



Alde and Ore Estuary Partnership Plan



Sustainability Appraisal/Strategic Environmental Assessment Scoping Report

Suffolk County Council

August 2015



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1. Introduction

Background

This is a Scoping Report for the proposed Alde and Ore Estuary Plan (hereafter referred to as Estuary Plan), and is the first stage of the Sustainability Appraisal (SA) process incorporating the requirements of the Strategic Environmental Assessment (SEA) Directive.

The document aims to outline the baseline information and evidence which is needed to inform the Sustainability Appraisal of the emerging Estuary Plan objectives and policies. This is based on the identification of plans and programmes which are relevant to the study area; environmental, economic, and social baseline information; and environmental issues and problems. The framework will consist of a number of SA/SEA objectives, key questions and potential monitoring indicators which will examine whether the policies set out in the Estuary Plan are sustainable.

If you would like to comment on any part of this document please respond by any of the following means:

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The consultation period runs from 6 August 2015 to 16 September 2015.

This document will be later available on the Alde and Ore Estuary Partnership (AOEP) website at:

<http://www.suffolkcoastandheaths.org/projects-and-partnerships/alde-and-ore-estuary-partnership/>

1.1 Alde and Ore Estuary Plan

The Alde and Ore Estuary Partnership (AOEP) was formed in 2012 following the 2009 Alde and Ore Futures Project that demonstrated a strong community view that the current shape of the estuary should be maintained for as long as was feasible and practical. The AOEP comprises representatives from key stakeholders in the estuary, representing parishes, landowners, farmers, river users, environment expert and businesses, with members of statutory bodies taking advisory and, where possible, facilitative roles. The AOEP, the Environment Agency (EA), Coast and Heaths AONB Unit, and Natural England are together drawing up an Estuary Management Plan for the Alde and Ore. The Alde and Ore Estuary Plan is being developed as an 'Estuary Plan' as referenced by the Suffolk Coastal District Council Core Strategy Policy SP30. The 'Estuary Plan' is expected to be submitted to Suffolk Coastal District Council (SCDC) for endorsement following agreement of the plan.

A 'resilience' approach, to strengthen the landward slope to resist breaching even if overtopped, is considered by the AOEP as the preferred management approach for rural walls in the medium term (i.e. next 20-50 years). The AOEP's vision for the Alde and Ore is the maintenance of broadly the current configuration of the estuary and its significant contribution to the local economy, the environment, the community and the amenity value of the area.

The strategic aims and objectives underlying the plan (as set out in Draft 9 April 2014) are:

1. To manage the estuary and adjoining land as a whole¹ so as to ensure, in so far as is reasonable, and in compliance with any mitigatory or compensatory measures set out in the sustainability appraisal, the maintenance of broadly the current configuration of the estuary and its significant contribution to the local economy, the environment, the community and the amenity value of the area.
2. To ensure within the management of the estuary as a whole and, in so far as is lawful and reasonably practicable, flood and river defences of a standard that will withstand overtopping without breaching during a tidal surge of a 1 in 200 year frequency given the sea level rise predicted up to the year 2050².
3. In close association³ with the EA, to develop a rolling⁴ and prioritised programme of overall works for the estuary, including routine maintenance and minor repairs, maintaining and enhancing the current environment as far as is possible, consistent with the achievement of the above standard of flood and river defences by the year 2025.
4. To ensure that the rolling and prioritised programme of works takes fully into account the following key considerations:
 - a. Regularly updated assessments of the impact on the estuary as a whole for each vulnerable section of the flood and river defences if that section were to be breached.
 - b. Priorities determined according to vulnerability, probable consequences including built or natural environmental, ecological, economic, social or cultural concerns and funding availability.
 - c. Respect for the implications of Government cost benefit analyses where Central Government funding may be involved and respect for local priorities where funding other than from Central Government may be involved.

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

² This reflects the UKCP09 prediction for sea level rise which means that a 1 in 200 year flood in 2050 is expected to be higher than a 1 in 200 year flood in 2012.

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

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

- d. The use, where appropriate, of local resources⁵.
5. To develop a partnership approach⁶ to the management of the estuary and to consult⁷ locally⁸ in respect of individual projects or works and with the wider local community⁹ at regular intervals on more general matters.
6. To co-operate with those responsible for emergency measures, and in particular support EA and Suffolk County Council (SCC) in raising awareness of flood risk issues in the estuary and in promoting emergency plans with parish councils that increase community resilience.

The AOEP is formulating a plan which gives the local community, parish council, landowners and local businesses more involvement in the future of their estuary and seeks to achieve the sustainability of the estuary. The resilience approach accepts that the walls will be overtopped on large surges but this method would significantly reduce the risk of a breach and minimise impact should any flooding occur. The damage from breaches and the cost of repairing them far exceeds that from overtopping of walls. As such, the Partnership is keen to promote the resilience method in order that communities and landowners can recover from flood events more quickly. The resilience approach also requires a clear plan of the likely engineering approaches, costs and priorities to help partners support the AOEP in their approach in terms of both statutory roles on consenting and permissions as well as Partnership Funding approaches. It is proposed that repairs and upgrading of the defences all around the estuary will be carried out according to a flood cell prioritization beginning with the most vulnerable river defences to the least vulnerable to bring all defences to the same standard in a comprehensive plan. To keep the estuary protection as an integral whole, funds raised will generally be used across the estuary rather than by seeking local pockets of funding for individual flood cells.

The Plan is likely to include:

- A Programme of works covering the period up to 2025
- A Funding Framework – recognising that Central Government funding will not be able to pay for all the flood defence work that people would like to see in the estuary. A funding framework will look towards identifying a wide range of financing options – both traditional and innovative. The aim will be to align potential funding streams with activities over 10 year periods – allowing time for new money to be sought and bid for.
- A Planning Framework – ensuring activities and opportunities within the estuary are recognised by and integrated with other planning and management policies.

1.2 SA and Strategic Environmental Assessment

Strategic Environmental Assessment (SEA) is the European Directive 2001/42/EC which states that its objective is “to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development”.

⁵ This echoes Terms of Reference 2 a ii of the AOEP interim constitution. It suggests where appropriate the use of local labour, contractors, materials, machinery or equipment etc as well of course as local finance.

⁶ This echoes Guiding Principle 4a of the AOEP interim constitution.

⁷ This echoes Terms of Reference 3 of the AOEP interim constitution.

⁸ This would include, where appropriate, consulting on the basis of an individual flood cell or group of flood cells.

⁹ This might include having a ‘reference group’ of a very wide range of communities of interest in the estuary area with which the AOEP might wish to engage for their views periodically.

The aim of the SEA is to identify potentially significant environmental effects created as a result of the implementation of the plan or programme on issues such as 'biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factor' as specified in Annex 1(f) of the Directive.

Sustainability Appraisal (SA) is the process by which the UK Government has transposed the SEA Directive into town planning legislation to incorporate economic and social objectives as well as environmental ones.

Both processes are undertaken during the preparation of a plan or strategy to aid the implementation of sustainable development. The main difference between them is that while SEA has more of an environmental focus, SA includes greater coverage of the social and economic aspects of sustainable development. Although SA and SEA are distinct requirements, government guidance has recommended a single appraisal process.

National Planning Policy Framework (NPPF) states:

'A sustainability appraisal which meets the requirements of the European Directive on strategic environmental assessment should be an integral part of the plan preparation process, and should consider all the likely significant effects on the environment, economic and social factors' (NPPF paragraph 165).

Therefore, to ensure the compliance with NPPF this SA/SEA Scoping Report has been prepared for the proposed Estuary Plan.

This SA/SEA Scoping Report is built upon previous work of the EA's 'Alde and Ore Futures – Managing the Coast Strategic Environmental Assessment Draft Environmental report June 2011' and on the large amount of environmental data collected from engagement with local and national government bodies, local communities and parishes to date to ensure that plan policies are based on up-to-date information about the state of natural environment and other characteristics of the study area.

Natura 2000 Obligations - Under the European Union (EU) Directive on the conservation of natural habitats and of wild fauna and flora (referred to as the 'Habitats Directive'), sites that are of international importance for the conservation of natural habitats and wild fauna and flora are designated as Special Areas of Conservation (SACs). Under the EU Directive on the conservation of wild birds (referred to as the 'Birds Directive'), sites of international importance for the conservation of wild birds are designated as Special Protection Areas (SPAs). SACs and SPAs are collectively known as Natura 2000 sites.

In addition to the EU legislation, the Convention on Wetlands of International Importance, especially as Waterfowl Habitat 1971 (the Ramsar Convention), places a responsibility on the UK government to designate wetlands of international importance and promote their conservation and wise use. These are known as Ramsar sites and it is government policy that these are given the same protection as SPAs and SACs. For the purpose of this Plan reference to Natura 2000 sites includes Ramsar sites.

UK government interpretation of the legislation is that Natura 2000 sites must be maintained in situ, if it is sustainable to do so, and where it is not sustainable, compensatory habitat must be provided prior to its loss.

The Habitats Directive and the Birds Directive are implemented in England and Wales via The Conservation of Habitats and Species Regulations 2010 (referred to as the 'Habitats Regulations'). Under the Habitats Regulations, a **Habitats Regulations Assessment (HRA)** is required where a plan or project is likely to give rise to significant effect upon a Natura 2000 site, either alone or in combination with other plans or projects.

Two Special Areas of Conservation (SAC) lie within the Alde-Ore Estuary Plan area: The Alde, Ore and Butley Estuaries SAC and also Orfordness to Shingle Street SAC. The intertidal areas form the Alde-Ore Estuaries SPA and Ramsar Site. These qualify under Article 4.1 of the Birds Directive (79/409/EEC) by supporting important numbers of five Annex 1 breeding species (Marsh Harrier, Avocet, Sandwich tern, Little tern, Lesser black-backed gull) and under Article 4.2 by regularly supporting at least 20,000 waterfowl and internationally important numbers of three wintering bird species (Avocet, Ruff and Redshank) (Source: Defra [Natura 2000 Standard Data form](#), 2006).

The land currently protected by the existing defences is not included within either the SPA or Ramsar site boundaries. However, some qualifying species may use habitats landward of the existing defences as part of their life cycles and this has to be taken into consideration.

In developing a management plan for the Alde and Ore estuary, the requirements of the qualifying species must be taken into account and an HRA will have to be completed. Should the HRA conclude that the initially recommended strategic option would have an adverse effect on one or more qualifying species, we can only implement the plan if there are no feasible alternatives and we can show imperative reasons of overriding public interest. In this case, compensatory measures would be required to ensure the overall coherence of the Natura 2000 network is maintained.

All compensatory habitat requirements as a result of any flood and coastal risk management (FCERM) works to be delivered under this Plan would be delivered via our regional habitat creation programme, which combines habitat requirements from all of our plans and projects within the region to deliver replacement habitat in a strategic manner.

A HRA is a requirement to assess the effects of plans and projects on the internationally designated habitats and species present. It is complementary to SA/SEA process and its requirements will be integrated into the process of developing and refining options of the Estuary Plan at a later stage to ensure that emerging options avoid adverse effects on European sites.

Water Framework Directive (WFD) Assessment - the WFD is a European Directive which aims to protect and improve the water environment. It is implemented in England and Wales by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 ('the Regulations'). The WFD divides the water environment into water bodies. These can include lakes, reservoirs, streams, rivers, canals, groundwaters, transitional waters (estuaries) and coastal waters. The Environment Agency is the lead authority in England for implementing the WFD. Working through river basin management plans, the WFD requires that waters are managed sustainably. Good status or potential for each type of water body is defined by a set of biological, chemical and physical standards. The Alde and Ore Estuary falls within the Anglian River Basin Management Plan and a WFD compliance assessment will be integrated within the SA/SEA of the Alde and Ore Estuary Plan.

Requirements and Objectives of the Water Framework Directive

The WFD stipulates that all water bodies should aim to meet good status by a set timeframe. This refers to the overall status of the water body which is defined differently for surface and groundwater bodies. For natural surface waters, good status is a composite of ecological status and chemical status and the aim is to achieve 'Good Ecological Status' (GES). Surface waters that are unnatural are classed as either Heavily Modified Water Bodies (HMWB) or Artificial Water Bodies (AWB), and the target for HMWB and AWB is to achieve 'Good Ecological Potential' (GEP). For surface water bodies, GES (or GEP) is made up of a number of biological, hydromorphological and chemical quality characteristics called 'Quality Elements'. For groundwater bodies the overall status is defined by 'quantity' and 'chemical status'. All of the Quality Elements relating to groundwater and surface water bodies have been considered as part of this preliminary WFD Compliance Assessment. Article 4 of the WFD sets out the Environmental Objectives that must be met for all surface and groundwater bodies. The Environmental Objectives of relevance to the Plan are shown in Table 1.

Table 1: Environmental Objectives of the Water Framework Directive of relevance to the Plan Objectives Reference (taken from the Directive)

Objectives	Reference (taken from the Directive)
Surface Water	
Member States shall implement the necessary measures to prevent deterioration of the status of all bodies of surface water.	Article 4.1(a)(i)
Member States shall protect, enhance and restore all bodies of surface water, subject to the application of subparagraph (iii) for artificial and heavily modified bodies of water, with the aim of achieving good surface water status by 2015.	Article 4.1(a)(ii)
Heavily Modified and Artificial Water Bodies	
Member States shall protect and enhance all artificial and heavily modified bodies of water, with the aim of achieving good ecological potential and good surface water chemical status by 2015.	Article 4.1(a)(iii)
Progressively reduce pollution from priority substances and cease or phase out emissions, discharges and losses of priority hazardous substances.	Article 4.1(a)(iv)
Groundwater	
Prevent deterioration in Status and prevent or limit input of pollutants to groundwater.	Article 4.1(b)(i)
Other water bodies	
Member State shall ensure that the application does not permanently exclude or compromise the achievement of the objectives of this Directive in other bodies of water within the same river basin district and is consistent with the implementation of other Community environmental legislation.	Article 4.8
Other EU legislation	
Member State shall ensure that the application of the new provisions guarantees at least the same level of protection as the existing Community legislation.	Article 4.9

1.3 The Aim and Structure of this Report

The first step in the SA/SEA is to produce a scoping report which presents the proposed structure and knowledge base for the assessment. This report outlines the proposed scope of the SA/SEA process as follows:

- Chapter 1 - An introduction to the Estuary Plan and the SA/SEA process.
- Chapter 2 - Demonstrates the Scope for the SA/SEA process:

- Identification of other policies, plans, programmes and sustainability objectives;
 - Shows baseline information;
 - Identification of key sustainability issues in Alde and Ore Estuary;
 - Shows the SA/SEA objectives and framework chosen to assess the sustainability of the Estuary Plan and alternatives;
- Chapter 3 -Outlines remaining stages of the SA/SEA process:
 - Identifies options, choosing preferred options;
 - Proposes structure of the SA/SEA Environmental Report;
 - Description of intended consultation procedure;
 - Describes monitoring effects of implementation of Alde and Ore Estuary Plan.

2. Developing the Scope

The scope of the Estuary Plan has been developed by the AOEP, Suffolk Coast and Heaths Unit, EA, Natural England, Suffolk Coast District Council and SCC incorporating feedback from engagement with local communities and parishes to date. It will consider flood risk management and flood defence options, seeking to develop a 'resilience' approach that will strengthen the landward slope to resist breaching of defensive walls even if overtopped. Hence the plan is likely to cover:

- Flood risk and defence (protection of property, businesses and farmland)
- Flood and emergency resilience plans
- Business viability (agricultural, marine, tourism and specialist industries, protection of water abstraction points for irrigation)
- Conservation and management of the natural environment (including water quality, regenerating saltmarsh, conserving, and sustaining habitats, and role of pilot projects and different management strategies to increase wall resistance to overtopping)
- Funding strategies (Enabling development)

The Estuary Plan is expected to set priorities for upgrading defences over a 10 year period.

Prior to starting the SA/SEA process a plan or programme would normally undergo 'screening'. This process determines whether the plan is subject to the SEA Directive and therefore requires SEA. In the case of Alde and Ore Estuary Plan, this question is answered in Article 3 of the 'SEA Directive' which states the SEA is required for plans and programmes which are likely to have significant environmental effects and which are prepared for water management (See Table 2 below).

This Scoping Report follows and sets out the requirements of the SEA and has been developed in accordance with the following:

- Directive 2001/42/EC 'on the assessment of the effects of certain plans, and programmes on the environment' (European Commission, 2001) i. e the Strategic Environmental Assessment Directive.
- Environmental Assessment of plans and programmes Regulations 2004 (SI 2004 No 1633)
- A Practical Guide to the Strategic Environmental Assessment Directive (ODPM, 2005);
- Guidance on Integrating Climate Change and Biodiversity into Strategic Environmental Assessment. (4th April 2013 European Commission)

Table 2: The Estuary Plan - Screening using ODPM Practice Guide 2005

1. Is the Estuary Plan subject to preparation and/or adoption by a national, regional or local authority OR prepared by an authority for adoption through a legislative procedure by Parliament of Government? (Article 2(a))	Yes – SCDC are involved in the preparation of the Estuary Plan and are likely to endorse it in due course.
2. Is the Estuary Plan required by legislative, regulatory or administrative provisions? (Article 2(a))	No – Strategic Policy SP30 – The Coastal Zone in Suffolk Coastal's Core Strategy "will promote with partners 'Integrated Coastal Management ' including the preparation of a comprehensive management plan for the

	coast and estuarine areas, supported by plans for specific areas.”
3. Is the Estuary Plan prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use, AND does it set a framework for future development consent of projects in Annexes I and II to the EIA Directive? (Art. 3.2(a))	No – the Estuary Plan covers flood defence and water management but the framework for the future development consent of projects in Annexes I and II to the EIA Directive (Art. 3.2 (a)) such as yacht marinas and holiday villages/hotels is already controlled by other Core Strategy policies, particularly SP8.
4. Will the Estuary Plan in view of its likely effect on sites, require an assessment under Article 6 or 7 of the Habitats Directive? (Article 3.2(b))	Yes – the Estuary Plan will look at options for flood defences that could impact sites covered by the Habitats Directive.
5. Does the Estuary Plan determine the use of small areas at local level OR is it a minor modification of a Plan or policy subject to Art.3.2?	Yes – The Estuary Plan could determine the use of small areas at local level.
6. Does the Estuary Plan set the framework for future development consent of projects (not just projects in Annexes to the EIA Directive)? (Article 3.4)	Yes – The Estuary plan will set out proposals for managing flood risk and future estuary defences taking into account the needs of communities, landowners, businesses, parish councils, tourism, wildlife and the environment.
7. Is the Estuary Plan sole purpose to serve national defence or civil emergency OR is it a financial or budget PP	No - It will cover flood risk with a view to managing civil emergencies and have an action plan but this is not the sole purpose.
8. Is it likely to have a significant effect on the environment? (Article 3.5)	Yes – because of the impact on specific areas of the SPA/SAC/RAMSAR designation, of decisions on future flood defences and land use features to manage flood risk.

The Scoping Report has three objectives:

Objective 1-

The EU Directive (Annex 1) states that the Scoping Report should provide:

- a) an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes;
- b) the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;
- c) the environmental characteristics of areas likely to be affected.
- d) Any existing problems which are relevant to the plan including those relating to any areas of environmental importance concerning the conservation of wild birds and the Habitats Directive

Objective 2-

Articles 5.4 of the EU Directive 2001/42/EC (SEA Directive) highlights that the Scoping Report will be consulted upon, as well as indicate how the SA will integrate with the LFRMS documents.

Objective 3-

The SA/SEA Scoping Report must state how the SA/SEA environmental issues are addressed in the SA objectives. These issues are “Biodiversity; Population; Human

health; Fauna; Flora; Soil; Water; Air; Climatic factors; Material assets; Cultural heritage including architectural and archaeological heritage; Landscape and the interrelationship between the above factors”.

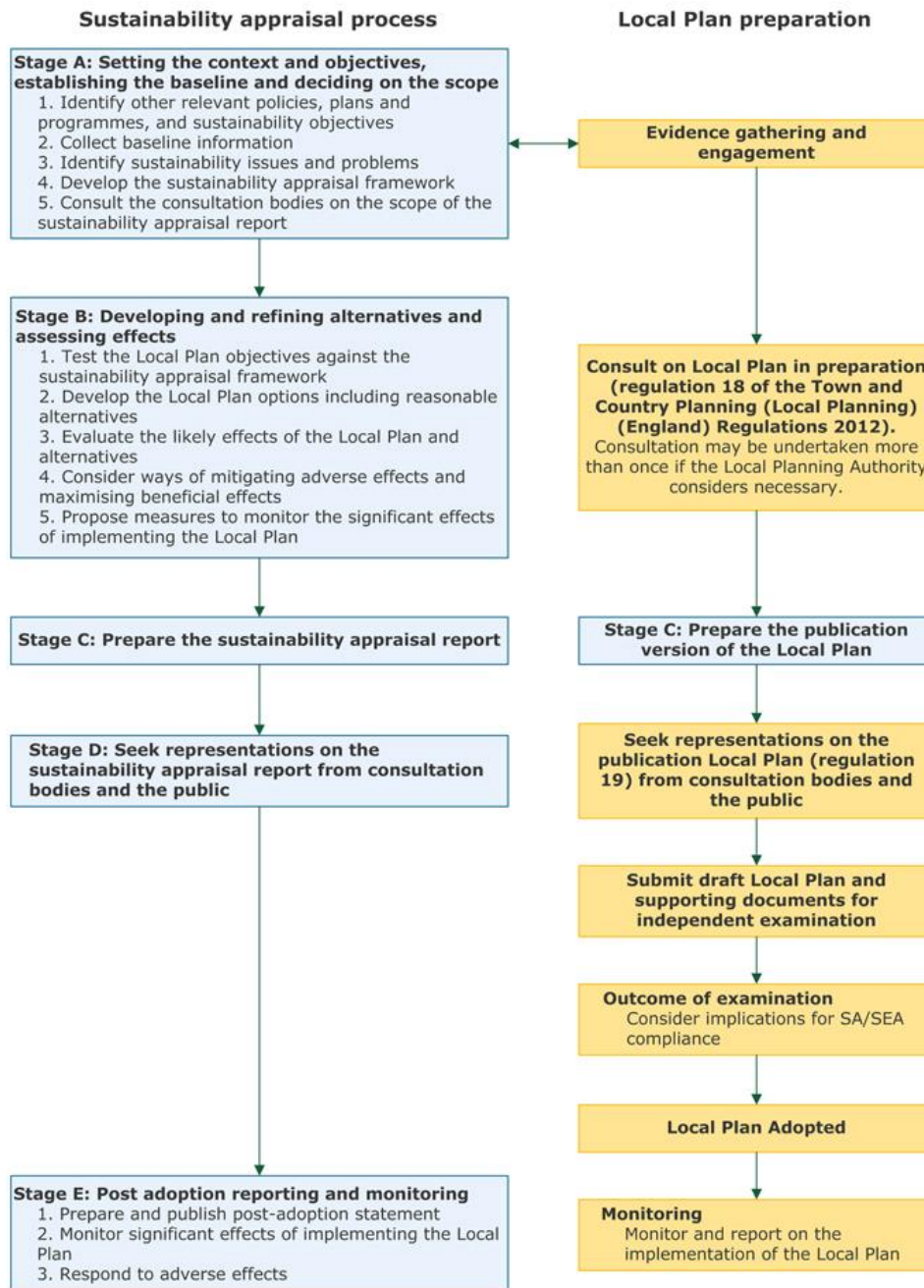
The purpose of this Scoping Report is to set out the scope of the SA/SEA, focusing on:

- The extent of the Study Area and lifetime of the Estuary Plan.
- The key environmental, social and economic issues.
- The relationship of the Estuary Plan with other relevant plans, policies and programmes.
- The SA/SEA assessment criteria.

Table 3: The stages and tasks of the SA/SEA against the Estuary Plan production stages

Plan Stage	SA/SEA Stage
Preproduction	<p><u>Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope</u> Task A1- Identifying other relevant policies, plans and programmes, and sustainability objectives Task A2- Collecting baseline information Task A3- Identifying sustainability issues and problems Task A4- Developing the SA framework Task A5- Consulting on the scope of the Sustainability Appraisal</p>
Production	<p><u>Stage B: Developing and refining options and assessing effects</u> Task B1- Testing the Estuary Plan objectives against the SA/SEA framework Task B2- Developing the Estuary Plan options Task B3- Predicting the effects of the Estuary Plan Task B4- Evaluating the effects of the Estuary Plan Task B5- Considering ways of mitigating adverse effects and maximising beneficial effects Task B6- Proposing measure to monitor the significant effects of implementing the Estuary Plan</p>
	<p><u>Stage C: Preparing the Sustainability Appraisal Report</u> Task C1- Preparing the SA/SEA Report</p>
	<p><u>Stage D: Consulting on the preferred options of the Estuary Plan and SA/SEA Report</u> Task D1- Public participation on the preferred options of the Estuary Plan and the SA/SEA Report Task D2(i)- Appraising significant changes</p>
Examination	<p>Task D2(ii)- Appraising significant changes resulting from representations</p>
Adoption and monitoring	<p>Task D3- Making decisions and providing information</p> <p><u>Stage E: Monitoring the significant effects of implementing the Estuary Plan</u> Task E1- Finalising aims and methods for monitoring Task E2- Responding to adverse effects</p>

Table 4: Sustainability Appraisal Process



Source: National Planning Practice Guidance 2005

2.1 Identifying other plans, programmes and sustainability objectives (Task A1)

European Directive 2001/42/EC requiring Strategic Environmental Assessments (SEA) on the effects of certain plans and programmes on the environment (those which have land use implications) was incorporated into UK law in July 2004. Current government guidance for spatial plans requires a Sustainability Appraisal (SA); to incorporate a wider consideration of social and economic considerations than SEA alone.

Task A1 requires that all relevant policies, plans, programmes and environmental objectives are analysed.

The relationship between various policies, plans, programmes and environmental protection objectives may influence the Estuary Plan. The relationships are analysed to:

- Identify any external social, environmental or economic objectives that should be reflected in the SA/SEA process;
- Identify external factors that may have influenced the preparation of the plan ; and
- Determine whether the policies in other plans and programmes might lead to cumulative or synergistic effects when combined with policies in the plan.

The most relevant plans, that will require detailed consideration at the next stage of the Plan, are summarised in sections below.

Water Act 2014

This implemented some of the plans in the White Paper, [Water for Life](#), 2011. Of relevance to this SA are measures to restore the sustainable abstraction of water, improving the way water resource management and drought planning are managed, enabling owners of small-scale water storage to sell excess water into the public supply, and encouraging use of Sustainable Drainage Systems (SuDs) by clarifying this can be a function of sewerage undertakers.

Flood & Water Management Act 2010

In April 2010, the Flood & Water Management Act became law. The Act, which applies to England & Wales, aims to create a simpler and more effective means of managing the risk of flood and coastal erosion. The Act also aims to help improve the sustainability of our water resources and protect against potential droughts. The Act has a significant component which addresses groundwater flooding.

Future Water Strategy (Defra, 2008a)

Future Water is Defra's water strategy for England. The strategy is a response to the predicted pressures of future climate change. Defra's vision for the strategy is for the sustainable delivery of secure water supplies and an improved and protected water environment. The strategy collates current policy positions and actions already in hand or planned. In relation to flooding, the Future Water Strategy outlines two main themes. The first is the Making Space for Water initiative, which is a holistic approach to managing flood and coastal erosion risks in England over the next 20 years. The second theme is taken from the recommendations of the Pitt Review of the 2007 summer flood event.

Making Space for Water Policy (Defra, 2004a)

Making Space for Water is the cross Government programme developing the approach to flood and coastal erosion risk management in England. The aims and objectives of Making Space for Water will be considered in development of the Plan.

Protocol for the maintenance of flood and coastal risk management assets (England only) 2013

This guidance sets out the approach to be taken in cases where there is insufficient economic justification for continuing to maintain sea defences. It outlines the approach it expects us to take and clarifies our position in terms of appraisal and categorisation, options for landowners, compensation, the Habitats Regulations and Human Rights.

Foresight Future Flooding Report (Office of Science & Technology, 2004)

This report aims to produce a long term (30 -100 years) vision for the future of flood and coastal defence in the whole of the UK. The objectives of the Future Flooding Report include:

- Identifying and assessing the relative importance of threats which need to be addressed in future long term flood and coastal defence planning.
- Constructing risk-based scenarios over 30 – 100 year timescales addressing social, economic and environmental issues.
- Providing an overview of responses available and the key issues that determine these responses.
- Informing policy and its delivery.

The Marine and Coastal Access Act (Defra, 2009b)

The Marine and Coastal Access Act received Royal Assent on 12 November 2009. It covers a number of subjects including marine planning, migratory and freshwater fisheries, coastal access and coastal and estuary management. It addresses the issue of coastal access and places a duty on the Secretary of State and Natural England to secure a long distance access route.

The AEOP will need to monitor the progress of the Marine and Coastal Access Act and consider any resultant changes in policy which will influence the development of the Plan.

National Planning Policy Framework 2012

The National Planning Policy Framework sets out the Government's policies for England and how these are expected to be applied. Planning Policy Statements (PPSs) are developed by the Government in collaboration with interested parties. These inform the development of local planning policies and must be taken into account in the preparation of plans. The following two documents are particularly relevant:

Suffolk County Council Plans

Suffolk Minerals Core Strategy (Suffolk County Council, 2008a) and Minerals Specific Site Allocation Development Plan (Suffolk County Council, 2009). The Core Strategy provides policies on minerals planning and the Site Allocations Plan indicates sites allocated for minerals extraction, subject to gaining planning permission.

The Suffolk Local Transport Plan 2011-31 focuses on improving access to jobs and services, achieving development and regeneration and improving the quality of urban and rural environments (Suffolk County Council, 2010).

The Suffolk Waste Core Strategy Development Plan Document 2011 covers the period up to 2026 and provides for policies on waste planning and identifies strategic sites for waste management facilities.

Suffolk Coastal District Council Local Plan

The whole of the Study Area lies within the Suffolk Coastal District Council administrative area. The Suffolk Coastal District Local Plan - Core Strategy and Development Management Policies was adopted in July 2013. The Local Plan establishes policies and proposals for the development and use of land within the district. These are aimed at guiding planning decisions and at informing all interested parties about the types of developments that are likely to be permitted by the Suffolk Coastal District Council.

Enabling Communities - A Suffolk Coastal District Council Strategy 2014

This sets out how **Suffolk Coastal District Council** will support local communities to do more for themselves, and have greater influence and control over their local environment and the services that are provided. This will involve Ward councilors working closely with their

local communities to establish what their priorities are, then guide them to use the most appropriate tools and resources to achieve what the community wants.

East Suffolk Growth Plan 2014 - 2025

This sets out proposals to build more prosperity in the Suffolk Coastal and Waveney District Council areas, including creating 900 new enterprises and 10,000 extra jobs.

Regional Management Plans

In the UK, there are a number of high level regional management plans which guide the development of flood risk management strategies either directly by setting higher level flood risk management or coastal erosion management policy, or indirectly, by setting out regional water quality, nature conservation or landscape management policies and plans.

The Suffolk Shoreline Management Plan

Shoreline Management Plans (SMP) are non-statutory and provide a large-scale assessment of the risks associated with coastal processes. SMPs present a policy framework to manage those risks to people and the developed, historic and natural environment at the coast for the next 100 years. Suffolk Coastal District Council published the Final Suffolk Coast SMP2 in 2010 (Suffolk Coastal District Council, 2010a). The SMP2 coastal boundaries are slightly different to the Plan coastal study unit boundaries because the SMP2 is a higher level appraisal. The difference between the coastal boundaries for the two studies does not affect the decision-making process and selection of policies or options for future flood and coastal erosion risk management. The draft SMP2 flood and coastal erosion risk management policies within each Plan coastal study unit are presented in Table 5. The Plan looks at how the policy decisions made for each unit of the SMP can be implemented.

For each of the SMP2 time periods of short term (2009 to 2025), medium term (2026 to 2055) and long term (2056 to 2105), one of four SMP2 policies has been identified. The policies are Hold the Line (HTL), Managed Realignment (MR), Advance the Line (ATL), and No Active Intervention (NAI). The SMP2 and Plan time period start dates differ because it has been assumed that the Plan will be approved in 2011. The start date has therefore been taken as Year 0. The SMP2 start date has been based on the SMP2 guidance (EA, Technical report 2011).

Table 5: Shoreline Management Plan 2 Policies 2010

Coastal Study Unit	SMP2 Policies		
	2009 - 2025	2026 - 2055	2056 - 2105
CSU1 Thorpeness to Haven House	NAI	NAI	NAI
CSU2 Haven House to Aldeburgh	MR	MR	MR
CSU3 Aldeburgh	HTL	HTL	HTL
CSU4 Slaughden	HTL	HTL	HTL
CSU5 Martello Tower to Sudbourne Beach	HTL	NAI	NAI
CSU6 Sudbourne Beach	HTL	NAI	NAI
CSU7 Lantern Marshes	NAI	NAI	NAI
CSU8 Orford Ness Nose	NAI	NAI	NAI
CSU9 Orford Beach	• Orford Beach	NAI	NAI
	• North Weir Point	MR	NAI

The East Suffolk Catchment Flood Management Plan 2009

Catchment Flood Management Plans (CFMPs) provide an overview for managing the long term flood risk within a catchment over the next 50 to 100 years. CFMPs look at flooding from all sources including rivers and estuaries, but excluding flooding directly from the sea. The CFMP also takes into account the likely impacts of climate change and future development across the region. CFMPs are high-level strategic planning tools which set high level policies for flood risk management.

The Study Area lies within the Suffolk Coast and Heaths Policy Unit of the East Suffolk CFMP (Environment Agency, 2009e). The summary of the final CFMP published in December 2009 assesses future flood risk and identifies flood risk management policies that will be reviewed and monitored. The CFMP policy for the Suffolk Coast and Heaths Policy Unit is to reduce bank and channel maintenance in some locations. This will enable limited resources to be targeted to other areas of the catchment where the risks are greater (for example in towns and villages), to ensure value for money. The plan also seeks to develop resilience and resistance projects to investigate the impact and extend of flooding on the environmental sites. It also encourages the maintenance of local tidal flood warning infrastructure as a means of managing the consequences of flooding throughout the catchment and the development of emergency response plans for transport links at risk from flooding.

River Basin Management Plan

The Anglian River Basin Management Plan (RBMP) was published in December 2009 following approval by the Secretary of State. The plan focuses on the protection, improvement and sustainable use of the water environment. The Anglian RBMP implements the Water Environment (Water Framework Directive) Regulations 2003, within the Anglian River Basin District. These Regulations make provision for the Water Framework Directive (WFD) in river basin districts within England and Wales. They require a new strategic planning process to be established for the purposes of managing, protecting and improving the quality of water resources. The Regulations require all inland and coastal waters to reach "good status" by 2015. It does this by establishing a river basin district structure within which demanding environmental objectives are set, including ecological targets for surface waters. There are two implications for the project, firstly that the proposed actions should not have a negative effect upon the good status of the water bodies within the Plan study area, and secondly, that the flood defence options should contribute to achieving the objectives of the RBMP.

The Environment Agency consulted on an update to the [Anglian River Basin Management Plan](#) in October 2014 to April 2015 producing a Catchment Summary for [East Suffolk](#). It sets out the current state of the river basin district, the challenges it faces and the future objectives and measures that might apply.

Catchment Abstraction Management Strategy

The water resources within the Study Area are covered by one river catchment area managed under the East Suffolk Catchment Abstraction Management Strategy (Environment Agency, 2013). East Suffolk CAMS area is heavily abstracted with further licen most likely only available at high flows.

Site Improvement Plan Alde-Ore Estuary

Natural England published a [Site Improvement Plan \(SIP\) for the Alde-Ore Estuaries](#) in October 2014. This sets out the issues and priorities for action for the Natura 2000 sites, hence covering the Alde and Ore SPA and SACs.

Suffolk Local Biodiversity Action Plan

Biodiversity Action Plans (BAPs) originate from the International Convention for Biological Diversity signed in Rio de Janeiro in 1992. The national and local BAPs set specific targets for habitat creation to offset previous and predicted losses and provide ecological enhancements.

Defra has incorporated the objective of meeting national habitat BAP targets into its High Level Targets for flood and coastal defence. In particular, operating authorities need to avoid damage to environmental interest, to ensure no net loss of BAP habitats and to seek opportunities for environmental enhancement. All potential losses and gains of BAP habitats as a result of flood risk management schemes must be reported to Defra.

The Suffolk Local Biodiversity Action Plan (LBAP) was prepared in 1997, overseen by a working group comprising representatives of Suffolk Local Authorities, Environment Agency, Natural England, Suffolk Biological Records Centre, Suffolk Farming Wildlife and Advisory Group (FWAG), Suffolk Wildlife Trust and the Royal Society for Protection of Birds (RSPB). The Suffolk LBAP incorporates local action plans for national priority habitats and species occurring in Suffolk. Moreover, it incorporates specific action plans for species that are considered to constitute an important part of the character of the wildlife of Suffolk.

Suffolk Coast and Estuaries Coastal Habitat Management Plan

The Suffolk Coast and Estuaries Coastal Habitat Management Plan (CHaMP) is one of the seven pilot CHaMPs that was prepared under the 'Living with the Sea' project. 'Living with the Sea' was jointly undertaken by Natural England, the Environment Agency and the Natural Environment Research Council (NERC) and was part-funded by the European Union's LIFE Nature fund. Other CHaMPs have subsequently been prepared.

The Suffolk Coast and Estuaries CHaMP (Posford Duvivier, 2002) provides a framework for the management of coastal processes with due regard for European nature conservation interests and Ramsar sites. It considers the likely balance of habitat losses and gains over a 30-100 year timescale in the Alde-Ore estuary and Orfordness and either a) outlines potential measures to avoid damage, or b) identifies the necessary habitat restoration or recreation works to compensate for unavoidable losses.

Suffolk Coast and Heaths Area of Outstanding Natural Beauty Management Plan

The Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) was designated to conserve and enhance natural beauty, taking into consideration agriculture, forestry and rural industries as well as the economic and social needs of local communities. A new management plan for the Suffolk Coast and Heaths AONB covers the period 2013 to 2018. The Plan sets out a 20-year vision which defines long term goals to ensure the conservation of the AONB and to meet the needs of residents and visitors to the area.

Water Level Management Plans

A Water Level Management Plan (WLMP) is a written statement produced by the Environment Agency, along with relevant partners, outlining the objectives for water management in nature conservation sites specifically reliant on the control of water levels for the maintenance of the site. It considers the water level requirements for a range of users and considers how these can be reconciled and integrated. There are no WLMPs in the Study Area.

Specific Local Management Plans

There are a number of local management plans that are specific to sites within the Study Area:

- LIFE+ Alde and Ore Future for Wildlife - National Trust in partnership with the RSPB project to improve water level management on the Orfordness marshes and Havergate Island. Layman Report 2014
- South Alde-Ore Estuary - Future for Coastal Wetlands Project RSPB
- Sandlings Forest Recreation Strategy (Forestry Commission, 2005). This strategy emphasises the importance of the forest and the surrounding landscape; this importance is carried over to the Assessment Criteria of the Plan.
- Suffolk Wildlife Trust Management Plan for Hazelwood Marshes (Wright, 2003). This details the existing agreements and constraints of the land and details short-term management plans for the site.
- Havergate Reserves (Havergate Island, Boyton Marshes Hollesley Marshes and Butley River) Management Plan 01/04/2010 to 31/03/2015 (RSPB, 2010). This plan details the management of RSPB owned land and mentions the potential requirement for the provision of compensatory habitats.
- North Warren Reserve Long Term Vision and Management Objectives (RSPB, 2009). This plan details that the reserve will be managed principally to maintain the nationally important wetland and heathland habitats in favourable condition so that they continue to support their notable biodiversity.
- Haven Gateway Green Infrastructure Strategy (Haven Gateway Partnership, 2010).
- Haven Gateway Water Cycle Study (Haven Gateway Partnership, 2008a) and Haven Gateway Framework for Growth (Haven Gateway Partnership, 2008b).

These local management plans outline issues that are particular to individual sites and describe their visions for the future. The collective objectives to these plans are to reinstate areas and provide ecology and archaeology enhancements. The Plan will take these local management plans into consideration and will be developed through continued liaison with the relevant stakeholders involved in producing these plans.

The Environment Agency Vision and Contribution Plan

In 2001, EA published a 20-year vision for the environment as “a better place for people and wildlife, for present and future generations”. As the vision cannot be achieved all at once a Corporate Strategy with phased implementation has been developed setting out how the vision with objectives (from 2010 to 2015) for quality of life, wildlife, the environment, air quality, water quality, sustainable use of natural resources, adapting to climate change and reducing flood risk will be achieved (Environment Agency, 2009a).

In 2011 an updated Local Contribution Plan for the Anglian Region was published by EA. This plan sets out what EA will be doing to contribute to the national corporate strategy at a local level. To Create a Better Place, the Anglian Local Contribution Plan contains relevant policies on managing flood risk, influencing sustainable development, improving the water environment, managing waste as a resource and managing incidents / emergencies. The environmental outcomes to be delivered in the Local Contribution Plan are monitored annually. The monitoring results of the outcomes will be taken into consideration during the next stage of the SA/SEA.

2.2 Collecting Baseline Information and Key Sustainability Issues in Alde and Ore Estuary (Tasks A2 & A3)

The baseline data for the SA/SEA includes existing environmental and sustainability information from a range of sources which is both quantitative and qualitative. The information provides the basis for assessing the potential impact of the Estuary Plan policies and will aid development of appropriate mitigation measures, together with future monitoring data.

This SA/SEA Scoping Report is built upon previous work of the EA's Alde and Ore Futures - Managing the Coast Strategic Environmental Assessment Draft Environmental report June 2011 and on the large amount of environmental data collected from engagement with local and national government bodies, local communities and parishes to date to ensure that plan policies are based on up-to-date information about the state of natural environment and other characteristics of the study area.

Location of the Alde and Ore Estuary

The Alde – Ore estuary is located on the Suffolk coast in the United Kingdom, approximately 40km south of Lowestoft. It forms a major part of the Suffolk Coast and Heaths Area of Outstanding Natural Beauty, a legally protected distinctive landscape area. There are strong links between the coast and estuary. The deepest part of the main Alde-Ore channel has a length of approximately 30.1km. The coastal frontage extends from Thorpeness village to the north, down to the mouth of the Alde and Ore Estuary to the south, including Alderton and Bawsey (Figure 1). The Alde and Ore estuarine system consists of the River Alde, River Ore and the Butley River tributary. It is located inland of Orford Ness. The low lying coastal hinterland is predominantly rural, with the exception of Aldeburgh town, comprises an extensive shingle spit (Orford Ness) and contains areas at risk from coastal flooding and erosion. The defences protecting this stretch of coast include seawalls, rock armouring and timber groynes, supplemented with shingle recycling in places. The estuary is lined with saltmarshes, some which have been drained for use as agricultural land. The estuary defences consist mainly of earth embankments, with some localised areas of rock armouring protecting particular areas.

The area covered by the Estuary Plan shown in Figure 1 covers 20 parishes containing part or all of 13 flood cells identified by the Environment Agency and any parishes with land affected by the December 2013 surge. Parish boundaries rather than geographical boundaries such as contour lines have been chosen by the Partnership “to facilitate engagement with the relevant local administration and communities and to help gathering of necessary statistics” (AOEP July 2014).

Flood cells are areas of land that are currently protected by flood defences and are at risk of flooding. Figure 2 shows the location of the flood cells and the flood defences. The flood cell names can be found in Table 6. The Estuary Plan also refers to “Flood cell 0” identified as the coastal area south of Shingle Street which largely falls into Alderton and Bawdsey parishes and notes that that area has decided to form its own partnership but is currently included in both the Deben and Alde and Ore estuary partnership plans.

Figure 3 gives a geographical overview of the Estuary Plan area naming the marshes and dividing the estuary into upper, middle and lower.

Figure 1: Map of Alde and Ore estuary parishes covered by the Plan

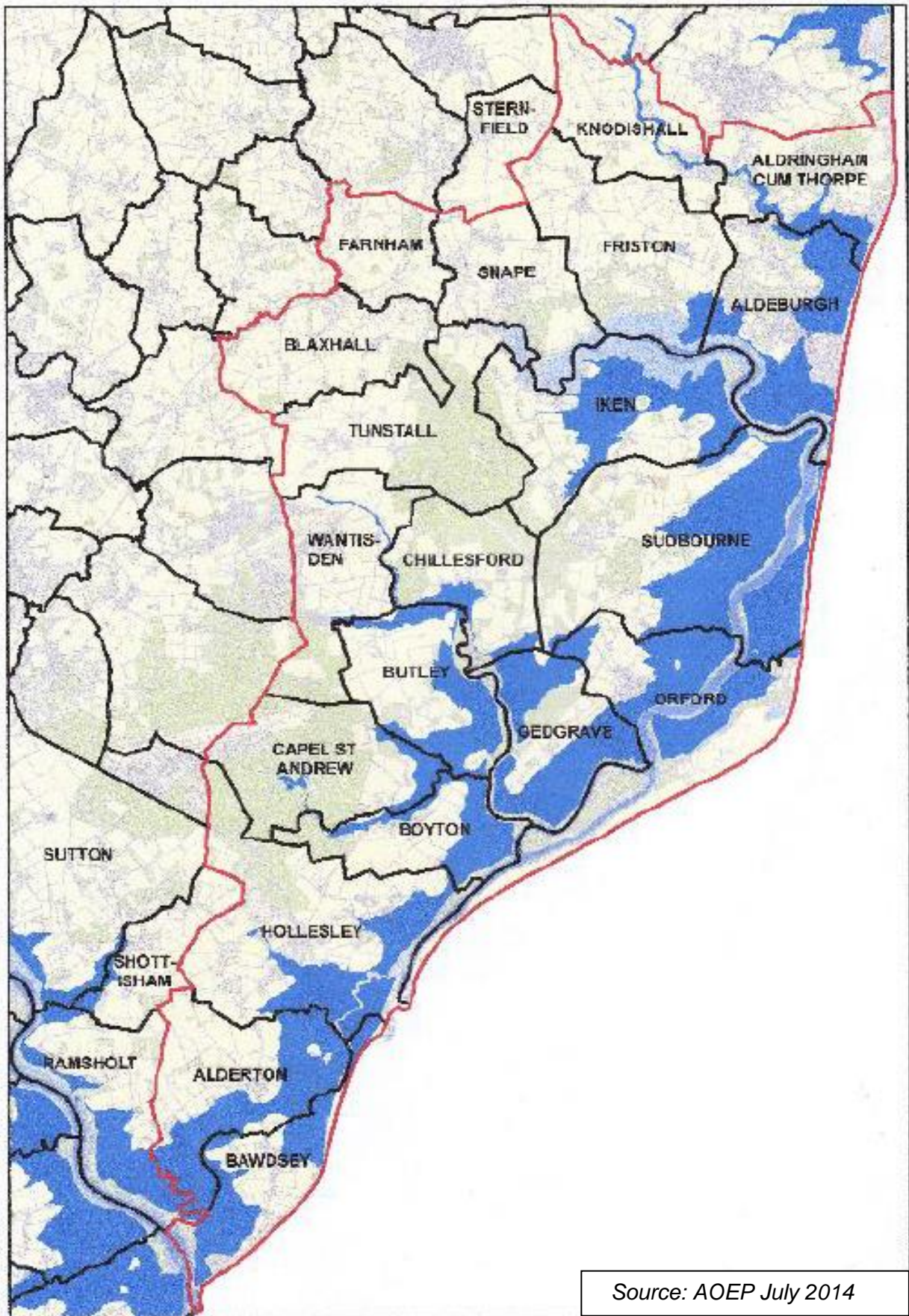


Figure 2: Location of Flood Cells and Flood Defences

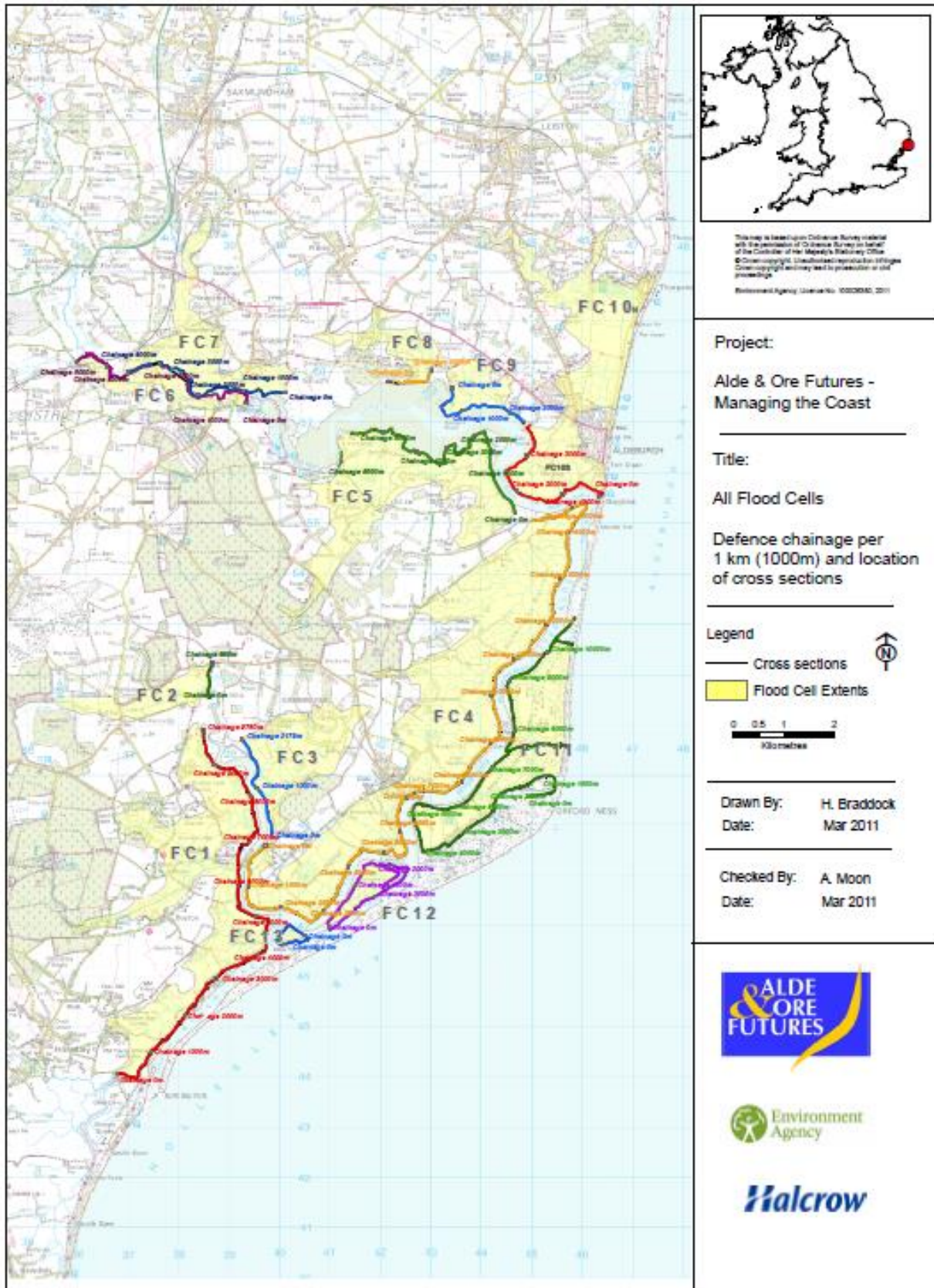
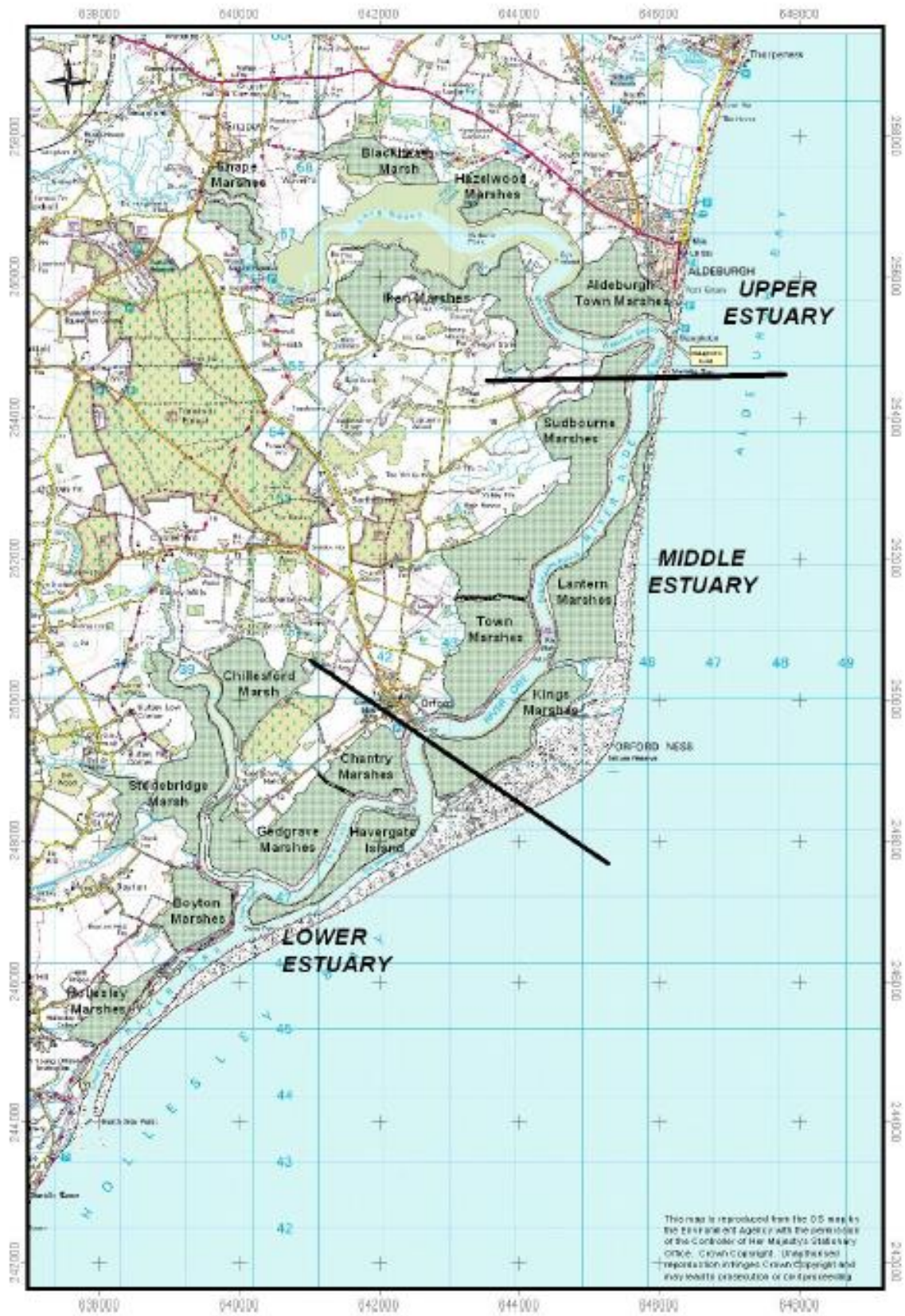


Figure 3: Geographic Overview Showing Locations



Source: Environment Agency (Jan 2006)

Overview of the three main sections of the estuary

Upper estuary

The upper estuary, upstream of Slaughden is orientated west-east and is relatively wide, almost basin-shaped, and is 7.33 km in length. The River Alde, which enters the estuary at its head near Snape, has two tributaries, the Ore and the Fromus, which join above the present tidal limit at the Snape Barrier, just upstream of Snape Bridge. Prior to construction of the barrier in the late 1960s the normal tidal limit lay approximately 1 km further upstream near the confluence of the Alde and the Fromus, and a significant area of the upper Alde valley was subject to tidal flooding during surge tides. The thalweg (deepest part) of the estuary varies along its length but is most shallow at 'The Horse' on the relatively straight reach south of Slaughden. In the early- to mid-Holocene (postglacial) the late period the River Alde entered the sea via a west - east oriented channel near Slaughden. In the later Holocene the mouth of the river was progressively deflected to the south by the build-up of gravel and sand transported along the open coast from the north.

The estuary overall has a mean spring tidal range of 2.2 to 2.3 m, meaning that it can be classified as 'mesotidal'. The flood tidal wave moves southward along the Suffolk coast and there is a phase lag (time difference) of approximately 2.3 hours at low water and 1.75 hours at high water between the open coast at Slaughden and the inside of the estuary at Slaughden Quay. The average flow velocities on the flood tide tend to be higher than on the ebb tide and so the estuary may be expected to show a net tendency to import and retain fine-grained sediment.

Active saltmarshes form a fringe in front of the flood embankments along much of the estuary, and more extensive active marshes remain along Barthorpe's Creek near Hollesley, in the upper parts of Stony Ditch on Orford Ness, and near Iken, so in the upper, middle and lower sections of the estuary. The average surface elevation of the mature active marshes shows a general increasing trend up the estuary reflecting the general pattern of increase in high tidal levels. Before embanking and reclamation (mostly in the 16th century) saltmarshes were much more extensive.

The upper estuary contains flood cells 5 to 10. The modelling of options for flood defences in the estuary has assessed FC6 and FC7 together due to the strong flood risk link between the two flood cells upstream of Snape sluice. FC10 has been subdivided into FC10n and FC10s as these two areas are essentially separate flood risk areas north and south of Aldeburgh (separated by the A1094). The primary source of flood risk to FC10n is from the coast; for FC10s it is from the estuary. The two areas only link up during low probability events. CSU4 has been subdivided into CSU4a and CSU4b to reflect the different risks associated with the north and south of this frontage. FC10s is landward of CSU4a and therefore assets in this location are primarily at risk of flooding from the estuary, because of the lower estuary defences. The estuary channel is landward of CSU4b and therefore assets at risk along this coastal frontage are primarily at risk from erosion of the shingle bank. Flood cell 9 Hazelwood Marsh, has seen recent change due to the surge event in December 2013.

The mean freshwater flow into the estuary from the Alde and Ore rivers above Snape (c. 0.62 m³ s⁻¹) is relatively small compared with the mean tidal flow (reported by Gardline, 2003 to be 945 m³ s⁻¹ for a spring tide and 514 m³ s⁻¹ for a neap tide, respectively).

The upper estuary is the more heavily populated area with largest settlement of Aldeburgh near the coast and Snape with the nationally renown Music venue at the Maltings at the western end of the River Alde. The A1095 is the most heavily trafficked road in the whole estuary plan area with average annual daily flows of 4000, although there will be seasonality with much higher flows in the summer and lower flows in the winter.

Middle estuary

The middle and lower parts of the estuary have a general N – S orientation and cross-cuts the generally W-NE trend of the underlying and surrounding geological formations. The name 'Alde' is applied to the estuary north of Halfway-Reach, above Orford; between this point and the sea the estuary has traditionally been referred to as the 'Ore' (Steers, 1926; Arnott, 1973).

This section of the estuary is approximately 7.95km in length between Slaughden and the north end of Havergate Island. The channel is artificially constricted at Orford Quay. It contains flood cells 4 and 11 and the broadest part the Orford Ness Spit.

This area has the lowest population, particularly sparse towards the coast. Orford is the biggest settlement in this area although its less than half the size of Aldeburgh. The main road into Orford has an average annual daily flow of around 2500 vehicles, again with some seasonality due to the place being a popular tourist attraction.

Lower estuary

From the north end of Havergate Island to the mouth of the River Ore the river is about 6.5km in length. The Ore divides into two around Havergate Island with the main flow taking place through the Gull, the deeper channel on the north side of the Island. Historical evidence suggests that in the 11th century when Orford Castle construction was started, the mouth of the estuary was closer to the castle and in Elizabeth I's time (c.1570-8) the end of Orford Ness Spit was opposite Hollesley. This suggests that there was a period of marked southerly growth of the spit between the 13th and late 16th centuries, possibly driven by a high frequency of north-easterly storms and strong southerly sediment drift during the earlier part of the Little Ice Age (Source: Kenneth Pye Associates Ltd. 2014).

Near the south end of Havergate Island the Ore is joined by the Butley River which flows in a general NNW direction towards Chillesford before turning west towards Butley. At the present time the normal tidal limit lies at Butley Mill, although this can be overtopped during extreme surge tides. In the relatively shallow water areas near the estuary mouth ebb velocities often exceed the flood tide velocities, restricting the movement of shingle upstream into the estuary.

Small amounts of freshwater are discharged into the estuary from the Butley River and number of other small streams and springs around the margins of the estuary giving rise to reduced salinities in the inner estuary but no density stratification so the estuary overall is classified as well mixed (HR Wallingford 1999).

The estuary mouth is constricted by shingle accumulations on either side at North Weir Point and Shingle Street and by a series of shingle shoals outside the estuary mouth. There is also a linear mouth bar which separates the channel into two parts. A survey by Trinity House on 1st April 2014 shows that the estuary mouth had moved approximately 80 m north compared with its position in 2012. The cross-sectional area of the mouth below HAT and MHWS was slightly larger than in 2012 although the cross-sectional area below MLWS was slightly smaller due to sediment accretion.

Hollesley is the largest settlement in this area, accounting for 65% of the population of the area although in fact the settlement itself is small with Hollesley Bay Young Offenders institution making up much of the population.

Key Facts and Issues

Social Issues

Key Issues

- Nearly 16,000 people live in the area with an older average age (49) than Suffolk (42). Nearly 450 are aged over 85 representing a significant issue for evacuation in the event of flooding.
- The biggest community is in the north of the area at Aldeburgh, acting as a transport node. The place with the second largest population is Hollesley which includes an open prison.
- There are several small communities with limited access to public transport and hence car ownership is high.
- 1700 houses are in the 13 defined flood cells of which 298 are below current defence walls. Over 400 businesses and work places including Snape Maltings are also located in the flood cells.
- Suffolk Coastal's Core strategy policies do not anticipate much residential development taking place in the area due to physical and natural environment restrictions.
- 20% of the population work at home (compared to the Suffolk average of 6%) and further 60% travel to work by car or van.
- There are no bus services on a Sunday limiting the possibility of encouraging visitors to use public transport to visit the area.
- Nearly 26% of the usual residents aged 16-74 are not economically active (of which 91% are retired) and of the 4192 that are employed 24.5% are in part-time jobs and 26.9% are self-employed, suggesting there are quite a few people around during the day.
- There is a social divide with a higher proportion employed in the Manager and Professional levels (14.1%) than in Suffolk (10.7%) and in skilled trades (19.9% compared to 13.4% countywide and a higher proportion of the Estuary Plan residents employed in elementary occupations than the county average.
- Local commercial and recreational fisheries are important.
- The growth in tourism, from visitors coming from outside the local area is the biggest social challenge facing the Alde and Ore in the next 10 years, in terms of the ability of communities and environment to accommodate them without losing its unique appeal.
- The remaining effective life (residual life) of the existing defences on the coast is estimated at 10-30 years, whereas within the estuary the estimated residual life values range from <2years to <10 years.
- Slaughden sea wall defences are a key concern as they were weakened by the 2013/4 storms and they are crucial to the continuation of the estuary in its current form as their failure would lead to a different outlet for the River Alde to the sea.
- There are weaknesses in the river defences and it is a very dynamic environment that can result in changes to policy due to force majeure issues however the current assessment by the AEOP is that over £7-10 million needs to be invested.
- The Estuary Plan area has low light pollution, giving it an unique environment worth protecting from large scale development.
- Public access to the Alde-Ore estuary, the watercourse and associated recreational facilities provides benefits to the local population's health and supports the local tourist economy.
- The East Coast One proposal for a cable to come ashore at Bawdsey affects the Deben and Alde –Ore Estuary plan areas, in terms of habitat disruption.
- There is an ageing population whose health would be sensitive to the effects of flooding and coastal erosion.
- There are a growing number of second homes.

- The local economy primarily consists of tourism, agriculture and fishing industries. The economy is relatively small and so sensitive to the effects of flooding and erosion.
- There is a risk to human life and health from flooding.
- Snape Maltings, a focal point for tourism, is vulnerable to flooding, with about 250,000 visitors a year.
- Recreational assets including Public Rights of Way, sailing, golfing, fishing and bird watching are vulnerable to flooding and erosion.

Population and Health

According to the Alde & Ore Local Economic Study February 2014, the total population size of the Alde-Ore local area is estimated at 15,820 residents in 2011 (Table 4-1). This figure is an increase from the total population size recorded in 2001 (6% increase), with most wards showing increases, and the wards of Aldeburgh; Snape; and Orford & Tunstall showing population declines. Of particular note is Rendlesham, which has shown the highest population increase (706), and Aldeburgh, with the highest decrease (313). A significant increase in population during summer times is observed.

Ward	2001	2011	Change 2001-2011
Aldeburgh	3,538	3,225	-9%
Snape	1,914	1,911	-0.1%
Orford & Tunstall	1,855	1,830	-1%
Hollesley with Eyke	2,314	2,473	+7%
Sutton (50%)	1,206	1,507	+25%
Rendlesham (50%)	988	1,694	+71%
Leiston (50%)	3,120	3,180	+2%
Total	14,935	15,820	+6%

Note that figures for the wards of Sutton, Rendlesham and Leiston are presented as 50% of actual figures to take account of them not fully being within the Alde-Ore study area.

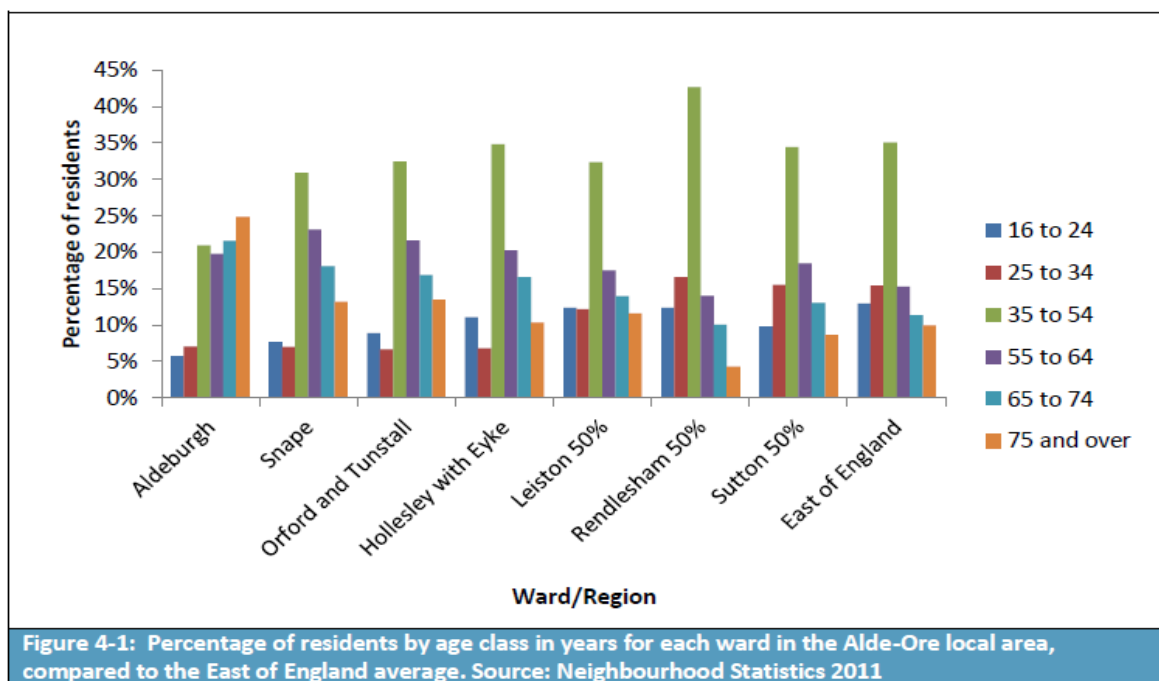
Source: Alde & Ore Local Economic Study February 2014

The age structure of the Alde-Ore local area has slightly more residents within the older age ranges (55 to 75+ yrs) when compared to the East of England average than the lower age ranges (16 to 54 yrs) (Table 4-2). The overall average age of residents within the Alde-Ore local area is 52.

Age class	Percentage of residents	
	Alde-Ore local area	East of England
16-24	9%	13%
23-34	10%	15%
35-54	31%	35%
55-64	19%	15%
65-74	16%	11%
74 and over	14%	10%

Source: Alde & Ore Local Economic Study February 2014

Aldeburgh, in particular, has markedly more residents over the age of 75 than any other age class while Rendlesham has more residents between the ages of 35 to 54 than the East of England average. The percentage of residents within each age range by Ward and for the East of England is shown in Figure 4-1.



Source: Alde & Ore Local Economic Study February 2014

The total number of residential properties in the Alde-Ore local area was 8,549 in 2011. A relatively high number of second homes were recorded in Aldeburgh with lower numbers in Snape and Orford & Tunstall, though recent figures are not available for most Wards. The total number of residential households can be calculated by subtracting second homes (964) from all dwellings, giving 7,585 properties (using the most recent figures for second homes).

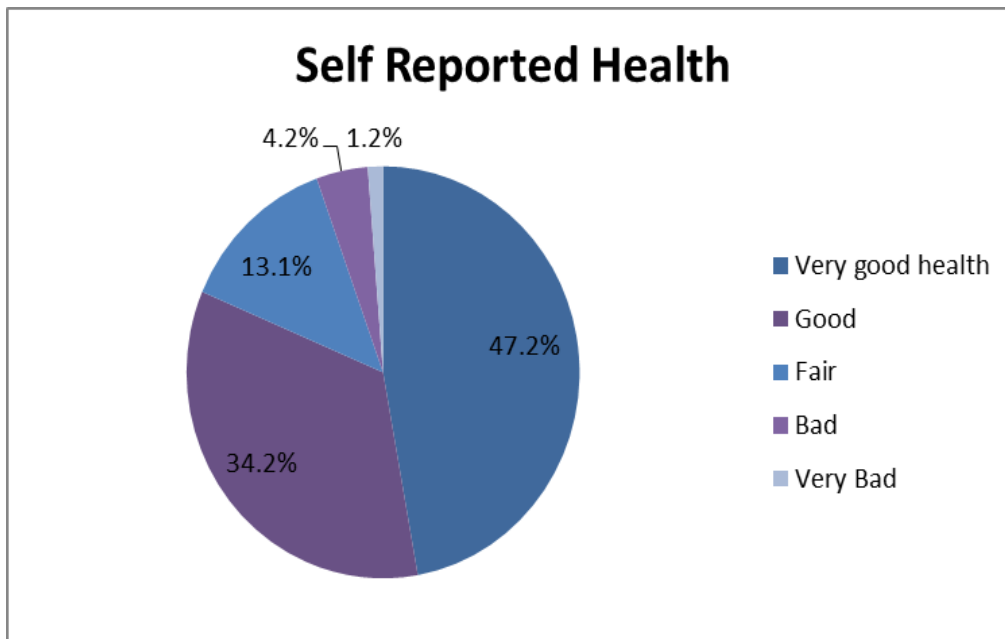
Self-reported Health (2011 Census)

According to the 2011 Census the self-reported health of the usual residents of the Estuary Plan area largely follows the Suffolk average.

Table 6: Self-reported Health

	Very good	Good	Fair	Bad	Very bad
AOEP No.	4,003	4,279	1,378	354	72
AOEP %	40.9%	38.6%	15.7%	3.7%	1.1%
Suffolk	46%	36%	13%	3%	1%
England	47.2%	34.2%	13.1%	4.2%	1.2%

There are 267 people in the Estuary Plan area reporting in the 2011 Census that their day to day activities are limited a lot. This is 2.6% of the total population. 85.1% of the Estuary Plan area residents do not provide any form of unpaid care (Suffolk 89%, England 90%) but in all 1,046 are providing some unpaid care with over 250 people providing over 50 hours a week.

Figure 5: Self-reported health of residents in the Alde and Ore Estuary Plan area

The natural environment can play an important part in dictating the health of a population. Recreational activities within the Study Area, many of them water-related, such as sailing, canoeing, water skiing and also walking, are likely to play an important contributing role to the health of the local population and those who visit the area for recreation.

Impacts on human health may be experienced at those properties in the Study Area that are at risk of flooding. Notably, significant injury and / or death can result from flooding events. Furthermore, flood events can also cause health impacts (both physical and psychological), including stress and trauma sometimes months or years after the flood event, or whenever flooding appears likely to occur (Tapsell *et. al.*, 2002).

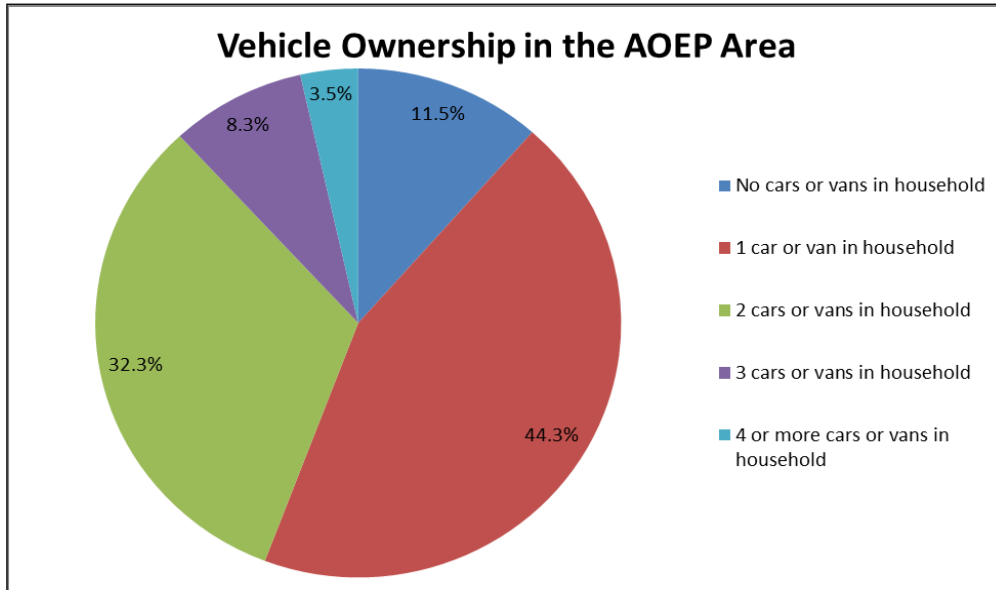
There are 18 communal establishments in the Estuary Plan area with a total of 591 residents. These are distributed in Aldeburgh, Alderton, Bawdsey, Blaxhall, Hollesley and Knodishall and are all medical/care homes except in Alderton, Bawdsey (probably linked to the International School) and Hollesley (includes Young Offender Institution. Hollesley accounts for 78% of this type of resident in the Estuary Plan area.

There are 507 households in the Estuary Plan area that have no car. As Table 9 shows this is much lower than the Suffolk and national average reflecting the lack of options for transport (see transport section below). Overall there are 4,405 households in the Estuary Plan area.

Table 7: Car/van ownership (2011 Census)

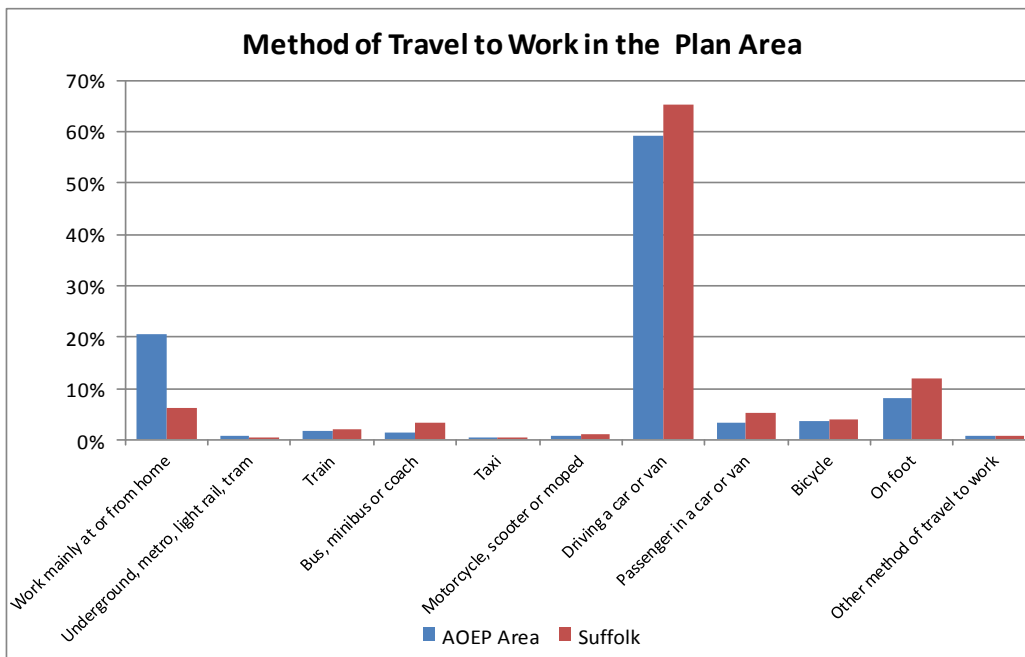
	No car	1	2	3	4+
AOEP area	11.5%	44.3%	32.3%	8.3%	3.5%
Suffolk	18%	43%	29%	7%	3%
England	26%	42%	25%	5%	2%

Figure 6: Vehicle ownership in the Estuary Plan area



Twenty percent of people in the Estuary Plan area work at or mainly from home (879 people) which is a much higher proportion than in Suffolk (6%) and England (5%). The proportions cycling and going by foot are similar to the county average. 61% of people travel to work by car (either driving or as a passenger) compared to 70% in Suffolk and 62% in England.

Figure 7: Travel to Work (2011 Census)



Accommodation Type (2011 Census)

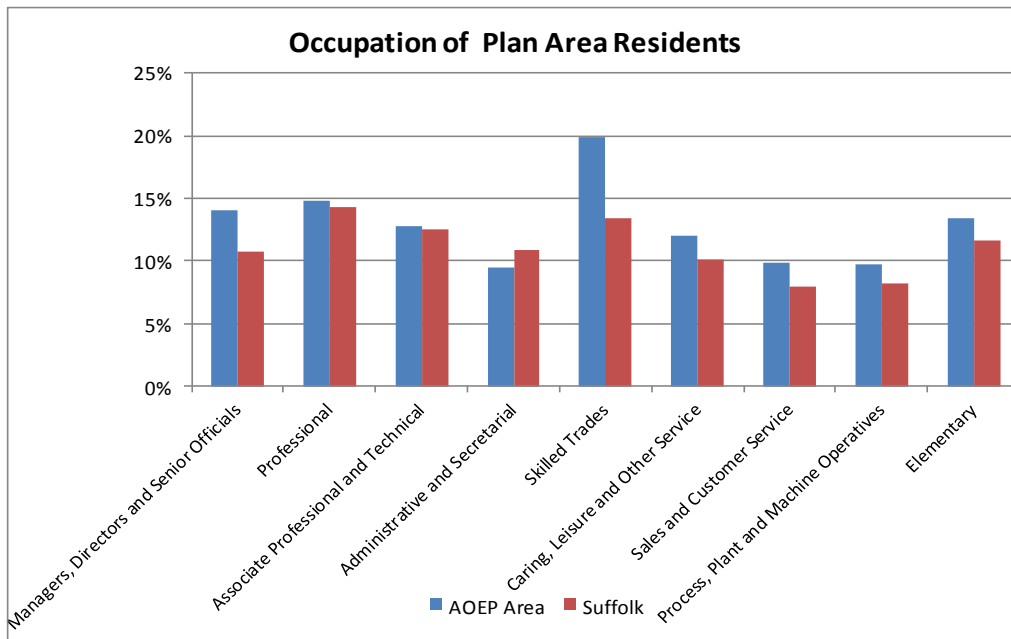
A higher proportion of people live in detached housing in the Estuary Plan area (26.9%) compared to Suffolk (35%) and England (22%). There are also 10 caravans in the area, found in Aldeburgh, Aldringham, Butley, Hollesley, Iken, Knodishall and Tunstall.

Employment (2011 Census)

Of the 7,105 usual residents of the Plan area aged 16-74, 25.5 % are not economically active, and of these 91.1% have retired. 8.9% are unemployed and of the 4192 that are employed, 48.6% are in full-time employment, 24.5% are in part-time jobs and 26.9% are self-employed.

In terms of occupations of the usual residents of the Plan area, there is a higher proportion employed in the Manager and Professional levels (14.1%) than in Suffolk (10.7%) and in skilled trades (19.9% in the Estuary Plan area compared to 13.4% countywide). A higher proportion of AOEP residents are also employed in elementary occupations than the county average.

Figure 8: Occupation of Estuary Plan Area residents



Recreation and Amenity

There is an extensive network of Public Rights of Way (PRoW) in the Plan study area including the Suffolk Coast and Heaths Path, the Sandlings Path and Sailor’s Path. Countryside and coastal walking, along with visits to the beach are the most frequent activities undertaken by the majority of residents and visitors. In addition, a wide range of more specific activities comprising sailing, golfing, concert going, bird watching, fishing and sightseeing are regularly undertaken.

The greatest pressure for recreation occurs on, or near the river, and the number of people using the river for leisure purposes has increased steadily for many years. Orford Ness is particularly vulnerable to increasing recreational pressure which has the potential to affect features of the designated sites in this location (see Section 4.3).

In addition to the shore-based facilities at Aldeburgh Yacht Club, Orford Sailing Club, Slaughden Sailing Club, the boat-yard and the quay, there are a considerable number of moorings in the estuary. These are controlled by the Moorings Committee of the Aldeburgh Yacht Club and by a Moorings Charges Advisory Committee, which includes representatives of all users. Sailing and water sports are very popular within the Plan study area; however these pursuits may be negatively affected if current trends in coastal erosion continue, with the sailing clubs at Slaughden being particularly vulnerable.

Public access is restricted in some areas due to nature conservation reasons. Examples of this are Havergate Island and Orford Ness where, due to the need for boat access (from Orford) and the sensitivity to disturbance, the sites are not able to receive more than a small number of visitors (approximately 550-800 per annum for Havergate Island).

A Sustrans National Cycle Route (on minor roads) passes through Orford and follows the estuary north towards Snape, providing an important amenity for cyclists.

Recreational sea angling is also an important activity in the area, and the beach at Orford Ness is nationally considered an important location for this activity. During summer and winter months chartered fishing trips are also organised. *Dicentrarchus labrax* (sea bass) and *Solea solea* (common sole) are caught during the summer months; while *Gadus callarias* (Atlantic cod), *Merlangius merlangus* (whiting), and common sole dominate the winter catch.

The RSPB acquired a lease from the Crown Estate in 1997 to stop wildfowling being carried out on the Boyton/Butley River. Some wildfowling still occurs in other areas of the estuary.

Future Trends

With the eighth highest proportion of people over 65 in Britain, this proportion is expected to rise in Suffolk to around a quarter of the population by 2021. Over the same time period, the proportion of working age population is predicted to decrease by 4% (Suffolk Strategic Partnership, 2008).

Table 8 indicates trends in population growth in Suffolk. The increasing trend in the population of Suffolk Coastal district is expected to continue with the population being predicted to reach 128,000 by 2021 (Suffolk County Council, 2005). It is important to note that locally this trend is reversed as there is a stable or declining population in the settlements of Aldeburgh, Orford and Butley (Suffolk Coastal District Council, 2010b).

Table 8: Trends in population growth (Source Suffolk County Council, 2005)

Town	2001	2003	2005	2021 forecast	% increase 2001-2021
Aldeburgh	2800	2850	2690	-	-
Butley	200	210	200	-	-
Orford	660	670	630	-	-
Felixstowe*	24050	24050	24000	-	-
Ipswich*	117160	117650	118400	145600	24.3

*Ipswich and Felixstowe are included for reference only; they are not within the Plan study area.

Tourism is expected to increase in the region with the cultural sector expected to comprise 5.9% of the regional economy by the end of 2010 (Suffolk County Council, 2008d). In Suffolk, tourism revenue has increased by 7.4% in 2010 (Lowestoft Journal, 2010).

Flood Risk Management

The first flood defences on the Ore, were built in the 12th century principally to provide grazing for sheep to feed the workers building the Orford Castle. In the 16th century the river wall were built higher up the estuary, again to provide marshes for pasture. In 1515 a Mr Dobby rented the Aldeburgh Town marshes for grazing on the condition that he built a ditch or dike to keep the pasture drained: that channel is still there today running at right angles to the river wall. Today about 1700 houses are in the 13 defined flood cells of which 298 are below current defence walls. Over 400 businesses and work places are also in the flood cells including Snape Maltings and the Aldeburgh High Street. Five wildlife reserves depend on the flood defences

with 3878ha of defended floodable land and 3171ha of farmland irrigated with freshwater taken for abstraction points that depend on flood defences.

The flood cells boundaries (shown in Figure 2 and named in Table 9) are defined by the flood extent of an extreme water level (EWL) with a 0.1% (1 in 1,000 chance of occurring in any one year) annual probability of occurrence (APO), including an allowance for sea level rise over the 100 year appraisal period. This level is 5.1m Above Ordnance Datum (AOD). (Source: EA, Technical Appraisal 2011).

Table 9: 2011 Estimate of when significant maintenance may be required

(Source: EA 2011 Technical Appraisal report)

Flood cell	Estimated life
FC1 Boyton and Butley Marshes	5 years
FC2 Butley Mills	2 years
FC3 Chillesford Lodge marshes	10 years
FC4 Orford with Gedgrave and Sudbourne Marshes	2 years
FC5 Iken Marshes	2 years
FC6 Snape to Langham Bridge South	2 years
FC7 Snape to Langham Bridge North	2 years
FC8 Ham Creek Marshes	5 years
FC9 Hazelwood Marshes	5 years
FC10 Haven & Aldeburgh Marshes	5 years
FC11 King's and Lantern Marshes	2 years
FC12 Havergate Island	5 years
FC13 Dovey's island	5 years

* Estimated life of FC6 defence is <5 years, however, since FC6 and FC7 are being assessed as a single flood cell due to then predicted flood route, a residual life value of 0-2 years is representative of the unit.

The existing defences protecting the coast (defined in 9 units, see table 5) include seawalls, rock armouring and timber groynes, supplemented with shingle recycling in places. The estuary defences consist mainly of earth embankments, with some localised rock armouring protecting particular areas. The net longshore sediment transport in the study area is generally directed towards the south, although variation in wave conditions can result in northerly or southerly drift. The remaining effective life (residual life) of the existing defences on the coast is estimated at 10-30 years, whereas within the estuary the estimated residual life values range from <2 years to <10 years (EA Technical Appraisal report, 2011).

According to the EA Technical Report 2011 undertaken for the Alde-Ore Futures – Managing the Coast plan to appraise technically sound, environmentally acceptable and economically viable proposals for the estuary and coast for the next 100 years, the No Active intervention (NAI) scenario for the coast and estuary predicted that:

Coastal frontages:

- In the short term (0-20 years) the southerly areas will continue to accrete. Retreat is likely to occur from Thorpeness to Aldeburgh and in front of Slaughden where erosion here will eventually lead to the failure of the Slaughden defences.
- In the medium term (20-50 years) erosion will become more prevalent along the coastal frontage. At Slaughden the failure of the defences will allow a breach to form, if it has not already, and deepen. There is a high risk of a new estuary mouth forming at this position towards the end of this period.

- In the long term (50-100 years) it is likely much of the coastal frontage will be subject to shoreline recession. Orford Beach and the beach between Thorpeness and Aldeburgh will become vulnerable to overtopping and a permanent tidal inlet at Slaughden is also likely to have formed.

Estuarine frontages:

- In the short term (0-20 years), the defences in the estuary are likely to fail leading to the creation of new intertidal areas, an increase in flows through the existing mouth and a reduction in EWLs, with the greatest reduction in the upper estuary. However, the reduction in EWLs is likely to be short lived since a breach at Slaughden is likely to develop towards the end of this time period, which would result in an increase in water levels, to levels similar to or lower than the existing water levels.
- In the medium term (20–50 years), if a breach has not formed in the previous time period, it is likely to occur early in this one. If it has previously formed, it is likely to develop further, by deepening and widening. Water levels in the lower and middle estuary are likely to rise to their former levels before the failure of the estuary defences. Water levels in the upper estuary will also rise, but by a smaller amount and will be marginally lower than elsewhere in the estuary.
- In the long term (50-100 years), the breach at Slaughden is expected to continue to enlarge and is likely to become the dominant mouth, though there may be several decades of instability before the system reaches equilibrium. Over time the existing mouth is anticipated to decline in importance and may even close at the end of the time period. The enlargement of the mouth at Slaughden will lead to a rise in extreme levels within the estuary as water levels approach those experienced on the open coastline.

The EA Technical Appraisal report 2011 for the Alde-Ore Futures – Managing the Coast Plan looked at flood and coastal erosion risk management policies of NAI, Hold the Line (HTL), Managed Realignment (MR) and Advance the Line (ATL) although ATL was screened out at an early stage because it did not meet many of the original Futures plan objectives in terms of economic, technical and environmental viability. A long list of coastal and estuarine protection activities were refined into a short list for appraisal for short, medium and long term effectiveness against the NAI baseline. This resulted in the identification of three ‘Managing the Coast’ plans: Plan A the most affordable options assuming no maintenance of defences by the Environment Agency or landowners beyond the end of the residual life of the defences ; Plan B a combination of the most affordable options and landowners maintaining defences for an additional 10 years; and Plan C a combination of the most economically viable and affordable options (taking account of current mechanisms for obtaining central government funding) and assuming the required private contributions are forthcoming to undertake maintenance works beyond the end of the residual life of the defences. The Technical Appraisal report 2011 concluded that Plan C was the most economically viable and affordable, if sufficient contributions are available. This Plan represented the most significant reduction in flood risk to people and property, while allowing for the estuary to evolve and adapt through time due to the effects of climate change.

This Technical Appraisal by the EA inspired community consultation on future flood defences and the outcome was desire by local people to sustain the current economic, environmental and community life as it now is for as long as that is feasible by maintaining the existing shape of the estuary. This has resulted in the development of a ‘resilience’ approach to flood defences, to strengthen the landward slope to resist breaching even if overtopped. This is the preferred management approach for river walls in the medium term (next 20-50 years)

However, this plan generated considerable concern about areas where little or no public funding would be available owing to the Benefit to Cost Ratio (BCR) being too low. The BCR is a function of Treasury criteria primarily concerned with life and property but taking no account of local economic and community values. Only two flood compartments in this estuary are currently judged to have a BCR less than 1, the threshold below which no public money can be spent. This applies to FC8 Ham Creek and FC9 Hazelwood Marsh, although as FC9 is an SSSI, EU regulations would have required some form of reinstatement, but as this cell has been seriously breached by force majeure in the December surge, it is understood this is no longer so. However, most compartments have BCRs which, while showing that it is worth incurring some funding to maintain them, they are unlikely ever to receive a high percentage of central government assistance. Other more densely developed areas (Orford, Aldeburgh and Snape) will foreseeably receive the great majority of the available investment. Importantly, however, this EA plan has not said that works may not be carried out in places with low BCR's.

Therefore, the AOEP has an opportunity to produce a fresh Whole Estuary Plan. The AOEP's plan is for managing the river defences as a whole, taking account of the impact to changes affecting one flood cell on other flood cells as well as river flows, property, economic factors, environmental considerations including habitat needs and regulations against the back ground of sea level changes resulting from climate change and isostatic rebalancing. It sets priorities for upgrading defences over a 10 year period, seeking to repair the walls in greatest need of repair first, prioritised by high Benefit Cost Ratio (BCR) flood cells, and linking in with Environment Agency funding where it is available. Where defences require upgrading rather than altering to meet a changed management approach, to seek to upgrade these to a standard to withstand overtopping in a 1 in 200 year event, given likely sea level in 2050 (the December 2013 surge was a 1 in 20 year event) with provision for timely removal of water after a surge event. The approach would allow for overtopping from time to time but recovery from overtopping should be very quick unlike the longer term damage which would arise from breaches in the walls. Funding for the necessary works would be sought from Enabling Development, i.e. securing development value from land donated by landowners and receiving exceptional planning permission.

The AEOP has drawn up plans for works showing the ability of estuary walls to survive without multiple breaches during storm events. It is assumed that a wall can survive a 300mm overtopping event undamaged and an allowance of 32.5cm has been added to the surge heights provided by EA (base date 2011). The programme is based on a 'Ski-Run' system i.e. the most urgent defences needing refurbishment being BLACK, through RED and BLUE to the least urgent and currently most able to withstand a major event being GREEN.

- BLACK** Will overtop and may breach during a 1:20 year event in 2012 but **cannot** survive a 1:20 year surge event in the year 2050.
- RED** Will not overtop during a 1:75 year event in 2012. **Can** survive a 1:20 year surge event in the year 2050 but **cannot** survive a 1:75 year surge event in the year 2050.
- BLUE** Will not overtop during a 1:200 year event in 2012. Can survive a 1:75 year surge event in the year 2050 but **cannot** survive a 1:200 year surge event in the year 2050.
- GREEN** Can survive a 1:200 year surge event in the year 2050.

The flood cell maps facilitate strategic decision to be made on how design upgrades can be prioritised. The AEOP estimates that their resilience approach will cost £7-10 million (assuming the most efficient design, easy access to local clay and maintenance costs and upgrading of revetments on the river side wall are not included). It is anticipated that the sale of enabling development will provide the local funding. Built into the plans will be measures to enable immediate drainage of any water resulting from overtopping. Such measures will include the need for structures such as sluices, temporary mobile pumping equipment. Grass

grazing/cutting and revetment maintenance will also be considered and a number of trials have taken place to test the suitability of approaches.

December 2013 Surge

The December 2013 surge caused extensive damage to the existing flood bank around Hazelwood marshes, as it was breached in two locations. Within the tidal floodplain is 92 ha of land, 7 residential properties and part of the 9 hole Aldeburgh golf course. The properties were not flooded but some gardens were and two tees of the golf course were inundated. The majority of the floodplain was an 80ha freshwater wetland habitat designated as a SPA and managed by the Suffolk Wildlife Trust. The impact and possible technical solutions have been investigated (EA draft report March 2014). A report on hydrodynamics has suggested that the inundation is good for flood storage and that Avocets can be accommodated on intertidal island that will be created. Monitoring of breeding levels will reveal if the EA will need to put mitigation into place. It is considered that breeding Marsh Harriers will be lost from this area but can be absorbed elsewhere. An HRA is being prepared that will comment on the coastal squeeze issues but because the walls have failed managed realignment is needed and will help relieve the issue of coastal squeeze. Discussion with land owners is assuming that the original defences will not be reinstated but a new 2m high wall will be built to protect the golf club tees. Managed realignment is also likely to happen at Boyton (Personal communication with EA, August 2014). This illustrates the dynamic nature of the estuary as this sets the new baseline for the flood cells.

The Estuary Plan contains a priority order for work on flood cells taking into account the impact of the 2013 surge:

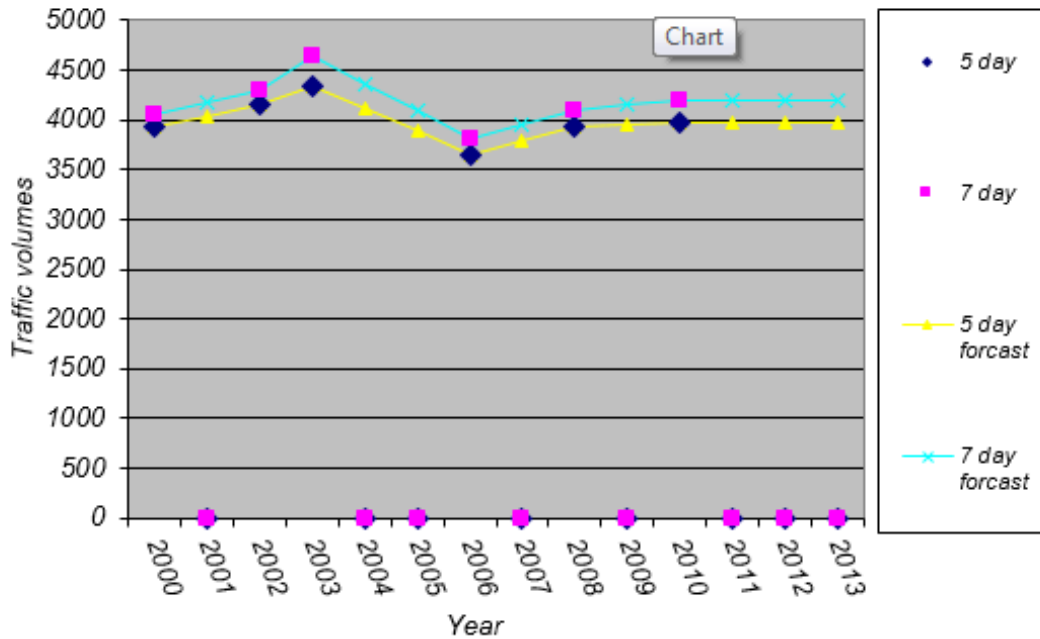
1 FC6/7	Snape
2 FC 10s	Aldeburgh
3 FC4	Orford
4 FC5	Iken
5 FC1	Butley/Boyton
6 FC3	Chillesford
7 FC2	Butley Mills
8 FC8	Ham Creek (to be financed by relevant landowners)
9 FC9	Hazlewood Marsh

The impact of the 2013/14 winter storms on the Slaughden sea wall defences has made what were thought to be reasonably secure defences for some time very much more vulnerable: how to address this defence which is absolutely crucial to the continuation of the estuary in its current form, is currently under discussion.

Traffic and Transport

The main road network is limited as there is no coastal road as such, with the A12 running northeast / southwest, only crossing into two parishes in the Study Area in the north at Blaxhall and Farnham. The most heavily trafficked road in the study area is the A1094 that links Aldeburgh to the A12 with minor B-roads running parallel to the A12 through Snape (B1069) and linking onto the B1084 to Orford and the coast in the south of the Plan study area. There is seasonal traffic problems at Aldeburgh, Orford and Snape related to visitor activity during the summer holidays and at weekends. The area encourages visitors for its economic wellbeing, but finds it difficult to cope with the influx of cars at peak periods.

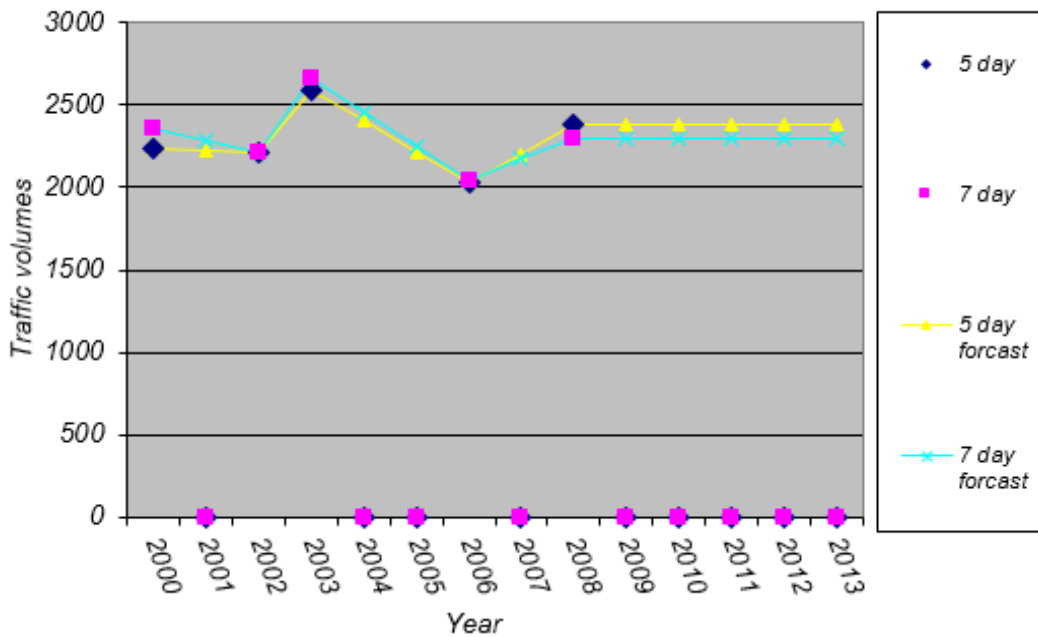
Figure 9: Traffic numbers North West of Aldeburgh



Average speed along the A 1094 is just under 50mph and notably the 7 day flow is higher than the 5 day indicating just how much traffic uses the road at the weekend.

Orford South of U3829 - average speed used to be over 41mph in 2003 but has fallen 39mph (last count 2008). The seven day average is lower than the 5 day indicating that there is slightly less weekend traffic than week days.

Figure 10: Traffic numbers Orford South of U3829



The EA's Economic appraisal report (2011c) suggested that the main and secondary roads subject to flood and erosion risk are:

- B1122 Leiston Road (FC10 (Haven));
- B1069 Bridge Road (FC6 & 7);
- B1084 Hertfords Place and The Street (FC2);
- A1094 Saxmundham Road (FC10).

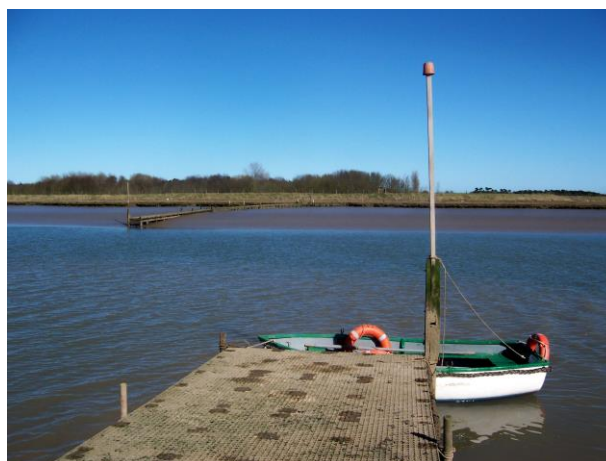
The nearest rail line to the study area runs parallel to the A12 with stations at Saxmundham and Wickham market. The railway line passes through the Plan study area to the west of Snape. A small section of the railway line to the north of Blaxhall has the potential to be affected by flooding.

Commercial bus services run from Aldeburgh through Snape to Woodbridge and Ipswich 6 days a week (Service 64, 65) and similarly Aldeburgh to Halesworth (Service 521). There are two buses a day to and from Orford. There are no services on a Sunday. Coastal Accessible Transport Service (CATS) run a range of services aiming to meet the access needs of the Alde –Ore area including Suffolk Links Demand Responsive Transport; Alde service operates in the Orford and Snape area and Blyth covers Aldeburgh. These run to nearest connecting commercial bus routes or do local trips to the nearest town or village, 6 days a week. There are also community car services and dial a ride for those with mobility impairments. Public transport access options are limited in the Alde –Ore area and there is nothing available on Sundays, severely limiting the degree to which bus services can be used by visitors to the area.

Navigation is important for commercial fishing and recreation in the area. The Alde and Ore estuary is a popular area for sailing with a number of moorings and shore based facilities in the area. The tidal estuary provides 15 miles of sheltered sailing water and is accessible at all states of the tide. The River Alde is navigable from Snape Maltings through the Ore Estuary to the open sea. These 'safe waters' are one of the main attractions for sailing and the associated tourism is important to the local economy. There are 156 moorings in the River Ore at Orford and 400 on the Alde at Aldeburgh (EA, Economic Appraisal report, 2011).

The Butley Ferry across the Butley River is one of the oldest in Great Britain and manned by volunteers, still runs between Easter and the end of September between 11am and 4pm on Bank Holidays and weekends, transporting people, cycles and dogs.

Orford Ness Lighthouse, completed in 1792, was decommissioned in June 2013 due to the encroaching sea and unless demolished is estimated by the [last attendant](#), to survive 7-8 years before falling into the North Sea. [Trinity House](#) has increased the power of the light at Southwold Lighthouse to compensate for the closure of Orford Ness lighthouse. (BBC News, 2013)



Butley Ferry (Supplied AEOP, 2015)

Most cycling takes place on public roads and town paths that permit cycles – there are no Sustrans routes running through the study area or many signed local routes but the area is popular for recreational cycling.

Tourism and Recreation

Tourism is a significant industry in the Study Area. The natural environment of the Alde and Ore Estuary and the coast draws in visitors during holiday periods, for walks, bird watching, shopping and sightseeing in historic and seaside towns, music and art. Table 10 lists the main visitor attractions, type and location in the Alde and Ore area.

Table 10: Visitor attractions within the Alde and Ore Plan area (Source: RPA, 2014)

Name of attraction	Type of attraction	Location
The Suffolk Punch Trust	Animal Farm	Hollesley
Orford Castle	Historical site	Orford
Snape Maltings	Shopping and art gallery	Snape
Aldeburgh Music	Cultural	Snape
Rendlesham Forest Centre	Recreation/Nature	Woodbridge
Jubilee Hall	Cultural	Aldeburgh
Aldeburgh Church	Cultural and Historical	Aldeburgh
The Red House	Cultural and Historical	Aldeburgh
Thorpeness Windmill	Historical and recreation/Nature	Thorpeness
Thompson's Gallery	Cultural	Aldeburgh
Dunwich Underwater Exploration	Historical	Orford
Orford Ness	Recreation/Nature	Orford
Lady Florence River Cruises	Recreation/Nature	Orford
Orford Museum	Historical	Orford
Havergate Island	Recreation/Nature	Orford
The Martello Towers	Historical	Aldeburgh
Aldeburgh Mystery Treasure Trail	Recreation	Aldeburgh
Orford Crafts	Cultural/shopping	Orford
Hazlewood marshes	Recreation/Nature	Aldeburgh
Snape Marshes	Recreation/Nature	Snape
Blaxhall common	Recreation/Nature	Saxmundham
Tunstall Forest	Recreation/Nature	Tunstall
Captains Wood	Recreation/Nature	Sudbourne
Sutton and Hollesley Common	Recreation/Nature	Woodbridge
Boyton Marshes	Recreation/Nature	Boyton
Bawdsey Radar	Historical	Bawdsey
Bentwaters Cold War Museum	Historical	Rendlesham
Aldeburgh Food Festival (plus fringe events)	Cultural/Shopping	Aldeburgh and local area
<i>Source: Information taken from www.visit-suffolkcoast.co.uk, www.discoversuffolk.org.uk/, www.visitengland.com and http://www.visitsuffolk.com on 27th November 2013</i>		

RPA 2014 estimated that there are approximately 1 million day visitors to the Alde-Ore. Snape Maltings is a multi-purpose complex providing craft shops, art gallery facilities, pub and restaurants, holiday accommodation, workshops, circular walks, boat trips and a concert hall which plays host to Aldeburgh Music, attracts visitors from both inside and outside of the local area and Aldeburgh Music alone attracts 100,000 visits pa (URS, 2013) with around 40,000 coming from outside the area. Aldeburgh Food and Drink Festival is a yearly event which takes place at Snape Maltings for a few weeks between September and October. The 2012 festival is estimated to generate a total spend of just under £1m (RPA, 2014). The recent economic survey (2014) estimated that visitors were willing to travel an average of 126 km to visit the Alde –Ore local area; 67% were repeat visitors and 30% indicating that they visit more than 4 times pa.

In contrast Orford Ness nature reserve offers quite a different experience. The site contains fragile coastal vegetation and unexploded bombs originating from its previous use as a military

experiment site; this means that visitor numbers are restricted to a daily maximum of 156 and the site can only be accessed by ferry to protect the fragile spit. Visitor numbers are estimated to be between 7,000 and 8,000, with 95% visiting between April and September (RPA, 2014). Parts of the Alde – Ore estuary are remote and are the least accessible parts of Suffolk offering a unique wilderness type experience that is consequently very sensitive to visitor numbers (e.g Shingle Street, Orford Ness spit).

There are 3 sailing clubs in the Estuary Plan area; Aldeburgh Yacht Club, Orford Sailing Club and Slaughden Sailing Club plus two on the Deben fridge at Bawdsey. They have shore based facilities and moorings in the estuary. These are controlled by the Mooring committee of the Aldeburgh Yacht club and a Moorings Charges Advisory Committee which includes representatives of all users. Sailing and water sports are very popular in the plan area however these pursuits may be negatively effected if current trends in coastal erosion continue with the sailing club at Slaughden being particularly vulnerable. (EA 2011a).

Suffolk Coastal's 2014 assessment ([Ploszajski Lynch Consulting Ltd, 2014](#)) calculates that 115,000 people (92.3% of the district population) are within 30 minutes drive of their nearest water sports facility, current supply meets demand and no quality improvements are needed but by 2017 one additional facility will be needed to meet demand. Figure 11 shows the points of public access for waterborne craft in the plan area. Recreational sea angling is also an important activity in the area with the beach at Orford Ness considered a nationally important location. Chartered fishing trips are organised in the summer (for sea bass and common sole) and winter months (for whiting and common sole).

Public access is restricted in some areas of the estuary for nature conservation reasons. Examples are Havergate Island and Orford Ness where due to the need for boat access (from Orford) and the sensitivity to disturbance the sites are not able to receive more than a small number of visitors (approximately 550 – 800pa for Havergate Island) (EA 2001a). The RSPB acquired a lease from the Crown Estate in 1997 to stop wildfowling on the Boyton/Butley river but some still occurs in other areas of the estuary.

The Eastern branch of 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. A stretch of the Butley River is designated as Shellfish and Bivalve Mollusc harvesting areas and a small stretch of the Alde south of Slaughden is a shellfish harvesting area (Natural England [website 2014](#)).

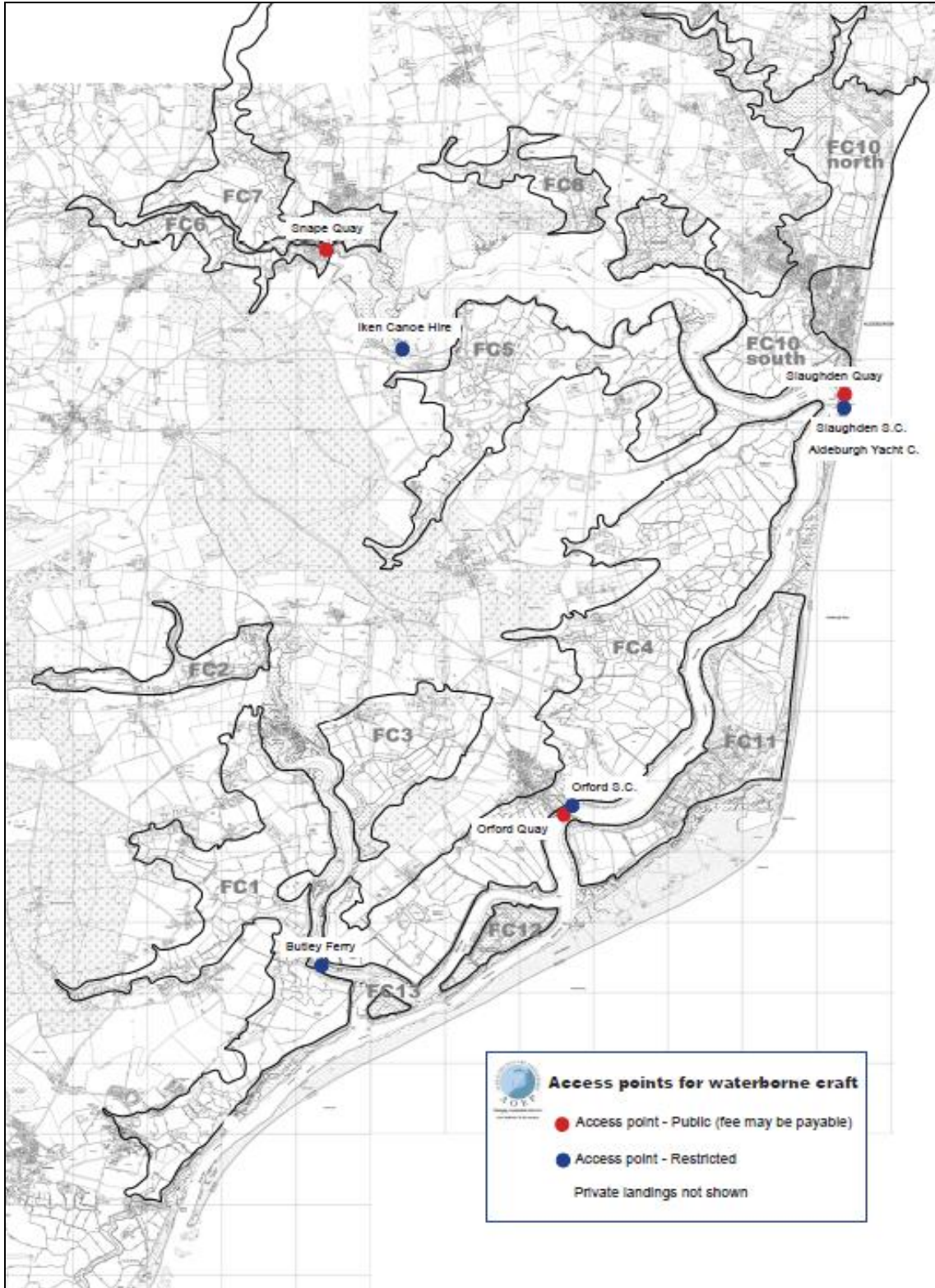
Public Rights of Way

There is a network of Public Rights of Way (PRoW) in the Study Area, totalling 101km including the Suffolk Coast Path long distance path that runs from Lowestoft to Felixstowe. This footpath follows the coast from Bawdsey and then tracks along the River Ore to Boyton, follows the Butley River then runs inland to Snape and Aldeburgh (Source Suffolk Coast and Heath Management Plan, 2013). There are public rights of way along the inland riverbank of the River Alde and Ore but the seaward side is much less accessible, making Orford Ness uniquely remote. Areas of shingle are particularly vulnerable to visitor pressure as the highly specialised vegetation is easily destroyed by trampling. The use of sea and estuarine walls for walking and cycling can place people above the skyline and this can have a significant impact in the winter on wading birds (Suffolk Coast and heaths Plan 2013).

As noted above a pedestrian and cycle ferry operates for limited periods during the summer months. There are a few picnic sites in the area provided by Suffolk Coastal District Council, notably at Iken (free), Thorpeness Beach (Pay and Display) and Hollesley Common (free) with

larger areas of car parking provided by other providers at Orford and Snape and Aldeburgh where parking is known to be a problem at peak holiday periods. Parking is a key tool to controlling the location and numbers of visitors.

Figure 11: Access points for waterborne craft (Source: AEOP, 2015)



Light Pollution

The Alde and Ore estuary area is one of the least light polluted areas of Suffolk. There are pockets of light pollution at Aldeburgh, Orford, Snape and Hollesley, the biggest settlements in the area but as there are few settlements along the coast this means it is the most unpolluted stretch of coast in East Anglia, causing minimal disturbance to wildlife. Hence such an area would be particularly sensitive to large scale new development.

Suffolk Coastal District Council Core Strategy (July 2013)

The Suffolk Coastal District Council's planning policies for the Alde and Ore Estuary area recognises the sensitivity of the area to development. Aldeburgh is the largest settlement and is categorised as a market town in the District's settlement hierarchy but due to its physical and natural constraints future development is expected to be relatively limited to previously developed land including infilling. Housing stock in Aldeburgh has only grown by 16 in the period 2003-2012. (Suffolk County Council, 2012) In the 5 market towns in the District only 1520 new housing units are thought to be needed in the period 2010 - 2027. Even smaller amounts of residential development is anticipated in other settlements in the Plan as they are categorised as follows (Core Strategy allocation **for whole district** up to 2027, 1350):

Key Service centres: Alderton, Ekye, Hollesley, Orford, Snape – minor extensions to some villages to meet local needs, within defined physical limits (modest estates, groups or infill)

Local Service centres: Bawdsey, Blaxhall, Butley, Chillesford, Thorpesness, Wenhaston – minor extensions consistent with scale and character groups or infill.

In the following categories only 100 new units in the whole of Suffolk Coastal are thought to be needed up to 2027, with a further 850 anticipated as windfall that could be anywhere in the District.

Other Village: Boyton, Farnham, Sudbourne – very limited development, infill to meet evidenced local needs and possibly small scale developments within or abutting existing villages in accordance with the Community Right to Build or in line with Village Plans or other clearly locally defined needs with local support.

Countryside: Gedgrave, Iken, Wantisden – No development other than in special circumstances, infilling in clusters well related to sustainable settlements.

In terms of tourism development the SCDC Core Strategy for the Suffolk Coast and Heaths AONB (SP8) is for development in the form of conversions, improvements/minor extensions to existing facilities and small scale new development in unexposed areas within sustainable locations where a landscape assessment shows these could be accommodated with no adverse impact.

The nearest major residential development allocation (of 2,320) is in East Ipswich (mainly at Adastral Park). This is likely to put pressure on the River Deben in particular for recreational activities but will also increase visitors to the Plan area due to the proximity of the A12 as the site is only 30 minutes drive from Snape Maltings.

East Anglia ONE is the first phase of development of the East Anglia Array, a windfarm located some 43km off the Suffolk coast. It is a 1.2GW windfarm and as such is considered a Nationally Significant Infrastructure Project (NSIP). It received consent from the Department for Energy and Climate change on 17th June 2014 with construction programmed to begin in 2016 and last for 2 years. Electricity transmission cables will come ashore at Bawdsey and the 240 wind turbines will be located off the Orford Ness spit as shown on the [linked map](#). An HRA and

Environmental Impact report has been prepared and the Ecological Management Plan recognises that the landfall at Bawdsey needs to avoid impact to a UK and Suffolk BAP priority habitat that is part of the Suffolk Shingle Beaches County Wildlife site during construction. This is to be achieved by avoiding the main areas of vegetated shingle which is of greatest value with full reinstatement of the general shingle profile (Scottishpower Renewables, 2012).

Future Trends

The Office for National Statistics (ONS) projections anticipates net inward migration will continue to contribute to Suffolk's population growth. In the Plan area there is likely to be pressure from people seeking to retire into the area, with time to volunteer to help look after the environment and with a respect for it. The level of growth planned for in settlements in the Alde and Ore area is relatively low and hence although there are policies in place requiring 1 in 3 homes to be affordable, there is likely to be limited affordable housing available for young people/first time buyers. The Plan policy of allowing enabling development could help provide more affordable housing than otherwise anticipated.

This growth may increase pressure on the floodplain and encourage unsuitable development within the floodplain. Suffolk Coastal District Council, through the application of the NPPF Sequential Test, their Local Plan, and use of their Strategic Flood Risk Assessment, should steer development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding.

The Marine and Coastal Access Act 2009 provides for the creation of a National Coastal Trail. Work on this has started in Norfolk but plans are yet to be developed for Suffolk.

The biggest social challenge to the Estuary Plan is going to be from increasing visitor numbers. Population in Suffolk is projected to increase by 11.6% (85,000) between 2012 and 2034 with over one third of this growth being in Ipswich and Suffolk Coastal, on the doorstep of the Alde and Ore. This is likely to put pressure on the key attractions at Snape, Orford and Aldeburgh, exacerbating parking issues, whilst the more remote areas are likely to be sought out by the active retired.

ENVIRONMENTAL ISSUES

Key Issues

- There is a range of international and national designated habitats and species (largely located below mean high water within the Alde and Ore Estuary which are dependent on the dynamic coastal and estuarine processes that maintain a habitat mosaic of intertidal mudflats and saltmarsh. The Alde-Ore Estuary SSSI is in a marginally favourable condition but there are concerns over the loss or degradation of saltmarsh habitats as a result of the process of 'coastal squeeze', where saltmarsh is affected by rising sea levels and beach activities causing disturbance.
- Many of the habitats and species present within the Study Area are protected under national legislation or are the subject of a number of UK and Suffolk Local Biodiversity Action Plans.
- The Study Area lies within the Suffolk Coast and Heaths AONB and forms the Suffolk Heritage Coast.
- Climate change, in particular sea level rise, is likely to lead to increased risk of flooding. Sea level rise may cause changes in intertidal zone structure to habitats such as mudflats and saltmarsh, potentially causing effects on species that they support. Avocets, Marsh Harriers and Redshanks are noted to be under particular pressure in the

Natural England Site Improvement Plan, as are Lesser black-backed gulls due to the flooding of Lantern Marshes.

- Disturbance is one of the greatest threats to the estuary's value as an ecological asset. The need for a plan to improve users of the estuary awareness is recognised as is the need to monitor the levels and impact of military and civilian aircraft flying over the area and development of Sizewell C nuclear power station.
- There is concern that the aerial deposits of nitrogen may exceed the site critical load (20-30kg N ha⁻¹yr⁻¹) above which the diversity of saltmarsh vegetation begins to be altered (possibly to reed).
- There have been a number of attempts to quantify change in the extent of active saltmarsh with the estuary based on the analysis of aerial photographs but different techniques have been used so the findings are unclear.
- Orford Ness is one of the biggest vegetated shingle features in Britain and the finest pure shingle spit in Europe extending for 16km. Much of it being in private ownership or owned by SWT and the National Trust access is carefully controlled and it is largely in a favourable condition.
- There is 1600Ha of lowland heath in the Plan protected by SSSI and SPA designations and sympathetic land management. The main threat to internationally important habitat is now neglect, lack of management and encroachment by trees, development, recreation, fires and run off from agricultural land.
- Grazing marshes at Sudbourne and Boyton are particularly important for the numbers of breeding waders they support although the floodplain grazing marshes are considered poor habitat by SWT being a monoculture of short, species poor overgrazed grassland with a low water table. The only herb rich grazing is at Snape and Stanny Farm is identified as an important scrub habitat.
- The Plan study area includes species and habitats dependent on dynamic coast and estuary processes, whilst in other places species and habitats are dependent on more stable freshwater conditions.
- Maintaining and improving the integrity and conservation value of internationally and nationally designated nature conservation sites including the Alde, Ore and Butley Estuaries Special Area of Conservation (SAC), Orfordness-Shingle Street SAC, Alde-Ore Estuary Ramsar and Special Protection Area (SPA) and Sandlings Forest SPA.
- Maintaining and improving the integrity and conservation value of BAP habitats and wildlife sites of regional and local value.
- Protecting and maintaining viable populations of protected species and BAP species whose habitats may be hydrologically linked to coast and estuaries.

This Section highlights statutory and non-statutory nature conservation designations within the Plan study area and considers the biodiversity associated with these protected areas. The Habitats Regulations Assessment, being completed for this Plan, will consider areas that are adjacent to or within the wider area that could potentially be affected.

International Nature Conservation Areas

In terms of international designations in the study area there are two Special Areas of Conservation (SACs), the Alde-Ore Ramsar site and two Special protection Areas (SPAs). Inclusion of the parish of Bawdsey in the plan area means that a small part of the Deben Estuary SPA also falls within the Study Area although works in this plan are not intending to impact the Deben foreshore. Hence brief details of the international designations for the Deben Estuary are included below, for the Deben Estuary SPA/Ramsar.

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

The Alde, Ore and Butley Estuaries SAC was designated on 1 April 2005 (See Figure 12). The SAC is located immediately adjacent to the Orford Ness - Shingle Street SAC. The three qualifying features are:

- a) Estuaries - primary Annex 1 habitat
- b) Mudflats and sandflats not covered by seawater at low tide - in the upper region of the River Alde there are extensive intertidal mudflats and saltmarsh, through which the estuary meanders. Species found in this part of the estuary include the variable salinity bivalves *Macoma balthica* (baltic macoma) and estuarine *Manayunkia aestuarina* (fanworm).
- c) Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) - pioneer communities along the River Ore include annual salt tolerant plants *Salicornia* (genus of succulent plant) and *Suaeda maritima* (a salt tolerant Halophyte).

The Alde, Ore and Butley estuaries have been designated as an entire unit including the water column which has been included because of its importance not only in the biological functioning of the system, but also as the means by which sediment is mobilised and transported. The key features for the Alde and Ore estuaries are mudflats, sandflats, lagoons (including saltwork basins) (70%), saltmarshes, salt pastures, salt steppes (25%), shingle, sea cliffs, and islets (5%).

The conservation objectives for this SAC (Natural England Site code [UK0030076](#), June 2014)) is, subject to natural change,

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of qualifying natural habitats**
- **The structure and function (including typical species) of qualifying natural habitats, and**
- **The supporting processes on which qualifying natural habitats rely**

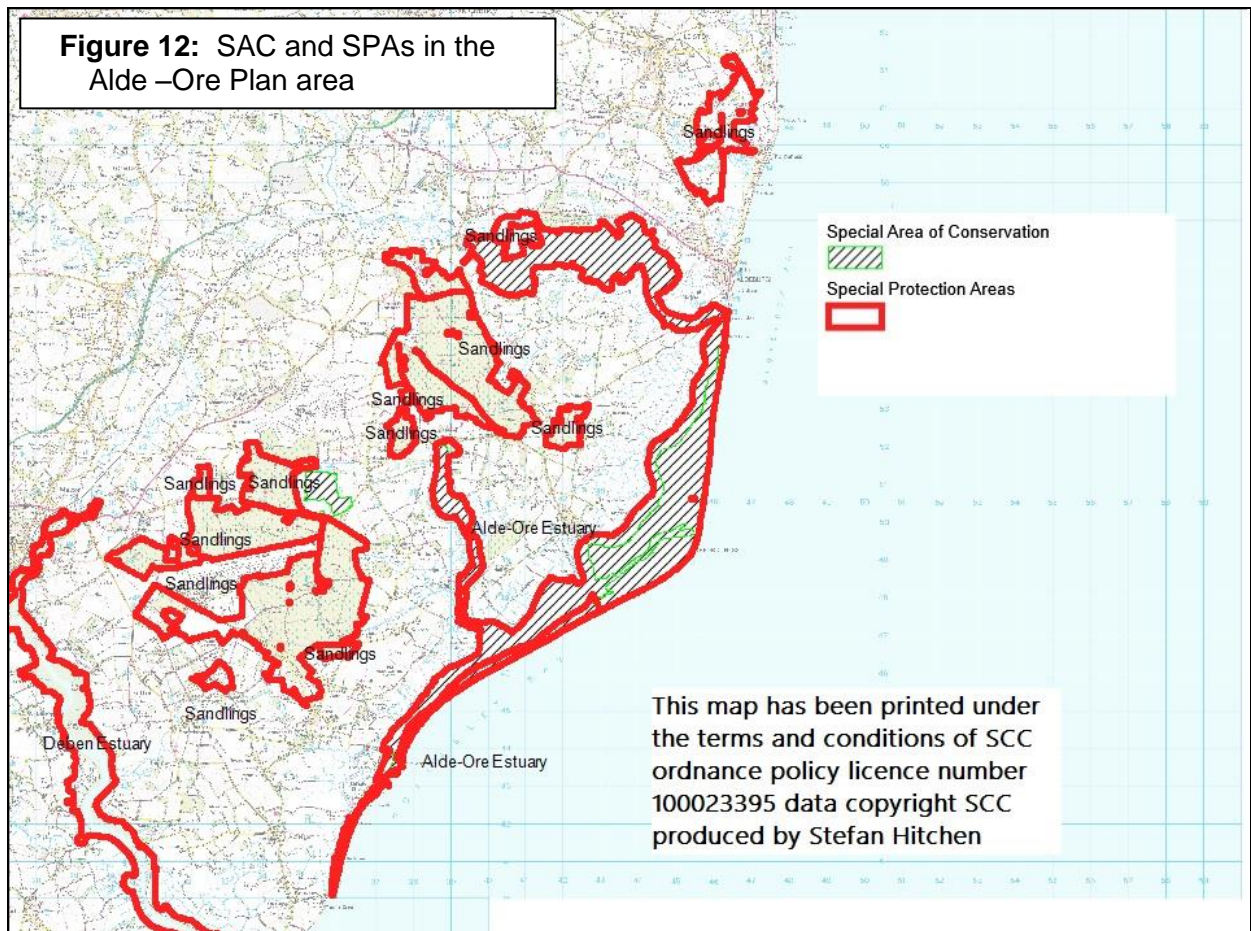
Orford Ness-Shingle Street SAC

The Orford Ness-Shingle Street SAC was notified on 1 April 2005. Orford Ness is an extensive shingle spit some 15km in length and is one of two sites selected to represent the habitat type on the east coast of England. Its extent is shown in Figure 12 outlined in green.

The three qualifying features are:

- (a) Coastal lagoons (Annex I priority habitat) - One of the best areas of coastal lagoon habitat in the UK.
- (b) Annual vegetation of drift lines - This is one of only four outstanding localities in the UK where annual vegetation of drift lines occurs (total extent in the UK is less than 100ha). Drift line vegetation occurs on the sheltered, western side of the spit, at the transition from shingle to saltmarsh. The driftline floral community is widespread on the site and comprises *Beta vulgaris* (sea beet) and *Atriplex* spp (various orache) in a strip 2-5m wide.
- (c) Perennial vegetation of stony banks (coastal shingle vegetation outside the reach of waves) - one of the best areas in the UK for perennial vegetation of stony banks. The southern end of the spit has a particularly fine series of undisturbed ridges, with zonation of communities determined by the ridge pattern.

The Conservation objectives for this SAC are the same as for the Alde – Ore and Butley estuary above. ([UK0014780, June 2014](#)).



Alde-Ore Estuary Special Protection Area (SPA)

Orford Ness and Havergate Island were originally designated as an SPA in 1982. This was superseded in 1998 by the Alde-Ore Estuary SPA designation which covers a larger area of the estuary (2,417ha) reflecting the ornithological interest of the area. The legal citation for the Alde –Ore Estuary SPA (1996) states that the site qualifies under Article 4.1 of the European Community Birds Directive by sustaining nationally important numbers of Annex 1 species. The site also qualifies under Article 4.2 for regularly supporting internationally important numbers of migratory species. A review of SPA accounts was undertaken by the JNCC in 2001 (known as the SPA Review), and a revised site account was produced. However, this most recent revision has not yet been adopted by UK Government.

The citation notes that the area is vulnerable to sea level rise and coastal squeeze.

The European Site Conservation objectives for the Alde –Ore SPA ([Site code UK9009112](#))

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**

➤ **The distribution of the qualifying features within the site.**

The qualifying features are:

A081 *Circus aeruginosus*; Eurasian marsh harrier (Breeding) 1.9% of GB breeding population

A132 *Recurvirostra avosetta*; Pied avocet (Non-breeding) 60.3% of GB population

A132 *Recurvirostra avosetta*; Pied avocet (Breeding) 23.1% of GB breeding population

A151 *Philomachus pugnax*; Ruff (Non-breeding) 0.4% of GB population

A162 *Tringa totanus*; Common redshank (Non-breeding) 1.1% of the population

A183 *Larus fuscus*; Lesser black-backed gull (Breeding) 11.3% of GB breeding population

A191 *Sterna sandvicensis*; Sandwich tern (Breeding) 1.2% of GB breeding population

A195 *Sterna albifrons*; Little tern (Breeding) 2% of GB breeding population

[Natura 2000 SPA and SAC data form](#) source of % measure in 1990's.

The SPA is part of the Alde Ore & Butley European Marine Site (EMS).

Sandlings SPA

The Plan study area includes part of the Sandlings Forest SPA which was designated on 21 January 2008. This site qualifies under Article 4.1 of the Birds Directive by supporting nationally important numbers of two Annex 1 species during the breeding season; *Caprimulgus europaeus* (nightjar) and *Lullula arborea* (woodlark). This SPA has the same conservation objectives for these two species as the Alde –Ore SPA above.

Site Improvement Plan for the Alde-Ore Estuaries

Natural England published a [Site Improvement Plan \(SIP\) for the Alde-Ore Estuaries](#) in October 2014. These have been developed for Natura 2000 sites and hence covers the Alde and Ore SPA and SAC. Table 11 below is the plan summary showing 9 priority and issue areas.

Avocets, Marsh Harriers and Redshank are noted to be under particular pressure. The detailed actions included in the plan takes into account the flood wall breaches in December 2013 that flooded Hazelwood Marches and Lantern Marshes south, recognising that this has led to a loss of nesting habitat and saline lagoons. This is a particular issue for breeding avocets so work is to be undertaken to investigate options, monitor breeding numbers and create islands of higher ground within Hazelwood Marshes as part of a restoration/creation of new habitat strategy.

Lesser black –backed gulls are affected by the flooding of Lantern marshes and following further investigation, mitigation may be required for saline lagoon habitat loss. The need for a plan to improve users of the estuary's awareness of its sensitive nature is recognised as is the need to monitor the levels and impact of military and civilian aircraft flying over the area and possible implications of disturbance from the development of Sizewell C nuclear power station. The impact of coastal defence improvements are noted as concerns that needs investigation. The Alde-Ore Plan itself is highlighted as needing to address coastal squeeze issues and include opportunities for mitigation/compensation for any loss of saltmarsh through intertidal habitat creation or adaptive measures. Declines in Lesser black –backed gull (breeding), avocet and Little tern is noted as needing investigation, looking at predation, disturbance and food sources.

Conservation Advice for Marine Protected Areas.

Natural England is producing updated conservation advice for Marine Protected Areas (MPAs) under regulation 35 of the Habitats Regulations 2010 and the Marine and Coastal Access Act 2009.

Conservation advice for MPAs covers the following designations:

- Special Protection Areas (SPA) (including potential sites)
- Special Areas of Conservation (SAC) (including candidate sites)
- Ramsar sites

- Marine Conservation Zones (MCZ)

Sites of Special Scientific Interest (SSSIs) underpin many MPAs, but conservation advice for SSSIs is not provided in the same way. Use Natural England's designated sites system to find out more about SSSI advice under the Wildlife and Countryside Act 1981.

The advice package for each site consists of 3 documents:

- site guide, including site information, site overview and the conservation objectives
- advice on operations, including how an activity can affect a protected feature on the site
- supplementary advice on conserving and restoring site features, including feature descriptions, condition assessment and site-specific information for its designated or qualifying features

Each advice package is site specific and tells you its:

- designated or qualifying features
- habitats and species that they are dependent on and where they occur
- conservation objectives
- minimum targets each feature needs to achieve to meet the conservation objectives
- features which may be sensitive to human activity
- condition of the designated or qualifying features
- evidence-base

You must refer to this advice if you:

- do a Habitats Regulation assessment (HRA) for a plan or project
- provide information for a HRA
- do a MCZ assessment when considering an activity
- respond to specific measures to prevent the deterioration of habitats and significant disturbance of features
- considering the need to put new or additional management measures in place
- carry out any other activity which does not need a licence

The advice package helps you decide whether any planned marine activity will have an impact on the features of a protected marine site.

There are several stages to go through when using the advice to assess if your activity, or one you regulate, is going to damage a site in some way. You should:

- use the site guide to help you determine if your work is in, or near to, the site
- use the advice on operations to determine those pressures your activity causes that could harm the habitat and/or species features of the site
- screen those aspects of your activity into or out of an assessment
- use the conservation objectives and the supplementary advice tables to assess the impacts of your work on the important attributes of each site
- bring this together in an assessment of the overall impacts on the site

To help understand how Natural England will use the information in the conservation advice as part of the assessment process for different MPA types, see the flowcharts for the following MPAs:

- MCZs(PDF, 85.5KB, 1 page)
- SPAs, SACs and Ramsars(PDF, 88.6KB, 1 page)

You may need to apply for a marine licence or consent to undertake certain activities in the marine environment, such as depositing or removing substances or objects at sea. Find out about marine licensing from the Marine Management Organisation.

Advice Packages:

<https://www.gov.uk/government/publications/marine-conservation-advice-for-special-area-of-conservation-alde-ore-and-butley-estuaries-uk0030076>

<https://www.gov.uk/government/publications/marine-conservation-advice-for-special-area-of-conservation-alde-ore-and-butley-estuaries-uk0030076>

Table 11: Site Improvement Plan for Alde-Ore Estuaries (Source: Natural England 2014)

Plan Summary				
<i>This table shows the prioritised issues for the site(s), the features they affect, the proposed measures to address the issues and the delivery bodies whose involvement is required to deliver the measures. The list of delivery bodies will include those who have agreed to the actions as well as those where discussions over their role in delivering the actions is on-going.</i>				
Priority & Issue	Pressure or Threat	Feature(s) affected	Measure	Delivery Bodies
1 Hydrological changes	Pressure	A081(B) Marsh Harrier, A132(B) Avocet, A183(B) Lesser Black-backed Gull, H1130 Estuaries, H1150 Coastal lagoons	Seek alternative habitat provision or habitat enhancement opportunities	National Trust, Natural England, Suffolk Wildlife Trust, Babcocks, Alde & Ore Estuary Partnership
2 Public Access/Disturbance	Pressure	A132(B) Avocet, A132(NB) Avocet, A162(NB) Common redshank, A183(B) Lesser Black-backed Gull, A195(B) Little Tern, H1210 Annual vegetation of drift lines, H1220 Coastal shingle vegetation outside the reach of waves, Waterbird assemblage	Reduce bird disturbance and trampling of shingle vegetation	Eastern Inshore Fisheries Conservation Authority (IFCA), Ministry of Defence (MoD), National Trust, Natural England, RSPB, Suffolk Coast & Heaths AONB, Suffolk Coastal District Council, Suffolk County Council, Suffolk Wildlife Trust, Marine Management Organisation (MMO), British Association for Shooting and Conservation (BASC), Joint Nature Conservation Committee (JNCC), Civil Aviation Authority (CAA), Suffolk Little Tern Group, EDF Energy, Shingle Street residents
3 Inappropriate coastal management	Pressure	H1210 Annual vegetation of drift lines, H1220 Coastal shingle vegetation outside the reach of waves	Seek long term sustainable solutions	Environment Agency, Natural England, Suffolk Coastal District Council, Suffolk County Council, Alde & Ore Estuary Partnership, Bawdsey-Shingle Street Partnership
4 Coastal squeeze	Threat	A132(B) Avocet, A132(NB) Avocet, A162(NB) Common redshank, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, H1330 Atlantic salt meadows, Waterbird assemblage	Ensure there is scope for natural adaptation or intertidal habitat creation to offset the impacts of sea level rise	Environment Agency, National Trust, Natural England, RSPB, Suffolk Coast & Heaths AONB, Suffolk Coastal District Council, Suffolk County Council, Suffolk Wildlife Trust, Crown Estate, Local partnership, Alde & Ore Estuary Partnership, Alde & Ore Association
5 Inappropriate pest control	Pressure	A081(B) Marsh Harrier, A132(B) Avocet, A183(B) Lesser Black-backed Gull, A191(B) Sandwich Tern, A195(B) Little Tern	Ensure adequate protection of nesting birds from predators	National Trust, Natural England, RSPB
6 Changes in species distributions	Threat	A081(B) Marsh Harrier, A132(B) Avocet, A132(NB) Avocet, A183(B) Lesser Black-backed Gull, A191(B) Sandwich Tern, A195(B) Little Tern	Understand population dynamics, and enable boundary flexibility/ better wider habitat provision	National Trust, Natural England, RSPB, Suffolk Coast & Heaths AONB, Suffolk Coastal District Council, Suffolk Wildlife Trust, British Trust for Ornithology (BTO), LIFE+ Little Tern Project, Suffolk Little Tern Group, Shingle Street residents
7 Invasive species	Pressure/Threat	A132(B) Avocet, A132(NB) Avocet, A162(NB) Common redshank, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, H1330 Atlantic salt meadows, Waterbird assemblage	Manage <i>Spartina anglica</i> encroachment	Natural England
8 Air Pollution: impact of atmospheric nitrogen deposition	Pressure	A132(B) Avocet, A132(NB) Avocet, A162(NB) Common redshank, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, H1330 Atlantic salt meadows, Waterbird assemblage	Establish a Site Nitrogen Action Plan	Not yet determined
9 Fisheries: Commercial marine and estuarine	Pressure	A195(B) Little Tern	Revised approach to fisheries management	Eastern Inshore Fisheries Conservation Authority (IFCA), Centre for Environment, Fisheries and Aquaculture Science (Cefas)

There is concern that the aerial deposits of nitrogen may exceed the site critical load (20-30kg N ha-1yr-1) above which the diversity of saltmarsh vegetation begins to be altered (possibly to reed). Many land use practices contribute to this problem locally including outdoor pigs and high nutrient inputs on fields. It is also noted that there are fishing pressures close to shore that may include by catch of juvenile fish and disturbance of fish nursery areas that could potentially impact Little Tern by reducing suitable feeding areas. (Source: [Site Improvement Plan for the Alde-Ore Estuaries](#)).

Alde-Ore Estuary Ramsar Site

The Ramsar designation covers the same area as the Alde and Ore SPA. The site qualifies under criterion 2, 3 and 6 of the Ramsar Convention. Criterion 2 relates to the number of nationally-scarce plant species and British Red Data Book invertebrates. These species and the habitats with which they are associated are listed in Table 12.

Table 12: Species listed under Alde-Ore Estuary Ramsar criterion 2

Species		Associated Habitat (if known)
Latin name	Common name	
Invertebrates		
<i>Nematostella vectensis</i>	Starlet sea anemone	Saline lagoons
<i>Gammarus insensibilis</i>	Lagoon sand shrimp	Saline lagoons
<i>Malacosoma castrensis</i>	Ground lackey	Saltmarsh
<i>Campsicnemus magius</i>	Fancy-legged fly	Mudflat and upper saltmarsh (does not normally occur on tidal parts of saltmarsh).
<i>Cheilosia velutina</i>	Hoverfly	Lowland calcareous grassland
<i>Empis prodomus</i>	Fly	Various
<i>Dixella attica</i>	Miniscus midge	Saltmarsh
<i>Hylaeus euryscapus</i>	Solitary bee	Coastal shingle and sand dunes
<i>Pseudamnicola confusa</i> – now known as <i>Mercuria confusa</i>	Swollen spire snail	Bare mud exposed at low tide beneath emergent vegetation such as <i>Phragmites australis</i> or <i>Glyceria maxima</i> . It requires water with a very low salinity.
<i>Pseudamnicola confusa</i> – now known as <i>Mercuria confusa</i>	Swollen spire snail	Bare mud exposed at low tide beneath emergent vegetation such as <i>Phragmites australis</i> or <i>Glyceria maxima</i> . It requires water with a very low salinity.
<i>Euophrys browningi</i>	Spider (jumping)	Shingle beaches
<i>Baryphyma duffeyi</i>	Money spider	Saltmarsh
<i>Haplodrassus minor</i>	Ground spider	Coastal shingle and sandy beaches with upwash
<i>Trichoncus affinis</i>	Money spider	Coastal / vegetated shingle
Higher Plants		
<i>Althaea officinalis</i>	Marshmallow	Upper saltmarsh
<i>Frankenia laevis</i>	Sea-heath	Upper saltmarsh
<i>Lathyrus japonicus</i>	Sea pea (or Beach pea)	Sand and gravel storm beaches
<i>Lepidium latifolium</i>	Broadleaved pepperweed	Saltmarsh
<i>Medicago minima</i>	Bur meddick	Lowland dry acid grassland
<i>Parapholis incurva</i>	Curved hard-grass	Saltmarsh
<i>Puccinellia fasciculata</i>	Borrer's saltmarsh grass	Saltmarsh
<i>Ruppia cirrhosa</i>	Spiral tasselweed	Saline lagoons
<i>Sarcocornia perennis</i>	Perennial glasswort	Saltmarsh

Species		Associated Habitat (if known)
Latin name	Common name	
<i>Sonchus palustris</i>	Marsh sow-thistle	Saltmarsh
<i>Trifolium suffocatum</i>	Suffocated clover	In turf on shingle beaches, or bare ground, near the coast.
<i>Vicia lutea</i>	Yellow vetch	Shingle
<i>Zostera angustifolia</i>	Narrow-leaved eelgrass	Intertidal mudflats

The Ramsar site also qualifies under criterion 3 for supporting a notable assemblage of breeding and wintering wetland birds. The breeding assemblage comprises populations of:

- *Circus aeruginosus* (marsh harrier)
- *Sterna albifrons* (little tern)
- *Sterna sandvicensis* (sandwich tern).

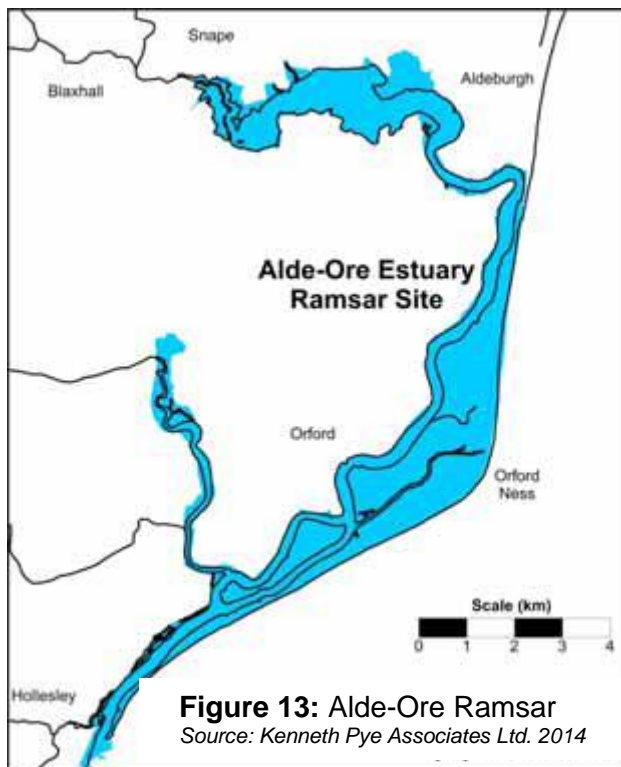


Figure 13: Alde-Ore Ramsar
Source: Kenneth Pye Associates Ltd. 2014

The wintering assemblage (including spring and autumn passage) comprises populations of:

- *Limosa limosa* (black-tailed godwit)
- *Anser albifrons albifrons* (white Fronted goose)
- *Tringa nebularia* (greenshank)
- *Anas acuta* (pintail)
- *Tringa erythropus* (spotted redshank)
- *Tadorna tadorna* (shelduck)
- *Anas clypeata* (shoveler)
- *Anas crecca* (teal)
- *Anas penelope* (wigeon).

The site also qualifies under criterion 6 for supporting species internationally important breeding populations of *Larus fuscus* (lesser black-back gull) and *Larus melanocephalus* (Mediterranean gull) and internationally important wintering populations of *Recurvirostra avosetta* (avocet).

Alde – Ore Estuary European marine site

The Alde-Ore Estuary European marine site comprises a Special Protection Area (Alde-Ore Estuary) and Special Area of Conservation (Orford Ness to Shingle Street) and English Nature's advice (2001) covers the **marine elements** of both the SPA and SAC interests. European marine sites are defined in the Conservation (Natural Habitats &c.) Regulations 1994 as any part of a European site covered (continuously or intermittently) by tidal waters or any part of the sea in or adjacent to Great Britain up to the seaward limit of territorial waters.

The conservation objective for the internationally important populations of **the regularly occurring Annex 1 bird** species, under the Birds Directive is, subject to natural change, maintain the following habitats in favourable condition:

- Shingle areas
- Intertidal mudflats
- Saltmarsh communities

- Shallow coastal waters

The conservation objective for the internationally important populations of regularly occurring **migratory bird** species is subject to natural change, maintain the following habitats in favourable condition:

- Intertidal mudflats
- Saltmarsh communities
- Shallow coastal waters

Numbers of bird species using these respective habitats are given in Table 13.

Table 13: Information on populations of internationally important species of birds under the Birds Directive using the Alde-Ore Estuary European marine site at the time the SPA was classified. Internationally important populations of regularly occurring Annex 1 species.	
Breeding populations	
Species	Population (5 yr mean)
Avocet (<i>Recurvirostra avosetta</i>)	104 birds (1989 - 1993/4)
Sandwich tern (<i>Sterna sandvicensis</i>)	169 pairs (1989 - 1993/4)
Little tern (<i>Sterna albifrons</i>)	155 pairs (1989 - 1993/4)
Wintering populations	
Species	Population (5 yr peak mean for 1989/90 - 1993/94)
Avocet (<i>Recurvirostra avosetta</i>)	749 birds
Ruff (<i>Philomachus pugnax</i>)	12 birds
Internationally important populations of regularly occurring migratory bird species	
Importance	Population (5 yr mean for 1989/90 - 1993/94)
Redshank (<i>Tringa totanus</i>)	1662 birds
Lesser black-backed gull (<i>Larus fuscus graellsii</i>)	8223 birds
SAC interest feature. Conservation objective for annual vegetation of drift lines	
Subject to natural change, maintain the annual vegetation of drift lines in favourable condition	

The favourable condition table for the Alde and Ore European marine site summarises the habitat conditions expected for regularly occurring Annex 1 birds and migrating birds, by habitat type. In summary for Annex 1 species, competent authorities are advised to manage the human activities within their remit such that they do not result in deterioration or significant disturbance to habitats or species for which the site has been selected, through any of the following:

- Physical loss from removal
- Physical damage from abrasion
- Non-physical disturbance through noise and/or visual presence
- Toxic contamination from the introduction of synthetic and/or non-synthetic compounds
- Non-toxic contamination through changes in nutrient and organic loading
- Biological disturbance through the selective extraction of species

For migratory birds

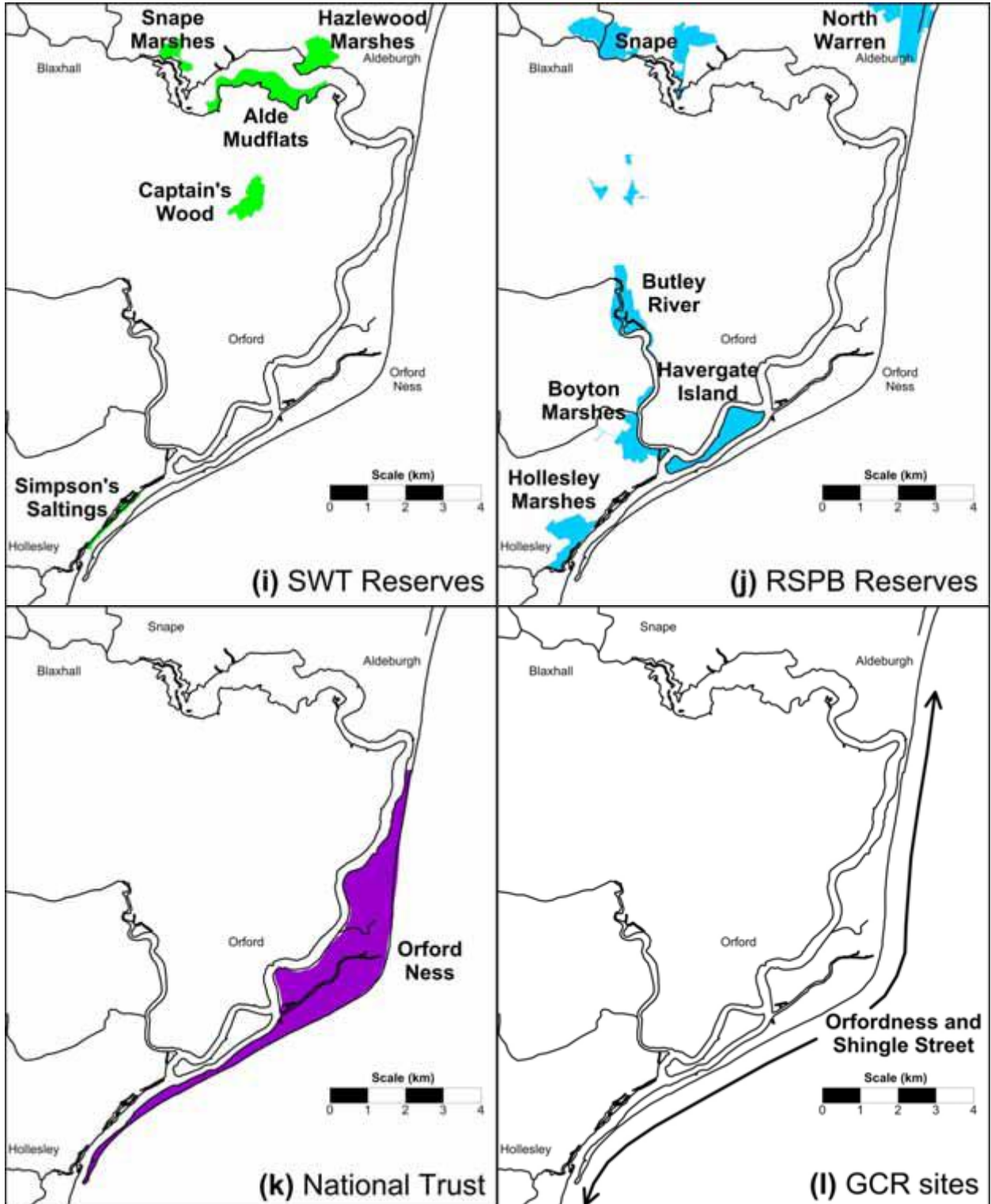
- Physical loss from removal
- Non-physical disturbance through noise and/or visual presence
- Toxic contamination from the introduction of synthetic and non-synthetic compounds
- Non-toxic contamination through changes in nutrient and organic loading

For annual vegetation of drift lines

- Physical loss through removal
- Physical damage resulting from abrasion

- Toxic contamination through the introduction of non-synthetic compounds

Figure 13: Conservation designations in the Alde-Ore Estuary
 (Source: Kenneth Pye Associates Ltd. 2014)



National Conservation Areas

Sites of Special Scientific Interest (SSSI)

There are 22 SSSIs within the Plan study area (Figure 14). Of these, six are water dependent or within close proximity to water courses within the Plan study area. A further eleven are designated due to their geological interest, although some are undergoing mineral extraction as this is not considered likely to damage the special interest of the site as permissions were in place before designation as a SSSI. The Alde-Ore estuary has more SSSIs in favourable condition than the Deben (see Deben Estuary Plan SA, 2014).

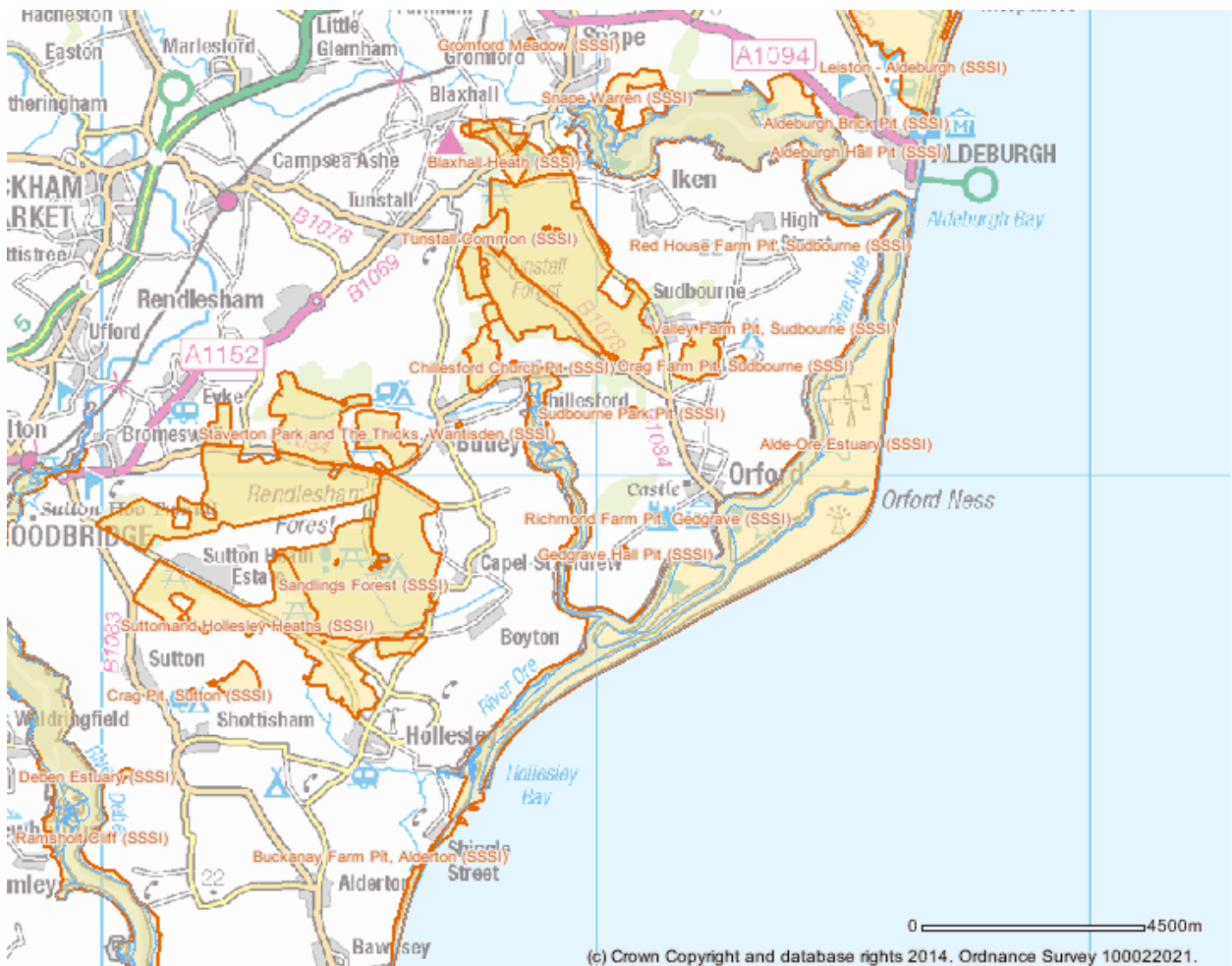
Table 14: SSSIs within the Plan study area and details of their condition

Name	SSSI unit condition (approx. %)	Unfavourable condition reason
Aldeburgh Brick Pit	Unfavourable no change 21 March 2012	Presence of tipping/landfill
Aldeburgh Hall Pit	Favourable 19 March 2012	-
Alde-Ore Estuary	52% favourable, 34% unfavourable recovering. 14% Unfavourable no change March 2014	Coastal squeeze, inappropriate coastal management, beach activities causing disturbance , inappropriate pest control
Bawdsey Cliff	Favourable 4 October 2011	-
Buckanay Farm Pit, Alderton	Favourable Feb 2008	-
Chillesford Church Pit	Favourable 25 Feb 2008	-
Crag Farm Pit, Sudbourne	Favourable 16 June 2014	-
Crag Pit, Aldeburgh	Unfavourable declining 16 Nov 2010	Vegetation, scree and sediment build up
Deben estuary	77% unfavourable declining 23% favourable 2011	Coastal squeeze, loss of saltmarsh
Gedgrave Hall Pit	Favourable 29 Feb 2008	-
Gromford Meadow	Unfavourable recovering 3 July 2012	Target sward height exceeded but may be due to wet summer and increased vegetation growth.
Leiston-Aldeburgh	53% favourable, 45% unfavourable recovering, 2% Unfavourable declining Sept 2010	Public access/ disturbance, encroachment
Neutral Farm Pit, Butley	Unfavourable – declining June 2014	Geological pit obstructed by build up of scrub/vegetation and talus over exposures.
Red House Farm Pit, Sudbourne	Favourable June 2014	-
Richmond Farm Pit, Gedgrave	Favourable February 2008	-
Round Hill Pit, Aldeburgh	Favourable June 2014	-

Name	SSSI unit condition (approx. %)	Unfavourable condition reason
Sandlings Forest	Unfavourable recovering Dec 2010	Decline in woodlark and nightjar since notification.
Snape Warren	Unfavourable recovering July 2013	Designated for dwarf scrub heath failed on abundance of bracken and birch scrub
Staverton Park & The Thicks, Wantisden	74%Favourable, 26% unfavourable no change Sept 2011	Acute oak dieback found in a number of trees plus deer browsing and dense bracken.
Sudbourne Park Pit	Unfavourable – declining June 2014	Coralline Crag obstructed by build up of scrub/vegetation and talus over exposures.
Tunstall Common	Unfavourable recovering May 2014	Neglected heath showing signs of recovery
Valley Farm Pit, Sudbourne	Favourable July 2011	-

Source: [Natural England February 2015](#)

Figure 14: Alde-Ore Estuary Sites of Special Scientific Interest (SSSI)



The Alde-Ore Estuary SSSI is a key designation covering the whole estuary, stretching along the coast, from Bawdsey to Aldeburgh and inland to Snape, covering Orford Ness, Shingle Street, Havergate Island and Butley, and the Alde-Ore rivers and includes the Orford Ness-Havergate NNR (part of which is also a SPA). It has 35 units covering Littoral sediment, Neutral grassland lowland, Supralittoral sediment (shingle areas all in unfavourable condition), earth heritage, fen, marsh and swamp lowland.

Because of the importance of the site, a number of Potentially Damaging Operations are prohibited on the site without the express and formal Assent of Natural England. These include, for example, restrictions on any coast protection works, cultivation, stock practices, use of pesticides and fertilisers.

English Nature's [2005 Management Statement](#) for the Alde-Ore SSSI covers:

Estuaries – noting in the absence of constraints such as flood banks and hard defences, the estuary would adjust to sea level rise by inland translocation of intertidal habitats. Where constraints occur, space to accommodate greater volumes of water is compressed and the extent and quality of intertidal habitats declines. The maintenance of high quality estuarine habitats such as saltmarshes and mudflats is essential if the associated plant and animal communities are to be maintained.

Coastal Saltmarsh - the aim of will be to create a short turf that can be attractive to over-wintering wildfowl, with a reduction in stock density in the early summer for the benefit of ground-nesting birds. Where there has not been a history of grazing, the saltmarsh will be able to maintain itself and grazing-sensitive species are likely to be present, therefore grazing should not be introduced.

Littoral sediments (mud and sand flats) Management needs to create space to enable landward roll-back to take place in response to sea-level rise, and should also allow the system to be dynamic and retain the flexibility to respond to associated changes such as the movement of physical features within the system, e.g. migrating subtidal sandbanks.

Orfordness and Shingle Street geomorphology Active management of these sites is often only necessary if human activities have affected the natural processes. For example, management may involve removal of man-made barriers which restrict the natural movement of geological features, clearance of rubbish or planted trees.

Vegetated shingle – Manage access and prevent scrub encroachment

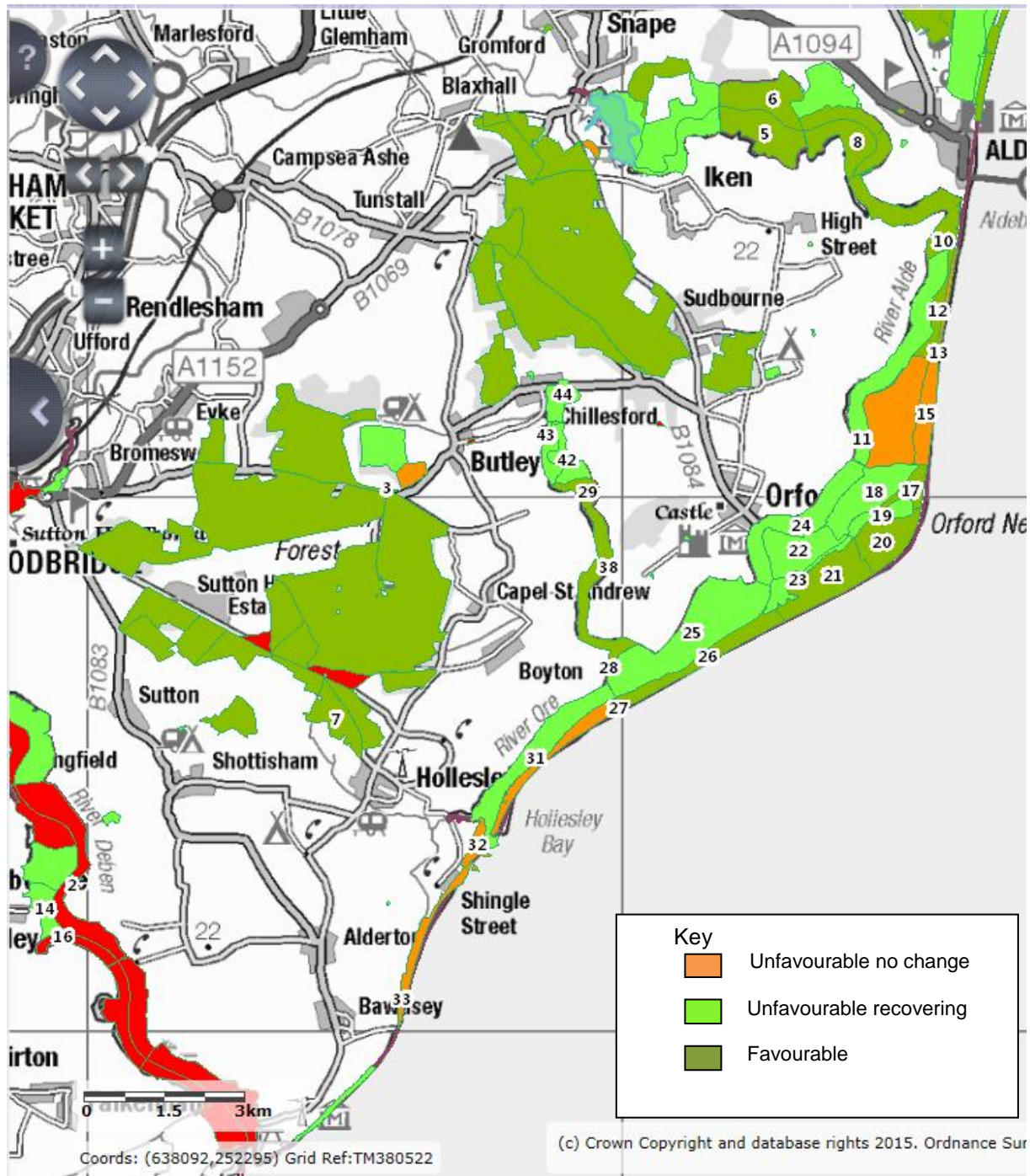
Coastal Lagoons – maintain salinity and water depths

Coastal Cliffs and Foreshore (Gedgrave Cliff) - Clearance of vegetation or rock debris

All Habitats – avoid inorganic fertilizers and pesticides and control access and recreational activities.

Hazelwood Marshes is part of the Alde-Ore Estuary SPA and SAC and is also designated as a Site of Special Scientific Interest (SSSI). It was noted as one of only a few sites that had freshwater characteristics (the other being King's Marshes and Lantern Marshes on Orford Ness) and important for breeding wading birds and wintering wildfowl. However, the marshes were flooded during the storm surge of 2013 and have now changed to intertidal habitat (see page 38). The SSSI designation for Alde-Ore Estuary (1992) notes "Several nationally rare and scarce insects are found within ditches running through Hazelwood Marshes." The modelling work for options on future management warns that over time the salinity of the soil and groundwater in the area will increase which could have implications for insects, illustrating the importance of the Habitats Assessment currently being undertaken. It is too early to say if any revisions/updates of any designations will be justified but it serves to warn that possibly some of the unique quality of Hazelwood Marsh has been lost, making it more important to safeguard King's Marshes and Lantern Marshes on Orford Ness. (N.B. Lantern Marshes on Orfordness were also breached on the storm surge, but the walls have not yet been repaired.)

Figure 15: Map of SSSI (Site of Special Scientific Interest) Condition



RSPB Nature reserves

There are two RSPB reserves within the Plan study area:

- *Havergate Reserves* – breeding avocets and various terns throughout spring and summer (at Havergate Island) and breeding waders in spring and wildfowl in winter (Boyton Marshes, Hollesley Marshes and Butley River);

- *North Warren* – *Sylvia undata* (Dartford warbler) and woodlark can be seen on the lowland heathland. Bittern and marsh harrier can be seen in the reedbeds. The site also supports *Anser fabalis* (bean goose) in winter.

Regional and Local Nature Conservation Designations

A Local Nature Reserve (LNR) is a statutory designation made by principal local authorities under section 21 of the *National Parks and Access to the Countryside Act 1949*. Local Nature Reserves are places with wildlife or geological features that are of special interest locally. The Haven is the only LNR within the Plan study area and covers an area of approximately 20ha to the north of Aldeburgh, located within the boundary of Leiston-Aldeburgh SSSI. It was designated in 1994 for its important communities of wild flowers growing on the shingle beach and marsh edge including *Glaucium flavum* (Yellow-horned Poppy) and *Crambe Maritima* (Sea Kale).

County Wildlife Sites (CWS) are places considered to be especially important for their wildlife in a county context and support characteristic or threatened species or habitats included in Local or National Biodiversity Action Plans. They are designated according to selection criteria. The Suffolk CWS panel, made up of representatives from Suffolk County Council, Suffolk Biological Records Centre (SBRC), Suffolk Wildlife Trust and Natural England, meets to assess and designate CWS using the Suffolk CWS criteria. SBRC maintain a register that includes CWS locations, boundaries and key features. Sites can be private or publicly owned but the majority are privately owned and do not have public access. Although notification is not statutory, it creates a partnership between landowners and conservation agencies by recognising the wildlife value of a site.

CWS are recognised by national planning policy (National Planning Policy Statement (NPPF)) as having a fundamental role to play in meeting overall national biodiversity targets. CWS are not protected by legislation but their importance is recognised by local authorities when considering planning applications. Under current planning policy there is a presumption against granting permission for development that would have an adverse impact on a CWS. This has been strengthened by the provisions of the Natural Environment and Rural Communities Act 2006 that require all public bodies to have regard for the conservation of biodiversity. There are 30 County Wildlife Sites (CWS), within the Plan study area (Figure 17) covering over 3000 ha, and these are detailed in Table 16.

Biodiversity Action Plan (BAP) Habitats

The Convention on Biological Diversity, in 1993 was the start of BAPs and launched the Biodiversity: the UK Action Plan in 1994 and creation of the UK Biodiversity Steering Group to implement the UK BAP, which published Biodiversity: the UK Steering Group Report – meeting the Rio challenge (UK Biodiversity Steering Group, 1995). From this initial list, national Habitat Action Plans (HAPs) and Species Action Plans (SAPs) for priority habitats and species were published and action was also taken at a local level to create Local Biodiversity Action Plans (LBAPs) for habitats and species. BAP habitats are deemed to be of national importance and their conservation is considered a priority within the UK BAP. Suffolk supports several of these priority habitats with the majority being associated with the existing designated nature conservation sites. The Suffolk local BAP includes action plans for the following priority habitats which are present within the Plan study area:

- coastal and floodplain grazing marsh
- coastal sand dunes
- coastal vegetated shingle
- maritime cliffs and slopes

- mudflats
- reedbeds
- saline lagoons
- saltmarsh
- seagrass beds
- lowland heath

A new European Union LIFE funded project has been set-up to sustain and enhance the habitats and species at Orford Ness and Havergate Island (RSPB, 2011). The project will be monitored and the effects of the project work on the birds, habitats and species will be evaluated. This information will be used to develop future site management plans.

The main implications to biodiversity in the Aldeburgh region are identified in Habitat Action Plans (HAPs), which have been written for the habitats identified in the Suffolk local BAP. The SEA considers the main factors affecting these habitats to include:

- sea level rise and climate change;
- recreational pressures including erosion of saltmarsh, sand dunes and coastal vegetated shingle through excessive pedestrian use;
- developmental pressures;
- deteriorating water quality as a result of discharges from agriculture, industry and urban areas;
- changing water levels associated with drainage, impoundment and abstraction;
- lack of appropriate management;
- threat to species in certain habitats from both drying out and flooding;
- spread of invasive non-native species.

Figure 16: County Wildlife Sites in the Alde and Ore Estuary Plan area

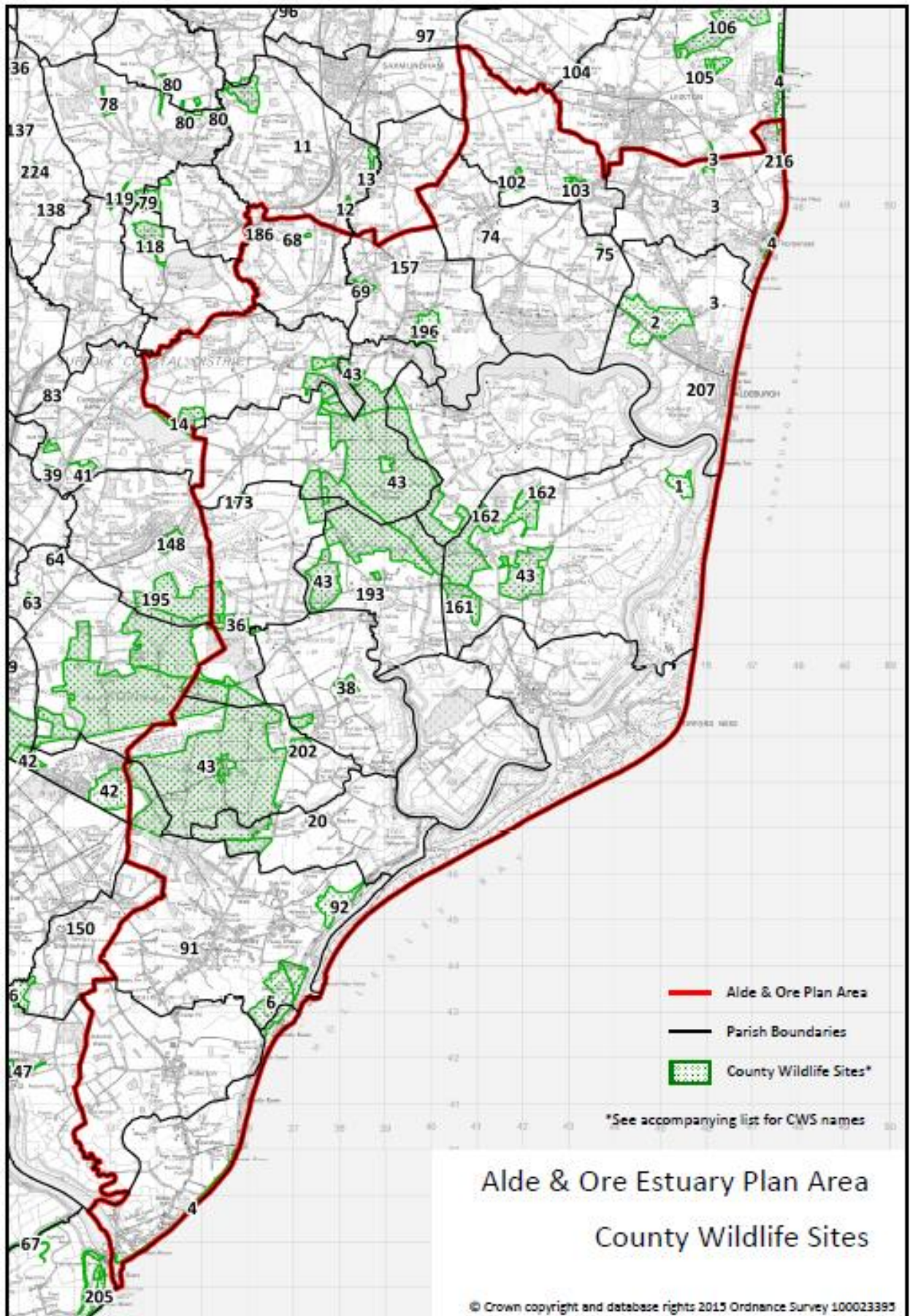


Table 15: County Wildlife Sites in Alde-Ore Estuary Plan area
(Source: Suffolk County Council)

Site No.	CWC site name	Description	Parish	Area Ha.
1	Ferry Farm, Marshes	Wetland mosaic and ornithological interest	Sudborne	18.98
2	Aldeburgh Golf Course	Habitat mosaic	Aldeburgh	88.79
3	Aldringham to Aldeburgh Disused Railway Line	Species-rich grassland	Aldringham-cum-Thorpe	0.86
3	Aldringham to Aldeburgh Disused Railway Line	Species-rich grassland	Aldringham-cum-Thorpe	0.36
4	Suffolk Shingle Beaches	Vegetated shingle	Bawdsey	12.81
4	Suffolk Shingle Beaches	Vegetated shingle	Aldringham cum Thorpe	4.82
6	Oxley Marshes & River Ore intertidal area	Habitat mosaic	HOLLESLEY	92.89
14	Long Grove	Ancient woodland	Blaxhall	28.84
20	Boyton Wood	Ancient woodland	Boyton	2.56
36	Staverton Lake, Marshes and Alder Carr	Wetland mosaic	Staverton	21.77
37	Water Wood	Ancient woodland	Butley	10.91
38	Carmen's wood	Ancient woodland	Butley	11.73
43	Aldewood Forest (Tunstall Forest)	Ornithological interest and habitat mosaic	Sudbourne	80.76
43	Aldewood Forest (Tunstall Forest)	Ornithological interest and habitat mosaic	Tunstall	908.57
43	Aldewood Forest (Tunstall Forest)	Ornithological interest and habitat mosaic	Tunstall	28.59
43	Aldewood Forest (Rendlesham Forest)	Ornithological interest and habitat mosaic	Capel St Andrew	1463.79
43	Aldewood Forest (Tunstall Forest)	Ornithological interest and habitat mosaic	Chillesford	62.27
44	Kiln Wood	Ancient woodland	Chillesford	2.15
68	Foxburrow Wood	Ancient woodland	Farnham	4.38
69	River Fromus Marshes	Habitat mosaic	Farnham	7.85
74	Knodishall Whin	Habitat mosaic	Friston	1.95
75	Great Wood	Ancient woodland	Friston	5.87
91	Black Ditch Meadows	Species-rich grassland	Hollesley	0.81
92	Cauldwell Hall Farm Marsh	Ornithological interest	Hollesley	35.13
102	Grove Wood	Ancient woodland	Knodishall	10.17
103	Knodishall Common	Acid grassland	Knodishall	10.75
103	Knodishall Common	Acid grassland	Knodishall	0.65
157	Church Common	Heathland mosaic	SNAPE	2.17
161	Watling and Oakyard Woods	Ancient woodland	Sudbourne	30.27
162	Captain's & Sudbourne Great Woods	Ancient woodland	SUDBOURNE	48.21
162	Captain's & Sudbourne Great Woods (Captain's Wood)	Ancient woodland	SUDBOURNE	5.28
173	Dogger's Grove	Ancient woodland	WANTISDEN	2.88
186	Farnham Churchyard	Species-rich grassland	FARNHAM	0.38
193	Chillesford Marsh	Wet species-rich grassland	CHILLESFORD	0.46
196	Snape Marshes	Habitat mosaic	SNAPE	30.01
202	Oak Wood	Ancient woodland	Capel St Andrew	18.08
207	Aldeburgh Old Allotments	Habitat mosaic	Aldeburgh	0.5
216	Dower House	Acid grassland	Aldringham cum Thorpe	2.13
			Total HA.	3059.38

Table 16: Protected BAP species within the Plan study area

Common name	Latin name
Mammals	
European water vole	<i>Arvicola amphibious</i>
European otter	<i>Lutra lutra</i>
Hazel dormouse	<i>Muscardinus avellanarius</i>
Eurasian water shrew	<i>Neomys fodiens</i>
Pipistrelle bat	<i>Pipistrellus pipistrellus</i>
Water vole	
Common porpoise	<i>Phocoena phocoena</i>
Reptiles	
Adder	<i>Vipera berus</i>
Grass snake	<i>Natrix natrix</i>

Common name	Latin name
Slow-worm	<i>Anguis fragilis</i>
Viviparous lizard	<i>Zootoca vivipara</i>
Amphibians	
Common toad	<i>Bufo bufo</i>
Invertebrates	
Stag beetle	<i>Lucanus cervus</i>
Starlet Sea Anemone	<i>Nematostella vectensis</i>

Habitats

An ecological assessment of the hinterland for the Alde and Ore Estuaries was undertaken by the Suffolk Wildlife trust in 2012. The purpose of the study was to evaluate the ecological features of the interest and the value of the Alde and Ore Estuaries for wildfowl and wading birds, otter and water vole. The field work was done in two phases: during the winter of 2010/11 and spring and summer 2011 when work focused on breeding birds, water vole, otter and other BAP species recorded in incidental sightings. Use was also made of desktop data to complement the survey work. This remains as one of the most up to date and comprehensive surveys of species and habitats and hence is the source of data for the following descriptions of habitats in the Alde-Ore plan area and describe the area before the flooding of Hazelwood marsh.

Grazing Marshes

All the grazing marshes on the Alde/Ore and Butley estuaries are within the floodplain and are derived from the enclosure of saltmarsh. Grazing marsh is defined as periodically inundated pasture or meadow, with ditches that are often old creek lines containing brackish (seepage from sea walls) or fresh water. All the areas are grazed and some are cut for hay. Some areas contain seasonal water-filled scrapes and permanent water bodies with emergent swamp communities.

These grazing marsh areas also provide safe roosting sites for nationally important populations of wintering waterbirds and feeding areas for species such as teal, wigeon and geese.

The grazing marshes at Hazelwood, Sudbourne and Boyton Marshes are particularly important for the numbers of breeding waders they support such as redshank, lapwing and avocet. However, the majority of the flood plain grazing marshes are poor habitat for wildlife and are in general, a monoculture of short, species poor over-grazed grassland. The only herb rich grazing marsh is at Snape (SWT, 2012).

The grazing marshes at Sudbourne, Boyton and Iken, and those at King's Marshes on Orfordness are particularly important for the number of breeding waders they support such as redshank, lapwing and avocet. Hazelwood marshes in the upper estuary were also important for breeding waders but these were flooded during the storm surge of 2013, and are now developing as intertidal habitat (see page 38). Lantern Marshes on Orfordness which supported breeding waders were also flooded in 2013, and to date the walls have not been repaired.



Saltmarsh

Salt marshes the vegetated portions on the upper shore of Intertidal mudflats are the most significant habitat within the Alde/Ore and Butley estuaries and are internationally and nationally important for waterbirds. The botanical interests of these areas are rich and include the rare intertidal flowering plant *Zostera angustifolia*. The narrow fringes of saltmarsh are mostly dominated by sea purslane *Halimione portulacoides* and sea lavender *Limonium vulgare*, but a wide range of other saltmarsh species also occur, including sea-heath *Frankenia laevis*, glasswort *Salicornia pusilla*, small cord-grass *Spartina maritima* and Borrer's saltmarsh grass *Puccinellia fasciculata* (SWT, 2012).

The embankments around the estuary have been overtopped and breached by storms on many occasions in the past, but most have been re-built and improved. The storm surge of 31st January – 1st February 1953 created numerous breaches and caused extensive flooding around the estuary, but most of the land was subsequently drained and the walls re-built. Exceptions where no repairs were made, or subsequently failed, occur mainly between Iken and Snape in the upper estuary and around Barthorpe Creek in the lower estuary.

The wall around Lantern Upper Marsh was deliberately breached by the National Trust in 1999 to encourage regeneration of saltmarsh behind one of the narrowest parts of the Orford spit (Warrington et al, 2013). In the same year the RSPB also created an area of mudflat and active saltmarsh by breaching part of the wall on Havergate Island. Areas of regulated tidal exchange have also been established on Havergate Island by the RSPB, and at Airfield and King's Marshes on Orford Ness by National Trust, to create and maintain saline and brackish lagoons for the bird interest.

There have been a number of attempts to quantify change in the extent of active saltmarsh within the estuary, based on analysis of aerial photographs. A study by the University of Newcastle (Cooper & Cooper, 2000; Cooper et al., 2001) identified 254 ha of saltmarsh within the Alde & Ore and suggested a loss of 3.9 ha (3%) between 1971 and 1998, although apparent change of this magnitude lies within the measurement error of the analysis techniques used. A more recent assessment by Phelan et al. (2011), based on analysis of 2006-09 aerial photography, suggested an area of saltmarsh within the Alde & Ore Water Framework Body of 424.4 ha. This illustrates the difficulty of identifying change in the extent of habits and morphological features through studies which specify different boundaries and use different analysis techniques. (Source: Kenneth Pye Associates Ltd. 2014)

Where there are hard sea/river defences, climate change, sea level rise and natural change (storm surges and changes in estuary channel formation) cause 'coastal squeeze'. The salt marshes effectively become 'trapped' between the hard defence and the rising water level or eroding channel.

Maritime cliffs and slopes (BAP, 2003)

Maritime cliffs and slopes are defined as sloping to vertical faces on the coastline where breaks in the slopes may be formed by slippage and/or coastal erosion. Maritime cliffs can either be soft or hard but in Suffolk there are only soft cliffs and slopes.

In Suffolk there are approximately 44 km of maritime cliffs and slopes and around 20% of these have cliff-tops comprising agricultural land. Semi-natural habitat, principally scrub, woodland and more rarely heathland and acid grassland occurs on around 40% and the remainder is almost exclusively developed, either within or close to built up areas.

The steeper cliffs, where slippages and erosion frequently occur, provide important breeding sites for sand martins (*Riparia riparia*) and the unusual combination of friable soils, hot, dry substrates and open conditions is able to support invertebrates which occur rarely elsewhere.

Cliffs are found at Bawdsey in this study area and are designated SSSIs. Bawdsey Cliffs provide over 2km of section in the Butleyan division of the Early Pleistocene Red Crag and are of great geological interest and potential for studies of non-glacial Pleistocene environments. Natural and recreational erosion are the most significant threats to the habitat although they are currently in a favourable condition as they are predominantly not actively eroding because a natural shingle beach protects them from the sea (SSSI report 2011).

Mudflats

Mudflats are sedimentary intertidal habitats found in estuaries. The sediments generally consist of silts and clays with a high organic content. Mudflats frequently occur as part of the natural sequence of habitats between the sublittoral zone and vegetated saltmarshes. Like most other intertidal areas they dissipate wave energy and have an important role to play in reducing the risk of erosion damage to saltmarshes and coastal defences, and of tidal flooding in low-lying coastal areas.

Mudflats are typically highly productive habitats supporting a high biomass but relatively low species diversity with few rare species. Mudflats are very important habitats that support huge numbers of birds and fish. They provide both feeding and resting areas for internationally important populations of waders and waterfowl and also act as nursery areas for flatfish.

There are 541 ha of mudflat in the Alde and Ore estuary, 15% of the Suffolk total. Suffolk has 5323Ha, 1.3% of the national resource. Sea level rise is the main threat to mudflats in the Alde and Ore and many of the SSSI littoral sediment units in the Alde –Ore SSSI are in unfavourable but recovering condition. They are recovering as other threats such as discharges from agriculture, fishing and bait digging, human disturbance have been low due to their remote location.

Saline lagoons (Source: BAP, 2003)

Saline lagoons are natural or artificial bodies of saline water that are partially separated from the sea. They retain a proportion of their water at low tide, which may be brackish, saline or hyper-saline. They support a distinctive fauna and flora, which in Suffolk includes the Starlet Sea Anemone, (*Nematostella vectensis*), the snails (*Hydrobia ventrosa*) and (*H. neglecta*), the Lagoon Cockle, (*Cerastoderma glaucum*), the Lagoon Sand Shrimp, (*Gammarus insensibilis*) and the Avocet (*Recurvirostra avosetta*). Saline lagoons occur as part of a complex mosaic of coastal habitats, including vegetated shingle, saltmarsh and coastal and floodplain grazing marsh, which are priority habitats in the UK Biodiversity Action Plan.

The plan area contains two of the four types of saline lagoon that occur in Suffolk:

- Pools enclosed within a shingle beach (for example at Shingle Street)
- Bodies of water behind sea walls that are fed by both rainwater and sea water via percolation, sea spray or sluices (for example on Havergate Island)

The other types are shallow pools on clay trapped behind ridges of shingle, through which there is percolation of sea water and small rivers that have been ponded back by shingled bars, which are occasionally over-topped by the sea.

Orfordness (part of the Alde-Ore Estuary SSSI) have been designated as a Special Area of Conservation (SAC) because of saline lagoons.

The main threats to saline lagoons and other coastal habitats in the region are associated with sea level rise. The problem is aggravated by the gradual sinking of south eastern regions of the country caused by isostatic tilt of the UK mainland. This process is predicted to occur at a rate too rapid for coastal habitat formation to keep pace with.

1.9ha of saline lagoon has been created at Orford Ness since 1995 and the aim is to maintain all coastal lagoons in favourable condition for species and community diversity. Figure 14 suggests most of the saline lagoon area in Havergate island is in favourable condition – access to it is restricted by the RSPB to monthly boat trips (maximum 12 people) and special events.

Coastal Sand dunes (*Source: HAP, 2003*)

Coastal sand dunes develop where there is an adequate supply of sand (sediment within the size range 0.2 to 2.0 mm) in the intertidal zone and where onshore winds are prevalent. The beach plain needs to be large enough so that the surface dries out between high tides. The dry sand is blown landwards and deposited above high water mark, where it is trapped by dune-building grasses, which grow up through successive layers of deposited sand.

There are 66 hectares of sand dunes in Suffolk (0.1% of the UK resource). Due to its limited extent in Suffolk, the habitat is considered to be of local significance only but it is nearly all protected by SSSI and CWS. Suffolk sand dunes are important for a nationally scarce moss, *Campylium polygamum*.

The main threats to sand dunes in Suffolk are associated with:

- Sea level rise, aggravated by the gradual sinking of the south east of the country caused by isostatic tilt of the UK mainland. This process is predicted to occur at a rate too rapid for sand dune formation to keep pace.
- Pedestrian access that can cause or exacerbate erosion
- Sea defence structures and artificial stabilisation measures such as fencing resulting in sediment starvation down-drift.

The action plan objectives and targets are:

- Protect existing area and nature conservation status of sand dunes from further losses to anthropogenic factors. Manage areas holding rare species.
- Offset any losses due to natural causes by allowing new dunes to accrete and by allowing mobile dune systems to move inland.
- Improve knowledge of extent, quality and current level of threat to Suffolk sand dunes.
- Promote the importance of sand dunes.

Coastal vegetated shingle (*Source: Biodiversity Action Plan, 2003*)

Globally, coastal features dominated by shingle are relatively rare. North –west Europe is one of the main locations where shingle beaches occur in quantity but are a disappearing resource

coming under pressure from damaging processes of development and aggregate extraction as well as 'coastal Squeeze' in the face of rising sea-level and coastal erosion. Britain holds about a third to all the vegetated shingle in Europe. Orfordness is an example of a barrier spit where a single spit made up of relict storm ridges and a shore system lies parallel to the open coast partially blocking a harbour and estuary. Shingle deposits consist of coarse sediment with particle sizes in the range of 2 to 200mm, i.e. between that of boulders and sand. In terms of particle size, shingle beaches can be classified into three types – those composed entirely of gravel (Orford Ness); those with the upper foreshore composed of gravel and the lower foreshore of sand separated with a marked break of slope (Thorpeness); and those where there is no clear spatial separation between gravel and sand (Sizewell, Dunwich).

Vegetated shingle communities which develop out of reach of the normal tide cover only 4000 ha to 5000ha in Britain. Over half of this occurs on two sites – Orford Ness and Dungeness. Colonisation of shingle is dependent on three main factors – degree of disturbance and mobility of shingle due to factors such as wave action; presence or absence of fines in the shingle matrix; and the availability of moisture. ([Biodiversity Action Plan](#), 2003) Orford Ness, as well as forming a cusped foreland, has the finest example of a pure shingle spit in Europe, extending for 16 km.

The Biodiversity Action Plan suggests the following factors particularly affect Orfordness:

- Development (previously a military test site)
- Access on foot and by vehicles for recreational use threaten habitat fragility, with loss of vegetation and lack of regeneration.(Thorpeness/Aldeburgh, Landguard, Shingle Street).
- Grazing by domestic livestock only occurs on a few shingle sites such as Simpson's Saltings on the Alde-Ore Estuary where the shingle vegetation is within a matrix of other vegetation types. Over-grazing in these situations will damage shingle 'heath'.

Shingle Street is privately owned and compared with Landguard Point receives relatively few visitors. Access points are mainly around the one parking area. The Suffolk Coasts and Heaths Project have erected an interpretation board, which highlights shingle vegetation and the need for protection.

Simpson's Saltings is part of the Alde-Ore Estuary SSSI and is owned by SWT. The site is lightly summer grazed with cattle which has an effect on the shingle vegetation. The island in the estuary is not grazed and here the lichen-rich shingle vegetation is best developed. Boat landing is not encouraged.

Orford Ness is owned and managed by the National Trust. Public access is restricted to ferry crossings from Orford Quay. The visitor route follows concrete/tarmac tracks except for a 300m section along the foreshore. Vehicular access is restricted at the Slaughden end to members of the Orford Ness Angling Club under annual agreement with the National Trust.

The HAP objectives and targets are:

- Maintain with no direct loss
- Prevent further exploitation or damage and maintain the quality of the existing plant and invertebrate communities and promote the importance of the habitat to users/public.
- Continue to monitor restoration sites to assess the potential for carrying out further work.

Reedbeds (Source: [BAP, 2003](#))

Reedbeds are wetlands dominated by stands of the common reed *Phragmites australis*, where the water table is at or above ground level for most of the year. In the Alde –Ore estuary there are areas ranging in size and structure from narrow fringes along river, dyke or ditch margins to extensive stands on floodplains. Not only are reed habitats important for a large number of

insect species, they provide specialised habitat for a variety of scarce breeding birds such as marsh harrier and bearded tit. In addition, they provide shelter for roosting birds such as yellow wagtail and swallow during autumn passage migration and pied wagtail, starling and reed bunting during the winter period. Within the floodplains there are borrow dykes and numerous ditches that are fringed by reed. The main stands of reed are to be found at Snape and Hazelwood Marshes and at the head of the Butley River (SWT, 2012).

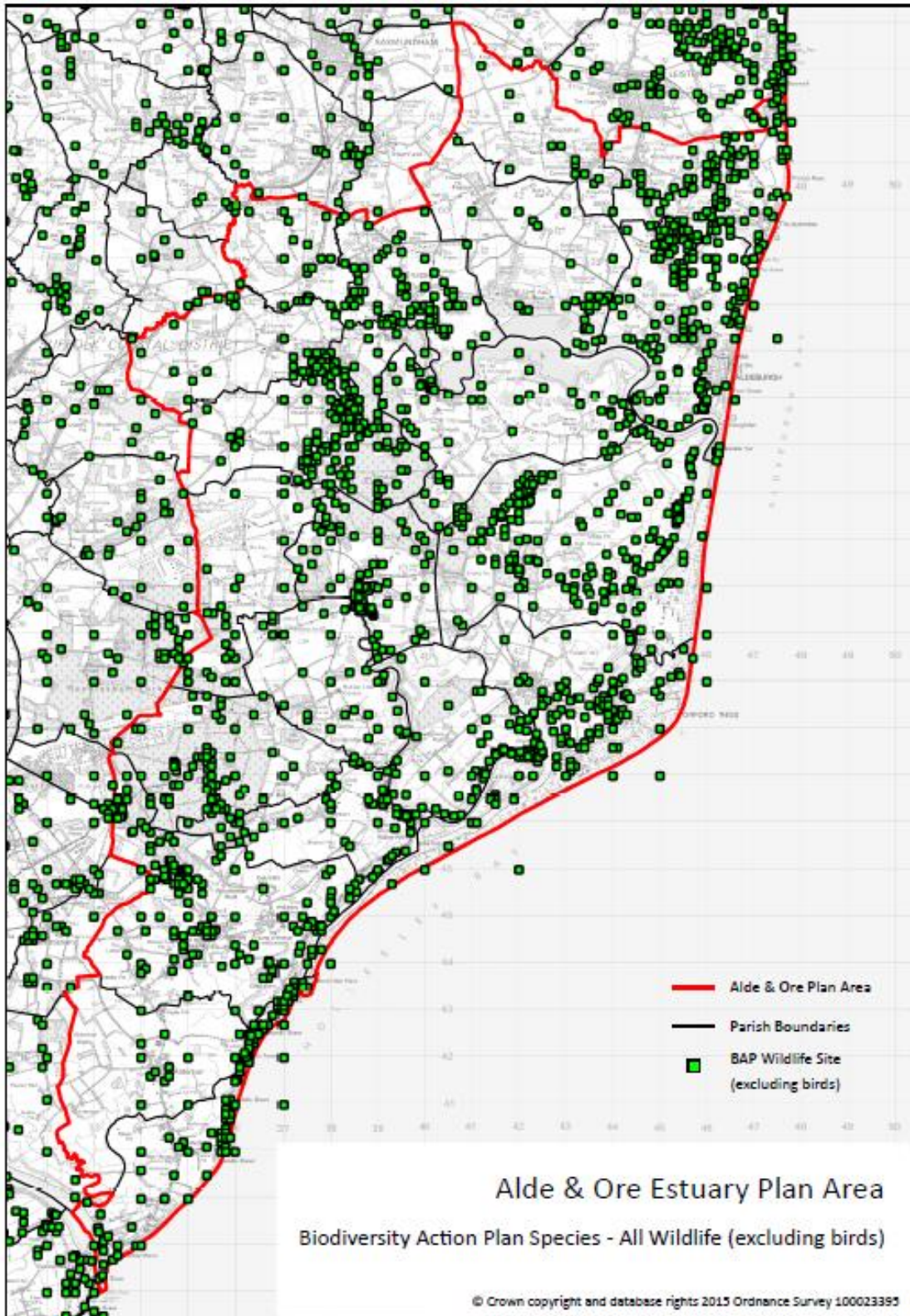
Lowland heath (Source: *BAP, 2003*)

Lowland heaths lie below 300m altitude and are characterised by vegetation dominated by dwarf shrubs, in particular various species of heather. They are characteristically found on acidic, sandy, free-draining soils that are nutrient-poor. The Sandlings area includes dwarf ericaceous shrubs, acid grassland, bracken, scrub and trees.

Lowland heath is a rare and threatened habitat internationally and the UK has 20% of the global total. Suffolk has over 3,000 ha of lowland heathland, out of a total of 58,000ha in the UK, which is 5.3% of the national resource. Much of the 1600Ha of Sandling is in the AEOP area and is protected by SSSI and SPA designations. Key National Biodiversity Action Plan species that use heathlands in Suffolk include Stone curlew, Nightjar, Woodlark, Skylark, Linnet, Natterjack Toad, Silver-studded Blue butterfly, Red-tipped Cudweed, Tower Mustard, Perennial Knawel and Small Alison and adders.

Agriculture and forestry used to be the main cause of loss of heathland but in more recent decades it is neglect, lack of management and recroachment by trees, development, recreation, fires and run off from agricultural land. Most of the Sandlings heaths have been under some form of management either directly through sympathetic ownership or through the Sandlings Group since 2003. The aim is to protect the heathland and maintain and strengthen populations of associated key BAP species.

Figure 17: Location of BAP Species (excluding birds)



Birds

The ecological assessment of the hinterland for the Alde and Ore Estuaries undertaken by the Suffolk Wildlife Trust in 2012 observed 104 species of wintering birds, including 17 species of wildfowl and 18 species of wading bird. Table 14 above set out the numbers at the time of designation as SPA. The 2012 survey observed all these in the area except Sandwich and Little terns. Appendix 1 lists the survey findings by species and their location by habitat compartment.

For wintering birds wildfowl were recorded on the arable land at Boyton and Alderton. Seven species of geese were observed with c600 white fronted geese at Aldeburgh Marshes and c300 at Ferry Farm and c 400 at Gedgrave. Of the 10 species of duck, wigeon was the most numerous with counts of 2,000 at Hollesley, 1,500 at Boyton and 450 at Stanny Fram, where c600 teal were also observed with another teal c500 on Iken marsh. Of the 18 species of wading birds, c600 golden plovers were observed at Sudbourne Marches and c400 lapwings were seen at Stanny Farm , 175 Town marshes and 230 Boyton marshes. Curlews were also seen at Town Marsh (386), Stanny Farm (147) and Boyton (116) and 120 Redshanks at Christmas Farm Marsh. The most common raptor seen was marsh harrier at Snape, Stanny Farm and Boyton marshes.

Roosting behaviour is governed by the tidal cycle not light. The 2012 survey found roost sites on the Alde/Ore/Butley estuaries varied from shoreline and saltmarsh to adjacent farmland. The major roost sites are Orfordness, Havergate Island, the saltings and shoreline of New England Farm and Black Heath Estate, the broken sea walls at Iken, Hazelwood Marshes, Stanny saltmarsh and on the higher reaches of Butley River. These are all regular sites, however, on the really high spring tides or in adverse weather conditions roosting behaviour will change and the hinterland will be used.

The summer bird survey identified three key areas for breeding birds: Boyton Marshes (RSPB), Hazlewood Marshes (SWT) and Stanny Farm Marshes. The grazing marshes of Stanny House Farm were identified as the most important site on the Suffolk coast for breeding lapwing with 37 pairs and the most important site within the Alde/Ore/Butley complex of estuaries for breeding **avocet** (West 2010); there were 41 pairs breeding in 2011, 4.6% of the British breeding population.

Important birds noted in the 2012 survey needing specific habitats included:

Marsh Harrier – nests in thick marshy vegetation, in the Alde ore often in borrow dykes. Two pairs usually breed at Hazelwood Marshes (SWT), a pair at Iken, up to three females at Stanny Farm marshes, two pairs at Boyton (RSPB) and up to two pairs at Gedgrave.

Avocet - breeds in open areas around coastal lagoons and usually nests colonially. In 2005 there were 12 pairs and by 2011 this number had grown to 41 pairs breeding, 4.6% of the British breeding population. This species is also breeding at Hazelwood Marshes (SWT). Monitoring of WeBs sites in the UK shows seven sites usually surpass the threshold for international importance for Avocet in recent years. The highest count however, from the Alde Complex (Suffolk) where 2,039 Avocets were present in March 2013, represented the highest monthly count ever submitted through WeBS ([WeBs, 2014](#)).

Redshank - Holt et al 2011 reported over the five winter periods 2005/06 to 2009/10 there was a mean of 3,206 birds. However Despite the amount of grazing marsh within the hinterland of the Alde/Ore/Butley complex of estuaries the number of sites where redshanks are to be found breeding is scarce. The grazing marshes of Stanny House Farm are by far the most important site, on the Suffolk coast, for breeding redshank with around 20 pairs. Other sites are Boyton

Marshes (RSPB) six pairs, Christmas Farm saltings two pairs and Hazelwood Marshes (SWT) with four pairs.

Figures from the Wetlands Birds Survey (WeBs) Waterbirds in the UK 2011/12/13 for Non-breeding waterbirds shows that total numbers fluctuate but are generally higher than the Orwell estuary but lower than the Stour.

Site	2008/09	2009/10	2010/11	2011/12	2012/13	5-year mean
Alde Estuary	31,791	33,268	36,138	33,908	31,854	33,392
Orwell Estuary	25,239	23,174	25,975	22,665	24,358	24,282
Stour Estuary	54,590	56,515	52,359	50,490	44,988	51,788

For individual wetland species figures taken from the WeBs work show a fair amount of stability or increases over the 10 year period particularly for the high concern Black –tailed Godwit. A notable exception is the red listed in serious decline Dunlin where figures have fallen by 2/3rds.

Low tide counts	BoCC*	2010 -2011			2001-2002		
		Month Peak	Monthly average	Average density	Month Peak	Monthly average	Average density
Brent Goose (Dark-bellied)		479	189	0.04	135	40	<0.01
Shelduck		906	543	0.12	866	710	0.16
Wigeon		6374	3740	0.82	6647	4200	0.89
Teal		3391	2174	0.49	2039	1598	0.35
Mallard		744	361	0.08	445	319	0.07
Pintail		142	83	0.02	632	399	0.08
Oystercatcher		214	73	0.15	184	92	0.21
Ringed Plover		222	70	0.16	85	37	0.06
Golden Plover		1054	402	0.13	460	263	0.09
Grey Plover		64	45	0.10	45	26	0.04
Lapwing		3490	2019	0.64	2241	1545	0.43
Knot		72	32	0.08	401	138	0.24
Dunlin		2185	1678	4.05	6730	3323	5.74
Black-tailed Godwit		1305	529	0.17	64	32	0.01
Bar-tailed Godwit		27	8	0.02	20	12	0.03
Curlew		922	671	0.21	937	599	0.17
Redshank		2022	1355	0.42	2071	1485	0.44
Turnstone		30	11	0.02	31	11	0.02
Avocet		1626	949	2.14	1537	924	1.97

Source: [WeBs](#)

*[BoCC \(2009\) Birds of Conservation Concern 3](#)

It is interesting to note that species of international concern (Black –tailed Godwit), dunlin and lapwing are found in the Alde & Ore estuary in notable numbers although do not meet the qualifying international threshold. Figures 16 and 17 show the very different distributions of birds. Teal and Redshank have a similar distribution to Wigeon, favouring the Butley Creek and north part of the Alde.

In addition to the main feeding areas on the estuary (particularly mudflat and saltmarsh habitat), the key high tide roosting areas are of great significance, and most sensitive to disturbance. Disturbance at any time of year is a concern but most damaging to bird ecology in winter months when the birds are requiring completely uninterrupted roost sites to conserve body heat

and energy levels. Waterbirds breeding on the estuary clearly also require safe, uninterrupted areas for success. Encouraging a greater number of landowners to enter into agri-environment schemes within the estuary catchment is of great importance in the short term future.

Figure 18: Distribution of Wigeon



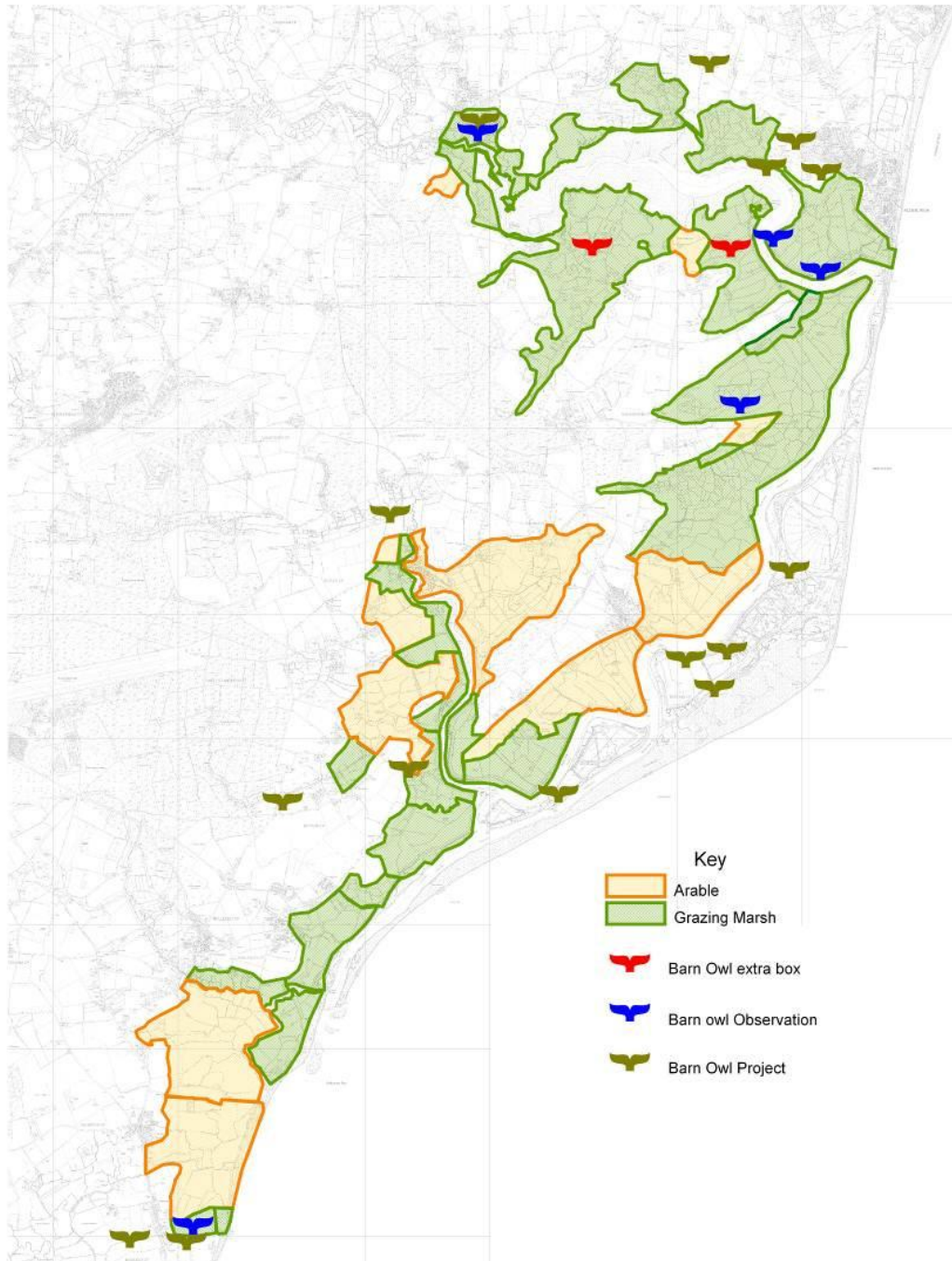
Source: [WeBs](#) 2010 -11 data

Figure 19: Distribution of Golden Plover



Source: [WeBs](#) 2010 -11 data

In terms of BAP species which breed within the hinterland are barn owl, bittern, lapwing, cuckoo, skylark, yellow wagtail, song thrush, starling, house sparrow, linnets and reed bunting. For Barn Owl the best feeding habitat on the Alde/Ore/Butley hinterland is the tall, tussocky grassland associated with the sea wall, apron and borrow dyke. Figure 16 shows the barn owl breeding sites observed by SWT in 2011.

Figure 20: Barn Own breeding sites (Source: SWT 2012)

In terms of habitat quality the SWT 2012 report concluded that the grazing marshes at Hazelwood, Sudbourne and Boyton marshes are particularly important for the numbers breeding waders they support, although the flood plain grazing marshes were considered to be poor habitat for wildlife in general, a monoculture of short, species poor over-grazed grassland with a low watertable. The only herb rich grazing marsh is at Snape. The hinterland was considered deficient in scrub habitats with only small pockets of gorse, willow and blackthorn. Stanny Farm was identified as an exception plus the blackthorn thicket on Sudbourne Marshes. Within the floodplain borrow dykes and ditches fringed with reeds are valued habitats supporting less common species of birds such as marsh harrier and bearded tit, reed warbler and in winter bitterns. In general there is a concern about the level of grazing and grazing with cattle preferred as it leads to a greater diversity of habitats. Water level management is essential to maintain water vole and breeding wader habitat. Mink control is also needed to allow breeding wildfowl

and water vole to flourish and known to be operation on Snape, Hazelwood (at the time) Sudbourne, Iken and Boyton Marshes.

Future Trends

The main threats to biodiversity in the Study Area are identified in the HAPs, which have been written for the habitats identified in the Suffolk LBAP. The main factors affecting these habitats to include:

- If walls are maintained in situ sea level rise and resulting coastal squeeze will lead to a loss of coastal intertidal habitat.
- Rising sea levels and resulting coastal squeeze caused by climate change, aggravated by the gradual sinking of the south east of the country caused by isostatic tilt of the UK mainland. This process is predicted to occur at a rate too rapid for sand due to formation to keep pace.
- Sudden realignments have occurred in the estuary due to flooding and there are issues associated with these in terms of habitat loss and coastal squeeze.
- Recreational pressures including erosion of saltmarsh through trampling or from boatwash.
- Developmental pressures.
- Deteriorating water quality as a result of discharges from agriculture, and urban areas.
- Lack of appropriate management.
- Threat to freshwater water dependant species from potential changes in water levels, flow or water quality.
- An increase in disturbance is one of the greatest threats to the estuary's value as an ecological asset.

Rising sea levels are predicted to result in saltmarsh loss in the estuary if the current management approach (of keeping existing defences in their current position throughout the estuary) is continued.

Future loss of freshwater habitats due to tidal flooding is a particular concern and one that might require consideration of replacement habitats or changes to designations. The UK government has a duty under EU legislation to ensure there is no net loss of habitat. Where flood defences are needed to protect people and property and there is a coastal squeeze impact the Environment Agency is tasked by Government to ensure losses are replaced.

Soils, Geology and Hydrogeology

Key issues

- Important sites of geological interest are at risk from flooding.
- A primary chalk aquifer may be exposed in the north west of the Plan study area.
- Secondary Crag aquifers (superficial deposits) are at risk from saline intrusion during tidal inundation.
- Risk of contaminants being released from historic landfills and previous gas work sites.

Soil

Throughout East Suffolk much of the solid geology is overlain by a series of sands and gravels deposited as outwash material from the last ice sheet retreat. These sediments give rise to the

deep, free draining acidic soils of the area. In the lower parts of the estuary, the soil is muddy, nutrient-rich, containing sediments and shingle. Havergate Island and much of Boyton Marshes in particular are covered by heavy clay soils derived from the underlying alluvium (RSPB, 2010).

Geology and Geomorphology

The solid geology of the Suffolk Coast is dominated by rocks formed by sedimentary processes, mainly chalks. These soft, generally undisturbed rocks are responsible for creating the gentle rolling landscape characteristic of the area. The solid geology of the Alde and Ore consists of Coralline and Red Crag and London Clay over the foundation of Chalk. The oldest of these, the Coralline Crag, surfaces as a ridge between Orford and Aldeburgh, through which the valleys of the Alde and Butley rivers have been eroded. The Coralline Crag is particularly rich in fossils, yielding a diverse fauna of molluscs, bryozoans, fish and corals. This rock type is found nowhere else in Britain and this is reflected in the designation of a number of disused pits around the estuary and the river cliff at Gedgrave as geological SSSI.

In geological terms the Suffolk estuaries are of recent origin having formed as sea level rose following the end of the last Ice Age, approximately 7000 years ago. In comparison, the subsequent evolution of the Ore estuary has occurred through more recent and different processes. Local history records indicate a breach through Slaughden 6,000 years ago and it is suggested that approximately 2,000 years ago the River Alde flowed eastwards and entered the sea just to the south of Aldeburgh. Since this time, the deposition of the shingle spit of Orford Ness deflected the course of the Alde southwards, so that it flowed parallel to the coast forming the Ore estuary.

Orford Ness is of very high importance for its geomorphology. It is comprised of sand and gravels lying on top of Crag deposits and older deposits of London Clay and is one of only three major shingle landforms in Britain, ranking among the most important shingle features in Europe. It is the only such landform which combines a shingle spit with a foreland. This 'nose' or 'ness' gives rise to the name for the whole area. The spit comprises a complex sequence of shingle ridges and swales (valleys) deposited over centuries and recording many stages in the evolution of the landform. It is one of the most dynamic landforms on the UK coastline and is subject to change through sediment erosion and deposition. Despite recent major ground disturbance and damage it is of the highest research value (National Trust, 2011). This area has been a focus of a European Union LIFE project which has involved a five year restoration programme at Orford Ness to conserve its outstanding geomorphological interest, encourage the breeding of a large number of wild birds; and to increase the nature conservation value of its habitats (National Trust, 2011).

Hydrogeology

The hydrogeology of the area is controlled by the position of the relatively impermeable deposits of London Clay, relative to the Plan study area. This is because the impermeable London Clay controls the recharge of the underlying principle Chalk aquifer (bedrock) and secondary Crag aquifer (superficial deposits).

The western extent of the London Clay is approximately in line with the A12 (where it begins to thin out). This means to the west of this line, the Crag aquifer overlies the Chalk aquifer and to the east of the line, the Crag aquifer overlies London clay, which overlies the Chalk aquifer. The relation to public water supply is detailed in the section on groundwater below.

All of the flood compartments and coastal study units are to the east of the London Clay limit. Therefore, any saline intrusion through inundation from a breach in the embankment is unlikely to degrade the Chalk aquifer. Although, towards the limit, the thickness and extent of the London Clay can vary and there may be areas of exposed Chalk along certain features, such as old stream beds where the London Clay has been eroded. The secondary Crag aquifer still

remains susceptible to any saline intrusion through inundation from a breach in the embankment.

The Chalk and Crag aquifers are important to the regions because they provide the base flow to the rivers and support abstractions for potable supply, industry and agriculture.

Contaminated Land

There are two small historic landfill sites on Aldeburgh Town Marshes which lie within the 100% APO indicative floodplain. One large site approximately 1km west of Thorpeness lies just outside of the 100% APO indicative floodplain but could be affected by a change in groundwater levels associated with inundation.

A historic Ordnance Survey (OS) map (1882) shows that a gas works was located to the east of the existing Anglian Water Services (AWS) Park Road Pumping Station (NGR 462562). Land contamination is likely to be associated with the by-products of gas manufacture e.g. ammoniacal liquor, coal tar, spent oxide and fowl lime.

Water

Key issues

- The physical processes within the estuary are highly dynamic.
- Surface water quality is fairly good and estuarine water quality is very good. These are vulnerable to diffuse pollution from agricultural land that may be exacerbated by flooding.
- The study area is within a highly sensitive Groundwater Vulnerability Zone (GVZ).
- Changes in groundwater and surface water quality may affect potential abstraction uses including use for irrigation and public water supply.
- Consented discharge points are vulnerable to flooding and erosion.
- Boreholes that help to maintain salinity in the lagoons on Havergate Island are vulnerable to flooding.

Water Bodies

River Water Quality

Ecological status is the main classification reported by EA internally and to the public and many of our partners and stakeholders. It consists of up to four different assessments:

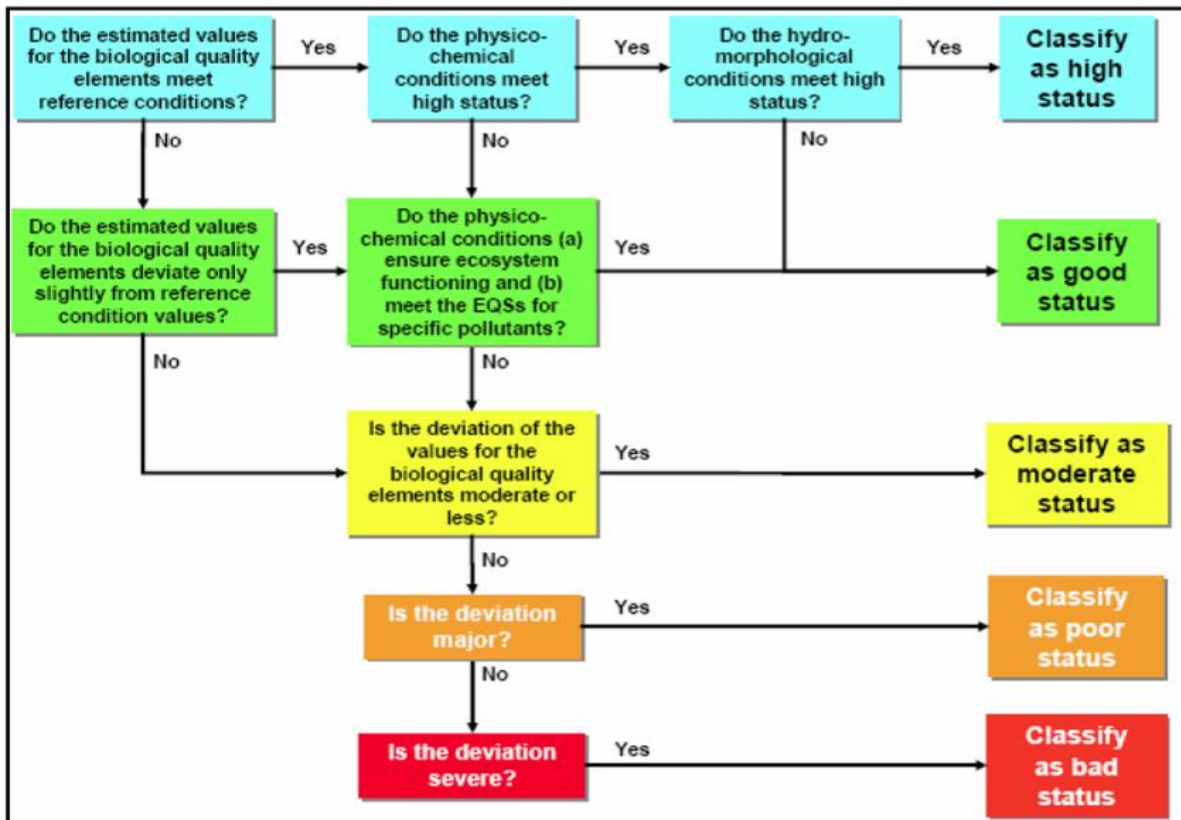
1. An assessment of status indicated by a **biological** quality element such as fish, invertebrates or algae. We also assess for the presence of invasive species as a separate test.
2. An assessment of compliance with environmental standards for supporting **physico-chemical** conditions, such as dissolved oxygen, phosphorus or ammonia (Table 9)
3. An assessment of compliance with environmental standards for concentrations of **specific pollutants**, such as zinc, cypermethrin or arsenic (these are known as 'Annex VIII' substances)

And in determining high status only:

4. A series of tests to make sure that **hydromorphology** is largely undisturbed

EA corporate scorecard measure is based on ecological status. These classifications are shown in summary in the flow diagram Figure 22.

Figure 21: Decision tree illustrating the criteria for determining the different ecological status classes



Source: EA Monitoring Strategy 2011

Surface Water

The principal physical process in the estuary is tidal flow; however there are a range of dynamic conditions from the head to the mouth of the estuary. At the head of the estuary is Snape Sluice, located approximately 100 metres west of the B1069 road bridge. The sluice acts to limit the tidal influence of the estuary, maintaining freshwater conditions west of the sluice and helping to control water levels in the River Alde.

In the upper River Alde, the Iken cliffs and the high land at Snape Warren create a narrow river channel which opens out further downstream and becomes less well defined. Flow in this area is slow. Downstream of Iken Cliffs the river widens until Barbers Point where the width is constrained with a series of meanders formed by ridges of high ground and flood defence banks.

From Sudbourne Marshes to Orford, the channel is relatively straight and flow is constrained by the flood banks to each side and at the eastern end of the channel by the harbour entrance works. The Butley River enters the River Ore at Boyton Marshes and is a narrow meandering channel with areas of intertidal habitat and intermittent lengths of embankment.

The River Ore is divided around Havergate Island with the main channel (the Gull) flowing around the Islands Western Flank, while a subsidiary channel flows nearly straight to the shingle spit of the coast. The split in the channel decreases the velocities. The northern channel meets the Butley River to the west. The channel is restricted by embankments and is narrow and meandering with little intertidal areas.

Within Orford Ness there is a network of ditches which drain the area. As part of the restoration work for the European Union LIFE project a channel has been created within King's Marshes.

Groundwater

The geology underlying the Alde and Ore catchment is mainly impermeable deposits of clays. In the Anglian region approximately 50% of public water supply is obtained from groundwater. Groundwater can be particularly vulnerable to pollution and as such is protected by legislation such as section 85 of the Water Resources Act 1991. Protection is achieved through the evaluation of vulnerability and risk; with vulnerability being a function of the presence and nature of the overlying soils and drift, the geology and depth to water table. The whole of the Plan study area is situated within a groundwater vulnerability zone (GVZ) which is a minor aquifer, defined as strata of variable permeability, where groundwater may be used as a local source but seldom produces sufficient water for large abstractions. The aquifer underlying the majority of the Plan study area is assessed as being highly vulnerable; a small area to the west of Snape falls within an intermediate GVZ.

Source Protection Zones (SPZ) are designated to protect sources of drinking water. There is a SPZ at Aldeburgh that is within the tidal floodplain of the River Alde. At Aldeburgh, there is also a public water supply abstraction within the Grade 1 SPZ and two industrial abstractions within the Grade 3 SPZ.

Nitrate Vulnerability Zones (NVZ) are catchments where nitrate concentrations in sources of public drinking water exceed, or are likely to exceed, nitrate concentrations greater than 50mg/l (Defra, 2007b). There are two groundwater NVZs within the Plan study area. One is in the northern section of the River Alde, down to Short Reach, and another south of Sudbourne Marshes, Lantern and King's Marshes and the village of Orford.

Water Quality

Background

The Water Framework Directive (WFD) (2000/60/EC) was implemented in England and Wales by The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003. The Environment Agency, as the competent authority in England and Wales is responsible for delivering the Directive through the Regulations. RBMPs set out measures to achieve the aims of the WFD, to ensure that by 2015 water bodies within England and Wales achieve 'Good Status'.

WFD Water Bodies

There are 16 WFD water bodies within the study area including 13 rivers, one estuarine, one coastal and one groundwater body. The ecological status of surface waters is defined as 'Good Ecological Status (GES)' for natural water bodies and 'Good Ecological Potential (GEP)' for Heavily Modified Water Bodies (HMWBs) and Artificial Water Bodies (AWBs). GES (or GEP) is made up of a number of biological, hydromorphological and chemical quality characteristics called 'Quality Elements'. The overall ecological status is determined by the lowest element status. For groundwater the overall status is defined by 'quantitative status' and 'chemical status' only.

Consideration of hydromorphology is an integral part of the WFD assessment. Information on the hydromorphological status of the water bodies within the study area has been informed by a report on the geomorphology of the Alde and Ore estuarine and coastal system (Environment Agency, 2009). Of the fifteen surface water bodies that fall within the Plan study area seven are classed as either a HMWB or AWB. These classifications indicate that the water bodies have been created or modified for a particular use and for the water bodies concerned the reasons for classification are due to flood protection, coastal protection and/or land drainage.

Table 17: Characteristics of WFD water bodies within the study area*(Source: EA, SEA Draft Environmental Report, 2011)*

WFD Water body code	Name	Hydro-morphological designation	Current ecological status/potential	Current chemical status	Status Objective
Rivers					
GB205035040150	Black Ditch	Not designated A/HMWB	Moderate	Does not require assessment	GES by 2027
GB105035040160	Tang	Not designated A/HMWB	Moderate	Poor	GES by 2027
GB105035040170	Tributary of Butley River	HMWB	Moderate potential	Does not require assessment	GES by 2027
GB105035040190	Butley River	HMWB	Moderate potential	Does not require assessment	GES by 2027
GB105035077790	Alde and Ore (Tidal)	Artificial	Moderate potential	Does not require assessment	GES by 2027
GB105035040180	Alde and Ore (Tidal)	Not designated A/HMWB	Moderate potential	Does not require assessment	GES by 2027
GB105035077800	Alde and Ore (Tidal)	HMWB	Moderate potential	Does not require assessment	GES by 2027
GB105035045950	Alde	Not designated A/HMWB	Moderate potential	Does not require assessment	GES by 2027
GB105035045970	Ore	Not designated A/HMWB	Moderate potential	Does not require assessment	GES by 2027
GB105035046060	Alde	Not designated A/HMWB	Moderate potential	Does not require assessment	GES by 2027
GB105035045980	Fromus	Not designated A/HMWB	Poor	Does not require assessment	GES by 2027
GB105035045960	Alde and Ore (Tidal)	HMWB	Moderate potential	Does not require assessment	GEP by 2027
GB105035046260	Hundred River	HMWB	Poor potential	Does not require assessment	GEP by 2027
Estuarine					
GB520503503800	ALDE & ORE	HMWB	Moderate potential	Does not require assessment	GEP by 2027
Coastal					
GB650503520002	Suffolk	HMWB	Moderate potential	Good	GEP by 2027
Groundwater					
GB40501G400600	Waveney and East Suffolk Chalk & Crag	N/A	Poor	Poor	Good by 2027

EC Bathing Waters Directive

The EC Bathing Water Directive 2006/7/EC sets standards for the protection of human health whilst bathing by setting standards for designated bathing waters during defined bathing periods. None of the beaches within the Plan study area are classified as designated bathing beaches. However, both Southwold Pier Beach to the north of the Plan study area and Felixstowe South Beach to the south of the Plan study area were awarded Blue Flags in 2008, with water quality meeting the guideline standards according to the former EC Bathing Water Directive.

Water Resources

The water resources within the Plan study area are covered by one catchment and managed under the East Suffolk Catchment Abstraction Management Strategy (CAMS) (Environment Agency 2008a). The CAMS has identified that the Plan study area is entirely underlain by Groundwater Management Unit (GWMU) 9 which has resource availability status of 'over abstracted'. The Plan study area also includes a small part of Water Resource Management Unit (WRMU) 5 just above Thorpeness (also over abstracted), WRMU 6 west of Snape (over licensed) and WRMU 6B south west of Snape (over abstracted).

Demand for water resources within the Plan study area includes potable and non-potable licensed abstractions for agriculture, amenity use, industrial and commercial processes, production of energy and water supply. Within the Plan study area there are 102 licenses for surface and groundwater abstractions. There are approximately 40 groundwater licences within Plan study area and an additional 18 within a 500m buffer zone of the Plan study area that could be affected.

In addition there are 29 licences for consented discharge to receiving water bodies within the Plan study area. These allow discharge of sewage or trade effluent into surface water such as rivers and estuaries. Depending on the risk associated with the discharge, the Environment Agency may monitor the discharge and/or the receiving water.

There are three boreholes situated on Havergate Island classified as amenity use from which fresh/brackish water has been pumped into lagoons to reduce the salinity and prevent damage to the features of nature conservation interest. However, the majority of the groundwater abstractions are used for agricultural purposes on the marshes. There are also a number of surface water abstractions which supply agriculture in the region. In particular, Gedgrave Marshes contains an important source of water for the higher agricultural land to the west (see Section). In addition to licensed abstractions there may also be other single abstractions which do not require a licence if they are less than 20m³/day as they have been deregulated under the Water Act 2003.

Alde Ore Estuary Water Quality

The Alde Ore estuary was studied intensively in the 1990s by the Environment Agency's predecessor organisation, the National Rivers Authority. This enhanced survey work was undertaken to assess the trophic status of the estuary in relation to any obligations the UK may have had in relation to the EU Urban Waste Water Treatment Directive. Between 1992 and 1994, monthly samples were taken and analysed for a number of physical and chemical determinants including Total Oxidised Nitrogen (TON), Soluble Reactive Phosphate (SRP), Chlorophyll a. and suspended solids. Phytoplankton samples and dissolved oxygen readings were also taken.

These enhanced surveys yielded the following results: Total Oxidised Nitrogen levels were generally exceeded threshold levels indicative of hypereutrophic conditions (CSTT, 1994). Chlorophyll a levels occasionally exceeded 10ug/l in spring, though such levels were never

sustained through the summer. Dissolved oxygen levels were generally high (around 100% or greater) and phytoplankton samples revealed species typical of the Southern North Sea.

Around 1994, the following conclusions were reached. The estuary was hypereutrophic as exhibited by high TON levels (according to criteria set by a 'Comprehensive Studies Task Force in relation to compliance with Article 6 of the Directive 91/271/EEC, the Urban Waste Water Treatment Directive. However, there were no excessive or prolonged algal blooms (reflected in chlorophyll a analyses), low dissolved oxygen levels or any evidence of benthic organism mortalities. As such a further conclusion was reached that even though hypereutrophic the estuary was not exhibiting the effects of a eutrophic estuary.

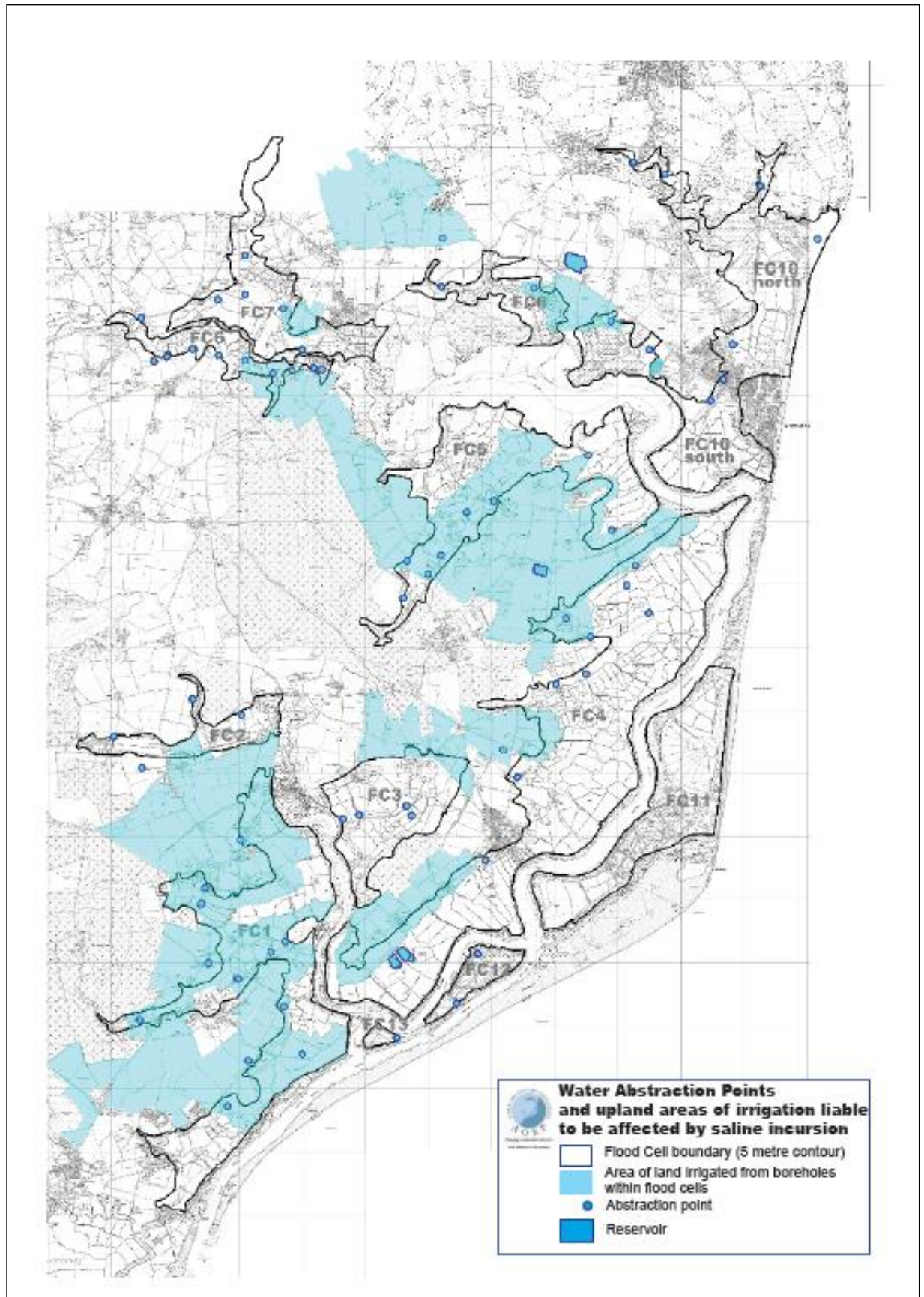
There are 2 designated shellfish waters in the Alde Ore Estuary; one on the River Alde near Aldeburgh, and the other in the middle reach of the Butley River. The one on the River Alde is currently not harvested and there is very limited recent monitoring. The Butley River beds are in production and shellfish flesh quality is monitored by the local authority. The catchment is very rural and the estuary receives very little sewage effluent. However, the shellfish quality is not particularly good considering the nature of the catchment. The flesh generally meets Class B (Shellfish Hygiene Directive) so will require depuration before sale. Contamination most likely comes from livestock farming but wading birds will also contribute. The EC Shellfish Directive has been repealed and compliance is now assessed against the standards in the Water Framework Directive.

While conducting a routine fish survey, members of our Sampling and Collection and Analysis and Reporting teams, recorded the first ever Twaite Shad fish in the Alde Ore Estuary. This was only the 23rd Twaite Shad ever recorded by the Environment Agency in the last 40 years. It's also the largest.

In recent years the fish has suffered considerably from pollution, over-fishing and river obstructions. This discovery is evidence that the shad can migrate through the estuary to freshwater where it spawns and, together with the other species recorded here, shows the water quality is good or high under the Water Framework Directive (WFD) classification

Abstractions

Figure 22: Water Abstraction Points (Source: AEOP, 2015)



- map showing water abstraction points within flood cells and the areas irrigated by that water both within and beyond flood cells. The river defences provide protection for these abstraction points which, if the walls broke, would become salinated and unuseable. The reservoirs shown are those filled from the abstraction points.

Future Trends

Under the UK commitment to the WFD, the UK must aim to reach good chemical and ecological status within inland and coastal waters by 2015. Furthermore the WFD seeks to:

- enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands;
- promote the sustainable use of water;
- reduce pollution of water;
- ensure progressive reduction of groundwater pollution.

Predicted increases in population and tourism within the area will lead to increased pressure on water resources, meaning that efficiency measures are vital to secure adequate water supplies without affecting the environment.

It is still uncertain whether climate change will result in an increase or decrease in water resources in the UK. However, there is general agreement by UK Climate Predictions (UKCP, 2009) that the winters will be wetter and stormier and the summers warmer and drier, especially in the south. It is important that these issues are considered with regards to management of future water resources.

Material Assets

Key issues

- The railway line just north of Blaxhall is vulnerable to flooding.
- Key infrastructure is vulnerable to flooding and erosion.
- Potential disruption to navigation on the estuary due to flooding and erosion.
- Local on-road cycle routes are vulnerable to flooding.
- Commercial fishing fleet is vulnerable to flooding and erosion.

Suffolk is a largely rural county and towns within the Plan study area are situated around the periphery of the regional centre. Seasonal congestion occurs in some towns within the Plan study area as a result of tourist traffic. The Local Transport Plan has identified the need for improvement of the public transport network in the region (Suffolk County Council, 2006b).

Services and Utilities

There are a number of nationally and locally important material assets within the Plan study area that are vulnerable to the effects of flooding. These include:

- the BBC World Service transmitters at Orford Ness;
- electricity pylons to/from Sizewell B Power Station which pass through the Plan study area around Gromwell;
- sewage treatment works including Sandy Lane, Aldeburgh Leiston Road and Aldeburgh Park Road;
- electricity stations;

- telephone infrastructure;
- public buildings including schools, hospitals and prisons.
- Five Internal Drainage Board (IDB) pumps

Sizewell B Power Station supplies around 3% of the UK's entire electricity needs (British Energy, 2009) and is therefore a material asset of national importance. However it lies outside of the Plan study area and is unlikely to be affected by flooding or by any of the recommendations of the Plan.

Within the Plan study area there are a number of assets which the Environment Agency maintains including flood defences, gauging stations, pumping stations, locks and weirs. The Environment Agency is concerned with the construction, location and operation of a wide range of material assets, e.g. water supply and management infrastructure, transport networks, housing and industry. In FC11 (King's and Lantern Marshes) the National Trust maintain all the defences with the exception of two pumping stations on the estuary wall which are maintained by Babcock International Group PLC (Babcock).

Roads

The main land transport infrastructure is limited to the A12 which runs northwest/southeast to the west of the Plan study area. The A1094 links Aldeburgh to the A12 with minor B-roads running parallel to the A12 through Snape and linking onto B-roads towards Orford and the coast in the south of the Plan study area. There is seasonal traffic problems at Aldeburgh, Orford and Snape related to the increase in visitor activity to Aldeburgh during the summer holidays and at weekends. The area encourages visitors for its economic wellbeing, but finds it difficult to cope with the influx of cars at peak periods.

Rail

The railway line from Ipswich to Lowestoft runs parallel to the A12. The nearest stations to the Plan study area are Saxmundham and Wickham Market. The railway line passes through the Plan study area to the west of Snape. Only a small section of the railway line just to the north of Blaxhall has the potential to be affected by flooding.

Navigation

Navigation is important for both commercial fishing and for recreation in the area. The Alde and Ore estuary is a popular area for sailing with a number of moorings and shore based facilities in the area (see Section 0). The tidal estuary provides 15 miles of sheltered sailing water and is accessible at all states of the tide. The River Alde is navigable from Snape Maltings through the Ore Estuary to the open sea. These 'safe waters' are one of the main attractions for sailing and the associated tourism is important to the local economy. Orford Ness Lighthouse, built in 1637, still provides an important function as a warning beacon for ships approaching the Suffolk coastline and has the potential to be affected by coastal erosion.

Other Forms of Transport

Cycling is popular in towns within the Plan study area, with most cycling taking place on public roads and town paths that permit cycles. There is a local on-road cycle route which runs along minor roads, crossing the Butley River via a ferry link (Suffolk Coast and Heaths, 2008a) then passing through Orford and then north towards Snape.

Commercial Fishing

Commercial fishing vessels in the area are all below ten metres in length and carry out inshore trawling mainly for white fish. The largest inshore fishing fleet within the Plan study area is stationed at Aldeburgh. A smaller inshore fishing fleet is also located at Orford, where fish is sold at the Quay. The fleet at Orford is more sensitive to the risks from flooding and erosion.

The main fish taken in the area are: sea trout, sea bass, grey mullet, common sole, European plaice, rays, dabs, common flounder, Atlantic cod, whiting, dogfish, herring, sprats and brown shrimp.

Nearshore fishing in the form of netting and potting is carried out in close proximity to beaches and groynes. Drift nets, set nets and parlour pots are the only gears fixed inshore; these are marked with buoys and left in the sea.

Future Trends

Potential developments identified in the Suffolk Local Plan include the completion of the link road between Thorpe Road and the A1094/B1122 junction in conjunction with the residential development of Church Farm (Suffolk Coastal District Council, 2006).

There are no proposed future national cycle network routes which pass through the Plan study area.

The economic importance of fishing to the area is declining although it is still of relative importance to the local economy.

Land Use and Natural Resources

Key Issues

- Risk of flooding of settlements.
- Risk of flooding of valuable agricultural land.
- Risk of flooding leading to a loss of irrigation sources as a result of saltwater contamination.
- Small areas of ancient and semi-natural or ancient replanted woodland are vulnerable to flooding.
- Mineral abstraction sites are vulnerable to flooding.
- Potential for inundation of current landfill sites.

Agriculture

The Alde and Ore area is predominately rural with a mix of nature conservation and agricultural land uses. The main settlement within the Plan study area is the small coastal town of Aldeburgh with the town centre being based on a medieval street pattern with a wide variety of attractive small buildings. Continued coastal erosion has reduced the extent of Aldeburgh and adjacent Slaughden over the years. North of Aldeburgh is the village of Thorpeness, a small seaside community which is protected from the sea by a line of sand dunes. The large village of Orford lies behind the shingle spit to the west of the river channel and the small village of Snape is situated at the head of the estuary.

Agriculture is the most common land use in Alde and Ore floodplain, with the majority of the agricultural land on the floodplain being reclaimed from the intertidal zone. Some of these areas have since returned to their former state, with more recently Lantern Marshes being returned to the sea.

The Agricultural Land Classification (ALC) provides a method for assessing the quality of farmland to enable informed decisions to be made about its future use within the planning system. ALC Grades 1, 2 and 3 are considered to be the 'best and most versatile land' by Planning Policy Statement 7. However the limitations of the free-draining acidic soils on the relatively higher land within the Plan study area gives rise to agricultural land of predominantly

Grade 4 quality which means that, without irrigation and drainage in the floodplain (the low lying marshes are pumped) the land is largely unproductive. Over the past 60 years, farmers in the study area have developed irrigation systems that abstract fresh water from the low-lying marshes round the estuary for use on the higher, sandy, arable land. This has enabled this inherently infertile arable land to grow high value vegetable, salad and potato crops. Farms in the study area have developed well-established links with the major supermarket chains for this produce. While more conventional commodity crop production could relocate to elsewhere in the UK, much of this high value production could not, and would therefore be substituted by imports. The protection of agricultural water supplies from saltwater contamination is a key local environmental factor that has been considered within the Plan.

Forestry

The main wooded area in the region is Tunstall Forest but this lies beyond the Plan study area. The largest forested area within the Plan study area is Black Heath, north of the estuary opposite Iken Cliffs. There are other scattered copses and a few small areas of ancient woodland including Carmen's Wood, Water Wood, Oak Wood, Boyton Wood and the tip of Sudbourne Park. These are either ancient and semi-natural or ancient replanted woodland and are important BAP habitats.

Tourism Promotion

The [Suffolk Coast Ltd Destination Management Organisation](#) (DMO) is a company limited by guarantee, formed in 2012, with the purpose of promoting the Suffolk Coast as a visitor destination following the demise of government funding for tourism promotion. Founding organisations include: Adnams PLC, Aldeburgh Music, Snape Maltings, Suffolk Coast & Heaths, Suffolk Secrets Ltd, TA Hotel Collection Ltd and Suffolk Coastal District Council. These organisations share the vision that, by working together, they can build a more compelling package of reasons for a visitor to choose the Suffolk Coast as a holiday destination.

Fisheries

The main species caught in the area are *Salmo trutta* (sea trout), *Dicentrarchus labrax* (sea bass), *Liza ramada* (grey mullet), *Solea solea* (common sole), *Pleuronectes platessa* (European plaice), *Rajidae spp.* (rays), *Limanda limanda* (dab), *Pleuronectes flesus* (common flounder), *Gadus morhua* (Atlantic cod), *Merlangius merlangus* (whiting), *Scyliorhinus canicula* (dogfish) and *Clupea harengus* (Atlantic herring) and *sprattus sprattus* (sprats), with *Crangon crangon* (brown shrimp) also being taken along the coast and from the estuary.

Butley Creek has been designated a Shellfish Water under the *Quality of Shellfish Waters Directive (2006/113/EC)* and is designated for both *Crassostrea gigas* (pacific oysters) and *Ostrea edulis* (native oysters) further downstream at the Butley Orford Oysterage.

Mineral Extraction

A variety of mineral resources is found within Suffolk. The most widespread is sand and gravel which is extracted for aggregate and exported to the continent for use in the construction industry. Previous activities in the area include extraction of shingle from Havergate Island in 1933 for a year and clay extraction at Boyton Marshes in the 17th and 18th Centuries.

Currently there are a number of planning permissions for the extraction of minerals within the Plan study area. These planning permissions represent areas where a commercial decision to work minerals has been made. These areas include:

- Aldeburgh Brickworks
- Aldeburgh Brickworks Sandpit
- Aldeburgh Marshes
- Gedgrave Hall Pit
- Neutral Farm
- Chillesford Claypit

Landfill Sites and Waste Management

The Environment Agency is the Waste Regulation Authority but Suffolk County Council is the Waste Planning Authority and the Waste Disposal Authority. The Plan's study area is covered by the Suffolk Waste Local Plan. There are no sites with a waste management licence within the study area (see Section 4.4.4 for historic landfill sites). Where appropriate, waste minimisation, management and use of recycled materials have been considered throughout the development of the Plan.

There are two small historic landfill sites on Aldeburgh Town Marshes which lie within the 100% APO indicative floodplain. One large site approximately 1km west of Thorpeness lies just outside of the 100% APO indicative floodplain but could be affected by a change in groundwater levels associated with inundation.

A historic Ordnance Survey (OS) map (1882) shows that a gas works was located to the east of the existing Anglian Water Services (AWS) Park Road Pumping Station (NGR 462562). Land contamination is likely to be associated with the by-products of gas manufacture e.g. ammoniacal liquor, coal tar, spent oxide and fowl lime.

Future Trends

Consultation with the Forestry Commission has indicated that coastal change is unlikely to have any direct effects on the majority of woodland within the Plan study area. However, there may be an exception in relation to a wooded area at the southern end of Gedgrave which has the potential to become more estuarine if encroaching tidal flows change in the River Ore and River Butley.

The Suffolk Minerals Local Plan identifies a proposed extension of a site that lies within the study area where Chillesford Clay is extracted to be used for brick making. The extension to the site will be two hectares with the after-use of the site being detailed as woodland/ nature conservation (Suffolk County Council, 1999).

Increasing waste production and decreasing landfill capacity makes waste management a major challenge within the Plan study area. There is also a growing awareness that waste minimisation, recycling, reuse and treatment needs to increase to lessen the burden on ever-diminishing landfill space. A new Waste Transfer Station at Foxhill Landfill Site has been given consent by councillors in Suffolk Coastal district which will significantly increase the capacity for recycling, diverting around 65,000 tonnes of waste away from landfill each year (Suffolk Coastal District Council, 2008c). Continuing population growth and plans to build more houses will further exacerbate this situation in future.

Archaeology & historic environment

Key Issues

- Potential for erosion and flooding to cause structural damage to Scheduled Monuments (SM).
- Listed Buildings are vulnerable to flooding and erosion.
- Maintaining and protecting sites of archaeological importance.

Historic and Cultural Associations

There is a long history of human occupation in the area. Agriculture was introduced in the Neolithic era (4600BC to 2700BC) when forests were cleared making way for the heathland which remains on the higher parts of the estuary today. The Romans arrived in the 1st Century AD and extended the agricultural land, laid roads and established settlements. During Roman times, the River Alde discharged into the sea at Fort Green. Salt has always been of importance to human survival and evidence from the Bronze Age onwards shows that groups have evaporated water from the Alde to produce salt and evidence remains of these salt pans (or 'redhill' sites) along the estuary (Environment Agency, 2005).

By the middle ages, Aldeburgh was an important centre for trade, shipbuilding and fishing and originally had a harbour on its northern side. Orford was also once a thriving port, however both Aldeburgh and Orford were eventually made redundant through shingle accretion and the growth of Orford Ness by the end of the 16th Century. Substantial reclamation was undertaken during the 17th Century and Martello Towers were constructed along the coast stretching from the most northern tower at Aldeburgh down to the South coast. The small hamlet of Slaughden that had a strong commercial connection to Aldeburgh was lost to the sea in the 1920s when a breach occurred in the shingle.

There are a number of historic features within the Plan study area including;

- Orford Castle, a 12th Century royal castle. Due to its position on high ground it is not within the tidal floodplain.
- Slaughden Martello Tower, a Napoleonic sea defence which has already suffered from active coastal erosion which has removed the seaward side of the outer defence.
- Orford Ness research establishment which developed radar during World War II and later was used for developmental work on the atomic bomb, presumably favoured as a location due to its remote and inaccessible nature. Two test laboratories known as 'Pagodas' and World War II bunkers remain as landmarks to this period.
- The lighthouse at Orford Ness built in 1792 by Lord Braybroke which, due to its position, is particularly vulnerable to coastal erosion.

An example of the area's cultural depth is the Aldeburgh citizenship of Benjamin Britten whose opera Peter Grimes is loosely based around the town. This inspired the Aldeburgh festival which is housed in and around the Snape Maltings concert hall, which provides a cultural and learning centre.

Cultural Heritage

There are no World Heritage Sites or historic battlefields within the Plan study area. Whilst there are no Registered Parks and Gardens within the Plan study area, Sudbourne Park (grid reference TM407513) is protected by local planning policy.

There are seven Scheduled Monuments within the Plan study area. A number of Scheduled Monuments have the potential to be affected by flooding due to sea level rise and increased

storminess. This is particularly evident with Slaughden Martello Tower where the defence has already been subject to coastal erosion which has removed the seaward side of the defence.

There are 145 listed buildings within the Plan study area ranging from Grade I (buildings of exceptional interest) to Grade II (buildings of special interest) which have been identified by English Heritage as buildings warranting every effort to preserve them.

There are five Conservation Areas within the Plan study area. See Section 4.9.1 for further information.

There are a large number of other Historic Environment Record (HER) sites within the Plan study area. Factors to be taken into consideration include the setting of the assets and accessibility of such sites.

Archaeology

The archaeological resource of the Suffolk estuaries is relatively unknown. Survey work from the Essex estuaries has shown that these settings have provided important areas for settlement and food gathering over the past 4000 years.

Rapid Coastal Zone Assessment Survey (RCZAS)

A RCZAS for the Suffolk Coast has been carried out from 1999-2007 by Suffolk County Council (Good & Plouviez, 2007).

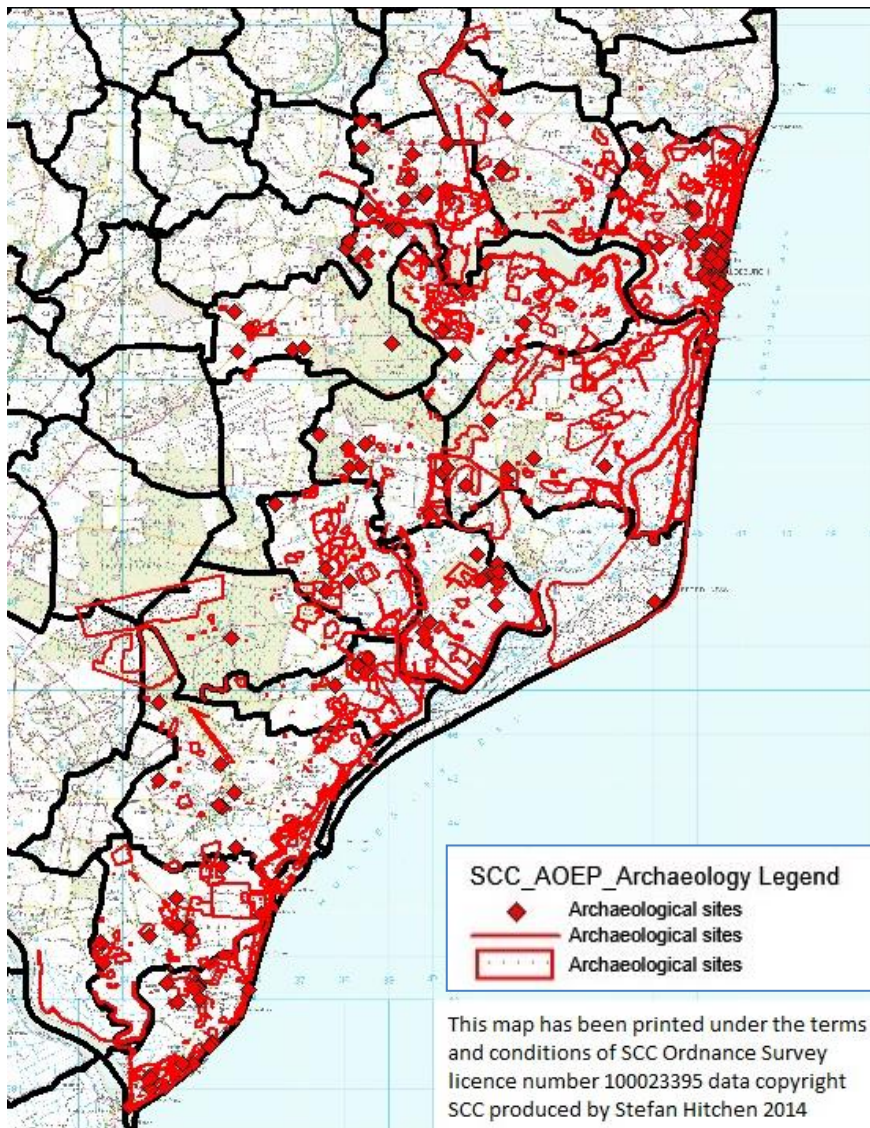
The total number of HER monuments in the Alde and Ore area were found to be 1,148, including 38 of high importance. The following features were mentioned as being of archaeological interest:

- four 'redhill' sites relating to Roman salt production in areas of Snape and Iken;
- two earth embankments in saltmarsh in Iken and Sudbourne;
- a suspected causeway between Snape or Friston and Iken;
- post alignments from old jetties and docks that appeared to be associated with riverside farms and houses;
- timber features with historic flood defence works;
- a brick World War II gun emplacement on a shoreline cliff;
- pottery scatters thought to be Roman identified in Snape and Iken.

Future Trends

Rivers, lake, wetlands and alluvium covered areas can be important in terms of archaeology and palaeoenvironmental remains because of potential for anaerobic conditions permitting the preservation of organic materials. Water levels may be critical to preserving remains as an increase may result in erosion and a decrease may lead to the loss of previously water logged deposits. Future changes in water levels may affect the preservation of certain important historic, cultural heritage and archaeological sites. These sites have been considered key receptors within the Plan study area.

Figure 23: Map of Archaeological sites



Landscape and Visual Amenity

Key issues

- Suffolk Coast and Heaths AONB Landscape Types and their special qualities are vulnerable to the effects of flooding and erosion.
- The historic landscape character of the heritage coast is vulnerable to the effects of flooding and erosion.
- Conservation Areas are vulnerable to the effects of flooding.

The Plan study area has been widened to form the landscape study area. The landscape study area was established by a desktop analysis of topography, woodland cover and an estimation of theoretical visual influence and intervisibility, i.e. areas of the wider landscape which are likely to, at this stage of the assessment work, have zones of sight to areas that may be affected by the range of potential options for managing flood risk and coastal erosion.

Statutory Landscape Designations

Suffolk Coast and Heaths AONB

The entire Plan study area falls within the Suffolk Coast and Heaths AONB which covers approximately 400 km². The primary aim of the designation is to conserve the special character of the area which is defined as 'its underlying geology, shaped by the effects of the sea and the interaction of people with the landscape' (Suffolk Coast and Heaths, 2008b)

A second Management Plan for the Suffolk Coast and Heaths AONB was published in 2008 for a five year period to 2013. It builds on the earlier plan, published in 2002. A total of 26 organisations have signed a commitment to implement the Plan and share a common vision for the long term care of the AONB. To meet the requirements of the vision, the Management Plan has 14 aims. The key aims relevant to this Plan are:

- Aim 2: Integrate planning and management of the coast and estuaries to meet AONB objectives so that all interests are recognised and the special qualities of the AONB are conserved.
- Aim 3: Conserve landscape character and enhance the distinctive nature of the AONB.
- Aim 4: Conserve biodiversity and lessen fragmentation of habitats.
- Aim 5: Conserve the historic resources of the area including landscapes, archaeology and the built environment.
- Aim 6: Manage farming and forestry in a sustainable way that enhances landscape and historic character, biodiversity and geodiversity.
- Aim 8: Conserve the geodiversity of the area.
- Aim 9: Have a built environment that reflects local character and is of a scale and form appropriate to the AONB.
- Aim 11: Have access and recreation provision that respects biodiversity, landscape, geodiversity and historic assets.

Conservation Areas

There are five Conservation Areas within the Plan study area. These include parts of Aldeburgh, Orford and Snape Maltings which are designated under the Planning (Listed Buildings and Conservation Areas) Act 1990 for their architectural and historic landscape character.

Ofgem the industry regulator has provided a budget of £5.6 million for the period 2010 - 2015 in the East of England. The AONBs and the Broads Authority will be working with UK Power Networks (who own the cables) and local communities to develop suitable undergrounding schemes. These will be vetted by a steering group using criteria designed

to ensure the work is achievable, cost-effective and has a positive impact on the landscape.

The AONB has already enabled high profile schemes at Blythburgh Marshes and Iken/Aldeburgh to demonstrate the potential of this new funding. At Blythburgh for example, with the support of the local community, up to 2km of overhead low voltage was 'under grounded', vastly improving the views across a highly protected landscape with important heritage and wildlife value.

To date approximately £2.36m of external funding has been or will be invested in the AONB to pay for schemes at Blythburgh, Iken/Aldeburgh, Chillesford, Shotley/Erwarton, Sutton Common and Shingle Street. ([Suffolk Coast and Heaths, 2014](#))

Suffolk Heritage Coast

The whole of the Alde –Ore study area has Suffolk Heritage Coast status, designated in 1973 to protect the coastline from undesirable development. It runs from Kessingland to Felixstowe and incorporates the Blyth, Deben and Lower Deben Estuaries. A Suffolk Heritage Coast Plan was adopted in 1978. However, its policies have been subsequently incorporated into the Suffolk Coast and Heaths AONB Management Plan.

Non Statutory Landscape Areas

Suffolk Heritage Coast

The Plan study area is included within the Suffolk Heritage Coast runs from Kessingland to Felixstowe and incorporates the Blyth, Alde and Ore and Lower Deben estuaries. Whilst there are no statutory requirements or powers associated with the Heritage Coast definition, the designation is recognition of scenic quality of a largely unspoilt nature and the need for these features to be safeguarded.

A Suffolk Heritage Coast Plan was adopted in 1978. However, its policies for the historic landscape character of the area were subsequently incorporated into the Suffolk Coast AONB Management Plan (see above) in 2002. The management plan therefore includes objectives, policies and actions that will be applied to the Heritage Coast.

Special Landscape Areas

A Special Landscape Area (SLA) is identified jointly by Suffolk County Council and the Borough/District Councils as an area within Suffolk with special landscape attributes that is particularly vulnerable to change.

The valleys and tributaries of the Rivers Alde, Ore and Butley are designated as Special Landscape Areas (SLA) in the Suffolk Coastal Local Plan. No development is permitted in these areas that will be to the material detriment of, or materially detract from, the special landscape quality, unless it is demonstrated that there is an overriding need for the development and no alternative sites can be found.

SLAs have been identified jointly by Suffolk County Council and the Borough/District Councils as other areas within Suffolk with special landscape attributes which are particularly vulnerable to change. Within the landscape study area there is one SLA in the upper valleys of the River Alde and the Hundred River. According to the Suffolk Coastal District Local Plan (Suffolk Coastal District Council, 2006), the vulnerability relates to the presence of '*traditional grazing meadows and marshes, with their hedgerows, dykes and associated flora and fauna and Historic Parklands*'.



Source: [Suffolk Coast and Heaths Project](#)

Garrett Era Area

Within Aldeburgh there is an additional area which is protected in from development by planning policy (in a similar way as Conservation Areas) known as the 'Garrett Era Area'. Its protection is more closely related to the need to discourage substantial enlargement of existing properties or sub-division of existing plots rather than simply important historic character. The aim of the designation has been taken into account in assessing the effect of any proposals within the Plan.

Landscape Character and Setting

National Characterisation

The Plan study area falls within the Suffolk Coast and Heaths Joint Character Area (JCA) which is described as being a '*tightly-knit*' mixture of landscape types created over many centuries by the interaction of natural processes and human activity.

Regional Characterisation

A 'Regional Landscape Typology' within an 'East of England Regional Landscape Framework' (Landscape East, 2009) has been produced to provide a level of detail greater than the national characterisation. This, therefore, has limited application but provides the SEA with additional perspective on the rarity and importance of some of the landscape types to the wider region.

County Characterisation

Suffolk County Council has defined a greater detail of 'landscape character typology' as part of its Landscape Character Assessment (Suffolk County Council, 2008e). The Landscape Character Types defined in the assessment have already been adopted by the Suffolk Coast and Heaths AONB Unit. Whilst the information upon each Landscape Character Type is informative, the level of characterisation has been investigated further at a local level.

Local Characterisation

The Suffolk Coast and Heaths AONB Management Plan (Suffolk Coast and Heaths, 2008b) used the Suffolk County Council Landscape Character Assessment to provide a more specific description of its own 'Landscape Character Types'. The Landscape Character Types featured within the Plan study area include:

- Sand dunes and shingle ridges
- Saltmarsh and intertidal flats
- Coastal levels
- Valley meadowlands
- Estate sandlands.

The special qualities, features of importance and other unique features formed by the close-knit inter-relationship of its constituent features have been taken into account during the assessment of effects of the Plan.

NE has recently produced landscape character area profiles – including one for the Suffolk coast. This is the link:

<http://publications.naturalengland.org.uk/publication/5626055104659456?category=587130>

As part of Natural England's responsibilities as set out in the Natural Environment White Paper, Biodiversity 2020 and the European Landscape Convention, Natural England are revising profiles for England's 159 National Character Areas (NCAs). These are areas that share similar landscape characteristics, and which follow natural lines in the landscape rather than administrative boundaries, making them a good decision-making framework for the natural environment.

NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and encourage broader partnership working through Local Nature Partnerships. The profiles will also help to inform choices about how land is managed and can change.

Each profile includes a description of the natural and cultural features that shape our landscapes, how the landscape has changed over time, the current key drivers for ongoing change, and a broad analysis of each area's characteristics and ecosystem services. Statements of Environmental Opportunity (SEOs) are suggested, which draw on this integrated information. The SEOs offer guidance on the critical issues, which could help to achieve sustainable growth and a more secure environmental future. NCA profiles are working documents which draw on current evidence and knowledge. Natural England aims to refresh and update them periodically as new information becomes available.

Future Trends

There are unlikely to be any changes to landscape related planning designations in the Plan study area in the near future. A review of Natural England's existing Landscape Character Assessments Guidance is currently underway which will ensure that the guidance reflects its current use, good practice and the European Landscape Convention.

The AONB Management Plan states that the AONB Unit would like to carry out a more detailed landscape character assessment of the AONB and review the Suffolk Country Council Historic Landscape Characterisation. It is uncertain when this work will be completed but it will be considered in the future reviews of the Plan.

There are no major developments currently proposed in the Plan study area that are likely to have an effect on the local visual amenity.

Air and Climate

Key issues

- Climate change is likely to lead to a decrease in rainfall.
- Storms and floods will be greater and more frequent in the future.

- Sea levels are likely to rise by 4mm per year until 2025.

The eastern part of East Anglia is very dry in comparison with the rest of England and Wales. This is due to the seasonally variable and west-east distribution of rainfall, resulting in the area receiving approximately two thirds of the national average. Suffolk has an annual yearly rainfall of 610mm of which approximately 460 mm is lost to evaporation. Continued low rainfall in eastern Suffolk will ultimately result in lower groundwater levels and lower flows in the rivers (Environment Agency, 2008a).

In relation to East Anglia as a whole, the Suffolk coast has relatively mild winters and cool summers because of its proximity to the sea.

Future Trends

Defra guidance on sea level rise suggests that the East of England will see a net rise of 4mm per year from now until 2025. This yearly average is likely to increase to a predicted 15mm per year from 2085 to 2115 (Defra, 2006). UK Climate Projections (UKCP09, 2009) shows a sea level rise from 1990 levels of between 37.3cm and 53.1cm at London by 2095. This will put added pressure on structures such as tidal defences as they will be subjected global sea levels. With higher sea levels, larger waves will also be able to get closer to the shore.

Also, climate change is expected to increase storminess. The onset of global warming has also led to predictions that the UK will experience wetter winters and drier summers as well as higher annual mean winter and summer temperatures. By the 2020s, temperatures across the Plan study area could rise by up to 1.5°C, while average summer rainfall may fall by up to 15% and average winter precipitation may increase by up to 10% (UKCP09, 2009).

Climate change predictions will be considered in the assessment of the flood and coastal erosion risk management options. The Plan has undertaken numerical modelling of options both with and without future climate change predictions using the latest Defra guidance (Defra, 2006). This has shown that the coastal frontage and Alde and Ore Estuary are sensitive to the effects of climate change. The results from modelling have informed the option selection process using both scenarios (with and without climate change) to ensure a robust recommendation is made.

Economy

According to Alde & Ore Local Economy Study February 2014, based on the total number of residential properties (7,585) and second homes (964) within the Alde-Ore local area the estimated total spend by home and second homeowners is £16 million and £1.6 million per year respectively. The estimated total visitor spend within the Alde-Ore local area by day and overnight visitors is £59 million and £17 million per year respectively, based on 280,000 day visitors per year (estimated as a proportion of the number of day visitors to the Suffolk Coast and Heaths Area of Outstanding Natural Beauty from URS, 2013) and 99,000 overnight visitors per year (estimated as a proportion of the number of overnight visitors to the Suffolk Coastal District from Visit England, 2011). A further £1.4 million per year is generated by yachting and sailing, and around £65,000 per year by wildfowling.

This gives a total annual spend of £96 million within the Alde-Ore local area by residents, visitors and recreational users.

Agriculture is also an important land use within the estuary that relies on freshwater being available for irrigation. The current value of agricultural output alone to the local economy is

estimated at £9-£12 million per year within the Alde-Ore local area (based on information from the East Suffolk Water Abstractions Group). Businesses in the Alde-Ore local area also play an important role in the local area economy supporting a large number of jobs, many of which rely on the revenue generated from tourism and recreation. Many of these businesses will benefit from some of the £96 million spent in the area each year¹; others will benefit from agricultural production in the area. However, it is important to recognise that detailed, area specific analysis of supply chain benefits and the associated value of employment have not been carried out as part of this study, though the value of these is likely to be significant.

The estuary and the environment of the Alde-Ore local area play a significant role in the reasons why residents choose to live in the area and in attracting visitors and recreational users to the area. The environment played an important role in sustaining their business, though it must be recognised that this is based on a small sample size (37 businesses) with a high probability of self-selection. The economic impacts of changes to the management of flood defences may be significant. There are a number of activities which rely on the estuary and the local environment, with residents, visitors and local businesses valuing the landscape characteristics and opportunities they provide.

Interactions Between the Above Receptors

SA/SEA provides the opportunity to identify cumulative (including synergistic, interactive, inter-related and antagonistic) effects which are not often available at the project specific level.

It is most effective to consider which environmental issues are likely to be susceptible to cumulative effects when establishing the environmental context. The Plan will give consideration to the following items during the assessment stage to ensure that the cumulative effects are considered throughout the Plan:

- Relevant information that is not limited to the Study Area's boundary.
- Relevant environmental issues, sensitive areas and vulnerable resources will be identified and assessed.
- Historic factors that are considered to be driving the trends for the future state of the environment will be considered.
- Relevant policies, actions or developments included in other plans or programmes that may occur at the same time or place to those being proposed in this Plan.

2.3 Key Sustainability Issues in Alde & Ore Estuary (Task A3)

As plan development process key issues were derived from the baseline data collection exercise and are result of output of different groups and workshops carried out by the Alde & Ore Estuary Partnership.

Table 18: Sustainability issues identified

Environmental Issues/Sustainability Objective	Implications for Alde and Ore Estuary	Plans and Programmes	Source
Water quality and resources	Implications to freshwater water dependant species from potential	SCC Preliminary Flood Risk	Alde & Ore Futures -

<p>(1.To maintain or improve quality of surface water and groundwater)</p> <p>(2.To maximise the efficient use of water)</p> <p>(3. To ensure compliance with the requirements of the WFD objectives)</p>	<p>changes in water levels, flow or water quality. Surface water quality is fairly good and estuarine water quality is very good. These are vulnerable to diffuse pollution from agricultural land that may be exacerbated by flooding. The study area is within a highly sensitive Groundwater Vulnerability Zone (GVZ). Changes in groundwater and surface water quality may affect potential abstraction uses including use for irrigation and public water supply. Consented discharge points are vulnerable to flooding and erosion. Boreholes that help to maintain salinity in the lagoons on Havergate Island are vulnerable to flooding. Predicted increases in population and tourism within the area will lead to increased pressure on water resources, meaning that efficiency measures are vital to secure adequate water supplies without affecting the environment.</p>	<p>Assessment Report 2011</p> <p>Water Framework Directive (England and Wales) Regulations 2000/60/EC.</p> <p>Groundwater Regulations 1998</p>	<p>Managing the Coast SEA Report - Environment Agency 2011</p> <p>Environment Agency State of Suffolk Report 2011</p> <p>Water Cycle Study Guidance – Environment Agency 2009</p> <p>Water Resources Strategy for England and Wales 2009 – Environment Agency</p>
<p>Soil</p> <p>(4.To maintain/improve soil quality/resource)</p>	<p>The limitations of the free-draining acidic soils on the relatively higher land within the Plan study area gives rise to agricultural land of predominantly Grade 4 quality which means that, without irrigation and drainage in the floodplain (the low lying marshes are pumped) the land is largely unproductive. To alleviate this problem, irrigation using water sourced from the grazing marshes on the valley floors has been utilised to make higher elevation land valuable for vegetable production and there are well established supply links between the farmers and major supermarket chains in this area. The protection of agricultural water supplies from saltwater contamination is a key local environmental factor that needs to be considered.</p>	<p>Defra Safeguarding our Soils, A Strategy for England, 2009</p>	<p>State of Suffolk Report 2011</p>

<p>Landscapes and townscapes</p> <p>(5.To maintain/improve the quality and local distinctiveness of landscapes/townscapes)</p>	<p>Suffolk Coast and Heaths AONB Landscape Types and their special qualities are vulnerable to the effects of flooding and erosion. The historic landscape character of the heritage coast is vulnerable to the effects of flooding and erosion. Conservation Areas are vulnerable to the effects of flooding.</p>		<p>Suffolk Coast & Heaths and Dedham Vale AONB Management Plan 2008</p> <p>CPRE studies into light pollution</p> <p>Alde & Ore Futures - Managing the Coast SEA Report - Environment Agency 2011</p>
<p>Contributions to climate change and vulnerability to climatic events</p> <p>(6. To adapt development to the impacts of climate change)</p> <p>(11. To minimise the risk of flooding on existing development and amenity)</p> <p>(12. To ensure that the risk of flooding to new and proposed development is minimised)</p>	<p>Nearly 16,000 people live in the area, nearly 450 are aged over 85 representing a significant issue for evacuation in the event of flooding. The remaining effective life (residual life) of the existing defences on the coast is estimated at 10-30 years, whereas within the estuary the estimated residual life values range from <2years to <10 years. Slaughden sea wall defences are a key concern as they were weakened by the 2013/4 storms and they are crucial to the continuation of the estuary in its current form as their failure would lead to a different outlet for the River Alde to the sea. The economy is relatively small and so sensitive to the effects of flooding and erosion. There is a risk to human life and health from flooding. Snape Maltings, a focal point for tourism, is vulnerable to flooding. Recreational assets including Public Rights of Way, sailing, golfing, fishing and bird watching are vulnerable to flooding and erosion. Climate change is likely to lead to a decrease in rainfall. Storms and floods will be greater and more frequent in the future. Sea levels are likely to rise by 4mm per year until 2025.</p>	<p>Defra Flood and Coastal Erosion Risk Management Appraisal Guidance (FCERMAG)</p> <p>SCC Preliminary Flood Risk Assessment Report 2011</p>	<p>Alde & Ore Futures - Managing the Coast SEA Report - Environment Agency 2011</p> <p>SCC Traffic monitoring Energy data from District Councils' Home Energy survey and DTi</p> <p>Environment Agency flood risk data</p>
<p>Biodiversity and geodiversity</p>	<p>If walls are maintained in situ sea level rise and resulting coastal squeeze will lead to a loss of coastal</p>		<p>Alde & Ore Futures - Managing the</p>

<p>(7. To maintain/improve geology and geomorphological processes of the Study Area)</p> <p>(8. To minimise disturbance in sensitive areas)</p> <p>(9. To protect and enhance biodiversity and geodiversity through Study Area)</p>	<p>intertidal habitat. Rising sea levels and resulting coastal squeeze caused by climate change, aggravated by the gradual sinking of the south east of the country caused by isostatic tilt of the UK mainland. Recreational pressures including erosion of saltmarsh through trampling or from boatwash. There is a range of international and national designated habitats and species (largely located below mean high water within the Alde and Ore Estuary which are dependent on the dynamic coastal and estuarine processes that maintain a habitat mosaic of intertidal mudflats and saltmarsh. The Plan study area includes species and habitats dependent on dynamic coast and estuary processes, whilst in other places species and habitats are dependent on more stable freshwater conditions. Maintaining and improving the integrity and conservation value of internationally and nationally designated nature conservation sites including the Alde, Ore and Butley Estuaries Special Area of Conservation (SAC), Orfordness-Shingle Street SAC, Alde-Ore Estuary Ramsar and Special Protection Area (SPA) and Sandlings Forest SPA. Protecting and maintaining viable populations of protected species and BAP species whose habitats may be hydrologically linked to coast and estuaries. Disturbance is one of the greatest threats to the estuary's value as an ecological asset.</p>		<p>Coast SEA Report - Environment Agency 2011</p> <p>Biodiversity Action Plans and Habitat Plans (Suffolk Biodiversity Partnership) <i>Suffolk's Environment</i> (annual) Natural England Suffolk Biological Records Centre (SBRC)</p>
<p>Historical and archaeological importance</p> <p>(10. To maintain and/or enhance the character of townscapes, cultural heritage and assets within Study Area)</p>	<p>Potential for erosion and flooding to cause structural damage to Scheduled Monuments (SM).</p> <p>Listed Buildings are vulnerable to flooding and erosion.</p> <p>Maintaining and protecting sites of archaeological importance.</p>		<p>Alde & Ore Futures - Managing the Coast SEA Report - Environment Agency 2011</p> <p>SCC Archaeology service</p>
<p>Social Issues</p>	<p>Implications for Suffolk</p>		

<p>Health (13. To maintain and improve recreation and amenity) (14. To protect and enhance human health and wellbeing)</p>	<p>Nearly 450 are aged over 85 representing a significant issue for evacuation in the event of flooding. There are no bus services on a Sunday limiting the possibility of encouraging visitors to use public transport to visit the area. There is an ageing population whose health would be sensitive to the effects of flooding and coastal erosion. There are a growing number of second homes. The local economy primarily consists of tourism, agriculture and fishing industries. The economy is relatively small and so sensitive to the effects of flooding and erosion. There is a risk to human life and health from flooding.</p>		<p>Alde & Ore Futures - Managing the Coast SEA Report - Environment Agency 2011</p>
<p>Economic Issues</p>	<p>Implications for Suffolk</p>		
<p>Patterns of movement (15. To ensure the potential economic impact of flooding on existing and future infrastructure is minimised) (16. To achieve sustainable levels of prosperity and economic growth throughout the Plan Area.) (17. To maintain/improve existing infrastructure)</p>	<p>The biggest social challenge to the Plan is going to be from increasing visitor numbers. Population in Suffolk is projected to increase by 11.6% (85,000) between 2012 and 2034 with over one third of this growth being in Ipswich and Suffolk Coastal, on the doorstep of the Alde and Ore. This is likely to put pressure on the key attractions at Snape, Orford and Aldeburgh, exacerbating parking issues, whilst the more remote areas are likely to be sought out by the active retired. Public access to the Alde-Ore estuary, the watercourse and associated recreational facilities provides benefits to the local population's health and supports the local tourist economy. The local economy primarily consists of tourism, agriculture and fishing industries. The economy is relatively small and so sensitive to the effects of flooding and erosion. Snape Maltings, a focal point for tourism, is vulnerable to flooding. Recreational assets including Public Rights of Way, sailing, golfing, fishing and bird watching are vulnerable to flooding and erosion.</p>	<p>Suffolk County Council, Local Transport Plan 2006-2011</p>	<p>Alde & Ore Futures - Managing the Coast SEA Report - Environment Agency 2011 Alde-Ore Local Economic Study 2014</p>

2.4 Developing the SA Framework (Task A4)

A total of 17 SA/SEA objectives have been derived for the assessment of the Estuary Plan (See Table 20). They are based on policy advice and guidance and related to the current state of the county. The information in relevant plans and documents was used as a qualitative data together with the baseline data, as quantitative information, to form the SA Framework with particular relevance to the Plan. Table 19 below shows the link between SEA Directive issues and SA objectives.

Table 19: Link between SEA Directive Issues and SA objectives

SEA Directive Issue	SEA/SA Objectives
Material Assets	1,2,3,10
Climatic Factors	6,11,12
Biodiversity	7,8,9
Fauna	7,8,9
Flora	7,8,9
Water	1,2,3
Soil	4
Air	Scoped out
Cultural heritage, including architectural and archaeological heritage	10
Landscape	5
Population	7
Human health	13,14

Table 20: SA/SEA Objectives, associated questions & indicators

SA/SEA objective	Questions	Related Data/ Potential Indicators
Environmental		
1. To maintain or improve quality of surface water and groundwater	<p>Will the Estuary Plan seek to sustain the highest water quality for the Estuary and its tributaries?</p> <p>Will the Estuary Plan have an adverse impact on water quantity?</p> <p>Will the Estuary Plan seek to prevent pollution from field run off or other sources?</p> <p>Is the Estuary Plan likely to change the general quality assessment grades of surface and ground water quality?</p>	<p>Water Framework Directive Baseline Data (Environment Agency)</p> <p>Water Resources Act 1991</p> <p>Groundwater Regulations 1998</p> <p>Surface water Quality Directive</p> <p>Land Drainage Act 1991</p>
2. To maximise the efficient use of water	<p>Will the Estuary Plan change potable and/or non-potable abstraction resources or disrupt aquifer continuity?</p>	<p>Water use figures from Anglian Water/Essex & Suffolk Water</p> <p>Resource availability status for units of groundwater in</p>

		Catchment abstraction Management Strategy Areas Groundwater Regulations 1998
3. To ensure compliance with the requirements of the WFD objectives	Are the Estuary Plan objectives and policies in conformity with the WFD objectives?	Water Framework Directive (2003)
4. To maintain/improve soil quality/resources	Will the Estuary Plan change the extent, quality, structure of the soil resource?	Map/data showing soil quality Area/number of incidences where Grade 1,2 or 3 soil is lost due to need for flood defence
5. To maintain/ improve the quality and local distinctiveness of landscapes/ townscapes	Will the Estuary Plan adversely affect the landscape in AONBs and SLAs? Will the Estuary Plan adversely affect characteristic landscape features? Does the Estuary Plan follow guidelines set out in the Suffolk Coast & Heaths Area of Outstanding Natural Beauty Management Plan? Does the Estuary Plan contribute to the development and articulation of the concept of Tranquillity as an important part of the character of the area? Does the Estuary Plan create opportunities to co-ordinate environmentally sympathetic management of land across several adjacent land holdings? Does the Estuary Plan takes into consideration findings of the National Landscape Character Area Profile 82. Suffolk Coast and Heaths?	Changes in landscape (Landscape Character Assessment) Area of designated landscape (SLAs & AONBs) Number of proposed and actual flood mitigation developments to be located within landscapes with a high sensitivity.
6. To adapt development to the impacts of climate change	What potential impact will the Estuary Plan have on the county's vulnerability to the impacts of climate change?	Floodplains and the developments occurring within under climate change scenarios.
7. To maintain/improve geology and geomorphological processes of the Study Area	Does the Estuary Plan change the conservation value of key geological or geomorphological features? Does the Estuary Plan provide a pathway from a source of contaminated land to a receptor within the Study Area? Will the Estuary Plan contribute to coastal squeeze? Does the Estuary Plan seek to reduce the saltmarsh loss? Does the Estuary Plan promote habitats recreation?	Condition and processes of geological and geomorphological sites. Extent of and SoP of agricultural land and contaminated land.

<p>8. To minimise disturbance in sensitive areas</p>	<p>Does the Estuary Plan seek to research and monitor the reasons and consequences of disturbance, land based, water based, and aerial? Does the Estuary Plan prevent/restrict disturbance to identified roosting area and other important areas for wildlife in conformity with the Ornithological Importance and Status for Waterbirds Report at 2013 by ELAC? Does the Estuary Plan seek to prevent and exert greater management of inappropriate activities that create unacceptable levels of disturbance in sensitive areas? Does the Estuary Plan seek to manage and monitor recreational activity? Does the Estuary Plan seek to reduce light pollution? Does the Estuary Plan achieve environmental gain when work is undertaken on flood defences? Does the Estuary Plan seek co-ordinated, well-timed work on walls which minimises impact on wildlife? Will the Estuary Plan result in impacts on geological SSSI?</p>	<p>Species Action Plan((progress towards achievement) Development proposals affecting BAP habitats and geodiversity sites outside protected areas</p>
<p>9. To protect and enhance biodiversity and geodiversity thought Study Area</p>	<p>Will the Estuary Plan protect and/or enhance statutory/non-statutory designated sites? Will the Estuary Plan protect and /or enhance local BAP species and BAP habitats (saltmarsh, mudflats)? Will there be enhancement opportunities for biodiversity and geodiversity as a result of the Estuary Plan? Will there be improvement of the wider environment (i.e non-designated sites)? Does it change aquatic habitat quality, quantity and structure: fish movements; watercourse connectivity or spawning areas, extent of non-native species, dredging activities?</p>	<p>Changes in number and condition of designated ecological/geodiversity sites Reported condition of ecological and geodiversity SSSIs Habitat Action Plan targets (progress towards achievement) Species Action Plan((progress towards achievement) Development proposals affecting BAP habitats and geodiversity sites outside protected areas Chemical and ecological condition of rivers Requirements for habitat compensation arising out of the Estuary Plan. Fluvial and Estuarine waster quality and quantity. Fish movement and migration. Riverine and Estuarine flow</p>

		regime. Natural England PSA 28
10. To maintain and/or enhance the character of townscapes, cultural heritage and assets within Study Area	Does the Estuary Plan have an adverse impact on local historic assets, historic buildings and archaeological Deposits? Does it change the condition of known or potential archaeological monuments and/or the ability to record unknown buried archaeology?	Number of listed buildings at risk of flooding events. Area of historic parks & gardens. Size, condition and number of Conservation Areas Buried archaeology as listed in NMR or HER. Areas of significant archaeological and palaeo-environmental potential.
Social		
11. To minimise the risk of flooding on existing development and amenity	Do the Estuary Plan proposals change the flood risk to people and property or affect human health?	Standards of Protection (SoP). Area and number of recreational amenity facilities affected by flooding Number of developments permitted contrary to EA advice Number of properties and businesses at risk of flooding.
12. To ensure that the risk of flooding to new and proposed development is minimised	Do the Estuary Plan proposals change the flood risk to new and proposed development?	Standards of Protection (SoP). Area and number of recreational amenity facilities affected by flooding Number of developments permitted contrary to EA advice Number of properties and businesses at risk of flooding.
13. To maintain and improve recreation and amenity	Does the Estuary Plan promotes new location, extent or access to Public Rights of Way, navigation or resources for recreation, sport and open space?	Length of Public Rights of Way Length of navigable river Yacht/Sailing/Canoeing Clubs Moorings Landing areas Access to beach (for fishing, open space) Golf courses Play spaces Picnic sites Safety of navigation
14. To protect and enhance human health	Will the Estuary Plan have an adverse impact on human health?	Standards of Protection (SoP).

and wellbeing	<p>Will the Estuary Plan impact on the quality and quantity of footpaths? Will the Estuary Plan seek to preserve areas with an amenity use? Does the Estuary Plan change the flood risk to people and property or affect human health?</p>	<p>Area and number of recreational amenity facilities affected by flooding Number of developments permitted contrary to EA advice Number of properties and businesses at risk of flooding.</p>
Economic		
15. To ensure the potential economic impact of flooding on existing and future infrastructure is minimised	<p>Does the Estuary Plan reduce the flood risk to activities that produce or distribute goods or services?</p>	<p>Economic cost of flood damage. Industrial and commercial assets.</p>
16. To achieve sustainable levels of prosperity and economic growth throughout the Plan Area.	<p>Will the Estuary Plan improve the resilience of business and the economy? Will the Estuary Plan promote growth in key sectors? Will it encourage rural diversification? Will the Estuary Plan encourage inward investment?</p>	<p>Business starts ups and closures. Number and percentage of businesses by industry type in key sectors. Employment permissions and allocations in rural areas. Number of enquiries to business advice services from outside of area.</p>
17. To maintain/improve existing infrastructure	<p>Does the Estuary Plan change the flood or erosion risk to key services, utilities or transport infrastructure? Does it minimise the use of virgin materials and allow for the use of local, reused or recycled materials? Does it change the ability to extract and distribute minerals?</p>	<p>Communications links, utilities and transport infrastructure routes. Use of local materials, Use of low embedded energy materials. Mineral Resources identified Suffolk Minerals Core Strategy.</p>

3. Remaining Stages of the SA/SEA

3.1 Identifying options, choosing preferred options and proposing measures to mitigate (Stage B)

The Estuary Plan options will be informed by the problems that Alde and Ore Estuary face and which have been mentioned, as well as comments from consultees. The SA/SEA of the Plan will appraise the individual policies, objectives and strategies against the SA/SEA objectives outlined in the SEA Framework to assess the environmental, social and economic effects of the implementation of the Plan.

An example of how the table for Sustainability Appraisals of the Estuary Plan document will look like is shown in Table 21 below. Impacts will be commented on, and mitigation measures for such impacts are proposed, whether that is through rewording of the policy or mitigation by using other policies in the Estuary Plan.

Compatibility testing of Strategic Plan Objectives against the SA/SEA Objectives

The SA/SEA will show a test of the aims and objectives of the Estuary Plan against the SA/SEA Objectives. The assessments will be based on a symbol based system which indicates the degree of compatibility between SA/SEA Objectives and objectives of the Estuary Plan.

Key

	Compatible
	Neutral
	Incompatible

Predicting the effects of Policy Options and the proposed against the SA/SEA Objectives

Testing the policy options against the 17 SA/SEA Objectives uses symbol based scoring system and provides a brief commentary explaining and expanding on the scoring. Effects are examined in terms of the short, medium and long-term.

Key

++	Very positive effect
+	Positive effect
0	Neutral effect
-	Negative effect
--	Very negative effect
?	Uncertain

Table 21: Estuary Plan assessment template

Policy	Option			Option				
SA Objectives	Short term	Medium term	Long term	Comments	Short term	Medium term	Long term	Comments
1. To maintain or improve quality of surface water and groundwater								
2. To maximise the efficient use of water								

3.2 Proposed Structure of the SA/SEA Environmental Report

Next steps of the SA/SEA process are detailed below. Responses received as a result of consultation on Scoping SA/SEA Report for Estuary Plan will be incorporated into the draft Environmental Report. The possible structure and contents of the Environmental report are presented below:

Structure of report	Information to include
Non-technical summary	<ul style="list-style-type: none"> • Summary of the SA/SEA process • Summary of the likely significant effects of the plan • How to comment on the report
Methodology used	<ul style="list-style-type: none"> • Approach adopted in the SA/SEA • Who was consulted, and when • Difficulties encountered in compiling information or carrying out the assessment
Background	<ul style="list-style-type: none"> • Purpose of the SA/SEA • Objectives of the plan
SA/SEA objectives, baseline and context	<ul style="list-style-type: none"> • Relationship with other policies, plans and programmes and environmental protection objectives • Environmental, social and economic baseline characteristics • Key environmental, social and economic issues and problems identified • Limitation of the data • SA/SEA objectives, targets and indicators

Plan issues and options	<ul style="list-style-type: none"> • Main strategic options considered • Comparison of the significant environmental, social and economic effects of the options • The preferred option and explanation of choice
Plan policies	<ul style="list-style-type: none"> • Significant environmental effects of the policies and proposals
Conclusions and recommendations	<ul style="list-style-type: none"> • Significant, secondary, cumulative and synergistic effects • Proposed mitigation measures • Monitoring suggestions

3.3 Preparing the SA/SEA Report (Stage C)

- The Sustainability Report incorporating the requirements of the SA/SEA for Estuary Plan will summarise:
 - The findings of the scoping stage;
 - How the environmental issues raised were taken into account when choosing the preferred options and developing the documents;
 - Other options considered and why they were rejected;
- Significant effects of the Estuary Plan as whole documents as well as each individual policies on the study area;
 - Links to other relevant documents;
- Proposed monitoring of the significant impacts of the Estuary Plan.

3.4 Consulting on the preferred options of the Estuary Plan document and SA/SEA Reports (Stage D)

- The SA/SEA Report will be made available for consultation alongside the consultation draft Estuary Plan document in July 2015. Comments from the consultees and the public will form part of the Submission version of the Estuary Plan and aid in preparing the final Sustainability Appraisal Report.
- This Scoping Report is a subject to a 6 week consultation period and has been submitted to the 4 statutory consultation bodies with environmental responsibilities:
 - Environment Agency
 - Natural England
 - Historic England
 - Marine Management Organisation (MMO)

3.5 Monitoring effects of implementation of the Estuary Plan document (Stage E)

- The policies and objectives that have been devised, selected and assessed and refined as a result of assessments and consultation representations will be monitored. Monitoring, reviewing and updating the Estuary Plan will be essential

both to ensure it continues to be 'fit for purpose' but also as a way of demonstrating success in delivering reduced flood risks to the people in the Study Area.

Glossary of Terms

TERM	DEFINITION
Abstraction	Removal water from surface or groundwater.
Air Quality Management Area (AQMA)	This is an area in which the National Air Quality objectives are not likely to be achieved.
Alluvium	Soil or sediment, commonly composed of sands and gravels, transported and sited by a river or other flowing water.
Area of Outstanding Natural Beauty (AONB)	A statutory landscape designation, which recognises that a particular landscape is of national importance.
Aquifer	A water bearing bed of strata, either by virtue of its porosity or because it is pervious.
Baseline Data	Data collected to determine the 'baseline' or 'existing' conditions.
Biodiversity	Genetically determined variability amongst living organisms, including the variability within species, between species, and of ecosystems.
Catchment	The total area from which a single river collects surface run-off.
Coastal Squeeze	The process by which coastal habitats and natural features are progressively lost or drowned, caught between coastal defences and rising sea levels.
Conservation Area	An area of particular architectural or historic interest, the character or overall appearance of which it is desirable to preserve or enhance. Conservation area consent is required for demolitions of unlisted buildings in conservation areas (sec 69 and 70), Town and Country Planning [Listed Buildings and Conservation Areas] Act 1990.
Environment	Where environmental issues are referred to, this term is used to encompass landscape/natural beauty, flora, fauna, geological or geomorphological features and buildings, sites and objects of archaeological, architectural or historical interest.
Environmental Assessment	A systematic study which identifies and predicts the effects on the bio-geophysical, social and economic environment of a project.
Flooding	Refers to inundation by water whether this is caused by breaches, overtopping of banks or defences, or by inadequate or slow drainage of rainfall or underlying ground water levels.
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.
General Quality Assessment (GQA)	Used by the Environment Agency to measure and monitor aspects of water quality in rivers and canals in England and Wales.
Geology	The study of the Earth's history, structure and composition.
Geomorphology	The study of landforms, including their origin and evolution, and the processes that shape them.
Groundwater	Water contained in the void spaces in pervious rocks and also within soil.
Habitat	A place where an organism lives; a type of environment inhabited by a particular species and/or communities; often characterised by dominant plant forms, physical characters, or a combination of these.
Hydrogeology	Branch of geology concerned with water within the earth's crust.
Hydrology	The study of water and its dynamics.
Invertebrates	Animals without a backbone e.g. insects, worms and spiders.
Landscape Character	The distinct pattern and arrangement of landscape elements or features that collectively create a sense of place.
Magnitude	A combination of the nature, size, extent and duration of an effect.

Main River	Designated under the Water Resources Act 1991 by the Ministry of Agriculture, Fisheries and Food (now the Department for Food and Rural Affairs). Formal consent is required for all activities that interfere with the bed or banks of the river or obstruct the flow.
Mitigation	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.
Minerotrophic.	Minerotrophic refers to soils and vegetation whose water supply comes mainly from streams or springs. This water has flowed over or through rocks or other minerals, often acquiring dissolved chemicals which raise the nutrient levels and reduce the acidity.
Natural	Encompasses both the small number of natural areas and the much greater semi-natural areas of Britain which have been influenced by humans over the years. It is also applied to those processes over which humans have no significant control, e.g. wind, waves, sediment transport etc.
Nitrate Vulnerability Zones (NVZs)	This is an area of surface water or groundwater that has, or is at risk of having a high nitrate concentration.
No active intervention	A —without project case where there is no flood or coastal defence activity. The effects of doing nothing should be costed in a project appraisal as a basis for comparison with schemes involving some investment.
Operating Authorities	A body with statutory powers to undertake flood defence or coast protection activities, usually the Environment Agency, Internal Drainage Board or Local Authority.
Ordnance Datum (OD)	Land levels are measured relative to the average sea level at Newlyn in Cornwall. This average level is referred to as 'Ordnance Datum.' Contours on Ordnance Survey maps of the UK show heights in metres above Ordnance Datum.
Plan	A purposeful, forward looking framework or design, often with co-ordinated priorities, options and measures, that elaborates on and implements policy e.g. Shoreline Management Plans
Policy	A general course of action or proposed overall direction that an organisation is, or will be, pursuing and which guides ongoing decision making.
Potable Water	Water suitable for human consumption.
Ramsar Site	Internationally important wetland identified for conservation under the Ramsar convention (1971).
Receptor	Any component of the natural or man-made environment that is potentially affected by an impact from a development
Run-Off	Water leaving a river catchment. Normally regarded as rainfall minus evapotranspiration (evaporation and the loss of water by plants) but commonly used to mean rainwater flowing across the land.
Scoping	Determines all of a proposal's possible impacts to address those that are significant.
Screening	Focuses on proposals with potential significant adverse environmental impacts or with impacts not fully known to eliminate those proposals.
Site of Special Scientific Interest (SSSI)	An area of land of special interest by reason of its flora, fauna, geology or geographical features notified under Section 28 of the Wildlife and Countryside Act 1981.
Source Protection Zone (SPZ)	A Source Protection Zone is the area over which recharge is captured by an abstraction borehole. SPZs are designated by the Environment Agency and are delineated to protect potable supplies against the polluting effects of human activity.
Special Area Conservation (SAC)	Special Area of Conservation as designated under the EU Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.
TERM	DEFINITION
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.
Surface Water	General term used to describe all the water features such as rivers, streams, springs, ponds and lakes.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.' (WCED, 1987).
Topography	The physical features or configuration of a land surface.
Wetlands	Areas where the water table is either seasonally or permanently high. They naturally occur in river valleys where drainage is impeded either by topography or soil structure and they can be entirely natural or man made. Wetlands may be used for agriculture, forestry or amenity purposes that can tolerate intermittent

	high water tables. An area could be both a washland and a wetland, these are not mutually exclusive terms.
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Appendices

Appendix 1: Figure of flood cells and coastal study units – Source EA 2011 Appendix A Technical Appraisal Report



Appendix 2: Alde/Ore Estuaries Hinterland 2010-12 Survey

1.1 Table taken from SWT Ecological Assessment 2012 by compartment and key

1.2 Map of compartments (as above)

	BAP	BoCC	A	B	E	F	G	H			
Lapwing						2N	8N				
Common Redshank				2		2pr	2	2pr			
Cuckoo					1T	2S		1S			
Skyllark					8T	4T	1T	6T			
Yellow Wagtail								1s			
Dunnoek								B			
Common Starling			P	P		P					
Linnet				4pr		14pr	4pr	4pr			
Reed Bunting				2t	8fl	2t	3T	4t			

	BAP	BoCC	I	J	K1	K2	L	M	N		
Garganey			2pr								
Marsh Harrier			2pr			1	1	2N			
Lapwing			17pr			1		10D			
Common Redshank			6pr			1pr			1		
Turtle Dove			2pr								
Cuckoo					1S				1S		
Barn Owl			P								
Skyllark			4S		8T	9T	3T		10T		
Yellow Wagtail			10M		3T			5T	8N		
Dunnoek							B				
Song Thrush				B							
Common Starling			3						P		
House Sparrow									P		
Linnet					6pr	3pr	4pr	2pr	4pr		
Reed Bunting			3T		4T	11T	1S	6T	2pr		

	BAP	BoCC	P	Q	R	S	T	U	V	W	X
Grey Partridge			*1								
Bittern										1pr	
Avocet							12			7pr	
Lapwing							37pr			6pr	
Common Redshank							4	2pr		4pr	
Barn Owl					B	B	B			B	B
Cuckoo						B					
Skyllark			8T	2T	5T	2T	8T	c20T		7pr	3T
Dunnoek			B	B	B	B	B	B			B
Bearded Tit						B	6pr		B	12pr	P
Song Thrush					B	B	B	B			
Common Starling			P	P	P	P		P			
House Sparrow				P	P		P		P		P
Linnet				1pr		1pr		3pr		4pr	2pr
Reed Bunting			3T		3T	10T	8T	1T	2T	8pr	1T

Key

Non-breeder
F Flying over

Possible breeder
H Observed in suitable Habitat

M Migrant

S Singing male

U Summering non-breeder

P Present

Probable breeder

Pr Pair

T Permanent Territory (defended over at least one week)

D Courtship and Display

N Visiting probable Nest site

A Agitated behaviour

I Brood patch of Incubating bird (from bird in the hand)

B Nest Building or excavating nest hole

Confirmed breeder

DD Distraction-Display or injury feigning

UN Used Nest or eggshells found from this season

FL Recently FLedged young or downy young

ON Adults entering or leaving nest-site in circumstances indicating Occupied Nest

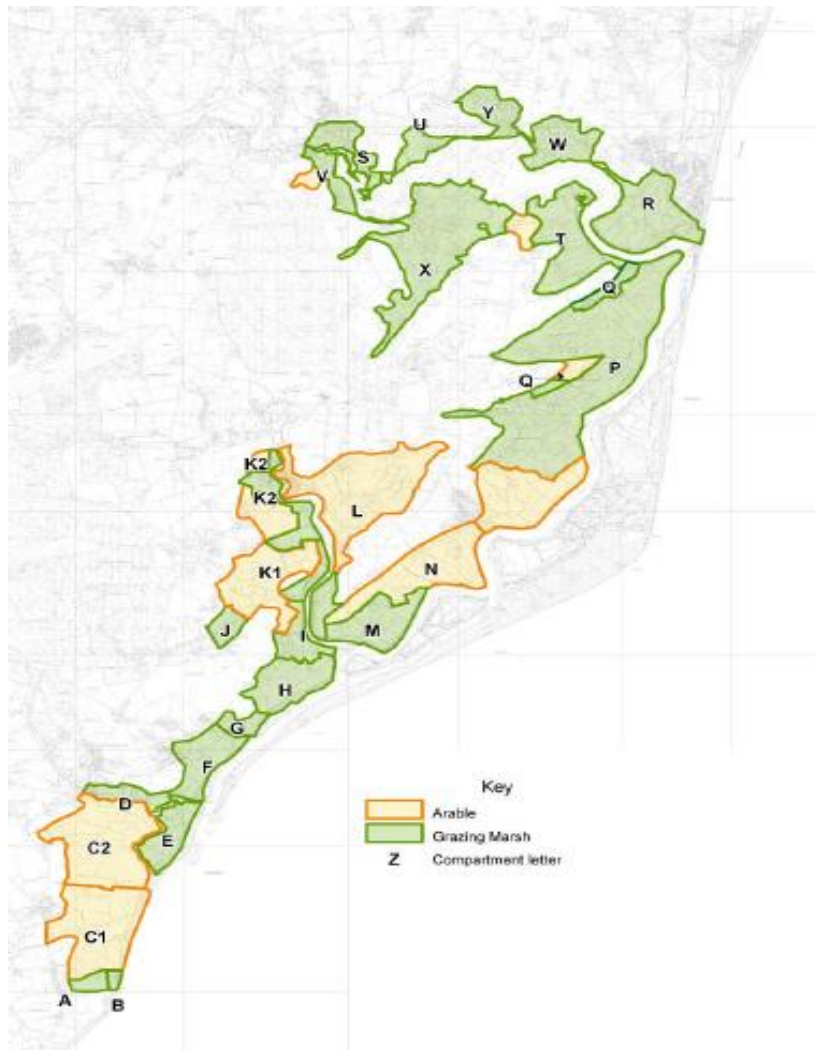
FF Adult carrying Faecal sac or Food for young

NE Nest containing Eggs

NY Nest with Young seen or heard

* Unconfirmed record

1.2 Compartments (The scale means that the habitat classifications are approximate)



Note: Correction – area L is a grazing marsh now.