



## **Addendum to the Essex and South Suffolk Second Generation Shoreline Management Plan**

September 2012

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## 1. Introduction

Since the finalisation of the second generation Essex and South Suffolk Shoreline Management Plan (SMP2) (Environment Agency, 2010), new information about saltmarsh<sup>1</sup> habitat change has been published. This information updates our understanding of saltmarsh habitat change expected within the Essex and South Suffolk SMP2 area.

This addendum updates the saltmarsh habitat change figures documented within the SMP2 document and associated Appendices B-F and I. This addendum also seeks to give reassurance following further feedback about managed realignment policies

## 2. Changes in saltmarsh habitat

The Habitats Regulations Assessment (HRA) for the SMP, and subsequent Statement of Case for Imperative Reasons of Overriding Public Interest (IROPI), have already been updated and were based on this new information. These documents have been signed off by the Secretary of State.

During the production of the SMP2 document, it was thought that the saltmarsh habitat within the SMP2 area, was being lost quite rapidly. This assumption was based on data provided in the Cooper *et al.* (2000) report for the period 1988-1998, which identified an amount of around 45 hectares per year loss for the SMP2 area.

The new information on saltmarsh habitat change reported by the Institute of Estuarine and Coastal Studies, University of Hull (IECS, 2011) on behalf of Natural England, and by the Environment Agency (2011), show that the amount of loss is less than previously thought: these reports calculated that the amount of loss expected in the SMP2 area is approximately 0.9 hectares per year<sup>2</sup>. A breakdown of this figure, per Site of Special Scientific Interest (SSSI) within each estuary is shown in Table 1.

It is important that the SMP2 uses the most up-to-date information about saltmarsh change, to inform flood and coastal risk management decision making. This approach has been agreed with Natural England and with the Secretary of State through approval of the HRA and Statement of Case for IROPI. However, as there have been such large differences in the amount of saltmarsh reported to have been lost, this information should be treated with caution. Monitoring of how the coast is changing will be undertaken as part of the SMP2, to check the amount of saltmarsh being lost, with appropriate steps being taken to offset any changes should loss figures not be in accordance with those anticipated.

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<sup>1</sup> Saltmarsh habitat is a muddy shore with vegetation growing on it.

<sup>2</sup> Note that this amount of loss excludes the area included in the Benfleet and Southend Marshes Site of Special Scientific Interest (SSSI). Although partly within the area covered by this SMP2, the Environment Agency Thames Estuary 2100 project has taken responsibility for the changes to saltmarsh in the Benfleet and Southend Marshes SSSI.

Table 1: Saltmarsh change rates

SSSI	Annual derived rate of change (ha/yr)
Stour and Orwell	+1.34 <sup>a</sup>
Hamford Water	+0.30 <sup>b</sup>
Colne Estuary	-0.62 <sup>b</sup>
Blackwater Estuary	-0.13 <sup>b</sup>
Dengie Peninsula	-1.42 <sup>b</sup>
Crouch and Roach	+0.52 <sup>b</sup>
Foulness	-0.85 <sup>b</sup>
<b>Total considered within this SMP2 (excluding Benfleet and Southend Marshes<sup>2</sup> which has a rate of change of +1.09ha/y<sup>b</sup>)</b>	<b>-0.86</b>

Data from Environment Agency (2011, Table 4.2)<sup>a</sup> and IECS (2011; Table 10)<sup>b</sup>

Table 2 presents text from the SMP2 document (Environment Agency, 2010) that requires updating in line with the new information on saltmarsh habitat change, and indicates the revised text that supersedes this original text.

Table 2: Current text from the SMP2 document (Environment Agency, 2010) and the revised text in line with the new saltmarsh habitat change data

SMP Document	Section Title	Section Number	Page	Para	Current Text	Revised text in line with the updated saltmarsh data
Main Document	Key Processes	2.1.2	43	4	The Stour and Orwell, the Colne and the Roach and Crouch estuaries show similar behaviour with an overall loss of saltmarsh area. Those estuaries are confined by geology and flood defences that limit the landward evolution of intertidal areas. The waves and tidal flows cause erosion of the seaward edge of the intertidal areas. However, the intertidal areas are growing at the inner estuaries. The Blackwater estuary (Figure 2-2) and Hamford Water are less constrained, but they show the same trends of overall saltmarsh loss and growth of the inner estuary creeks.	The Stour and Orwell, the Colne and the Roach and Crouch estuaries show similar behaviour with accretion and erosion of saltmarsh taking place in different parts of the estuaries. Those estuaries are confined by geology and flood defences that limit the landward evolution of intertidal areas. The waves and tidal flows locally cause erosion of the seaward edge of the intertidal areas, while other intertidal areas are growing at the inner estuaries and well established saltmarshes. The Blackwater estuary (Figure 2-2) and Hamford Water are less constrained, but they show the same trends - areas of erosion and areas of accretion of saltmarsh within the estuaries.

SMP Document	Section Title	Section Number	Page	Para	Current Text	Revised text in line with the updated saltmarsh data
Main Document	Contemporary processes and geomorphology	2.1.5	49	4	A general conclusion is that the Essex and South Suffolk estuaries are generally losing saltmarsh. Data on mudflat losses and gains is inconclusive; however, the Coastal Trend Analysis report suggests that mudflats are accreting at Dengie and Foulness. Table 2-1 lists the average loss of saltmarsh per year based on available assessments.	A general conclusion is that the Essex and South Suffolk estuaries were generally losing saltmarsh up to around 2000, but the picture since then has become more mixed: saltmarshes are eroding in areas under pressure by the coastal processes and accreting in others, with a small overall loss across the SMP area. Data on mudflat losses and gains is inconclusive; however, the Coastal Trend Analysis report suggests that mudflats are accreting at Dengie and Foulness. Table 2-1 lists the average loss and gain of saltmarsh per year based on available assessments.
Main Document	Contemporary processes and geomorphology	2.1.5	49	5	<ul style="list-style-type: none"> <li>• these are measured loss rates, which may not all have been caused by coastal squeeze or the presence of defences;</li> <li>• some more recent data show different trends (but these are difficult to quantify); this means there is large uncertainty;</li> <li>• the data are based on the area within the designated Special Protection Areas (SPAs); there are no quantitative data for Foulness.</li> </ul>	<ul style="list-style-type: none"> <li>• the loss rates may not all have been caused by coastal squeeze or the presence of defences;</li> <li>• within individual estuaries there are areas of accretion and areas of erosion; any erosion of saltmarsh is a concern;</li> <li>• the data is based on the area within the designated Sites of Special Scientific Interest (SSSIs).</li> </ul>

<b>SMP Document</b>	<b>Section Title</b>	<b>Section Number</b>	<b>Page</b>	<b>Para</b>	<b>Current Text</b>	<b>Revised text in line with the updated saltmarsh data</b>
Main Document	Contemporary processes and geomorphology	2.1.5	50	1	The majority of these figures are taken from the saltmarsh surveys completed in the 1970s, 1980s and 1990s which were conducted over number of years. This is currently the best available data regarding saltmarsh losses. Natural England began a new survey into saltmarsh extent in Essex during SMP development. When the results become available early in 2011 they will provide a new baseline for further intertidal habitat monitoring as set out in the Action Plan. Any new data will be shared with stakeholders and will feed into further decision making following completion of the SMP.	The majority of these figures are taken from the recently completed work surveying changes in saltmarsh extent along the Essex coast covering the decade from the late 1990s (IECS 2011). The Stour and Orwell estuaries figures are derived from recent Environment Agency work (2011). These recent studies, carried out during SMP development, provide a new baseline for further intertidal habitat monitoring as set out in the Action Plan. This new data has been shared with stakeholders and will be fed into further decision making following completion of the SMP.
Main Document	Contemporary processes and geomorphology	2.1.5	50	2	Table 2-1 Saltmarsh erosion rates based on monitoring (from Essex CHaMPS, 2003)	Table 1 of the Addendum Note: Saltmarsh change rates (ICES, 2011 and Environment Agency, 2011).

SMP Document	Section Title	Section Number	Page	Para	Current Text	Revised text in line with the updated saltmarsh data
Main Document	Future External Development	2.1.7	57	1	As described in section 2.1.5, the evolution of the intertidal area in the coming years is an important driver for shoreline management. The Coastal Habitat Management Plans (the Essex CHaMP from 2003, the Suffolk CHaMP from 2003 and the Thames Estuary CHaMP from 2008) contain predictions of saltmarsh evolution up to 2050, based on a range of techniques.	As described in section 2.1.5, the evolution of the intertidal area in the coming years is an important driver for shoreline management. The Coastal Habitat Management Plans (the Essex CHaMP from 2003, the Suffolk CHaMP from 2003 and the Thames Estuary CHaMP from 2008) contain predictions of saltmarsh evolution up to 2050. These predictions were based on rates of saltmarsh loss available at the time. Recent data (ICES 2011), show lower erosion rates and local accretion; this highlights the uncertainty around predicting future trends.
Main Document	Future External Development	2.1.7	57	1	However, given the uncertainty that surrounds the current rates (see section 2.1.5) and the important role of these rates in policy development, we only have sufficient confidence in the data to assume that the current overall rate of loss of approximately 48.5 hectares per year (see Table 2-1) will continue up to the end of epoch 1 (short term, up to 2025). This is seen as a conservative estimate.	Based on this, and given the important role of these rates in policy development, we only have sufficient confidence to assume that the current overall rate of loss of approximately 1 hectare per year (see Table 1 of the Addendum Note) may continue up to the end of epoch 1 (short term, up to 2025).
Main Document	Future External Development	2.1.7	57	1	For the later epochs, rates of loss could be faster as a result of accelerating sea level rise, or could slow down due to other processes, but more information is needed to confirm this.	For the later epochs, accelerating sea level and other processes could cause different trends, but more information is needed to confirm this.

SMP Document	Section Title	Section Number	Page	Para	Current Text	Revised text in line with the updated saltmarsh data
Main Document	Management Unit B: Hamford Water	2.2.3	62	1	Within Hamford Water saltmarsh is being lost through erosion. Estimates suggest that approximately 25 per cent of the total area has been lost over the past 25 years.	Within Hamford Water, estimates suggest that approximately 25 per cent of the total area was lost between 1975 and 2000, but recent surveys show a mixture of localised accretion and erosion.
Main Document	Management Unit D: Colne Estuary	2.2.5	64	3	Recently saltmarsh erosion has speeded up reflecting the ebb tidal dominance within the estuary.	Saltmarsh erosion was speeding up toward the end of the 20th century, but has slowed down again since then.
Main Document	Background developments	2.3.2	71	6	There is an overall net loss of saltmarsh, which is estimated conservatively at approximately 48 hectares per year.	There is an overall net loss of saltmarsh, which is estimated at approximately 1 hectare per year for the whole of the SMP area.
Main Document	Background developments	2.3.2	72	1	For Dengie and Foulness there are indications of a general trend of saltmarsh and mudflat accretion.	For Dengie and Foulness there are indications of a general trend of some saltmarsh loss but overall mudflat accretion.
Main Document	Background developments	2.3.2	72	1	For Mersea Island, the foreshore consists of mudflats and sandflats; these are generally eroding. For Dengie and Foulness there are indications of a general trend of saltmarsh and mudflat accretion. This is the response of the shoreline to sea level rise if there is sufficient sediment available. Finally, the Southend frontage is similar to Mersea, with a foreshore of sandflats and mudflat which are generally eroding.	For Mersea Island, the foreshore consists of mudflats and sandflats; these are partly eroding and partly accreting. For Dengie and Foulness there are indications of a general trend of some saltmarsh loss but overall mudflat accretion. Finally, the Southend frontage has a foreshore of sandflats and mudflat which are generally accreting.
Non-Technical Summary	How will we manage the coast	Management Unit B (Hamford Water)	16	1	Although the area is less constrained than other areas along the Essex coastline, the rate at which saltmarsh is being lost has been increasing.	The area is less constrained than other areas along the Essex coastline. There is a mixture of local increase and reduction of saltmarsh.

<b>SMP Document</b>	<b>Section Title</b>	<b>Section Number</b>	<b>Page</b>	<b>Para</b>	<b>Current Text</b>	<b>Revised text in line with the updated saltmarsh data</b>
Non-Technical Summary	How will we manage the coast	Management Unit D (Colne Estuary) and Management Unit E (Mersea Island)	20	1	Monitoring has shown that the total area of saltmarsh in the estuary is reducing, and that this process has recently been speeding up.	Monitoring has shown that the total area of saltmarsh in the estuary is reducing at variable rates.
Non-Technical Summary	How will we manage the coast	Management unit H (Crouch and Roach Estuaries), Management Unit I (Potton and Rushley Island), Management Unit J (Southend Frontage)	26	1	There is loss of saltmarsh and mudflat in the outer estuary and ongoing siltation in the inner estuary.	There is loss of saltmarsh and mudflat in some parts of the estuary and ongoing siltation in some others.
Appendix B - Stakeholder engagement	-	-	-	-	A vast number of replies to the consultation questions are based on outdated information on saltmarsh loss.	All responses related to gains and losses of saltmarsh may have been superseded by recent data which has become available (see Table 1 in this Note and the proposed changes for Section 2.1.5 of the main document).

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Appendix C - Baseline Processes	Saltmarsh	C5.4	C23	6	Erosion of saltmarsh along the Essex coast and estuaries has been a great concern over the past couple of decades. Saltmarsh erosion rates have been recorded by Burd (1992) and Cooper (2000), and were presented in CHaMPs (2002). Table C5.1 and Figure C5.1 present data from these reports.	Erosion of saltmarsh along the Essex coast and estuaries has been a great concern over the past couple of decades. Saltmarsh erosion rates have been recorded by Burd (1992) and Cooper (2000), and were presented in CHaMPs (2002). Recent work surveying changes in saltmarsh extent along the Essex coast covering the decade from the late 1990s is reported in IECS (2011), showing that recent developments are a mixture of erosion and accretion, with a small resulting overall loss. Table C5.1 and Figure C5.1 present data from the earlier reports. The data based on the data in IECS (2011) are presented in Table 1 of this Addendum Note.
Appendix C - Baseline Processes	Saltmarsh	C5.4	C25	3	Table C5.1 lists the average loss of saltmarsh per year based on the most recent monitoring periods.	Table 1 of this Addendum Note presents the new data on the changes in saltmarsh per year in each of the estuaries in the South Suffolk and Essex SMP2 area.

SMP Document	Section Title	Section Number	Page	Para	Current Text	Revised text in line with the updated saltmarsh data
Appendix C - Baseline Processes	Saltmarsh	C5.4	C25	3	<ul style="list-style-type: none"> <li>• These are measured loss rates, which may not all have been caused by coastal squeeze or the presence of defences;</li> <li>• Some more recent data show different trends (but these are difficult to quantify); this means there is large uncertainty;</li> <li>• The data are based on the area within the designated Special Protection Areas (SPAs); there are no quantitative data for Foulness.</li> </ul>	<ul style="list-style-type: none"> <li>• The loss rates may not all have been caused by coastal squeeze or the presence of defences;</li> <li>• Within individual estuaries there are areas of accretion and areas of erosion; any erosion of saltmarsh is a concern;</li> <li>• The data is based on the area within the designated Sites of Special Scientific Interest (SSSIs).</li> </ul>
Appendix C - Baseline Processes	Saltmarsh	C5.4	C26 - C29	-	Section: "Analysis of saltmarsh loss in the SPAs within the SMP study area"	Table 1 of this Addendum Note presents the new data on the changes in saltmarsh per year in each of the estuaries in the South Suffolk and Essex SMP2 area.
Appendix C - Baseline Processes	Hamford Water	C5.8.2	C35	1	This is a large problem within this system, which is currently experiencing the largest losses of saltmarsh habitat in the region (see Section C5.4), due to erosion and coastal squeeze.	This has been a large problem within this system, which until 2000 was experiencing the largest losses of saltmarsh habitat in the region (see Section C5.4), due to erosion and coastal squeeze. Recent data show a mixture of local accretion and erosion.
Appendix D - Thematic review	Theme Review D - Colne Point to East Mersea	D4.4	D15	3	Recently, saltmarsh erosion has sped up, reflecting the ebb tidal dominance within the estuary.	Toward the end of the 20th century saltmarsh erosion had sped up, but more recent data shows a combination of erosion and accretion.

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Appendix E - Policy development and appraisal	E4.4 Management Unit A: Stour and Orwell E4.4.1 Characterisation and summary of options	E4.4.1	E24	4	In the Stour estuary horizontal erosion of saltmarsh is occurring at a rate of four hectares a year, while the Orwell estuary has vertical erosion of mudflats in the lower reaches and saltmarsh erosion at a rate of one hectare a year.	In the Stour and Orwell, much like the Essex estuaries as a whole, there are areas of accretion and areas of erosion of saltmarshes.
Appendix E - Policy development and appraisal	E4.7 Management Unit D: Colne estuary E4.7.1 Characterisation and summary of options	E4.7.1	E51	3	Recently, saltmarsh erosion has accelerated reflecting the ebb tidal dominance within the estuary.	Toward the end of the 20th century saltmarsh erosion had sped up, but more recent data shows a combination of erosion and accretion.
Appendix E - Policy development and appraisal	E4.11 Management Unit H: Crouch and Roach E4.11.1 Characterisation and summary of options	E4.11.1	E78	1	At both the Crouch and Roach there is an overall loss of saltmarsh, with some accretion at inner estuaries and creeks.	At both the Crouch and Roach there is local loss of saltmarsh, with some accretion at inner estuaries and creeks.

SMP Document	Section Title	Section Number	Page	Para	Current Text	Revised text in line with the updated saltmarsh data
Appendix F – Shoreline interactions and responses	Various	Various	-	-	Numerous references made to saltmarsh and erosion.	All comments relating to recent gains and losses of saltmarsh may have been superseded by recent data (IECS 2011) which has become available (see Table 1 in this Addendum Note and the proposed changes to Section 2.1.5 of the main document for an overview of conclusions drawn from more recent data). This is particularly true for Stour and Orwell, Hamford Water, Roach & Crouch and Southend Marshes where the current overall trend is one of slight accretion.
Appendix I – Bibliographic Database	-	-	-	-	-	Two additional references:  Institute of Estuarine and Coastal Studies, University of Hull) (2011) <i>Essex Coastal SSSIs: Assessment of Changes in Extent of Saltmarsh Over the Period 1997 to 2008</i> . Volume 1. Report: ZBB745-F-2011S Thomson, C Reid & S Boyes. September 2011.  Environment Agency (2011) <i>The Extent of Saltmarsh in England and Wales: 2006-2009</i> .

### **3. Preferred managed realignment policy options**

The Managed Realignment policies in the plan were chosen principally on the basis of current/future vulnerability to coastal processes rather than to ensure compliance with the EU Habitats Directive. Consequently, the policies in the plan do not require changes as a result of the most recent saltmarsh information.

Managed realignment policies will only be progressed with the full support of the landowner. If this is not forthcoming then such projects will not be progressed. Landowners may wish to initiate their own works to hold the line in such locations. The most recent saltmarsh information has made the consenting of such works more straightforward.

Although SMP policies within the document have changed from 'draft' (during the consultation) to 'preferred' in the final SMP, they may be subject to review in the future. There remains great uncertainty regarding climate change, impacts of future storm events and future availability of public funding. As such they should be regarded as the policy which would be explored in the first instance at the appropriate time.

Shoreline Management Plans across England and Wales are expected to be reviewed and updated in the future to ensure that flood and coastal erosion risk management decision making is based upon the most up to date and accurate information possible. Mechanisms are being put in place across the country, including for the Essex and South Suffolk SMP, to ensure that any necessary changes and updates can be made and that local democratic procedures are followed.

### **4. References**

Cooper, N.J., Skrzypczak, T. & Burd, F. (2000) *Erosion of the salt marshes of Essex between 1988 and 1998. Vol. 1: Implications for flood defence and nature conservation; Vol. 2: A recommended monitoring framework for the future; Vol. 3: Maps of changes in the Essex salt marshes, 1988-1998.* Report to Environment Agency (Anglian Region).

Environment Agency (2011) *The Extent of Saltmarsh in England and Wales: 2006-2009.*

Environment Agency (2010) *Essex and South Suffolk Shoreline Management Plan 2*

IECS (Institute of Estuarine and Coastal Studies, University of Hull) (2011) *Essex Coastal SSSIs: Assessment of Changes in Extent of Saltmarsh Over the Period 1997 to 2008. Volume 1.* Report: ZBB745-F-2011S Thomson, C Reid & S Boyes. September 2011.