The Deben Estuary Plan

April 2015

Deben Estuary Partnership

Environment Agency

Suffolk Coast & Heaths
Area of Outstanding Natural Beauty

'This Plan addresses the principle issue of flood risk management for the Deben Estuary but also takes a more inclusive stance, reflecting the preferred Local Plan Strategy for an integrated approach to the coastal zone.

To be fully effective the Plan acknowledges that the estuary must be approached as an integrated system. In responding to the identity of the estuary as a whole it adopts a joined up approach that brings together different interests and recognises the interrelationships between the river systems, the needs and aspirations of communities and the ecological integrity of a unique environment.'

Sustainability Appraisal / Strategic Environmental Assessment Report November 2014

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Preface

A management plan for a whole river system

There is a world of difference between how, in the past, it has been routine to manage a tidal estuary only in terms of flood risk management and how this has now become a part of a more inclusive plan that responds to the broader identity of the estuary.

This plan is the result of growing awareness that the effectiveness of any management strategy relies upon a willingness to embrace the principle of an integrated system. For the Deben Estuary, this involves recognition of the need to reconcile the continued wellbeing of the river systems, the interests of the communities for whom it has a core value and the ecological integrity of a unique estuarine environment.

Although it is necessary to break the estuary down into separate policy interests, the analysis of the spectrum of stakeholder interests in relation to estuary processes confirms that no single aspect can be considered in isolation and that any separate management decision in a single area will have ramifications across the whole. Understanding this correlation is crucial to the success of the Estuary Plan.

For example the flooding tide carries its load of sediment from the North Sea and with it, in season, migratory fish - herring, bass or seat trout; it also supports its own non-migratory species of fish - dab, flounder and mullet. These in turn support their own predatory species and every year a sure sign that the herring are back in the river is the presence of the Common Seal stalking the shoals of fish in the tideway. As the tide turns, sediment drops out and nutrients that are carried into the estuary settle across the intertidal zone - once the tide has receded, this nutrient enriched foreshore attracts huge flocks of wading birds to feed from an abundance of marine invertebrates - this apparent open and tranquil but nonetheless busy landscape makes the estuary so special which in turn attracts human visitors.

The saltmarsh that fringes our river is a buffer zone that mitigates the direct effect of wave and tidal action upon estuary walls. Without this the resilience of the clay walls cannot be guaranteed and the cost of maintaining flood defence works can soar. Saltmarsh is enshrined in the European Habitats Directive 1992 and has guaranteed protection in law; like many bio-diverse sites, it has the capability to sequester carbon, but like any other sensitive landscape it is susceptible to externally driven change, such as sea level rise and surge events. These are some of many complex interlocking relationships that characterise an estuarine environment. The process of developing a management policy must have equilibrium as its target and work with the principle of interdependency when accounting for the condition of the estuary and determining action plans.

The thin line of a flood defence structure is the meeting point between the estuary and dry land and is where attention and emotions become most concentrated. It is where one domain gives way to another; wet gives way to dry, salt gives way to fresh. It is the margin where uses of and interests upon the river meet, where the necessity for flood risk management must correspond with the obligation to protect intertidal habitat. It is where interests intersect.

It exemplifies the issues that become recurrent themes through the course of this Plan:

- The river defence system along much of its length is also a permissive pathway that affords walkers a prospect of the river to one side and its hinterland to the other; as such it is intensively used.

- For landowners, the floodwall is a defining point between the managed and the unmanaged, the protected and the unregulated; it allows them to conduct their business with a degree of security. It allows them the certainty that their land will not become tainted with salinity and that their aquifers and well points will not become compromised.

- For the ecologist the river wall separates two different types of wetland habitat. The wall determines zones of biodiversity where the saltwater environment may be either degraded or helped by human intervention. On the landward side the freshwater habitat is subject to higher levels of regulation and managed towards very particular functions; here habitat is negotiated and planned into the mosaic of land use.

- For the mariner, this margin is the connection with land; where it is possible to step ashore, but there may not always be permission. It gives a direct link to the services that cater for the marine industry such as boatyards, marinas, chandleries that cluster the shoreline.

A range of uses of the river can give rise to different views of and priorities for the estuary but for satisfactory solutions to be arrived at there must be a consensus that recognises statutory designations and controls already in existence. To establish a plan for the estuary is to understand the value of achieving an integrated system that acknowledges the integrity of the estuary environment, its importance to the viability and sustainability of the local economy, its sensitivity to human pressure and changing environmental conditions, and the realisation that the health of the estuary landscape and the wellbeing of local communities must go hand in hand.

Simon Read,
Deben Estuary Partnership and member of the River Deben Association, author of Portrait of the River Deben

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1. Introduction

Purpose of the Plan

1.0.01 The estuaries along the Suffolk coast form a major part of the coastal area and are intrinsic to its character. The Deben is distinctive; an area of high quality estuarine landscape, significant habitat for wildlife and important historical features. The exceptional quality of the natural, historic and built environment makes it a special place to live and work and a valued destination for visitors. Threats to the stability of the estuary and its hinterland are various but the risk of flooding and the sustainability of flood defences are primary concerns for local people.

1.0.02 This Estuary Plan extends the Environment Agency's former process of only addressing flood risk management and aims to set out not only how flood risk can be managed but also how the interrelated benefits, challenges and threats to the estuary and its hinterland relate to the sustainability of the wider area. It places importance on the interrelationship of land use and the marine environment and, as with the Integrated Coastal Zone Management Strategy set out in the Suffolk Coastal District Plan, 2013, seeks to address the needs of communities and the natural environment within the context of the estuary.

The former process of drawing up an Estuary Strategy

1.0.03 Traditionally the risk of flood and coastal erosion related to an estuary has been considered as a stand alone matter set out in coastal and estuary strategies.

1.0.04 The Environment Agency (EA) must consider how flooding can affect the range of activities and assets that exist within an estuary and oversee how government funds, ear-marked for protecting people and property against flood risk, are spent nationally. The resulting Flood Risk Management Strategy must focus predominantly on the costs and benefits of maintaining or improving flood defences and the impact this will have on the immediate environment and local economy. This approach is governed by Defra Treasury Guidance. It is limited in so far as it cannot consider broader estuary benefits, is expected to adopt a sustainable approach and be mindful of managing flood risk over a 100 year timescale.

A different way to consider estuary planning

1.0.05 In 2009 a revision of the Deben Estuarine Strategy was considered. Previously community feedback had drawn attention to the fact that the Environment Agency had been unable to make allowance for the values and aspirations which landowners, river users, residents and businesses had for their estuary. Recognising this issue the EA consulted with community leaders and took the decision to set aside the former strategy process and encourage a wider, more inclusive view of estuary planning where flood risk and estuary defences could be considered in conjunction with the needs of communities, landowners, businesses, tourism and recreation.

A new partnership approach to drawing up a Plan for the Deben Estuary

1.006
This new approach to estuary planning acknowledges statutory requirements. It positions the Plan under the umbrella of existing policy but allows local needs and aspirations to influence the decision making process.

The Deben Estuary Plan has been put together jointly by a partnership of the Environment Agency, who hold the statutory responsibility for flood defence, Suffolk Coast and Heaths Area of Outstanding Natural Beauty Unit (SCH), who carry responsibility for the management of the AONB, and the community based Deben Estuary Partnership (DEP), who have taken a lead role. The EA has appraised technical solutions for flood risk management in both the short term (20 years) and the long term (100 years) and has assisted in assessing the environmental implications of the chosen flood risk management options.

Wide community involvement and consultation has informed the work of this innovative partnership approach.

Background to the community based Deben Estuary Partnership

1.0.07 The DEP came together in response to the community's desire to influence the complex and increasingly significant issues that have an impact on the river and wider estuary area. They have adopted a step by step approach as a way of tackling identified concerns and gone on to obtain charitable status in order to facilitate the flood protection and environmental projects that will stem from an Estuary Plan.

1.0.08 Underpinning the partnership has been a straightforward, pro-active, dialogue with the statutory bodies and local authorities who have responsibility for and interest in the estuary. Constructive working relationships have been built up with the Environment Agency, Suffolk Coast and Heaths AONB Unit, Natural England, Suffolk Coastal District Council, Suffolk County Council, the East Suffolk Internal Drainage Board (ESIDB), National Farmers Union and The Crown Estate. Links have been established with the Marine Management Organisation and East Suffolk Water Abstractors Group and nature conservation organisations including the RSPB and Suffolk Wildlife Trust. Close working with the River Deben Association (RDA) and communication with the Parish Councils who represent communities around the estuary has been important, as has feedback from water-sport clubs and marine businesses based around the river.

The underlying principle of consultation

1.0.09 In November 2008 DEP representatives began to consider the future of the estuary, examining positive ways of sustaining flood defence and recognising the implications of changing climatic conditions. They acknowledged the principle of an interrelated estuary system, taking into account the economic and recreational interests of residents and visitors as well as the overarching obligation to conserve the valued and sensitive estuary environment.

1.0.10 The new Localism Agenda places importance on the opportunity for communities to become involved with other agencies in order to shape the future of their area. The DEP, together with its partners, welcomed the 'duty to co-operate' and, in considering an Estuary Plan, saw the benefit of statutory organisations and river communities acknowledging each other's views and understanding that these are important elements in achieving a constructive and integrated approach to estuary management. The opportunity for landowners, residents, Parish Councils, businesses, local organisations and wildlife groups to put forward their aspirations and requirements has continued throughout the Plan making process. The breadth and regularity of this dialogue have ensured that issues are understood and that the resulting policies can be recognised by everyone.

1.0.11 While this way of preparing an estuary plan offers local people greater influence over the future of the river and surrounding area, it carries with it increased responsibility for the sustainability and implementation of the policies and actions that are set out.

The consultation process

1.0.12 A pattern of meetings aimed to give stakeholders involvement in the process of developing the Estuary Plan. Three rounds of well attended meetings with Parish Councils and residents from the east and west bank villages, Woodbridge and Melton at the head of the estuary and Felixstowe Ferry at the mouth first considered how a new approach would differ from previous estuarine strategies and learnt how statutory constraints and overarching national policies must influence local estuary policy. At this early stage community representatives were asked what they saw as the most important matters that an Estuary Plan should address. A second meeting looked at emerging concerns, aspirations and conflicts and, having acknowledged the impact of funding constraints, began to think about how new proposals could be implemented. The funding theme was further developed in the third round of meetings which largely concentrated on assessing more defined policy proposals.

1.0.13 At each stage the dialogue between the Plan partners (the DEP, the EA and SCH) and the community provided the opportunity to inform policies and propose future actions. The fourth and final round of meetings encompassed formal consultation on the draft Plan.

1.0.14 At a very early point in formulating an overall approach to the Plan, the River Deben Association, a voluntary organisation representing river users and people who care about the river, circulated a survey to their extensive membership. They sought their views on a range of matters from the value of the environment to practical river management. The responses highlighted the value that is placed on the peace and tranquillity of the estuary, a recurring theme throughout consultation, stressed the importance of recreational activities, both on the river and in the surrounding area, and emphasised the added value that these bring to the local economy.

Engagement with interest groups

1.0.15 A number of working groups, set up by the DEP. brought together both lay and professional views.

- **The Environment, Landscape and Archaeology Committee (ELAC)** brought together representatives from the local community, NGOs, Natural England, the Environment Agency and Suffolk County Council to gather new evidence, examine and map landscape features, heritage and archaeological sites of the area. The Group paid special attention to areas designated under International, European and National habitat directives; they looked at landowner stewardship schemes and examined the biodiversity of the river estuary and its hinterland. Their conclusions were presented in a report.

  (ref: Deben Estuary Partnership Environment, Landscape and Archaeology Report April 2013)

- **The Access Group**, made up of representatives of local parishes, the RDA, recreational groups and Suffolk County Council's Rights of Way team, looked at opportunities for recreation across the wider estuary area and noted places of interest and visitor facilities. They considered where and in what way it was possible to access the river, where car parking was available and examined the footpath network, differentiating between the routes that are popular and well used and the paths that are some distance from the public highway and therefore walked comparatively infrequently.

The studies carried out by the Group suggested the importance of balancing the benefits of access with the value attributed to the quiet areas of the estuary. A number of short reports documented conclusions.

In conjunction with ELAC the Access Group examined the impact of disturbance on designated habitats and species and considered the value of different kinds of mitigation measures.

- **The Saltmarsh Group** examined the extent and condition of saltmarsh within the estuary. Saltmarsh is important for its biodiversity, habitat and the special contribution it makes to the quality of the estuary landscape. The role of saltmarsh as a natural element of flood defence, able to alleviate wave action during storm surges and absorb the tidal energy expended against the toe of the river walls, was recognised. Informed by careful examination, the benefits of taking action to conserve this habitat were considered. Sites were selected for intervention and innovative techniques to facilitate the accumulation of sediment were carried out in order to conserve and regenerate specific areas of saltmarsh.

Graham Henderson

Meetings with stakeholders

1.0.16

- **Landowners** have discussed the importance of estuary defence – vital in protecting agricultural land and sources of fresh water for irrigation. Attention was drawn to the benefit derived from the mild climate, light soils and access to irrigation which supports valuable early vegetable crops. The contribution this growing pattern makes to both the local economy and national markets is significant. Emphasis was placed on the role landowners have in delivering land stewardship schemes; examples of where landowners are now able to maintain their estuary walls have informed the Estuary Plan.

- **Boatyard owners and marine business representatives** have expressed concerns and described issues which constrain their activities. The need to dredge boatyard quays and slipways and enable access to the marina and moorings in the upper estuary is an ongoing problem, as is the cost of the required licences. However, it is recognised that sediments from such operations could be used beneficially to recharge depleted saltmarsh.

- **River based recreational clubs and Fairways Committees** have expressed strong views on the management of the river. River users, Fairways Committees and The Crown Estate have noted and expressed a range of aspirations and concerns about future levels of river use. The present stretches of open water, which are seen not only as epitomising the estuary landscape but offering opportunities for sailing and other, faster speed, water sports, are valued. A general consensus indicates that moorings should not encroach over the whole river.

1.0.17 For those groups who have been harder to reach other opportunities to draw them into the Plan process have been found:

- **Young people** answered a Survey Monkey questionnaire about their connection with the river. Their answers showed that they came to the riverside often and enjoyed water sports, walking and meeting friends. Some expressed an interest in being more involved in the future of the estuary.

- **Owners of visitor accommodation** answered questions about how their business related to the estuary environment and, in many cases, drew attention in their advertising to the estuary landscape and opportunities for walking and birdwatching.

Forums and Workshops

1.0.18

- **Landowner Forum** - 17 March 2011 introduced the initial findings of the EA's examination of economic factors likely to influence the future availability of government finance for the maintenance of estuary defences. Discussion with landowners drew attention to the estuary walls which, because of the rural nature of the area they protect, would be unlikely to receive Government funding.

- **Subsequent sessions with landowners** explored how individuals, with uneconomic defences, could seek assistance from the EA to gain the relevant Flood Defence consents necessary to enable them to carry out their own maintenance and improvement work. A Landowner Pack, 'Supporting Change', was made available.

- **Estuary Mouth Workshop** - October 2011 brought together expertise and technical knowledge about the complex processes influencing the mouth of the estuary. Reports from several different consultants were presented and evaluated in the light of local knowledge.

(see EA Estuary Mouth Workshop Report).

- **Environment and Archaeology Workshop** - May 2012 enabled representatives of all Statutory Bodies and local interest groups to come together to consider the landscape, archaeology, birds and wildlife habitats found in and around the estuary. Matters of interest relating to the river and its hinterland were recorded area by area.

- **Policy Development Workshop** - October 2013 involved key estuary stakeholders, community representatives and partners. The Workshop examined each estuary flood cell and considered policies which would apply across the wider estuary area. Draft proposals from this workshop informed the Sustainability Appraisal.

Appraising the Estuary Plan

1.0.19 Sustainability Appraisal - including Strategic Environmental Assessment

A Sustainability Appraisal has been undertaken as part of the preparation for the Estuary Plan. The Appraisal has looked at the extent to which the Plan, when judged against reasonable alternatives, will help to achieve relevant, sustainable environmental, economic and social objectives. The Sustainability Appraisal finds that, overall, the Plan policies work well together to deliver the vision set out by the Estuary Plan.

1.0.20 Assessment of the cumulative effects of Plan policies show either a positive or neutral impact overall. 'A number of the policies directly promote SA/SEA objectives facilitating sustainable management of the Deben Estuary while other policies illustrate their progressive nature by ensuring a balanced approach to water based recreation without compromising other SA/SEA objectives.' *(SA/SEA Assessment Report November 2014)*

1.0.21 Habitats Regulation Assessment

A Habitats Regulations Assessment (HRA) is required, under European Directive 92/43/EEC, in order to assess matters within the Plan which may have an impact on European (Natura 2000) Sites. The HRA for the Deben Estuary Plan has examined the likely impact of policies in the context of the conservation objectives for designated sites and ascertained whether there would be an adverse effect on the integrity of the site. The outcome of the HRA states that no likely 'Negative Significant Effects' will arise from the Plan and that implementation will be more likely to result in Positive Significant Results, increased understanding and actions that assist in achieving the conservation objectives.

(The Deben Estuary Plan, Habitats Regulations Assessment)

1.0.22 Water Framework Directive Compliance Assessment

The EU Water Framework Directive (WFD) relates to European legislation that became part of UK law in 2003. This looks at the ecological health of both groundwater and surface water bodies and their chemical and physical status with the aim of achieving 'good chemical status' by 2015 and 'good ecological status' by 2027.

1.0.23 A Water Framework Compliance Assessment concludes that the Plan policies have accounted for the protection and enhancement of the environment, surface waters and ground waters but notes that some specific activities promoted by the Plan may require permissions from the relevant regulatory authorities. *(Water Framework Directive compliance assessment of the Deben Estuary Plan 2014)*

Chris Woods

Profile of the Estuary

1.0.24 The Deben Estuary stretches from Felixstowe Ferry to its furthest tidal limit inland above Woodbridge at Ufford Mill. The area lies largely within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty, the lower reaches of the river are part of the Heritage Coast and, from Felixstowe Ferry to Bromeswell, the estuary is designated as a Special Protection Area under Natura 2000 legislation.

1.0.25 The distinctive open estuary landscape, full of water at high tide but an expanse of saltmarsh and wide, intertidal mud flats when the water has ebbed, is backed by coastal levels which rise to wooded estate sandlands on and beyond the shallow valley sides. The land, as seen from the river, remains largely empty of intrusive urban development. The hamlets of Felixstowe Ferry and Bawdsey Ferry mark the mouth of the estuary; small rural villages, often set back on higher ground, are found on either side of the river. At the head of the estuary the historic maritime town of Woodbridge spreads along and behind the waterfront. Beyond the wider area the major port of Felixstowe and town of Ipswich both continue to expand.

1.0.26 Important cultural and historic features are found throughout the estuary and its hinterland - most notably Woodbridge Tide Mill, Sutton Hoo Anglo-Saxon burial site, historic churches and Bawdsey Manor, the home of radar. The area is important for its biodiversity and almost the entire estuary carries International, European and National environmental designations protecting important habitat, wintering birds and local wildlife. Outcrops of coralline crag at Bawdsey and Ramsholt are marked as geological Sites of Special Scientific Interest.

1.0.27 The local estuary economy centres on agriculture, tourism and marine related businesses. Agriculture benefits from the mild climate, light soils and access to irrigation, and profitable cropping underpins a system of interconnected employment. The marine businesses flourish at several locations along the river and provide one of the reasons why increasing numbers of visitors choose to come to the area to enjoy the riverside and opportunities for water based recreation. Popular visitor destinations, such as Sutton Hoo, ensure that tourism plays an increasingly significant part in sustaining the local economy.

1.0.28 Within the estuary 1300 properties and some 2250 hectares of land are at varying risk of tidal flooding. Flood defence measures, from hard structures at the mouth of the estuary and Woodbridge, to the long predominantly clay river walls, which protect rural properties and farmland, provide varying levels of protection.

The area covered by the Estuary Plan

1.0.29 The area covered by the Plan is clearly defined. Wherever possible the boundary line follows roads or rights of way, recognises the natural crest of the high ground above the estuary and includes :

- all land adjacent to the river or its tributaries which is below the 5 metre contour line and potentially vulnerable to flooding. Such areas are defined as Flood Cells numbered 1 to 13
- the landscape types and features characteristic of the estuary area - open tidal water, intertidal mud flats and saltmarsh enclosed by river walls, coastal levels backed by woods and estate sandlands rising up the valley sides
- the uplands further away from the river where agricultural productivity is dependent on irrigation using fresh water drawn from sources along the valley floor
- estuary settlements, including the town of Woodbridge, where the river and access to the sea continue to play a major role in the life of the community
- villages and hamlets on the crest of valley sides - Falkenham, Hemley, Kirton, Ramsholt Sutton and Bromeswell. Villages set back along tributary valleys – Shottisham, Newbourne and Old Martlesham
- where communities are orientated towards both coast and river the Estuary Plan covers only that part of the settlement which has geographic proximity to the estuary – thus in Bawdsey and Alderton the line of the Plan boundary follows the public highway and excludes those dwellings which naturally look towards the coast and sea
- historic, archaeological and geological sites dependent upon or closely associated with the river – of which the Anglo Saxon burial site at Sutton Hoo is the most significant


Chris Woods

Map of the area covered by the Estuary Plan

DEP Boundary

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Deben Estuary Partnership

What the plan includes

1.0.30 The Plan addresses the principal issue of flood risk management for the Deben Estuary but also adopts a more inclusive stance, reflecting the preferred Local Plan strategy for an integrated approach to the coastal zone. Thus the Plan recognises that the estuary area must be seen as an integrated whole, encompassing different interests and recognising an interrelationship between the river systems, the needs and aspirations of communities and the ecological integrity of a unique environment. While the Plan considers the estuary in terms of separate policy areas, each with their particular interests, it recognises that actions stemming from the Plan cannot be considered in isolation.

1.0.31 This Plan does not deal with wider issues of land based planning (housing development, economic growth or infrastructure) which come within the overarching plans and strategies produced by Local Authorities. However it does recognise and take into consideration the potential impact that housing and economic development may have on the estuary area.

Policy areas

1.0.32 **Flood Risk and Management**

The Environment Agency replaced its former process of drawing up an Estuarine Strategy, working instead with the Plan partners (the DEP and SCH) to research options and present a preferred policy for future flood risk management throughout the estuary. In adopting a more inclusive approach it has been possible to give additional weight to the needs of local landowners, businesses and communities.

1.0.33 Tidal processes throughout the estuary have been examined and particular attention focussed on the river mouth where the configuration of the Knolls and hard defence at Felixstowe Ferry play a significant role in determining the future of the rest of the estuary. The financial viability of providing protection for each flood compartment has been analysed and the Plan sets out which flood cells are likely to secure an element of Government funding to meet the cost of ongoing improvement. In the context of this information the Plan recognises the fact that landowners and communities wish to sustain estuary flood defences and, in so doing realise that they will need to generate a high percentage of the required funding locally.

1.0.34 The Plan acknowledges that flood risk management must recognise the likely impact of changing climatic conditions.

1.0.35 **Landscape and Heritage,**

As a part of the Suffolk Coast and Heaths Area of Outstanding Natural Beauty the river and wider estuary area are of national importance. The Plan notes the geological and landscape features and history of human settlement. It recognises that the landscape character of the estuary is derived from both physical and social factors; the underlying rock and deposits, the surface soils and land cover, the way people have used the land over many centuries, the cultural heritage that is left behind – all of these combine to give the area the special quality that it has today. The Plan recognises the pressures that the estuary will come under as a result of additional housing and development in the wider area. It proposes ways in which such pressures can be managed in order to safeguard the quality and valued tranquillity of the river and its immediate hinterland.

1.0.36 **Environment and Biodiversity**

The Plan describes the Deben as an intimate estuary offering a rich mosaic of habitats - arable farmland, sandy cliffs, woodland, freshwater marshes and, most notably, a rich expanse of saltmarsh and mudflats, all of which support considerable biodiversity.

It acknowledges the range of national and international wildlife designations that protect listed species which depend on both the estuary and its hinterland for their continued wellbeing. The Plan recognises the challenges of balancing the conservation and protection of important habitats with the opportunities for recreation that the river offers as well as the importance of sustaining a viable local economy. Development and economic growth in the wider area will put increased pressure on the estuary environment; to counteract this, the Plan takes a proactive approach to mitigation as a way of safeguarding the environment for future generations to enjoy.

1.0.37 **Estuary Economics**

The principle elements of the local estuary economy are seen to be agriculture, marine related business and tourism. Agriculture derives considerable benefit from the light soils and favourable climate which enable particular crops to be grown but, if these are to be profitable, regular irrigation is a necessity. The boatyards are central to marine activity on the river and generate demand for a wide range of associated services. Marine business is aided by the relative ease of navigating the river, a tidal range which allows most craft to access moorings at high water as far up as Melton, and regular dredging of slipways and quays to prevent some areas from silting up. Small-scale fishing activity contributes to the local economy. Tourism brings increasing numbers of visitors to the estuary, both for the day and to stay longer. Many are attracted to the riverside or come to enjoy the special landscape and the opportunities offered for quiet recreation. The Plan seeks to acknowledge this and find a balance between sustainable economic prosperity and conservation of the environment.

1.0.38 **Surface Water Management**

The contrasting issues of excess surface water and prolonged drought are of significant concern across the wider estuary area. Much of the valuable agricultural cropping that now takes place is dependent on a reliable source of water for irrigation. The Plan recognises that, while abstraction from water courses and the aquifer is essential, the availability of water is becoming critical. The Plan considers how best to address this and proposes ways of managing and storing surplus water – not only for the security and advantage of farmers but also in order to benefit the environment.

1.0.39 Access and Estuary Based Recreation

The Plan, and research that supports it, recognise the valuable role that the river plays in providing opportunities for recreation and enjoyment and how this can benefit the health and wellbeing of residents and visitors. People of all ages come to walk through the area, to sail, swim, row and water ski. Although the Deben is valued as a rural estuary it is likely to become a favoured recreational destination for ever increasing numbers of visitors. The Estuary Plan welcomes opportunities for recreation but sets out to establish a balance between recreation, both on the river and in the immediate riverside area, and the conservation of a distinctive landscape and sensitive environment.

1.0.40 Flood and Emergency Resilience

It is important that local communities and businesses understand the need for flood resilience. Even where people and property are protected by flood defences there is the potential for storms and surge tides to overtop and breach defences – as was evident in December 2013 when properties were affected in Woodbridge, Waldringfield, Bawdsey and Felixstowe Ferry. How businesses react both before, during and after a flood is very important and the Environment Agency, in partnership with Suffolk County Council Joint Emergency Planning Unit, is working to help Estuary communities and businesses develop parish based Emergency Plans. The intention is that all parishes and businesses within the tidal floodplain have an awareness of the emergency plan process, that they have a plan in place and are able to respond to a flooding emergency.

The period of time covered by the Plan

1.0.41 The Government requires the Environment Agency to consider and plan for the likely risk of flooding over a 100 year period. This allows assessment of the possible effects of climate change and sea level rise and enables the decisions that offset change, minimise risk or trigger adaptive measures to be taken at the appropriate time.

1.0.42 At the local level a 100 year time-frame carries only limited meaning for the community who may find it difficult to relate policy to either long periods of apparent stability or circumstances that force immediate and unforeseen change. It can be hard for people to accept policy decisions if these are based on theoretical guidance from Government Bodies that may appear unsubstantiated by tangible evidence. If the consequences of sea level rise are not clearly apparent at local level, policy measures, such as managed realignment, are very likely to be resisted.

1.0.43 Inevitably the estuary will be affected by the interlocking factors of climate change, environmental pressure and availability of finance. If landowners, communities, businesses and stakeholders are to engage with the key issues that determine the future of the estuary it will be important to recognise that present circumstances will not stand still. To ensure that the management of the estuary is better understood and accepted, a new approach is proposed that goes beyond setting out flood defence policy on the basis of given periods of time. Instead of determining policy based purely on periods of time (i.e. 10-20 years) a more flexible approach identifies those factors which will cause incremental change and therefore may trigger the necessity to adopt changes in management policy. By the ongoing assessment of changing conditions a staged and more responsive approach to the implementation of policy can be adopted.

The factors likely to bring about changes to estuary management

1.0.44

- **Climate change / sea level rise:** an increasing pattern of extreme weather with more frequent surge tides is likely to cause damage to estuary walls and flood defence structures. Evidence of incremental sea level rise may be seen in the intertidal zone, where, for example, saltmarsh habitat may decline.

- **Changes to the estuary mouth and navigation:** weather conditions and coastal processes may alter the configuration of the entrance to the estuary. Substantial change to the shingle knolls is likely to affect the estuary dynamic, threatening the resilience of flood defences and therefore the safety of people, property and livelihoods.

- **Lack of finance to maintain defence:** continuing reduction in the national flood defence budget will limit the availability of grant aid for the maintenance or improvement of estuary flood defence structures. Estuary walls that do not protect domestic or commercial property will be unlikely to receive funding. This will have a direct impact on the amount of finance that will have to be raised from other, local sources. Without such funding the lack of maintenance will weaken defences and increase the risk of flooding.

- **Loss or fragmentation of saltmarsh:** changing climatic conditions and long term sea level rise will put aspects of the estuary's environment under increased pressure. Saltmarsh, both as an element of flood protection and a designated environmental habitat, will suffer. Loss or degradation of a high percentage of this important habitat could not only expose defence walls to increased wave and tidal action causing the deterioration of estuary defences but would also require compensatory measures, such as the creation of new intertidal saltmarsh elsewhere in the estuary.

- **Decline or loss of designated habitats:** international, European and national environmental designations protect the rich biodiversity of the area but habitats which are in a failing condition may need to be managed differently or may even trigger the obligation to create new, compensatory habitat.

- **Diminishing availability of freshwater:** climate change may bring a hotter and drier climate which will impact on the availability of fresh water necessary to meet the needs of a growing population and to sustain agricultural productivity. Without measures to manage water resources the present pattern of land use will come under pressure.

- **Sustaining local communities:** the economic prosperity of the wider area will call for more housing and business development. This will generate increasing pressure on the environment and prompt the need for compensatory measures to safeguard the environment.

Managing change over time

1.0.45 Bearing in mind the factors that are likely to trigger change the Plan identifies three periods of time:

Current, which ensures that communities, landowners and residents are aware of and able to respond to factors within the estuary that are likely to cause change. Together with the appropriate statutory authorities, they will be able to monitor and then determine the point at which the degree of change must trigger alternative management policies.

Over 20-30 years, which delivers proposals for the management of river walls and estuary habitats within a relevant and meaningful timeframe.

Over 100 years, which complies with the Government requirement to indicate options that recognise a timeframe of 50 to 100 years. This delivers the economic assessments necessary to attract Government funds and counteracts the difficulty which arises when short timescales do not allow flood defence projects to accrue sufficient benefits to attract funds.

2. Vision - the future of the Deben Estuary

2.0.00 The people who live in, work by or visit the Deben Estuary place great importance on:

- the integrity of defence structures and flood risk management which lessens the risk of flooding and offers sustainable protection.
- the distinctive quality of the estuary landscape, set apart from urban influence; the perceived tranquillity and inherent sense of peace.
- the special qualities of the environment affording enriched and bio diverse land and saltwater habitats.
- the contribution the estuary area makes to the local economy through agriculture, tourism and marine business.
- the opportunities for recreation supporting health and providing pleasure.

From this comes a vision for the future of the estuary and its hinterland

2.0.01 Safeguard the Deben Estuary from degradation by creating management partnerships of all the interested parties, particularly local communities, working together for future benefit.

Ensure that proactive estuary management, within the required legal framework, recognises and retains the character, tranquillity and special qualities of the area, balancing the many demands of wildlife, agriculture, recreation, tourism, business, access and the aspirations of local communities.

Deliver sustainable flood risk management, for those who live near, work on and visit the estuary; within timescales that recognise changing pressure on coastal landscapes and allow for environmental, social and economic adaptation when necessary.

Objectives and Outcomes

2.0.02 **Develop a sustainable, strategic approach to manage flood risk to property, agricultural land and other assets around the estuary up to 2100.**

Outcome: *To co-ordinate sustainable flood risk management policies throughout the estuary. To balance the diverse demands of community wellbeing, financial constraints, environmental requirements and climate change that influence the delivery of flood defence measures.*

2.0.03 **Recognise and consider the social, economic and environmental implications of climate change for the Deben Estuary.**

Outcome: *To ensure that the impact of climate change is recognised and monitoring demonstrates when mitigation or adaptation is needed to offset the impact of change on landowners, local communities and the environment. To secure appropriate defence or adaptation options to safeguard homes, businesses and farmland.*

2.0.04 **Conserve the landscape, natural environment, and heritage in the Deben Estuary, and take opportunities to enhance them.**

Outcome: *To facilitate and support the sustained conservation and enhancement of the natural and historic landscape as well as the distinctive and valued environment, all of which are important for wildlife and the wellbeing of residents and visitors. To safeguard the estuary landscape from the visual intrusion of new development.*

2.0.05 **Balance the benefits derived from quiet and tranquil areas of the estuary with the growing requirement for recreation, visitor enjoyment and an inclusive, sustainable visitor economy.**

Outcome: *To identify, value and retain undisturbed, tranquil areas of the estuary which provide a sense of peace and wellbeing. To recognise the importance for people's health of opportunities for enjoyment which the peace and tranquillity of the river and surrounding area offers.*

2.0.06 **Ensure compliance with the requirements of environmental legislation, including the Habitats and Wild Bird Directives and Water Framework Directive.**

Outcome: *To recognise, strengthen and enhance the habitats and biodiversity of the estuary and its hinterland. To maintain designated International, European and national environmental sites in good condition and ensure that any adverse impact on the adjacent hinterland is answered by appropriate compensation and mitigation measures.*

2.0.07 **Underpin business, with particular reference to agricultural, marine and leisure industries.**

Outcome: *To foster a sustainable and viable local economy, with particular reference to the agricultural, marine and tourism sectors. To support sustainable tourism that is compatible with and complements the character of the Deben Estuary. To ensure the benefit derived from tourism and attendant development does not compromise the landscape and wildlife assets which exemplify the distinctive and special qualities of the estuary.*

2.0.08 **Promote the beneficial use of dredging spoil, particularly for the recharge of saltmarsh in the Deben Estuary.**

Outcome: *To ensure dredging within the estuary supports the viability of boatyards, marine business and the management of moorings. To facilitate an estuary wide, integrated approach to the use of dredging spoil to recharge degraded saltmarsh as part of an on-going saltmarsh management strategy which benefits navigation, flood defence and biodiversity.*

2.0.09 **Ensure there is adequate fresh water to meet human needs, secure a healthy environment and deliver a sustainable local agricultural economy.**

Outcome: *To ensure good management of all water resources in order to meet human needs, maintain the environment and sustain, via irrigation ,nationally important agricultural land, both within the estuary and on uplands above the valley. To promote whole river catchment area management able to conserve and store winter water and provide more sustainable reserves for use during periods of drought.*

2.0.10 **Take opportunities to improve water quality within the Estuary or reverse any decline.**

Outcome: *To promote the importance of good water quality for marine biodiversity and for the safe use of the river for recreation. To recognise sources of pollutants and foster action to limit and mitigate their effect.*

2.0.11 **Manage responsible access to the estuary enhancing the quality of people's enjoyment of the area while averting harm to, and mitigating against, degradation of the estuary environment.**

Outcome: *To support appropriate access to the estuary area for all. To support the network of paths which allow residents and visitors to reach and enjoy many areas of the estuary but recognise the impact people and new development can have on the environment. To limit and mitigate the disturbance that will be caused.*

2.0.12 **Develop emergency planning that safeguards communities at risk from flooding**.

Outcome: *To encourage communities to recognise risk from flooding and ensure that adequate measures are in place which will help to keep residents safe and protect properties.*

2.0.13 **Encourage and support communities to deliver projects that take the objectives of the Deben Estuary Plan forward.**

Outcome: *To encourage communities to work in partnership with statutory bodies, Local Authorities, Parish Councils and local organisations to advance the aims and actions set out in this Plan.*

2.0.14 **All projects arising from the Deben Estuary Plan will be subject to Habitats Regulations and Water Framework Directive screening and assessment where required.**

Outcome: *To ensure that, whenever projects are planned, the integrity of the SPA and its hinterland are taken into account and safeguarded. To ensure that appropriate screening assesses the cumulative impact of projects in order to protect the wildlife and environment of the Deben estuary.*

3.1.00 **The context for flood defence management**

Physical flood defences are managed to reduce flood risk. Seen in combination with local emergency plans they promote community resilience to flooding. The ongoing management of defences must be considered in the context of coastal change and a predicted increase in extreme weather and tidal surge events as a result of climate change. Risks will vary depending on the location of the defence. In 2009 the standards of flood risk protection varied greatly throughout the estuary. Using the Environment Agency's Technical Assessment which supports this Plan, a minimum, estuary wide, standard of flood protection able to meet a 1 in 75 year event (allowing some overtopping of rural walls) is recommended.

3.1.01 **The estuary in relation to coastal processes**

The tidal movement within the North Sea basin sees the flood tide moving from north to south. Due to a bottleneck effect where the southern North Sea meets the English Channel, tidal surges, driven by a combination of extreme weather conditions, barometric pressure and spring tides, can back up along the Suffolk Coast exposing both cliffs and the low lying coastal plain to larger swell waves and potential overtopping of defence works. This can result in unusually high tides within the estuary and the possibility of overtopping and breaching of defences.

3.1.02 The coastal frontage of the Deben, including the lower estuary, is covered by **the Suffolk Shoreline Management Plan -SMP 7, Lowestoft Ness to Landguard Point,** (Spring 2012). Policy Development Zone 6, Management Area reference Deb 17, considers the risks of coastal erosion and indicates how the shoreline would retreat as well as the possible changes over the next 100 years were the coastal defences not maintained. The SMP does not consider the effect of changes within the entire estuary but does recognise the mouth of the estuary to be a critical factor.

3.1.03 The summary of the preferred policy of the SMP for the Deben in the short, medium and long term is:

- **From the present day**: Improve the defences at Bawdsey Manor in a manner consistent with maintaining the Deben Wstuary mouth configuration. Maintain protection to locally vulnerable sections along the Felixstowe Ferry frontage.
- **Medium Term:** Maintain defences.
- **Long Term:** Maintain defences and improve or adapt defences within the Deben Estuary.

3.1.04 To supplement the Shoreline Management Plan, the Deben Estuary Plan undertakes a strategic assessment of current and future flood risk management with the objective of promoting the sustainable long term management of the estuary and its flood defences.

3.1.05 **The coastal frontage to the north of the Deben Estuary**

There is a strong relationship between the coast to the north of the Deben and the estuary mouth. Any management of this frontage will need to consider the wider coastal processes and impact on the Deben Estuary mouth and associated shingle banks.

3.1.06 The SMP notes that there is considerable uncertainty about the behaviour of the coastal frontage to the north of the Deben but recognises the impact this coastline has on the mouth of the Estuary and the Knolls.

The intention is to manage the configuration of Hollesley Bay, letting the wide shingle beach to the north and cliffs to the south of East Lane erode back. It is important to allow the natural throughput of sediment along the Bawdsey frontage and across the mouth of the Deben while, at the same time, maintaining defences below Bawdsey Manor consistent with SMP policy and the need to safeguard the mouth of the estuary.

3.1.07 From the open coastal frontage to Bawdsey Quay a section of sheet piling differs greatly from embankment defences within the estuary. While the SMP recommends that the mouth is held the ongoing management of this frontage is challenging and will require a different approach from the rest of the estuary.

The coastal frontage to the south of the Deben Estuary

3.1.08 On the south side of the estuary mouth the SMP policy for the Felixstowe Ferry frontage of holding the line is seen as an essential part of managing the whole area. Further south, along the north Felixstowe frontage, the aim is to maintain the defence, permitting the varying supply of sediment coming down the coast to lessen the need for overall control of coastal processes.

The mouth of the estuary

3.1.09 Prior to post glacial sea level rise, the wider Thames estuary, from Orford Ness in Suffolk to North Foreland in Kent, was drained eastwards by three river valleys. It is generally believed that one of these rivers was the Stour with its tributaries, the Orwell, Deben and Butley rivers. As sea levels rose separate estuaries for each of these rivers were created with the size and location of the mouth of the Deben varying over time. Further change to the mouth occurred when large areas of the open estuary saltings were enwalled between AD1200 and AD1600 in order to create summer grazing marshes. The impact of this was to narrow the mouth of the estuary to the approximate configuration it has now. Today the mouth of the Deben Estuary is a very dynamic part of the Suffolk coast where coastal processes are interacting with the estuary.

The Knolls

3.1.10 The Knolls are the extensive offshore shingle banks at the mouth of the estuary (Woodbridge Haven), which are visible at low water, but mostly submerged when the tide is high. These banks, fed by sediment travelling down the coast from Hollesley Bay, are continually shifting, building up and breaking down in response to prevailing winds and storms. The pattern of the sediment accretion is thought to behave on a cyclical basis. The Knolls accumulate sediment to a point where they eventually collapse, feeding shingle onto the Felixstowe shore or up into the estuary towards Felixstowe Ferry.

Mike Page

3.1.11 Although the size, extent and position of the Knolls vary, they protect the mouth of the estuary from North Sea swell and play a key role in governing the characteristics and behaviour of the whole estuary. As the Knolls change position the channel into the Deben varies in orientation and length. Frequently aligned nearer to the southern Felixstowe shore, it runs just east of the Martello tower at Felixstowe Ferry, where it is confined between the Felixstowe Ferry frontage and the Knolls. When the banks break down the channel realigns, swinging towards the north.

3.1.12 **There is agreement on two points regarding the mouth of the Deben Estuary:**

- The general location of the mouth and main channel does not seem to have changed greatly over the last 200 years although the configuration of the Knolls has varied substantially.
- Much of the mouth is regularly submerged by the tide. In order to identify its full extent it is necessary to include a significant area both offshore and back upstream towards Felixstowe Ferry Sailing Club.

Felixstowe Ferry - Coastal defence

3.1.13 Modern flood and coastal defences have been in place at Felixstowe Ferry since 1953 when they were constructed to prevent a repetition of the flooding that occurred at that time. Previously the shoreline would have been allowed to move in response to wave attack and the changing pattern of the Knolls but now the hard defences protect the Ferry hamlet and valuable assets in the coastal hinterland.

3.1.14 The coastal defences that have been put in place have usually been designed taking account of the protection given by the Knolls. Problems occur when northerly and north easterly winds drive larger waves through the shingle banks and different stretches of the foreshore come under attack. When this has happened rock armour has been used to shore up the defences.

3.1.15 It is hard to predict when the Knolls will shift and how much shingle they will release onto the Felixstowe Ferry shore. As a consequence regular investment is likely to be required at this location if the hamlet is to be protected from the sea.

3.1.16 Tides entering the mouth of the Deben Estuary have mean spring and neap ranges of 3.2 metres and 1.9 metres respectively. The strength of the currents through the channel can make navigation challenging.

3.1.17 **It is agreed that:**

- The Knolls shelter the estuary and constrain the tidal flow going into the river.
- Under certain weather conditions larger waves are able to pass over or through gaps in the Knolls and break on the Felixstowe Ferry frontage.
- As the configuration of the Knolls changes so does the point along the shoreline where wave energy is greatest and therefore the existing coastal defences are under most direct pressure. This heightens the risk of flooding at Felixstowe Ferry.

Felixstowe Ferry - Estuary defence

3.1.18 Gradual erosion of the Felixstowe Ferry frontage over the past 200 years has brought the shoreline much closer to property and so there is less flexibility in the coastal defence line. The deep water channel into the estuary has moved closer to the Felixstowe Ferry frontage, allowing the foreshore to fall away steeply. As the deep water channel attempts to undermine the existing defences, the foreshore becomes less stable and it is difficult to know how best to defend it, both in the immediate future and in the longer term.

3.1.19 In 1979 a cross wall was constructed linking the coastal defence at Felixstowe Ferry with the estuary flood defence wall protecting Felixstowe Marshes. This cross wall leaves properties around the Felixstowe Ferry Sailing Club outside the flood defences and at risk of flooding. However, some protection from erosion is provided by a clay embankment. The Tomlin Wall, to the west of Ferry Road, is currently not treated as a flood defence but if suitably strengthened has the potential to act with the cross wall and coastal defences to protect the hamlet from flooding should Felixstowe Marshes become flooded.

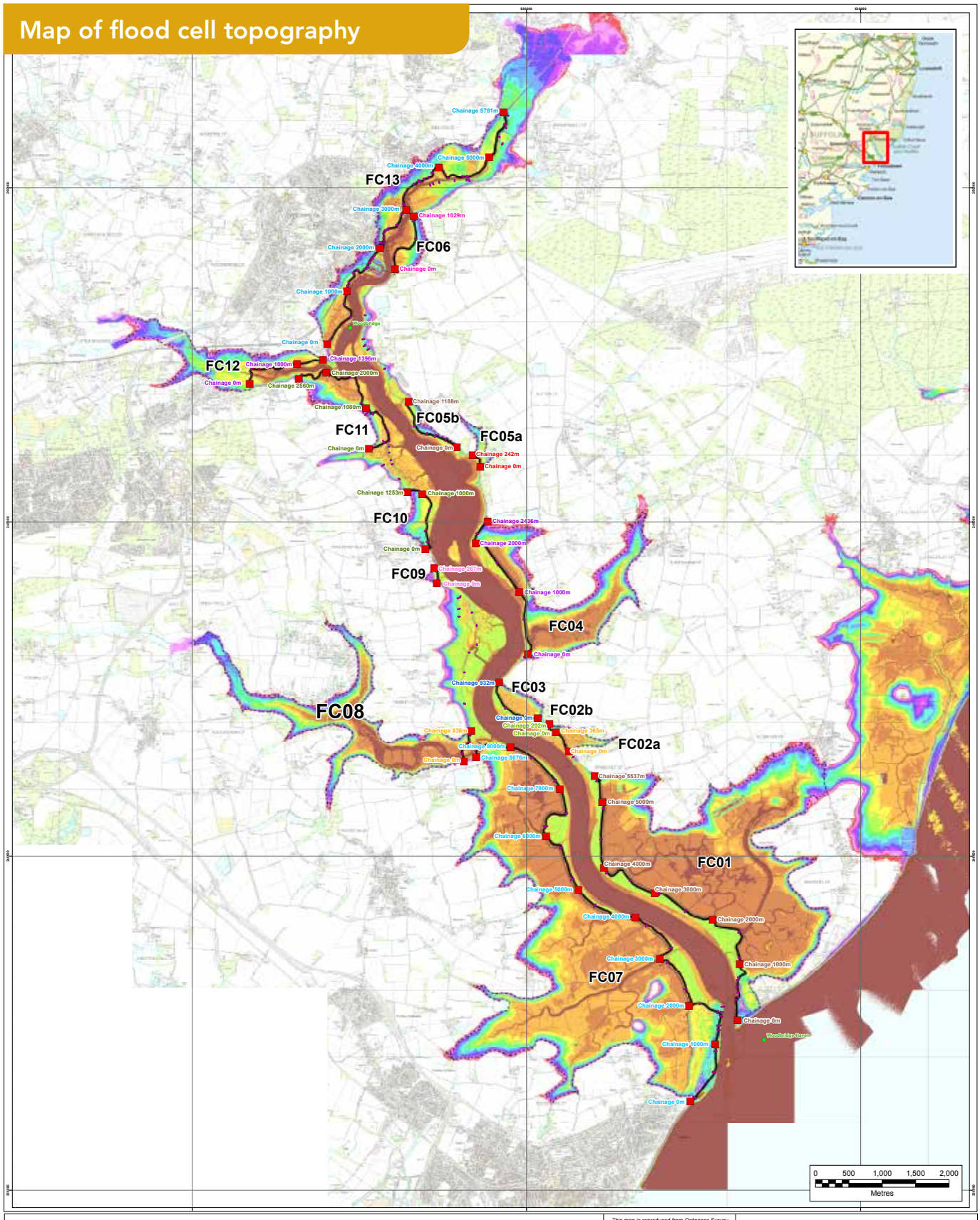
The mouth of the estuary - conclusions

3.1.20 In this complex and dynamic system, the threat posed by both coastal erosion and flooding may change over time, but the failure of any part of the defence system, already under pressure, could result in a significant increase in flood risk.

If defences along the shoreline were allowed to fail, the shore would erode back; as the defence failed around the entrance to the Deben, the mouth would widen and probably become highly dynamic with channels forming and changing through the Knolls. It is therefore important that all options for this coastal frontage are considered while there is time to respond, rather than simply reacting after the event.

C. Block

Map of flood cell topography



Legend:

- Chainage Marker
- Defence Cross Sections
- Surveyed Defences
- Flood Cells (November 2010)
- Mean Water Location

	MHWS	MHWN	MLWN	MLWS
Woodbridge Haven	3.7	2.9	1.0	0.5
Woodbridge	4.0	3.1	0.9	0.4

Composite Ground Model (mAOD)

5.0 - 5.5	2.0 - 2.5
4.5 - 5.0	1.5 - 2.0
4.0 - 4.5	1.0 - 1.5
3.5 - 4.0	0.5 - 1.0
3.0 - 3.5	0 - 0.5
2.5 - 3.0	<0

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Environment Agency

Deben Estuary Strategy

Overview of Flood Cell Topography

Rev.	Description	Drawn	Approved	Date
01	First Draft	PH	AJS	26/09/11
02	For Issue	AS	AJS	25/10/11

Scale: 1:25,000 @ A1 Project Number: 108632 Drawing Number: 0101

The Estuary

3.1.21 Requirement for flood protection

The estuary has some 33km of flood embankments which protect over 1300 properties and hundreds of hectares of land. Defences are predominantly grass covered clay walls, which follow historical defence lines dating back centuries to when areas of saltmarsh were reclaimed for agricultural production. Some of the low-lying, reclaimed land protected by the walls is below sea level and consequently vulnerable to storm surges and flooding.

3.1.22 Without flood defence measures, communities such as Felixstowe Ferry and Bawdsey Ferry, would be vulnerable to flooding. Properties further up the estuary at Waldringfield, Martlesham and Woodbridge could be affected and key infrastructure throughout the estuary - roads, railways, water and electricity distribution and sewage works – would also be at risk.

3.1.23 The combination of climate change and sea level rise is likely to bring an increase in the frequency and severity of tidal flooding. In extreme circumstances this could result in the widespread failure of estuary defences and the inundation of large tracts of low-lying estuary land (demarcated as 'flood cells'). Changes in approach to the flood risk management of such areas could affect the extent and quality of the soil resource, and therefore the ability to support different types of land use. Such changes have the potential to affect not only communities but food production, the local economy and wildlife habitats.

3.1.24 Beyond the protection of people and property, flood defence measures must be mindful of the impact of flooding on the natural environment. Much of the Deben is protected under the European Natura 2000 obligations and Special Protection Area (SPA) and Sites of Special Scientific Interest (SSSI) designations are in place across all or part of the tidal estuary. UK government interpretation of this legislation is that Natura 2000 sites must be maintained in situ, if it is sustainable to do so, and if that is not possible, compensatory habitat must be provided prior to an initial loss.

3.1.25 The Convention on Wetlands of International Importance places a responsibility on the UK government to designate wetlands of international importance and promote their conservation; the Deben estuary includes a number of such RAMSAR sites. Climate change, and in particular sea level rise and an increased risk of flooding, may cause changes to intertidal zone habitats, such as mudflats and saltmarsh, and impact on the species that such areas support.

3.1.26 The estuary hinterland, although currently protected by existing defences, is not included within either the SPA or Ramsar site boundaries. However, some qualifying species such as Dark Bellied Brent Geese, use habitats landward of the existing defences as part of their life cycles and this has to be taken into consideration.

3.1.27 In developing a management plan for the Deben estuary, the requirements for protection of listed species must be taken into account. The likely impacts of management policies contained within the Plan are subject to a Habitat Regulations Assessment (HRA). Where an HRA identifies that a policy or subsequent project will result in an adverse effect on the integrity of a European site, the plan (or project) cannot go ahead unless there are no feasible alternatives available, there are imperative reasons for overriding environmental legislation and compensatory measures can be provided. This is to ensure that nature conservation sites of European importance are afforded the highest level of protection from any damaging impacts of development. In the case of the Deben Estuary compensatory measures would be required to ensure the overall coherence of the Natura 2000 network was maintained.

Changing nature of flood defence

3.1.28 Following the floods of 1953 there was considerable damage to defences around the East Coast. Estuary walls were repaired and rebuilt to a higher standard of protection and over the following 60 years maintenance has continued where appropriate. While the Environment Agency do not own the defence walls (these belong to the landowners whose holdings abut the river) historically the EA have managed the walls and carried out maintenance. This arrangement is changing. The present focus of Government funding is to protect people and property and a lack of government investment in rural defences demands a different approach. To facilitate this, the EA has established new ways of working which offer not only support but greater autonomy to landowners who wish to maintain and enhance their own walls. In addition statutory Flood Risk Management Authorities and the East Suffolk Internal Drainage Board are also adopting new working relationships with the EA in order to undertake flood defence projects.

Archive photograph
Flooding at Felixstowe Ferry 1953

Determining future flood risks

3.1.29 Knowledge and understanding of the frequency and potential severity of flooding is based on past flood events as well as modern flood modelling techniques and international and national climate change predictions.

3.1.30 Using current data on the risk of flooding from tides and storm surges computer modelling is able to build a picture of future water levels within the estuary. Accurate information, achieved using LIDAR technology is able to give land levels within the flood plain and show the extent of current flood risk. In map form this delineates the estuary section by section and forms the basis on which future flood risk may be assessed. Areas of low lying land, below the 5 metre line, at risk of flooding if defences fail, are separated into compartments, flood cells, the largest and most significant of which are Flood Cell 1 Bawdsey Marshes and Flood Cell 7 Felixstowe Marshes.

3.1.31 Modelling has looked at how the estuary behaves in the present day and considered how estuary processes may alter over time taking sea level rise and natural change into consideration. Local knowledge has also been incorporated into the EA modelling of estuary processes in order to understand fully the flood risk in the Deben estuary. A range of different scenarios, including the loss of flood defences from some or all of the flood cells, a widening of the mouth, changes to the Knolls and future sea level rise, have been considered together with the effect different management options would have on water levels and tidal velocities during normal and surge tide conditions. Data from this work has been used to build a picture of future flood risk over the next 20-100 years.

3.1.32 The East Coast surge in December 2013 saw the over-topping of many of the defences in the Deben, some walls were breached and properties were flooded in several locations, notably at Waldringfield. This event displayed all too clearly that flood risk remains a significant issue, particularly in circumstances where weather systems in the North Sea combine with high spring tides to create a storm surge that increases water levels at or around high tide.

3.1.33 Without intervention, it is estimated that flood defences for most of the flood cells would breach within 20 years. If defences fail at Felixstowe Ferry it is likely that the estuary channel would widen and deepen with an attendant effect on the level of erosion on the Felixstowe Ferry shore followed by an unquantifiable alteration in the behaviour of the Knolls. Should defences be lost at either Bawdsey Marshes (Flood Cell 01) or Felixstowe Marshes (Flood Cell 07) the volume of water flowing into and out of the estuary on each tide would increase. This would have a noticeable impact on the tidal prism (the volume of water in the estuary between mean high tide and mean low tide) and increase the tidal velocities at the entrance to the estuary. This, in turn, would exacerbate the effects of erosion at the estuary mouth, increasing its width and depth, and exposing the coastal defences along the Felixstowe Ferry frontage to more severe wave and tidal action.

3.1.34 Following a failure of the estuary defences at FC01, Bawdsey Marshes, and FC07, Felixstowe Marshes, there would be an initial decrease in water levels within the whole estuary as tidal waters were able to spread over a greater area. But, over time, the widening of the estuary mouth, combined with sea level rise, would lead to an estuary wide increase in water levels. Existing land use would change due to more frequent flooding and some properties might not be habitable. The community of Felixstowe Ferry, at risk from erosion of the mouth of the estuary, would become increasingly vulnerable. In due course this would affect the equilibrium of estuary processes, impacting on the entire tidal length of the river; properties in Woodbridge would be affected and the change in the tidal range could alter and potentially constrain navigation in the upper reaches. Key infrastructure throughout the estuary, such as roads, rail, water supply, wastewater treatment and electricity distribution, could be either lost or damaged, with an associated, negative impact across a much wider area.

3.1.35 The preferred option is therefore to maintain the existing defences (i.e. "Hold the Line"), so that the estuary mouth remains as it is, the Knolls, in some similar configuration, are maintained, as are the defences for Flood Cells 01 and 07, and water levels within the estuary are unchanged (apart from gradual sea level rise).


Andrew Hawes

Ongoing viability of maintaining all Estuary Walls

3.1.36 During 2009 technical work was undertaken to establish the condition of estuary defences, the standards of protection they offered and the type of assets the defences protected. A cost benefit analysis, following Environment Agency Flood and Coastal Erosion Management guidance, was undertaken. This analysis set out a cost for maintaining or improving each section of flood defence as against the value of the benefits that the defence protected. A range of economic criteria was used to attribute value to residential and non-residential property, agriculture, utilities, roads, railway, recreation and risk to life. In addition environmental and social characteristics, including flora and fauna, soil quality, historic environment, landscape character and climate change, were considered. As a result of landowner feedback, the wider economic benefits of freshwater abstraction points able to facilitate agricultural production on highland ground (with a consequential change to agricultural land values) were factored into the equation.

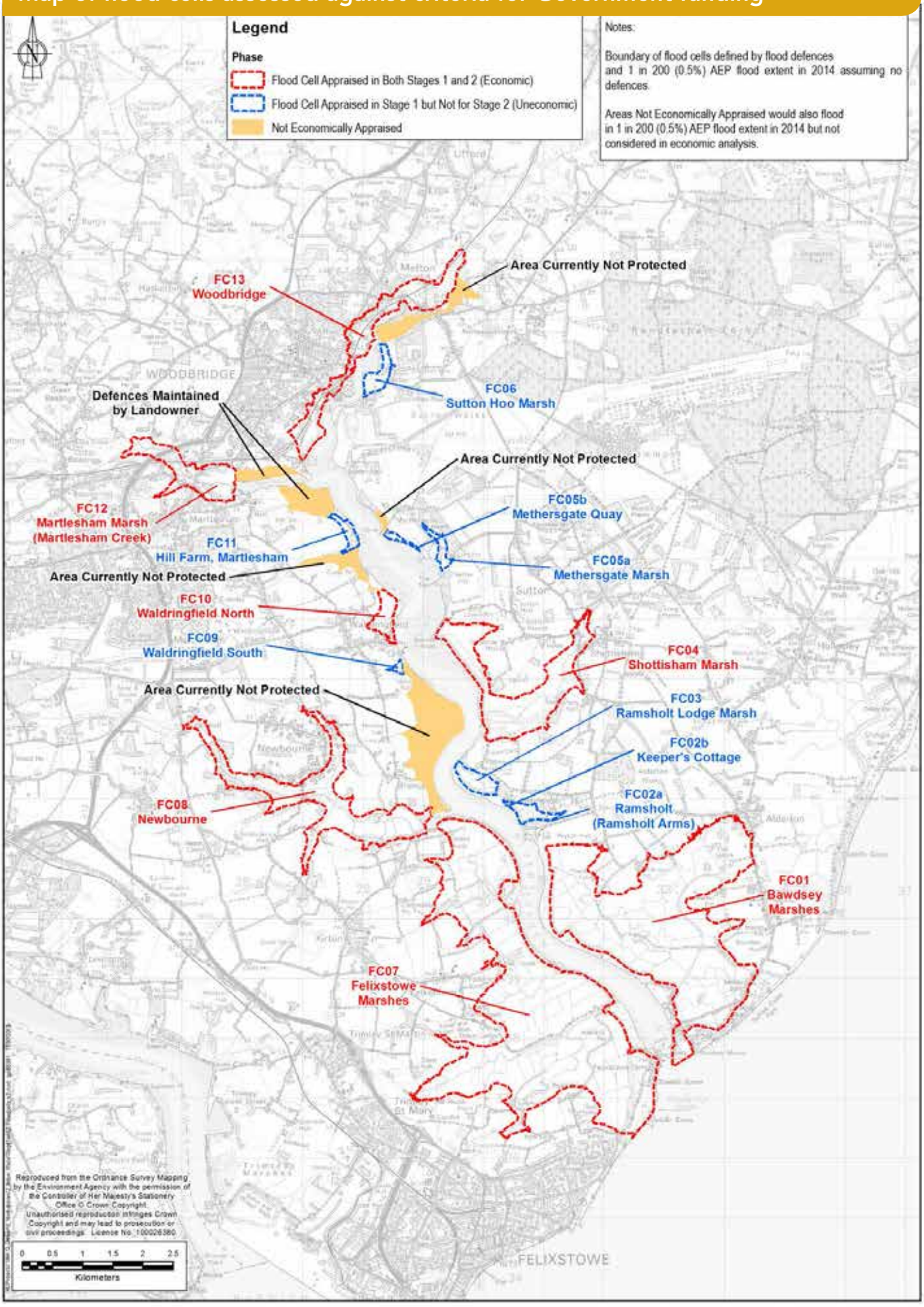
3.1.37 Set against Government policy, which is weighted in favour of reducing flood risk to people and property, the outcome of this analysis indicated where flood defence work would qualify for at least some funding. Where defences were unlikely to qualify for Government funding they could be managed locally by the landowner, perhaps in partnership with others. Thus, in the case of a small rural flood cell, with little or no residential property, the cost benefit ratio would not meet the levels required to secure Government funding, leaving landowners the choice of whether to maintain, improve or realign their own defence.

3.1.38 In the Deben, 6 out of 13 flood cells do not qualify for Government funding. The remaining flood cells, numbered 1, 4, 7, 8, 10, 12 and 13, are considered economically viable and could seek an element of Government funding. These are typically defences which protect areas where there are significant numbers of people and properties at risk.

3.1.37

Deben Estuary Flood Cells	Flood Cell Name	Cost benefit to allow future Government funding
FC1	Bawdsey Marshes	economic
FC2a	Ramsholt (Ramsholt Arms)	uneconomic
FC2b	Keeper's Cottage	uneconomic
FC3	Ramsholt Lodge Marsh	uneconomic
FC4	Shottisham Marsh	economic
FC5a	Methersgate Marsh	uneconomic
FC5b	Methersgate Quay	uneconomic
FC6	Sutton Hoo Marsh	uneconomic
FC7	Felixstowe Marshes	economic
FC8	Newbourne	economic
FC9	Waldringfield South	uneconomic
FC10	Waldringfield North	economic
FC11	Hill Farm, Martlesham	uneconomic
FC12	Martlesham Marsh (Martlesham Creek)	economic
FC13	Woodbridge	economic

Map of flood cells assessed against criteria for Government funding



Defence of rural flood cells

3.1.39 It is accepted that Government finance to maintain the defence of rural flood cells, which do not meet their cost benefit criteria of protecting people or property, will either not be available at all or only in small measure. However, landowners and communities are often disinclined to see this result in the withdrawal of all maintenance and improvement of such defences. They recognise the economic, environmental and social value of the estuary in its present form and wish to explore alternative ways and methods of managing all necessary flood defence.

3.1.40 Based on this position, landowners, local communities and other beneficiaries, working with Statutory Bodies, will be able to drive locally preferred solutions and priorities. Local preference may well be for a more robust standard of protection but beneficiaries must be aware that they will have to fund the cost of work which either does not qualify for any Government money or goes beyond the standard recommended by national guidelines.

3.1.41 Some landowners, enabled by the more streamlined consent and licensing process developed by the EA, are already maintaining and strengthening their defences at their own cost. Such action not only benefits the individual landowner and enhances the overall standard of protection but safeguards rights of way and permissive paths which run along the top of the walls and provide recreational access to the estuary.

Simon Read

Future methods of maintenance and improvement – over-topping

3.1.42 Ensuring that estuary walls can survive storm surge events without multiple breaches can influence the financial viability of any maintenance and improvement options.

(Andrew Hawes – Report for the Deben Estuary Partnership Flood Cell Survivability Report 2013)

The adoption of a "controlled over-topping" approach, which allows temporary flooding of the flood cell, can help to ensure the survivability of the defence and thus reduce the cost of any neccesary repair work after flooding. Applying this approach consistently throughout the estuary will be beneficial. To date (October 2014) landowners have used this measure at a number of estuary locations, notably Ramsholt, Sutton and Martlesham. The EA are contributing to comparable work on the economically viable wall which protects FC 8, Kirton Creek. The East Suffolk Internal Drainage Board (ESIDB) are also progressing a scheme with Waldringfield Flood Defence Group which will offer an improved level of protection as well as creating and securing freshwater habitat. However, significant further investment will be needed to deliver similar measures for other defences, notably FC1, Bawdsey Marshes, and FC4, Shottisham.

3.1.43 The approach above focuses on securing survivable estuary defences which are resilient to future tidal flooding. However it should be acknowledged that, in the long term, there may be some Flood Cells where the need may arise to consider further options, such as defence re-alignment, as a more practical and cost effective solution. This is particularly in cases where any additional protection offered by a revetment or fringing saltmarsh is likely to fail in the future. Therefore if, in 30 or 35 years time, present lines of protection are found to be inadequate or have become too costly to maintain in their current position, alternative solutions will be required.

3.1.44 In accordance with Government's instruction to prepare flood defence management policies that recognise changing climatic conditions, sea level rise and the frequency and severity of tidal flooding, there may be the future need for new defences to be built along new alignments in order to protect populated areas. The Environment Agency recommends that adaptive options be considered to provide additional flood protection for the Felixstowe Ferry area (FC07), counter-walls to the north and south of Woodbridge and Melton (FC13) , to the south of Shottisham village (FC04) and protection for the road to Bawdsey Ferry along the edge of FC01. These options may need to be considered in the future but the more immediate action will be to develop schemes and secure funding to manage the existing defences for FC1 and FC4.

Principles informing policy

3.1.45

- The economic, environmental and social benefits of ensuring the survivability of estuary flood defences are fully recognised. Consideration must be given to the continuing evolution of the mouth of the estuary, potential environmental degradation and the effects of climate change.

- Climate change is likely to result in more variable weather patterns - warmer temperatures, wetter winters, drier summers and stormier conditions. The effects of such changes will carry increased risk of fluvial and coastal flooding (Defra quantify this as a 10% increase in fluvial flows by 2025) .

- Flooding in FC01 (Bawdsey Marshes) and FC07 (Felixstowe Marshes, including Felixstowe Ferry), either alone or in combination, will have a noticeable impact upon the tidal prism, affect water levels in the estuary and cause changes to the mouth and the Knolls. Management of FC01 and FC07 must take account of these likely consequences.

- Flooding upstream of inner estuary flood cells (FCs 02 to 06, 9 and 11) will have a negligible impact on water levels within the estuary. These upstream flood cells could be managed independently in order to meet the needs of the landowner and wishes of wider beneficiaries but the long term effects of sea level rise may, ultimately, demand adaptive measures.

The context for policy

3.1.46

- In order to have a sustainable, strategic approach to managing flood risk a combination of flood risk management options and different ways of funding and delivering those options is necessary. Partnership working between landowners, communities, the ESIDB and EA can facilitate this.

- Government investment in flood defence is targeted towards measures which protect people and property. Some areas of the estuary are eligible to receive national funding; this has allowed improvements to defences protecting key communities, Waldringfield, Newbourne and Woodbridge, to be delivered or planned. Defences at Felixstowe Ferry are already of a high standard and will continue to be maintained.

- Consents and licensing issues have been addressed to ensure legitimate private defence work is not hampered. Private works by landowners can be progressed and innovative techniques and approaches are being shared across the Suffolk estuaries.

- New funding sources, such as enabling development, must be identified to support ongoing management of defences. The Deben Estuary Partnership, in conjunction with others, will endeavour to raise funds for work within the estuary – including for those areas where Government funding is limited or unavailable.

Objectives

3.1.47 **Develop a sustainable, strategic approach to manage flood risk to property, agricultural land and other assets around the estuary up to 2100.**

Outcome: *To co-ordinate sustainable flood risk management policies throughout the estuary.*
To balance the diverse demands of community wellbeing, financial constraints, environmental requirements and climate change that influence the delivery of flood defence measures.

Recognise and consider the social, economic and environmental implications of climate change for the Deben Estuary.

Outcome: *To ensure that the impact of climate change is recognised and monitoring demonstrates when mitigation or adaptation is needed to offset the impact of change on landowners, local communities and the environment.*
To secure appropriate defence or adaptation options to safeguard homes, businesses and farm land.

Policy

3.1.48

- Encourage partnership working between Flood Risk Management Authorities to ensure an holistic approach to managing flood risk and securing funding.
- Maintain and/or improve flood defence assets that protect estuary communities, businesses and the environment by working with land and property owners, local residents, Parish Councils, the Environment Agency and the East Suffolk Internal Drainage Board.
- Deliver maintenance and/or improvement for economically viable flood cells.
- Manage flood defence assets protecting rural areas. Work with landowners to deliver the best strategy for maintaining or improving these defences.
- Seek co-ordinated funding solutions to deliver maintenance / improvement of estuary defences.
- Prepare a considered response to flood risk management at Felixstowe Ferry - thus avoiding short term reactive measures. In partnership with landowners, communities and statutory bodies, explore a potential secondary defence line to reduce flood risk in the event that the Knolls move, the level of erosion is changed and defences are compromised.
- Recognise that saltmarsh offers an element of flood protection, continue to deliver saltmarsh restoration projects and ensure existing marshes are managed and enhanced.
- Seek co-ordinated, well-timed work on wall which minimises impact on wildlife and safeguards valuable habitat and flora and fauna.
- As and when loss of habitat is evidenced work in partnership, with landowners, statutory organisations and interest groups, to consider locations where new, compensatory intertidal habitat could be created.
- Monitor and record, on an annual basis, change within the estuary: evidence of sea level rise, coastal squeeze and any ongoing loss of intertidal habitat.
- Implement appropriate flood risk management policies that respond to estuarine change, developing and implementing adaptive options when required.

Wider context - Landscape designations

3.2.00 The Deben Estuary, one of five Suffolk estuaries, is a protected landscape under the Suffolk Coast and Heaths Area of Outstanding Beauty designation. It is a Valley of Significance in the Suffolk Coastal Local Plan (SP15) and the lower Deben is part of the Suffolk Heritage Coast. This is an exceptional area for biodiversity and wildlife and almost the entire tidal estuary is designated as a Special Protection Area (SPA), Ramsar site (conservation of wetlands) or Site Of Special Scientific Interest (SSSI).

3.2.01 The built environment and historic landscape includes many fine listed buildings and grade one churches; examples include Bawdsey Manor with its surrounding park and garden, conservation areas in Woodbridge and Shottisham, designated for their special architectural or historic interest, and the internationally important Anglo Saxon burial site at Sutton Hoo. Archaeology across the area is of significant importance but some heritage assets may be at risk from flooding.

3.2.02 The National Planning Policy Framework (NPPF) gives landscape and scenic beauty in Areas of Outstanding Natural Beauty the highest level of protection and states that wildlife and cultural heritage are important considerations. The Suffolk Coast and Heaths AONB Management Plan says that "People's sense of place and belonging in landscape should not be underestimated".

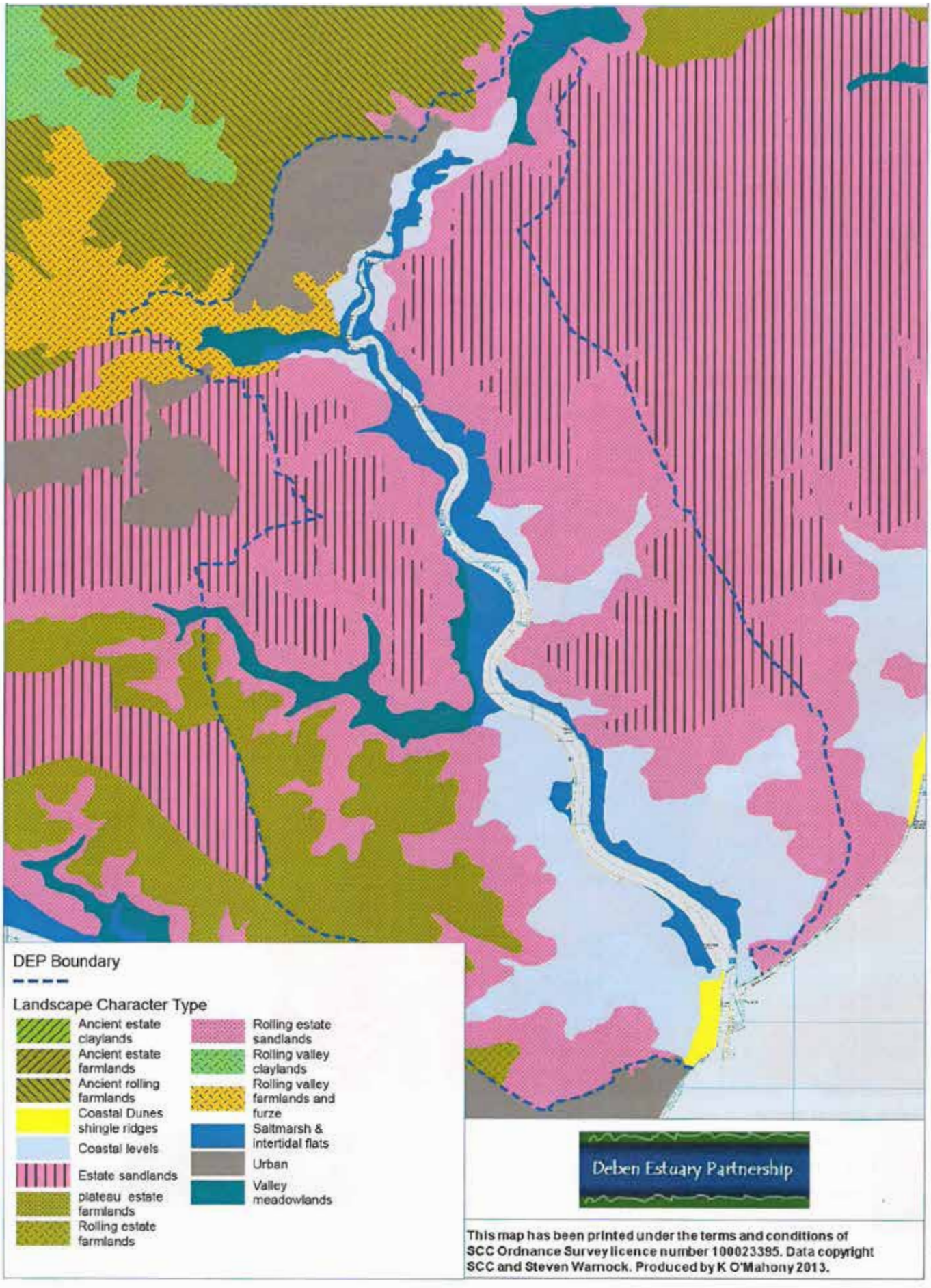
3.2.03 **Landscape types**

The high quality landscape extends from the unique ebb tide delta shingle ridges and banks of the Knolls, across vegetated coastal shingle beaches to the saltmarsh and intertidal flats of the river; past the coastal levels and open arable fields of the floodplain, the reedbeds and grazing marsh of the tributary valley meadowlands and on through the estate farmlands with their stands of pines to the acid grasslands beyond – a landscape of great diversity within a relatively small area. Most of the land is privately owned, there are no large public parks apart from areas of green space at Woodbridge, Melton and Felixstowe, but public footpaths offer access into the countryside.

3.2.04 The settlement pattern sees small villages, such as Bromeswell, Sutton and Kirton, on the higher ground above the estuary plain while others, Waldringfield and Felixstowe Ferry are down at the water's edge. The busy market town of Woodbridge is at the head of the estuary and acts as a gateway to the AONB while, not far beyond the estuary, the urban and commercial centres of Felixstowe and Ipswich continue to expand. There are few public roads near to the river and along much of the estuary a largely wooded skyline allows only glimpses of urban development. At night the glow of light from Felixstowe and the docks is seen in the southern sky but the estuary itself remains predominantly dark overhead.

Chris Woods

Map of landscape types




Haidee Stephens

Perception of the landscape

3.2.05 The landscape has been governed by the interaction of water and land, moulded by farming practices and social aspirations, enhanced by rich biodiversity. It can be busy in summer but quiet in winter; for many it carries a sense of place that engenders wellbeing, a feeling of peace and tranquillity.

Many elements of the estuary landscape are sensitive to change and it will be necessary to balance climatic, economic and social pressures but throughout the consultation process that underpins this Plan the importance given to the 'quality' of the landscape and the sense of peace that it engenders has been virtually unqualified.

The River Entrance - Bawdsey and Felixstowe Ferry

3.2.06 To the north and south of the estuary mouth vegetated shingle beaches erode and rebuild and the rare and ever-changing off shore shingle banks, the Knolls, frame the view of the sea from the estuary. Container ships, appearing surprisingly close, pass in the nearby shipping lanes on their way to and from the ports of Felixstowe and Harwich. The sight of Bawdsey Manor, set in wooded parkland, gives the entrance to the river a grand and rather romantic air while on the opposite shore an earlier military presence is marked by two Martello towers. An historically important golf course (formed in 1880 and sympathetically managed to enhance the environment), occupies the sandy coastal levels between Felixstowe town and the Ferry. There the boatyard, moored yachts and fishing boats are features of a popular seaside hamlet, busy with visitors in the summer but quieter on winter days.

3.2.07 The Felixstowe Ferry Foreshore Trust owns three acres of foreshore surrounding the boatyard, and manages it, aiming to "maintain the essential character of the Felixstowe Ferry Foreshore, to maintain access to the river for recreation and business and to control commercial development".

3.2.08 Between the 12th and 19th centuries the enclosure of extensive areas of saltmarsh created the wide coastal levels which are now protected by river walls. Former channel systems have been shut off by these walls, leaving only dykes and creeks, such as King's Fleet below Falkenham and Queen's Fleet on the opposite side of the river. Once used for grazing, these coastal flood plains are now valuable agricultural land given over to arable and vegetable farming. Footpaths follow the river but the expanse of the Bawdsey Marsh fields is undisturbed except for occasional agricultural vehicles.

3.2.09 At Ramsholt, now only a scattering of houses, the round church tower is a striking landmark which looks out across the estuary. Ramsholt Cliff, an SSSI, marks the most southerly exposure of Coralline Crag in Britain and is of historic importance as one of the major sites in British palaeontology. In the summer the river here is full of moored boats and visitors come down to a popular riverside pub. Further upstream, beyond Ramsholt, there is no public, vehicular access down to the river on this bank until you come to Wilford Bridge. This is a quiet area with few houses and little disturbance.

Suffolk Coast & Heaths AONB

3.2.10 Below the hamlet of Hemley, on the opposite side of the river, the failure of the flood defence in 1937 has resulted in an extensive area of creeks and saltmarsh. This is an inaccessible area, a valued habitat where wildlife flourishes.

Middle Reaches – to Kyson Point

3.2.11 Here the reedbeds and meadows in the valleys of the two tributary Mill Rivers which flow through Newbourne and Shottisham, give way to rising estate farmlands. The estuary curves round spurs of high ground marked by stands of pine trees. In some places woodland comes down to the river, and only the occasional farmhouse is visible. Above Stonner Point there are two sandy points – the Hams and the Tips - and below Methersgate a small quay with a cottage appears unchanged since the 18th century.

3.2.12 On the opposite shore, the village of Waldringfield stretches back from the river. Here the estuary offers extensive moorings, and a narrow beach sheltered by a low, wooded cliff provides a popular destination for summer visitors. Upstream of Waldringfield, the landscape is rolling farmland. Woods fringe the south bank of Martlesham Creek, which has a boatyard but is little more than a winding channel surrounded by extensive mudflats, reed beds and saltmarsh. Once at Kyson Point there is a memorable view up the estuary to Woodbridge with its churches, boatyards and Tide Mill.

Upper Reaches – to Wilford Bridge and Ufford Mill

3.2.13 Woodbridge has a long history as a port and marine centre with a tradition of rope making and boat building. The quay area, with its white weatherboard malting buildings and 1793 Tide Mill, is distinctive; other attractive buildings in the town date back to the 15th century.

3.2.14 The river itself encompasses all shades of life from high-end motor cruisers and yachts coming to the marina, to the traditional vessels that, at low tide, settle at odd angles on the mud, to a fringe of residential houseboats of varying shapes and sizes - all of which provide a spectacle which makes a significant contribution to the character of the wider area.

3.2.15 The Sutton bank, opposite Woodbridge, presents a completely different aspect. It is rural - woodland and meadows with just a handful of larger houses set back from the river. Opposite the Tide Mill, Ferry Cliff is a wooded SSSI, a site of geological interest where rocks of Palaeocene age have yielded important fossils. On high ground above the estuary the National Trust owns the internationally important Sutton Hoo Anglo Saxon Burial Site together with a substantial Edwardian house and some 240 acres of grassland, woods and saltings.

3.2.16 Between Sutton Hoo and Wilford Bridge the river opens out to a wide mere of extensive mudflats which provide a feeding ground for flocks of wildfowl and waders. Only here, on the Melton side of the estuary, does commercial development activity intrude on the view from the water.

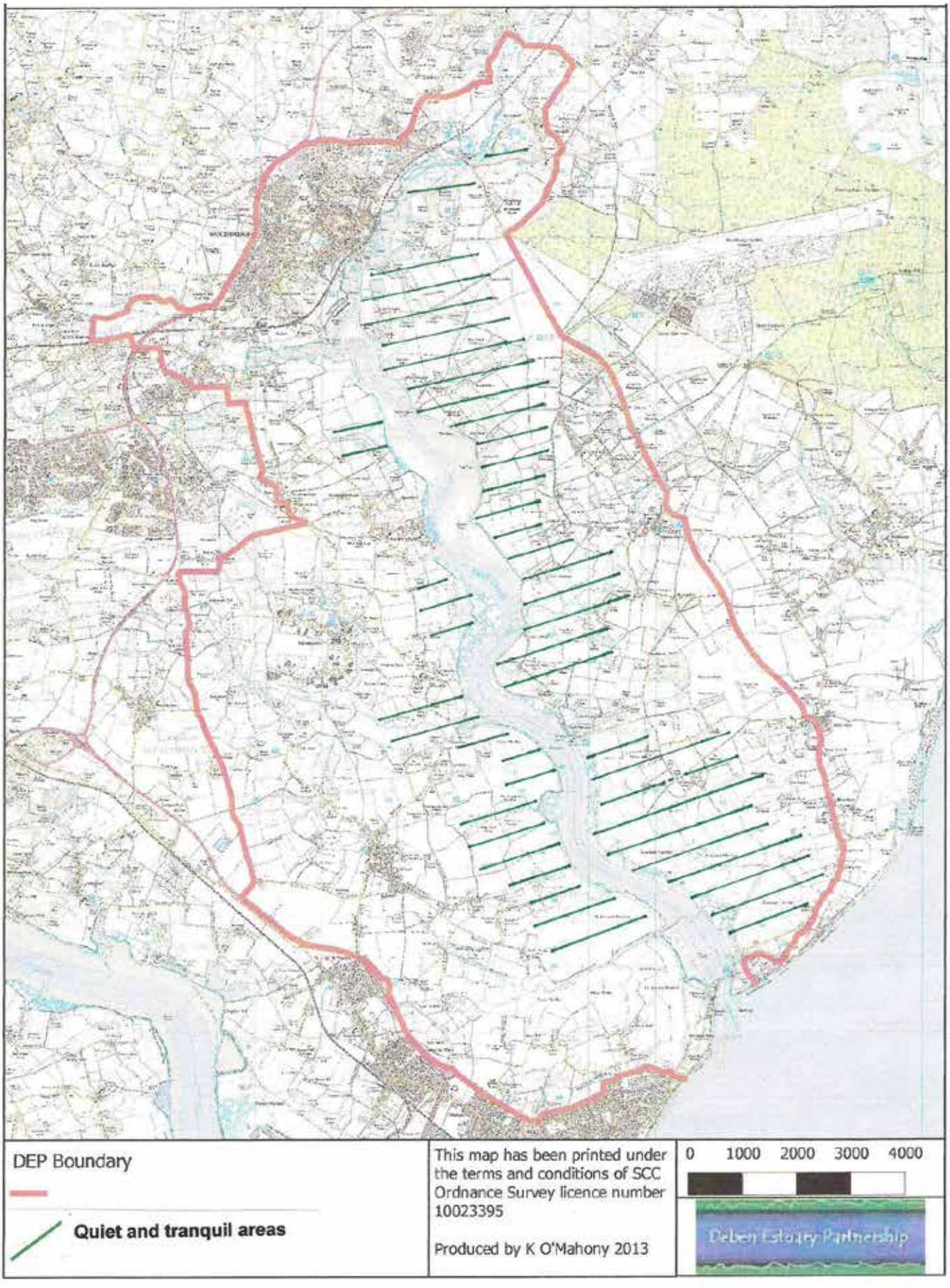
3.2.17 Above Wilford Bridge the landscape goes through a profound change. The bridge itself acts as a 'throttle', reducing the influence of the tides, the river narrows and meanders through reedbeds and small islands. Further upstream still, to Ufford Mill, there are grazing meadows and willow plantations.

The tranquillity of the estuary

3.2.18 The consultation conducted in preparation for this Plan reflected an almost unanimous view that the 'peace and tranquillity' of the Deben Estuary was highly valued, something that should not be lost or degraded. In this context, areas within the estuary recognised as being 'tranquil' were identified.

3.2.19 While detailed tranquillity mapping, as has been done elsewhere, has not yet been undertaken in the Deben Estuary, the Plan proposes, as a first step, to define areas where all the attributes, or indicators, that go to make up a 'tranquil area' are most evident.

Quiet and 'tranquil' areas of the Deben Estuary



Concept of tranquillity

3.2.20 Tranquillity is a holistic term for the accumulated benefits that are experienced from a particular state of affairs and which are considered to be an important part of the experience of being in a natural environment.

3.2.21 A large body of research now underpins the concept of tranquillity:

- A recent survey by Defra found tranquillity was the most common reason for visiting the countryside.
- Over 100 studies have uncovered convincing evidence of the importance of the natural environment in facilitating recovery from stress. They highlight the research that points out that "the primary reasons for visiting natural environments include escape from the stress of urban areas and the attainment of tranquillity and solitude". The Government's National Ecosystem Assessment draws attention to the fact that 'peace can come from spending time in the beautiful great outdoors' and this can be hugely restorative, with estimated health benefits of simply living near a green space amounting, in monetary terms, to as much as £300 per person every year.
- The report **'Tranquillity Mapping: Developing a Robust Methodology for Planning Support'** compiled by the Centre for Environmental and Spatial Analysis, Northumbria University best describes tranquillity as

'a valuable and seemingly elusive resource... It is aspired to, as it induces or increases feelings of calm and well being and therefore has positive effects on health and quality of life. This has both benefits to the individual and to the economics of the country. Finding the qualities of places which generate tranquil feelings and protecting those locations and attributes can be considered important as a reserve for a country pressured by development'.

Tranquillity as it applies to the Deben Estuary

3.2.22 Tranquillity is now recognised in the National Planning Policy Framework. Paragraph 123 states that 'Planning policies and decisions should aim to: identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.'

3.2.23 The Suffolk Coast and Heaths Area of Outstanding Natural Beauty Management Plan says in its vision for the area ' the importance of peace and tranquillity to the character of the AONB is fully recognised and sources of noise and visual intrusion have been resisted or mitigated.' It goes on to give, as a future action, the need to 'develop and articulate the concept of tranquillity as an important part of the character of the area and test through consultation'.

The characteristics of tranquillity

3.2.24 The definition of tranquillity is taken to be 'the quality of calm experienced in places with mainly natural features and activities, free from disturbance from manmade ones' From all sources comes the view that the characteristics of tranquillity focus primarily on :


David Thomas

3.2.25

- Seeing a natural landscape – a semi natural, often intimate, landscape occupying most of the area seen
- Quietness
- Hearing birdsong and other natural sounds
- Seeing natural woodland
- Seeing and hearing streams and rivers, the sight and sound of the sea
- Seeing the stars at night - no overhead light pollution
- Evidence of human habitation limited to historical, traditional or religious buildings, landmarks or monuments - all of which contribute to the visual context of the natural environment
- Minimal modern infrastructure, such as overhead power lines, in the immediate area

To this could be added the distinction that places are sufficiently far from the visual or noise intrusion of development or traffic to be considered unspoilt by urban influences

References :

3.2.26

The first method of mapping tranquility was developed by Simon Rendel of ASH Consulting for a Department of Transport study in 1991. This led to the production of a set of Tranquil Area maps covering England, produced by Rendel and ASH Consulting and published by the Campaign to Protect Rural England (CPRE) and the former Countryside Commission.

More sophisticated mapping techniques are now available following work by researchers at Northumbria University, Newcastle University, and CPRE.

CPRE has long understood such benefits of the countryside part of CPRE's work to create a national tranquillity map.

The exploration of tranquillity has now been extended beyond previously-targeted areas to generate, through a necessarily less qualitative, simpler quantitative consultation approach, a 'national' understanding of the concept of tranquillity. The products of this extensive research are illustrated in the National Relative Tranquillity Map 2006.

Ref 4.2.5 Suffolk Coast & Heaths AONB Management Plan 2013-18 http://www.suffolkcoastandheaths.org/about-us/aonb-management-plan/

Objectives

3.2.27 **Conserve the landscape, natural environment, and heritage in the Deben Estuary, and take opportunities to enhance them.**

Outcome: *To facilitate and support the sustained conservation and enhancement of the natural and historic landscape as well as the distinctive and valued environment, all of which are important for wildlife and the wellbeing of residents and visitors. To safeguard the estuary landscape from the visual intrusion of new development.*

Balance the benefits derived from quiet and tranquil areas of the estuary with the growing requirement for recreation, visitor enjoyment and an inclusive, sustainable visitor economy.

Outcome: *To identify, value and retain undisturbed, tranquil areas of the estuary which provide a sense of peace and wellbeing. To recognise the importance for people's health of opportunities for enjoyment which the peace and tranquillity of the river and surrounding area offers adaptation options to safeguard homes, businesses and farm land.*

Policy

3.2.28 The estuary and surrounding countryside is an important environmental, social and economic asset which enhances the wider area.

- Foster understanding of the inter-dependent relationship between elements of the estuary landscape, local economy and public amenity, recognising the Deben Estuary as an important environmental, social and economic asset, which enhances the wider area.
- Conserve and enhance the estuary landscape, valuing the characteristic features that it displays: the open aspect of the river, the mosaic of fields and trees on the valley sides, the wooded valley ridge and Scots pines on headland promontories.
- Value and conserve the landscape's distinctive heritage assets and archaeological features: the churches, chapels, military defence structures, old landing hards and quays, ancient fish traps, old burial grounds and crag pits.
- Recognise and value the riverscape and the landscape of the Deben Estuary as seen from the river.
- Support high standards for the built environment, ensure new build is sensitive to the estuary topography, is unobtrusive and sits comfortably within the riverscape.
- Promote the retention of dark skies and restrict or lessen the impact of an increase in exterior lighting in areas where lights will be visible from across a wide area of the estuary.
- Ensure conservation aims and projects contribute to safeguarding the landscape and character of the estuary – particularly in relation to saltmarsh.
- Recognise that tranquillity is an important part of the character of the estuary. Retain and conserve the quiet, rural areas of the estuary where there is limited noise and disturbance.

Geodiversity

3.3.00 The Suffolk estuaries were formed when sea levels rose and the North Sea basin subsided at the end of the last Ice Age. The geology is dominated by sedimentary rock formations, mainly chalks, which create the gently rolling landscape characteristic of the area. In the Deben valley river erosion of the London Clay has exposed marine deposits of Coralline and Red Crag. The oldest of these rocks, Coralline Crag, is found nowhere else in Britain and is rich in marine fossils. Sites such as Rockhall Wood Pit at Sutton, Ramsholt Cliff and Ferry Cliff opposite Woodbridge are designated geological SSSIs and considered to be important sites historically. Ferry Cliff is noted for providing evidence of early hoofed animals, our ancestral horses.

3.3.01 The surface geology of the Deben Estuary is characterised by river terrace deposits of sands and flint rich gravels overlaid by floodplain deposits from rivers and glacial melt waters. The sediments give rise to free draining acidic soils, assessed as lower grade agricultural land, which often requires irrigation if the land is to be productive.

Designations protecting the estuary environment

3.3.02 The importance of the natural environment and the biodiversity of the Deben Estuary is widely recognised. The Estuary is small compared with many others but it holds significant numbers of birds of international and national importance, as well as other species in notable numbers. As a consequence the conservation and enrichment of this environment is of great importance not only for the County of Suffolk but at a national and international level.

3.3.03 The Government is committed to ensuring that nature conservation, landscapes and enjoyment of the natural environment is promoted and enhanced, through the work of Natural England (NE), its statutory adviser on such matters. The Environment Agency (EA), Suffolk County Council (SCC) and Suffolk Coastal District Council (SCDC) also have statutory responsibilities and duties to safeguard and protect aspects of the environment. As a part of the AONB the estuary is a category 4 protected area as recognised by the International Union for the Conservation of Nature (IUCN). It is of international importance for the breeding, wintering or the migration of rare and vulnerable species of birds found within European Union countries and is part of the Natura 2000 network.

3.3.04 **The Deben Estuary is designated as:**

- **Special Protection Area (SPA)**
  for wintering Avocets and Dark-bellied Brent Geese.

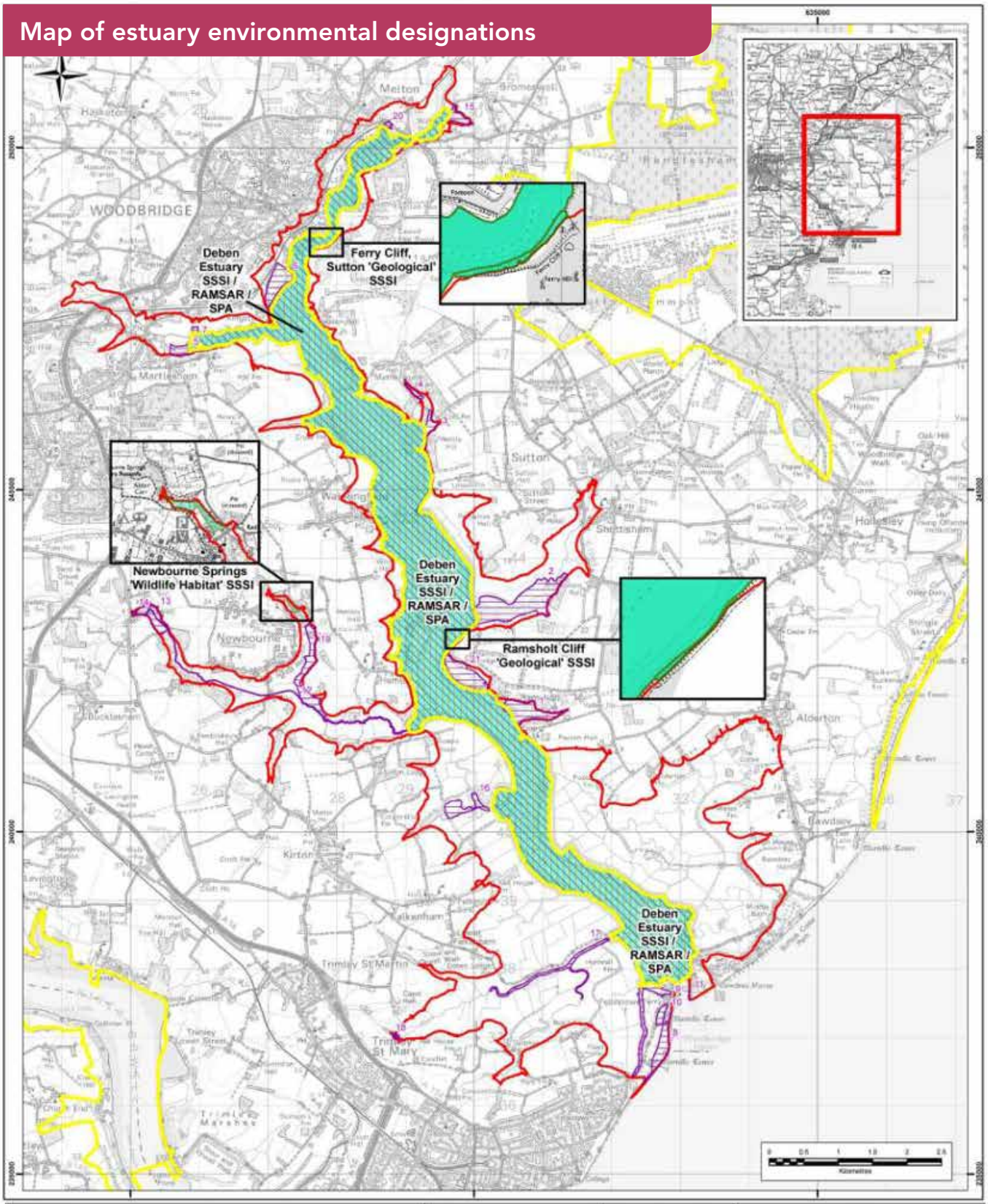
- **Ramsar site**
  for regularly supporting internationally important numbers of wintering birds.

- **Site of Special Scientific Interest (SSSI)**
  for populations of overwintering waders and wildfowl and also for the extensive and diverse saltmarsh communities, estuarine plants and invertebrates.

3.3.05 The estuary is also notable for the nationally important numbers of migratory waterfowl : Shelduck, Avocet, Grey Plover, Black-tailed Godwit, and Redshank.

(see Andrew Excell and Kieran O'Mahony - The River Deben Estuary Ornithological Importance and Status for Waterbirds - The Deben Estuary and its Hinterland.2013)

Map of estuary environmental designations



3.3.06 **SSSIs** are notified because of specific biological or geological features and are measured by Conservation Objectives which define the desired state for each site in terms of the features for which it has been designated. When these features are being managed in a way which maintains their nature conservation value the site is said to be in 'favourable condition'. The Conservation Objectives and definitions of favourable condition for features on the SSSI will inform the scope and nature of any 'appropriate assessment' under the Habitats Regulations.

Wildlife

3.3.07 There are extensive records of species and numbers of birds in the estuary. Starting in the 1960s as The Birds of Estuaries Enquiry, The Wetland Bird Survey (WeBS) has been carried out every year with only one exception. The principal aims of WeBS is to identify population sizes, determine trends in numbers and distribution and to identify important sites for waterbirds. In addition bird counts are conducted in each month from September through to April. All the counts are completed around high tide, on the same day, when waders and wildfowl are on roosts.

3.3.08 The different habitats across the estuary and its hinterland support many bird species including Water Rail, Snipe, Short Eared Owl, Reed Warbler, Bearded Tit, Cetti's Warbler, Kingfisher, Meadow Pipit, Ring Plover, Sedge Warbler, Nightingale and Oystercatcher.

3.3.09 Some birds are listed as Suffolk Priority Species (previously known as BAP species) these include Barn Owl, Reed Bunting and Bittern. Others are also classed as Species of Conservation Concern

(ref. British Trust for Ornithology (BTO) Report : Birds of Conservation Concern)

and these include Corn Bunting, Yellow Wagtail, Lapwing, Linnet, Grey Partridge, Yellowhammer, Skylark, Starling and Grasshopper Warbler.

3.3.10 In winter the floodplains regularly attract large numbers of waders and wildfowl for both roosting and foraging. These include Widgeon, Teal, Brent Goose, Golden Plover and Curlew (a Suffolk Priority Species). Several of these species are also dependent on the arable land behind the estuary walls for all or part of their life cycle.

3.3.11 As well as birds and small mammals the estuary also supports nationally and internationally important flora and fauna, which includes a range of swamp communities that fringe the estuary, and occasionally form larger stands. In general, these are dominated by Common Reed, Eelgrass, Marsh mallow and Tufted Saltmarsh grass. Endangered molluscs, including the Narrow-Mouthed Whorl Snail and the Desmoulin's Whorl snail, are also found in the Deben Estuary.

Wildlife habitats within the estuary

3.3.12 The Deben Estuary includes extensive stretches of saltmarsh and intertidal mudflats, which are delineated by estuary walls. The saltmarsh and intertidal habitats are vulnerable to changes caused by occasional storms, sea level rise, coastal squeeze and wash from some boats.

Beyond the estuary walls lie a network of freshwater borrow dykes, reed beds, ponds and scrapes, flood-plain grasslands, arable fields with narrow field margins, scattered scrub, hedges and woodland.

3.3.13 **Borrow dykes** are important for the conservation of wetland species. Wider borrow dykes and the remnants of creeks, such as King's Fleet, with open water, fringing vegetation and thick stands of reeds will support quite large bird populations; the presence of scrub along the margins increases the diversity of the bird community. Water Rail, notoriously difficult to monitor as they are mainly nocturnal, have been heard 'squealing' on Shottisham Creek and, together with water voles, are likely to breed in the dykes. Management of the dykes and ditches will include a cycle of dredging and clearing, essential for effective land drainage. However to retain their value for wildlife, ditches need appropriate management and good quality water. This involves two processes: removing sediment and vegetation cutting, which starts a new cycle of plant growth. If large sections are completely cleared in one go, re-colonisation will be slow and will result in drainage channels of low wildlife value. It is therefore important for the natural environment to leave some areas uncleared and take a 'little and often' approach to cleaning slow-flowing lowland channels.

3.3.14 **Fen and reedbeds** support a diversity of plant and animal communities. An area of fen lies within Newbourne Springs SSSI and reedbeds are found at Kings Fleet, west of Kirton Creek, Shottisham Creek and in the upper reaches of the estuary in Martlesham Creek and above Wilford Bridge. This habitat supports distinctive breeding birds which include Grasshopper Warbler, Cetti's Warbler, Reed Bunting and Little Grebes and is also important for wintering birds coming in from elsewhere in the UK.

3.3.15 **Grazing marsh**, found on the Deben at Shottisham, Ramsholt, Kirton, Newbourne and Martlesham Creek, is predominately freshwater pasture drained by ditches which are especially rich in plants and invertebrates. This habitat is particularly important for numbers of breeding waders and internationally important populations of wintering wildfowl. At high tide Pintail can be found on grazing marshes in the upper stretches of the estuary. Teal feed mostly on grazing marshes inland of the seawall as do Black-tailed Godwits and Redshank, especially when the estuarine mud is covered at high tide.

3.3.16 **River wall grassland** Although walls are managed and cut the grass tussocks are a habitat for bank voles, field voles, shrews, as well as grass snakes, slow worms and lizards. Meadow Pipits nest in the thick grass of the seawalls. The small mammal populations are exploited by birds of prey such as Barn Owls, Short Eared Owls and Marsh Harrier.

3.3.17 **Arable land** Arable agriculture offers feeding and nesting opportunities to several species - Dark -Bellied Brent Geese feed on the arable fields inland of the seawall between Falkenham and Felixstowe Ferry, Lapwing breed along the length of the river mainly on the arable fields and there are Yellow Wagtail and brown hares.


Suffolk Coast & Heaths AONB

County Wildlife Sites

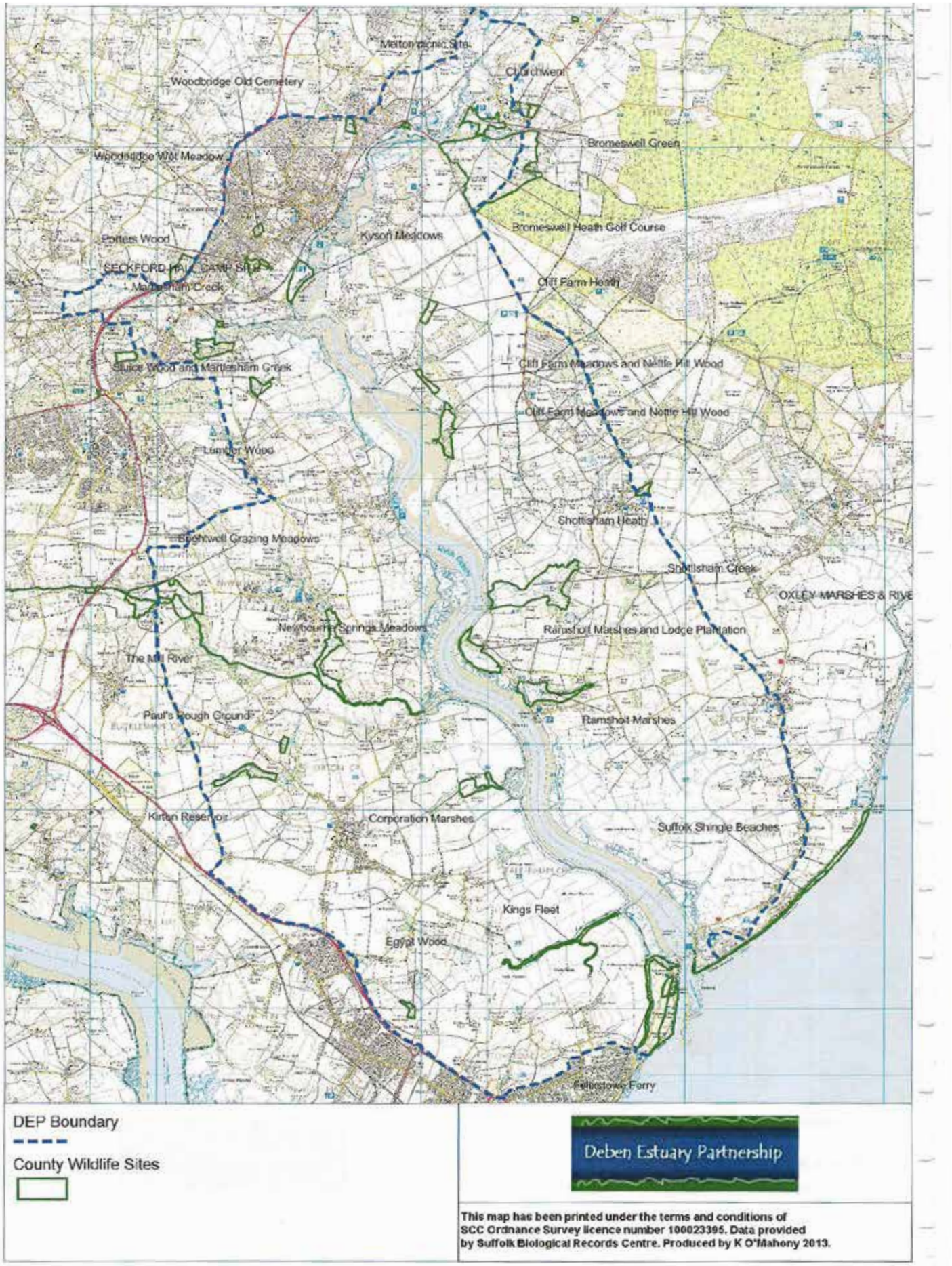
3.3.18 The Deben Estuary and its hinterland includes many County Wildlife Sites (CWS). Designation as a County Wildlife Site is non-statutory but recognises the high value of varied habitats for wildlife. Such sites are often designated because they support characteristic or threatened species or habitats included in Local or National Biodiversity Action Plans. They play a key role in the conservation of Suffolk's biodiversity and must be considered by the Local Planning Authority when determining applications that may impact on them.

3.3.19 A number of County Wildlife Sites are in or adjacent to the area covered by the Plan. Those which include habitats influenced by the Estuary are :

- **Bromeswell Green.**
- **Cliff Farm Meadows and Nettle Hill Wood.**
- **Shottisham Creek;** small tributary flowing through arable fields and grazing marshes before joining the River Deben.
- **Ramsholt Marshes and Lodge Plantation;** Agriculturally improved grazing marshes drained by a network of dykes. This designation includes a woodland.
- **Melton Picnic Site**; a wet meadow located next to the picnic site.
- **Kyson Meadows;** cattle grazed unimproved pasture bordering the Deben Estuary.
- **Sluice Wood;** woodland adjoining Martlesham Creek .
- **Martlesham Creek Reedbed;** freshwater reedbed adjoining the Creek.
- **Brightwell Grazing Meadows;** wet species-rich grassland.
- **Newbourne Springs Meadows;** wooded valley with marsh, fen and heathland.
- **The Mill River;** flowing from Newbourne Springs Meadows to the River Deben.
- **Falkenham Corporation Marshes;** freshwater reedbed and scrub drained by a dyke that flows into Falkenham Creek.
- **King's Fleet;** freshwater open water with a reed fringe.
- **Felixstowe Ferry Golf Course**; dykes, reedbed, rough grassland, gorse and the Tomlin Wal.

Consideration can be given to creating further sites if the required criteria are met and the sites pass the designation process.

Map of County Wildlife Sites



Floodplain and intertidal habitats

3.3.20 Many of the species which make the flood plain habitats notable will not tolerate saline conditions. Loss of grazing marsh and field margins as a result of flooding would affect the diversity of vegetation. If the vegetation changes because of increased salinity, the availability of naturally ocurring seeds may be affected and many birds, reliant on seed resources over winter, could suffer. If permanent grassland were to be lost the small mammal population would decrease, which in turn would have an adverse effect on Barn Owls.

3.3.21 **Mudflats**, deposits of mud, silt and clay found in sheltered intertidal areas, are found throughout the estuary. Ranging from soft muds in the most sheltered inner areas of harbours and estuaries to firm sands in areas exposed to waves and currents, the habitat represents a transition from sub-tidal sediment areas that are continually covered by the sea to areas submerged and exposed approximately twice daily. In sheltered areas, mudflats usually grade into saltmarsh. This is a dynamic habitat and its continued presence depends on maintaining the balance between the rate of deposition of sediments from the water column and the erosion of sediment by tidal and wave action. Mudflats are important in helping to dissipate wave energy and so reduce the risk of eroding saltmarsh. This helps to prevent stress on coastal defences and protect low-lying land from flooding.

3.3.22 The Intertidal mudflats and sandflats which occupy the majority of the Deben SPA are an Annex 1 habitat under the EU Habitats Directive due to their European importance. They provide an important nursery and feeding ground for many fish species such as plaice and dab. They are feeding areas for sole, gobies, sea bass and flounder which feed on the worms, bivalve young and crustaceans. They also provide a valuable food source for internationally important populations of over-wintering waders and wildfowl such as Brent Goose, Redshank, Bar-tailed Godwit, Curlew, Oystercatcher, Turnstone and Dunlin.

Saltmarsh

3.3.23 **Saltmarsh** and mudflats are important for many reasons and, in many cases, are protected under European and UK legislation. Where they are being lost or damaged the UK Government has a duty to restore or recreate them elsewhere.

3.3.24 Statistically the River Deben has approximately 40% of Suffolk's saltmarsh and contains the most complete range of vegetation types. This is largely due to the loss of previously reclaimed land increasing the amount of intertidal space where saltmarsh could become established.

3.3.25 The health of the saltmarsh is important for the health of the estuary as the marshes and mudflats filter pollutants, lock up toxins and improve water quality as well as acting as valuable carbon sinks, taking carbon out of the atmosphere. Saltmarsh provides a vital nursery and feeding ground for juvenile fish, such as sea bass, which come into the creeks with the tide to feed away from the high flows in the main river channels.

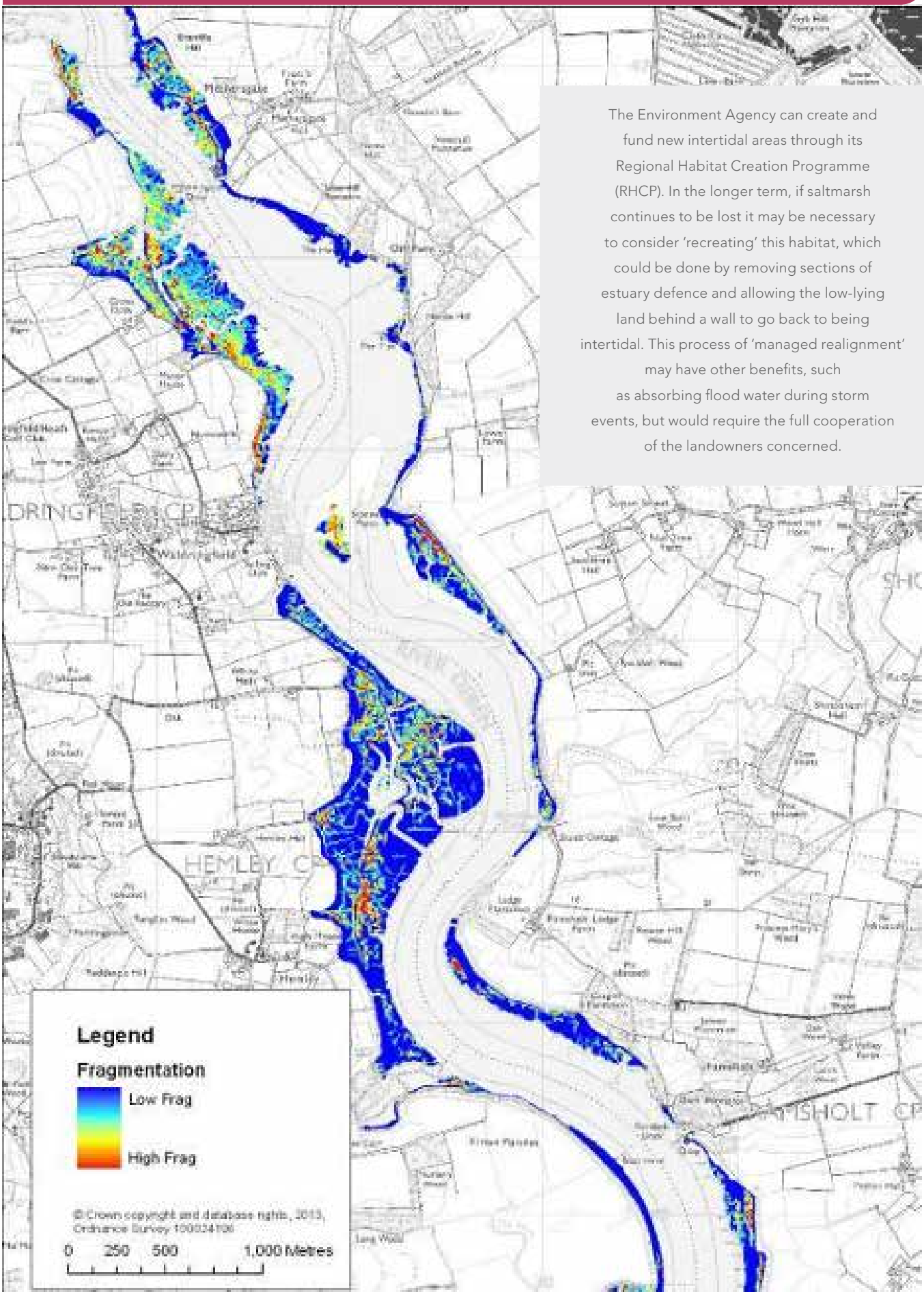
3.3.26 In the Deben Estuary most saltmarsh is backed by sea walls and so it acts as a natural flood defence, breaking wave action, absorbing tidal currents within the network of saltmarsh creeks and thus lessening tidal pressure on the base of the flood defence wall. Saltmarsh in front of seawalls will continue to be under stress from increased inundation due to storms, wash from some watercraft and sea level rise. This in effect 'drowns' the saltmarsh, which leads to its ongoing deterioration and fragmentation as well as greater tidal pressure and subsequent damage to flood defence walls.

Monitoring saltmarsh within the Estuary

3.3.27 Using mapping data derived from aerial photography from three different time periods it has been shown that, between 2000 and 2011, there was change to the extent of saltmarsh on the Deben Estuary. This change has been in the form of both erosion and accretion of saltmarsh. Throughout the estuary, erosion and accretion have been occurring along the leading (seaward) edge of the marsh and, while erosion in one area is largely balanced by accretion in another, fragmentation and sinking of saltmarsh is seen as a potential precursor to future erosion and loss. (see Fragmentation Index, National Vegetation Classification Studies, 2013) As such Natural England has classified SSSI saltmarsh areas in the Deben estuary as being in 'unfavourable condition' and, as a consequence, there is a need to restore, enhance and potentially recreate marsh.

(See map of saltmarsh fragmentation – erosion and accretion.)

Map showing saltmarsh fragmentation – erosion and accretion



The Environment Agency can create and fund new intertidal areas through its Regional Habitat Creation Programme (RHCP). In the longer term, if saltmarsh continues to be lost it may be necessary to consider 'recreating' this habitat, which could be done by removing sections of estuary defence and allowing the low-lying land behind a wall to go back to being intertidal. This process of 'managed realignment' may have other benefits, such as absorbing flood water during storm events, but would require the full cooperation of the landowners concerned.

Reasons for the changing condition of saltmarsh

3.3.28 **Sea level rise and isostatic change:**
As a consequence of global sea-level rise and the post-glacial sinking of land of the South East Coast, sea levels are increasing by between 1.5 - 2mm per year. This results in the low water mark moving landward but being contained by the estuary defence walls, which in turn means that intertidal habitats are being "squeezed" between the rising sea levels and artificial defence works. Under these conditions a stable accreting saltmarsh develops a cliff-like front edge susceptible to wave attack, erosion and collapse. The saltmarsh vegetation starts to be drowned out; the profile of the marsh slumps, eventually reverting to pioneer vegetation, such as cord grass, and then an uneven mudscape.

3.3.29 **Wind, tide and wave action:**
Although not common, strong north easterly winds can quite quickly alter the configuration of the shingle Knolls, which normally protect the mouth of the river. Erosion can occur in the lower reaches of the estuary when there is increased wave action. Storm surges will also cause damage to the shore and saltmarsh. Similarly, wash from from boats generating a high energy wake, whatever their speed, will cause damage, especially to saltmarsh in the narrow, upper reaches of the estuary.

3.3.30 **Unforeseen breaching of flood defences:**
The accidental failure of river defences will allow flooding of the land behind and, if left to establish its own morphology, may develop healthy saltmarsh. However, over time a breach in a wall can only become wider and the channel that feeds through it deeper. On a daily basis, as the channel systems become established within the new marsh, more water flows in and out. There is a likelihood that further sections of the defence, attacked by the tide from the inside, will fail, allowing the tide to flood through the site, washing out the newly established saltmarsh and leaving an expanse of mudflat.

3.3.31 **Sources of sediment likely to replenish saltmarsh:**
The supply of sediment to the Deben estuary from offshore is greater than that supplied via freshwater sources within the river catchment. The amount of sediment coming from the north-south coastal processes has reduced. The distribution of sediments within the estuary is governed by the tidal dynamic - whether the ebb tide is more powerful than the flood tide at any specific point in the system. A flood dominant tide transports sediments up river and deposits them as the tide slackens, whereas an ebb dominant current in the middle and lower reaches of the river can re-suspend sediment and cause it to be transported out to sea. The supply of sediment is a critical factor in replenishing saltmarsh threatened by sea level rise; any loss of sediment from the estuary threatens the sustainability of saltmarsh.

3.3.32 **Previous excavation of saltmarsh:**
The historic excavation of mud to create winter lay-up berths or to provide material for the cement industry and construction of estuary walls has not only damaged saltmarsh vegetation but also increased the vulnerability of the marsh, by allowing the tide to flow through the network of dug channels. Rather than refilling with sediment these holes and channels allow sediment to be washed out by the tide on a daily basis, contributing to the proliferating creek pattern and the incremental fragmentation of the marsh itself.

3.3.33 **Crustaceans:**
There is an ongoing debate over whether burrowing shore crabs and ragworms are having a negative effect on the stability of saltmarsh. Crabs burrowing into the mud 'cliffs' created by fragmenting saltmarsh may be making the saltmarsh more vulnerable to collapse but further research and evidence is required to substantiate this view.

Saltmarsh management

3.3.34 It is important to be aware of the high ecological value that saltmarsh has and the important place that it holds within the mosaic of habitats in the estuary. It acts as a first line of defence in the overall flood defence system, without which the flood walls of a predominantly rural estuary could become economically unviable.

3.3.35 The process of drawing together a Plan for the Deben Estuary has included consideration of the viability of present estuary walls and the value of the land that they protect. It is recognised that, at some point in the future, sea level rise and the imperative to maintain the high ecological value of the estuary may demand the creation of new saltmarsh through managed realignment. Evidence of saltmarsh loss must provide a legal driver for this and, significantly, any scheme would require the agreement of landowners. Managed realignment to create new intertidal habitat has been put forward as a potential course of action but this led to a counter-proposal from the community to explore the potential for the existing saltmarsh to be stabilised, managed and enhanced.

3.3.36 Following the initiative of the River Deben Association in 2009 to introduce a tidal barrier to protect fringing saltmarsh below Sutton Hoo, the Deben Estuary Partnership has undertaken further projects, on an experimental basis, to trial a range of solutions designed specifically to accommodate the characteristics and demands of particular sites. The emphasis has to be on fostering an enhanced awareness of estuarine systems and a heightened sense of community ownership of the estuary and its management. The work is being used as a basis for further research into the drivers for saltmarsh loss.

3.3.37 The main objective of the work is to use ways of impeding or mitigating the tidal flow through eroding or fragmenting sections of saltmarsh, and to encourage the deposition of sediment.

3.3.38 Various methods and materials can be used to balance possible erosion:

- Use of small structures such as fencing, faggots or straw bales to help trap sediments, build up the level of the saltmarsh and create the right conditions for new plants to grow.
- Use of the mud and sediments, dredged for navigation purposes from within the estuary, to build up badly eroded areas and, in some cases, to raise the level of whole marshes, encouraging new vegetation at the right tidal level.

Sutton before

Suffolk Coast & Heaths AONB

Sutton after

Suffolk Coast & Heaths AONB

Objectives

3.3.39 **Conserve the landscape, natural environment, and heritage in the Deben Estuary, and take opportunities to enhance them.**

Outcome: *To facilitate and support the sustained conservation and enhancement of the natural and historic landscape together with the distinctive and valued environment important for both wildlife and the well-being of residents and visitors. To safeguard the estuary landscape from the visual intrusion of modern development.*

3.3.40 **Ensure compliance with the requirements of environmental legislation, including the Habitats and Wild Bird Directives and Water Framework Directive.**

Outcome: *To recognise, strengthen and enhance the habitats and biodiversity of the estuary and its hinterland. To maintain designated International, European and national environmental sites in good condition and ensure that any adverse impact on the adjacent hinterland is answered by appropriate compensation and mitigation measures.*

Policy

3.3.41

- Promote the good management and enhancement of features which provide wildlife habitats and refuge.
- Safeguard sites of geological, ecological and environmental importance and support other areas managed in the interests of wildlife or set aside as wildlife reserves.
- Safeguard and sustain the long term future of designated sites, improving sites which are in unfavourable condition, maintaining all sites and the relevant hinterland in favourable condition.
- Safeguard all freshwater wetland areas from pollution, disturbance or deterioration in designated sites.
- Where sites are outside the SSSI designation support appropriate management through agri-environment grants or other mechanisms.
- Seek environmental gain when work is undertaken on flood defences or development is planned in close proximity to the estuary.

Saltmarsh

- Recognise Saltmarsh as a significant environmental asset, juvenile fish habitat, important element of flood defence and a contributor to carbon sequestration.
- Encourage and deliver projects to restore and regenerate intertidal saltmarsh.
- Advocate where practicable, the beneficial re-use of dredged silt as recharge for saltmarsh areas.
- Monitor habitats and species within the estuary, taking note of climate change and coastal squeeze.

in accordance with legislation:
Conservation of Habitats and Species Regulations (2010)
EU habitats and Birds Directive/Natura 2000
Wildlife and Countryside Act (1981)

3.4.00 The Deben Estuary provides the setting for specialist marine companies, agriculture and tourism, each of which is based on the natural environment. The viability and sustainability of the estuary economy requires a balance to be achieved between environmental and commercial needs.

Agriculture

3.4.01 Agriculture is the most common land use in the estuary area. The majority of land within the flood plain, originally reclaimed from the intertidal zone and protected by river walls, is agriculturally referred to as marsh land. The soils here are fertile and are expected to produce a high yield of any crop grown. Crop rotation produces wheat and break crops of oilseed rape or sugar beet. Some areas that are not growing arable crops are made up of small fields of grazing pasture. All this farmland is protected by grass covered flood defence walls, many of which were rebuilt after the 1953 East Coast floods. The ongoing integrity and viability of the walls is necessary to sustain the agricultural economy.

3.4.02 Slightly further from the river, on land spreading up the valley sides, three key features govern cropping - the lighter soils, clement climate and availability of water for irrigation. The mild, relatively frost free, climate allows early and late cropping and the light soils are ideal for growing root vegetables, principally carrots, potatoes, onions, brassicas and salads. The availability of fresh water, either via abstraction from the underground aquifer or from reservoirs storing surplus winter water, ensures that these high value crops can be irrigated, which is particularly important for the more sandy soils on higher ground above the estuary.

3.4.03 The estuary area produces in excess of 200,000 tonnes of vegetables per year. This ability to grow high quality vegetables is important to the national as well as local economy; locally grown potatoes provide the UK with some of the earliest harvested vegetables in the UK and lessen the need for expensive imports. However, the cost of intensive field scale vegetable growing is now so great that, without a guaranteed supply of water, growers will not commit. Research done in 2010 by Stephanie Pullen, Cranfield University, concluded that of approximately £51m generated from irrigated vegetable production in East Suffolk £13m goes directly into the local economy in the form of wages and £20m goes, indirectly, to lorry drivers, food preparation, agronomists, marketing and machinery dealers. Comparing this level of benefit with what can be expected from land that cannot be irrigated, the potential loss to the local economy is clear. Without irrigation the light soils would only grow cereals, which would lead to a reduction in both direct and indirect employment. Based on an annual output of some £13m it is estimated that only £1.3m would go into the local economy.

Peter Youngs

3.4.04 Some livestock farming still takes place in the Deben Valley. Modest numbers of sheep and cattle are grazed in meadows by the river and pigs are reared in increasing numbers on less productive, higher land above the estuary. Some poultry, such as at Sutton Hoo, is reared to supply free range and organic products to a specialist market. Further diversification includes growing willows for a specialist cricket bat business at Bromeswell and a number of farmers produce consistently high quality turf on the light sandy soils above the estuary.

3.4.05 At the moment there are 24 extraction points within the estuary flood plain, which are essential for irrigating the land beyond the flood plain. However, the future supply of water for irrigation is in doubt (see section 3.5 Freshwater Management). Climate change is likely to bring higher summer temperatures, longer periods of drought and more winter storminess, a combination of which will cause increased pressure on British food production. This must also be seen in the context of the increased demand for food from a growing population.

3.4.06 Today landowners are having an increasing role in managing rural flood defences and, as has always been the case, they continue to have a major influence on the estuary environment, The way in which they manage the land affects the pattern and character of the landscape. While landowners must use the economy of scale inherent in larger units of production, generally the retention of a traditional pattern of fields and woods remains sympathetic to the character of the area. At the present time the biodiversity of the area has benefitted from environmental stewardship schemes throughout the estuary. Field margins, ditches and fresh water meadows offer an important refuge and habitat for wildlife and the over wintering flocks of birds find a food source on the arable land behind the river walls.

Marine Business

3.4.07 The marine industries make a significant direct and indirect contribution to both the identity of the river and the local economy. They are at their most visible in the boatyards and marinas which provide not only a service to boat owners but also play an important part in fostering the vibrant and busy waterfront atmosphere that draws visitors to the area.

3.4.08 Each yard provides a common service, but each has its own specialism and for this reason they tend to complement each other. The yards offer a wide range of services that includes boat building, fitting out and repair, storage and winter layup, moorings and berths, marine maintenance, towage, slipping and launching facilities. In a similar way the water sport clubs cater for quite distinct activities and, naturally, make full use of the yards and contractors based on the river.

3.4.09 Like the farming sector, employment associated with marine industries is not confined to those businesses directly located on or close to the river. The yards provide direct employment but also support the viability of a range of associated businesses. Related to them is a service community of tradesmen and suppliers that includes highly specialised contractors who travel to where the work is and who depend upon a healthy marine sector, not only on the Deben Estuary, but also along the entire Suffolk Coast, for their livelihood. They range from boat builders with experience in wood, GRP and steel, riggers, engineers, painters, towage, dredging and mooring contractors, upholsterers, fabricators and professional crew and skippers.

3.4.10 Other marine related services include brokerage, insurance, chandlery and sail making. As well as these a spectrum of other interests, from architects and web designers to photographers are located close to the river in small units and offices suited to their particular business needs.

3.4.11 Together, the marine industries are an important contributor to the economy of the Deben area; they directly service the boat-owning community based on the river and those visitors for whom the river is a magnet during the summer season. They facilitate a part of the tourist economy that attracts large numbers of visitors, drawn to the area and riverside by the marine activity and summertime events and regattas.

3.4.12 The boatyards and marinas include Felixstowe Ferry Boatyard Ltd, Waldringfield Boatyard, Martlesham Creek Boatyard, Woodbridge Boatyard, Ferry Quay, Tidemill Marina, Robertsons of Woodbridge, Melton Boat Club, Melton Boatyard, Granary Yacht Harbour and Larkmans Boatyard.

Marine related business and legislation

3.4.13 Environmental legislation (European Habitats Regulations) and the Water Framework Directive (WFD) place limits on what can and cannot be done on the river. This means that proposals which might have an impact on the environment or water quality, or intervene in the tideway so as to change the dynamic of the estuary systems are subject to EU and UK legislation and regulation. Proposals may require assessment and consent from both marine and land based planning authorities and consents may stipulate mitigation measures to counteract any negative impact.


Riverside Trust

Development of the river frontage

3.4.14 There is sensitivity about development of the land abutting the river. The reason for this is a desire to conserve the integrity and character of the riverside and the need to take account of the visual impact of the built environment when seen from the river. At Woodbridge re-development of the former Whisstocks boatyard will include a 5500 sq ft boat shed and a new town museum, buildings which will be gifted to the Woodbridge Town Council and leased to the Woodbridge Riverside Trust and the Museum trustees. The waterfront heritage is to be safeguarded and enhanced with the open space around the site protected and the slipway repaired.

Dredging

3.4.15 **The effects of dredging and the re-use of dredging spoil**

To date it has been impracticable and uneconomic to dredge the navigation channel in the Deben; however there have been frequent and extensive operations to keep moorings, docks and foreshore clear of accumulated mud.

3.4.16 This has usually been in the form of a plough dredge where material is pulled out into the tideway to be redistributed by the current. While the effect of this operation is not always satisfactory since it can have the effect of simply moving mud onto a neighbour's foreshore, the operation is both small scale and infrequent and is essential to ensure the continuing viability of boatyards and boat club facilities.

3.4.17 Suction dredging is regularly carried out at two sites on the river; one is at the Tidemill Marina, where the dredging spoil is transferred to a spoil pond where it settles out and is eventually re-used to raise the level of the hard standing areas within the Marina. The other is at the Granary Yacht Harbour, Melton, where spoil is pumped into the adjacent Sutton Hoo saltmarsh management site. Both of these operations are subject to dredging licences.

3.4.18 Since April 2014, all dredging operations require a licence from the Marine Management Organisation (MMO), who will assess the potential impacts of each operation. The application for licences on a case by case basis with continue, but the option of a single dredging licence for the estuary might be considered if beneficial and viable. There is support for facilitating the use of dredging spoil to recharge degraded saltmarsh as part of an estuary wide saltmarsh management strategy. The beneficial use of this spoil can offer benefit to navigation, flood defence and biodiversity.

Robert Simper

Fisheries

3.4.19 The Eastern branch of the Inshore Fisheries and Conservation Authorities (EIFCA) protects the marine inshore environment. Their officers work throughout the district, both on land and at sea, on a variety of activities – which can include managing fisheries and enforcing fisheries legislation, meeting with fishermen and anglers, conducting survey work and stock assessments and responding to external consultations on planned marine development work

3.4.20 Fishing on the Deben, as on the Stour and Orwell and the Alde/Ore, is a small scale operation, using small boats. At the present time, 12 registered fishing boats, mostly working out of Felixstowe Ferry, go for cod, skate, whiting, bass and flat fish, crab and lobsters. Employment is mostly part-time, with fishing dependent on the weather and allowable fishing quotas as well as the seasons. Fresh fish for sale brings people down to Felixstowe Ferry and local fish is served in cafes and pubs. Two charter boats can be booked to take people out for fishing trips.

3.4.21 As far back as the mid-eighteenth century there were organised shell fisheries on the River Deben, but these died out. Now there are a number of designated Bivalve Mollusc Production Areas for pacific oysters and mussels and investment has been made in reintroducing native oysters and young mussels to increase stocks. Water quality is an important consideration for maintaining the designated status of these production areas. It is hoped that a sustainable shellfish population will be re-established in the river. A new enterprise, Simpers of Suffolk, has leased a section of the river from The Crown Estate and restarted cultivation based at their farm in Ramsholt where the beach they own is used for landing a catch. This has brought new jobs to the area, employees live locally and work is divided among the boats, purification, packing, delivery, sales and administration. In all ten people are directly involved in this new fishery.

Tourism

3.4.22 Suffolk's landscapes and heritage are seen as the foundation of the County's tourism industry. Attractions are enhanced by a longstanding commitment to protect the environment and emphasis is placed on developing the green tourism sector and eco-tourism businesses. (Suffolk Growth Strategy 2014).

3.4.23 The Deben Estuary lies largely within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty and, as such, is promoted with the tourism marketing that is done under that banner. The combination of the sea and open estuarine landscape, the varied wildlife, historic features and attractive villages make the Deben Estuary an appealing place to visit. Heritage and cultural attractions draw visitors to the area and Woodbridge acts as a key centre where the varied boats and iconic working Tide Mill give the river frontage a distinctive character. On the opposite shore the Anglo-Saxon Sutton Hoo burial site attracts more than 80,000 visitors a year, which makes it a 'flagship' visitor centre for the area. At Bawdsey Manor a Museum in the original Transmitter Block tells the story of the development of Radar and at the mouth of the estuary two Martello towers are part of a unique chain of military defence structures. Throughout the estuary the historic village churches are of interest to many people.

3.4.24 Maritime activity attracts many visitors to the area from the UK and beyond. The river is a magnet for those who enjoy boating and water based activities of all kinds and river trips, from Woodbridge, Waldringfield and Felixstowe Ferry, are increasingly popular in the summer months. Some visitors spend their holidays on boats while, elsewhere in the wider estuary area, a range of holiday accommodation is available. This varies from hotels and places offering bed and breakfast to a thriving holiday cottage rental sector.

3.4.25 Favourite pubs and cafes along the river are busy with holiday makers in the warm weather, and beyond the riverside, tourists play an important role in sustaining the viability of many local shops and businesses. However, the villages along the estuary are beginning to feel the pressure of increased traffic and congestion. As visitor 'hot-spots' become more popular, managing the impact on the surrounding area is increasingly important. Encouraging further summer visitors may not be appropriate but the Suffolk coast has a distinctive appeal at other times of the year and fostering tourism in the autumn and spring seasons may be beneficial.

Alexis Smith

3.4.26 A number of surveys over recent years have looked at why visitors choose to come to the area. Research completed in 2004 by Suffolk Coast and Heaths AONB found that visitors talked of the high quality natural environment, saying that they enjoyed the peace and quiet of the scenery. The same theme recurred in the 2010 County Council Suffolk Visitor Survey with visitors finding the coastal area quiet, with historic and unspoilt villages and the countryside 'iconic' for its beauty. The visitor survey supporting the 2013 Suffolk Coast Tourism Strategy finds that just over half for the people questioned like the peace and tranquillity of the area and almost as many value the quality of the natural environment. Many of the people who visit the area come back regularly.

3.4.27 This particular fondness for the area coupled with the intention to return is reflected, at a local level, by some customer base analysis done by a local café owner at Bawdsey Ferry. A short survey of the owners of holiday accommodation, undertaken to provide information for the Deben Estuary Plan, found that a very high percentage of respondents felt that the estuary landscape was an important factor in marketing their business and that holiday makers who stayed with them came to enjoy the river and the natural environment. All felt that the environment was an important factor for their business.

3.4.28 It is evident that the income that visitors bring to the area is being driven by the characteristics of the environment. It is undoubtedly the combination of the special landscape, interesting places to visit, pleasant accommodation and opportunities for quiet recreation that generates the tourist economy. Conversely a preponderance of large and highly visible holiday villages or caravan sites close to the estuary would be inappropriate. In order to sustain the attributes that attract tourists to the area it is important to ensure that a balance is struck between the pressure of increased numbers of visitors and the need to safeguard the environment, without which there is a danger that tourism might jeopardise the very essence of the area that sustains its viability.

Objectives

3.4.29 **Underpin business, with particular reference to agricultural, marine and leisure industries.**

Outcome: *To foster a sustainable and viable local economy, with particular reference to the agricultural, marine and tourism sectors. To support sustainable tourism that is compatible with and compliments the character of the Deben Estuary. To ensure the benefit derived from tourism and attendant development does not compromise the landscape and wildlife assets which exemplify the distinctive and special qualities of the estuary.*

3.4.30 **Balance the benefits derived from quiet and tranquil areas of the estuary with the growing need for recreation, visitor enjoyment and an inclusive, sustainable tourist economy.**

Outcome: *To identify, value and retain undisturbed, tranquil areas of the estuary which provide a sense of peace and wellbeing. To recognise the importance for people's health of opportunities for enjoyment which the peace and tranquillity of the river and surrounding area offers.*

3.4.31 **Promote the beneficial use of dredging spoil, particularly for the recharge of saltmarsh in the Deben Estuary.**

Outcome: *To ensure dredging within the estuary supports the viability of boatyards, marine business and the management of moorings. To facilitate an estuary wide, integrated approach to the use of dredging spoil to recharge degraded saltmarsh as part of an on-going saltmarsh management strategy which benefits navigation, flood defence and biodiversity.*

Policy

3.4.32

- Identify and support the commercial success factors that are specific to the Deben Estuary.
- Support sustainable flood defence measures that protect estuary businesses, agricultural land and water sources necessary for irrigation.
- Encourage and support appropriate agri-environment schemes.
- Safeguard the viability of the marine business sector and the attendant positive effect it has on local tourism.
- Support developing marine fisheries compatible with the environment.
- Establish an estuary wide strategy for the beneficial use of dredging spoil, promoting the use of dredged silt as recharge for depleted saltmarsh where regeneration is beneficial.
- Support dredging where it is needed to ensure sufficient depth of water to enable the use of slipways, quays, jetties and swinging moorings.
- Focus and align visitor facilities in known, existing tourist centres which already offer car parking, cafes, public toilets and access to the river.
- Support sustainable tourism and a 'Responsible Tourism' Code. Welcome 'green tourism' which does not degrade the special qualities of the Deben Estuary.
- Recognise and safeguard the qualities of the estuary landscape and heritage assets that are highlighted by visitors: the natural environment , the peace and tranquillity of the estuary, the opportunities for walking, bird watching and boating.

3.5.00 The East of England is the driest region in the country, receiving only two thirds of the average UK annual rainfall. Up to 75% of the required fresh water supply is obtained from underground aquifers. Groundwater is an extremely important resource but many of the region's surface and ground waters are under severe pressure and climate change, which may alter both the pattern and the amount of rainfall the area is likely to experience, will exacerbate this situation.

Background

3.5.01 Upstream, above Easton to its source near Debenham, the River Deben flows through clay soils with few springs to augment its flow. This freshwater section of the river suffers from droughts in the summer and high flows in wet periods when the water running off the clay fields fills the ditches which flow down to the river. Depending on weather patterns, very variable amounts of freshwater from the upper Deben enter the saline estuary about a mile north of Wilford Bridge.

3.5.02 The tidal estuary, between Melton and Felixstowe, flows through the crag soils of Suffolk's coastal strip. These are very porous and hold vast quantities of water within their aquifers. Where the upland slopes of the estuary valley meet the flat river plain the aquifer produces a line of springs which flow all year round. Originally these springs would have run straight into the river but the historic enclosure of marshes for summer grazing prevented this from happening and trapped spring water behind the encircling river walls. As in the past, this water is discharged into the estuary via sluices managed either by the landowner, the East Suffolk Internal Drainage Board or the Environment Agency. The ongoing spread of development with the resulting increase in surface water run off, adds to the spring flows and puts increasing pressure on pumps and sluices during very wet winters.

Freshwater to support the environment

3.5.03 Rivers, streams, ponds and marshes together with brackish reed beds and saltmarsh are intrinsic elements of the estuary landscape, the importance of which is recognised through its inclusion in the nationally designated AONB. As well as providing valuable areas for wildlife and enhancing the public's enjoyment of the countryside, these wetland systems play a part in flood control and can help to reduce diffuse pollution from agriculture.

3.5.04 The freshwater flows into the Deben are very important for the eco-structure of the river estuary and the sustainability of designated wildlife habitats. Freshwater sustains the biodiversity of the grazing marshes along the Deben's tributaries and, particularly during the migration seasons, freshwater flows over the mudflats attract many wading birds.

Freshwater to support the economy

3.5.05 Land use is mainly agricultural and the light, sandy soils, combined with a favourable climate, enable farmers to grow high quality vegetables, crops which are an essential part of the local economy and for which the area is becoming renowned. This cropping pattern is, however, dependent on a secure supply of water for irrigation which has a significant impact on cropping flexibility and the ability of the land to produce consistently high quality yields.

3.5.06 Over the last 50 years it has become increasingly important to be able to use the spring flows as a source of water to irrigate both land near the river and the sandy uplands above the estuary. During the winter some water is pumped into farm storage reservoirs; during the summer this augments water taken from rivers and streams and, via authorised abstraction points, from the underground aquifer. This is then used for direct spray irrigation.

Excess or shortage of water

3.5.07 Climate change indications all point to more extreme weather patterns where periods of heavy, prolonged rain or drought are likely to be more frequent and last for longer. Excess surface water already causes many problems and flooding will continue to put increased pressure on drainage systems. Drought and water shortages will have an impact on both agriculture and the environment. New housing development in the wider area will not only reduce areas of land for free-drainage and increase the risk of flooding caused by surface water run-off, but add to the demand for water and the pressure on water supplies during droughts.

3.5.08 While most of the abstracted water needed for irrigation comes directly from rivers or the ground aquifer the Lower Deben catchment is now classified by the EA as over licensed or over-abstracted, which means that no new groundwater abstraction licenses will be issued. Climate change will influence the Catchment Abstraction Management Strategy (CAMS) and may curtail abstraction for direct summer spray irrigation. East Suffolk Water Abstractors' Group (ESWAG) representing the interests of irrigation abstractors in the area, states that a drought period can be an irrigator's worst nightmare. In a drought scenario of two dry summers with an intervening dry winter, water shortages, whether physical or regulatory, begin to impact on cropping viability. The only abstraction within the Deben estuary area by a public water company (Anglian Water) is from the Mill River at Newbourne.

Farm reservoir - C. Block

Managing the demand for water

3.5.09 In order to deal with future demand and changing climatic conditions a proactive, rather than reactive approach is needed. Every opportunity needs to be taken to maximise the percolation of rainwater into the permeable crag aquifer thereby replenishing natural water storage which can then be re-abstracted when needed.

3.5.10 As more water is required there needs to be a general shift away from reliance on abstracted groundwater to using other methods of storing water. Most on-farm reservoirs in the Deben estuary are above-ground, rectangular structures providing easy compliance with regulatory requirements and the cheapest construction methods (using waste soil to build walls). This kind of water storage must be increased and funding used to encourage the development of both natural and artificial reservoirs to capture rainfall. Both planning and regulatory systems need to take a positive attitude towards the provision of reservoirs, both small and large.

3.5.11 Measures which can help to lessen the impact of a water shortage or an excess of water can include:

- Channelling surplus water into dedicated wetland sites (which act as a buffer to hold water back until it can be discharged into the river).
- Leaving farmland over winter in a state where it can readily absorb rainfall. (Compaction from heavy harvesting machinery can cause localised problems and limit how easily rainfall can percolate into the soil).
- Cleaning and maintaining ditches, drains and streams (where they are intended as drainage routes) by the appropriate landowners or authority.
- Using permeable surfaces whenever possible and ensuring any hard surface areas drain into receptacles which allow water to percolate into the soil.

Initiatives for future water management

3.5.12 The drought of 2011/12 demonstrated the need to find more ways of becoming resilient over shortages of water. The Environment Agency, which regulates water resources, is exploring ways of making abstraction more flexible and linking demand to availability. Locally this momentum has led to the creation of a stakeholder Forum tasked to study water management in East Suffolk. A pilot project focussing on Holistic Water Management will lead the way in co-ordinated surface water management across the River Deben catchment area. Based on information about the whole river system a range of management techniques can be introduced.

Reservoir storage

- Sending flood waters in the upper river catchment area to storage reservoirs.
- Storing water in the lower catchment area that would otherwise be allowed to flow out to sea.
- Sending water from Internal Drainage Board pumping facilities into storage reservoirs.

Aquifer storage and recovery

- Taking flood water from the river or IDB pumped areas to replenish the aquifer where it can be stored and re-abstracted when required.

Natural flood management and channel improvements

- Modifying land use in the top of the catchment - small scale storage schemes, removal of weirs, construction of twin channels, woodland planting.

Regulatory and economic incentives

- Changing the charging scheme to encourage high flow abstraction; simplifying the reservoir planning process

Water Quality

3.5.13 The Water Framework Directive (WFD) sets objectives for water protection for the future. Attention should be paid to a number of environmental objectives including preventing deterioration of aquatic ecosystems and associated wetlands, conserving habitats and species which directly depend on water, reducing pollution of groundwater and contributing to mitigating the effects of floods and drought The waters of the Deben are expected to reach 'Good Ecological Potential' status by 2027.

3.5.14 According to the Environment Agency's "General Water Quality Assessment" of 2007, the chemical and biological quality of the Deben was given a 'C' standard rating and described as 'fairly good'. High levels of nitrates and moderate levels of phosphates were recorded in the assessment; these come from various sources, including agricultural production, sewage treatment discharges, some untreated sewage from boats, naturally occurring phosphates leaching from crag-based soils and nitrates released into the system from the breakdown of saltmarshes. The discharge of waste water is regulated by Anglian Water.

3.5.15 Enhanced or constructed wetlands together with urban and rural sustainable drainage systems (SuDS) can be used to trap and treat pollutants and can be one of the best examples of a measure that will provide a wide range of additional benefits to people and wildlife, including cleaning and retaining water and creating new habitats. Both the EA and ESIDB promote Sustainable Urban Drainage systems as a way of managing surface water run-off from new housing or commercial developments.

3.5.16 There are no designated bathing water sites on the Deben. A WFD designated Drinking Water Protected Area includes the area around Newbourne and Anglian Water's abstraction point. Catchment Sensitive Farming is supported in the estuary area and work with farmers and landowners goes on to reduce the risk of diffuse water pollution from agriculture.

Objectives

3.5.17 **Ensure there is adequate fresh water to meet human needs, secure a healthy environment and deliver a sustainable local agricultural economy.**

Outcome: *To ensure good management of all water resources in order to meet human needs, maintain the environment and sustain, via irrigation, nationally important agricultural land, both within the estuary and on uplands above the valley. To promote whole river catchment area management able to conserve and store winter water and provide more sustainable reserves for use during periods of drought.*

3.5.18 **Take opportunities to improve water quality within the estuary or reverse any decline.**

Outcome: *To promote the importance of good water quality for marine biodiversity and for the safe use of the river for recreation. To recognise sources of pollutants and foster action to limit and mitigate their effect.*

Policy

3.5.19

- Ensure that the efficient management of water resources within the estuary area delivers sufficient water to meet human, agricultural and environmental need.
- Promote whole river catchment management and the Deben Holistic Water Management Plan; maximise the recharge of the crag aquifer.
- Support the creation of reservoirs for storage of water for agriculture and public water supply.
- Reduce and eventually remove damage to the environment and interruption to human activities caused by surpluses of water (floods) and shortages of water (droughts).
- Support and encourage urban and rural SUDS programmes – particularly in instances where such schemes can mitigate instances of localised flooding.
- Promote and sustain good water quality throughout the estuary and its tributaries.
- Embed a strategy for delivering Water Framework Directive initiatives (marine and freshwater) across the estuary.

The estuary area

3.6.00 The estuary provides the recreational setting for water and land based activities, many of which make an important contribution to the health and wellbeing of the people who come to the area. Key heritage and cultural attractions draw people to this part of Suffolk and the high quality, 'unspoilt' estuarine landscape is highlighted by residents and visitors as one of the main reasons for their particular enjoyment of this area.

Neil Winship

Access to the estuary

3.6.01 **By road** Beyond Woodbridge access to the Deben Estuary villages is via B roads that run south eastwards down the Colneis and Deben Peninsulas towards the coast. A network of single track lanes, some carrying a 'Quiet Lanes' designation, lead to the smaller hamlets. Very few roads go down as far as the riverside and therefore much of the area remains quiet and relatively undisturbed. The roads are generally less busy in the winter months, but it can be difficult to cope with the influx of cars at peak summer periods and traffic congestion is an increasingly familiar problem during the holiday season – particularly by the river at Waldringfield, Felixstowe Ferry and Bawdsey Ferry.

3.6.02 **Public car parks** close to the waterside are only found in a handful of places – Waldringfield, Felixstowe Ferry, Bawdsey Ferry, and the centres of Melton and Woodbridge. Problems occur in most of these locations when car parks fill up on days when the weather is fine and people like to come down to the river. Simply creating more parking areas close to the river is likely to increase congestion, which, in turn, will have a detrimental impact on the estuary environment. Measures that encourage parking away from the estuary are to be preferred.

3.6.03 The proposed housing development at Adastral Park is very likely to exacerbate the parking problems at Waldringfield, but mitigation required through Local Plan policies is intended to minimise the impact of that development. Parking at Felixstowe Ferry is often difficult because of lack of space but there can be spare capacity in the Clifflands car park near where the road turns towards the Ferry. Targeted signage is in place to encourage motorists to use this parking area but more may need to be done, particularly during busy holiday periods, to limit traffic going as far as the Ferry and encourage people to walk along the sea wall path instead.

3.6.04 Elsewhere in the estuary small informal parking areas exist in the countryside in several places. These are often some way from the river and are generally used by local residents who know the area. Expansion of these ad hoc arrangements into more formal 'car parks' would have a detrimental impact on the quieter parts of the estuary.

3.6.05 **By bus** There are no scheduled bus services to the majority of villages on the north side of the river. A Demand Responsive Transport (DRT) service provides some local connections and does pick people up from convenient locations but this mini-bus can only be used if booked in advance. Along the Colneis Peninsula there are buses linking the villages with Ipswich and Felixstowe.

3.6.06 **By train** The local train service between Ipswich and Lowestoft, stopping at Woodbridge and Melton stations, offers a convenient way of reaching the top of the estuary. Another option is the rail link to Felixstowe and then a walk (about 2 miles) from the town centre down to the river at Felixstowe Ferry.

3.6.07 **Along rights of way** The network of bridleways and footpaths is a highly valued aspect of the Suffolk Coastal area. They offer a level of access to the river and surrounding countryside that draws in visitors and provides local residents with recognisable health and recreational benefits. Paths along the river walls, particularly those which can be accessed from a nearby car park, are favoured by many day visitors and residents from nearby urban housing areas. Footpaths that are some distance from the public highway and that require a long walk to reach the river are used less frequently and remain quiet for most of the year

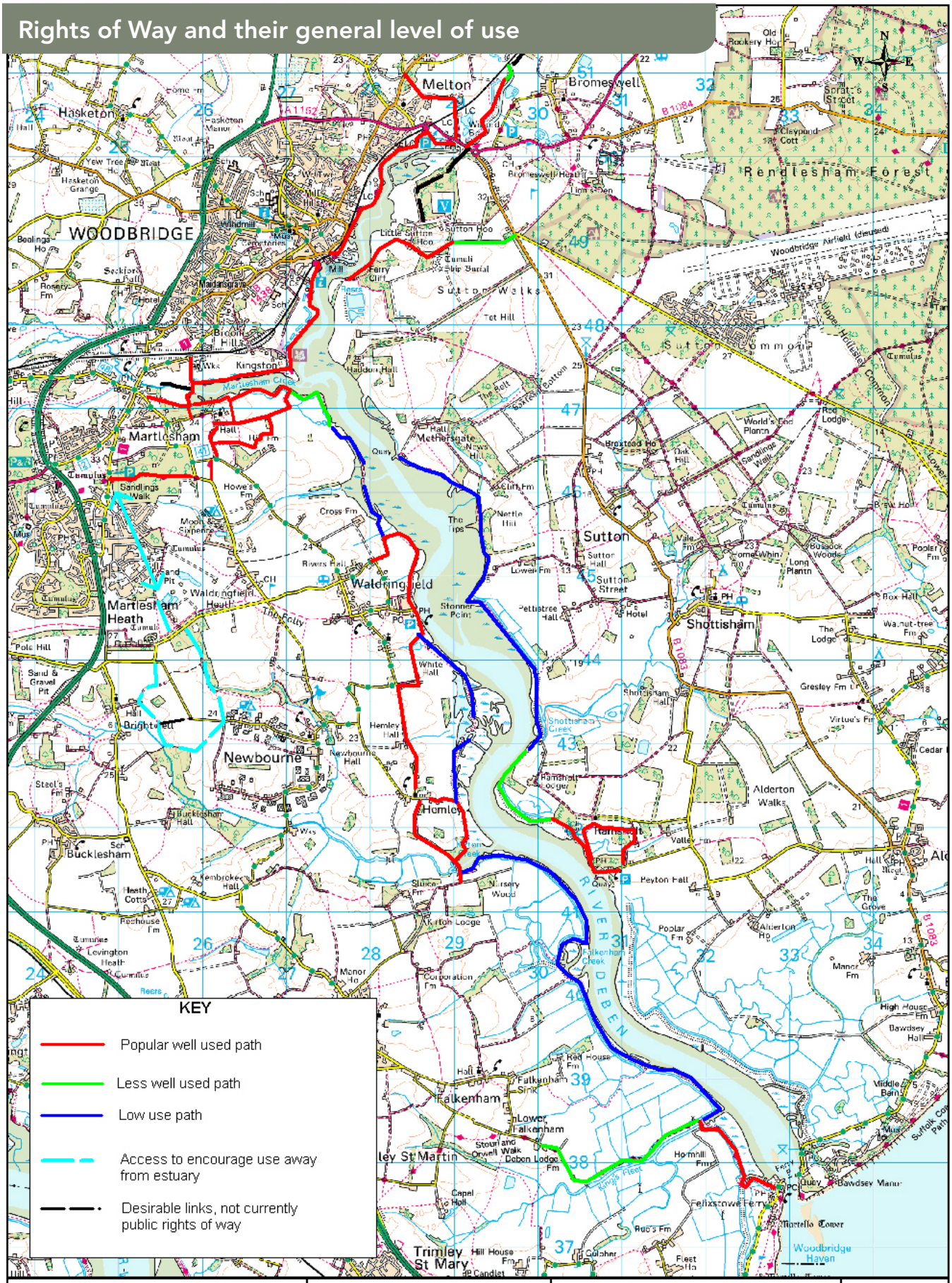
3.6.08 The route of the long distance Suffolk Coast Path reaches Bawdsey and Felixstowe Ferry. Walkers keen to complete longer sections of the route can use the (currently seasonal) foot-ferry link across the river.

3.6.09 The national Coastal Access initiative will designate a route along the Suffolk coast but, when reaching the river Deben, will either have to establish new connecting paths up the estuary as far as the first crossing at Wilford Bridge or make use of a potentially enhanced ferry service.

3.6.10 Along stretches of the estuary between Martlesham and Felixstowe two of the river wall paths are no longer passable as the wall itself has been breached and deep channels allow water to flood through. Rectifying this situation presents a significant challenge. Reinstating the wall is not considered to be an option by the EA, who highlight the environmental value of the lagoons and saltwater habitat created behind the breach and the ability of this area to absorb flood water during a surge tide. Reconnecting the paths by bridging the gaps may be an option that could be considered but construction work would be complex and very costly. An alternative route for one of these paths has been considered but not confirmed.

3.6.11 As further housing development occurs around the edges of the estuary the present network of paths may need to be enhanced. Paths which run along the crest of river walls offer lovely views across the estuary and are popular for this reason but walkers (perhaps with dogs off the lead) can cause disturbance to birds and wildlife. This is a particular concern during the winter months when cold weather can mean flocks of overwintering birds are at their weakest and need to feed, undisturbed, on both arable fields and mudflats exposed by the tide. With this in mind it will be necessary to identify and improve urban-countryside links and ensure that there are good opportunities for circular walks close to where people live.

Rights of Way and their general level of use



3.6.12 **Via the ferry** A convenient foot ferry operates between Bawdsey Quay and Felixstowe Ferry. This is popular with visitors as well as local people and increasing numbers of cyclists find the ferry an important link along Cycle Route 41. Although seasonal at the present time extending the service would have many benefits - encouraging visitors to the area at all times of the year, lessening disturbance elsewhere in the estuary and promoting the benefits of accessible stretches of the coastal paths.

3.6.13 A bus service has provided a regular link from the ferry point into Felixstowe town centre but, at the present time, this has ceased and only a tourist bus operates during the peak summer season.

3.6.14 Some years ago a foot ferry operated between Woodbridge and Sutton Hoo. Reinstating this route is an appealing idea, but the necessary consents, financial viability, limitations imposed by the tides and the environmental sensitivity of the Sutton shore would need to be examined.

3.6.15 **Access to the water** for recreation and marine business is via jetties, pontoons and slipways or hards. The majority of these are owned by the boatyards and clubs but some are privately owned. In places public access to a slipway is possible on payment of a fee. Some of the hards and slipways can be reached by a vehicle from the public highway but there is little provision for parking boat trailers near to launch points. Suffolk Coastal District Council owns a landing platform at Woodbridge and a quay further up river by Wilford Bridge. Boats can moor at the Tide Mill quay for a limited period only.

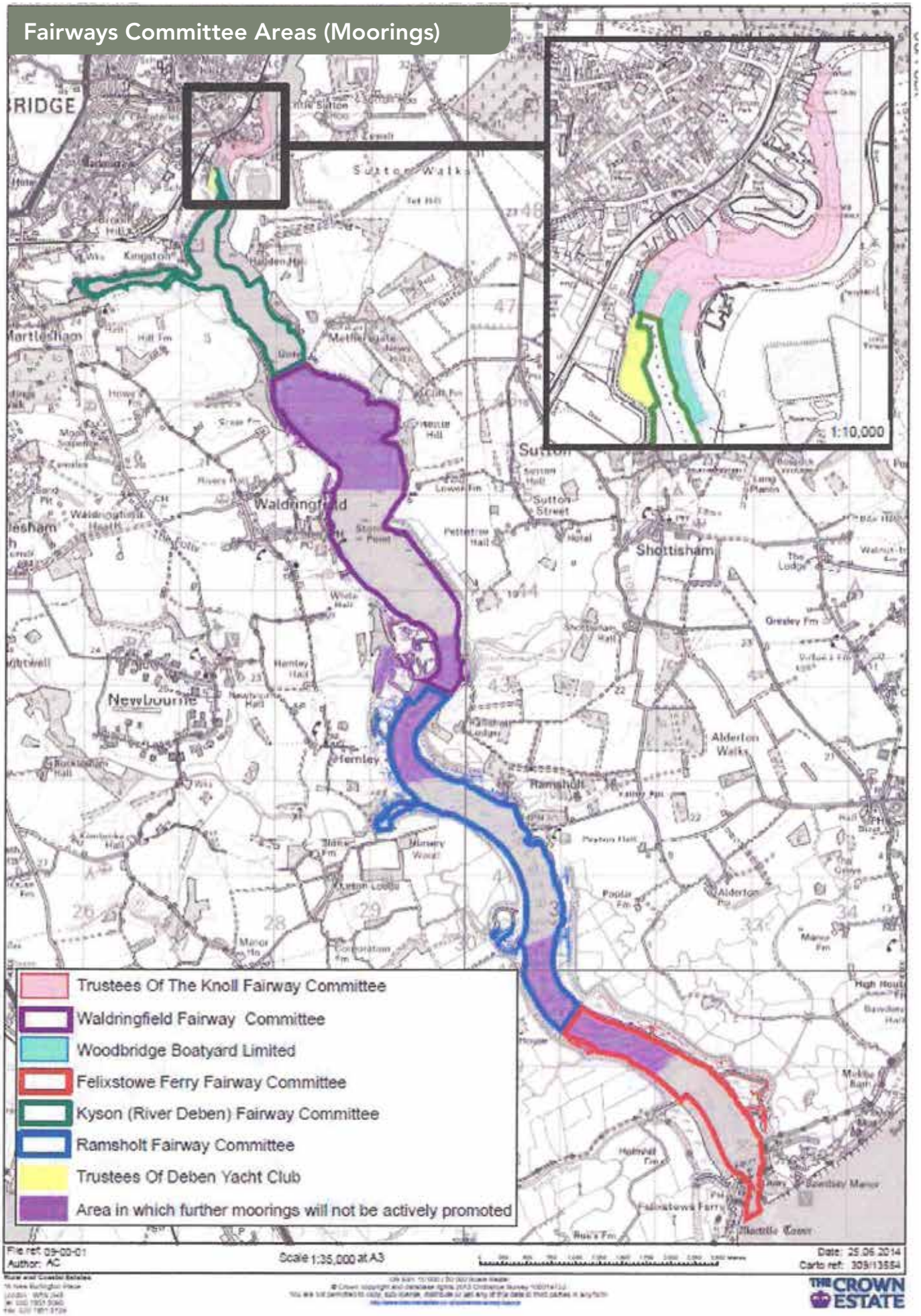
3.6.16 Access to the estuary from the sea can be difficult due to the constrained estuary mouth and the ever changing configuration of the Knolls. Strong tides and the shifting shingle banks allow only a narrow, navigable channel which, can be dangerous under certain tidal and weather conditions. Past Felixstowe Ferry there is a marked, navigable channel up the estuary as far as Wilford Bridge but once beyond Waldringfield, passage for larger boats is dependent on the height of the tide. In the upper reaches siltation is causing the channel to narrow, a problem which can be compounded by the larger moored vessels slewing across the channel in the wind when they are on swinging moorings.

3.6.17 The Deben does not have a Harbour Authority but Fairways Committees lease the bed of the river from The Crown Estate and, in a number of locations, manage moorings and rent them out to leisure craft. Some boatyards also lease moorings en bloc directly from The Crown Estate. These are considered vital to their business operation. The total number of moorings on the river in the summer of 2013 was approximately 1,060.

3.6.18 The Fairways Committees are: Felixstowe Ferry Fairway Committee, Ramsholt Fairways Committee, Waldringfield Fairway Committee, Kyson Fairway Committee and Knoll Fairway Committee. Woodbridge Tide Mill Yacht Harbour has a 60 berth marina. The Harbour Masters at Felixstowe Ferry, Ramsholt, Waldringfield and Woodbridge Tide Mill look after the day-to-day administration of the boats on the river and visitors can contact them with regard to the use of moorings and slipways. Temporary anchorage is possible in some locations along the River Deben.

(see River Deben Association Report - Review of River Users - Summer 2013)

Fairways Committee Areas (Moorings)



WSC

Recreation on the River

3.6.19 In his book 'The Deben River, an Enchanted Waterway' Robert Simper wrote 'The sailing, water skiing and canoeing clubs make very different uses of the same river. Many Deben river users don't join any club and like the river simply for the sense of freedom it gives them.' Although written in 1992 this remains true today.

3.6.20 At the mouth of the estuary Felixstowe Ferry Sailing Club supports yachting and provides the opportunity for dinghy racing, including national championships. On the opposite shore the small Bawdsey Haven Yacht Club shares the same slipway as the sailing school run by the Alexander's International School at Bawdsey Manor. At the estuary mouth jet skis and kite surfing are currently popular. Water skiing has been an activity on the river for many years and the East Suffolk Water Skiing Club uses an area free of speeding restrictions between Horse Sand and the Ramsholt moorings. Further up the estuary there is dinghy sailing from Waldringfield Sailing Club.

3.6.21 At Woodbridge the water is often crowded with boats: Deben Yacht Club focuses on dinghy sailing and racing, Deben Rowing Club offers both sweep oar rowing and sculling on singles and small crew boats, Suffolk Water Sport gets people afloat in canoes as well as offering safety instruction, while Woodbridge Cruising Club, and its pontoon access to the river, not only provides a focal point ashore but also a base from which its members can explore the East Coast estuaries and beyond. There is a troop of Sea Scouts and all the main clubs have popular sections for young people, keen to learn to canoe, row and sail.

Steve James

3.6.22 The Deben has also been the centre for a group of experienced swimmers who take to the water throughout the year. The small beach areas at Woodbridge, Waldringfield, Ramsholt, and Felixstowe attract summer visitors and the narrow stretch of sand at Bawdsey Ferry is a popular place for families with young children. Crabbing has a long tradition of drawing children down to the river to dangle a line in the water but nowadays access to jetties has to be carefully regulated for safety reasons.

3.6.23 The value of the river to a wide variety of users is unquestionable. Boat owners frequently travel between favoured areas and many sailors bring their boats into the river for the summer regattas and for over-winter storage. People often recount their memories of being on or around the water in their childhood and then being drawn back to the Deben in later life. The estuary is frequently described as being 'special' and having a particular charm, which is echoed in such comments as 'with the changes in weather and tides it is a different river every time you go near it.'

3.6.24 Over time the river has changed from commercial use to its present focus on leisure activities, and as a result attention has been directed not only towards the preferences of pleasure boat owners but also the value of the estuary environment. This different approach came to the fore in the 1990s when Annie Healey set in motion the River Deben Association with its aim of involving all those who wanted to protect the Deben and share agreed aims for its future management. Today that same wish to influence and safeguard aspects of the river comes from many directions. Views are expressed about the increasing size of yachts and the number of large motor boats coming into the estuary while the likely damage caused by the wake from some boats at certain speeds is a concern for many. The silting up of the upper reaches of the river, which may limit the number of viable swinging moorings in the future, is felt to be a problem by some, but there is consensus on the present extent of moorings elsewhere and a desire to retain some stretches of open water left 'free' for boating. Research and consultation, conducted by the River Deben Association, has examined these aspects of the estuary. The findings have informed a guidance leaflet setting out practical information and a voluntary River Code advising on such matters as speed, boat wash and noise on the water. *(see River Deben Association – River Users' Code 2014)*


Graham Henderson

- Speed restrictions apply to pleasure boats using the river between 1st May and 30th September.
- A 10 knot limit applies from the entrance of the river at Felixstowe Ferry to the sluice outlet at Kings Fleet, a de-restricted area follows and then an 8 knot restriction applies from Falkenham Creek up to Wilford Bridge.
- Restrictions are generally observed but there are a small proportion of river users who disregard the speed limits and put others at risk.

Recreation elsewhere in the estuary

3.6.25 Walking is very popular. The availability of short or longer circular routes appeals to a wide variety of people and offers a rewarding and sustainable way of exploring the natural environment and heritage of the estuary. Walks that go down to the river and along river walls are often favoured but other routes through the surrounding hinterland are equally pleasant. Many visitors enjoy the trails through the Sutton Hoo estate from where there are fine views across the river towards Woodbridge. Guided walks are arranged by a number of organisations and local groups

3.6.26 The estuary is a favoured area for bird watching, with local people and visitors coming regularly to watch resident and migratory birds. Thanks to information posted on the internet very unusual birds can attract large numbers of 'twitchers'.

3.6.27 Cycling down to the coast and through the surrounding countryside is increasingly popular, one of the reasons being the cycle trails that form part of the National Cycle Network: National Cycle Route N1 passes through Woodbridge, Regional Cycle Routes 41 and 42 form a coastal trail that begins in Felixstowe and goes northwards along the coast. The Felixstowe to Bawdsey foot ferry, which can carry cyclists and their bikes across the River Deben, provides an important and well used link.

3.6.28 Golf is enjoyed by many. There are a number of golf courses within the area – Felixstowe, Waldringfield, Seckford Hall, Ufford and Woodbridge. Some of these are rated as being among the best golf courses in the country and Felixstowe Ferry, established in 1880, is also one of the oldest clubs. These courses can provide the opportunity for conservation and landscape enhancement, as has been done at Felixstowe.

3.6.29 Other sports and interests that bring people to the estuary include horse riding, based at the growing number of equestrian centres and liveries; wildfowling and regular winter shoots for game birds take place and recreational fishing trips can be arranged as an alternative to fishing off the beach.

3.6.30 The river is a favourite place for artists and photographers who find the ever changing estuary a source of inspiration. And many people simply like to come down to the water to sit and enjoy the view and watch the world of the estuary go by. Such opportunities for untroubled enjoyment are valued.

Suffolk Coast & Heaths AONB

Overview

3.6.31 The estuary offers residents and visitors alike the opportunity to pursue a wide range of interests and activities - all of which take place in the context of a 'special' environment. Many people will find the river an appealing place, somewhere to return to; the opportunities for recreation provide not only a sense of wellbeing which enhances health, but the valued landscape is a significant factor in the viability of the local economy.

3.6.32 In looking to the future it will become increasingly important to sustain an equilibrium between recreation and environment.

3.6.33 The Deben Estuary is close to the built-up areas of Felixstowe and the Trimleys, Martlesham and Kesgrave - areas that will see new housing within easy distance of the river. At the head of the estuary likely future development in Woodbridge or Melton may be within walking distance of the river and, a short drive away, there will be further housing expansion on the edge of Ipswich. Inevitably the estuary environment will come under increasing pressure as more people come to Suffolk and discover the Deben. To counteract this a proactive, coordinated approach will be required to balance different aspirations, demands and benefits while, at the same time, conserving the high quality landscape and protecting the environment from degradation. In doing this the factors which cause disturbance and the opportunities for mitigation should be understood and acted upon.

Objectives

3.6.34 **Manage responsible access to the estuary – enhancing the quality of people's enjoyment of the area while averting harm to, and mitigating against degradation of, the estuary environment.**

Outcome: *To support appropriate access to the estuary area for all. To support the network of paths which allow residents and visitors to reach and enjoy many areas of estuary but recognise the impact people and new development can have on the environment. To limit and mitigate the disturbance that will be caused.*

3.6.35 **Balance the benefits derived from quiet and tranquil areas of the estuary with the growing need for recreation, visitor enjoyment and an inclusive, sustainable visitor economy.**

Outcome: *To identify, value and retain undisturbed, tranquil areas of the estuary which provide a sense of peace and wellbeing. To recognise the importance for people's health of opportunities for enjoyment which the peace and tranquillity of the river and surrounding area offers.*

Policies

3.6.36

Recognise the benefit to people's health and well-being offered through enjoyment of the estuary landscape and opportunities for recreation

- Support responsible access to the estuary area and opportunities for safe water-based and countryside recreation balancing these against conserving the valued peace and tranquillity of the estuary environment.

Transport

- Encourage sustainable public transport options which offer a convenient way of reaching tourist destinations within the estuary area.
- Conserve the quality of single track lanes and recognise the benefits of designated Quiet Lanes within the Estuary area.

Car parking

- Support effective management of existing car parks with any additional parking arrangements set back from the river frontage. Resist new, informal rural parking areas in quiet locations.

Cycling

- Promote cycling and walking as sustainable ways of accessing the estuary.
- Promote cycle paths between existing and developing urban areas within the estuary in order to minimise the need to use private motor vehicles

Footpaths

- Manage footpaths based on the level of use. Enhance or improve popular, well-used walking routes and establish opportunities for circular walks, particularly around new housing areas. Ensure some paths provide easy access for disabled users.
- Resist any increase in public footpaths adjacent to the estuary in areas that are quiet, undisturbed and valuable for wildlife.
- Where possible protect estuary rights of way from loss due to flooding or erosion. When loss occurs seek to restore the path or establish a viable, alternative route.

River access and navigation

- Maintain a navigation channel up to Wilford Bridge with a fairway that is clearly marked and free from moorings. Retain open stretches of the river to allow further appropriate navigation.
- Encourage sustainable access to the river via existing locations and launching facilities and resist an indiscriminate increase in public and private slipways and jetties.

Ferries

- Support the foot ferry between Felixstowe and Bawdsey – promote the addition of a suitable, 'dial-a-ride' service throughout the year.

Signage

- Promote signage appropriate to the AONB and varied communication methods which provide information and guidance for estuary visitors and local residents. Support the use of seasonal signage to reflect changing pressures throughout the year.

3.6.37 **Legislation which deals with the requirement to mitigate disturbance**

The purpose of the European Habitats and the Birds Directives is to ensure that the most important designated natural habitats do not deteriorate, species do not suffer significant disturbance and adequate measures are available to offset any negative impact. Local Authorities have a legal duty to make sure that their strategic plans and planning decisions do not have an adverse effect on the integrity of the sites covered by these designations. The Special Protection Areas (SPA) and RAMSAR sites within the Deben Estuary come under this European and international legislation.

Disturbance

3.6.38 Suffolk County Council predicts that net inward migration will continue to contribute to Suffolk's population growth. Housing and business development will be needed to sustain the economic prosperity of the area and the estuary will, inevitably, become busier as increasing numbers of residents and visitors choose to come to the river for recreation. In consequence disturbance is one of the greatest threats to the estuary's ecological integrity and value.

3.6.39 Good management will help to ensure that the pressures resulting from public access are not in conflict with the natural environment. If this is to be achieved it will be necessary for potentially negative impacts to be acknowledged and mitigated against before damage to designated sites and species occurs.

3.6.40 Detailed work in other, comparable estuary areas has shown that regular visitors, as opposed to those on holiday, can come to the estuary area from a radius of up to 10km.

(Footprint Ecology, South-east Devon European Site Mitigation Strategy, 2013 and Solent Mitigation and Disturbance Project. 2013)

3.6.41 In order to assess the cumulative impact of visitors to the Deben it will be necessary to gather further information. At the present time it is considered that the majority of regular visitors to the estuary come from the urban areas of Felixstowe, Martlesham and Kesgrave and the northern fringe of Ipswich. All of these areas will experience increased housing development. At the head of the estuary Woodbridge and Melton will also expand.

3.6.42 Gradual, incremental change will stem from development, both in the immediate neighbourhood and further afield. Over the next 15 years in the region of 2,800 additional dwellings are likely to be built in the main urban areas surrounding the Deben Estuary Plan area, with a small proportion falling within the boundary of the Plan. The full impact from increased numbers of visitors and additional recreational activity will be felt over a period of time.

3.6.43 The present vulnerability of each designated site will be exacerbated by the effect of disturbance. Sites in a poor ecological condition are likely to suffer further deterioration as a result of additional disturbance while other areas may be able to absorb some increase in the level of recreation. However, taking a precautionary approach to the impact of increased disturbance will lessen future adverse effects.

3.6.44 **The effects of disturbance on wintering and migrating birds**

Birds are potentially vulnerable when roosting, feeding on the estuary or feeding on grassland on the landward side of river walls. There will be a negative impact when birds have to avoid sites or have to move to different feeding grounds because of the recurring presence of people. Birds moving from site to site within the estuary can be a short-term response to individual disturbance events or evidence of ongoing avoidance of certain areas. In either case movement will mean increased energy

expenditure, less time spent feeding and possibly forced reliance on poorer quality feeding and roosting areas.

3.6.45 A range of activities can cause disturbance. These will include people walking with or without dogs, some water-based activities and low flying aircraft. These activities will have a varying impact depending on the time of year: for instance kite surfing at the mouth of the river causes considerable disturbance to Little Terns during the breeding season and game shoots close to roosting areas will cause birds to be displaced across wide areas of the estuary.

Mitigation

3.6.46 The aim of mitigation strategies is to ensure that the level of pressure and disturbance on designated sites and species does not increase. Mitigation measures should be appropriate to the scale and impact of disturbance, therefore;

- Mitigation should be specific to the area likely to experience disturbance and provide lasting protection for any of the sites' designated features.
- Monitoring should provide an early indication of whether changes or additions to mitigation measures are necessary.

Funding for mitigation measures may come through contributions obtained from developers (via the Community Infrastructure Levy and through Section 106 Agreements where applicable). Such a system applied to all housing developments close to the estuary would provide a reasonable, incremental funding pot to be used in accordance with site requirements.

Range of mitigation measures

3.6.47 **Habitat management** – improving and enhancing existing habitat and providing alternative or more suitable breeding/roosting/feeding sites beyond the designated area. These measures could include improving grassland and wetland habitats along watercourses, retaining patches of standing open water, parkland trees, woodland, copses and pine belts.

3.6.48 **Visitor management** – seasonally adapting the route of paths around the periphery of designated sites. Screening paths, particularly in sensitive locations, and giving seasonal information about vulnerable species in designated sites.

3.6.49 **Screening or protecting important areas** – using different methods to create barriers which act as a 'separation' between people and wildlife – for example, hiding people from the immediate view of birds. Methods can include creating banks or bunds, using solid fencing, reed screens and careful planting/management of vegetation. Hides, or similar structures, can provide facilities that allow people to enjoy wildlife. Structures can also help to remind visitors that they are entering an area important for wildlife – for example gateways can be designed to ensure dogs can't run ahead.

3.6.50 **Managing visitor access** - restricting or adapting access to some areas at particular times of the year when wintering or breeding birds are most vulnerable. Seasonal information can help to explain the benefits of temporary fencing, barriers or footpath diversions. Providing information and encouraging visitors to use areas that are easily reached and managing paths so that the surface, design and maintenance can influence how and when they are used. Visitors are more likely to stay on easily walked paths and a well surfaced path can be effective in drawing cyclists away from quieter routes or very sensitive areas.

3.6.51 **Managing the number of visitors to the estuary during busy, holiday periods** – modifying parking fees, parking capacity and restricting on-road parking.

3.6.52 **Good communication and education** - signs, interpretation boards and leaflets, guided walks, school visits, and community events can all provide information which helps visitors to understand the importance of designated sites and the benefit of appropriate behaviour.

3.6.53 **Guidance for dog walkers** – asking dog walkers to respond to seasonal information signs, avoid roost areas and keep dogs under control or on leads.

3.6.54 **Code of Conduct** - developed in partnership with the clubs who use the river to ensure everyone's enjoyment and safety and minimise any impact on designated sites or species.

3.6.55 **Wardens or rangers** - covering the frequently used areas of the estuary and delivering an on-site presence across a number of sites; offering guidance to visitors, monitoring difficulties and directly approaching people whose actions were causing disturbance or nuisance.

3.6.56 **Providing alternative, open green space away from the estuary** – designed to provide a viable and attractive destination close to urban areas. Ideally such sites would be thought of as 'natural areas', offering a variety of habitats, woodland, scrub, grass and heathland. They would provide plenty of space for dogs to be exercised freely and safely off lead and the majority of paths would be easy for any walker to use all year round. Car parking would encourage use of these sites by those from further afield who might prefer a well defined and 'safe' walking environment. Such an area adjacent to new development should be clearly sign-posted and advertised to new home owners.

3.6.57 **An ongoing visitor management plan** should collate and regularly review information relating to the pattern of visits and preferred locations. Impacts such as footfall, the deterioration of access routes, vegetation changes and the consequences of climate change should be recorded in order to inform effective, ongoing mitigation.

3.6.58 Present disturbance levels and the proposed measures to avoid and reduce levels of disturbance within the Deben Estuary are set out in a report commissioned by the Deben Estuary Partnership : 'The Deben Estuary and its Hinterland, Evaluation of Key Areas for Birds, Recreational Disturbance Issues and Opportunities for Mitigation and Enhancement. Nick Mason, Andrew Excell & James Meyer 2013'.

Objectives

3.6.59 **Manage responsible access to the estuary – enhancing the quality of people's enjoyment of the area while averting harm to, and mitigating against degradation of, the estuary environment.**

Outcome: *To support appropriate access to the estuary area for all. To support the network of paths which allow residents and visitors to reach and enjoy many areas of estuary but recognise the impact people and new development can have on the environment. To limit and mitigate the disturbance that will be caused.*

Policy

3.6.60 Seek to minimise and put in place measures to mitigate pressure and disturbance within the estuary area. Promote and facilitate the adoption of a range of mitigation measures which are appropriate to particular sites and levels of disturbance.

3.7 Estuary Policy Areas

Flood and Emergency Resilience

Waldringfield Flood Defence Group

Background – roles and responsibilities

3.7.00 The Environment Agency has powers and responsibilities to manage flood risk from main rivers and the sea. The Civil Contingencies Act of 2004 imposes a legal duty on Local Authorities and a moral responsibility on Town and Parish Councils to prepare and maintain Emergency Plans in response to possible emergencies, such as severe flooding. In Suffolk this duty is carried out through the Suffolk Joint Emergency Planning Unit, a shared service owned by all eight Local Authorities in Suffolk. Its purpose is to assist each Local Authority in preparing for and carrying out their statutory responsibilities with regard to major emergencies.

3.7.01 Local Authorities and service providers will, therefore have plans in place to inform the way in which they respond to a community wide emergency. As far as possible their role will be to assist the emergency services, help victims, maintain services, protect the environment and work with others to restore normality.

3.7.02 The Suffolk Community Risk Register is a document that shows which risks have been identified and assesses their likely occurrence and impact. In Suffolk the risk of coastal flooding is considered to be very high and, in order to respond effectively to this, Local Authorities have drawn up a Flood Plan.

3.7.03 **Suffolk Flood Plan** - is linked to national policies and detailed plans on flood and coastal erosion risk and to the warning and informing systems which are managed by the Environment Agency. The Plan summarises the Suffolk response to major flood events and proposes a co-ordinated approach to contingency planning. The response to a major flood event will involve giving timely and accurate information to the public and first responders, advising on any precautionary evacuation of communities at highest risk, rescuing people who are trapped in flooded areas and assisting communities cut off by flooding.

3.7.04 Later on in the sequence of emergency actions, there may be a requirement to provide environmental care and health advice to communities affected by flooding and restrict access to public rights of way in or near flooded areas.

Community resilience

3.7.05 If widespread flooding occurs assistance from the Emergency Services may not reach all small communities straight away. In these circumstances it is sensible for householders and villages to know what to do so that they can manage on their own until assistance arrives. In order to be able to do this safely parishes should have their own Emergency Plan ready to put into operation once a warning of severe flooding has been given. Advice on emergency preparedness and drawing up an Emergency Plan is available from the Suffolk Resilience Forum and the National Flood Forum websites.

3.7.06 The aim of a local Emergency Plan is to circulate straightforward, practical information on flood preparedness to the households in the community and to ensure that, in the event of flooding, the community can operate a local support network, identify vulnerable people who may need additional help and open a pre-designated emergency centre and safe refuge for residents who may have to temporarily leave their homes. Sharing knowledge of significant local hazards with the Emergency Services may also speed recovery after an event.

3.7.07 The Environment Agency provides a free service, **Floodline Warnings Direct**, which sends flood warnings by phone, text or email to individual people and businesses. It is the responsibility of individual property owners to take appropriate action to safeguard their property from flooding. If they are aware that buildings they own are in an area that could flood they are advised to prepare for an emergency well in advance and obtain protection equipment to reduce the risk of flood water getting inside.

3.7.08 Sandbags are sometimes used by professional partners for strategic flood defence purposes, but the Environment Agency and Local Authorities do not provide free sandbags or offer a sandbag delivery service to residents. Traditionally sandbags have been used to block doorways, drains and other openings into properties but they can be difficult to handle and will only keep water out for short periods. They cannot be easily stockpiled before a flood event and therefore require a lot of local manpower to fill and distribute ahead of an expected flood. They also need to be disposed of after a flood as they can be polluted and require specialist disposal. The Environment Agency encourages people to use purpose made flood protection products, such as flood boards, non-return valves for plumbing and air brick covers rather than sandbags. Kite-marked flood protection products can be found on the National Flood Forum website.

The Environment Agency

Flooding within the Deben Estuary

3.7.09 Much of Suffolk Coastal is vulnerable to coastal flooding should defences be overwhelmed or breached. Within the Deben Estuary the majority of people and property, at Felixstowe Ferry and Woodbridge, are behind flood defences. Some properties have been or are at risk at Waldringfield and Bawdsey Ferry; elsewhere individual dwellings are vulnerable to varying degrees of flooding and significant amounts of marsh reclaimed for agricultural use could be inundated in a major flood. Most infrastructure is only at risk during a major coastal flood event, exceeding 1953 levels, when existing defences could be overtopped or breached.

3.7.10 Within the estuary area flooding from the sea is most likely to occur during a North Sea surge event. When an area of low pressure moves eastwards across the Atlantic towards the north of British Isles, it raises the level of seawater beneath it by up to a third of a metre. If this 'plateau' of sea water passes north of Scotland and then down into the shallow basin of the North Sea, perhaps further heightened by strong winds from the north, it can cause a surge of up to 2 metres in the southern North Sea. If climate change prompts an increase in extreme weather events and if the subsequent surge conditions coincide with a twice monthly spring tide, there is an increased likelihood of flooding.

3.7.11 A serious event triggered by these weather conditions occurred in 1953 when large areas of land were flooded, property was damaged and lives were lost at Felixstowe Ferry. In early December 2013 very similar conditions occurred. While improved defences, better warning systems and community awareness averted a major disaster, considerable damage was done when river walls in the upper estuary were overtopped or breached, marine businesses were affected and homes were flooded in several places, most notably at Waldringfield.

Objective

3.7.12 **Develop emergency planning that safeguards communities at risk from flooding.**

Outcomes: *To encourage communities to recognise risk from flooding and ensure that adequate measures are in place which will help to keep residents safe and protect properties.*

Policy

3.7.13

- Achieve community preparedness throughout the Deben estuary area.
- Ensure that communities and businesses are able to respond to a flooding emergency.

4.1.00 The delivery of actions arising from an Estuary Plan is dependent on funding which, in the present budgetary climate, will not be easy to obtain. Eligibility to achieve a contribution towards the cost of flood defence is determined by a specific set of criteria which indicate a relative 'economic' or 'uneconomic' value. This assessment process may not tally either with the value of the land to the landowner or the public perception of the value of the land as part of the natural environment. If the intent is to conserve the estuary for as long as possible the delivery of policies and actions set out in the Plan will have to rely heavily on finding alternative funding to replace the inevitable shortfall in state funding.

4.1.01 The concept of partnership funding will play an important role in carrying out projects to maintain or enhance the estuary but this will require statutory authorities and local communities coming together to deliver common objectives (which has already been demonstrated through the development of the Estuary Plan). Funding will have to come from a range of sources – the Environment Agency, Local Authorities, grant aiding organisations, charities, and beneficiaries - as well as more innovative solutions that draw in finance. Each individual project is likely to require a funding framework which identifies finance options which can be combined to pay for the scheme.

4.1.02 This process of collaborative working and fundraising has already proved an effective framework for action on the Deben estuary.

Funding for Flood Defence Management

4.1.03 Historically, Government paid for the maintenance and improvement of flood defences where there was a demonstrable cost benefit to do so. Over time there has been a need for improved flood defences, built to a higher standard to reduce increasing levels of flood risk. In this context Defra introduced a new policy, 'Flood and Coastal Erosion Resilience Partnership Funding', in May 2011. This shift towards 'partnership' funding marks a significant change in the way projects in England are considered. Now, rather than using the criteria which allowed some projects to be fully funded while others received no money at all, the Government's aim is to facilitate more schemes by the use of additional funding drawn from other parties. This is particularly helpful in more rural areas where fewer people and less property are at risk and consequently less Government funding is achievable.

4.1.04 The Government intention is to provide better protection for more communities. This new approach allows those that benefit most from flood defences to have a role in their management. Landowners able to fund the maintenance or improvement of flood defences which protect rural flood cells can commission works, subject to the necessary consents. Communities who apply for and secure grant aid can trigger flood defence projects by combining the money they have raised with any allocation available from Government, again subject to the necessary consents.

4.1.05 On the Deben Estuary both individual landowners and the Waldringfield Flood Defence Group have been able to move forward using this approach. Defences have been enhanced to a good standard of protection and are more resilient to future tidal flooding. However, further work is necessary elsewhere in the estuary and the larger sums required will cause local communities and landowners to search for different ways of raising money.

Potential sources of finance

4.1.06 Communities will recognise the challenges as well as the benefits of securing finance by way of enabling development. The process requires landowners, or a partnership, to put forward suitable sites for housing development, obtain planning consent, sell the land to a housing developer and use the money raised to fund targeted flood defence measures within a defined estuary area. Following a report commissioned by the Deben Estuary Partnership *(Hawes Associates Deben Estuary Flood Cell Survivability Report 2013)* the cost of outstanding work on flood cells deemed to be economic (FC01 and FC04) is some £600,000. If enabling development becomes an appropriate and chosen method of raising finance to augment any allowance received from Government this will be on an 'exception' to planning policy basis. Any such proposal would have to be fully justified and the number of dwellings the minimum required to fund the necessary flood defence.

(see Enabling Development Guidelines Appendix 4)

4.1.07 With increasing flood risk, identifying alternative sources of funding has an added urgency. Enabling development is only one way of securing additional finance. The money raised can go some way to meet capital costs but cannot be used to cover the shortfall in funding for future maintenance. It will be necessary not only to quantify the amount of money required to maintain flood defences in a fit for purpose state but to determine where that money should come from.

4.1.08 It will be necessary to be aware of other opportunities for funding which may lie beyond recognised sources of grant aid. One possibility could be potential EU funding, accessed, perhaps, in connection with a wider environmental project developed in conjunction with European partners. Another route may be to use a quantifiable means of ascribing value to natural assets, such as saltmarsh, and the opportunity thus presented for carbon sequestration, and trading that benefit. This would fall within the emerging thinking around 'ecosystem services'.

4.1.09 Other than the options above there may be commercial enterprises which can deliver a regular payment to meet revenue costs. And as people begin to understand the need for ongoing sustainable defences, the principle of seeking a proportionate contribution from all those who benefit in some way from the flood defence – the principle of 'beneficiary pays' - may also be a pragmatic way of raising money.

4.1.10 It should be expected that any finance raised through private initiatives would have, as its basis, the flood defence management policies agreed by an estuary wide plan.

Simon Read

4.2.00 It will be important to know of and track changes within the Deben Estuary and to understand, as far as possible, the reasons for change. Monitoring should provide accurate evidence on which to base knowledge of change, understanding of how far objectives are having the intended effect and therefore whether modifications are needed to proposed courses of action.

4.2.01 **Monitoring should include:**

- Wider issues such as sea level rise, saltmarsh extent and condition, visitor numbers and the pattern and level of disturbance. Particular reference to monitoring sea level rise data would be needed to justify proposals for adaptation.
- Outcomes from individual projects dealing with specific sites or problems.

4.2.02 An effective monitoring programme will be dependent on consistent data collection over a given period of time. The Deben Estuary Partnership is unlikely to have the resources to collect and collate all data itself; it will therefore be necessary for partners to work together to share information gathering and determine how data can best be selected and used to provide relevant information. It is recognised that, in order to establish consistency, it is vital to retain collaborative relationships with institutional partners and to identify an income stream that will allow for compatibility between disparate projects.

Monitoring process

4.2.03

- Determine indicators and timescales appropriate to monitor specific issues or projects.
- Set out a monitoring and delivery framework appropriate for work with both community and Statutory Bodies.
- Create a record / evidence base specific to the areas or projects to be monitored.
- Deliver an annual monitoring report. As with the AONB Management Plan the annual report should log both short term changes and emerging long term trends.
- Present an annual monitoring report to the Coastal Forum, the EA, NE and Local Authorities and publish for public information.
- Review, amend and develop action plans based on the monitoring results.

4.2.04 It is expected that, in delivering particular projects, the monitoring regime will be dictated by the requirements of the project. With specialist areas, such as saltmarsh, the development of innovative monitoring techniques may be required. The example of methodology below shows how this is being developed.

Monitoring methodology for saltmarsh management schemes

4.2.05 Saltmarsh projects are monitored using a variety of methods appropriate to the site. Monitoring results are judged against an independent baseline survey and report establishing the condition of the marsh prior to the management intervention. Monitoring techniques include a grid of marked posts sited to measure accumulation or loss of sediment, fixed point photography and Horizon Markers (circular deposits of feldspar marked by a post where the depth of deposit can be measured over time by taking a core sample.) Surveys using a remote controlled drone can give an accurate overview of the marsh and its vegetation and link into current Lidar data. Each monitoring session provides evidence of change in sediment levels and in the range and cover of vegetation.

4.3.00 The Deben Estuary Partnership (DEP) is based on the principle of developing a recognised and respected link between local people, statutory agencies, interest groups and local authorities. It recognises the requirement to fit local aspirations and solutions into a wider context and seeks to develop mechanisms for engendering action, co-ordinating resources and sharing information, knowledge and innovation.

4.3.01 The development of the Deben Estuary Plan has been based on the principle of partnership. It has used a flexible, community based governance model that can respond to issues within a defined, geographic area, that offers an opportunity to deliver solutions to recognised local problems and promotes a sense of local 'ownership'. In adopting this new way of working the Partnership accepts the implicit requirement to work within the framework of legislation, adhere to principles of 'responsibility' and 'liability' and work with – not against – statutory bodies. Equally, statutory bodies must be willing to revisit historic areas of control and forge links that do not impose solutions but rather support a culture of shared problem solving.

The Deben Estuary Partnership

4.3.02 The membership of the DEP represents a range of community views which reflect a sense of 'ownership' of place and a desire to influence the future of the local estuary area where people live and work. A central Steering Group is made up of local landowners, Parish and District Councillors, members of the River Deben Association, representatives from the AONB, IDB and local businesses, and individuals who come with knowledge of recreational and environmental matters. Commissioned, topic-based sub-groups, able to draw in further, wider representation, focus on Access, Environment and Saltmarsh. All sub groups feed back to the Steering Group which provides strategic direction and guides the DEP's activities. In order to handle grant aid dedicated to specific projects and finance allocated to developing the Estuary Plan the DEP has set up a charity, DEP Limited (DEPL).

(Ref: Deben Estuary Partnership – Constitution)

(Ref: Deben Estuary Partnership – Constitution)

4.3.03 The DEP has a close working relationship with the Environment Agency, Suffolk Coast & Heaths Area of Outstanding Natural Beauty, Natural England. Suffolk Coastal District Council and Suffolk County Council. Members are in touch with The Crown Estate, Suffolk Wildlife Trust (SWT), National Trust (NT), the RSPB and Marine Management Organisation (MMO).

The Role of the Deben Estuary Partnership in drawing up the Estuary Plan

4.3.04 The Estuary Plan itself has been drawn up as a shared undertaking between the Deben Estuary Partnership (DEP), supported by the River Deben Association (RDA), the Environment Agency (EA) and the Suffolk Coast & Heaths Area of Outstanding Natural Beauty Unit (AONB). The DEP has acted as the lead partner. Matters relating to the Plan have been approached in an inclusive, open, honest and accountable manner. Throughout the process decision making has been evidence based and by consensus, with no one group having an overriding influence.

Process of developing the Plan

4.3.05 Sub-groups, representing authority and community interests, were tasked by the DEP to research specific areas, become conversant with any overarching strategic policy and put forward evidence based policy proposals. This work was co-ordinated by a dedicated core Plan Group working closely with the Environment Agency and the Suffolk AONB Unit. A Wider Plan Group, comprising representatives of Suffolk County Council (SCC), Natural

England, Suffolk Coastal District Council (SCDC), the National Farmers Union and East Suffolk Water Alliance Group, advised on process and scrutinised the development of the Plan.

4.3.06 Matters relating to both policy and process that required further guidance and endorsement were reported back to both the Wider Plan Group and the DEP Steering Group in order to ensure that decisions reached were based on all relevant information.

4.3.07 Throughout, the DEP Steering Group provided direction and monitored progress while members of the DEP continued to engage with estuary communities and interest groups, exchanging information and gathering feedback on emerging policy proposals.

Assessment of the Plan

4.3.08 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).'

4.3.09 Developing and producing the Estuary Plan has complied with statutory processes. As such it has been subject to the required Sustainability Appraisal/ Strategic Environmental Assessment, Habitat Regulations Assessment and Water Framework Directive Compliance Assessment. It has adhered to the requirements set out in Suffolk Coastal District Council's Statement of Community Involvement, Supplementary Planning Documents.

Acceptance of the Plan

4.3.10

- The Plan has been endorsed by Suffolk Coastal District Council in accordance with Planning Policy SP30, ensuring that it becomes a material consideration in relevant planning decisions and informs other relevant decisions in the area.
- Suffolk County Council Cabinet received and endorsed the Plan.
- The Environment Agency have put the Plan before the Regional Flood and Coastal Committee who have endorsed it as the principle strategic plan for flood management in the estuary.
- The Plan has been received and endorsed by the Coastal Forum.
- The Suffolk Coast & Heaths Area of Outstanding Natural Beauty Partnership will endorse the plan.

Implementation of the Plan

4.3.11 Implementation of Plan policy and actions will be subject to the appropriate consents, licences, permissions and authorisation required by the relevant administrative bodies.

A range of authorities and organisations, both statutory and community-based, will facilitate actions arising from the Plan. An action group has been set up to ensure actions are prioritised and delivered

4.3.12 **The role of the Deben Estuary Partnership will be to;**

- Facilitate actions set out in the Plan, including projects relating to flood defence, nature conservation and access.
- Support and assist with the pursuit, when necessary, of sources of funding for flood defence and other projects set out in the Plan.
- Research, encourage and seek sponsorship for innovative solutions to problems recognised and set out in the Plan.
- Respond to consultation when issues relating to Plan policy are raised.
- Submit an annual monitoring report to the Coastal Forum and publish for public information.

4.3.13 It will be necessary for the partners to monitor how effectively the policies contained in the Plan deliver the intended objectives. In addition to their regular meetings the Deben Estuary Partnership will invite relevant partners to discuss action planning and monitor progress every 12 months. If evidence indicates that changes to the planned actions or supporting policies are required amendments will be considered and, when necessary, taken through a formal review process.

C. Block

Introduction to appendices

1. Shoreline Management Plan - extract
2. Jetties, Pontoons and Slipways (Hards) - Guidelines
3. Residential Boats on the Deben Estuary - Guidelines
4. Enabling Development Guidelines
5. RDA - River Users' Code

Appendices 1-5 have been compiled following research, observation, consultation and comparison with policies and good practice adopted elsewhere by other organisations and Councils.

Appendix 2 and 3 Jetties and Residential Boats. The guidelines are intended to assist in decision making and inform future planning policy. Existing Houseboat policies for Woodbridge and Felixstowe (AP191 and AP241) from the previous Local Plan document have been 'saved' and will remain until replaced.

Appendix 4 Enabling Development sets out guidelines for how enabling development can be approached. The guidelines are based on the previous experience of delivering enabling development to secure a coastal defence scheme at East Lane, Bawdsey.

Appendix 5 River Users' Code has been developed as advice to river users by the River Deben Association following extensive consultation and assessment of current circumstances.

Appendices - Volume Two
(separate documents available on www.debenestuarypartnership.co.uk)

- *Andrew Hawes - Flood Cell Survivability Report*
- *EA Deben Estuary Pan - Technical Report*
- *EA Geomatics - Deben Estuary Saltmarsh Re-Mapping and Change Analysis 2011-2013*
- *RDA and DEP - Carol Reid - Possible Causes of Saltmarsh Erosion with reference to the Deben Estuary*
- *Robert Simper – Recent History of Changes to the Saltmarshes of the River Deben*
- *Andrew Excell and Kieron O'Mahony (2013) - The River Deben Estuary Ornithological Importance and Status for Waterbirds The Deben Estuary and its Hinterland*
- *Nick Mason, Andrew Excell & James Meyer - Evaluation of Key Areas for Birds, Recreational Disturbance Issues and Opportunities for Mitigation and Enhancement*
- *Deben Estuary Partnership Environment, Landscape and Archaeology Report April (2013)*
- *River Deben Association - Review of River Users - Summer 2013*
- *The Crown Estate – Association of River Deben Fairway Committees – Position Statement - June 2014*

Appendix 1

Suffolk Shoreline Management Plan - extract

Shoreline Management Plans (SMP's) although non-statutory, provide a large-scale assessment of the risks associated with coastal processes. In the widest sense they aim to reduce risk to the social, economic, natural and historic environment. On a more local level they set out the risks from flooding and erosion to people and their property, identify policies and ways of managing those risks and inform others so that any future development can take account of the likely risks and preferred policy.

SMPs divide up the entire coastline of England and Wales into discrete areas called Policy Zones. These are further subdivided into Policy Units and Management Areas which is the level that policies have been defined.

The Shoreline Management Plan for the Suffolk coast was formally approved by the EA's Regional Director on 22nd August 2011. Policy Development Zone 6 – Orford Ness to Cobbold's Point, and the Policy Unit (DEB 17) includes Bawdsey Cliffs (DEB 17.1) Bawdsey Manor frontage (DEB 17.2) the lower DEBEN estuary (DEB 17.3) and Felixstowe Ferry frontage (DEB17.4). The Plan notes that there is a general drift of sediment from north to south but highlights the most obvious and important feature of coastal processes at this point as being the shingle banks system – The Knolls – at the mouth of the Deben.

The summary of the specific policies for this Policy Development Zone are:

Policy Unit		Policy Plan			
		2025	2055	2105	Comment
DEB 17.1	Bawdsey Cliffs	NAI	NAI	NAI	
DEB 17.2	Bawdsey Manor	HTL	HTL	HTL	Maintain estuary configuration with local decisions on management of individual sections. This may require private funding.
DEB 17.3	Lower Estuary	HTL	HTL	MR	Manage potential flood compartments in a manner to allow sustainable management of the estuary entrance.
DEB 17.4	Felixstowe Ferry	HTL	HTL	HTL	Manage alignment of the coast. This is dependent on cyclical coastal process moving sediment onto the frontage. May need to review policy at the end of the first epoch.
Key: HTL – Hold the Line, MR – Managed realignment, NAI No Active Intervention					

Full details in the approved Shoreline Management Plan can be found at:
http://www.suffolksmp2.org.uk/policy/index.php

Appendix 2

Jetties, Pontoons and Slipways (Hards) - Guidelines

Jetties, pontoons and slipways (hards), including those at Woodbridge, Martlesham Creek, Waldringfield, Ramsholt, Felixstowe and Bawdsey Ferry, facilitate access to the water for recreation and marine business. The majority are owned by the boatyards, sailing or rowing clubs, some jetties are privately owned and Suffolk Coastal District Council owns a jetty in Woodbridge.

Any new jetty, pontoon or slipway requires consent from:

- the local Planning Authority
- the Marine Management Organisation – who will assess each application on a case by case basis against the likely impact on the environment and other users of the area
- the need for further provision of jetties, pontoons or slipways should balance the requirements for leisure and commercial access to the water against conserving the environment and valued tranquillity of the estuary landscape
- the location of and access to any new jetty, pontoon or slipway should not cause undue disturbance – particularly to designated environmental sites, nesting, foraging and roosting areas for estuary birds
- the enlargement of any existing jetty, pontoon or slipway should not cause undue disturbance – or detrimental change to the character of the neighbouring foreshore and AONB
- the location of and access to any new jetty, pontoon or slipway should not have an undue, detrimental impact on the visual quality of the river and wider landscape

Any new jetty, pontoon or slipway should not:

- cause erosion or damage to river banks or saltmarsh
- cause scouring or silting up of the river bed
- obstruct existing footpaths and / or rights of way

The length, form, design and location of any new jetty, pontoon or slipway should recognise the need for recreational and commercial access to the river but avoid:

- detrimental change to the character of the neighbouring foreshore and AONB
- obstruction of existing recreational 'beach' areas

With particular reference to: SP12 , SP14, SP15, DM21 and DM22

Appendix 3

Residential Boats on the Deben Estuary - Guidelines

With reference to information supplied by Melton Parish Council, Felixstowe Ferry Foreshore Trust and the DEP. With regard to the Environment Agency's guidance on Private Houseboats, Adur District Council's Code of Practice for Houseboats and information from British Waterways and The Green Blue, an environmental awareness initiative run by the British Marine Industry and Royal Yachting Association with support from Defra and the Crown Estate.

The term "residential boats" is widely used, particularly by British Waterways to denote all manner of craft used as a "primary or temporary residence". It is a more appropriate term than the more familiar "houseboat" on the River Deben, since it acknowledges the high proportion of craft that are navigable and, in order to comply with their licence agreements with landowners, must remain so. However, just as houseboats, these are "floating decked structures without a permanent foundation that have been designed or adapted for use as a primary or secondary residence" and vary in dimension, type and seaworthiness.

For the purpose of convenience it is possible to draw a distinction between boats that serve as a permanent or primary residence, those that are able to go to sea and those which are used on a transitory, holiday basis but are not moored in the channel, boats that have fallen into disrepair, are derelict and lie in the mud.

Residential boats in relation to the environment

In order to conserve and enhance the natural beauty of the Suffolk Coast and Heaths Area of Outstanding Natural Beauty and protect the intertidal areas, mudflats and saltmarsh within the SSSI, a policy of minimal disturbance is required. Due to coastal squeeze, from rising sea levels and hard defences, estuarine habitats are being lost.
In relation to the residential boats, this means that there should be no storage of materials on the intertidal areas. The Environment Agency, MMO and Natural England advises there should be no deposition/storage of any materials on the saltmarsh vegetation and mudflats and no erection of structures which will reduce its area or potential usage by birds (e.g. jetties and walkways) without prior consultation and consent from Natural England.

Residential boats on the Deben

No single area is exclusively devoted to moorings for residential boats, most areas include boats that are moored up by owners who do not happen to live aboard. All the areas that have residential boats on the Deben are either within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) or the AONB and the Heritage Coast.
There are a number of residential boats that are moored to the river wall between Melton and Woodbridge and at Felixstowe Ferry. Boatyards manage private moorings at Woodbridge and Martlesham Creek but at Felixstowe Ferry the majority of boats (currently 13) are berthed on land owned and managed by the Felixstowe Ferry Foreshore Trust.

Aims

The variety of sizes, shapes and types of boat is a distinctive and an established aspect of the character of the area and can enhance the sense of place. However:

- Residential boats should not have a negative impact upon the natural environment and should respect the unique habitat within which they are situated.

- Areas of mixed moorings which include residential boats should still retain the open feel of the river, maintaining wide views across the estuary for, not only residential boat owners, but other residents and visitors to the river.

- The riverside should be kept clear of waste materials. Any storage facilities ancillary to residential boats and overland service cables and water pipes should be managed in a way that is sympathetic to the surrounding environment.

Appendix 3 - Residential Boats on the Deben Estuary - Guidelines

In order to retain the character of residential boat areas and avoid the potential for negative impact on either the environment, nearby residents or other residential boat owners, boats should be kept in good repair, have a suitable water supply and facilities for sanitation and waste water disposal which do not cause pollution, access to appropriate refuse disposal and adequate provision of fire-fighting equipment.

The size and dimensions of residential boats should be in keeping with the immediate environment. Superstructures should retain a marine as opposed to domestic form.

Access to residential boats

Access is often obtained via a footpath (sometimes a public right of way), which runs along the top of the riverbank. This embankment is likely to be a primary river defence whose integrity is essential to the prevention of tidal flooding. An equal proportion of boats are accessed through private or commercial premises, mainly boatyards.

Structures ancillary to residential boats - jetties, platforms, sheds, bunkers and fences

- Jetties, gang planks, sheds and platforms should not obstruct public rights of way.

- Jetties should not exceed a given length and width.

- Design and construction of any platform, shed or bunker should not have an undue, detrimental impact on the visual quality of the riverscape nor on designated environmental sites, nesting, foraging and roosting areas for estuary birds.

- Platforms should be positioned directly adjacent to the riverbank path and not exceed a given length and width.

- Sheds and bunkers: should not exceed a given size and height.

- Larger platforms should be constructed in such a way as to allow light through - thus limiting shadowing which impacts on growth of the plants and algae which support invertebrates, fish and birds in the area and damages the special features of the Deben SPA and SSSI.

- Fences: These can obstruct views of the river from the riverbank path. It is preferred that fences are kept low, up to 1 metre.

Timber and material storage

Boat owners are encouraged to keep only small quantities material (such as timber) necessary for boat or jetty maintenance and to store that away from the intertidal areas and avoid blocking footpaths or public rights of way.

Pollution and Waste Management

Pollution is caused through the discharge of sewage, paint, oil and other substances from any moored vessel, shed or bunker. This can have a significant negative impact on the estuarine biodiversity, the water quality of the river and the wellbeing of other residents.

The discharge of untreated sewage and other wastes directly to the estuary should be avoided. Excessive input of nutrients (both from sewage and grey water, which can contain pollutants such as phosphates) can change plant and animal communities and reduce water quality within the estuary.

Discharges from sea toilets are not prohibited. However it is good practice not to discharge a sea toilet where doing so would affect the water quality or harm the amenity value of local waters. It is therefore important to provide adequate facilities for both resident and visiting boats to ensure that the good practice is adhered to. The fitting of holding tanks for boats regularly using inshore waters is encouraged. These should then be discharged well offshore (3 miles) or to the shore through pump out facilities. Boatyards and marinas should be encouraged to install pump out facilities, available for the use of boat owners. In the matter of discharge of grey water however, this may be ameliorated through diligent use of ecological washing products and detergents.

Marinas and boatyards should provide clean, accessible shore side toilet facilities and washrooms and encourage berth holders to use these facilities whenever possible.

Related activities that require consent, including advice from statutory consultees, the EA, NE and MMO and The Crown Estate

1. **Land Drainage Consent**

- Any works whatsoever in, over or under the channel of the River Deben or on its banks, the tidal wall/embankment or within 15 metres of the landward toe, would require the prior land drainage consent of the Environment Agency under Section 109 of the Water Resources Act 1991 and/or Byelaws.

2. **Planning Consent** (covering land down to mean low water) should be obtained for :

- A residential boat moored to a new site on land that has not previously been used as a berth for a residential boat

- Alterations to a residential boat that may materially change its external appearance

- A replacement residential boat on an existing mooring which is substantially different in size and form from the original

- Construction of, jetties, platforms and sheds (including alterations materially changing the size of such structures)

3 **Marine Management Organisation (MMO) consent**

- The MMO should be consulted over all work, even if fairly minor, which affects the foreshore between high and low water springs. The installation of moorings may require a marine licence. The MMO would be responsible for issuing the licence which would be assessed on a case by case basis.

- The MMO should be consulted over any works proposed below mean high water springs tides (MHWS). Any activity involving the disposal of dredged materials below MHWS will need a view from the MMO as to whether the activity requires a licence. Without prior agreement with the MMO it would be an offence to dispose of any wreckage, litter and debris below mean high water (MHW).

4 **The Crown Estate Agreement**

- Where the river bed is owned by The Crown Estate, their prior knowledge of work and agreement is needed.

5 **Natural England's advice or consent**

- NE should be consulted in relation to sites which carry SPA / Ramsar environmental designations.

(With reference to saved policies AP191 and AP 241 for Woodbridge and Melton and Felixstowe Ferry only)

Appendix 4

Enabling Development - Guidelines

Enabling development is development permitted as an exception to policy on the basis that it delivers sufficient, measurable benefit (finace) to secure flood protection and estuary management 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 S106 or CIL 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, SP28 and SP29

- 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 (DM21/DM22)

- 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 Planning Policy Framework, under paragraph 55, 'To promote sustainable development in rural areas', and in the reference to heritage assets in paragraph 140.

River Users' Code Leaflet

Visitors should contact the Harbour Master about moorings and slipways.

Felixstowe Ferry Mr J White
01394 270106/07803 476621
Ramsholt Mr G Collins
07930 304061
Waldringfield Mr A Lyon
01473 736291/07925 081062
Woodbridge Tidemill Yacht Harbour
01394 385745 Mr M Ellis
Melton Boatyard Mr M Skeet
01394 386327

Anti-social behaviour concerns should be reported to:
Suffolk Coastal District Council
Tel: 01394 444763
Email:
communitysafety@suffolkcoastal.gov.uk

The following is a link to the Byelaws:
http://www.riverdeben.org/wp-content/uploads/2010/10/River-Deben-Byelaws-.htm

THE CROWN ESTATE

River Code

Many people enjoy the river.
Please observe the following:

- **Speed** - excessive speed through places where activities such as swimming, dinghy sailing, and fishing are taking place is dangerous and it can damage the saltmarshes. So please observe the relevant speed limits throughout the tidal length of the river as shown on the map inside.
- **Boat Wash** - excessive boat wash is damaging to saltmarshes and river banks, and disturbing to those in moored/anchored boats.
- **Noise** - noise can cause disturbance to wildlife, local inhabitants and to other visitors.
- **Look out** - other river users may not be expert or may be undertaking complicated manoeuvres; please be prepared to take avoiding action even if you think you have 'right of way'.
- **Litter** - please clean up after yourself and your dog.

There are few visitors moorings on the River Deben. Contact the Harbour Master or owner before leaving boat on mooring. Launching is by permission of the owners of the slipways.

River Deben Association in Partnership

River Users' Code

The River Deben is unique. We can keep it that way in a changing environment by working together.

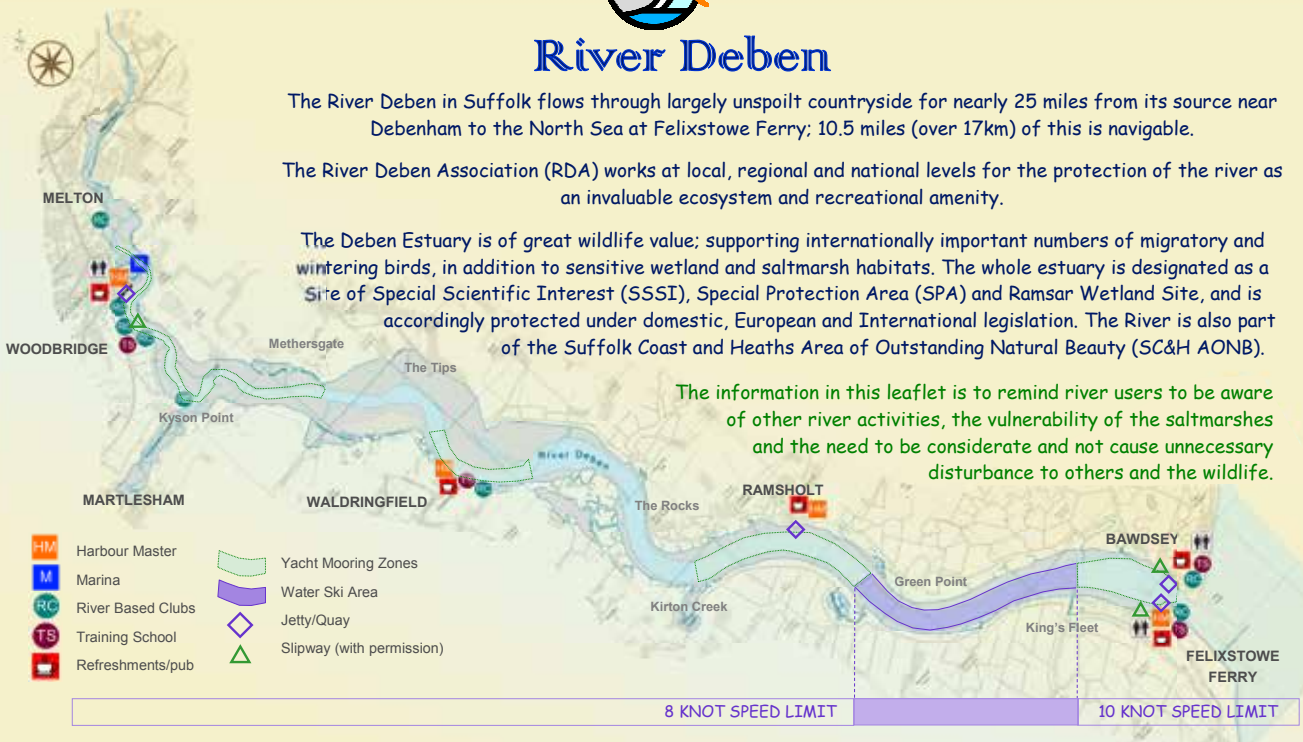
River Deben

The River Deben in Suffolk flows through largely unspoilt countryside for nearly 25 miles from its source near Debenham to the North Sea at Felixstowe Ferry; 10.5 miles (over 17km) of this is navigable.

The River Deben Association (RDA) works at local, regional and national levels for the protection of the river as an invaluable ecosystem and recreational amenity.

The Deben Estuary is of great wildlife value; supporting internationally important numbers of migratory and wintering birds, in addition to sensitive wetland and saltmarsh habitats. The whole estuary is designated as a Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Ramsar Wetland Site, and is accordingly protected under domestic, European and International legislation. The River is also part of the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (SC&H AONB).

The information in this leaflet is to remind river users to be aware of other river activities, the vulnerability of the saltmarshes and the need to be considerate and not cause unnecessary disturbance to others and the wildlife.



The information in this leaflet is provided in good faith and reflects current river understanding and services at the time of publication; 2014.

6. Wider Policy Context

12.0.01 The Deben Estuary Plan recognises and sits within a number of other Policies, Plans and Strategies drawn up at European, National and local level. Decisions on the management of the Deben Estuary and its hinterland are informed by Environmental Habitat Regulations, Water Management legislation, the Marine Plan and Shoreline Management Plan. (see policy context diagram)

12.0.02 **The Deben Estuary Plan has regard to Local Plan Policies.**
It relates to Strategic Policy SP30 – The Coastal Zone, which states:

'Within Suffolk Coastal specifically, 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).

12.0.03 **Local Strategic Plan Policies**

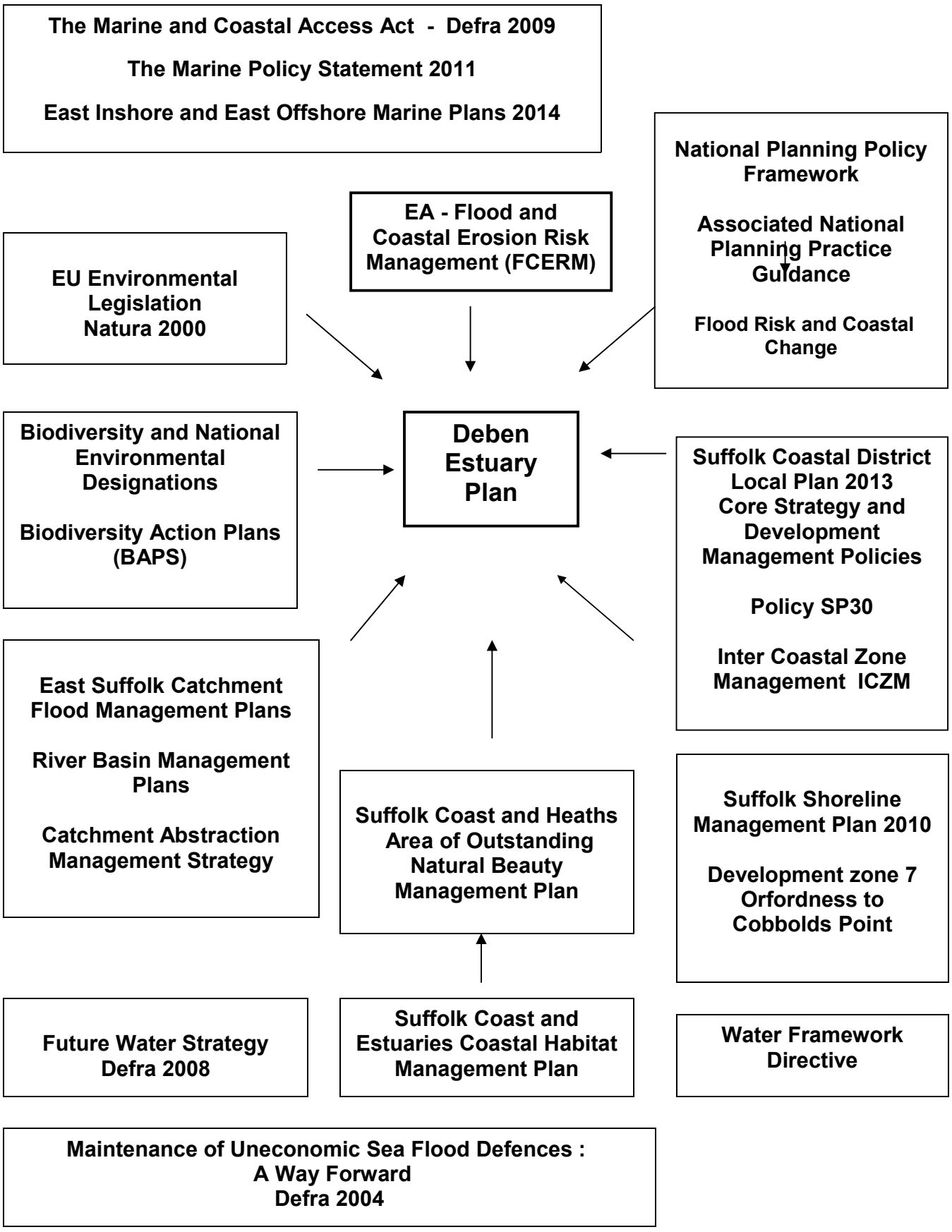
SP12 Climate Change
SP14 Biodiversity and Geodiversity
SP15 Landscape and Townscape
SP7 Economic development in the Rural Areas
SP8 Tourism
SP17 Green Space
SP26 Woodbridge
SP27 Key and Local Service Centres
SP28 Other villages
SP29 The Countryside

12.0.04 **Development Management Policies**

DM28 Flood Risk
DM27 Biodiversity and Geodiversity
DM21 Design Aesthetics
DM26 Lighting
DM14 Farm Diversification

12.0.05 **Saved Policies - to be reviewed but current at time of writing.**

AP157 Deben Peninsula:
Residential Development in the Villages
AP164 Deben Peninsula: Coastal
Instability, Bawdsey Manor
AP165 Deben Peninsula
East Lane, Bawdsey
AP190 Felixstowe
Car Parking at Felixstowe Ferry
AP191 Felixstowe
Houseboats at Felixstowe Ferry
AP241 Woodbridge & Melton
Houseboats
AP242 Wilford Bridge
Employment Area
AP243 Melton
Employment Area off Melton Road
AP245 Woodbridge
Lime Kiln Quay and Ferry
Quay Employment Area
AP247 Woodbridge
Environmental Enhancement, Riverside
AP249 Woodbridge and Melton
Retention of Riverside Qualities
AP250 Woodbridge
Riverside Recreational Area
AP252 Woodbridge: New Yacht
Harbours and Marinas



Policy context for the Deben Estuary Plan

7. References - Supporting Research and Reports informing the Deben Plan or relating to the Deben Estuary

Key Documents :

- *Environment Agency - Deben Estuary Plan (Stage 2) Technical Report (2013)*
- *Andrew Hawes – Flood Cell Survivability Report (March 2013)*
- *Suffolk Estuarine Strategies – Deben Estuary Mouth Workshop Report (2011)*
- *Suffolk Coast and Heaths AONB Unit - Suffolk Coast and Heaths Management Plan (2013)*
- *Suffolk Coast and Heaths AONB Unit - The Landscape Character Guidelines for the Suffolk Coast and Heaths AONB (2001)*
- *Suffolk County Council – GeoSuffolk – The Deben Estuary*
- *Andrew Excell and Kieran O'Mahony - The River Deben Estuary Ornithological Importance and Status for Waterbirds - The Deben Estuary and its Hinterland (2013)*
- *Nick Mason, Andrew Excell & James Meyer - SWT, AONB & DEP Report Evaluation of key areas for birds, recreational disturbance issues and opportunities for mitigation and enhancement (2014)*
- *Deben Estuary Partnership Environment, Landscape and Archaeology Report April (2013)*
- *Natural England - Site Improvement Plans – Deben Estuary (2014)*
- *British Trust for Ornithology - A study of habitat use by Avocet and Dark-bellied Brent Geese on the Deben Estuary over the High Tide Period (2012)*
- *Natural England - Condition of SSSI units*
- *Suffolk Coast and Estuaries Coastal Habitat Management Plan (CHaMP) (Posford Duvivier, 2002)*
- *Natural England Toby Abrehart - NVC Survey of Deben Estuary SSSI/SPA No lb13/14-84030 DEBEN (2013)*
- *Environment Agency - Deben Estuary Saltmarsh Re- Mapping & Change Analysis 2000 – 2011. (April 2013)*
- *Carol Reid - Possible Causes of Saltmarsh Erosion with Reference to the Deben Estuary by River Deben Association and the Deben Estuary Partnership (2013)*
- *Robert Simper – Recent History of Changes to the Saltmarshes of the River Deben*
- *Suffolk Coast and Heaths AONB Unit Trazar Astley-Read - Saltmarsh on the River Deben (2013)*
- *Suffolk Coastal District Council - Core Strategy & Development Management Policies, Sustainability Appraisal and Appropriate Assessment (2013)*
- *National Planning Policy Framework DCLG (2012)*
- *Suffolk Coast Tourism Strategy (2013)*
- *The Crown Estate - Association of River Deben Fairway Committees - Position Statement June 2014*
- *River Deben Association – River Users' Code*
- *River Deben Association - Review of River Users - (Summer 2013)*

Other Relevant Documents

- *Environment Agency Suffolk Estuarine Strategies – Deben Strategic Landscape Capacity Study (2011)*
- *Environment Agency - Suffolk Estuarine Strategies – Deben Strategic Environmental Assessment: Scoping Report (2010)*
- *Environment Agency - Suffolk Estuarine Strategies Stage 1: Deben Scoping Report (2005)*
- *Suffolk Coastal District Council - Woodbridge Riverside Planning Brief (2004)*
- *Woodbridge and Melton Riverside Action Plan (2003)*
- *Suffolk Coastal District Council - Woodbridge Riverside Characterisation Study (2003)*
- *Suffolk Local Authorities – Suffolk Growth Strategy (2014)*
- *SBRC (Suffolk Biological Records Centre) - Deben Estuary Strategy species records and Biodiversity Action Plan habitats data (2009).*
- *Fragmentation Index, National Vegetation Classification Studies (2013)*
- *Bradford and Brighton - Phase 2: River Deben, Data Collection and Options Identification (2013)*
- *Environment Agency - Deben Estuary Plan, Natural England HRA Work Plan Step 1 (2013)*
- *Liley, D., Stillman, R.A. & Fearnley, H. - The Solent Disturbance and Mitigation Project Phase II. Results of Bird Disturbance Fieldwork, 2009/10. Footprint Ecology/Solent Forum*
- *No Adastral New Town - Deben Estuary Visitor Survey Report (2011)*
- *Posford Duvivier - Suffolk Estuarine Strategies, River Deben Strategy Report. Volume 1 Main Report. (November 1999).*
- *Environment Agency - East Suffolk Catchment Abstraction Management Strategy (2008)*
- *The Anglian River Basin Management Plan (2009)*
- *MMO East of England Marine Plans (2014)*
- *MMO Marine Policy Statement (2013)*

8. Abbreviations / Glossary

Abstraction: Removing surface or groundwater.

Area of Outstanding Natural Beauty (AONB): Areas of national importance because of their high landscape quality created under the National Parks and Access to the Countryside Act 1949. Their purpose is to conserve and enhance the natural beauty of the area.

Aquifer : A layer of rock or soil able to hold or transmit water.

Biodiversity Action Plan (BAP): Strategies for conserving and enhancing wild species and wildlife habitats in the UK.

Birds Directive (EU Birds Directive): The abbreviated term for Council Directive 79/409/EEC of 2 April 1979 on the Conservation of Wild Birds. This Directive aims to protect bird species within the EC through the conservation of populations of certain birds and the habitats used by these species.

Coastal Squeeze : the process by which coastal habitats and natural features are progressively lost ot drowned, caught between coastal defences and rising sea levels.

Conservation Areas: Areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance.

County Wildlife Site (CWS) or County Geological Site (CGS): Also known as RIGS Non-statutory designations for sites of county significance for wildlife or geology. Positive management of CWSs and CGSs is encouraged and development affecting them is controlled by Local Plan policies. Local authorities are involved in the selection of CWSs and CGSs, on the basis of standard criteria. Some Local Plans adopt different names for sites of county or local importance.

Entry Level Stewardship (ELS): provides a straightforward approach to supporting the good stewardship of the countryside. This is done through simple and effective land management that goes beyond the Single Payment Scheme requirement to maintain land in good agricultural and environmental condition. It is open to all farmers and landowners.

Environmentally Sensitive Area (ESA): The ESA scheme was introduced by MAFF in 1987 to pay farmers for maintaining or adopting agricultural methods which promote the conservation and enhancement of the countryside in areas of high wildlife, landscape or historic value.

EU Habitats Directive: The abbreviated term of Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora. It is the aim of this Directive to promote the conservation of certain habitats and species within the European Union.

European Marine Site: A European Site (SPA or SAC), which consists of, or in so far as it consists of, marine areas.

European Site: A classified Special Protection Area, designated Special Area of Conservation, site of Community Importance (selected as a candidate SAC, adopted by the European Commission but not yet designated), candidate Special Area of Conservation (in England only), or a site hosting a priority species in respect of which Article 5 of the Habitats Directive applies.

Flooding and Coastal Erosion Risk Management - FCERM.

Flood Defence Grant in Aid - FDGiA.

Flood Management Strategy: A long-term plan developed for an estuary, which sets out the policy and objectives for flood defence taking into account a broad range of local interests and issues.

Floodplain: Areas of river valley floors or coastal plains which are inundated during times of flood, including areas protected by flood defences.

Fluvial: Pertaining to, or found in rivers.

Foreshore: The part of the shore between high and low tide marks.

Geographical Information System (GIS): A system for capturing, storing, checking, integrating, manipulating, analysing and displaying digital data which are spatially referenced to a geographical region.

Geomorphology: Study of landforms, including their origin and evolution, and the processes that shaped them.

Groundwater: Water contained in the spaces in pervious rocks and also within soil.

Habitats Regulations: The common term for the Conservation (Natural Habitats, &c.) Regulations 1994, which transpose the requirements of the Habitats Directive into national law and provide for the conservation of SACs and SPAs in Great Britain.

Higher Level Stewardship (HLS): A selective, environmental stewardship land management scheme involving more complex types of management and agreements which are tailored to local circumstances and priorities. HLS applications are assessed against specific local targets and agreements and are offered where they meet these targets and represent good value for money.

Hydrology: the study of water and its dynamics.

Intertidal: Of or being the region between the high tide mark and the low tide mark.

Landscape Character: The distinct pattern and arrangement of landscape elements or features that collectively create a sense of place.

Listed building: A building that has been designated of special historic or architectural interest. The building may be graded I,II* or II and alterations will have to be determined by either the District Council or by English Heritage.

Local Nature Reserve (LNR): Site of local nature conservation importance owned or managed by a local authority. LNRs are designated by local authorities in agreement with English Nature, under the National Parks and Access to the Countryside Act 1949.

Managed Realignment: Realignment of a flood defence wall either landward or seaward of a designated site. If the realignment is landward of an existing defence, the intention will be for the tide to inundate the site on each tidal cycle.

Mittigation: The measures, including any process, activity or design to avoid, reduce or remedy or compensate for adverse landscape and visual effects of a development project.

Mudflat: Flat un-vegetated wetlands subject to periodic flooding and minor wave action.

National Nature Reserve (NNR): Site of outstanding wildlife or geological importance managed either by, or on behalf of, English Nature in the interests of wildlife, research and public appreciation (where appropriate). NNRs are declared by English Nature under the National Parks and Access to the Countryside Act 1949 or the Wildlife and Countryside Act 1981.

Ordnance Datum (OD): Land levels are measured relative to the average sea level at Newlyn in Cornwall – this level is referred to as Ordnance datum. Contours on Ordnance Survey maps of the UK show heights in metres above Ordnance Datum.

Pollutant: A substance that occurs in the environment, at least in part as a result of anthropogenic activities, which has a deleterious effect on living organisms.

Organic Entry Level Stewardship (OELS): The organic strand of ELS. It is geared to organic and organic/conventional mixed farming systems and is open to all farmers not receiving Organic Farming Scheme aid.

Potable water: Water suitable for human consumption.

Ramsar Site / Ramsar Convention - 1971: The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty, which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

Register of Historic Parks and Gardens: A list managed by English Heritage of nationally important parks and gardens.

Rights of way (RoW): Highways (which can include anything from footpaths to bridleways to roads) along which any member of the public has a right to pass and re-pass at any time.

Roost: A place where birds regularly settle in order to sleep.

Saltmarsh: A community of salt tolerant plants growing on intertidal mud in brackish conditions in sheltered estuaries and bays.

Scheduled Monument: An archaeological site protected under the Ancient Monuments and Archaeological Areas Act 1979. The schedule is managed by English Heritage.

Shoreline Management Plan (SMP): A plan used to decide flood and coastal defence policy for a geographic unit with identifiable coastal processes. The document brings together information pertaining to coastal issues such as flooding, erosion, coastal processes and human and environmental needs.

Site of Special Scientific Interest (SSSI): A UK designation given to sites considered to be of nature conservation and/or geological importance in a national context.

Special Protection Area (SPA): A site designated under the Birds Directive by the EC where appropriate steps are taken to protect the bird species and their habitats for which the Site is designated. These sites form part of a European network collectively known as Natura 2000 sites.

Source Protection Zone (SPZ) : The area, designated by the EA, over which water for recharge is captured by an abstraction borehole; delineated to protect potable supplies against pollution.

Strategic Environmental Assessment (SEA): A formal process of systematic analysis of the environmental effects of the development policies, plans, programmes and other proposed strategic actions.

Sustainable Development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Tidal Prism: the volume of water in an estuary between mean high tide and mean low tide, or the volume of water leaving an estuary at ebb tide.

Water Framework Directive (WFD): Directive 2000/60/EC. An EU Directive introducing a single system of water management through river basin management.

Wetland: Wetlands are areas where water is the primary factor controlling the environment and the associated plant and animal life. They occur where the water table is at or near the surface of the land, or where the land is covered by shallow water.

Wildlife and Countryside Act 1981: The principal mechanism for the legislative protection of wildlife in Great Britain.