cliff, Sutton SSSI	
Ferry Cliff, Sutton SSSI	
Frithy And Chadacre Woods SSSI	
Gedgrave Hall Pit SSSI	
Gromford Meadow SSSI	
Leiston to Aldeburgh SSSI	
Neutral Farm Pit, Butley SSSI	
Red House Farm Pit, Sudbourne SSSI	
Red House Farm Pit, Sudbourne SSSI	
Richmond Farm Pit, Gedgrave SSSI	
Snape Warren SSSI	

## 2.3 Alde-Ore Estuary Special Protection Area (SPA)



Alde-Ore Estuary SPA is designated under the EC Habitats Directive for its breeding and wintering birds, plus waterbird and seabird assemblages. The SPA boundary includes the Alde, Ore and Butley Estuaries, Hazelwood Marshes Havergate Island, Orfordness and Shingle Street

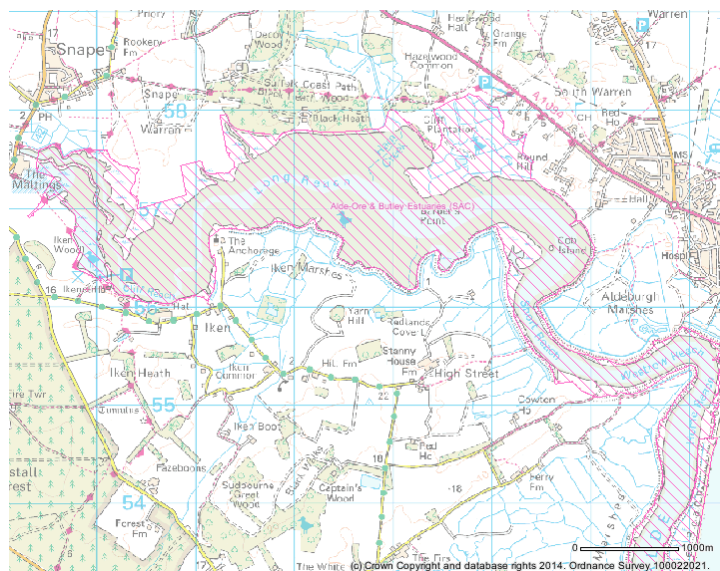
## 2.4 Alde-Ore Estuary Ramsar Site



Alde Ore Estuary Ramsar Site is designated under the Ramsar Convention on Wetlands of International Importance. It is designated for its nationally-scarce plant species, assemblages breeding and wintering wetland birds, and internationally importance numbers of breeding Lesser black-backed gull, and wintering Avocet and Common redshank. The boundary includes Alde, Ore and Butley Estuaries, Hazelwood Marshes Havergate Island, Orfordness and Shingle Street

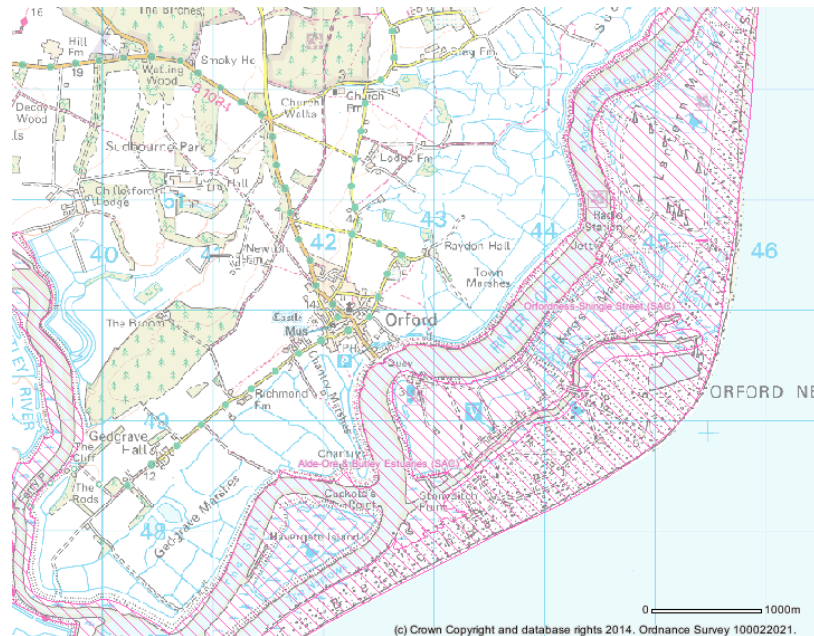
*For info the UK Government has stated that, as a matter of policy (Planning Policy Statement 9: Biodiversity and Geological Conservation), listed Ramsar sites should be afforded the same level of protection as SPAs or SACs. There should not be any difference between the way that European and Ramsar sites are treated in project management and decision making (PPS9, 2005).*

## 2.5 Alde, Ore and Butley Estuaries Special Area of Conservation (SAC)



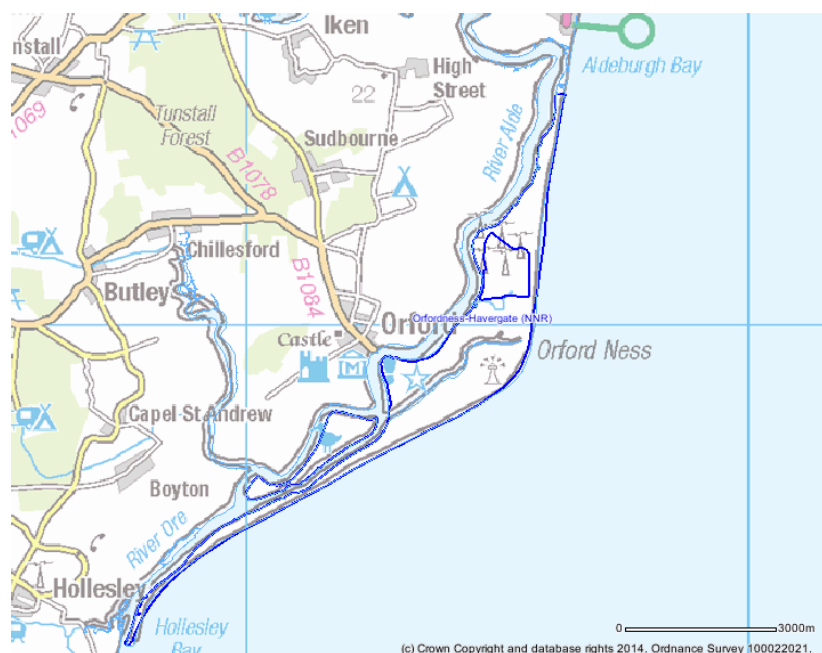
Alde, Ore and Butley Estuaries SAC is designated under EC Habitats Directive for its estuaries, intertidal mudflats and saltmarsh features. Its boundary includes Alde, Ore and Butley Estuaries, and Havergate Island.

## 2.6 Orfordness – Shingle Street SAC



Orfordness – Shingle Street SAC is designated under the EC Habitats Directive for its coastal lagoons, perennial and annual shingle vegetation features. The SAC boundary includes Orfordness and Shingle Street.

## 3. NATIONAL NATURE RESERVE



This covers the southern 8km of Orfordness spit, together with the RSPB owned and managed Havergate Island

## 4 OTHER SITES OF ENVIRONMENTAL IMPORTANCE

### 4.1 County Wildlife Sites:- pasture and saltmarsh at Oxley Marshes( Hollesley)

- semi improved pasture at Hollesley
- grazing marsh at Ferry Farm (northern end of Home Reach, western side of the river)
- part of Aldeburgh Town marshes
- grazing marsh on the northern side of the estuary, to the west of Aldeburgh Town Marshes

4.2 **RSPB Reserves:** Snape Wetlands (formerly Abbey Farm and Botany Farm)  
Snape Warren  
Havergate Island  
Hollesey query the new one? Boyton and Hollesley Marshes are two coastal reserves in the lower reaches of the Alde-Ore Estuary.

Both are coastal grazing marshes with shallow pools and flood during the winter. They are important for a variety of breeding wading birds and wintering ducks and geese, as well as many grassland insects and flowers. They are also great for watching birds of prey, owls, butterflies and dragonflies.

4.3 **Suffolk Wild Life Trust:** Hazelwood Marsh (was freshwater marsh, now intertidal post Dec 13 surge); Simpson's Saltings 26 hectare reserve mainly saltmarsh and rare plants such as Sea Heath.

4.4 **National Trust:** recently created bird reserve area (almost opposite Orford)

4.5 The entire estuary and much of its hinterland was contained within the Suffolk River Valleys ESA which was designated in 1988 and extended in 1993 by MAFF

April 2014

### RIVER DEFENCE TRIALS AND PROJECTS

#### 1. WALL REPAIR PROJECTS

Through the Alde & Ore Futures project, the Landowners Group worked directly with the local Internal Drainage Board and the following two pilot schemes were carried out to test future ways of working.

1. **The Orford Chantry wall Project** – a project designed and completed in 2011 by Hawes Associates, and managed by the East Suffolk Internal Drainage Board in partnership with the Environment Agency who funded it. The project uses new ways of protecting the back of the flood defences and securing the raised crest. This area of flood defence is also a well used footpath so Suffolk County Council Rights of Way were also involved. The project was completed on time and in budget. The Right of Way was diverted for a further few months whilst the grass established prior to use. A new product was used on the Right of Way top of the defence which should not only help maintain the strength of the defence but also protect the defence from long term foot fall damage. This project is an excellent example of funding being available through the EA and works being carried out by the local IDB.

**COST: £54,594.66** Financed by Public money in the EA budget for Trial projects

2. **Butley Wall Refurbishment** – This work was instigated by the East Suffolk IDB and was funded by the landowners. It involved the improvement to the structure of the defence and raising the defence to make it resilient to a 1 in 200yr event. This work was carried out in 2011 and the Environment Agency was fully consulted throughout the whole project. This is an example of work being fully carried out and managed by the local IDB and funded privately due to it being in an area deemed unsuitable for funding from the EA.

**COST: £45,406.48** Landowner Funded which has been apportioned to the beneficiaries according to Drainage Rateable Values as follows:

Boyton Hall Farms:	£12,516.48 (28%)
Capel St Andrews Farms:	£18,320.54 (40%)
Greenwell Farms:	£14,569.46 (32%)

As the fourth landowner in the flood cell, RSPB would have paid £8,395.06 (18%) had they supported the project, which would have reduced costs proportionately. All costs are subject to Vat at 20%.

#### 2. SALTINGS REGENERATION PROJECTS

The development of trials to test different approaches to saltings protection and restoration began with a private initiative before the AOEP was formed. Since then AOEP have installed a number of trials. The Saltings, plants that tolerate sea water and grow at the toe of the wall, help to dissipate wave action and therefore lessen the erosion at the base of the wall so helping to preserve the defence. The following trials have been implemented:

1. **Ferry Point Saltings Regeneration Trial** – At a site just off Ferry Point, opposite Slaughden Quay, there has been a dramatic loss of saltings that are the front line protection to reducing the effect of wave action on any soft flood defence. This was a small project of a length of 100m where a plasticated mesh (uv resistant) was placed in front of the existing salting to act as a breaker to reduce long term salting damage and to hopefully encourage salting recreation due to the reduction in water flow. This project was fully funded by the Sustainable Development Fund and was completed within budget last August. This project required authorisation to be carried out by the Environment Agency and Natural England and the project was wholly managed by the landowner. This project is small but nevertheless shows that smaller bite size pieces can be carried out by landowners before major damage has occurred.

**COST: £2,185.12** Financed by a Sustainable Development Grant.

2. Three further saltmarsh projects of varying scale and situation have been carried out by the AOEP during 2013. The locations are:
  - i. **Iona.** an 80m stretch linked to the Iona boat remains near the Slaughden bend of the river at a point which bears the full force of southerly winds. The defence uses a double section of hazel wood faggots supported by chestnut stakes with gaps to allow movement of the various creatures during the ebb and flow of the tide.
  - ii. **Brick Dock.** A 340 metre stretch flanking the river wall at Brick Dock which gets the full force of westerly winds but being in a curve of the river is fairly shallow. The project is using various forms of defence from double faggot construction to faggot plus Tensar fencing to parts where using only tensar supported by oak stakes.
  - iii. **near Orford quay.** Depleted saltings just north of Orford where a 75m line of similar construction to the Iona site has been used.

These are designed to demonstrate the best designs using Tensar mesh and hazel faggots in a number of locations to test reaction to a variety of wave actions and situations. When laying the faggots there are gaps left to enable fish to escape as the tide drops.

**COST: £17,000** Financed by SCC, SCDC, Jackson Trust, Councillor Richard Smith

3. In autumn 2015, along the north bank of the Alde near West Row Point (Stanny buoy), the AOEP Saltmarsh team installed trial defences at 7 small areas, five bays of approximately 5 metres long and two 12 metre stretches along a steep saltmarsh edge. These were chosen to give more information on small areas where wave action and tidal inflows may be damaging and whether can they be easily repaired. The defences consist of oak posts with the Tensar mesh applied, and behind that a layer of hazel faggots held by chestnut stakes with about 30cm gap to allow the build-up of sediment. Cost £2.2K match funding from Sustainable Development Grant and AOEP funds.
4. Plans for restoration saltings project sites throughout the estuary are going ahead for implementation during the next few years. Since the earlier projects a team of volunteers now cuts and makes the hazel faggots in Butley Wood so making a cost saving on this item.
5. **MONITORING**  
All these new saltings projects, together with the one at Ferry Point are now being monitored annually by trained volunteers. Annual reports will be made to the AEOP each May



### RIVER WALL GRAZING MANAGEMENT SYSTEM

The AOEP conducted a trial using sheep to graze the river wall for grass management rather than using a mechanical machine. The following comments were made:-

#### Advantages of using Sheep over Machinery

1. Natural
2. Sheep will graze the grass to encourage it to tiller and produce a better root structure. This in itself will render the grass sward stronger with better 'holding' effect on the river wall enabling it to withstand the effects of over topping better.
3. Non- invasive on other species. Sheep move around quite steadily grazing in harmony with other vertebrates, invertebrates and birds that inhabit the river wall environment.
4. Sheep can be moved on and off the river wall area easily to enable rotation of grazing avoiding over- grazing at any time.
5. Sheep grazing does not leave any grass cuttings on the wall. The sheep also naturally fertilise the grass as they graze.
6. Sheep can get everywhere to graze where machinery maybe limited by its size and lack of manoeuvrability.

#### Disadvantages of using Sheep over Machinery

1. Very little, other than requiring a small to medium sized flock to be owned/leased. With limited grazing availability there are several flocks that are moved regularly to different grazing areas and in this way the river walls can easily be grazed if the landowner does not own a flock.
2. Initial fencing costs to install electric fencing to prevent sheep accessing the saltings which can result in sheep occasionally drowning and damage to the vulnerable saltings vegetation.
3. Sheep will not eat thistles, so where there is a thistle issue they will have to be dealt with separately.

#### Advantages of using Machinery

1. No flock required

#### Disadvantages of using Machinery

1. Disruption though noise and people to other vertebrates, invertebrates and birds.
2. 1-2 intensive grass cuts that leave the grass cuttings on the walls. Sometimes the intensive grass cutting can leave bare patches of exposed earth where the grass has not tillered properly. This leaves the wall defence vulnerable if there was overtopping. This was seen very clearly in the December 2013 surge event when the breaches on the Iken wall occurred where recent mechanical grass cutting had left large bare patches of earth, leaving the defence useless when the overtopping occurred.
3. Large Annual COST for mechanical cutting and cost of Machinery

#### Conclusion

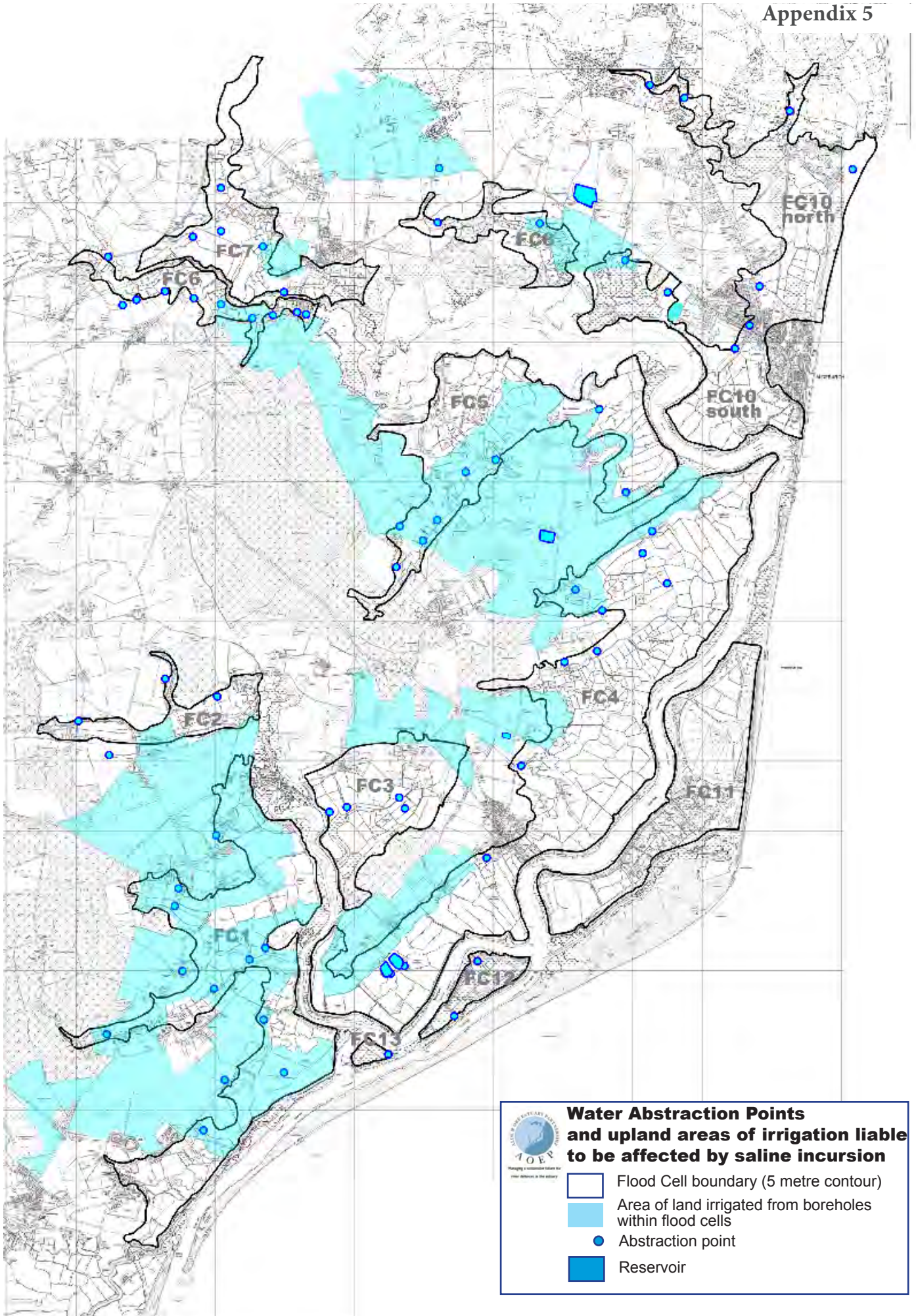
The net result of a year long period of trialling sheep grazing vs. machinery cutting of the river wall (flood defence) is that wherever possible the use of sheep is preferable. Sheep grazing is a natural process which has little impact on the environment and results in the grass sward being maintained in top condition.

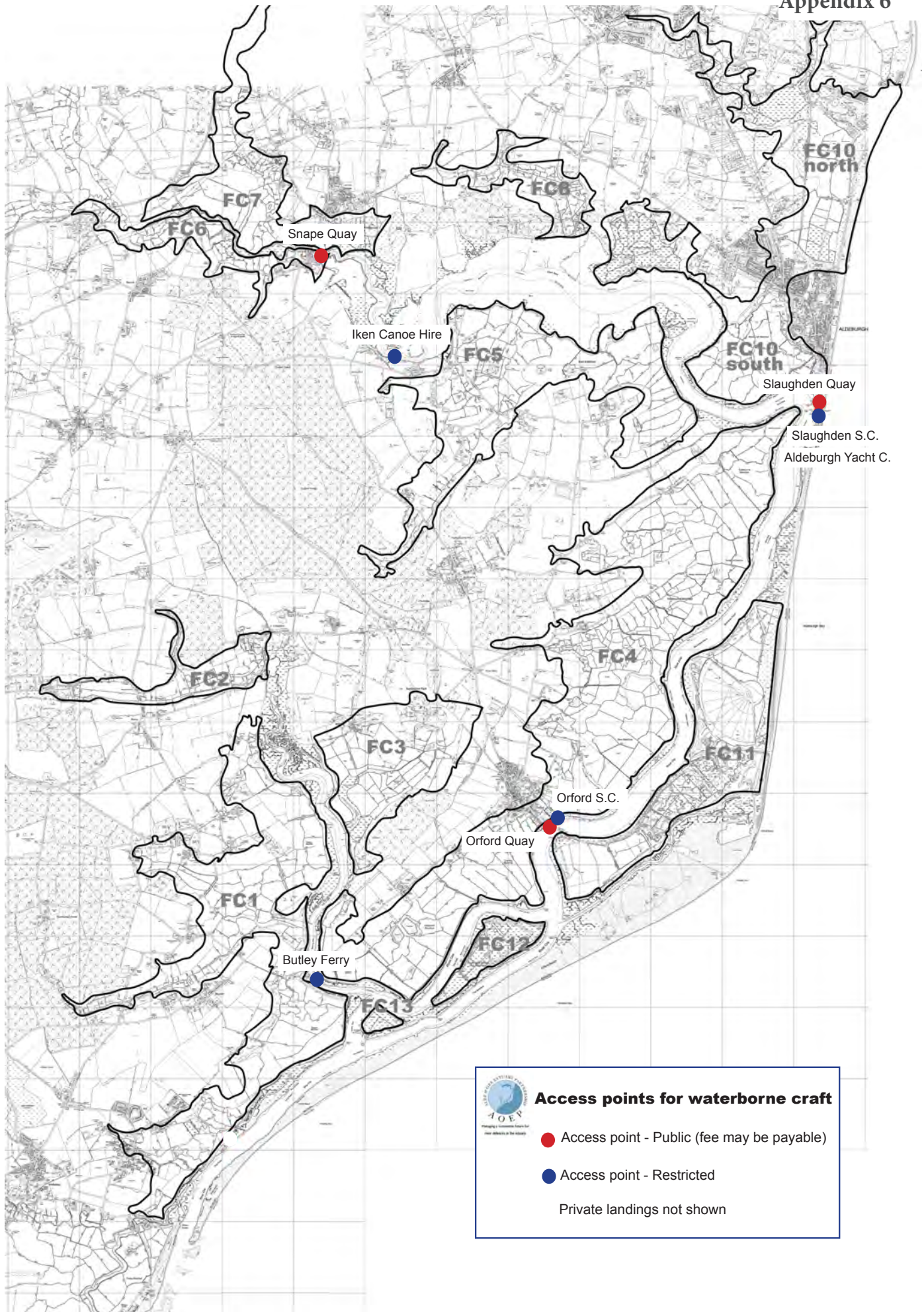
The sheep are rotated on and off the river wall as the grass is grazed down. This is a managed process by the shepherd to make sure that the sheep always have good grazing which in turn means that the river walls are never overgrazed.

Jane Marson Bsc

1<sup>st</sup> September 2015







## ALDE-ORE ESTUARY PLAN MONITORING AND REVIEW STRATEGY

Natural England considers that the Alde and Ore Estuary Plan potentially represents a likely significant effect on the European Features of the Alde-Ore Estuary Special Protection Area (SPA) and Special Area of Conservation (SAC). An appropriate assessment should be carried out to determine whether the plan represents an adverse effect on the wildlife interests of the estuary due to impacts on estuary form and function, and because of the potential for coastal squeeze effects on habitats. Any resultant degradation of habitat quality could in turn affect populations of dependent plant, invertebrate, and bird species.

Table 1 sets out the SAC and SPA habitats and species which could potentially be affected, along with site specific target ranges for their attributes. These are taken from the site Favourable Condition Table. The potential monitoring requirements are set out against each attribute, and these are collated and summarised in Table 2.

It is essential that the features of the estuary are maintained throughout their range and distribution in the upper, mid and lower estuary as far as possible, but the monitoring and review strategy should also take account of changes in this distribution, where these reflect the natural dynamism of estuary systems, or where features are developing in new re-alignment areas.

There is considerable uncertainty around climate change and therefore uncertainty around timescales and degree of impact on estuary features. For this reason an adaptive approach is proposed, whereby the provision of habitat is informed by regular and comprehensive monitoring to ensure that any replacement habitat can be provided in advance of any effect, as far as this is possible.

The area of intertidal habitat (c.60ha.) created by the unmanaged breach at Hazelwood Marshes following the winter 2013 surge has inadvertently increased the extent of intertidal habitat within the estuary. This is likely to contribute significantly to offsetting the impacts of future habitat squeeze elsewhere within the estuary, but cannot be considered as direct mitigation for the plan.

Monitoring of features across the whole site will be established, and if this shows impacts, then appropriate short and long term measures (e.g. habitat creation or restoration) will need to be provided in the upper, middle, or lower estuary as appropriate, in order to offset impacts.

We would hope to establish a collaborative approach between the community and relevant authorities (NE, EA, Local Authorities), with a monitoring baseline and monitoring programme being agreed in year 1. This will be reviewed every two to five years and the results of monitoring will be used to inform the need for further measures, should the likelihood of any future effect be identified. The details of this approach could be set out in a memorandum of understanding between parties

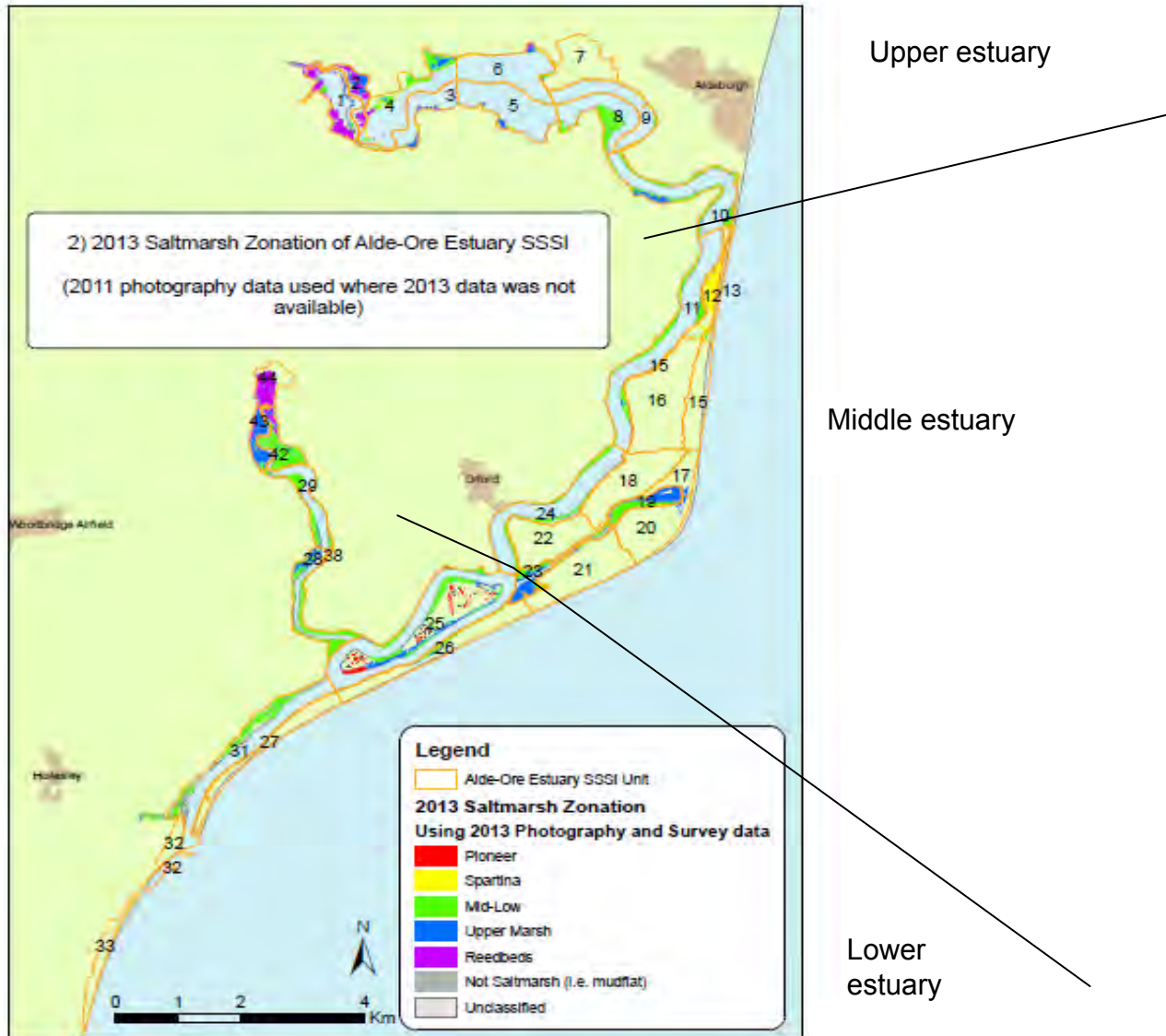
**DRAFT Table 1: Possible Likely significant effects of the AOEP on SAC and SPA features, target ranges and monitoring.**

Feature* considered likely to be affected  *FCT March 2014	Attribute of feature considered likely to be affected	Site specific target range	Monitoring  See table 2 for detail of types 1-7
<b>Estuary</b>	Extent- No change in extent of estuary feature.	Maintain extent and distribution of estuary.	1. Use remote sensing techniques (CASI/Lidar, AP analysis) to assess extent and distribution of estuary habitats.
<b>Estuary</b>	Distribution/spatial pattern of habitats	Maintain saltmarsh and intertidal mud habitat distribution in upper, mid, and lower estuary.	1. (CASI/Lidar, AP analysis)
<b>Estuary</b>	Morphological equilibrium  Tidal prism/CS ratio of selected sites along estuary  'no deviation from baseline'	No decline in TP/CS ratio in estuary.  Horizontal boundary of mudflat/saltmarsh interface maintained. Distribution and topography of sedimentary features maintained	2. Measure TP/CS in upper, mid, lower estuary. 5 year cycle  3. Measure distribution of sedimentary features.
<b>Saltmarsh</b>	Extent –no decrease in extent and distribution of saltmarsh subject to natural change	Maintain extent and distribution of saltmarsh in estuary.	1. (CASI/Lidar, AP analysis)

<b>Saltmarsh</b>	Zonation –maintain range and variation	Upper mid and lower marsh distribution should be maintained- see NVC survey and EA map as baseline.	4. Use transects, CASI/Lidar and NVC to assess extent of zones.
<b>Saltmarsh</b>	Characteristic species- of low, mid, upper marsh. Maintain frequency and distribution of species	Maintain in each estuary zone - see NVC survey and EA map as baseline.	4. Use transects and CASI/Lidar, AP analysis to assess extent on each zone.
<b>Intertidal mud</b>	No decrease in extent or distribution	Need to maintain intertidal mud distribution in estuary.	5. Intertidal mud monitoring.
<b>Intertidal mud</b>	Biotope composition	Maintain the variety of biotopes in estuary	6. Biotope sampling
<b>Intertidal mud</b>	Distribution of sediment types	Maintain the distribution of sediment types in the estuary	6. Biotope sampling and 5. Intertidal mud mapping
<b>Intertidal mud</b>	Biotope distribution	Maintain the distribution of biotopes in the estuary	6. Biotope sampling and 5. Intertidal mud mapping
<b>Intertidal mud</b>	topography	Maintain topography in the estuary	3. Measure distribution of sedimentary features.
<b>Wintering Birds</b>		Maintain feeding, roosting, loafing areas in estuary	7. Assess habitat availability in estuary. Monitor to ensure that appropriate habitat is maintained

Table 2 Key for details of monitoring column in table 1

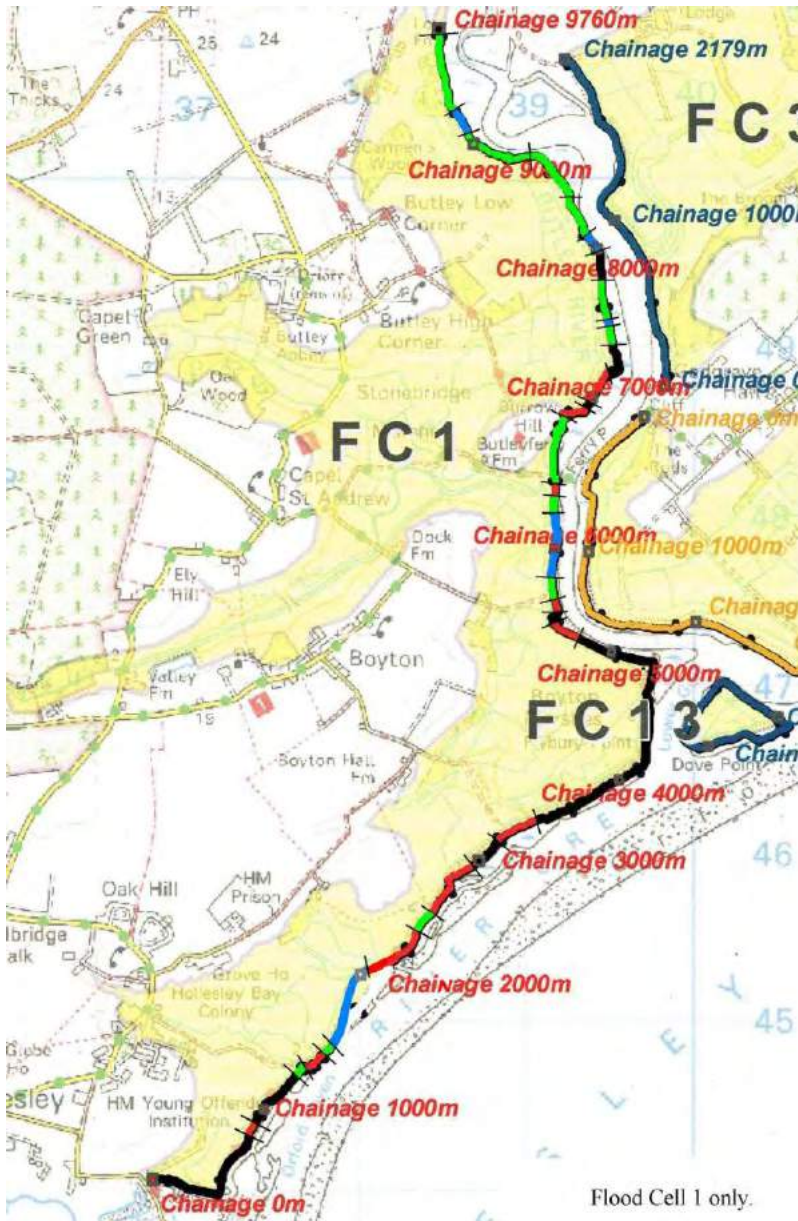
<b>Monitoring summary</b>
1. Use remote sensing techniques (CASI/Lidar, AP analysis) to assess extent and distribution of estuary habitats.
2. Measure Tidal Prism/Cross sectional area in upper, mid, lower estuary to assess estuary function
3. Measure distribution of sedimentary features to assess extent of intertidal mud biotopes.
4. Use transects, CASI/Lidar and NVC to assess extent of saltmarsh zones. ( Upper, mid, lower, pioneer)
5. Monitor elevation and distribution of intertidal mud biotopes.
6. Monitor in-fauna of intertidal mud biotopes.
7. Assess bird habitat availability in upper, mid, lower estuary. Monitor to ensure that appropriate habitat is maintained.



## Appendix 8

### MAPS OF ALL FLOOD CELLS, SHOWING RESILIENCE STATUS OF RIVER WALLS

#### FLOOD CELL 1 HOLLESLEY AND BOYTON



**BLACK** Will overtop and may breach during a 1:20 year event in 2012 but **cannot** survive a 1:20 year surge event in the year 2050.

**RED** Will not overtop during a 1:75 year event in 2012. **Can** survive a 1:20 year surge event in the year 2050 but **cannot** survive a 1:75 year surge event in the year 2050.

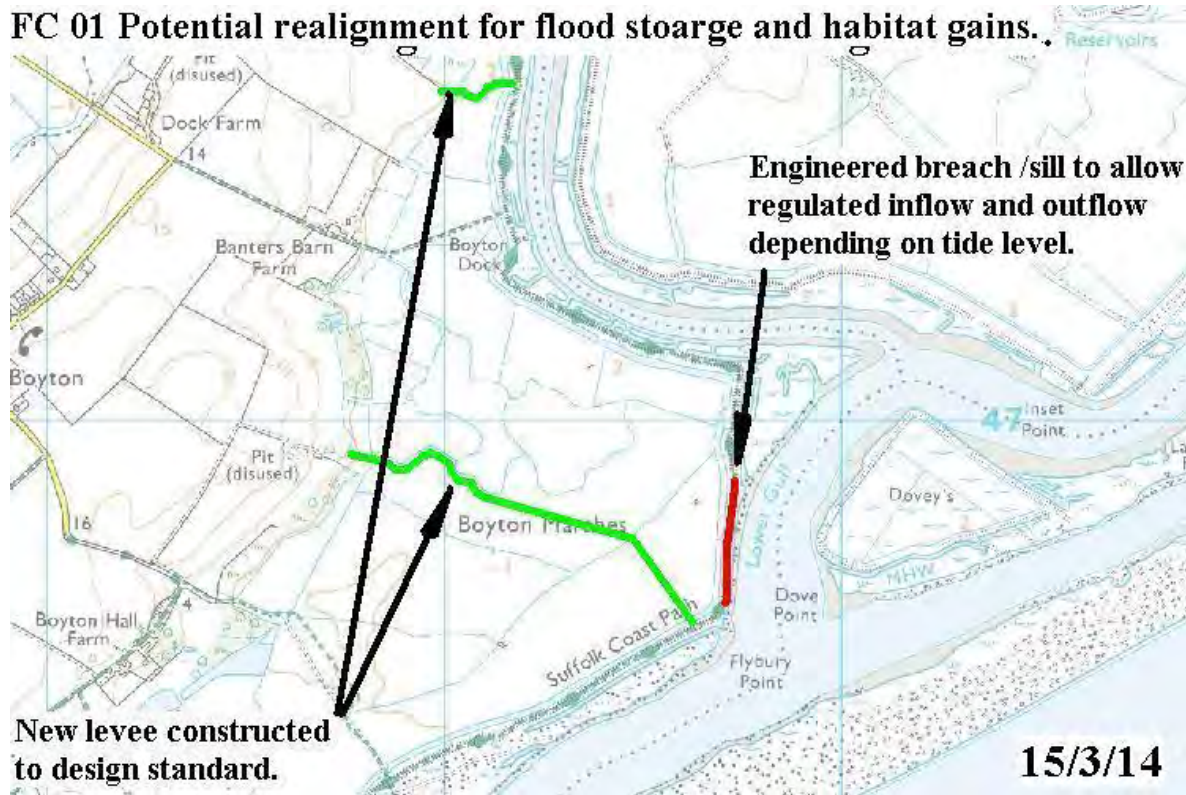
**BLUE** Will not overtop during a 1:200 year event in 2012. **Can** survive a 1:75 year surge event in the year 2050 but **cannot** survive a 1:200 year surge event in the year 2050.

**GREEN** **Can** survive a 1:200 year surge event in the year 2050.

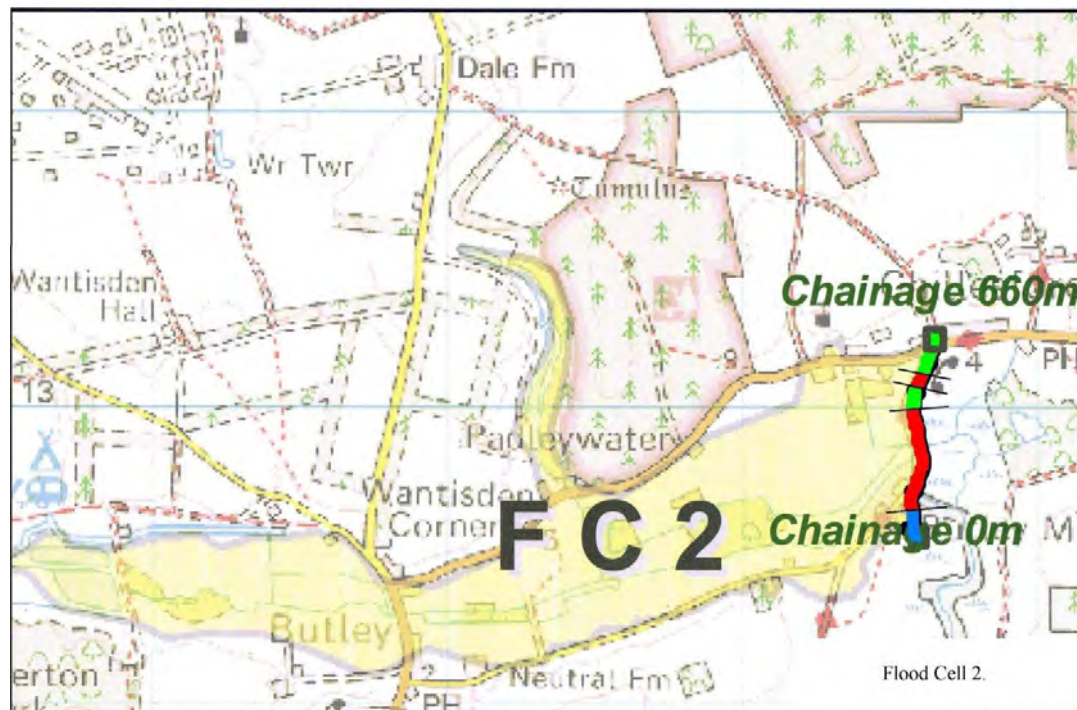
Chainage/ a surveyor's measurement  
= 1 chain = 66ft or 10 sq chains

POTENTIAL REALIGNMENT IN FLOOD CELL 1 **YET TO BE AGREED**

FC 01 Potential realignment for flood storage and habitat gains.



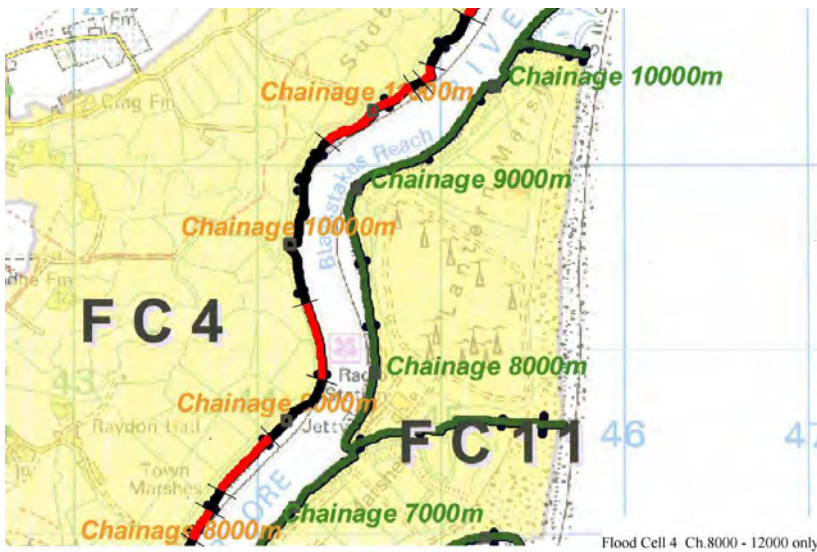
FLOOD CELL 2 BUTLEY MILLS





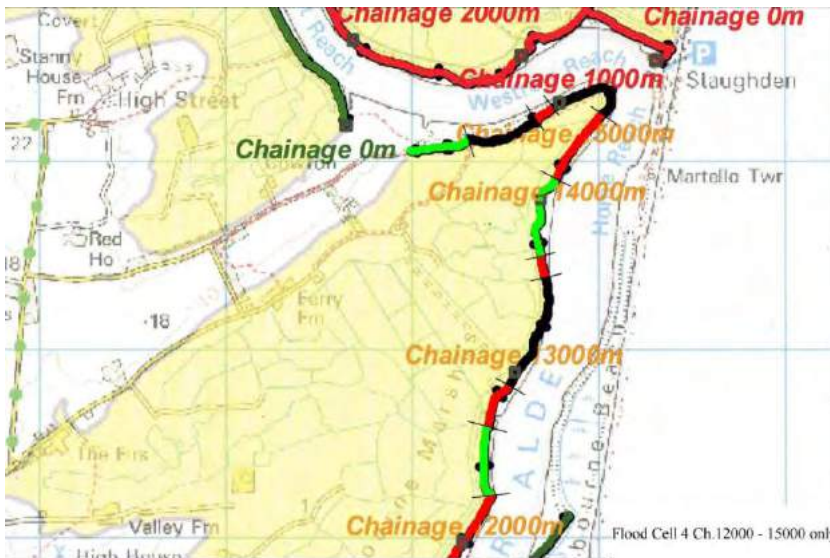


Flood Cell 4 Middle Section



Flood Cell 4 Ch.8000 - 12000 only.

Flood Cell 4 North



Flood Cell 4 Ch.12000 - 15000 only.

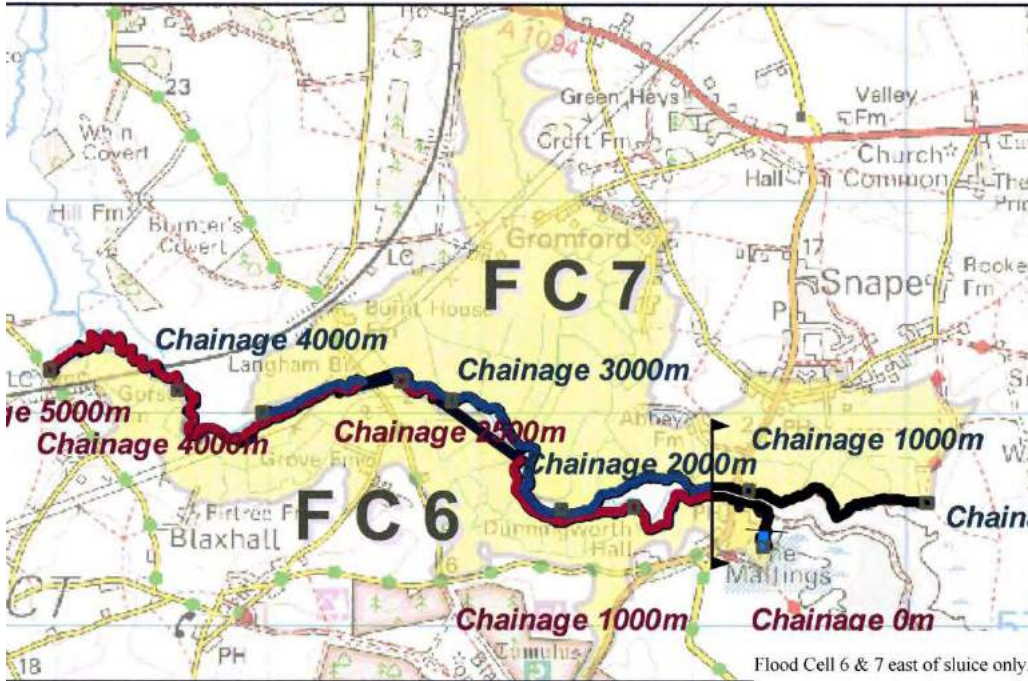
### FLOOD CELL 5 IKEN



Flood Cell 5 only.

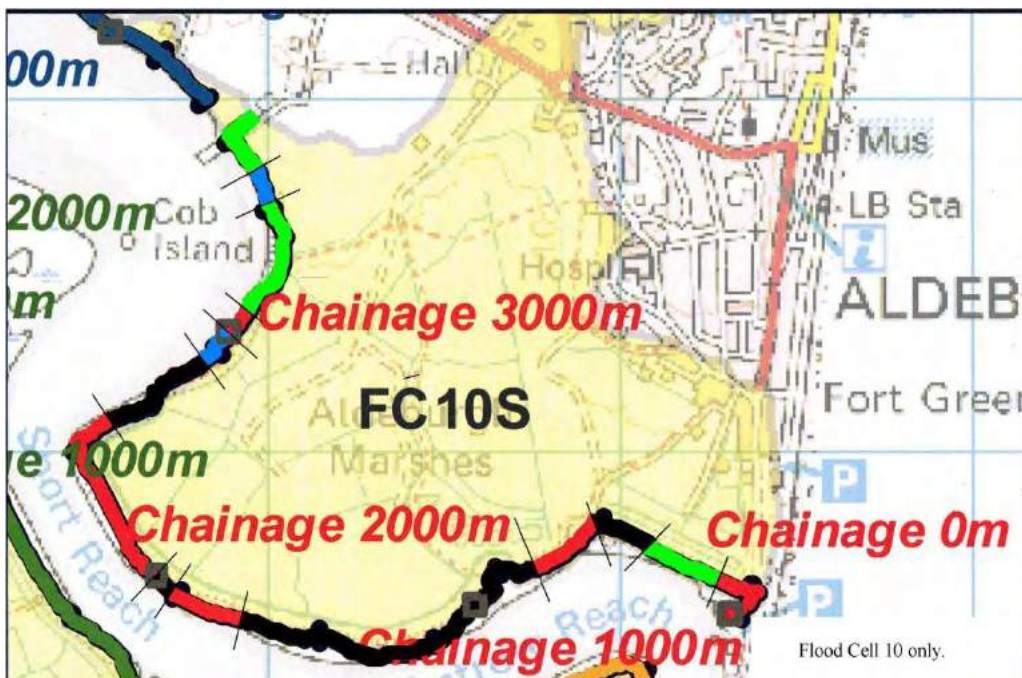
Appendix 8

FLOOD CELL 6 AND 7 SNAPE



Flood Cell 8 and 9 ham Creek and Hazlewood Marsh not assessed

FLOOD CELL 10 South ALDEBURGH MARSHES



## COSTS OF UPGRADING EACH FLOOD CELL

Appendix 9

These costs (completed 2013) reflect only the wall upgrading to crest and landward slope and do not include additional work such as sluices, drainage, environmental enhancement to the hinterland etc. These will be additional and agreed scheme by scheme. All Costs should be increased by 5% for 2015 uplift and further year on year uplifts until completion

FC	SURV CAT	INITIAL BROAD BRUSH COSTS			TOTAL	COMMENTS
Boyton 1	Black	676,800				
	Red		242,310			
	Blue			97,600	1,016,710	
Butley 2	Black	0				Upgraded Butley Mills wall has been completed by the EA
	Red		46,125			
	Blue			8,000	54,125	
Chillesford 3	Black	276,800				
	Red		35,670			
	Blue			0	312,470	
Orford 4	Black	1,369,638				
	Red		640,649			
	Blue			0	2,010,287	
Iken 5	Black	609,984				
	Red		106,272			
	Blue			43,200	759,456	
Snape 6+7	Black	235,360				New scheme being discussed at present to include sluices etc
	Red		0			
	Blue			6,720	242,080	
Ham Creek 8	Black	80,160				Local Landowners completed work
	Red		8,856			
	Blue			0	89,016	
Hazelwood 9	Black	355,310				Post surge 2013: New intertidal habitat developed. Main wall will not be reinstated.
	Red		0			
	Blue			0	355,310	
Aldeburgh 10	Black	257,280				Repair to previous work and possible upgrade scheme being discussed at present
	Red		160,761			
	Blue			16,080	434,121	
<b>Total</b>		<b>3,861,332</b>	<b>1,240,643</b>	<b>171,600</b>	<b>5,273,575</b>	
plus 10% supervision		386,133	124,064	17,160	527,358	
<b>Subtotal</b>		<b>4,247,465</b>	<b>1,364,707</b>	<b>188,760</b>	<b>5,800,933</b>	
plus VAT @ 20%		849,493	272,941	37,752	1,160,187	
		<b>£5,096,958</b>	<b>£1,637,649</b>	<b>£226,512</b>	<b>£6,961,119</b>	



### ENABLING DEVELOPMENT CRITERIA (as agreed by SCDC)

**Enabling development** *permitted as an exception to policy when delivering sufficient, measureable benefits to estuary management and flood protection which could not otherwise be achieved.*

#### Reasons for allowing Enabling Development

- to provide direct financial benefit to estuary management – focussing on essential, long term, flood protection measures within a defined estuary area, necessary to maintain or improve flood defence
- to support opportunities to deliver partnership funding when a lack or shortfall of other finance restricts action
- to support flood protection measures which have been agreed as necessary by all relevant landowners within and/or adjacent to a defined estuary area ( flood cell )

#### Conditions for allowing Enabling Development

Enabling Development should:

- utilise land and/or buildings solely for the purpose of enabling development
- offer no financial gain to the owner of the development site other than the existing value prior to enabling development
- receive the support of the community within which the development would be situated
- be exempt from standard S106 requirements unless overriding issues are identified following individual site assessment

#### Site selection for enabling development should

- be located outside areas identified by the Environment Agency as being at risk of flooding from rivers or sea
- be based on a principle of the optimal number of additional dwellings sustainable within a defined parish and estuary area
- be appropriate in scale, sensitive to the topography and recognise the significance of the various landscape and environmental designations that apply
- be sensitive to and not cause undue visual intrusion to the defining character and appearance of the local estuary landscape and marine environment
- have no significant, adverse impact on biodiversity and geodiversity ( SP14 / DM 27 )
- contribute to enhancing or maintaining the sustainability of rural communities in accordance with the Settlement Hierarchy SP27, SP 28 and SP 29
- deliver development that reflects, when possible, evidenced local need in terms of dwelling size and configuration
- consist of no more than two dwellings ( per site ) if located in hamlets, clusters or, as an exception to policy, in the countryside
- include the conversion or re-use of redundant or disused buildings
- reflect high standards of design and energy efficiency (DM 21 / DM 22 )
- be subject to acceptable access from the existing highway
- not cause loss of residential amenity to neighbouring property

Note: Enabling development is referred to in the National Policy Planning Framework, under paragraph 55, ‘To promote sustainable development in rural areas.. .’ (and paragraph 140 referring to heritage assets.)



## FLOOD CELL 1 BOYTON AND BUTLEY MARSHES BENEFIT COST RATIO (BCR) 2.7

## Appendix 12

	<b>FEATURES</b> The area in the flood plain to be defined as all land below 5m contour as that conforms to the EA's definition of the floodplain.	<b>STATISTICS</b>	<b>SOURCE OF DATA</b>	<b>DATA REQUIRED/ACTION</b>
<b>Location and Size</b>	From Hollesley Bay Young Offenders Institution, along west side of the Ore Estuary and Butley River as far as Butley Low Corner	<b>765 Hectares</b>	Alde and Ore Futures (AOF)/EA	
<b>Homes and other properties</b>	Total number of residential properties (not valued) Of which: Listed buildings Buildings in conservation area Holiday rentals	<b>13</b>  <b>Dock Farm, Boyton Hall, Valley Farm. Church at Boyton House at Butley High Corner. Butley Priory</b> No conservation areas  To be checked with rental companies	AOF/ EA	
	Number of residential properties protected by existing defences	3	AOF/EA	
	Number of other (non-residential) properties	72	AOF/EA	
	Number of other (non-residential) properties protected by existing defences of which : Businesses: e.g. boatyards, Storage, farm buildings	10  <b>Farm businesses are separate from ownership of land and houses</b> *	AOF/EA in all the above local knowledge may also be used	<b>Owen Smith, Banters Barn Farm Grazier Hay Boyton Hall Farms Capel St Andrew Farms Capel Farms Grove Dairy Warren Hill Hollesley HM Prison</b>
<b>Agricultural Land</b>	Area of agricultural land inside flood cell Of which: Arable Grazing	749 ha  <b>90 acres Boyton Hall</b> <b>60 acres Boyton Hall</b>  <b>180 acres Jamie Greenwell</b>	AOF/EA	

	<p>Surrounding land area irrigated by abstraction points inside flood compartment</p> <ol style="list-style-type: none"> <li>1. Land area irrigated by abstraction points inside flood cell (ha)</li> <li>2. Land irrigated outside any flood cell from abstraction point within cell</li> <li>3. Other economically useful land such as golf course, allotments</li> <li>4. Recreation ground</li> </ol>	<p>Some land may be irrigated from time to time such as to establish new grass seed in a dry season but crops are not regularly irrigated.</p> <p>200 Boyton Hall 800 James Greenwell 200 Edward Greenwell</p>	<p>AOF/EA ESWAG</p>	
<p><b>Wildlife and Habitat</b></p>	<p>A large flood cell running from Hollesley to Butley Low Corner. Most of the Hollesley and Boyton Marshes are in permanent wet grassland with freshwater ditches. Over 60% of the flood cell is in arable. One arm of the cell follows, in a south-westerly direction, the catchment area of the River Tang into the Sandlings Forest SSSI as far as Scotland Fen. Two ancient or semi-natural woodlands, Carmen's and Boyton Wood, are within the flood cell.</p> <p>The eastern and southern boundary of the cell abuts the River Alde/Ore which is part of the network of the Alde/Ore/Butley Estuaries, a designated SAC (Special Area of Conservation) and contains habitats of conservation concern (see the more detailed description at Annex 1).</p> <p>Intertidal habitat in front of the defences is internationally designated. Designations:</p>	<p>Boyton Marshes RSPB nature reserve, Hollesley Marshes RSPB nature reserve, Part of the Sandlings Forest SSSI Within the SAC but adjacent to this flood cell: Simpson's Saltings SWT nature reserve</p> <p>Will EA have area by flood cell? <b>70 acres James Greenwell</b> <b>30 Boyton Hall Farms</b> * <b>None in FC1 at present</b> * <b>Flood Cell 1 contains several Priority Species and Habitats which are nationally and locally (Suffolk) important.</b></p>	<p>ANOB SWT Wildlife survey</p> <p>2012 'Ecological assessment- Alde and Ore Estuaries'</p>	<p><b>Value should contribute to BCR</b></p>

	<p>1. Intertidal habitat in front of defences  a. saltings  b. mudflats</p> <p>2. Pilot schemes to renew Saltings</p> <p>3. Land behind the defences. List special features/species e.g. Wildlife habitat in floodplains behind the walls including ditches with reed buntings, little grebe and kingfisher, fields with hares, flight area of barn and short eared owls, range of birds including lapwing, egret, swans, varieties of gulls (ref: Wild life/Hinterland survey on a section covering all the estuary although each FC may have its own special species). Mostly the species will be the same, but with certain exceptions, e.g. breeding avocets in FC5 and now in Hollesley Marshes</p>	<p><b>Priority species include;</b>  Common toad <i>Bufo bufo</i>  Adder <i>Vipera berus</i>  Common lizard <i>Zootoca vivipara</i>  Grass snake <i>Natrix natrix</i>  Northern lapwing <i>Vanellus vanellus</i>  Reed bunting <i>Emberiza schoeniclus</i>  Skylark <i>Alauda arvensis</i>  Brown hare <i>Lepus europaeus</i>  European otter <i>Lutra lutra</i>  Water vole <i>Arvicola terrestris</i>  European eel <i>Anguilla anguilla</i></p> <p><b>Priority habitats include;</b>  Coastal and floodplain grazing marsh (including dykes)  Deciduous woodland</p> <p><b>Other breeding birds of importance</b>  European marsh harrier <i>Circus aeruginosus</i>  Pied avocet <i>Recurvirostra avosetta</i></p> <p><b>Winter assemblages of birds include;</b>  Wigeon <i>Anas penelope</i>  Teal <i>Anas crecca</i></p> <p>Lapwing  90 pairs Avocet  Hollesley Marsh reserve since completion of new scrapes  Bitterns Butley reported by James Greenwell</p> <p><b>RSPB reserves  ELS Capel Farms –  changing rules next year.</b></p>		
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	<p>4. Higher Level Stewardship Scheme</p> <p>5. Other? Monetary value of Nature Reserves Suffolk Punch Trust Butley Ferry</p> <p>2000 visitors per annum to RSPB reserves Value of coastal community</p>			
<b>Defences A&amp;O Futures 2011 assessment</b>	Defences are earth embankments; riverward and landward faces are relatively steep in places. They are generally in fair condition; though in some places the embankments are low and provide poor standard of protection.			
	Length of sea/estuary walls	9.8 Kilometers		
	How soon will major work be required?	Varies within 5 years	AOF/EA 2011	
	Current Standard of Protection (the chance of flooding in any year)	<20% (1 in 5)		
	Currently managed by	EA	AOF/EA	
<b>Features dependent on the maintenance of the river walls</b>	<p>1. Footpaths</p> <p style="padding-left: 20px;"><b>a)</b> along river walls (km)</p> <p style="padding-left: 20px;"><b>b)</b> providing access to river walls but in floodable area</p> <p>2. Allotments</p> <p>3. Boatyards for building, repairs, winter storage</p> <p>4. Public car parks</p> <p>5. Sailing clubs</p> <p>6. Utilities e.g. Sewage outlet (Anglian water, electricity station?)</p> <p>7. Wildlife</p> <p>8. Roads</p> <p>9. River management and moorings</p>	<p>in total 17Km 6500 chains Remainder of total</p> <p>* Hectares or Nos n/a n/a *</p> <p>n/a</p> <p>Outflow from Prison sewage treatment plant at Evacuation Sluice</p> <p>At Stone Bridge – Butley At Valley Farm Boyton</p> <p>Butley Ferry. River Tang from Tangham Forest to Butley river by ferry</p> <p>Butley River private – some moorings between Butley river and Gedgrave including Pinney’s fishing boats</p> <p>Hollesley Bay Prison</p>	<p>AOF/ SCC Rights of Way Dept Local</p> <p>Local Local</p> <p>Local knowledge Anglian,</p> <p>SWT report</p> <p>Highways Dept? Crown Estate, sailing clubs, watermen Local knowledge</p>	<p><b>Banters Barn</b></p> <p><b>Simpsons Saltings – very little maintenance noted over last two years</b></p> <p><b>Some utility services run through Stone Bridge area</b></p>

	<p>10 Employment: Jobs at risk if area is flooded</p> <p>11. Other features to be invited in consultation</p>			<p><b>Mainly agricultural workers to be researched further</b></p>
<p><b>Proposed Approach</b></p>	<p><b>A&amp;O Futures Approach:</b> National funding sources will not be available to maintain or improve the defences in this flood cell because it will cost more than the benefits it will provide to the small number of properties being protected. It will be for the local community to fund work themselves. The Environment Agency will support them through the transition and provide advice to help them develop their plans to maintain and improve defences. Note: REVISED BCR OF 2.7</p> <p><b>AOEP Approach: Cost £ 922,937 to upgrade the walls + VAT/Supervision fees. See Upgrade designs in Appendix 4</b></p>			

**Comments from the Partnership Annual meeting held on 8th May 2014  
– 100 members of the public in attendance.**

Loss of habitat in front of walls through natural erosion. Will require replacement elsewhere in longer term – RSPB comment - No plans for front face of walls. Some areas without any protection at all viz. Flybury Point (see RDC report) this is where cill is suggested if Boyton realignment is carried out. Length is upper Butley River, timber protection to river edge within 1M of foot of wall.

**FLOOD CELL 2 BUTLEY MILLS  
BENEFIT COST RATIO (BCR) 3.1**

**Appendix 12**

	<b>FEATURES</b> The area in the flood plain to be defined as all land below 5m contour which conforms to the EA's definition of the floodplain.	<b>STATISTICS</b>	<b>SOURCE OF DATA</b>	<b>DATA REQUIRED/ACTION</b>
<b>Location and Size</b>	At the top of the Butley Creek upstream of the road between Chillesford and Butley Mills	139 ha	Alde and Ore Futures (AOF)/EA	
<b>Homes and other properties</b>	Total number of residential properties Of which:  Listed buildings Buildings in conservation area Holiday rentals	30 (value in excess of £2,700,000 as at 2009)  <b>None</b> <b>None</b> <b>10</b>	AOF/ EA	
	Number of residential properties protected by existing defences	3	AOF/EA	
	Number of other (non-residential) properties	21	AOF/EA	
	Number of other (non-residential) properties protected by existing defences of which : Businesses: e.g. boatyards,  Storage, farm buildings	14  <b>Mill Lane B and B</b> <b>Butley Mills Studios</b> <b>Butley Mills</b> <b>Butley Barns</b> <b>Church Farm Stables, workshop, storage units, Dutch Barn</b>	AOF/EA in all the above local knowledge may also be used	
<b>Agricultural Land</b>	Area of agricultural land inside flood cell of which:  Arable Grassland	77 ha  <b>25%</b> <b>75%</b>	AOF/EA	

	<p>Surrounding land area irrigated by abstraction points inside flood cell</p> <p>1. Land area irrigated by abstraction points inside flood cell (ha)</p> <p>2. Land irrigated outside any flood cell from abstraction point within cell</p> <p>3. Other economically useful land such as golf course, allotments</p> <p>4. Recreation grounds</p>	<p>some land may be irrigated from time to time such as to establish new grass seed in a dry season but crops are not regularly irrigated</p> <p>479 ha +130 ACRES</p> <p><b>none</b></p> <p><b>n/a</b></p>	<p>AOF/EA ESWAG</p>	
<p><b>Wildlife and Habitat</b></p>	<p>FC2 Runs westerly from the head of the Butley River along the catchment area of the small stream that drains into the Butley River at Chillesford. The cell contains arable and wet grassland meadows, deciduous woodland and some freshwater lakes and reservoirs.</p> <p>The eastern boundary of the cell abuts the River Alde/Ore which is part of the network of the Alde/Ore/Butley Estuaries, a designated SAC (Special Area of Conservation) and contains habitats of conservation concern (see the more detailed description at Annex 1). The majority of the flood cell is not designated but some intertidal habitat in front of the defence is internationally designated and there is a small Country Wildlife site in the west of the flood cell managed by the RSPB.</p> <p>Designations:</p> <p>1. Intertidal habitat in front of defences</p> <p style="margin-left: 20px;">a. saltings</p> <p style="margin-left: 20px;">b. mudflats</p>	<p>Priority Species and Habitats which are nationally and locally (Suffolk) important.</p> <p><b>Priority species include;</b></p> <p>Common toad    <i>Bufo bufo</i> Adder            <i>Vipera</i> <i>berus</i> Grass snake    <i>Natrix</i> <i>natrix</i> Skylark           <i>Alauda</i> <i>arvensis</i></p> <p><b>Priority habitats include;</b></p> <p>Coastal and floodplain</p>	<p>ANOB SWT Wildlife survey</p> <p>2012 'Ecological assessment- Alde and Ore Estuaries'</p> <p>See 2013 NVC SURVEY</p>	

	<p>2. Pilot schemes to renew Saltings</p> <p>3. Land behind the defences. List special features/species e.g. Wildlife habitat in floodplains behind the walls including ditches with reed buntings, little grebe and kingfisher, fields with hares, flight area of barn and short eared owls, range of birds including lapwing, egret, swans, varieties of gulls (ref: Wild life/Hinterland survey on a section covering all the estuary although each FC may have its own special species). Mostly the species will be the same, but with certain exceptions, e.g. breeding avocets in FC5.</p> <p>4. Higher Level Stewardship Scheme</p> <p>5. Other?</p>	<p>grazing marsh (including dykes) Deciduous woodland</p> <p><b>50%</b></p> <p><b>*</b></p>		
<p><b>Defences AOF assessment 2011</b></p>	<p>Defences are earth embankments adjacent to the road. Riverward and landward faces have recently been upgraded with removal of large trees and the defence heightened to 3.30m AOD, currently around 50% of the wall is up to this level with the rest due to be completed in June/July.</p>			
	<p>Length of sea/estuary walls</p>	<p>0.7 km</p>		
	<p>How soon will major work be required?</p>	<p>Currently taking place</p>	<p>AOF/EA 2011</p>	
	<p>Current Standard of Protection (the chance of flooding in any year)</p>	<p><b>&lt;100% (1 in 1)</b> <b>repairs in progress</b></p>		
	<p>Currently managed by</p>	<p>EA</p>	<p>AOF/EA</p>	
<p><b>Features dependent on the maintenance of the river walls</b></p>	<p>1. Footpaths  <b>a)</b> along river walls (km)  <b>b)</b> providing access to river walls but in floodable area</p> <p>2. Allotments</p> <p>3. Boatyards for</p>	<p>in total 4Km 5km none</p> <p>none None none none</p>	<p>AOF/ SCC Rights of Way Dept</p> <p>Local Local</p>	

	building, repairs, winter storage 4. Public car parks 5. Sailing clubs 6. Utilities e.g. Sewage outlet (Anglian water, electricity station?) 7. Wildlife 8. Roads  9. River management and moorings 10. Employment: Jobs at risk if area is flooded  11. Other features to be invited in consultation	Substation in Mill Lane * Mill Lane and Chillesford & Butley Streets and B1084 No RC Engineering + Butley Mill Studio	SWT report Highways Dept? Crown Estate, sailing clubs, watermen Local knowledge	
<b>Proposed Approach</b>	<p><b>A&amp;O Futures Approach:</b> Work on this stretch of wall is due to be completed in July (as above) Butley Parish Council helped with local contributions.</p> <p><b>AOEP Approach:</b> Designs not yet completed – broad brush cost £54,125 but this does not take into account the work half completed. To be discussed.</p>			

**Comments from the Partnership Annual meeting held on 8th May 2014  
 – 100 members of the public in attendance.**

**Water Storage and Well points:**

- Irrigation well point at Neutral Farm
- Irrigation ditches and draw points at Low Corner
- Irrigation well point at Church Farm
- Kemballs Reservoirs and irrigation well points to north of Padley Water
- Boreholes at Mill Bungalow, Butley for domestic use

**FLOOD CELL 3    CHILLESFORD LODGE MARSHES    BENEFIT COST RATIO (BCR) 1.5**

	<b>FEATURES</b> The area in the flood plain is defined as all land below 5m contour which conforms to the EA's definition of the floodplain.	<b>STATISTICS</b>	<b>SOURCE OF DATA</b>	<b>DATA REQUIRED/ACTION</b>
<b>Location and Size</b>	The East side of the Butley River between Sudbourne Park and Gedgrave Hall	301 hectares	Alde and Ore Futures (AOF)/EA	
<b>Homes and other properties</b>	Total number of residential properties Of which:  Listed buildings Buildings in conservation area Holiday rentals	<b>28</b> (Value in excess of £8,120,000 as at 2009) Model Farm Broom House	AOF/ EA	
	Number of residential properties protected by existing defences	1	AOF/EA	
	Number of other (non-residential) properties	18	AOF/EA	
	Number of other (non-residential) properties protected by existing defences of which : Businesses: e.g. boatyards, Storage, farm buildings	1  Chillesford Lodge Farm Buildings	AOF/EA in all the above local knowledge may also be used	Sudbourne Park Industries (EG)
<b>Agricultural Land</b>	Area of agricultural land inside flood cell Of which:  Arable  Permanent Grass	279 ha  <b>50%</b> <b>50%</b>	AOF/EA	

	<p>Surrounding land area irrigated by abstraction points inside flood cell</p> <p>1. Land area irrigated by abstraction points inside flood cell (ha) note:</p> <p>2. Land irrigated outside any flood cell from abstraction point within cell</p> <p>3. Other economically useful land such as golf course, allotments</p> <p>4. Recreation grounds</p>	<p>some land may be irrigated from time to time such as to establish new grass seed in a dry season but crops are not regularly irrigated</p> <p>277 ha</p> <p>*</p> <p>*</p>	<p>AOF/EA ESWAG</p> <p>All from within Flood cell nothing from outside</p>	
<p><b>Wildlife and Habitat</b></p>	<p>A flood cell on the west side of the Butley River which contains arable, semi and permanent wet grassland, deciduous woodland and some hedgerow within the cell. An interesting feature known as the Fleet remains from the time before the river wall was built around 1600. A reed-filled freshwater lagoon surrounded by grazing marsh.</p> <p>The western boundary of the cell abuts the River Alde/Ore which is part of the network of the Alde/Ore/Butley Estuaries, a designated SAC (Special Area of Conservation) and contains habitats of conservation concern (see the more detailed description at Annex 1). Intertidal habitat in front of the defences is internationally</p>	<p>Reeds commercially farmed</p> <p>Priority Species and Habitats which are nationally and locally (Suffolk) important.</p> <p><b>For species these include;</b></p> <p>Common toad <i>Bufo bufo</i>  Grass snake <i>Natrix natrix</i>  Reed bunting <i>Emberiza schoeniclus</i>  Skylark <i>Alauda arvensis</i>  Brown hare <i>Lepus europaeus</i>  European otter <i>Lutra lutra</i>  Water vole <i>Arvicola terrestris</i>  European eel <i>Anguilla anguilla</i></p> <p><b>Priority habitats include;</b></p> <p>Coastal and floodplain grazing</p>	<p>ANOB SWT Wildlife survey 2012 'Ecological assessment- Alde and Ore Estuaries'</p>	



	<p>designated. Designations: 1. Intertidal habitat in front of defences     a. saltings     b. mudflats     c. Reedbed 2. Pilot schemes to renew Saltings  3. Land behind the defences. List special features/species e.g. Wildlife habitat in floodplains behind the walls including ditches with reed buntings, little grebe and kingfisher, fields with hares, flight area of barn and short eared owls, range of birds including lapwing, egret, swans, varieties of gulls (ref: Wild life/Hinterland survey on a section covering all the estuary although each FC may have its own special species). Mostly the species will be the same, but with certain exceptions, e.g. breeding avocets in FC5. 4. Higher Level Stewardship Scheme  5. Other?</p>	<p>marsh (including dykes) Deciduous woodland Hedgerow  <b>75%</b>  <b>*</b></p>		
<b>Defences A&amp;O Futures Assessment 2011</b>	<p>Defences are earth embankments; the riverward face is steep in places. They provide a moderate standard of protection and are in fair condition.</p>			
	<p>Length of sea/estuary walls</p>	<p>2.2 kilometers</p>		
	<p>How soon will major work be required?</p>	<p>Within 8- 10 years</p>	<p>AOF/EA 2011</p>	
	<p>Current Standard of Protection (the chance of flooding in any year)</p>	<p>&lt;5% (1 in 20)</p>		
	<p>Currently managed by</p>	<p>EA</p>	<p>AOF/EA</p>	
			<p>AOF/ SCC</p>	



### FLOOD CELL 4 ORFORD

### BENEFIT COST RATIO (BCR) 4 WITH GEDGRAVE AND SUDBOURNE MARSHES

	<b>FEATURES</b> The area in the flood plain is defined as all land below 5m contour which conforms to the EA's definition of the floodplain.	<b>STATISTICS</b>	<b>SOURCE OF DATA</b>	<b>DATA REQUIRED/ ACTION</b>
<b>Location and Size</b>	The town of Orford, (generally the area seaward of Broad Street) and the two extensive marshes to the north east and south west. This flood cell accounts for approximately one quarter of the total length of walls in the estuary running from a point about one third of the way up the Butley River to just round the bend in the river at Slaughden.	1273 hectares	Alde and Ore Futures (AOF)/EA	
<b>Homes and other properties</b>	Total number of residential properties Of which:  Listed buildings  Buildings in conservation area  Holiday rentals	105 (Value in excess of £37,970,000 as at 2009) *  Orford - 48	AOF/ EA	<b>Michael Cordle – 5 + House and 7 at converted farm buildings. Firs Farm House and Holiday let at Firs Farm</b>  <b>5 holiday lets at Valley &amp; Ferry Farms. Recent change from residential to holiday</b>
	Number of residential properties protected by existing defences	39	AOF/EA	<b>These were all difficult to do as the figure 39 did not tell us which ones were already listed so we didn't know which extra ones to add??</b>
	Number of other (non-residential) properties	97	AOF/EA	
	Number of other (non-residential) properties protected by existing defences of which : Businesses: e.g. boatyards, Storage, farm buildings	52 – this figure is very low needs amending	AOF/EA in all the above local knowledge may also be used	<b>Orford boatyard Smokehouse and cold store at Pinney's house Butley Ferry hut Orford Sailing Club Businesses on Quay Jolly Sailor Pump Street Bakery @ Gedgrave IDB pumps at</b>

		<p>with what we know and new ones</p> <p>* *</p>		<p>Sudbourne, Gedgrave Sewage plant @ Orford Lady Florence 5 boats fishing into Orford National Trust Ferry Regardless river trips</p> <p>Other businesses incl Commercial shoots and commercial duck ponds.</p>
<b>Agricultural Land</b>	<p>Area of agricultural land inside flood cell Of which:</p> <p style="padding-left: 40px;">Arable</p> <p style="padding-left: 40px;">Permenant</p> <p>Grassland</p>	<p>1255 hectares</p> <p>* *</p>	AOF/EA	<p>Ferry Farm: 50ha arable, 155ha grassland, 25ha saltings P Wareing – 60ha production, 100ha grassland MCordle – 120 acres arable, 9 acres grassland. To add info from E Greenwell and J Grimsey</p>
	<p>Surrounding land area irrigated by abstraction points inside flood cell</p> <p>1. Land area irrigated by abstraction points inside flood cell (ha)</p> <p>2. Land irrigated outside any flood cell from abstraction point within cell</p> <p>3. Other economically useful land such as golf course, allotments</p> <p>4. Recreation grounds</p> <p>5. Winter Storage Water/Reservoir</p>	<p>some land may be irrigated from time to time such as to establish new grass seed in a dry season but crops are not regularly irrigated</p> <p>545 ha</p> <p>* *</p> <p>E Greenwell x2 Ferry Farm x1 40 million gallons – Wareing 40 million gallons – P Cooke 12 million gallons Orford well points</p>	AOF/EA ESWAG	
<b>Wildlife and Habitat</b>	<p>Incorporating Town Marshes and Sudbourne Marshes, the land use of three-quarters of this large flood cell is made up of permanent and semi-permanent wet grasslands. Grazed by sheep, cattle and horses with some areas in HLS (Higher Level Stewardship – see <a href="http://www.naturalengland.org.uk">www.naturalengland.org.uk</a>) . The existing field pattern through much of the Crag</p>		EA? NE? EA?NE? ANOB SWT Wild life survey 2012 'Ecological assessment -Alde and Ore Estuaries'	<p><b>Orford Wild Flower Meadow</b></p> <p><b>Captains Wood</b></p> <p><b>Other species people thought should have value:-</b> <b>Woodcock</b> <b>Shoveler</b> <b>Pink Feet Geese</b> <b>Greylag Geese</b> <b>Teal</b> <b>Widgeon</b></p>

<p>Farm section is medieval in origin and ‘Roper’s Marsh’ is designated as a possible medieval harbour site. Most dykes are choked reed-filled and contain a freshwater flora and fauna of interest. Town Marshes at the southern end of this flood cell is primarily arable with an irrigation system, but still contains breeding lapwings, yellow wagtail and skylark. South of Orford are the Gedgrave Marshes which is principally arable with some semi-permanent grassland in the south-west corner. A freshwater reservoir sometimes holds interesting bird species in winter. The eastern boundary of the flood cell abuts the River Alde/Ore which is part of the network of the Alde/Ore/Butley Estuaries, a designated SAC (Special Area of Conservation) and contains habitats of conservation concern (see the more detailed description at Annex 1).</p> <p>Intertidal habitat in front of the defences is internationally designated. There is a County Wildlife site in the north of the cell near Slaughden bend. Designations:</p> <ol style="list-style-type: none"> <li>1. Intertidal habitat in front of defences             <ol style="list-style-type: none"> <li>a. saltings</li> <li>b. mudflats</li> </ol> </li> <li>2. Pilot schemes to renew Saltings</li> <li>3. Land behind the defences. List special features/species e.g. Wildlife habitat in floodplains behind the walls including ditches with reed buntings, little grebe and kingfisher, fields with hares, flight area of barn and short eared owls, range of birds including lapwing, egret, swans, varieties of gulls (ref: Wild life/Hinterland survey on a section covering all</li> </ol>	<p style="text-align: center;">*</p> <p><b>Ferry Farm 25ha Saltings Orford 3 acres Cordle Crag Farm will have some as well</b></p> <p>Completed At Ferry Point and Orford Quay</p> <p>Flood Cell 4 contains several Priority Species and Habitats which are nationally and locally (Suffolk) important. <b>Priority species include:</b></p> <p>Common toad <i>Bufo bufo</i>              Adder <i>Vipera berus</i>              Common lizard <i>Zootoca vivipara</i>              Grass snake <i>Natrix natrix</i>              Yellow wagtail <i>Motacilla flava</i>              Northern lapwing <i>Vanellus vanellus</i>              Reed bunting <i>Emberiza schoeniclus</i>              Linnet <i>Carduelis cannabina</i>              Skylark <i>Alauda arvensis</i>              Brown hare <i>Lepus europaeus</i>              European otter <i>Lutra lutra</i>              Water vole <i>Arvicola terrestris</i>              Water shrew <i>Neomys fodiens</i>              European eel <i>Anguilla anguilla</i></p> <p><b>Priority habitats include;</b>              Coastal and floodplain grazing marsh (including dykes)              Hedgerows (abutting the 5m contour)</p> <p><b>Winter assemblages of birds include;</b>              European golden plover <i>Pluvialis pritaria</i>              Eurasian curlew <i>Numenius arquata</i></p>	<p><b>Snipe Gadwill Barn Owls Oyster Catchers Bittern Marsh Harrier Shelduck Sparrow Hawk Merlin Egrets Curlew Redshank Lapwing/Plover Godwit Grey Partridge Mute Swans</b></p>
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	<p>the estuary although each FC may have its own special species). Mostly the species will be the same, but with certain exceptions, e.g. breeding avocets in FC5.</p>	<p><b>Keith Luxford</b></p> <p>*</p>		
<p><b>Defences A&amp;O Futures Assessment 2011</b></p>	<p>Most defences are earth embankments in fair condition although the riverward face is relatively steep in places. There are also some short sections of concrete defences that pass through and around the properties between Orford Quay and the town itself. Over all, the defences provide a low standard of protection due to some particularly low sections.</p>			
	<p>Length of sea/estuary walls</p>	<p>15.9 kilometres</p>		
	<p>How soon will major work be required?</p>	<p>Generally within 10 years but now in some places</p>	<p>AOF/EA 2011</p>	
	<p>Current Standard of Protection (the chance of flooding in any year)</p>	<p>&lt;20% (1 in 5)</p>		
<p><b>Features dependent on the maintenance of the river walls</b></p>	<p>1. Footpaths              <b>a)</b> along river walls (km)              <b>b)</b> providing access to river walls but in floodable area          2. Allotments          3. Boatyards for building, repairs, winter storage          4. Public car parks          5. Sailing clubs          6. Utilities e.g. Sewage</p>	<p>in total 26bKm          Other things to be included in River Management:-          Wildfowlers          Speedboats          Angling          Yachtsmen          Site seeing boats/Ferries          Moorings – 270 boats           Roads – Gedgrave Rd, Quay Street, Ferry Lane, Broad Street,</p>	<p>AOF/ SCC          Rights of Way Dept          Local knowledge and SCC?           Local          Local           Local knowledge          Anglian,</p>	<p><b>Cesspits – concern that there are a lot of private cesspits that may well be near or below 5m and we don't know how many?</b></p> <p><b>Info from Orford:-</b>          1) There are 44 allotments owned by NOTT bringing in £1200 per year          2) There are 15 riverside</p>

	<p>outlet (Anglian water, electricity station?)</p> <p>7. Wildlife</p> <p>8. Roads</p> <p>9. River management and moorings</p> <p>10. Employment: Jobs at risk if area is flooded</p> <p>11. Other features to be invited in consultation</p>	<p>Daphne Rd</p> <p>Other things that should be taken into account:- Farm Chemical stores that will be secure but may well be below 5m?</p> <p>Domestic Burning Oil tanks near or below 5m/Gas Tanks near or below 5m/Unknown</p>	<p>SWT report</p> <p>Crown Estate, sailing clubs, watermen</p> <p>Local knowledge</p>	<p>plots with sheds etc bringing in £6000 per year.(8 more plots will be created this summer)</p> <p>Both 1 and 2 are let to local residents.</p> <p>3)There are 124 moorings on the river bringing in £38,000 per year.</p> <p>4) Income from daily moorings ie foreign boats etc is £5000 per year.</p> <p>5) There are 480 residents in Orford and 42 in Gedgrave but there is also an unquantifiable but increasing number of seasonal visitors who stay a week or two at most and also a significant number of weekenders with their own houses .</p> <p>6) The number of businesses in Orford is not known but there are a lot of businesses apparently run from home beside the Bakery and The Lady Florence etc. Orford Business Association only know about 30% of businesses.</p> <p>7) Additionally the village car parks (especially the Quay Car Park) bring in probably £60,000 to the village annually</p>
<p><b>Proposed Approach</b></p>	<p><b>A&amp;O Futures Approach:</b> In short, existing defences could provide greater protection if the low spots are raised and erosion hot-spots repaired. This work can be supported by national funds...however it is expected that continuing to maintain these defences in the future will become increasingly expensive as sea levels rise and the aging defences need major work more frequently. At some point it will be a more efficient use of national funds to adapt to a new line of defence closer to the town of Orford where most of the properties at risk of flooding are located (approx 17 years time). <b>Unlikely that all costs will be met by central government.</b> But the remaining lengths of wall could only be maintained if the costs were met by the community including landowners, recreational river users and local businesses who may also have an interest in maintaining the existing configuration of the river.</p> <p><b>AOEP Approach:</b> A 100m stretch of the Orford Chantry wall was upgraded as a trial in 2013 and will be the basis of further upgrading in the estuary of similar sections. <b>Cost to upgrade the walls</b> £1,743,774.00 as per designs in Appendix 4</p> <p>River produces income for the NOTT to run the village approx £200K</p>			

**Comments from the Partnership Annual meeting held on 8th May 2014 – 100 members of the public in attendance.**

Pollution – concern over sewage plants / cesspits etc

900 Million Gallons of fresh water is pumped out a year by just one of the IDB pumps in Flood Cell 4. This water should be secured during the winter for storage for summer use. The Clay dug out of the ground to build the winter fill water storage could be stored and used for the river wall works.

Flood Cell 4 table were not happy with the idea of a separate wall protecting Orford and leaving land either side unprotected. Orford and its surrounding land are dependant upon each other and want to be protected together as per the AOEP approach.



	<b>FEATURES</b>	<b>STATISTICS</b>	<b>SOURCE OF DATA</b>
	<b>The area in the flood plain is defined as all land below 5m contour which conforms to the EA's definition of the floodplain.</b>		
<b>Location and Size</b>	South side of the river Alde from the Anchorage at Iken downstream to the high ground directly opposite Aldeburgh Marshes.	556 hectares	Alde and Ore Futures (AOF)/EA
<b>Homes and other properties</b>	Total number of residential properties (Value in excess of £16,700,000 as at 2009)	32	AOF/ EA
	Of which:	*	
	Listed buildings	*	
	Buildings in conservation area	*	
	Holiday rentals	*	
	Number of residential properties protected by existing defences	16	AOF/EA
	Number of other (non-residential) properties	21	AOF/EA
	Number of other (non-residential) properties protected by existing defences of which :	4	AOF/EA
	Businesses: e.g. boatyards,	*	in all the above local knowledge may also be used
	Storage, farm buildings	*	
<b>Agricultural Land</b>	Area of agricultural land inside flood cell	517 hectares	AOF/EA
	Of which:	*	
	Crops	*	
	Grazing	*	
	Surrounding land area irrigated by abstraction points inside flood cell	some land may be irrigated from time to time such as to establish new grass seed in a dry season but crops are not regularly irrigated	AOF/EA ESWAG
	1. Land area irrigated by abstraction points inside flood cell (ha) note:		
	2. Land irrigated outside any flood cell from abstraction point within cell	273 hectares	
	3. Other economically useful land such as golf course, allotments		
	4. Recreation grounds		
	The land-use of this flood cell is primarily semi-permanent wet grassland grazed by sheep and cattle		



	4. Higher Level Stewardship Scheme	<p>European otter <i>Lutra lutra</i>  Water vole <i>Arvicola terrestris</i>  Water shrew <i>Neomys fodiens</i></p> <p><b>Priority habitats include;</b>  Coastal and floodplain grazing marsh (including freshwater ditches)</p> <p><b>Other breeding birds of importance</b>  European marsh harrier <i>Circus aeruginosus</i>  Pied avocet <i>Recurvirostra avosetta</i>  Bearded Tit <i>Panurus biamicus</i></p> <p><b>Winter assemblages of birds include;</b>  Widgeon <i>Anas Penelope</i>  Black-tailed godwit <i>Limosa limosa</i></p>	
<b>Defences A&amp;O Futures Assessment 2011</b>	Defences are earth embankments: riverward and landward faces are relatively steep in places. They are in fair or poor condition; though in some places the embankments are low and provide poor standard of protection.		
	Length of sea/estuary walls	6.7 kilometers	
	How soon will major work be required?	Any time now	AOF/EA 2011
	Current Standard of Protection (the chance of flooding in any year)	<20% (1 in 5)	
	Currently managed by	EA	AOF/EA
<b>Features dependent on the maintenance of the river walls</b>	<ol style="list-style-type: none"> <li>1. Footpaths <ol style="list-style-type: none"> <li>a) along river walls (km)</li> <li>b) providing access to river walls but in floodable area</li> </ol> </li> <li>2. Allotments</li> <li>3. Boatyards for building, repairs, winter storage</li> <li>4. Public car parks</li> <li>5. Sailing clubs</li> <li>6. Utilities e.g. Sewage outlet (Anglian water, electricity station?)</li> <li>7. Wildlife</li> <li>8. Roads</li> <li>9. River management and moorings</li> </ol>	<p>in total 11Km  *km  *km</p> <p>* Hectares or Nos  *  *  *  *  *  *</p>	<p>AOF/ SCC Rights of Way Dept</p> <p>Local  Local</p> <p>Local knowledge</p> <p>SWT report</p> <p>Crown Estate, sailing clubs,</p>

	10. Employment: Jobs at risk if area is flooded 11. Other features to be invited in consultation	*	watermen Local knowledge
<b>Proposed Approach</b>	<p><b>A&amp;O Futures Approach:</b> Low BCR does not justify the EA maintaining defences using national funds. However, the defences will continue to be maintained in the short term (up to about 20 years) for the purposes of protecting the population of avocets, a qualifying feature of the Alde and Ore Estuary SPA. Compensatory habitats for the avocet population may be developed in a more sustainable location elsewhere. Thereafter it will no longer be possible to justify maintaining existing defences using national funds.</p> <p><b>AOEP Approach.</b> £632,917 to upgrade the walls</p>		

### FLOOD CELL 6 & 7 SNAPE TO LANGHAM BRIDGE BENEFIT COST RATIO (BCR) 10.6

	<b>FEATURES</b> The area in the flood plain is defined as all land below 5m contour which conforms to the EA's definition of the floodplain.	<b>STATISTICS</b>	<b>SOURCE OF DATA</b>	<b>DATA REQUIRED/ACTION</b>
<b>Location and Size</b>	At the top of the Alde estuary behind the 'horse-shoe' of defences that extend east from the tidal sluice at Snape.	412 hectares	Alde and Ore Futures (AOF)/EA	
<b>Homes and other properties</b>	Total number of residential properties (As valued in 2009) (FC6 £3,250,000*) (FC7 £19,239,000) *Snape Maltings complex not valued in 2009 but at July 2014 approx £36Million  Of which: Listed buildings  Buildings in conservation area Holiday rentals	86  <b>Abbey Farm Grade II</b> <b>Barn Grade 1</b> <b>Snape Maltings</b> *	AOF/ EA	
	Number of residential properties protected by existing defences	13	AOF/EA	
	Number of other (non-residential) properties	68	AOF/EA	
	Number of other (non-residential) properties protected by existing defences of which : Businesses: e.g. boatyards, Storage, farm buildings	33  <b>Ladybird Nursery,</b>  <b>Stud Farm</b> <b>Gromford Lane</b>	AOF/EA in all the above local knowledge may also be used	
<b>Agricultural Land</b>	Area of agricultural land inside flood cell Of which: Crops  Grazing	*  *	AOF/EA	
			AOF/EA	

	<p>Surrounding land area irrigated by abstraction points inside flood cell</p> <ol style="list-style-type: none"> <li>1. Land area irrigated by abstraction points inside flood cell (ha) note:</li> <li>2. Land irrigated outside any flood cell from abstraction point within cell</li> <li>3. Other economically useful land such as golf course, allotments</li> <li>4. Recreation grounds</li> </ol>	<p>some land may be irrigated from time to time such as to establish new grass seed in a dry season but crops are not regularly irrigated</p> <p>273 ha –low discuss Peter Youngs, Ropes, Wary, Kerr</p> <p><b>Snape Allotments</b></p> <p>*</p>	<p>ESWAG</p>	<p><b>Abstraction point</b></p>
<p><b>Wildlife and Habitat</b></p>	<p><b>FC6</b> A small area of scrub just west of the Snape Maltings complex runs into permanent wet grassland and further west semi-permanent wet grassland. Both areas are grazed by cattle and sheep. About 20% of the flood cell is in arable. Freshwater coarse fishing lake at Blaxhall.</p> <p><b>FC 7</b> is a complex mix of habitats including arable, semi-permanent and permanent wet grasslands, reedbed, water meadow and man-made freshwater lakes. The eastern end of the flood cell comprises of Snape Marshes with a mosaic of wetland habitats including cattle-grazed permanent wet grassland. Other habitats in this area include: herb-rich meadows, reedbed, scrub and wet woodland. Good populations of plants and butterflies are present. 14 species of dragonfly have been recorded.</p> <p>The central area consists of some arable with at Botany Marshes new reedbed and freshwater marshes have recently (2014) been created as mitigation for losses of</p>		<p>ANOB SWT Wild life survey</p> <p>2012 ‘Ecological assessment- Alde and Ore Estuaries’ Snape Maltings Bats</p>	

<p>habitat elsewhere on the Suffolk coast. This helps the government comply with the habitat regulations which are part of UK law. Salt water flooding would damage these habitats and mean that alternative sites would need to be found. A long (2 km) northern arm of the flood cell follows the catchment area of the River Fromus as far north as Marsh Farm, Sternfield. This area contains a mix of arable, a small area of wet meadow and alder carr at Benhall Wadd, which contains a rich plant and insect population. At the northern extremity is Marsh Farm, a commercial caravan site with many freshwater lakes stocked with carp species. Some free-range pig farming at the extreme western edge of the flood cell.</p> <p>The far eastern boundary of the flood cell, at Snape Marshes, abuts the River Alde/Ore which is part of the network of the Alde/Ore/Butley Estuaries, a designated SAC (Special Area of Conservation) and contains habitats of conservation concern (see the more detailed description at Annex 1).</p> <p>There is also a county wildlife site and site of Special Scientific Interest (SSSI) and intertidal habitat in front of the defences is internationally designated.</p> <p>Designations:</p> <ol style="list-style-type: none"> <li>1. Intertidal habitat in front of defences             <ol style="list-style-type: none"> <li>a. saltings</li> <li>b. mudflats</li> </ol> </li> <li>2. Pilot schemes to renew Saltings</li> <li>3. Land behind the</li> </ol>	<p style="text-align: center;">*</p> <p style="text-align: center;">*</p> <p style="text-align: center;">*</p> <p style="text-align: center;">*</p> <p><b>FC6 Priority species include;</b></p> <p>Common toad <i>Bufo bufo</i> Common lizard <i>Zootoca vivipara</i> Grass snake <i>Natrix natrix</i> Reed bunting <i>Emberiza schoeniclus</i> Linnet <i>Carduelis cannabina</i> Skylark <i>Alauda arvensis</i></p> <p>Brown hare <i>Lepus europaeus</i> European otter <i>Lutra lutra</i> Black poplar <i>opulus nigra</i></p> <p><b>Priority habitats include;</b> Coastal and floodplain grazing marsh (including dykes)</p> <p>Snape Marshes SWT/ RSPB nature reserve Abbey Marshes and Botany Marshes RSPB nature reserves Benhall Wadd a local PC run nature reserve</p> <p><b>FC7 contains several Priority Species and Habitats which are nationally and locally (Suffolk) important.</b></p> <p><b>Priority species include;</b> Common toad <i>Bufo bufo</i> Adder <i>Vipera berus</i> Common Lizard <i>Zootoca vivipara</i></p>	
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	<p>defences. List special features/species e.g. Wildlife habitat in floodplains behind the walls including ditches with reed buntings, little grebe and kingfisher, fields with hares, flight area of barn and short eared owls, range of birds including lapwing, egret, swans, varieties of gulls (ref: Wild life/Hinterland survey on a section covering all the estuary although each FC may have its own special species). Mostly the species will be the same, but with certain exceptions, e.g. breeding avocets in FC5.</p>	<p>Grass Snake <i>Natrix natrix</i> Slow-worm <i>Anguis fragilis</i> Reed bunting <i>Emberiza schoeniclus</i> Linnet <i>Carduelis cannabina</i> Skylark <i>Alauda arvensis</i> Brown hare <i>Lepus europaeus</i> European otter <i>Lutra lutra</i> Water vole <i>Arvicola terrestris</i> Water shrew <i>Neomys fodiens</i></p> <p><b>Priority habitats include;</b> Coastal and floodplain grazing marsh (including dykes) Lowland meadows *</p>		
	4. Higher Level Stewardship Scheme			

<b>Defences A&amp;O Futures Assessment 2011</b>	Defences are earth embankments, concrete walls (some running through the face of the concert hall building at Snape Maltings), parts of Bridge Road (B1069) and a tidal sluice. The defences form a horse-shoe shape defence system at the top of the estuary which protects the land behind on both the north and south sides of the river. They are generally in fair condition; though in some places are embankments are low and provide poor standard of protection.			
	Length of sea/estuary walls	1.7 kilometres		
	How soon will major work be required?	Any time now	AOF/EA 2011	
	Current Standard of Protection (the chance of flooding in any year)	<100% (1 in 1)		
	Currently managed by	Environment Agency (except quay at Snape Maltings managed by landowner)	AOF/EA	



<b>Features dependent on the maintenance of the river walls</b>	<ol style="list-style-type: none"> <li>1. Footpaths             <ol style="list-style-type: none"> <li>a) along river walls (km)</li> <li>b) providing access to river walls but in floodable area</li> </ol> </li> <li>2. Allotments</li> <li>3. Boatyards for building, repairs, winter storage</li> <li>4. Public car parks</li> <li>5. Sailing clubs</li> <li>6. Utilities e.g. Sewage outlet (Anglian water, electricity station?)</li> <li>7. Wildlife</li> <li>8. Roads</li> <li>9. River management and moorings</li> <li>10. Employment: Jobs at risk if area is flooded</li>   <li>11. Other features to be invited in consultation</li> </ol>	<p>in total FC6 .5Km FC7 7Km *km *km</p> <p>1 acre at Snape * * *</p> <p>Outlet at Snape</p> <p>* Some railway @ Beversham * *</p> <p><b>Commercial complex at Snape Maltings and Aldeburgh Music</b> (41 FTE and 59 part time) Farmers Markets – 30 local producers and ?others to be listed Sewage plant at Snape Village and Snape Maltings Pump to Blaxhall</p> <p>High number of visitors to Snape</p>	<p>AOF/ SCC Rights of Way Dept Local knowledge</p> <p>Local Local</p> <p>Local knowledge</p> <p>SWT report</p> <p>Crown Estate, sailing clubs, watermen Local knowledge</p>	
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<b>Proposed Approach</b>	<p><b>A&amp;O Futures Approach:</b> National funding could be used to maintain the defences to their existing levels. However this would only provide a low standard of protection to the communities and businesses and could put the environmental sites at risk of deterioration. Raising the defences on their existing alignment or a slightly straightened alignment would significantly reduce the impact of flooding and be a better use of money in this location so this is the proposed approach (A&amp;O Futures) there are a number of major beneficiaries so a combination of public and private funding is being explored.</p> <p><b>AOEP Approach:</b> Major flooding resulted during the December 2013 surge with 27 houses flooded, the road closed for a week and considerable acreage inundated for some time. Cost to upgrade the walls as per design in Appendix 4 <b>£167,908</b>. The EA has received notification that they have secured funding from the ‘national post flooding funds’ that will allow them to progress preparatory investigation work for the Snape Village flood defence. Discussions with AOEP and all concerned locally will need to confirm the agreed design and costs.</p> <p><b>October 2015:</b> A capital scheme is being progressed by the EA for both flood cells to include sluice upgrades (not costed in the figures above) – options to be discussed shortly</p>
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## FLOOD CELL 8

Appendix 12

### HAM CREEK MARSHES BENEFIT COST RATIO (BCR) 0.5

	<b>FEATURES</b> The area in the flood plain is defined as all land below 5m contour which conforms to the EA's definition of the floodplain.	<b>STATISTICS</b>	<b>SOURCE OF DATA</b>	<b>DATA REQUIRED/ACTION</b>
<b>Location and Size</b>	North side of the upper estuary approx half way between Snape and Aldeburgh	123 hectares	Alde and Ore Futures (AOF)/EA	
<b>Homes and other properties</b>	Total number of residential properties Of which: Listed buildings Buildings in conservation area Holiday rentals	1 * * *	AOF/ EA	
	Number of residential properties protected by existing defences	0	AOF/EA	
	Number of other (non-residential) properties	0	AOF/EA	
	Number of other (non-residential) properties protected by existing defences of which : Businesses: e.g. boatyards, Storage, farm buildings	0 * *	AOF/EA in all the above local knowledge may also be used	
<b>Agricultural Land</b>	Area of agricultural land inside flood cell Of which: Crops Grazing	78 ha * *	AOF/EA	
	Surrounding land area irrigated by abstraction points inside flood cells  1. Land area irrigated by abstraction points inside	some land may be irrigated from time to time such as to establish new grass seed in a dry season but crops are not regularly irrigated	AOF/EA ESWAG	

	<p>flood cells (ha)</p> <p>2. Land irrigated outside any flood cell from abstraction point within cells</p> <p>3. Other economically useful land such as golf course, allotments</p> <p>4. Recreation grounds</p>	<p>488 ha</p> <p>*</p> <p>*</p>		
<p><b>Wildlife and Habitat</b></p>	<p>A Flood Cell made up of permanent wet grassland, deciduous woodland, fen and arable. Also freshwater ditches and a freshwater flight pond.</p> <p>The southern boundary of the flood cell, at Ham Creek, abuts the River Alde/Ore which is part of the network of the Alde/Ore/Butley Estuaries, a designated SAC (Special Area of Conservation) and contains habitats of conservation concern (see the more detailed description at Annex 1).</p> <p>Intertidal habitat in front of the defences is internationally designated. Designations:</p> <p>1. Intertidal habitat in front of defences</p> <p style="margin-left: 20px;">a. saltings</p> <p style="margin-left: 20px;">b. mudflats</p> <p>2. Pilot schemes to renew Saltings</p> <p>3. Land behind the defences. List special features/species e.g. Wildlife habitat in floodplains behind the walls including ditches with reed buntings, little grebe and kingfisher, fields with hares, flight area of barn and short eared owls, range of birds including lapwing, egret, swans, varieties of gulls (ref: Wild life/Hinterland survey on a section covering all the estuary</p>	<p>*</p> <p>*</p> <p>*</p> <p>Flood Cell 8 contains several Priority Species and Habitats which are nationally and locally (Suffolk) important.</p> <p><b>Priority species include;</b>  Common toad <i>Bufo bufo</i>  Adder <i>Vipera berus</i>  Common Lizard  <i>Zootoca vivipara</i>  Grass Snake  <i>Natrix natrix</i>  Reed bunting  <i>Emberiza schoeniclus</i>  Linnet  <i>Carduelis cannabina</i>  Skylark  <i>Alauda arvensis</i>  Brown hare  <i>Lepus europaeus</i>  European otter <i>Lutra lutra</i>  Water vole  <i>Arvicola terrestris</i>  <b>Priority habitats include;</b> Coastal and floodplain grazing marsh (including dykes)</p>	<p>ANOB SWT Wildlife survey</p> <p>2012  ‘Ecological assessment- Alde and Ore Estuaries’</p>	

	<p>although each FC may have its own special species). Mostly the species will be the same, but with certain exceptions, e.g. breeding avocets in FC5.</p> <p>4. Higher Level Stewardship Scheme</p> <p>5. Other?</p>	<p>Lowland meadows Fen</p> <p>*</p> <p>*</p>		
<p><b>Defences A&amp;O Futures Assessment 2011</b></p>	<p>Defences are earth embankments; the riverward face is relatively steep in places. They are in fair condition and provide a low standard of protection; The concrete block work providing erosion protection is in <b>very</b> poor condition. Walls were badly affected with the December 2013 surge with breaches and back slips to the walls. These have been repaired.</p>			
	<p>Length of sea/estuary walls</p>	<p>0.9 Kilometres</p>		
	<p>How soon will major work be required?</p>		<p>AOF/EA 2011</p>	
	<p>Current Standard of Protection (the chance of flooding in any year)</p>	<p>&lt;100% (1 in 1) status to be checked when upgrade works complete</p>		
	<p>Currently managed by</p>	<p>EA</p>	<p>AOF/EA</p>	
<p><b>Features dependent on the maintenance of the river walls</b></p>	<ol style="list-style-type: none"> <li>1. Footpaths             <ol style="list-style-type: none"> <li>a) alongriver walls (km)</li> <li>b) providing access to river walls but in floodable area</li> </ol> </li> <li>2. Allotments</li> <li>3. Boatyards for building, repairs, winter storage</li> <li>4. Public car parks</li> <li>5. Sailing clubs</li> <li>6. Utilities e.g. Sewage outlet (Anglian water, electricity station?)</li> <li>7. Wildlife</li> <li>8. Roads</li> <li>9. River management and moorings</li> </ol>	<p>in total 17Km</p> <p>*km</p> <p>*km</p> <p>* Hectares or Nos</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p>	<p>AOF/ SCC Rights of Way Dept Local knowledge</p> <p>Local Local</p> <p>Local knowledge</p> <p>SWT report</p>	

	<p>10. Employment: Jobs at risk if area is flooded          11. Other features to be invited in consultation</p>		<p>Crown Estate,          sailing clubs,          watermen          Local          knowledge</p>	
<p><b>Proposed Approach</b></p>	<p><b>A&amp;O Futures Approach:</b> National funding sources will not be available to maintain or improve the defences in this flood cell because it will cost more than the benefits it will provide to the one property being protected.</p> <p><b>AOEP Approach:</b> The important asset to protect is the aquifer used for irrigation of land further afield and the landowners have taken on the maintenance of the wall themselves. Cost to upgrade the walls to be agreed with the landowners who will implement.</p>			

### FLOOD CELL 9      HAZLEWOOD MARSHES BENEFIT COST RATIO (BCR 0.6)

	<b>FEATURES</b> The area in the flood plain is defined as all land below 5m contour which conforms to the EA's definition of the floodplain.	<b>STATISTICS</b>	<b>SOURCE OF DATA</b>
<b>Location and Size</b>	North bank of the upper estuary just inland from Aldeburgh, between the estuary and the Saxmundham Road (A1094). Majority of cell owned by Suffolk Wildlife Trust.	<b>90 hectares SWT</b> <b>10 hectares Sir John Wheeler</b>	Alde and Ore Futures (AOF)/EA
<b>Homes and other properties</b>	Total number of residential properties (properties not valued in 2009 as not visible) Of which: Listed buildings Buildings in conservation area Holiday rentals	7 * * *	AOF/EA
	Number of residential properties protected by existing defences	<b>4 – to be surveyed</b>	AOF/EA
	Number of other (non-residential) properties	<b>0</b>	AOF/EA
	Number of other (non-residential) properties protected by existing defences of which : Businesses: e.g. boatyards, Storage, farm buildings	0 * *	AOF/EA in all the above local knowledge may also be used
<b>Agricultural Land</b>	Area of agricultural land inside flood cell Of which: Crops Grazing	82 ha  <b>100%</b>	AOF/EA
	Surrounding land area irrigated by abstraction points inside flood cell  1. Land area irrigated by abstraction points inside flood cell (ha) note:  2. Land irrigated outside any flood cell from abstraction point within cell  3. Other economically useful land such as golf course, allotments  4. Recreation grounds	some land may be irrigated from time to time such as to establish new grass seed in a dry season but crops are not regularly irrigated  52 ha  <b>250 acres of golf land irrigated</b>  *	AOF/EA ESWAG
	Hazelwood Marshes incorporate the entire area of flood cell 9. They were among the last undrained		



	4. Higher Level Stewardship Scheme 5. Other?	<p><b>Winter assemblages of birds include;</b> White-fronted Goose <i>Anser albifrons</i> Wigeon <i>Anas Penelope</i> Black-tailed Godwit <i>Limosa limosa</i></p> <p><b>Yes but no longer post surge</b></p> <p><b>ELS</b></p>		
<b>Defences A&amp;O Futures Assessment 2011</b>	Defences were earth embankments: riverward and landward faces are relatively steep in places. The walls provide a low standard of protection. In the December surge 2013 the walls were breached and the marsh is now regularly flooded and can no longer be considered a freshwater marsh.			<b>Community landowners and golf club and SWT waiting for a sustainable SOP for properties – under discussion</b>  <b>Not public ROW</b>  <b>Marine access needs to be limited and signage required</b>
	Length of sea/estuary walls	0.9 Kilometers		
	How soon will major work be required?	n/a	AOE/EA 2011	
	Current Standard of Protection (the chance of flooding in any year)	none		
	Currently managed by	EA	AOE/EA	
<b>Features dependent on the maintenance of the river walls</b>	<ol style="list-style-type: none"> <li>1. Footpaths               <ol style="list-style-type: none"> <li>a) along river walls (km)</li> <li>b) providing access to river walls</li> </ol> </li> <li>but in floodable area</li> <li>2. Allotments</li> <li>3. Boatyards for building, repairs, winter storage</li> <li>4. Public car parks</li> <li>5. Sailing clubs</li> <li>6. Utilities e.g. Sewage outlet (Anglian water, electricity station?)</li> <li>7. Wildlife</li> <li>8. Roads</li> <li>9. River management and moorings</li> <li>10. Employment: Jobs at risk if area is flooded</li> <li>11. Other features to be invited in consultation</li> </ol>	<p>in total 0Km *km *km</p> <p>* Hectares or Nos * * * * * * * *</p>	<p>AOE/ SCC Rights of Way Dept Local knowledge</p> <p>Local knowledge</p> <p>Local knowledge</p> <p>SWT report Crown Estate, sailing clubs, watermen Local knowledge</p>	
<b>Proposed Approach</b>	<p><b>A&amp;O Futures Approach:</b> Although in 2011 it was thought the remaining life of the defence was 5 years the EA had hoped to maintain the walls in the short term (up to about 17-20 years) and would be developing compensatory habitats which, when established, they would cease maintaining.</p> <p><b>AOEP Approach:</b> Major breaching resulted during the 2013 surge and the entire site remains inundated. The EA have confirmed that there will be no funding to reinstate the defences and there will not be a requirement to reinstate the marsh elsewhere. Various options/costs of bunds to protect local residents and the Golf Course Riverside fairways are under discussion with all concerned. Reinstatement of the wall is not available due to the cost (approx £2M) so the freshwater marsh is lost. There may be a cost in helping to establish a salt marsh.</p> <p><b>A new local defence to protect business and properties if the site is to remain intertidal.</b></p>			
<b>Funding will be required and EA funds not applicable. Other benefits e.g. to local economy MUST BE RECOGNISED</b>				

## Comments from the Partnership Annual meeting held on 8th May 2014 – 100 members of the public in attendance.

Localised property protection – time line – short term local protect/ long term raise funds This site can deliver intertidal habitat which benefits the wider estuary. (env + flood risk)

As landowners are prepared to 'give up' something for greater good of AOEP plan funding support should be sought from a range of sources and partnerships support required.

- local property/levee survey
- initial property protection urgent – enabling development ?AOEP
- Andrew Hawes to provide design for a NIS wall to separate the SWT area from private landowner + Golf Club
- Visitor /local opportunity LEP other funding sources

If the site is developed as an intertidal site then funding for additional car parking is required.

The Crown Estate issue needs to be addressed asap



### FLOOD CELL 10 (SOUTH) ALDEBURGH MARSHES and ALDEBURGH TOWN FRONTAGE TO SLAUGHDEN BENEFIT COST RATIO (BCR) 6.7

	<b>FEATURES</b> The area in the flood plain is defined as all land below 5m contour which conforms to the EA's definition of the floodplain.	<b>STATISTICS</b>	<b>SOURCE OF DATA</b>	<b>DATA REQUIRED/ACTION</b>
<b>Location and Size</b>	The southern side of Aldeburgh fronting both the coast and estuary	209 hectares- part of unique landscape within AONB	Alde and Ore Futures (AOF)/EA	
<b>Homes and other properties</b>	Total number of residential properties (as valued 2009) IP15 and IP16 (Sax/Leiston/Fairfield Rd) £178,995,500 IP15 (High St /Park/Lee Rd etc) £59,765,000 Coast Only £196,372,000 Total £435,132,500 Of which: Listed buildings Buildings in conservation area Holiday rentals <b>Moot Hall Museum</b> <b>Primary School</b> <b>Community Centre</b>	254     * * *	AOF/ EA	
	Number of residential properties protected by existing defences	55	AOF/EA	
	Number of other (non-residential) properties	48	AOF/EA	
	Number of other (non-residential) properties protected by existing defences of which : Businesses: e.g. boatyards, Peggs, shops in High Street, Coop and Tesco by roundabout, laundry, Cinema, Pet Perfection, Storage, farm buildings	17 * *	AOF/EA in all the above local knowledge	
	Area of agricultural land inside	179 ha	AOF/EA	

<p><b>Agricultural Land</b></p>	<p>flood cell Of which:</p> <p style="padding-left: 40px;">Crops</p> <p style="padding-left: 40px;">Grazing</p>	<p>*</p> <p>*</p>		
	<p>Surrounding land area irrigated by abstraction points inside flood cell</p> <p>1. Land area irrigated by abstraction points inside flood cell (ha) note:</p> <p>2. Land irrigated outside any flood cell from abstraction point within cell</p> <p>3. Other economically useful land such as golf course, allotments</p> <p>4. Recreation grounds</p>	<p>some land may be irrigated from time to time such as to establish new grass seed in a dry season but crops are not regularly irrigated</p> <p><b>0 ha (the one abstraction point here irrigates Aldeburgh Golf Club)</b></p> <p><b>*to find out amount of golf course, area of allotments.</b></p> <p><b>Kings Field including football club and open air gymnasium playground Moot Hall Green and sailing pond</b></p> <p>*</p>	<p>AOF/EA ESWAG</p>	<p><b>To ask Golf Club for more details eg on pipe for all waterworks. Ask ATC area of allotments</b></p>
<p><b>Wildlife and Habitat</b></p>	<p>A flood cell with some areas of permanent and semi-permanent wet grassland, freshwater ditches, freshwater flight ponds and over 50% used as arable. The wet grassland areas are grazed by cattle and sheep.</p> <p>The flood cell is surrounded on almost three sides by the River Alde/Ore which is part of the network of the Alde/Ore/Butley Estuaries, a designated SAC (Special Area of Conservation) and contains habitats of conservation concern (see the more detailed description at Annex 1).</p> <p>Intertidal habitat in front of the defences is internationally designated. Designations:</p>	<p>Will EA have area by flood cell?</p> <p>*</p> <p>*</p> <p><b>Schemes completed by Slaughden Iona site and by Aldeburgh Brick Dock</b></p>	<p>ANOB SWT Wildlife survey 2012 'Ecological assessment- Alde and Ore Estuaries'</p>	

	<p>1. Intertidal habitat in front of defences  a. saltings 2 pilot schemes to renew saltings now in place  b. mudflats</p> <p>2. Pilot schemes to renew Saltings</p> <p>3. Land behind the defences. List special features/species e.g. Wildlife habitat in floodplains behind the walls including ditches with reed buntings, little grebe and kingfisher, fields with hares, flight area of barn and short eared owls, range of birds including lapwing, egret, swans, varieties of gulls (ref: Wild life/Hinterland survey on a section covering all the estuary although each FC may have its own special species). Mostly the species will be the same, but with certain exceptions, e.g. breeding avocets in FC5 Borrow ditches/dykes- providing reeded and water habitats.</p> <p>4. Higher Level Stewardship Scheme</p> <p>5. Other?</p>	<p>Aldeburgh Hall SSSI</p> <p>Flood Cell 10s contains several Priority Species and Habitats which are nationally and locally (Suffolk) important.</p> <p><b>Priority species include;</b>  Common toad  <i>Bufo bufo</i>  Common lizard  <i>Zootoca vivipara</i>  Grass snake  <i>Natrix natrix</i>  Reed bunting  <i>Emberiza schoeniclus</i>  Skylark  <i>Alauda arvensis</i>  Brown hare  <i>Lepus europaeus</i>  European otter  <i>Lutra lutra</i></p> <p><i>Other locally valued birds- Marsh Harrier, Linnet, Stonechat, kingfisher, swans, redshank, barn owl, short eared owl, lapwing, egret, various gulls, little grebe in winter</i></p> <p><b>Priority habitats include;</b>  Coastal and floodplain grazing marsh (including dykes)</p> <p><b>New HLS subject to application post Dec 2013 surge</b></p> <p><b>Seals in the estuary</b></p>		
<p><b>Defences A&amp;O Futures Assessment 2011</b></p>	<p><b>Defences on the estuary</b> frontage are earth embankments with isolated concrete block work erosion protection. They are in fair condition and provide a moderate standard of protection.</p> <p><b>The coastal defences</b> provide high standard of protection and are in good condition and are a combination of various forms of concrete and steel defences fronted by a shingle beach which is managed, in part, by a system of groynes. They are not expected to need major work for 15-30 years. The coastal defences are dependent on the presence of the shingle beach in front of them to prevent them from being undermined. Natural processes remove the beach material over time and the maintenance of these defences has historically included activities to ‘top-up’ the beach using material from further south on Orford Ness.</p>			

	Length of sea/estuary walls	3.8Kilometres		
	How soon will major work be required?	Estuary: within 3 years Coast: between 12-27 years)	AOF/EA 2011	
	Current Standard of Protection (the chance of flooding in any year)	<10% (1 in 10)		
	Currently managed by	EA	AOF/EA	
<b>Features dependent on the maintenance of the river walls</b>	<ol style="list-style-type: none"> <li>1. Footpaths <b>a)</b> along river walls (km)</li> <li style="padding-left: 20px;"><b>b)</b> providing access to river walls but in floodable area</li> <li>2. Allotments</li> <li>3. Boatyards for building, repairs, winter storage</li> <li>4. Public car parks</li> <li>5. Sailing clubs</li> <li>6. Utilities e.g. Sewage outlet (Anglian water, electricity station?)</li> <li>7. Wildlife</li> <li>8. Roads</li> <li>9. River management and moorings</li> <li>10. Employment: Jobs at risk if area is flooded</li> <li>11. Other features to be invited in consultation</li> </ol>	<p>in total 24Km *km *km</p> <p>* Hectares or Nos * *</p> <p>Slaughden Sailing Club, Aldeburgh Yacht Club- note over 200 people/children on sailing courses every year* *</p> <p>* * * *</p> <p>Martello Tower</p>	<p>AOF/ SCC Rights of Way Dept Local knowledge</p> <p>Local Local</p> <p>Local knowledge</p> <p>SWT report</p> <p>Crown Estate, sailing clubs, watermen Local knowledge</p>	<p><b><i>GH –idea, continuous footpath along the river Aldeburgh to Snape</i></b></p> <p><b>6. Clarify locations- Electricity one by Pump House and more? Check out new fibre optic points (green)(? ask BT Whereabouts and if flood proof)</b></p> <p><b>8. Of the three main routes in the Aldeburgh, two are in the flood zone</b> <b><i>Query- at risk temporarily or permanently, depends if overtopping or total breach like Hazlewood</i></b></p>
<b>Proposed Approach</b>	<p><b>A&amp;O Futures Approach:</b> National funds can be used to maintain the coast and estuary defences in the short term (= now approx 20 years). At some point it will be more efficient use of national funds to adopt on the estuarine frontage a new line of defence closer to the town of Aldeburgh. Unlikely that all the costs will be met by central government. A combination of public and private funding is being explored. The existing defences could continue or the area becomes an intertidal habitat: this would be the decision of the landowner.</p> <p><b>AOEP Approach: Cost to upgrade the walls £371,202.00.</b> The strategy proposed intends to bring the walls to a standard so that they are resilient to overtopping in 2050 from a 1:200 year event. Unlike other flood cells, Flood Cell 10 is dependent on defences from the sea as well as from the river. The AOEP is not able to undertake coastal flood defence works, which will remain the province of the EA.</p> <p>Recent inadequate work and mowing has been completed on the wall which needs further attention.</p>			

## Comments from the Partnership Annual meeting held on 8th May 2014 – 100 members of the public in attendance.

If Aldeburgh became frequently subject to flooding, as well as if the sea wall breached and put paid to safe sailing, Aldeburgh would be viewed as a dangerous place to come : people would stop buying houses and some employment would be lost. Huge concern about possible loss of sea wall protection and impact on viability of Aldeburgh High Street as well as sailing and boatyards, plus some business sites lost. Need separate sheet on the sea wall.

### FLOOD CELL 10 (NORTH) THORPENESS AND HAVEN MARSHES BENEFIT COST RATIO (BCR) N/K

	<b>FEATURES</b> The area in the flood plain is defined as all land below 5m contour which conforms to the EA's definition of the floodplain.	<b>STATISTICS</b>	<b>SOURCE OF DATA</b>	<b>DATA REQUIRED/ACTION</b>
<b>Location and Size</b>	Inland behind the shingle ridge that runs between Aldeburgh and Thorpeness. This flood cell stops short of those areas currently affected by erosion of the cliffs and the work being done to limit that erosion.	409 hectares- part of unique landscape within AONB	Alde and Ore Futures (AOF)/EA	
<b>Homes and other properties</b>	Total number of residential properties Of which: Listed buildings Buildings in conservation area Holiday rentals	447 + <i>property values</i> * * *	AOF/ EA	
	Number of residential properties protected by existing defences	219+ <i>property values</i>	AOF/EA	
	Number of other (non-residential) properties	350+ <i>property values</i>	AOF/EA	
	Number of other (non-residential) properties protected by existing defences of which : Businesses: e.g. boatyards, Storage, farm buildings	267 + <i>property values</i> * *	AOF/EA in all the above local knowledge may also be used	
<b>Agricultural Land</b>	Area of agricultural land inside flood cell Of which: Crops Grazing	16 ha <i>value</i> * *	AOF/EA	
	Surrounding land area irrigated by abstraction points inside flood cell  1. Land area irrigated by	  some land may be irrigated from time to	AOF/EA ESWAG	

	<p>abstraction points inside flood cell (ha) note:</p> <p>2. Land irrigated outside any flood cell from abstraction point within cell</p> <p>3. Other economically useful land such as golf course, allotments</p> <p>4. Recreation grounds</p>	<p>time such as to establish new grass seed in a dry season but crops are not regularly irrigated</p> <p><b>365 ha (the one abstraction point here irrigates Aldeburgh Golf Club)</b></p> <p>*</p> <p>*</p>		
<p><b>Wildlife and Habitat</b></p>	<p>This flood cell stretches north of Aldeburgh to Thorpeness. Most of this area is within the Leiston to Aldeburgh SSSI and contains a mosaic of permanent wet grassland with ephemeral water flashes, reedbed, fen, freshwater bodes, deciduous woodland and freshwater ditches, some of which are choked reed-filled. About 15% of the cell is arable.</p> <p>An arm of the flood cell stretches north-west for 3 km along the catchment area of the Hundred River. The eastern boundary runs along the coast and incorporates the vegetated shingled that is between Aldeburgh and Thorpeness. This part of the SSSI is notable for its plant life.</p> <p>The area includes a Site of Special Scientific Interest (SSSI) and Local Nature Reserve along the frontage. Designations:</p> <p>1. Land behind the defences. List special features/species e.g. Wildlife habitat in floodplains behind the walls including ditches with reed buntings, little grebe and kingfisher, fields with hares, flight area of barn and short eared owls, range of birds including lapwing, egret,</p>	<p>North Warren RSPB Leiston to Aldeburgh SSSI Aldeburgh Hall Pit SSSI</p> <p>Flood Cell 10n contains several Priority Species and Habitats which are nationally and locally (Suffolk) important.</p> <p><b>Priority species include;</b> Common toad <i>Bufo bufo</i> Adder <i>Vipera berus</i> Common lizard <i>Zootoca vivipara</i> Grass snake <i>Natrix natrix</i> Northern lapwing</p>	<p>ANOB SWT Wildlife survey 2012 'Ecological assessment- Alde and Ore Estuaries'</p>	

	<p>swans, varieties of gulls (ref: Wild life/Hinterland survey on a section covering all the estuary although each FC may have its own special species). Mostly the species will be the same, but with certain exceptions, e.g. breeding avocets in FC5.</p>	<p>Reed bunting <i>Emberiza schoeniclus</i> Skylark <i>Alauda arvensis</i> Bittern <i>Botaurus stellaris</i> Brown hare <i>Lepus europaeus</i> European otter <i>Lutra lutra</i> Water vole <i>Arvicola terrestris</i> Water shrew <i>Neomys fodiens</i> European eel <i>Anguilla anguilla</i></p> <p><b>Priority habitats include;</b> Coastal and floodplain grazing marsh (including dykes) Coastal vegetated shingle Eutrophic standing waters Lowland fen Reedbed Rivers Wet woodland</p> <p><b>Other breeding birds of importance</b> European marsh harrier <i>Circus aeruginosus</i> Bearded Tit <i>Panurus biamicus</i></p> <p><b>Winter assemblages of birds include;</b> White-fronted Goose <i>Anser albifrons</i> Wigeon <i>Anas Penelope</i></p>		
<b>Defences</b>	<p>The flood area is protected from the sea by the natural shingle ridge and there are no formal defences to be maintained here. The exception to this is the sluice and associated structures approximately half way along the frontage which allows the flood area to drain to the sea. It is in poor condition.</p>			
	Length of sea/estuary walls	2.8Kilometres		

<b>A&amp;O Futures Assessment 2011</b>	How soon will major work be required?	within 5 years	AOF/EA 2011	
	Current Standard of Protection (the chance of flooding in any year)	<1% (1 in 100)		
	Currently managed by	EA and SCDC (parts of coast only)	AOF/EA	
<b>Features dependent on the maintenance of the river walls</b>	<ol style="list-style-type: none"> <li>1. Footpaths <ol style="list-style-type: none"> <li>a) along river walls (km)</li> <li>b) providing access to river walls but in floodable area</li> </ol> </li> <li>2. Allotments</li> <li>3. Boatyards for building, repairs, winter storage</li> <li>4. Public car parks</li> <li>5. Sailing clubs</li> <li>6. Utilities e.g. Sewage outlet (Anglian water, electricity station?)</li> <li>7. Wildlife</li> <li>8. Roads</li> <li>9. River management and moorings</li> <li>10. Employment: Jobs at risk if area is flooded</li> <li>11. Other features to be invited in consultation</li> </ol>	<p>in total ?5Km</p> <p>*km</p> <p>*km</p> <p>* Hectares or Nos</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p> <p>Martello Tower</p>	<p>AOF/ SCC Rights of Way Dept Local knowledge</p> <p>Local Local</p> <p>Local knowledge</p> <p>SWT report</p> <p>Crown Estate, sailing clubs, watermen Local knowledge</p>	
<b>Proposed Approach</b>	<p><b>A&amp;O Futures Approach:</b> The shingle ridge is expected to continue to provide protection to properties in this area in the future some work will be needed to maintain the sluice and it will be possible to use national funding for this. The ridge is expected to move slowly landward over the next hundred years and it may be expected to protect properties to the south of Thorpeness and the North of Aldeburgh. This is not expected for at least 20 years although long predictions are uncertain. Any new defences will probably need to be funded by a combination of public and private funding.</p> <p><b>AOEP Approach: to be considered.</b></p>			



## FLOOD CELL 11

## KING'S AND LANTERN MARSHES

	<b>FEATURES</b> The area in the flood plain is defined as all land below 5m contour which conforms to the EA's definition of the floodplain.	<b>STATISTICS</b>	<b>SOURCE OF DATA</b>	<b>DATA REQUIRED/ACTION</b>
<b>Location and Size</b>	On Orford Ness between the estuary and Stony Ditch, a channel which drains much of the Ness. Lantern Marshes is the more northerly of the two and is home to a large radio transmitter and receiver station. Kings Marshes is now split into 2 areas. Kings Marshes, which has no buildings is the central section between Lantern in the north and part of Kings Marshes, now known as Airfield Marshes in the south. This area also includes Chantry Marsh. Airfield marshes includes 12 buildings and numerous other structures. A group of these buildings are Grade II listed. These and other buildings house	408 hectares	Alde and Ore Futures (AOF)/EA	
<b>Homes and other properties</b>	Total number of residential properties	<b>1 (resident Ranger)</b> <b>Group Listings</b> <b>1) AWRE Buildings S.A.M.</b> <b>2) RFC/Interwar buildings</b> <b>3) Grade II listed Lighthouse</b>	AOF/ EA	
	Listed buildings Buildings in conservation area Holiday rentals			
	Number of residential properties protected by existing defences	<b>0</b>	AOF/EA	
	Number of other (non-residential) properties	<b>Approx 14 includes</b>	AOF/EA	

		<b>LH and Babcocks &amp; Cobra mist</b>		
	Number of other (non-residential) properties protected by existing defences of which : Businesses: e.g. boatyards, Storage, farm buildings	<b>See above. Buildings part of businesses including storage of farm crops/hay</b>	AOF/EA in all the above local knowledge may also be used	
<b>Agricultural Land</b>	Area of agricultural land inside flood cell Of which: Crops Grazing	218 ha  <b>Approx 100 ha</b>	AOF/EA	
	Surrounding land area irrigated by abstraction points inside flood compartment  1. Land area irrigated by abstraction points inside flood compartment (ha) note:  2. Land irrigated outside any flood cell from abstraction point within compartment  3. Other economically useful land such as golf course, allotments  4. Recreation grounds	0 ha  <b>N/A</b>  <b>National Nature Reserve</b>  <b>N/A</b>	AOF/EA ESWAG	
<b>Wildlife and Habitat</b>	The National Nature Reserves of Havergate Island and Orford Ness are the most important wildlife sites within the Alde/Ore estuary. Together they provide the most significant areas of breeding habitat in the estuary's SPA for over 50 species of seabird, wader and		ANOB SWT Wildlife survey  2012 'Ecological assessment- Alde and Ore Estuaries' NT	

<p>raptor. There are 16 regularly occurring and five breeding Annex 1 bird species (Bird's Directive). In addition to birds, these two National Nature Reserves support a large number of scarce and red Data book plants and invertebrates.</p> <p>The diversity of the wetland habitats types present is of particular significance to birds occurring in the SPA (Special Protection Area), as these provide a range of opportunities for feeding, roosting and breeding within the site complex.</p> <p>Protected status is: Alde/Ore SPA, Orford Ness/Shingle street SAC, Alde/Ore/Butley Estuaries SSSI, Orford Ness/Havergate National Nature Reserve and Alde/Ore Estuary, Ramsar site Designated 1961. Intertidal habitat in front of the defences is internationally designated. Intertidal habitat in front of defences</p> <ol style="list-style-type: none"> <li>a. saltings</li> <li>b. mudflats</li> </ol> <p>2. managed realignment scheme to renew saltings</p> <p>3. Land behind the defences. List special features/species e.g. Wildlife habitat in floodplains behind the walls including ditches with reed buntings, little grebe and kingfisher, fields</p>	<p>* *</p> <p><b>Saltmarsh habitat Scheme 1999-2019 Orfordness 27 ha. (MAFF now Defra)</b></p> <p><b>Priority species include;</b> Northern lapwing <i>Vanellus vanellus</i> Reed bunting <i>Emberiza schoeniclus</i> Skylark <i>Alauda arvensis</i> Brown hare <i>Lepus europaeus</i> European otter <i>Lutra lutra</i></p> <p>Starlet sea anemone Lagoon sand shrimp</p> <p><b>Priority habitats include;</b> Coastal and floodplain grazing marsh (including dykes) Saline lagoons Vegetated shingle</p> <p><b>Other breeding birds of importance</b> European marsh harrier <i>Circus aeruginosus</i> Pied avocet <i>Recurvirostra avosetta</i> LBB Gulls Herring Gull</p> <p><b>Winter assemblages of birds include;</b> Wigeon <i>Anas penelope</i> Teal <i>Anas crecca</i> Redshank <i>Totanus totanus</i></p> <p><b>Breeding redshank avocet and non breeding Ruff and Spoonbill</b></p> <p><b>Kings marshes and Airfield Marshes from 1 June 2014 (Hopefully)</b></p>		
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	<p>with hares, flight area of barn and short eared owls, range of birds including lapwing, egret, swans, varieties of gulls (ref: Wild life/Hinterland survey on a section covering all the estuary although each FC may have its own special species). Mostly the species will be the same, but with certain exceptions, e.g. breeding avocets in FC5.</p> <p>4. Higher Level Stewardship Scheme</p> <p>5. Other?</p>			
<p><b>Defences A&amp;O Futures 2011 assessment</b></p>	<p>Defences are earth embankments; riverward and landward faces are relatively steep in places. They are generally in fair condition; though in some places the embankments are low and provide poor standard of protection. After the December 2013 surge the American Wall at the north end of the cell breached and the northern part of the site remain inundated including the area owned by Babcocks.</p>			
	<p>Length of sea/estuary walls</p>	<p>9.6 Kilometers</p>		
	<p>How soon will major work be required?</p>	<p>Hope work will be carried out to repair breaches in Kings and Lantern Marshes during 2014</p>	<p>NT/Babcock 2014 AOF/EA 2011</p>	
	<p>Current Standard of Protection (the chance of flooding in any year)</p>	<p>&lt;100% (1 in 1)</p>		
<p>Currently managed by</p>	<p>National Trust</p>	<p>AOF/EA</p>		

<p><b>Features dependent on the maintenance of the river walls</b></p>	<p>1. Footpaths  <b>a)</b> along river walls(km)  <b>b)</b> providing access to river walls but in floodable area</p> <p>2. Allotments</p> <p>3. Boatyards for building, repairs, winter storage</p> <p>4. Public car parks</p> <p>5. Sailing clubs</p> <p>6. Utilities e.g. Sewage outlet (Anglian water, electricity station?)</p> <p>7. Wildlife</p> <p>8. Roads</p> <p>9. River management and moorings</p> <p>10. Employment: Jobs at risk if area is flooded</p> <p>11. Other features to be invited in consultation</p>	<p>in total 0  N/A</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p> <p>Babcock substation</p> <p>*</p> <p>Designated sites</p> <p>Non highway tracks</p> <p>N/A</p> <p>5(NT</p> <p>Radio Transmitter/receiver site</p> <p>S.A.M. &amp; listed structures</p>	<p>NT</p> <p>Local knowledge</p> <p>NT</p> <p>SWT report</p> <p>NT</p> <p>Crown Estate, sailing clubs, watermen</p> <p>Local knowledge</p> <p>NT</p>	
<p><b>Proposed Approach</b></p>	<p><b>A&amp;O Futures Approach:</b> the existing defences are maintained by the National Trust who plan to continue maintaining them into the medium term (30-50 years) if possible. In the long term it may be difficult for the landowners to continue investing in the defences at which time there will be a requirement to create a new habitat in advance of losses occurring.</p> <p><b>AOEP Approach: Dependent on discussions with the National Trust – carried out April 2014 (subject to further work)</b></p> <p><b>October 2015:</b> The Cobra Mist site has recently been sold and is now under new ownership. The American Wall breach is due to be repaired shortly (2016).</p>			

### FLOOD CELL 12 & 13

### HAVERGATE ISLAND

	<b>FEATURES</b> The area in the flood plain is defined as all land below 5m contour which conforms to the EA's definition of the floodplain.	<b>STATISTICS</b>	<b>SOURCE OF DATA</b>	<b>DATA REQUIRED/ACTION</b>
<b>Location and Size</b>	Island(s) at, and just upstream of, the confluence of the Butley Creek and the main estuary, approximately opposite Gedgrave Marshes.	77 hectares	Alde and Ore Futures (AOF)/EA	
<b>Homes and other properties</b>	Total number of residential properties Of which: Listed buildings Buildings in conservation area Holiday rentals	* * * N/A	AOF/ EA	
	Number of residential properties protected by existing defences	-	AOF/EA	
	Number of other (non-residential) properties	-	AOF/EA	
	Number of other (non-residential) properties protected by existing defences of which : Businesses: e.g. boatyards, Storage, farm buildings	* *	AOF/EA in all the above local knowledge may also be used	
<b>Agricultural Land</b>	Area of agricultural land inside flood cell Of which: Crops Grazing	0 ha * *	AOF/EA	
	Surrounding land area irrigated by abstraction points inside flood compartment  1. Land area irrigated by	  0 ha	AOF/EA ESWAG	

	<p>abstraction points inside flood compartment (ha) note:</p> <p>2. Land irrigated outside any flood cell from abstraction point within compartment</p>			
<p><b>Wildlife and Habitat</b></p>	<p>The National Nature Reserves of Havergate Island and Orford Ness are the most important wildlife sites within the Alde/Ore estuary. Together they provide the most significant areas of breeding habitat in the estuary's SPA for over 50 species of seabird, wader and raptor. There are 16 regularly occurring and five breeding Annex 1 bird species (Bird's Directive). In addition to birds, these two National Nature Reserves support a large number of scarce and red Data book plants and invertebrates.</p> <p>The diversity of the wetland habitats types present is of particular significance to birds occurring in the SPA (Special Protection Area), as these provide a range of opportunities for feeding, roosting and breeding within the site complex.</p> <p>Both sites are owned and managed by the Royal Society for the Protection of Birds (RSPB). Some of the compartment has been successfully converted to intertidal areas in recent years. The flood areas within the defences and intertidal habitat in front of the defences are internationally designated for the environmental interest features present. Designations:</p> <ol style="list-style-type: none"> <li>1. Intertidal habitat in front of defences             <ol style="list-style-type: none"> <li>a. saltings</li> <li>b. mudflats</li> </ol> </li> </ol>	<p><b>Limited probably managed realignment 2005/6 ?C12</b></p> <p><b>Priority species include;</b></p> <p>Northern lapwing <i>Vanellus vanellus</i> Reed bunting <i>Emberiza schoeniclus</i> Skylark <i>Alauda arvensis</i> Brown hare <i>Lepus europaeus</i> European otter <i>Lutra lutra</i> Starlet sea anemone Lagoon sand shrimp</p> <p><b>Priority habitats include;</b></p> <p>Saline lagoons Vegetated shingle <b>Other breeding birds of importance</b> European marsh</p>	<p>ANOB SWT Wildlife survey 2012 'Ecological assessment- Alde and Ore Estuaries'</p>	

	<p>2. Pilot schemes to renew Saltings</p> <p>3. Land behind the defences. List special features/species e.g. Wildlife habitat in floodplains behind the walls including ditches with reed buntings, little grebe and kingfisher, fields with hares, flight area of barn and short eared owls, range of birds including lapwing, egret, swans, varieties of gulls (ref: Wild life/Hinterland survey on a section covering all the estuary although each FC may have its own special species). Mostly the species will be the same, but with certain exceptions, e.g. breeding avocets in FC5.</p> <p>4. Higher Level Stewardship Scheme</p> <p>5. Other?</p>	<p>harrier <i>Circus aeruginosus</i> LBB Gull Herring Gull</p> <p>Pied avocet <i>Recurvirostra avosetta</i></p> <p><b>Winter assemblages of birds include;</b></p> <p>Wigeon <i>Anas penelope</i> Teal <i>Anas crecca</i> Redshank <i>Totanus totanus</i></p> <p><b>None</b></p>		
<b>Defences A&amp;OFutures 2011 assessment</b>	Defences are earth embankments: They are in fair condition and provide low standard of protection. Breaches occurred during the December 2013 surge.			
	Length of sea/estuary walls	5.8 Kilometers		
	How soon will major work be required?	? now	AOF/EA 2011	
	Current Standard of Protection (the chance of flooding in any year)	<100% (1in 1)		
	Currently managed by	RSPB	AOF/EA	



<p style="text-align: center;"><b>Features dependent on the maintenance of the river walls</b></p>	<ol style="list-style-type: none"> <li>1. Footpaths                         <ol style="list-style-type: none"> <li>a) along river walls (km)</li> <li>b) providing access to river walls but in floodable area</li> </ol> </li> <li>2. Allotments</li> <li>3. Boatyards for building, repairs, winter storage</li> <li>4. Public car parks</li> <li>5. Sailing clubs</li> <li>6. Utilities e.g. Sewage outlet (Anglian water, electricity station?)</li> <li>7. Wildlife</li> <li>8. Roads</li> <li>9. River management and moorings</li> <li>10. Employment: Jobs at risk if area is flooded</li> <li>11. Other features to be invited in consultation</li> </ol>	<p style="text-align: center;">in total 17Km ???</p> <p>*km</p> <p>*km</p> <p>* Hectares or Nos</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p> <p>*</p>	<p>AOF/ SCC Rights of Way Dept Local knowledge and SCC?</p> <p>Local Local</p> <p>Local knowledge Anglian, EON?</p> <p>SWT report Highways Dept? Crown Estates, sailing clubs, watermen Local knowledge</p>	
<p style="text-align: center;"><b>Proposed Approach</b></p>	<p><b>A&amp;O Futures Approach:</b> The RSPB plan to maintain their defences for at least the short term (up to 17- 20 years if possible). In the long term it may be difficult for the landowners to continue investing in the defences at which time there will be a requirement to create a new habitat in advance of losses occurring.</p> <p><b>AOEP Approach: For discussion with the RSPB</b></p>			

### SHORELINE MANAGEMENT PLAN

The following are extracts relating to shoreline bordering the Alde and Ore Estuary from the Suffolk Coast Shoreline Management Plan first issued in January 2010. The first section deals with the shoreline north of the Martello Tower, the second the shoreline to the south of it.

#### SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

**PLAN:** The aim of the plan is to maintain the natural shingle defence to the frontage, thereby providing sustainable defence to Aldeburgh. This would require maintaining control at either Fort Green or south of the Martello Tower, depending on the policy for a breach based on full examination of issues within the estuary.

There is a continuing flood risk over the frontage and this would increase with sea level rise. There needs to be a review of flood warning and emergency planning to address this.

PREFERRED POLICY TO IMPLEMENT PLAN:	
<b>From present day</b>	The short term policy would be for the maintenance of existing defence at Aldeburgh and through to the Martello Tower.
<b>Medium term</b>	In the medium term the position for control of defence at Aldeburgh would depend on policy based on an estuary management plan. If defences were to be managed at Fort Green, these works would be undertaken progressively forming a bastion at this location. If defences were to be managed at the Martello Tower, assuming a breach, these works would be in the form of a harbour pier.
<b>Long term</b>	Maintain defences and consider flooding of the area behind the Haven with local flood defence.

#### SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			Comment
		2025	2055	2105	
ALB 14.1	Thorpeness Haven property	NAI	NAI	NAI	This would not preclude minor works to sustain property, subject to impact assessment.
ALB 14.2	Thorpeness Haven Beach	MR	MR	MR	Consider allowing flooding with secondary defence but maintain the road.
ALB 14.3	Aldeburgh	HTL	HTL	HTL	Control at Fort Green.
ALB 14.4	Slaughden	HTL	HTL	HTL	Detailed management subject to an estuary management plan.
Key: HTL - Hold the Line, A - Advance the Line, NAI - No Active Intervention * HR - Hold the Line on a retreated alignment, MR - Managed Realignment					

#### CHANGES FROM PRESENT MANAGEMENT

No substantial change from existing policy over the northern section of the area. The potential for a breach at Slaughden.

#### IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

Economics		by 2025	by 2055	by 2105	Total £k PV
<b>Property</b>	Potential NAI Damages/ Cost £k PV	5,114	4,798	3,962	13,875
	Preferred Plan Damages £k PV	131	107	73	311
	Benefits £k PV	4,983	4,691	3,889	13,563
	Costs of Implementing plan £k PV	2,000	500	550	3,050

## SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION

**PLAN:** The aim of the plan is to maintain the important natural character of Orfordness. There remains uncertainty with respect to management to the area south of the Martello Tower through to the Lantern Marshes. This needs to be resolved through an estuary management plan. There is a commitment by the Suffolk Coast ICZM Initiative<sup>2</sup> to develop with local communities and interested groups a Management and Investment Plan for the Alde and Ore. This area will include the Alde and Ore estuary and its adjoining coastline. This plan will take account of the conclusions of the SMP, will review the recommended SMP policy and, if necessary, amend this accordingly. In the meantime it is important to have an interim policy for the coastline. From the perspective of purely managing the shoreline, a policy of No Active Intervention would be concluded. Present management relies on recycling shingle from further south on Orford Ness. There is currently an agreed emergency plan to recharge the shingle bank, if required, that is under constant review. Subject to continued monitoring this practice would continue in the short term. An alternative method may need to be developed later in the first epoch to avoid damaging the Orfordness shingle ridges. South of Lantern Marshes the intent would be for No Active Intervention. The Orfordness lighthouse is located on a highly dynamic feature and is now vulnerable to coastal process. Options for its future are currently being considered and these need to take into account the dynamic nature of the shingle feature, as well as environmental importance.

PREFERRED POLICY TO IMPLEMENT PLAN:	
<b>From present day</b>	No active intervention. Define actions with respect to Lighthouse.
<b>Medium term</b>	No active intervention.
<b>Long term</b>	No active intervention.

## SUMMARY OF SPECIFIC POLICIES

Policy Unit		Policy Plan			Comment
		2025	2055	2105	
ORF 15.1	Sudbourne Beach (south of the Martello Tower)	HTL	NAI	NAI	An interim policy pending an agreed Management and Investment Plan for the Alde and Ore area.
ORF 15.2	Orford Ness.	NAI	NAI	NAI	
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention MR – Managed Realignment					

## CHANGES FROM PRESENT MANAGEMENT

The intent is to maintain the defence at Slaughden while practical. The policy would then change to NAI. This changes from the policy in SMP1 but is in line with the more recent approach being adopted.

<sup>2</sup> The Suffolk Coast Integrated Coastal Zone Management (ICZM) initiative is a partnership of organisations committed to developing an integrated approach to the management of the Suffolk coast. It includes East of England Development Agency, the Environment Agency, GO-East, Natural England, Suffolk County Council, Suffolk Coastal District Council and Waveney District Council.



## THE ALDE AND ORE ESTUARY PARTNERSHIP

## Appendix 14

The Alde and Ore Estuary Partnership (the Partnership) was formed in May 2012 to provide an independent local voice in decision making about the management, upgrading and maintaining the flood defences in the Alde and Ore Estuary. This was a ground breaking initiative.

The Partnership was set up to oversee a strategy for the **estuary as a whole** and to prepare a plan, including a rolling programme of works, for the furtherance of the strategy. The Partnership has an important and influential role, making significant decisions about the future of the estuary. To date the Partnership has assessed the sustainability of the current defences and designed the upgrades which will be required to give a 1:200 standard in 2050. This means that, although the defences may be overtopped during a surge tide, they should not breach.

Twelve volunteer members, chosen to ensure that all aspects of the Alde and Ore estuary community are represented, make up this partnership and offer a wide range of skills. The Partnership is advised by the Environment Agency, Natural England and Suffolk County and Suffolk District Councils and the Suffolk Coast and Heath Unit. The constitution states that there shall be on behalf of the statutory agencies a presumption in favour of the AOEP's aims and objectives unless there are reasonable technical, engineering, built or natural environmental, financial, legal or other significant reasons against. The role of statutory bodies will be to provide neutral and impartial advice on these matters and to explain the statutory framework.

### 12 VOTING MEMBERS

Sir Edward Greenwell Bt	<b>Chairman, Farmer Nominee</b>
Guy Heald	Finance and Business *(Trustee)
Alison Andrews	Alde & Ore Association Nominee
Malcolm Walker	Aldeburgh Town Council Nominee
Harry Young	Business Representative
David McGinity	Butley Parish Council Nominee
Vacancy	Householder Representative
Brian Johnson	Boyton and Bawdsey Parish Council Nominee *(Trustee)
Rodney West	Ecological Representative for RSPB, NT, SWT
Mike Finney	Orford and Gedgrave Parish Council Nominee
Jane Marson	Landowner Nominee
Tim Beach	Snape Parish Council Nominee
Amanda Bettinson	Partnership Secretary

### ADVISORS

Karen Thomas	Internal Drainage Board
David Kemp	Environment Agency
Emma Hay	Natural England
Jane Burch	Suffolk County Council
Bill Parker	Suffolk Coastal District Council
Haidee Stephens	Suffolk Coast and Heaths Unit



## CONSULTANTS

Andrew Hawes                      Engineering Consultant  
Richard Marson                      Estuary Trust Trustee/Funding Group Chairman

## THE ALDE AND ORE ESTUARY TRUST

The Alde and Ore Estuary Trust (The Trust) was established in December 2013 and is a registered as a Charitable Incorporated Organisation (CIO) with the Charity Commission (No 1155115). The Trust was set up by the Partnership to facilitate fund raising for flood defences in the Alde and Ore Estuary. Its charitable status enables donors to take advantage of various tax exemptions and reliefs available where gifts are made to a charity. Through enabling development, it is anticipated that sites offered as donations will received planning permission on condition that the increase in the land value is donated to The Trust and used for flood defence work.

## TRUSTEES

Angela Sydenham (Chairman)  
Guy Heald\*  
Richard Marson  
Richard Pipe  
Brian Johnson\*  
1 vacancy  
Frances Barnwell (Secretary)

\*These Trustees are nominated, the remainder being elected, by the Partnership.

### ALDE AND ORE ESTUARY PARTNERSHIP CONSULTATION ON THE DRAFT ESTUARY PLAN

#### NOVEMBER –DECEMBER 2015

##### The Consultation

1. The public consultation on the draft Estuary Plan together with the Sustainability Appraisal took place from 5 November until 17 December 2015. The AOEP website was open with all the relevant documents and the facility to make comments. Three public drop-ins were held, in Aldeburgh on Saturday 21 November 9.30am-1pm, Snape Maltings on Thursday 26 November 2-7pm and Orford Town Hall 2-7pm. Over 170 people signed the attendance list (there may have been a few who did not), of which some 70 were at Aldeburgh despite the appalling weather, 60 plus at Snape and 50 plus at Orford, with a few people at two or all events.
2. Comments, mostly online, were made by 132 individuals or organisations. There were 3 from Parish Councils which do not have a member on the AOEP, (Chillesford, Iken and Sudbourne), one from Aldeburgh Town Council, and six from organisations namely RSPB, SCDC Coastal Management Team, AONB, SCC Rights of Way Dept., Deben Estuary Partnership and Suffolk Wildlife Trust.
3. AOEP representatives met with the Suffolk Coastal District Councillors for the area, Ray Herring, TJ Haworth-Culf and Maureen Jones to discuss the plan and its importance to the area. AOEP offered to attend all parish council meetings for those parishes in or partly in the Alde and Ore Estuary area and a number took up the offer. AOEP members have now attended meetings of Parish Councils not on the AOEP where it was possible to explain the AOEP plan and answer questions, namely Aldringham, Blaxhall, Boyton, Iken, Sudbourne, and Hollesley as well as some who have a representative on the AOEP, Snape and Orford. The Tunstall chairman has also had a briefing, Parish Councils which have not had a direct visit but which have a representative on AOEP any way and so have been continually updated on the plan by their representatives are Bawdsey, Butley, Orford plus Aldeburgh Town Council.
4. Separate meetings were held with the RSPB and National Trust and the revised draft plan, at their wish as well as that of the AOEP, will be more inclusive of their plans for the flood cells for which they are responsible.
5. Every effort was made to ensure that the consultation was widely known about including articles in the East Anglian Daily Times and local news communications including the Aldeburgh Gazette and Aldeburgh News, Village Voice (Orford) VillageVoices (Hollesley) EbbnFlo (Snape and Blaxhall) and the Link (Orford, Butley, Chillesford, Tunstall, Iken and Sudbourne). Posters were displayed as widely as possible throughout the area and 250 copies of the Draft Plan were also distributed. Individual members of the Partnership also made the consultation known on their networks.
6. A new AOEP website was specially set up to deal with the consultation as the page on the AONB website which AONB have kindly hosted did not have the capacity to hold all that a consultation web site needed.

7. During the course of the consultation and afterwards the Sustainability Appraisal, the Habitats Regulation Assessment and the Water Framework Directive Assessment have been completed requiring no further adjustment now to the Plan.

## Responses to the consultation

8. The consultation demonstrated a very strong ground swell of support for the draft Estuary Plan and helpful comments on emphasis, approach and on details were made. Overall the draft plan was welcomed and comments were made on the need for covering different aspects or emphasis but the general principles and thrust of the plan are well supported. At the drop-ins the most frequently raised concerns related to the coastline section of the Alde and Ore at Slaughden, concerns that enabling development projects might be detrimental to the area, as well as local interests at each place.

9. The main response to the six questions in the consultation were as follows:

*Question 1. Which location are you most interested in?* Responses given were that 68 were most interested in the Upper estuary (Aldeburgh Iken and Snape), 34 in the Middle Estuary (Orford), 5 in the Lower Estuary (Butley and below, and 21 in the Whole Estuary.

*Question 2. Have you any comments on the upgrading of the river walls? These will be raised and strengthened; although there will be some overtopping in the event of surge tide as happened in December 2013, breaching and damaging flooding should be avoided*  
Over 80% of the responses supported the plans for the river defences. 86 respondees very positively affirmed the plan, 16 made no comment so were presumably content and 20 were a mixture of supportive but with particular points of concern or made other comments such as the pity that the Hazlewood Marsh walls had not been restored, attention being required for roads.

*Question 3 Do you have any comments/observations on any environmental/ landscape/ wildlife concerns? Please detail:*

40 respondees commented specifically to support the Plan, 11 had nothing further to add to the plan while 41 made no comments indicating the plan says all it needs to do, giving '92 contents' in total. There were 18 more specific comments, two of which was concerned about engaging the RSPB, National Trust and others which has been done, 2 on concerns about cycle paths but most on particular local concerns or emphasising the good environmental and wild life features to be preserved. There was a third grouping of 12 comments on the balance between wildlife and human use of the land scape three quarters of which feel the emphasis is too heavily on wildlife.

*Question 4. Have you any comments on the recreational aspects of the area in terms of access to the river/footpaths/rambling and sporting interests etc.*

51 of the 77 responses to this question were supportive of the plan wishing to see the present recreation opportunities continue much as they are now. About ten would like to see more footpaths and the ferry between Slaughden and Ferry Point restored. There are mixed views on cycle paths.

*Question 5. Have you any comments on the proposal to raise funds through enabling development? What other ideas have you for raising funds?*

54 of the responses saw enabling development as an essential element of fund raising. 34 responses left the line blank and 4 stated they had no comments to offer. In total therefore 87 respondees supported or accepted the use

of enabling development. In addition, 22 separate responses gave advice on raising funds and so mostly supported the fund raising proposals. 4 focussed on the need to ensure that the area was not damaged by development and 6 others mentioned this point.

*Question 6. Finally, have you got any outstanding concerns or specific questions on the plan we have not answered or need clarifying? Or have we missed anything? Please detail here:*

21 responses expressed strong concerns that the Draft Estuary Plan had not addressed the continued life of the sea wall and shingle shore south of the Martello Tower sufficiently. The Draft had pointed out that this coastal stretch was primarily the responsibility of the Environment Agency. But these points have been well taken. The revised Estuary Plan will bring out the importance of this shoreline to the Estuary Plan and the need for the Shoreline Management Plan to be reviewed and to secure compatibility with Plan.

14 responses expressed thanks for the work that had been done to produce the plan, 4 mentioned timing, 2 drafting points and about 6 others were individual views on particular aspects including getting value for money, flooding of Aldeburgh from the north and water seeping under Orford walls, housing and one not supporting the plan. 81 responses gave no further points.

## **Changes to the Plan in the light of the Consultation and environmental appraisals.**

10. The main adjustments made to the draft Plan in response to the consultations and to the Sustainability Appraisal and Habitats Regulation Assessments are as follows

- i. **Coastal squeeze.** The draft plan recognised the need to take account of coastal squeeze and its impact on the environment. Discussion on meeting the various environmental regulations in the context of the Sustainability Appraisal has allowed more detailed plans to deal with this to be developed. To satisfy regulatory requirements the Plan will include a more specific reference to monitoring the environment and a commitment to find new habitats should coastal squeeze lead to the loss or degradation of habitats such as saltings.

Detailed discussion on the Monitoring Programme and memorandum and how it will work, will start once the Plan has been finalised post consultation. In the meantime EA and NE are preparing a list of everything already monitored and the timing/periods of the existing monitoring programmes so that when discussing a programme there is a base line of what data exists already and any gaps, if any, are identified. It may be possible to bring in the RSPB (who already work with NE) and possibly the National Trust to the EA and NE monitoring programme. The AOEP can include the monitoring and work the partnership does on salting projects and Rod West's work with students at Stanny Farm, Iken. The idea would be to have a full formal review of data every 5 years as stated in the draft above but in practice there could be an informal meeting of a sub group annually to check things are on track and pick up problems early.

- ii. **Shoreline Management Plan.** This matter was one of the main subjects raised at the drop-ins and was specifically referred to in almost 18% of responses. The Draft Estuary Plan had recognised the importance of the coastal defences south of Aldeburgh to north of the Orford Lighthouse but had taken the approach that sea defences fell primarily to the Environment Agency. The AOEP are in continuous talks with EA about this length of coast but it is clear that the central importance of this stretch to the integrity of the estuary must be more explicitly explored. In particular the need for the current Shoreline Management Plan to be reviewed to look at the possibility for the two parts of this stretch, the built up sea wall and the shingle ridge to be managed on the same time scale.
- iii. **Enabling development** proposals were fully supported by over half those who commented on the enabling development question while almost a fifth did not state a view but gave ideas, as requested, for additional ways of raising funds while about a quarter simply not comment at all. The concerns raised were particularly that such development might undermine the Area of Outstanding Beauty which the



estuary plan is seeking to sustain. The revised plan seeks to be more specific on the controls which will be in place on any enabling development and to describe in more detail the likely amount needed compared with existing building in order to show the intention is to add a relatively small amount to the local housing stock, not to flood the area with large developments out of keeping with the landscape and services. The Plan has also been amended to provide more detail on the funding strategy and plans.

- iv. **Boundary with the Deben and Bawdsey plans.** Section 3 of the Draft Plan will be amended to make it clear that the choice of parish boundaries taking in any parish which has all or part of a flood cell within its area or an upland area irrigated from a flood cell for the outline of the plan is solely to ease communication and administration. This differs from the Deben where the river catchment area was chosen and also the plan has a wide set of objectives. The Bawdsey Plan which is mainly coastal never the less has to cover an area of river which also links to the Ore so that clarity and good communication will be essential. The draft will therefore be strengthened on this point.
- v. **RSPB and National Trust** As a result of meetings with these bodies the flood cells for which they are responsible will be brought within the plan.
- vi. **AONB.** The Draft Plan has been amended to be compatible with AONB legislation and its Strategic Plan of the Suffolk Area of Outstanding Natural Beauty.
- vii. **Time line for the Plan.** The plan has been amended to put in specific times for review of the progress of the plan and re-assessments of the state of the estuary, including that the plan will be reviewed every 10 years from the date of its. Also that the aim is to complete the major defences works within 10 years of the start of the AOEP to provide, where needed, the target resilience standard in the year 2050. The plan will be reviewed regularly and a fundamental review will need to be undertaken on the future as 2050 approaches.
- viii. **A number of drafting changes** have been suggested either to make a point more clearly or to meet statutory or legal wording requirements. Drafting changes will also be made to bring out for example the way the estuary provides a living connection with its several settlements and creates a unique area and that the first stage is to get the walls in good repair and thereafter the work will mainly be monitoring and maintenance.

February 2016

**Note: the full details of every response, but not attributed to named individuals or bodies, will be available on the AOEP website: [www.aoep.co.uk](http://www.aoep.co.uk)**



## Appendix 16

### References supporting Reports and references

#### Key documents accompanying the Alde and Ore Estuary Plan

(to be found on the AOEP website [www.aoep.co.uk](http://www.aoep.co.uk))

Final Sustainability Appraisal/Strategic Environmental Assessment Report on the Alde and Ore Estuary Partnership Plan, January 2016, prepared by Irina Davis, Suffolk County Council

Strategic Habitats Regulations Assessment (Revised Draft III-November 2015) for the Alde and Ore Estuary Plan, prepared by the Natural Environment Ecology Team, Suffolk County Council

Water Framework Directive Assessment for the Alde and Ore Estuary Plan, January 2016, prepared by the Environment Agency

#### Reference Documents

Alde and Ore Estuary Partnership. Constitution. [www.aoep.co.uk](http://www.aoep.co.uk)

Alde and Ore Futures project study \*

Suffolk Landscape Assessment [www.suffolklandscape.org.uk/landscape.map.aspx](http://www.suffolklandscape.org.uk/landscape.map.aspx)

Posford Duvivier-Suffolk Estuarine Strategies, River Alde/Ore (Consultation)1999

Suffolk Coast and Heaths Area of Outstanding Natural Beauty Management Plan 2013-2018,  
[www.suffolkcoastandheaths.org](http://www.suffolkcoastandheaths.org)

Alde-Ore Local Economic Study \* February 2014 commissioned by the Alde and Ore Association, prepared by RPA( Risk and Policy Analysists) [www.aldeandore.org](http://www.aldeandore.org)

\* Key sources of the statistics in the report

DRAFT PROGRAMME OF PROPOSED FLOOD DEFENCE WORKS FOR NEXT 5 YEARS (Subject to FDGIA and partnership funding availability)						Appendix 17	
FLOOD CELL	2016	2017	2018	2019	2020	2021	
<b>UPPER ESTUARY</b>							
<b>SNAPE 6/7</b>							
Evidence Requirements to support Appraisal							
Project Appraisal (includes application for FDGIA)							
Delivery (includes consents, permissions)							
Monitoring							
<b>ALDEBURGH FC10</b>							
Evidence Requirements to support Appraisal (inc engagement)							
Project Appraisal (includes application for FDGIA)							
Delivery (includes consents, permissions)							
Monitoring							
The sea wall and shoreline south of the Martello Tower are subject to coastline planning and consideration of the Shoreline Management Plan.							
<b>ORFORD &amp; GEDGRAVE FC4</b>							
Evidence Requirements to support Appraisal (inc engagement)							
Project Appraisal (includes application for FDGIA)							
Delivery (includes consents, permissions)							
Monitoring							
<b>IKEN CONSTRUCTION</b>							
Delivery (includes consents, permissions)							
Monitoring							
<b>LOWER ESTUARY</b>							
<b>BOYTON/BUTLEY FC1</b>							
Evidence Requirements to support Appraisal (inc engagement)							
Project Appraisal (includes application for FDGIA)							
Delivery (includes consents, permissions)							
Monitoring							
<b>CHILLESFORD FC3</b>							
Evidence Requirements to support Appraisal (inc engagement)							
Project Appraisal (includes application for FDGIA)							
Delivery (includes consents, permissions)							
Monitoring							

