

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	The MU will protect the Harwich rail line. Depending on erosion levels some maintenance work may be required in E3; however policy is provided to support defence of the rail line if required. The effect is considered minor positive.
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths. The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policies have the potential to interrupt linear access along the coast (especially the Stour and Orwell Walk, an important tourist feature); however, it is not anticipated that this would lead to the loss of access along the coast. The route would simply be diverted to accommodate the MR and policy reflects this intent. The effect is considered to be neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
<b>The need to maintain a balance of providing navigation and access to estuary communities</b>				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The actual effect of policy is unknown, since the effects of MR and HTL policy are dependent on any schemes and associated measures. The potential effects of SMP policy may lead to siltation or erosion of channels with loss of navigational function, although it is anticipated that the implementation of SMP policy within this MU contains nothing which cannot be mitigated at the scheme level. This effect is therefore considered to be neutral.

Table 2 Management Unit B Hamford Water

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types</b>				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	Four MR policies are provided which actively seek to address the loss of intertidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Four PDZs in this assessment unit have been established as having an adverse effect on the integrity of international sites (Hamford Water SPA and Ramsar) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Coastal squeeze has the potential to lead to the loss of United Kingdom Biodiversity Action Plan (UKBAP) (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	MR policies in this MU provide the system with the opportunity to respond to SLR by providing intertidal UKBAP habitat over existing farmland. As the agreement between the Environment Agency and Natural England will offset habitat losses throughout the lifetime of the plan in response to SLR, additional sub-littoral habitat will be gained as SLR occurs. The effect is therefore minor positive.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSI in this area is Hamford Water which is designated for a range of birds, notably breeding terns and Brent geese.  The MR PDZs will lead to the loss of some freshwater habitat but will provide intertidal habitat and the effect is considered to be neutral, since the issue provides loss of one habitat type and the gain of another.  Mitigatory/compensatory habitat created to ensure no adverse effect on the Natura 2000 network will also ensure that habitat is created. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan.
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	MR2 is proposed in B2, B3a, B4a, and B5. The creation of new intertidal habitat supporting angiosperm, invertebrate and fish BQE means that deterioration in the overall

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	prevent WFD environmental objectives to be met?			ecological potential of the water body is considered unlikely.  WFD Environmental Objectives are likely to be supported by the proposed SMP2 policies, i.e. a minor positive.
<b>Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries</b>				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of Hamford Water. Overall the PDZs reduce the reliance on management (through MR) and allow for the natural development of this system. Overall the effect is considered minor positive.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The MU provides for protection of all coastal communities such as Walton on the Naze etc. The effect is considered minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides a range of policy, the intent of which is to move towards a more natural development of Hamford Water as an embayed system. This is achieved through a combination of MR policy whilst protecting existing communities from flood risk, and allowing the coast to erode according to natural processes (adjacent to the Naze). The effect is considered minor positive.
<b>Maintenance of water supply in the coastal zone</b>				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.  Change of salinity in the freshwater aquifer attributable to SMP policy.	Water	There are no issues identified with groundwater in regard to MR SMP2 policies for this MU. The groundwater within this MU is defined as unproductive. It is considered that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall the effect is considered neutral.
<b>Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast</b>				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for a balance of HTL to protect key assets and MR to enable the natural development of Hamford Water (important to the coastal landscape). No historic features would be lost within the MU and indeed such features are protected by the HTL policy. In the wider landscape, the MU provides for a balance of key natural, cultural and social features with a minor positive effect.

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<b>Potential loss of historic and archaeological features on a dynamic coastline</b>				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	As above, this MU will maintain a wide range of historic features (within or outside communities) with no losses expected. The effect is considered minor positive.
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP.	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, all NAI or MR PDZs were described as having moderate or high potential effects on archaeological sites. This accounts for approximately half of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on undiscovered archaeology. A key factor however is that in discussions with EH, it was stated that mitigation would be provided to allow time for site investigations and MR. PDZs have been specified across the timeline of the plan to accommodate this and time for site investigation is a requirement of MR policy and MRs are not clustered into one epoch). Overall the effect is minor negative.
<b>Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce</b>				
<i>Protection of coastal towns and settlements</i>				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for protection of all flood risk communities and the scope for intervention to protect erosion risk communities. The MU has been devised to offer a sustainable long term approach to protecting communities in this area and the effect is minor positive.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside of key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	The MU provides for the maintenance of key features to support settlements – Dovercourt Port, Walton Channel, footpaths (around Little Oakley) and Trimley Marsh Marina. Overall the effect is minor positive.

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<i>Protection of key coastal infrastructure</i>				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU will not lead to the interruption of any road transport systems and roads in this MU are located away from the foreshore. The effect therefore is neutral.
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	Not applicable
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths. The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policies have the potential to interrupt linear access along the coast (especially the Stour and Orwell Walk), however it is not anticipated that this would lead to the loss of access along the coast. The route would simply be diverted to accommodate the MR and policy reflects this intent. The effect is considered neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
<b>The need to maintain a balance of providing navigation and access to estuary communities</b>				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The actual effect of policy is unknown, since the effects of MR and HTL policy are dependent on the scheme and its measures. The MR policy adjacent to Walton Channel (B5) will maintain flows and the navigability of the channel which serves Trimley Marshes Marina. The overall effect therefore is minor positive.

Table 3 Management Unit C Tendring Peninsula

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types</b>				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	The majority of this frontage is developed urban areas adjacent to Clacton and Jaywick. However two MR policies are provided which actively seek to address the loss of inter tidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	One PDZ in this assessment unit has been established as having an adverse effect on the integrity of international sites (Colne Estuary SPA and Ramsar) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable.
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The loss of brackish areas in this area to intertidal habitat will provide similar amounts of BAP habitat through transition and the effect is therefore neutral.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	This MU contains three SSSIs with a foreshore frontage: Holland Haven Marshes, Clacton Cliffs and Foreshore and Colne Estuary. The key features for Holland Haven Marshes are aquatic and terrestrial invertebrates in brackish marsh, the Clacton Cliffs are a geological site of Pleistocene deposits and River Colne is for estuary feature. The MR over the Holland Marshes would have a minor negative effect, due to the loss through erosion of brackish habitat, which would be replaced with intertidal habitat. The policy adjacent to the cliffs at Clacton will not prevent the erosion of the cliffs and the effect is therefore neutral. The PDZ within the Colne enables natural development of the estuary and the effect is neutral. Overall, due to the loss of habitat at Holland Marshes the effect is minor negative. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan.

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<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	SMP2 policies within Holland Haven have the potential to prevent or compromise WFD Environmental Objectives being met in other water bodies. MR2 at Holland Haven will mean that the Holland and Hamford FWB (GB105037033970) and Holland Brook FWB (GB105037077810) may be affected by saline inundation. However as these water bodies run immediately behind the defences at Holland-on-sea they may already experience saline inundation and freshwater BQE may already be compromised. Further investigation with the Environment Agency is recommended. Overall the effect is minor negative.
<b>Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries</b>				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to provide long term stability of this frontage to protect coastal communities in Tendring and their respective foreshore areas. To some degree this is a continuation of previous policy, but an element of MR is also provided at Holland Gap (C2) and (through the coastal masterplan being developed by Tendring DC & Essex CC) adjacent to Jaywick (C4). Overall the effect of policy is minor negative since the MU provides for protection of communities as opposed to natural coastal development.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The MU provides continued protection for coastal communities, however the option is provided for MR adjacent to Jaywick (based on the outcome of the Jaywick Masterplan). The masterplan will feed SMP policy, however SMP policy currently provides for MR in E3. The approach to management adjacent to Jaywick seeks to provide long term sustainable management of this area and the effect is therefore neutral since actual flood risk will not increase under this policy.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU seeks to protect coastal communities in situ, and does not work with natural processes. The intent is to provide some stability and some dynamism in regards to coastal behaviour. Overall, the effect is considered neutral.
<b>Maintenance of water supply in the coastal zone</b>				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
		Change of salinity in the freshwater aquifer attributable to SMP policy.		

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<b>Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast</b>				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for a balance of HTL to protect coastal communities and MR to provide to maintain levels of intertidal habitat (important to the coastal landscape). The coastal communities which dominate this MU are a core element within the coastal landscape and their protection is therefore a significant measure to maintain coastal landscape values. In the wider landscape however, the MU provides for a balance of key natural, cultural and social features and the effect is considered minor positive.
<b>Potential loss of historic and archaeological features on a dynamic coastline</b>				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	As above, this MU will maintain a wide range of historic features (within or outside communities). The MR in C2 or C4 will not lead to the loss of historic features, historic settling or undiscovered archaeology. All historic features would therefore be protected in this MU and the effect is minor positive.
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, the MR in C2 was described as having moderate or potential effects on archaeological sites. Since the MR at Jaywick is in E3, ample time is provided for the investigation of this site which is considered a sustainable approach. A key factor however is that in discussions with EH, it was stated that mitigation would be provided to allow time for site investigations and MR PDZs have been specified across the timeline of the plan to accommodate time for site investigation, which is a requirement of MR policy and MRs are not clustered into one epoch) Overall the effect is neutral.
<b>Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce</b>				
<i>Protection of coastal towns and settlements</i>				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities.  Provision of appropriate standard of protection for key coastal communities.  Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for protection of all coastal communities (with the exception of Jaywick where local sustainable protection is sought through the Local Development Framework – with the SMP suggesting MR in E3). The MU has been devised to offer a sustainable long term approach to protecting communities in this area. The overall effect is therefore minor positive.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside of key coastal settlements or maintenance	Populations Communities	The MU provides for the maintenance of key features to support settlements – including roads and the foreshore areas (beaches etc). MR in C2 will lead to the loss of the golf course, but this is not considered an 'essential' feature. Overall the effect is neutral.



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		of the function or utility of such features.		
<b>Protection of key coastal infrastructure</b>				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU will not lead to the interruption of any road transport systems and the effect is neutral.
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	Not applicable – the rail line into Clacton is located inland.
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths. The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policy in C2 and C4 will interrupt linear access along the coast. However, it is not anticipated that this would lead to the loss of access along the coast, the route would be diverted to accommodate the MR and policy reflects this intent. The effect is considered neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
<b>The need to maintain a balance of providing navigation and access to estuary communities</b>				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	Not applicable

Table 4 Management Unit D Colne Estuary

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types</b>				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	Six MR policies are provided which actively seek to address the loss of inter tidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Six PDZs in this assessment unit have been established as having an adverse effect on the integrity of international sites (Colne Estuary SPA and Ramsar) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to the loss of terrestrial habitat and agricultural land, to offset loss of intertidal areas through coastal squeeze. Since the MR to provide BAP habitat will in part be over non-BAP habitat the effect is considered minor positive.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSI in this MU is the Colne Estuary with its intertidal features. The intent of the MU is to balance loss of intertidal through SLR by MR and the effect is therefore considered neutral in this MU. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan.
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	This MU has an extensive MR program of SMP2 policies. Overall, the MR planned within this water body should ensure that the ecological functioning of the system is maintained despite localised losses where HTL is the preferred policy. Therefore preferred policies within this SMP2 are considered unlikely to result in deterioration in ecological potential for the Blackwater and Colne Transitional water body and Blackwater Outer Coastal water body.  WFD Environmental Objectives are likely to be supported

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
				by the proposed SMP2 policies. The effect is considered minor positive.
<b>Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries</b>				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of the estuary. However some local intervention is specified for areas where management will provide for the protection of communities (Brightlingsea, Point Clear) and MOD land on D8b and D8c. The intent however is minimal impact on coastal processes. This is balanced by a range of PDZs which seek to move the estuary towards a more natural system. Overall the effect is considered minor positive.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The MU provides enhanced protection for coastal communities and moves towards more sustainable approaches to management (in managed realignment areas). Overall the effect is minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides a range of policy, the intent of which is to move towards a more natural estuarine system. This is achieved through a combination of MR policy whilst protecting existing communities from erosion /flood risk – strategic management of the estuary. The effect is minor positive.
<b>Maintenance of water supply in the coastal zone</b>				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
		Changes of salinity in the freshwater aquifer attributable to SMP policy.		
<b>Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast</b>				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for a balance of HTL to protect key assets and MR to maintain levels of intertidal habitat (important to the coastal landscape). No landscape features would be lost, and the estuary would develop into a more natural looking system. In the wider landscape context, the MU provides for a balance of key natural, cultural and social features with a minor positive effect.
<b>Potential loss of historic and archaeological features on a dynamic coastline</b>				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	As above, this MU will maintain a wide range of historic features (within or outside communities). On balance, all historic features, historic setting and undiscovered archaeology would be protected in this MU and the overall effect is minor positive

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, all NAI or MR PDZs were described as having moderate or high potential effects on archaeological sites. This accounts for approximately half of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on undiscovered archaeology. In discussions with EH, it was agreed that mitigation would involve time being allowed for investigation prior to any MR scheme taking place. Overall the effect is therefore minor negative.
<b>Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce</b>				
<i>Protection of coastal towns and settlements</i>				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities.  Provision of appropriate standard of protection for key coastal communities.  Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for protection of all flood risk communities and the scope for intervention to protect erosion risk communities. The MU has been devised to offer a sustainable long term approach to protecting communities in this area, with an overall minor positive effect.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	The MU provides for the protection of all key features; adjacent to communities. A further issue however is the effects on the oyster fisheries at Brightlingsea and the Mersea channel – the effects of policy on these fisheries are not known and could be either negative or positive (this will be assessed further at the scheme level). Overall the effect is minor positive.
<i>Protection of key coastal infrastructure</i>				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU will not lead to the interruption of any road transport systems and the effect is considered neutral.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	The MU will protect the Colchester – Clacton rail line and the effect is therefore neutral.
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths. The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policies have the potential to interrupt linear access along the coast (especially the coastal paths within D5 and D6), however it is not anticipated that this would lead to the loss of access along the coast. The route would be diverted to accommodate the MR and policy reflects this intent. The effect is therefore neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
<b>The need to maintain a balance of providing navigation and access to estuary communities</b>				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The actual effect of policy is unknown, since the effects of MR and HTL policy are dependent on the scheme and its measures. It is anticipated however that policy within this MU at a strategic level contains nothing which would provide for effects on channels which cannot be mitigated at the scheme level. In addition to this MR at D5 would increase the tidal prism and help maintain the channel in the River Colne. The effect is therefore minor positive.

Table 5 Management Unit E Mersea Island

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types</b>				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	Two MR policies are provided which actively seek to address the loss of inter tidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Two PDZs in this assessment unit have been established as having an adverse effect on the integrity of international sites (Colne and the Blackwater Estuaries SPA and Ramsar sites) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. <b>The overall effect is therefore considered major negative.</b>
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable.
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to the loss of terrestrial habitat and agricultural land, to offset loss of intertidal areas through coastal squeeze. Since the MR to provide BAP will in part be over non-BAP habitat the effect is considered minor positive.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	Mersea Island lies adjacent to two SSSIs, the Colne and the Blackwater Estuaries. The overall intent of the MU is to provide a combination of HTL and MR on the island to balance loss of habitat through coastal squeeze with creation of habitat through MR. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan. Overall the effect is considered neutral.
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	MR policy in PDZ E2 and E4a will increase intertidal habitat around Mersea, which will be beneficial to the BQE. Overall the preferred policies for this management area are considered unlikely to result in deterioration in ecological potential. WFD Environmental Objectives are likely to be supported by the proposed SMP2 policies. The effect is considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries</b>				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of Mersea Island. However some local intervention is specified for areas where management will provide for the protection of communities (West Mersea) in epoch3 and at East Mersea (epoch1 and epoch2). Equally a HTL policy is provided to protect the B1025 road. The intent however is minimal impact on coastal processes and three MRs are also proposed. Overall the effect is considered minor positive.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The MU provides enhanced protection for coastal communities (East and West Mersea) and moves towards more sustainable approaches to managed area (in managed realignment areas. The overall effect is therefore minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides a range of policy, the intent of which is to move towards a more natural estuarine system. This is achieved through a combination of MR policy whilst protecting existing communities from erosion/flood risk. The effect is minor positive.
<b>Maintenance of water supply in the coastal zone</b>				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies could result in deterioration of the aquifer. It is considered that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
		Changes of salinity in the freshwater aquifer attributable to SMP policy.		
<b>Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast</b>				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for a balance of HTL to protect key assets and MR to provide or maintain levels of intertidal habitat (important to the coastal landscape). No landscape features would be lost, and the island/estuary would develop into a more natural looking system. The MRs result in the loss of agricultural land, but this is a small percentage of the agricultural land in this area. In the wider landscape however, the MU provides for a balance of key natural, cultural and social features with a minor positive effect.
<b>Potential loss of historic and archaeological features on a dynamic coastline</b>				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	This MU will maintain a wide range of historic features (within or outside communities). The HTL policies maintain communities, whilst the MR areas would not lead to the loss of any historic features or undiscovered archaeology. Overall the effect is considered minor positive since a range of Listed Buildings are located in

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
				East and West Mersea and also six SMs in the areas protected by HTL. .
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, all MR PDZs were described as having high potential effects on archaeological sites. This accounts for approximately 30% of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on undiscovered archaeology. In discussions with EH, it was agreed that mitigation would involve time being allowed for investigation prior to any MR scheme taking place. Overall the effect is therefore minor negative.
<b>#</b>				
<i>Protection of coastal towns and settlements</i>				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities.  Provision of appropriate standard of protection for key coastal communities.  Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for protection of all flood risk communities (East Mersea) and erosion risk communities (West Mersea). The MU has been devised to offer a sustainable long term approach to protecting communities in this area, and an overall minor positive effect.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	There may be a localised effect on local oyster fisheries, but at present the nature of the effect is unknown. No essential features are lost elsewhere and the effect is therefore minor positive.
<i>Protection of key coastal infrastructure</i>				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU provides for the protection the B1025 road which is essential for access to communities on the island and the effect is therefore minor positive.



ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<p>The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.</p>	<p>Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?</p>	<p>Loss of any active rail links on the Essex coast.</p>	<p>Communities</p>	<p>Not applicable</p>
<p>The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths. The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).</p>	<p>Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.</p>	<p>Loss of rights of way routes on the Essex coast and estuaries.</p>	<p>Communities</p>	<p>The MR policies have the potential to interrupt linear access along the coast (especially the coastal paths within E2 and E4a), however it is not anticipated that this would lead to the loss of access along the coast. The route would be diverted to accommodate the MR and policy reflects this intent. The effect is therefore neutral.</p>
<p>The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.</p>	<p>Will SMP policy protect, in situ, Bradwell Nuclear power station.</p>	<p>Maintenance of Bradwell Power station.</p>	<p>Communities</p>	<p>Not applicable</p>
<p><b>The need to maintain a balance of providing navigation and access to estuary communities</b></p>				
<p>The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.</p>	<p>Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.</p>	<p>Loss of navigable channels which provide a utility to coastal/estuary communities.</p>	<p>Population Communities</p>	<p>The MR E4a is likely to maintain flows in the Stroud Channel. The effect is therefore minor positive.</p>

Table 6 Management Unit F Blackwater Estuary

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types</b>				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	Four MR policies are provided which actively seek to address the loss of inter tidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Four PDZs in this management unit have been established as having an adverse effect on the integrity of international sites (Blackwater Estuary and Dengie SPA and Ramsar) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to the loss of terrestrial habitat and agricultural land, to offset loss of intertidal areas through coastal squeeze. Since the MR to provide BAP will in part be over non-BAP habitat the effect is considered minor positive.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSI in this area is the Blackwater Estuary. The overall intent of the MU is to provide a combination of HTL and MR on the estuary to balance loss of habitat through coastal squeeze with creation of habitat through MR. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan. Overall the effect is considered neutral.
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	There will be some loss of intertidal habitat where SMP2 policies are HTL through rising sea levels and coastal squeeze but the overall ecological functioning of the system should be maintained where MR2 is proposed. Therefore, it is considered unlikely that there will be deterioration in ecological potential for the Blackwater and Colne Transitional water body as a result of SMP2 policies. WFD Environmental Objectives are likely to be supported by the proposed SMP2 policies. The effect is considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries</b>				
<p>The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.</p>	<p>Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?</p>	<p>Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.</p>	<p>Water Soil Landscape Historic Environment Habitats Species Population Communities</p>	<p>This MU intends to support the natural development of the Blackwater Estuary. The MU provides for five MR areas (split between both shores in extent) and also protects communities at Goldhanger, Maldon, St Lawrence, Tollesbury and Bradwell. Overall the effect is considered minor positive.</p>
	<p>Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?</p>	<p>Projected future risk levels for communities (existing or emerging).</p>		<p>The MU provides enhanced protection for coastal communities (Goldhanger, Maldon, St Lawrence, Tollesbury and Bradwell) and moves towards more sustainable approaches to managed area (in managed realignment areas). The overall effect is therefore minor positive.</p>
	<p>Does the policy work with or against natural processes.</p>	<p>Professional expert judgment required on the overall approach to management.</p>		<p>The MU provides a range of policy, the intent of which is to move towards a more natural estuarine system. This is achieved through a combination of MR policy whilst protecting existing communities from erosion/flood risk. The effect is minor positive.</p>
<b>Maintenance of water supply in the coastal zone</b>				
<p>Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.</p>	<p>Will SMP policy adversely affect abstraction infrastructure?</p>	<p>Number of boreholes on the Essex coast lost to erosion.</p>	<p>Water</p>	<p>Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.</p>
		<p>Changes of salinity in the freshwater aquifer attributable to SMP policy.</p>		
<b>Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast</b>				
<p>The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.</p>	<p>Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?</p>	<p>The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.</p>	<p>Landscape Historic Environment Habitats Communities</p>	<p>The MU provides for a balance of HTL to protect key assets and MR to provide to maintain levels of intertidal habitat (important to the coastal landscape). No landscape features would be lost, and the estuary would develop into a more natural looking system. The MRs result in the loss of agricultural land and freshwater habitat in the case of F3 and F5 at Tollesbury Wick and Old Hall Marshes. Additionally the MR at Old Hall Marshes (F3) may result in the loss of two SMs (both decoy ponds). These features although historically significant are not considered significant in the local landscape. In the wider landscape however, the MU provides for a balance of key natural, cultural and social features with a minor positive effect.</p>

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Potential loss of historic and archaeological features on a dynamic coastline</b>				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	This MU will maintain a wide range of historic features (within or outside communities). The HTL policies maintain communities which include several SMs at Maldon and a range of Listed Buildings (over 100). Additionally the Registered Battlefield at Maldon (Battle of Maldon) is protected by HTL policy. The MR policies would not lead to the loss of any Listed Buildings but would potentially lead to the loss of two SMs at Old Hall Marshes (F3) (both decoy ponds). Inundation may lead to a change in the form of the ponds, but not necessarily their loss. On balance, the effect of protecting features, offset against the effects on the decoy ponds remains minor positive.
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, all MR PDZs were described as having high potential effects on archaeological sites. This accounts for approximately 15% of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on undiscovered archaeology. In discussions with EH, it was agreed that mitigation would involve time being allowed for investigation prior to any MR scheme taking place. Overall the effect is therefore minor negative.
<b>Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce</b>				
<i>Protection of coastal towns and settlements</i>				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for protection of coastal communities at Tollesbury, Goldhanger, Maldon, Mayland, St Lawrence and Bradwell on Sea. The MU has been devised to offer a sustainable long term approach to protecting communities in this area, with an overall minor positive effect.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	The MU provides for the protection of key features including several sewage works and foreshore infrastructure in Maldon. The MR PDZs would not lead to the loss of any essential features apart from the loss of the caravan park at Steeple Bay Holiday Park and the adjacent sailing club in Steeple Bay (both of which could be relocated landwards to provide the same function). Overall the balance of effect is still considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<i>Protection of key coastal infrastructure</i>				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU provides for the protection the A414, B1026, B1018 roads and the effect is therefore minor positive.
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism, and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	The HTL policies in Maldon would maintain the location and function of the rail line and the effect is therefore minor positive.
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths. The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policies have the potential to interrupt linear access along the coast (especially the coastal paths within F3, F5, F12 and F14), however it is not anticipated that this would lead to the loss of access along the coast. The route would be diverted to accommodate the MR and policy reflects this intent. The effect is considered neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	The HTL policy in F15 will ensure the long term protection of the Bradwell Nuclear Power Station and effect is therefore minor positive.
<b>The need to maintain a balance of providing navigation and access to estuary communities</b>				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The MR policies in this MU are likely to provide enhanced flow in the estuary and help maintain navigable access in the estuary. The effect is therefore minor positive.

Table 7 Management Unit G Dengie

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types</b>				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	No MR policies are provided which actively seek to address the loss of inter tidal habitat through squeeze elsewhere in the frontage, the policy is for a continuation of uniform HTL policy. This continuation of management coupled with the effects of SLR (leading to loss of intertidal habitat) does not provide a balanced approach to management. The overall effect is considered major negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	The HTL policies in this assessment unit, may lead to a loss of designated intertidal habitat (on the Dengie and the Crouch and Roach SPA and Ramsar sites). This represents an adverse effect on site integrity and the overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to coastal squeeze on intertidal habitat on a frontage which is showing accretion in the central area of the MU (G3). The HTL policy in balance with the large scale accretion anticipated would have a neutral effect.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSI in this area is the Dengie. The key features on this site are tidal mudflat and saltmarsh. The overall intent of the MU is to provide HTL for this frontage which is showing ongoing accretion. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan. Overall the effect is neutral as policy is not affecting the extent of the designated features.
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	The section of coastline in PDZ G1 is currently eroding and HTL policy could result in the loss of habitat through sea level rise and coastal squeeze. However Blackwater Outer is presently at good ecological potential and as this defence unit will continue with present management deterioration in ecological potential is unlikely. Deterioration in ecological potential is also unlikely for G1 in the Blackwater and Colne water body due to the MR2 that is proposed in other PDZ that occur within that water body.  The section of coastline in PDZ G2 and G3 along the Dengie peninsula is accreting under the present HTL policy. Therefore adopting HTL policy for this PDZ should

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
				not result in deterioration in ecological potential within the Blackwater Outer and Essex Coastal and Crouch water bodies. Overall the effect is anticipated to be neutral.
<b>Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries</b>				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of the Dengue frontage which is accreting on the open coastal frontage of G2, but is witnessing coastal squeeze based localised erosion at (Sales Point) G1 and (Hollwell Point) G3. The intent of management is to allow for the development of the foreshore in G2 and part of G3, whilst HTL at the north and south. The reasons for HTL policies are to protect communities and historic features and due to the complex nature of the flood defence in those areas, which may be compromised of old waste material (with uncertainty relating to their composition). Overall the effect is considered neutral, since the HTL policies do not work with natural processes, whilst the HTL in G2 enables the natural accretion of the coast.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The MU provides for a uniform HTL policy along this frontage which will protect all coastal communities. The effect is considered minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides HTL policy in G2 which is accreting and therefore allows natural coastal development, but the HTL in G1 and G3 prevent erosion and the development of the coast. On balance the effect is therefore neutral.
<b>Maintenance of water supply in the coastal zone</b>				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.  Changes of salinity in the freshwater aquifer attributable to SMP policy.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
<b>Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast</b>				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for the protection of all existing terrestrial areas, enables ongoing accretion of the open coastal frontage in G2, but may lead to the loss of intertidal habitat in G1 and G3 through coastal squeeze. Since the levels of accretion in G2 offset this, the overall effect is considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Potential loss of historic and archaeological features on a dynamic coastline</b>				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	Due to the HTL policies in this MU, which are in part intended to protect historic features (such as the SMs of the Chapel of St Peters on the Wall in G1 and the WW2 minefield control towers in G3)) the effect is considered major positive.
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	As above, since the policy is HTL no negative effects are evident on this MU and areas such as the Othona Roman Fort are protected. The effect is therefore minor positive and not major positive, since it is acknowledged that there may be undiscovered assets seaward of the defences.
<b>Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce</b>				
<i>Protection of coastal towns and settlements</i>				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities.  Provision of appropriate standard of protection for key coastal communities.  Number of new developments located in unsustainable coastal locations.	Populations Communities	Coastal communities in this MU are not at risk and the effect is therefore neutral.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside of key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	The MU provides for the protection of the beach (Bradwell on Sea beach in G1) and extensive areas of agricultural land (large areas of Grade 2 land). The effect is therefore minor positive.



ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<i>Protection of key coastal infrastructure</i>				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The roads in this frontage are minor unclassified roads (The B1021 is located out of the flood zone) and the effect is therefore neutral.
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	Not applicable
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths. The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The HTL policies maintain access and the effect is therefore minor positive.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
<b>The need to maintain a balance of providing navigation and access to estuary communities</b>				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The MR policies in this MU may provide some degree of stability to the estuary mouths in G1 and G3; however this effect is considered limited. The effect therefore is considered neutral.

Table 8 Management Unit H Crouch and Roach Estuaries

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types</b>				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	Six MR policies are provided which actively seek to address the loss of inter tidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Six PDZs in this assessment unit have been established as having an adverse effect on the integrity of international sites (Crouch and Roach and Foulness SPA and Ramsar) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to the loss of terrestrial habitat and agricultural land, to offset loss of intertidal areas through coastal squeeze. Since the MR to provide BAP habitat will in part be over non-BAP habitat the effect is considered minor positive.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSIs in this area is the Crouch and Roach Estuary SSSI and the Cliff – Burnham SSSI. The cliffs are designated for the geological interests of avifaunal fossils in the Lower Eocene deposits. SMP policy will not have any impact on this site. The overall intent of the MU is to provide a combination of HTL and MR on the estuary to balance loss of habitat through coastal squeeze with creation of habitat through MR, overall the effect is considered neutral.
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	There will be some loss of intertidal habitat where the SMP2 policy is to HTL due to rising sea levels and coastal squeeze, but the overall ecological functioning of the system should be maintained where MR2 is proposed. Therefore it is considered unlikely that there will be deterioration in ecological status of the Crouch Transitional water body.  Similarly given the size of the H16 frontage relative to

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
				Thames North Coastal and Thames Lower Transitional there is unlikely to be deterioration in ecological potential for these HMWBs. Overall the effect is anticipated to be neutral.
<b>Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries</b>				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of The rivers Crouch and Roach. However, HTL policy is specified for areas where management will provide for the protection of communities (Burnham, S Woodham Ferrers, Hullbridge, North and South Fanbridge, Rochford, L & G Wakering & Canedon). This MU also includes six MR areas, including the extensive MR at Wallasea Island (H10). Overall the effect is considered minor positive.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		As above this MU provides for HTL to protect all existing communities. The overall effect is therefore minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides a range of policy, the intent of which is to move towards a more natural estuarine system. This is achieved through a combination of MR policy whilst protecting existing communities from erosion/flood risk. The effect is considered minor positive.
<b>Maintenance of water supply in the coastal zone</b>				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.  Changes of salinity in the freshwater aquifer attributable to SMP policy.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
<b>Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast</b>				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for a balance of HTL to protect key assets and MR to provide and maintain levels of intertidal habitat (important to the coastal landscape). No landscape features would be lost, and the island/estuary would develop into a more natural looking system. The MRs result in the loss of agricultural land, but this is a small percentage of the agricultural land in this area. In the wider landscape however, the MU provides for a balance of key natural, cultural and social features. The effect is minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Potential loss of historic and archaeological features on a dynamic coastline</b>				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	As above, this MU will maintain a wide range of historic features (within or outside communities). The HTL policies maintain communities, whilst the MR areas would not lead to the loss of any historic features. Overall the effect is considered minor positive.
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, all MR PDZs were described as having high potential effects on archaeological sites. This accounts for approximately 30% of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on archaeology. A key factor however is that in discussions with EH, it was stated that mitigation would be provided to allow time for site investigations and MR PDZs have been specified across the timeline of the plan to accommodate this and time for site investigation is a requirement of MR policy also MRs are not clustered into one epoch. Overall the effect is minor negative.
<b>Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce</b>				
<i>Protection of coastal towns and settlements</i>				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities. Provision of appropriate standard of protection for key coastal communities. Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU provides for protection of all coastal communities. The MU has been devised to offer a sustainable long term approach to protecting communities in this area, and an overall minor positive effect.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	No essential features are expected to be lost in this MU the effect is therefore minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<i>Protection of key coastal infrastructure</i>				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU provides for the protection of the A132, B1012 (in Epoch 3) and local unclassified roads which are essential for access to communities and the effect is therefore minor positive.
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	The MU provides for the protection of the rail line on the north shore of the Crouch and a small section of the rail line in Rochford, and the effect is therefore minor positive.
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths. The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR policies have the potential to interrupt linear access along the coast, however it is not anticipated that this would lead to the loss of access along the coast. The route would be diverted to accommodate the MR and policy reflects this intent. The effect is therefore neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
<b>The need to maintain a balance of providing navigation and access to estuary communities</b>				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The MR in this MU will help maintain the integrity of the channels in the Crouch and the Roach. The effect is therefore minor positive.

Table 9 Management Unit I Foulness, Potton and Rushley Islands

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types</b>				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	One MR policy is provided (on this three PDZ based unit) which actively seeks to address the loss of intertidal habitat through squeeze elsewhere in the frontage. The intent of policy is to actively move towards management which contains elements of MR to offset loss, although the figures relating to expected levels of squeeze are not known over the timeline of the plan. However, indicative figures would suggest that levels of intertidal habitat loss will far exceed habitat created through realignment in the lifetime of the plan. The effect is therefore considered to be minor negative.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	Two PDZs in this management unit have been established as having an adverse effect on the integrity of international sites (Foulness SPA and Ramsar) due to the loss of intertidal and freshwater habitat and its effect on cited bird species. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to the loss intertidal areas through coastal squeeze. However, due to the nature of this area, which is in an accretional state, no loss of this habitat is expected and the effects are neutral.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSI in this area is Foulness SSSI. The overall intent of the MU is to provide a combination of HTL and MR on this frontage to balance loss of habitat through coastal squeeze with creation of habitat through MR. Although losses are unknown at present, condition will be dependent on future intertidal habitat creation measures delivered through the SMP Action Plan. Overall the effect is considered neutral due in part to the accretional nature of this MU.
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	SMP2 policies which have the potential to cause this water body to fail one or more objectives include those associated with a HTL policy at PDZ 11a (Foulness). HTL policy in this PDZ may result in the loss of intertidal habitat through sea level rise and coastal squeeze, which will not be countered by MR2 policies that are present in this water body. Overall the effect is considered minor negative.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries</b>				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area needs to be maintained albeit within a dynamic context.	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species Population Communities	This MU intends to support the natural development of the Foulness frontage (including Potton and Rushley Islands). The MU does however take a HTL approach to the majority of the frontage with a small MR in Rushley Island. The intent being to protect MoD land through HTL. Overall the effect is considered minor negative.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The HTL policies protect all existing settlements (Church End, Courtsend and Great Potton) and the effect is therefore minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		The MU provides for a large expanse of HTL policy with only minor MR to offset this in Rushley Island. It should be remembered however, that within close proximity to this MU (in the Roach system) this SMP provides for an extensive MR at Wallasea Island. On balance therefore the MU is considered minor negative, since the effects are to some degree offset by adjacent actions.
<b>Maintenance of water supply in the coastal zone</b>				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.  Changes of salinity in the freshwater aquifer attributable to SMP policy.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
<b>Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast</b>				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for extensive HTL which will maintain all terrestrial features. Some limited areas of saltmarsh will be lost, but the extensive frontage of I1a is expected to provide consistent accretion. The overall effect is considered neutral.
<b>Potential loss of historic and archaeological features on a dynamic coastline</b>				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	The HTL will protect a SM (a Roman-British Burial Site) and 17 listed buildings. Overall the effect is considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	In discussions with EH, the MR PDZs were described as having high potential effects on archaeological sites. This accounts for approximately 10% of the PDZs in this MU. Whilst MR areas have been chosen to avoid historic features, this does not avoid effects on undiscovered archaeology. In discussions with EH, it was agreed that mitigation would involve time being allowed for investigation prior to any MR scheme taking place. Overall the effect is therefore minor negative.
<b>Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce</b>				
<i>Protection of coastal towns and settlements</i>				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities.  Provision of appropriate standard of protection for key coastal communities.  Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU has been devised to offer a sustainable long term approach to protecting communities in this area, and an overall minor positive effect.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	No essential features are expected to be lost in this MU the effect is therefore minor positive.
<i>Protection of key coastal infrastructure</i>				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU provides for the protection of the local unclassified roads which are essential for access to communities and the effect is therefore minor positive.



ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	Not applicable
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths. The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	The MR on Rusley Island will not lead to the loss of any established rights of way. The effect is therefore neutral.
The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.	Will SMP policy protect, in situ, Bradwell Nuclear power station.	Maintenance of Bradwell Power station.	Communities	Not applicable
<b>The need to maintain a balance of providing navigation and access to estuary communities</b>				
The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.	Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.	Loss of navigable channels which provide a utility to coastal/estuary communities.	Population Communities	The MR in this MU will help maintain the integrity of the channels in the Roach. The effect is therefore minor positive.

Table 10 Management Unit J Southend-on-Sea

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Threat to biodiversity on a dynamic coast and the interactions between various coastal habitat types</b>				
The interaction between the maintenance of designated freshwater or terrestrial habitat protected by defences and designated coastal habitat seaward of defences.	Will SMP provide a balanced approach to providing terrestrial, freshwater and coastal habitats when balancing habitat loss and gain?	Number of schemes which address the potential loss or change of terrestrial, freshwater and coastal habitat adjacent to defences or maintained structures.	Habitats Species	No policies are provided for managed realignment in this unit. The intent of policy is to hold the line in front of Southend, an urban frontage. This is a historical continuation of decades of previous management and the overall effect is considered neutral. Losses due to squeeze in this frontage are being addressed by the Thames Estuary 2100 project.
Coastal squeeze and changes to coastal processes have the potential to adversely affect the integrity of international sites (Ramsar sites and areas designated under the Habitats and Birds Directives).	Will SMP policy have an adverse effect on the integrity of any international sites?	Number of international sites recorded as not meeting conservation objectives for the sites.	Habitats Species	HTL policy in this management unit have been established as having an adverse effect on the integrity of international sites through the HTL policies leading to coastal squeeze. The overall effect is therefore considered major negative.
Loss of EU Annex I priority habitat on the Essex coast, which may be at risk from natural coastal processes or coastal policy which seeks to protect public health and safety.	Will SMP policy have an adverse effect on the integrity of any Annex I Priority Habitat?	Number of Annex I Priority Habitat features not meeting conservation objectives.	Habitats Species	Not applicable
Coastal squeeze has the potential to lead to the loss of UK BAP (priority & broad) coastal habitat. Alternative sites for habitat creation are required to help offset the possible future natural losses. Targets exist for the creation of UKBAP habitat at a local (LBAP) and national level (UKBAP).	Will there be no net loss of UK BAP habitat within the SMP timeline up to 2100 or will the SMP contribute towards the creation of UKBAP habitat?	Area of UK BAP habitat lost.	Habitats	The issue here relates to the loss intertidal areas through coastal squeeze, which would be lost in this MU through the HTL policy in front of Southend. The effect therefore is minor negative.
Coastal squeeze has the potential to lead to coastal SSSIs falling into unfavourable condition. Factors attributable to the unfavourable declining condition relating to the SMP, are cited as coastal squeeze.	Will SMP policy contribute to further SSSIs falling into unfavourable condition?	Number of SSSI units in unfavourable declining condition as a result of coastal management.	Habitats Species	The SSSI in this area is Benfleet and Southend Marshes and the Foulness SSSI. The overall intent of the MU is to provide protection to Southend, and as a result intertidal features will be lost through coastal squeeze. The effect therefore is minor negative.
<b>Maintenance of environmental conditions to support biodiversity and the quality of life</b>				
The need to ensure that water quality is not adversely affected as a result of SMP policy.	Will SMP policy potentially result in a deterioration of the status of any surface water bodies or ground water bodies, or prevent WFD environmental objectives to be met?	Number of water bodies potentially deteriorating in status.	Surface Water and Ground water	Under a HTL policy, there would be no cliff retreat throughout the Southend-on-Sea frontage. The position of the shoreline will be held largely at the same position, although there would be local changes to the foreshore with likely accretion of sands updrift of the groynes and conversely there could also be some localised erosion downdrift. Beach erosion/accretion rates are expected to remain unchanged. The development of the intertidal flats is not constrained by the defences. Overall the effect is anticipated to be neutral.
<b>Maintenance of balance of coastal processes on a dynamic linear coastline with settlements along estuaries</b>				
The Essex coast is a complex system of a dynamic linear coast, interspersed with a series of navigable estuary systems. The system has been maintained in recent years to provide relative stability to the system in order to protect coastal assets. The effects of sea level rise require a more strategic approach to shoreline management, but the relative stability of the plan area	Will SMP policy maintain an overall level of balance across the Essex coast in regard to coastal processes, which accepts dynamic change as a key facet of overall coastal management?	Professional expert judgment required on the overall integrity and balance (with regards to coastal processes) on the coast.	Water Soil Landscape Historic Environment Habitats Species	This MU intends to provide protection for this frontage and the Southend community. The intent of the MU is protection of this regionally important town, the location of which precludes allowing for natural coastal evolution in this area. Since this is a historical pattern of management. Overall the effect is considered minor

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
needs to be maintained albeit within a dynamic context.			Population Communities	negative.
	Will SMP policy increase actual or potential coastal erosion or flood risk to communities in the future?	Projected future risk levels for communities (existing or emerging).		The HTL policies will protect Southend and the effect is therefore minor positive.
	Does the policy work with or against natural processes.	Professional expert judgment required on the overall approach to management.		This MU works against coastal processes in protecting Southend (a historical development of this area). Overall the effect is minor negative.
<b>Maintenance of water supply in the coastal zone</b>				
Agriculture on the Essex coast utilises freshwater derived from groundwater aquifers. The delivery of this supply has the potential to be threatened by intrusion of salt water into freshwater aquifers and from the loss of boreholes at risk from erosion.	Will SMP policy adversely affect abstraction infrastructure?	Number of boreholes on the Essex coast lost to erosion.	Water	Essex GWB has been assessed by the Environment Agency as 'Not at Risk' from saline intrusion and therefore it is considered unlikely that SMP2 MR policies would result in deterioration of the aquifer. It is anticipated that potential changes through SMP2 policies will not result in the failure to meet good groundwater status, or in fact result in a deterioration of groundwater status. Overall, the effect is considered neutral.
		Changes of salinity in the freshwater aquifer attributable to SMP policy.		
<b>Maintenance of the coastal landscape with regard to the provision of a mosaic of landscape features which is characteristic of the Essex coast</b>				
The maintenance of the coastal landscape in the face of coastal change on a dynamic coast and estuary system. A key factor being the potential change in the landscape in response to shifts in coastal habitat composition.	Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the Essex coastal landscape?	The maintenance of relative proportions and diversity for the key features (social, historical and natural) in the coastal landscape, particularly those areas identified as rare and sensitive in character.	Landscape Historic Environment Habitats Communities	The MU provides for the maintenance of Southend and its foreshore, which is a key element in the local and regional landscape. The effect therefore is minor positive.
<b>Potential loss of historic and archaeological features on a dynamic coastline</b>				
The Essex coast contains a range of historic settlements and harbours typically located on along estuaries (for example, Burnham on Crouch, Southend on Sea etc). These communities may be at higher levels of risk from coastal flooding as a result of climate change or levels of erosions along the coast.	Will SMP policy maintain key historic features and areas along the coastline?	Number of historic buildings or historic features lost or impacted by inundation or erosion.	Historic Environment	The HTL will protect all historic features on this frontage. Overall the effect is considered minor positive.
The coastal zone in Essex contains a range of heritage and archaeological features which may be at risk from loss from erosion or inundation within the timeline of the SMP	Will SMP policy provide sustainable protection of archaeological features (where possible) and ensure the provision of adequate time for the survey of archaeological sites where loss is expected.	Number of historic environment features lost to erosion or inundation, without time being allowed for adaptation or survey prior to loss.	Historic Environment	Since the EMP2 policy for this MU is HTL, all archaeological features are maintained and the effect is minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<b>Protection of coastal towns and settlements and the maintenance of features which support tourism and commerce</b>				
<i>Protection of coastal towns and settlements</i>				
The Core Strategies of local authorities in Essex identify key coastal settlements which are important to the quality of life locally and the integrity of the economy of the area. The potential exists for these settlements to face a higher level of risk from coastal flooding and erosion in the future. There is a need therefore to ensure that coastal settlements are provided with sustainable flood risk management policies for the duration of the SMP.	Will SMP policy maintain key coastal settlements in a sustainable manner, where the impact of coastal flooding and erosion is minimised and time given for adaptation, where required?	Maintenance of key coastal communities.  Provision of appropriate standard of protection for key coastal communities.  Number of new developments located in unsustainable coastal locations.	Populations Communities	The MU will protect all coastal communities and the effect is therefore overall minor positive effect.
Coastal communities in Essex are often dependent on key features located outside of the settlement area. There is a need, therefore, to ensure that features which support communities are maintained, or the actual utility is maintained.	Will SMP policy maintain the form or function of features located outside of established settlements, which are essential to the economy and quality of life of key coastal settlements?	Maintenance of key features (features essential for the sustainability or quality of life of key coastal communities) located outside or key coastal settlements or maintenance of the function or utility of such features.	Populations Communities	No essential features are expected to be lost in this MU the effect is therefore minor positive.
<i>Protection of key coastal infrastructure</i>				
The Essex coast is served by a network of roads along the coast and a network of smaller roads to coastal settlements. The maintenance of these roads is important in regard to the utility it provides for the coastal economy and quality of life etc. The roads themselves are of secondary importance (they could be replaced), the important feature is the actual access provided as a social and economic function. The potential exists for this network to be affected by coastal processes.	Will SMP policy maintain road based transport connectivity between settlements on the Essex coast?	Loss of any major route to coastal settlements on the Essex coast.	Communities	The MU provides for the protection of the road network in Southend which are essential for access to communities and the effect is therefore minor positive.
The Essex coast is served by rail network linking towns along the coast to London and the national rail network. The network is critical to the functionality of the ports at these centres, supports commuting to London and tourism and runs through the 1 in 1000 year floodplain. The potential exists for areas of the network to be impacted by coastal processes.	Will SMP policy maintain rail based transport connectivity between the Essex coast and the national rail network?	Loss of any active rail links on the Essex coast.	Communities	All rail lines are maintained and the effect is considered minor positive.
The Suffolk coast is visited by a large number of tourists and residents every year. Access to and along the coast is provided by a range of coastal footpaths. The provision of this access, rather than the actual footpaths themselves supports a range of values which contribute to the quality of life and local economy of the Essex coastal area. Paths are often located close to the foreshore or along estuaries in areas at risk from coastal erosion (or within potential areas for managed realignment).	Will SMP policy maintain or enhance levels of access along or to the Essex coast and estuaries.	Loss of rights of way routes on the Essex coast and estuaries.	Communities	Coastal access will be maintained and the effect is considered minor positive.

ISSUE	ASSESSMENT CRITERIA	INDICATOR	RECEPTORS	ASSESSMENT
<p>The nuclear power station at Bradwell is located close to the foreshore. The protection of the power station in situ is important in the national interest and essential for the protection of the environment.</p>	<p>Will SMP policy protect, in situ, Bradwell Nuclear power station.</p>	<p>Maintenance of Bradwell Power station.</p>	<p>Communities</p>	<p>Not applicable</p>
<p><b>The need to maintain a balance of providing navigation and access to estuary communities</b></p>				
<p>The Essex coastline is a mixture of open coast and relatively large estuary systems. Historically, the county has developed a series of settlements on the estuaries based on providing transport and commerce. In the last century, estuary settlements have become important for tourism, as well as being attractive places to live. The amenity and utility offered by the estuaries is dependent on navigation for commercial and recreational vessels. The value of the estuaries to communities is therefore critically dependent on the provision of existing navigable channels.</p>	<p>Will SMP policy maintain the network of navigable channels in estuaries which support coastal/estuary communities.</p>	<p>Loss of navigable channels which provide a utility to coastal/estuary communities.</p>	<p>Population Communities</p>	<p>This MU will have a negligible effect on navigation within the Thames estuary or on local channels. The effect is therefore neutral.</p>



## **ANNEX II**

### **Summary of Consultation Responses**

## RESPONSE TO CONSULTATION ON ESSEX SEA SCOPING REPORT

### Responses Received

RICHARD ATKINS, CIVIL ENGINEER  
SOUTHEND BOROUGH COUNCIL

Comments received related to the specifics of the Southend Frontage and are detailed as follows:

2.7.2 My information is that in 2008, Jubilee Beach did not have a blue flag, although Shoebury East, Shoebury Common and Three Shells Beaches did.

Table 2.10 Clacton Pier (pierlet actually) is mentioned, but Southend Pier isn't

Appendix D description. I don't recognise Southend as the most populous and densely developed community in the Plan from this description. The "fairly limited .....small sections of the seafront" within the flood zone actually cover about 9 km linearly and extend up to 1.5km inland. Similarly the "some" properties within the flood zone amount to several thousand.

RACHEL BALANTYNE, REGIONAL SCIENCE ADVISOR  
ENGLISH HERITAGE

Comments received were supportive of the overall document, but made specific suggestions relating to the assessment criteria and indicators provided within the assessment framework.

A revised landscape indicator was provided, which provided a more specific account of the role of heritage features within the coastal landscape. Additionally, amendments were suggested relating to how heritage features are collectively described as heritage assets (indicators column of the assessment framework).

PHIL STURGES, PLANNING CONSERVATION ADVISOR  
NATURAL ENGLAND

Natural England were supportive of the content of the document and the manner in which it addressed environmental issues on the Essex and south Suffolk coast. Natural England did however suggest that regard is given to the output of the HRA and the identified effects on international sites (as a legal requirement) in the assessment of the plan.

### Response within the Environmental Report

In response to the comments of Southend Council the following changes were made in the Environmental Report:

- 1) **2.7.1 Paragraph 1.** Eight local planning documents now referred to and listed. List now includes Suffolk Coastal District Council and Babergh.
- 2) **2.7.1 Paragraph 2.** Text amended to read seven local authorities.
- 3) **2.7.2.** Blue Flag Beaches. Text updated with the 2009 Blue Flag list for Essex.



4) **Table 2.11.** Reference to Southend Pier included.

5) Appendix D – Unit 9. Description of Southend-on-Sea modified in line with comments to read:

*'Southend-on-Sea is the most populous and densely developed community in the Essex and south Suffolk SMP area. The land in the tidal flood zone extends 9km linearly and up to 1.5km inland of the Southend-on-Sea frontage. There are a variety of defences including sea walls, groynes and revetments.*

*A significant number of properties lie within the 1 in 1000 year flood zone at Shoeburyness, South church and behind the seafront at Southend. Sections of the B1016 and the railway line at Leigh-On-Sea are within the flood zone. The golf course at Southchurch provides recreational amenity. The seafront at Southend-On-Sea has important recreational and tourism value with its attractions including the beach, pier, aquarium and museum, while Shoeburyness has military importance as a Ministry of Defence firing range.'*

The suggested indicator provided for landscape has been used in the environmental report. The specific wording for indicators has been maintained to be consistent with other SMP SEAs, and retains the suite of features suggested by English Heritage.

In line with Natural England's comments the role of the Habitats Regulations has been accorded due weight in the assessment. Adverse impact on international sites is determined as major negative impact.

## **ANNEX III**

### **Consideration of the Effects of SMP Policy on Environmental Receptors**

Potential positive effects of SMP policy on SEA Environmental Receptors

SMP OPTION	POSITIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON S1 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
Hold the line (HTL)	Protection of communities and infrastructure located within the coastal flood zone;	The SMP is not considered likely to have any effect on parameters for air quality.	The protection of water abstraction sources	The protection of agricultural land	Protection of key features in the coastal landscape	Protection of key historical assets			Protection of key community assets
	Protection of habitat landward of defences;			The protection of soil as an integral element of habitat	Protection of key features in the coastal landscape		Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	
	Protects freshwater resources (e.g. abstractions & boreholes);		The protection of water abstraction sources	The prevention of salinisation of soils					Protection of key community assets
	Provides stability to areas of coastline, within a wider management context;				Provision of a natural and dynamic coastal landscape		Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	Protection of key community assets
	Protects economic assets located behind defences; and					Protection of key historical assets			Protection of key community assets
	Provides protection to ecological, cultural and historical assets landward of the defences.				Protection of key features in the coastal landscape	Protection of key historical assets	Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	Protection of key community assets
Advance the line (ATL)	Provides additional space for communities;			May provide for increased areas of agricultural land					Provides opportunity to increase area of land available for coastal communities
	Protection of communities and infrastructure located within the coastal flood zone;			The protection of agricultural land	Protection of key features in the coastal landscape				Protection of key community assets
	Protection of habitat landward of defences;			The protection of soil as an integral element of habitat			Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	
	Protects freshwater resources (e.g. abstractions and boreholes);		The protection of water abstraction sources						Protection of key community assets
	Protects economic assets located behind defences; and			The protection of agricultural land		Protection of key historical assets			Protection of key community assets
	Provides protection to ecological, cultural and historical assets landward of the defences.				Protection of key features in the coastal landscape	Protection of key historical assets	Protection of freshwater, saline or terrestrial habitat	Protection of freshwater, saline or terrestrial habitat	Protection of key community assets
Managed realignment (MR)	Coastal habitats allowed to move landwards under rising sea levels			Provision of a natural and dynamic coastal landscape			Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Creation of habitat to aid UKBAP: (United Kingdom Biodiversity Action Plan) and local BAP (Biodiversity Action Plan) targets;			Provision of a natural and dynamic coastal landscape			Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	

SMP OPTION	POSITIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON S1 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
	Habitat created for juvenile fish and other aquatic organisms (benefits to environment and fishing communities);						Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	Protects the viability of commercial and recreational fishing
	Reduces flood risk;								Protection of key community assets
	Promotes natural coastal processes;		May lead to enhanced water quality		Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Contributes towards a more natural management of the coast; and		May lead to enhanced water quality		Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Creation of high tide roosts and feeding areas.				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
No active intervention (NAI)	Coastal habitats allowed to move landwards under rising sea levels;				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Promotes natural coastal processes; and		May lead to enhanced water quality		Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	
	Contributes towards a more natural management of the coast.				Provision of a natural and dynamic coastal landscape		Provides for a dynamic transition of coastal habitat	Provides for a dynamic transition of coastal habitat	

Potential negative effects of SMP Policy on SEA Environmental Receptors

SMP OPTION	NEGATIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON SI 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
Hold the line (HTL)	Coastal squeeze (loss of habitat);	The SMP is not considered likely to have any effect on parameters for air quality or climatic factors.			Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Interruption of coastal processes;		Adverse effects on water quality through turbidity changes etc.		Reduction in the dynamic quality of the coastal landscape		Shifts in habitat composition or function	Reduction in abundance and diversity of species	
	May increase flood and coastal erosion risk elsewhere;			Potential degradation of soil quality through intrusion		Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Increased risk to existing community features
	Promotes unsustainable land use practices with the coastal flood zone;								Impacts on sustainability of communities
	Diverts limited resources away from an adaptation response to rising sea levels; and					Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Effects on the resourcing of other community related activities
	Requires ongoing commitment to future investment in maintenance and improvement.				Introduction of defence features into the area which detract from the coastal landscape	Need for expenditure on site investigation prior to loss through inundation			Potential impacts of expenditure on flood defence and the knock on effects of this to other areas of public and private expenditure
Advance the line (ATL)	Reduction in extent of coastal habitat;				Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Change in functionality of habitat;						Shifts in habitat functionality	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Increased coastal squeeze;				Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Interruption of coastal processes;		Adverse effects on water quality through turbidity changes etc.				Shifts in habitat functionality	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Effect on marine habitat;						Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community

SMP OPTION	NEGATIVE IMPACT	ENVIRONMENTAL RECEPTORS (BASED ON SI 1633)							
		AIR & CLIMATE	WATER	SOIL	LANDSCAPE	HISTORIC ENVIRONMENT	HABITATS	SPECIES	POPULATION AND COMMUNITIES
	May increase rate of coastal erosion either side of the advanced line.		Adverse effects on water quality through turbidity changes etc.	Potential degradation of soil quality through intrusion	Loss of intertidal elements from the coastal landscape	Loss of known or undiscovered archaeological resources	Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Impacts on other features important for community purposes
Managed realignment (MR)	Reduction in extent of habitat landwards of defences;				Shifts in the habitat mosaic as a function of the local landscape	Loss of known or undiscovered archaeological resources	Loss of habitat	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Change in nature of habitat to landward of defence;				Shifts in the habitat mosaic as a function of the local landscape		Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Impact upon aquifers and abstractions;		Loss of abstraction points and intrusion into aquifers						Impacts on water supply to communities
	Loss of communities or community assets;		Loss of abstraction points and intrusion into aquifers	Potential degradation of soil quality through intrusion		Loss of heritage features			Reduction in the amenity of coastal communities
	Loss of heritage and cultural features; and					Loss of heritage features			Reduction in the amenity of coastal communities
	Loss of agricultural land			Loss of agricultural land/soil					Impacts on the character of local communities and the local economy
No active intervention (NAI)	Lack of certainty of effects and time for adaptation;						Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Provision of community features in unsustainable locations
	Increased risk of inundation to landward habitats under rising sea levels;					Loss of known or undiscovered archaeological resources	Loss of habitat and shifts in habitat composition	Reduction in abundance and diversity of species	Loss of amenity from habitat and the function habitat provides to the community
	Impact upon aquifers and abstractions;		Loss of abstraction points and intrusion into aquifers						Impacts on water supply to communities
	Loss of communities or community assets; and		Loss of abstraction points and intrusion into aquifers	Loss of agricultural land/soil		Loss of heritage features			Reduction in the amenity of coastal communities
	Loss of heritage and cultural features.					Loss of heritage features			Reduction in the amenity of coastal communities

**ANNEX IV**  
**Scoping Report**

## L9 INTRODUCTION AND BACKGROUND

This section includes:

- Why we are using Strategic Environmental Assessment;
- Development of the study area; and
- The scope and structure of this document.

### L9.1 Why we are using Strategic Environmental Assessment (SEA)

SEA provides a systematic appraisal of the potential environmental consequences of high-level decision-making (i.e. plans, policies and programmes). By addressing strategic level issues, SEA aids the selection of the preferred options, directs individual schemes towards the most appropriate solutions and locations and helps to ensure that resulting schemes comply with legislation and other environmental requirements.

The Defra SMP guidance (Defra, 2006) states that the environmental effects of all policies must be considered before deciding which policies will be adopted. Consideration should be made with regards to both the positive and negative effects of options on wildlife and habitats, populations and health, soil, water, air, climate factors, landscape, cultural heritage and the intrinsic relationship between these.

Under Directive 2001/42/EC of the European Parliament and European Council on the assessment of the effects of certain plans and programmes on the environment, a strategic environmental assessment (SEA) must be made of plans and programmes that are required by legislative, regulatory or administrative provisions. SMPs set a framework for future development and have much in common with the kind of plans and programmes for which the Directive is designed. Therefore **although it is not a statutory obligation**, it is recommended (Defra, 2006) that operating authorities assess policies using the approach described in the Directive. The legislative act which transposes the Directive into domestic law is the Environmental Assessment of Plans and Programmes Regulations (SI 1633, 2004). The main aim of the EU Directive 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"*.

This document represents the first stage in the process of providing an SEA for the Essex SMP.

During the preparation of this document we have utilised, where applicable, the guidance provided by the following:

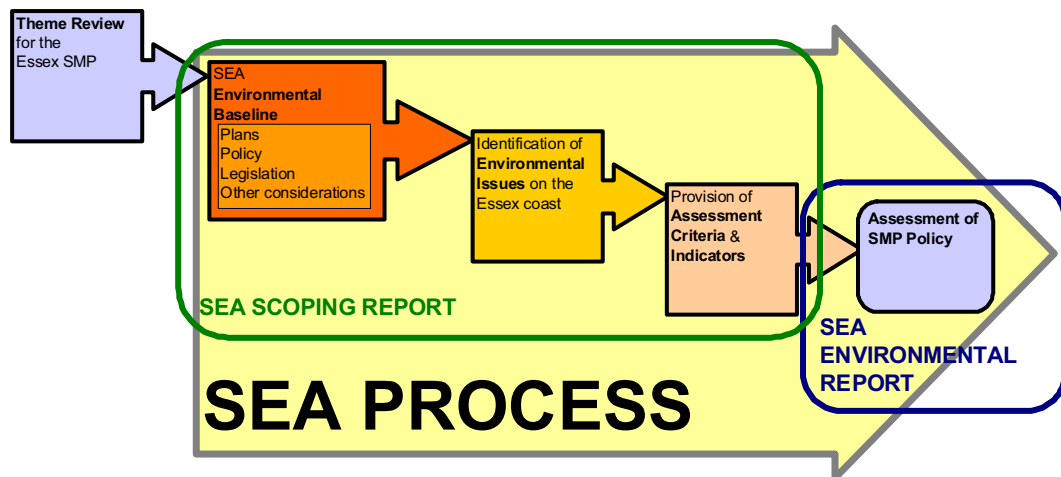
- Defra (2004). . . . Guidance on SEA;
- Defra (2006). . . . Shoreline Management Plan guidance: Volume 1: Aims and requirements;
- Environment Agency (2009). . . . Operational Instruction: SEA;
- Environment Agency (2005). . . . SEA Good Practice Guidelines; and
- ODPM (2005). . . . A Practical guide to the SEA Directive



Further information on the assessment methodology used for this SEA is provided in **Section 2**.

## L9.2 The SMP context for the SEA

The review of SMPs is being developed to ensure that sustainable coastal erosion and flood risk management policies are provided to deal with existing and emerging factors and issues in the coastal zone. The SMP provides the opportunity to develop policy for sustainable shoreline management, which is rooted in a consideration of the environmental, social and economic issues which are evident on a given coastal cell.



The SEA process to accompany the production of the SMP is intended to ensure that consideration of the environmental issues relating to the coast is central to the development and evaluation of policy. This SMP therefore provides the mechanism to support a structured evaluation of the environmental issues relating to the Essex coast and to develop assessment criteria which are focussed on these issues. The evaluation of policy can therefore be shaped and evaluated in a targeted, specific manner. The following sections summarise the approach taken to this task, and how environmental issues have been identified and structured into assessment criteria.

This section explains the SEA process including:

- The process for the development of assessment criteria against which the environmental effects of SMP policy will be evaluated;
- The methodology for baseline data and information collection and identification of any data gaps and/or uncertainty; and
- The prediction and evaluation methodology used for assessing policy.

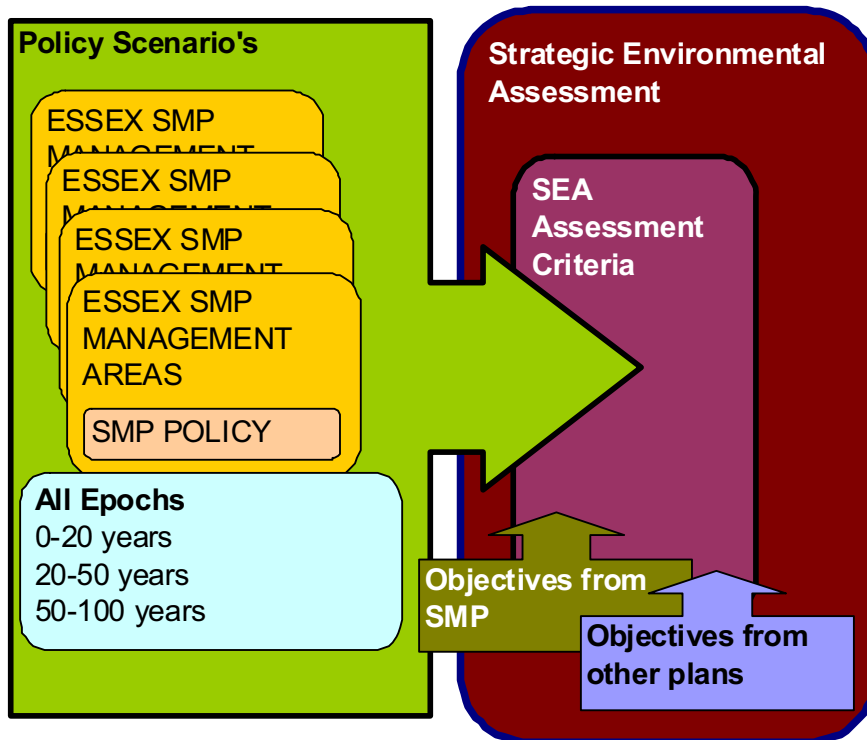
Within this SEA Scoping Report and in a manner analogous to that used throughout the SMP process (Defra, 2006), the term environment is used to cover landscape and natural beauty, wildlife, habitats, and buildings, sites and objects of archaeological, architectural or historical interest, human health, population, water air, climatic factors and material assets. In considering the effects on the environment within the SEA, assessment criteria will reflect the key environmental issues within the SMP area.

The SEA process will follow a simple process which combines the specifics of the SMP process with the stages of an SEA provided in the guidance suite. In regards to the current stage of SMP policy development for the Essex coast, the SEA will therefore be

used to determine the potential effects of policy options on the environment of the Essex coast (with a specific focus on key environmental issues).

The purpose of this scoping stage is to establish the environmental baseline and based on this identify the key environmental issues to be considered during subsequent stages of the SEA. This includes the **assessment criteria** which will provide the basis for the assessment of SMP **policy** (the assessment criteria will be harmonious and consistent with the objectives of the SMP), which will then be considered within the course of producing the SMP (i.e. the evaluation of SMP policy options).

### Strategic Environmental Assessment of SMP Policy



A suite of **assessment criteria** for the SMP process will be developed in this report, based on a review of pertinent plans, policy, legislation and other environmental factors. This review will be provided in the context of the environmental baseline for the assessment. One of the key sources of information within this process will be the Theme Review and Site Characterisation Reports which were developed as a key component of the SMP process. The Theme Review and Site Characterisation Reports for the Essex coast provide a detailed account of all the features located in the coastal zone (social, economic and environmental) and provide the basis for a consideration of the key issues facing shoreline management in this area.

The actual derivation of assessment criteria is therefore a simple expression of the factors which will need to be addressed, in establishing the likely significant effects of the SMP in response to key environmental issues.

### L9.3 Study Area

The Essex Shoreline Management Plan (SMP) study area encompasses approximately 440 km of coastline, stretching from Felixstowe Landguard Point (Ordnance Survey Grid

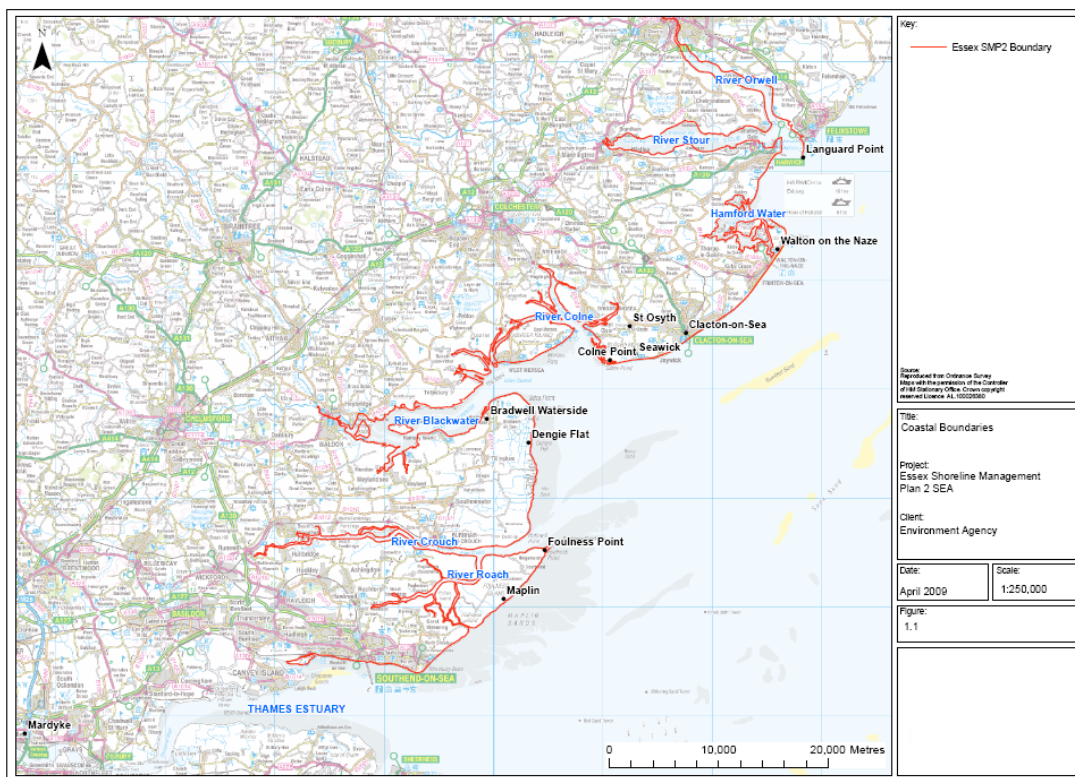
Reference TM 283 311) to the western tip of Two Tree Island, Southend-on-Sea (Ordnance Survey Grid Reference TQ 810 849) and is presented in **Figure 1.1**.

The SMP identifies areas potentially at risk from coastal flooding or erosion or physical coastal change over the next 100 years. The inland boundary is defined principally in relation to these areas of risk and change, but extends to areas and interests which may be affected by both directly and more indirectly by this risk and this is the rationale for selecting the 1 in 1000<sup>†</sup> year flood zone as the area of study. In terms of the estuaries, the SMP covers consideration of areas where management may influence or be influenced by the behaviour of the open coast shoreline.

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<sup>†</sup> The area defined as having a 0.1% (1 in 1000) chance of inundation per annum

Figure 1.1 Extent of coastline covered under the Essex SMP2 SEA.



## L9.4 Scope and Structure of the Document

This Scoping Report comprises six sections, of which this introduction forms **Section One**. Additional and background information is included within the **Appendices**.

The sections within this Strategic Environmental Assessment Scoping report are as follows:

**Section One** introduces this document and sets the context for the use of SEA within the SMP process. . . . In addition, this section explains rationale behind the SMP itself and describes the implication of the SMP on the wider environment;

**Section Two** provides the baseline data associated with the Suffolk coastline, including pertinent policies and legislation;

**Section Three** describes the relevant environmental issues and presents the derived assessment criteria;

**Section Four** presents the approach for consultation and describes how key issues raised through the consultation process will be considered within the SEA process;

**Section Five** provides an account of upcoming steps in this SEA process, as it aligns itself with the production of the SEA;

**Section Six** provides references for this document;

**Appendix A** presents plans and policy pertinent to the SEA process;

**Appendix B** presents legislation pertinent to the SEA process;

**Appendix C** presents information pertaining to sites of conservation importance within the study area;

**Appendix D** presents further baseline information;

**Appendix E** presents information for consideration of the potential effects of the SMP on environmental receptors; and

**Appendix F** presents cross sectional diagrams of the study area. . . .

The purpose of this Scoping Report is to clearly express the key environmental issues to be considered within the SEA. This document therefore provides the opportunity to review and refine the issues which have been initially identified, and to therefore provide focus to the assessment stage, relevant to the Essex coast.

## L9.5 Shoreline Management Plans (SMPs)

### L9.5.1 SMP aims and objectives

A Shoreline Management Plan (SMP) is a large-scale assessment of the risks associated with coastal processes and aims to reduce the risks to the social, economic,

natural and historical environment. An SMP aims to manage risk by using a range of methods which reflect both national and local priorities, to (Defra, 2006):

- Reduce the threat of flooding and erosion to people and their property; and
- Benefit the environment, society and the economy as far as possible, in line with the Government's 'sustainable development principles'.

The first generation of SMPs were produced for the coastline of England and Wales in the late 1990s and were based on sediment cell boundaries which related to the movement of sand and shingle along the coast. The boundaries of these cells were originally set at locations where the net 'along shore' movement of sand and shingle changed direction. In some instances, the area covered by an SMP differed from these sediment cell boundaries, due to different requirements, such as the area covered by a coastal authority. However, for the SMP reviews a behavioural systems<sup>‡</sup> approach was recommended, leading to slightly different boundaries to the first generation (Defra, 2006).

The objectives of an SMP must be in line with the Government's strategy for managing risks from floods and coastal erosion and should (Defra, 2006):

- Set out the risks from flooding and erosion, to people and the developed, historic and natural environment within the SMP area;
- Identify opportunities to maintain and improve the environment by managing the risks from floods and coastal erosion;
- Identify the preferred policies for managing risks from floods and erosion over the next century;
- Identify the consequences of putting the preferred policies into practice;
- Set out procedures for monitoring how effective these policies are;
- Inform others so that future land use, planning and development of the shoreline takes account of the risks and the preferred policies;
- Discourage inappropriate development in areas where the flood and erosion risks are high; and
- Meet international and national nature conservation legislation and aim to achieve the biodiversity objectives.

The most appropriate option for shoreline management will depend on the section of coastline in question and on technical, environmental, social and economic circumstances. The four options considered for shoreline management in the second generation SMPs are presented in **Table 1.1**.

**Table 1.1 Options used in SMP development**

SMP option	Description of option
Hold the line (HTL)	Hold the existing defence line by maintaining or changing the standard of protection. This policy will cover those situations where work or operations are carried out in front of the existing defences (such as beach recharge, rebuilding the toe of a structure, building offshore breakwaters and so on), to improve or maintain the standard of protection provided by the existing

<sup>‡</sup> The current program of SMPs around the coast is a review of the first generation of reports produced in the 1990s and reflects the availability of new coastal processes information, new considerations (site designations etc) and less uncertainty about climate change.

SMP option	Description of option
	defence line. You should include in this policy other policies that involve operations to the back of existing defences (such as building secondary floodwalls) where they form an essential part of maintaining the current coastal defence system.
Advance the line (ATL)	Advance the existing defence line by building new defences on the seaward side of the original defences. Using this policy should be limited to those policy units where significant land reclamation is considered.
Managed realignment (MR)	Managed realignment by allowing the shoreline to move backwards or forwards, with management to control or limit movement (such as reducing erosion or building new defences on the landward side of the original defences).
No active intervention (NAI)	No active intervention, where there is no investment in coastal defences or operations.

Within the development of an SMP, an epoch (time periods) based approach is used for planning purposes, with the three epochs being 0 – 20 (2005 – 2025), 20 – 50 (2025 – 2055) and 50 – 100 (2055 – 2105) years hence.

#### L9.5.2 Implications of SMP policy on the wider environment

Each of the SMP policies presented in **Table 1.1** has the potential to impact the wider environment in one or more ways. **Table 1.2** presents potential implications of each option.

**Table 1.2 Potential generic implications of each SMP option**

SMP option	Positive impacts	Negative impacts
Hold the line (HTL)	<ul style="list-style-type: none"> <li>• Protection of communities and infrastructure located within the coastal flood zone;</li> <li>• Protection of habitat landward of defences;</li> <li>• Protects freshwater resources (e.g. abstractions &amp; boreholes);</li> <li>• Provides stability to areas of coastline, within a wider management context;</li> <li>• Protects economic assets located behind defences; and</li> <li>• Provides protection to ecological, cultural and historical assets landward of the defences.</li> </ul>	<ul style="list-style-type: none"> <li>• Coastal squeeze (loss of habitat);</li> <li>• Interruption of coastal processes;</li> <li>• May increase flood and coastal erosion risk elsewhere;</li> <li>• Promotes unsustainable land use practices with the coastal flood zone;</li> <li>• Diverts limited resources away from an adaptation response to rising sea levels; and</li> <li>• Requires ongoing commitment to future investment in maintenance and improvement.</li> </ul>
Advance the line (ATL)	<ul style="list-style-type: none"> <li>• Provides additional space for communities;</li> <li>• Protection of communities and infrastructure located within the coastal flood zone;</li> <li>• Protection of habitat landward of defences;</li> <li>• Protects freshwater resources (e.g. abstractions &amp; boreholes);</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in extent of coastal habitat;</li> <li>• Change in functionality of habitat;</li> <li>• Increased coastal squeeze;</li> <li>• Interruption of coastal processes;</li> <li>• Effect on marine habitat; and</li> <li>• May increase rate of coastal erosion either side of the advanced line.</li> </ul>

SMP option	Positive impacts	Negative impacts
	<ul style="list-style-type: none"> <li>• Protects economic assets located behind defences; and</li> <li>• Provides protection to ecological, cultural and historical assets landward of the defences.</li> </ul>	
Managed realignment (MR)	<ul style="list-style-type: none"> <li>• Coastal habitats allowed to move landwards under rising sea levels</li> <li>• Creation of habitat to aid UKBAP; (United Kingdom Biodiversity Action Plan) and local BAP (Biodiversity Action Plan) targets;</li> <li>• Habitat created for juvenile fish and other aquatic organisms (benefits to environment and fishing communities);</li> <li>• Reduces flood risk;</li> <li>• Promotes natural coastal processes;</li> <li>• Contributes towards a more natural management of the coast; and</li> <li>• Creation of high tide roosts and feeding areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in extent of habitat landwards of defences;</li> <li>• Change in nature of habitat to landward of defence;</li> <li>• Impact upon aquifers and abstractions;</li> <li>• Loss of communities or community assets; and</li> <li>• Loss of heritage and cultural features;</li> </ul>
No active intervention (NAI)	<ul style="list-style-type: none"> <li>• Coastal habitats allowed to move landwards under rising sea levels;</li> <li>• Promotes natural coastal processes; and</li> <li>• Contributes towards a more natural management of the coast.</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of certainty of effects and time for adaptation;</li> <li>• Increased risk of inundation to landward habitats under rising sea levels;</li> <li>• Impact upon aquifers and abstractions;</li> <li>• Loss of communities or community assets; and</li> <li>• Loss of heritage and cultural features.</li> </ul>

### L9.5.3 Implications of SMP policy on environmental receptors

Defra SEA guidance (Defra, 2004) identifies a series of environmental receptors, which should form the initial basis and scope of the SEA. The receptors are the environmental features which may be impacted by the effects of the SMP.

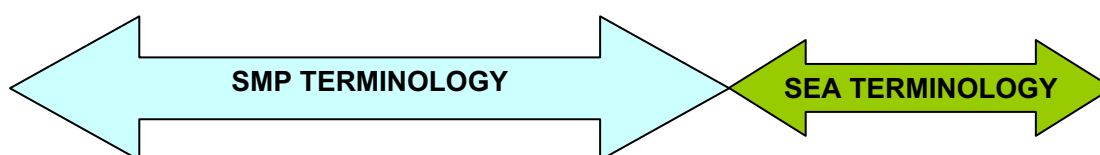
The SMP guidance requires that the SMP is developed in response to a consideration of the environmental features of the coast, features which need to be assessed to determine the nature and characterisation of the coast. There is a difference of language here between the building block of the SEA and the SMP. It is necessary therefore to clarify how SMP features relate to SMP receptors, and to then establish how the SMP may impact on the receptors. A cross reference of the manner in which SEA receptors relate to SMP terminology is provided below in **Table 1.3**.

The SEA Regulations require that for each environmental receptor, and initial appraisal is provided relating to how the SMP may impact each specific receptor. This is provided in **Appendix E**. A summary of the overall potential effects of the SMP on the environment is provided in Table 1.3 below. The receptors developed for the Essex SMP SEA have been aggregated from the SEA Regulations receptors due to the nature of the SMP process and its application across the coast; hence, biodiversity, fauna and flora has been separated into two receptors, habitats and species, as the assessment of impacts upon these receptors can be better quantified by this division



**Table 1.3 SMP and SEA Terminology**

SMP Issues & Objectives	SMP Thematic Review	SEA Receptor
Environment	Natural environment	Habitats
		Species
		Air, climatic factors and water
	Agriculture	Soil
Landscape and character	Landscape	Landscape
		Material assets
		Population
Heritage	Historic environment	Cultural heritage
Commercial	Current and future land use	Population and communities
Recreation		Population and communities
Hard assets		Population and communities



Collectively, the impacts on receptors can then be traced back, to establish how the SMP may influence the environment. This step provides clarity relating to how the environment has been a consideration in SMP production and assessed in the context of the SEA. Simply, the SMP process therefore provides an integral element in the development of SMP policy, and how policy options are evaluated and developed.

The assessment in **Appendix E** provides an illustration that all SMP policy options have the potential to have an impact on all SEA receptors, with the exception of air. Air has been scoped out as a receptor potentially effected by the SMP, since no pathway was identified for this effect. SMP policy concerns itself with land, water and the tidal interface as a spatial area, no instances were identified were SMP policy could have any impact, positive or negative on air quality.

The identification of receptors which may be impacted by the SMP will provide the focus for the subsequent assessment.

**L9.6 Appraisal methodology**

Due to the nature of the Essex SMP area, policy appraisal will be undertaken across eleven areas of coastline, as defined by the coastal cross-section diagrams (Royal Haskoning, 2008a). Undertaking the analysis in this manner will allow for a systematic and integrated appraisal of SMP policy across the Essex coastline. The cross-sections are based upon estuarine and open coast areas and will allow a holistic interpretation of the impacts of SMP policy. These cross-sections are presented in **Appendix F** and characterise the following areas of coastline:

- River Orwell;
- River Stour;
- Hamford Water;
- Tendring Peninsula;
- Colne Estuary;
- Blackwater Estuary;

- Dengie Flat;
- River Crouch;
- River Roach;
- Foulness; and
- Southend.

## L10 BASELINE DATA

The scale and level of detail in a SEA (particularly with regard to baseline information) is different to that of a project-level Environmental Impact Assessment (EIA), principally due to its position in the decision making hierarchy. As a SMP is a high level plan, this SEA considers the key features and characteristics of the study area that would influence decisions at a strategic level. As such, it is less detailed and quantitative than an EIA and is focused on broad directions of change. We have based this SEA on environmental data collected from our own records and through liaison with other bodies including Natural England, the Environment Agency and others.

The Theme Review (Royal Haskoning, 2008b) and Cross-section diagrams (Royal Haskoning, 2008a), which have been produced as part of the SMP process have been a key source of information in providing the basis and focus of the baseline provided below and in shaping the consideration of environmental issues. The SMP process requires a detailed assessment of the key features of the coastline, and the Theme Review and Site Characterisation reports provide an extensive tabulated and narrative based account of this. Accordingly the Theme Review and Site Characterisation reports should be considered by extension a critical element of the SEA process.

During the consultation process on the Scoping Report, any additional information relevant to this assessment will be collected (i.e. information not covered in the work described above). The forthcoming section describes the key features and legislation considered within the assessment, with the main subject areas for data collection being presented below:

- Pertinent policy relating to the Essex Coast;
- Legislation relating to the management of the Essex coast;
- Designations for environmental reasons relating to the Essex coastal area; and
- Wider environmental issues which are considered central to a consideration of SMP policy.

Baseline data has been provided in the following sections, based upon the themes which have emerging in the course of SMP production to date (Theme Review and Site Characterisation) and the receptors identified in the SEA Guidance (ODPM, 2006). The collation of data in this manner is representative of the issues identified within the SEA area and aids understanding of the relationship between receptors. For each heading, the relevant receptors have been identified from the list of receptors provided in Defra guidance (Defra, 2004) and specified in **Section 5**.

### L10.1 Air Quality

It is considered that given the nature of SMP policy, air quality is not a receptor of the effects of the plan, and air quality has therefore not been considered further in this assessment. No pathway has been established between SMP policy and air quality. Construction which may be required to implement policy will be subject to a range of environmental assessment procedures, where direct affects will be addressed. Accordingly baseline data has not been provided for air quality.

## **L10.2 Climatic impacts**

In a manner analogous to air quality, no tenable pathways were established between the SMP and climatic impacts, due to the high level and aspirational nature of the SMP. Again, where construction may be required to implement SMP policy, this will be subject to a range of environmental assessment procedures, where the direct affects will be addressed and therefore baseline data has not been provided for climatic impacts, with this receptor not being considered further.

## **L10.3 Water**

### L10.3.1 Designated shellfish waters 2004

As described in further detail in **Appendix B**, certain waters are designated under the Shellfish Waters Directive (2006/113/EC). The areas designated as such are intended to support the directive by protecting or improving shellfish waters in order to support shellfish life and growth, therefore contributing to the high quality of shellfish products directly edible by man. Within the SMP area designated shellfish waters are presented below:

- Walton Backwaters;
- Osea Island;
- Blackwater;
- Strood Channel;
- Salcott Channel;
- Tollesbury Channel;
- Pyefleet;
- Colne;
- Dengie;
- Roach and Lower Crouch;
- Upper Crouch;
- Upper Roach;
- Foulness;
- Outer Thames; and
- Southend

### L10.3.2 Hydrology & water resources

The geology of coastal Essex is a complex array of varying marine, alluvial and glacial drift sediments that overly or border the thick deposits of the London Clay and terrace gravels. The characteristic fringing marshlands protected by sea walls were traditionally grazing marsh, composed of varied marine sediments lying at the seaward foot of the low clay hills or terrace gravels. The river catchments within the Essex CAMS comprise of the Rivers Orwell, Stour, Colne, Chelmer, Blackwater, Crouch and Roach.

### L10.3.3 Borehole and water abstraction

Two groundwater protection zones lie within the SMP area, these being along the River Orwell around Ipswich and along the River Stour to the west of Manningtree. **Figure 2.1** presents groundwater protection areas within the wider Essex area (Environment Agency, 2008).

As can be seen from **Figure 2.1**, these groundwater protection zones are limited in extent and therefore SMP policy is unlikely to have a significant impact upon these areas. Licensed abstraction information for the Essex coastline is presented in **Figures 2.2 – 2.5**. There are numerous abstraction points in the flood zone along the coast, however the critical factor is there their specific location (i.e. providing access to water) does not need to be restricted to a coastal location. In simple terms, abstraction points could be moved to more landward locations (if required by coastal policy or processes) without any risk to interruption of the water supply.

**Figure 2.1** Groundwater sources protection zones within the wider Essex area (Environment Agency, 2008)

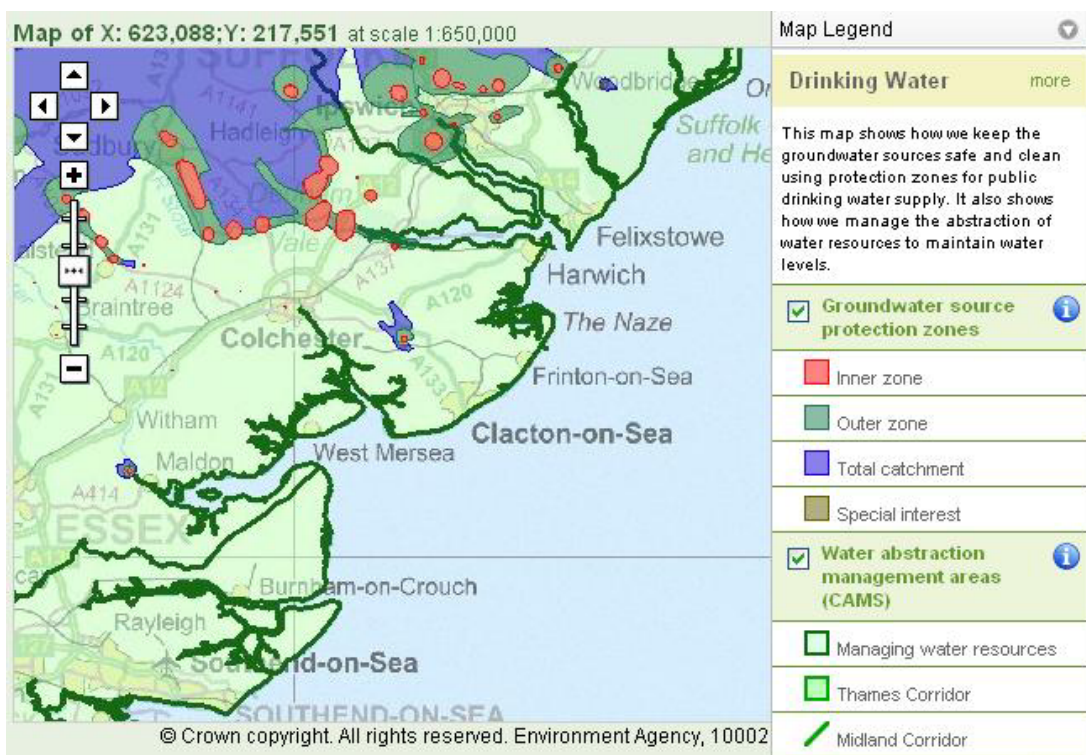


Figure 2.2 Licensed Abstraction locations of the Essex coastline (Section 1)

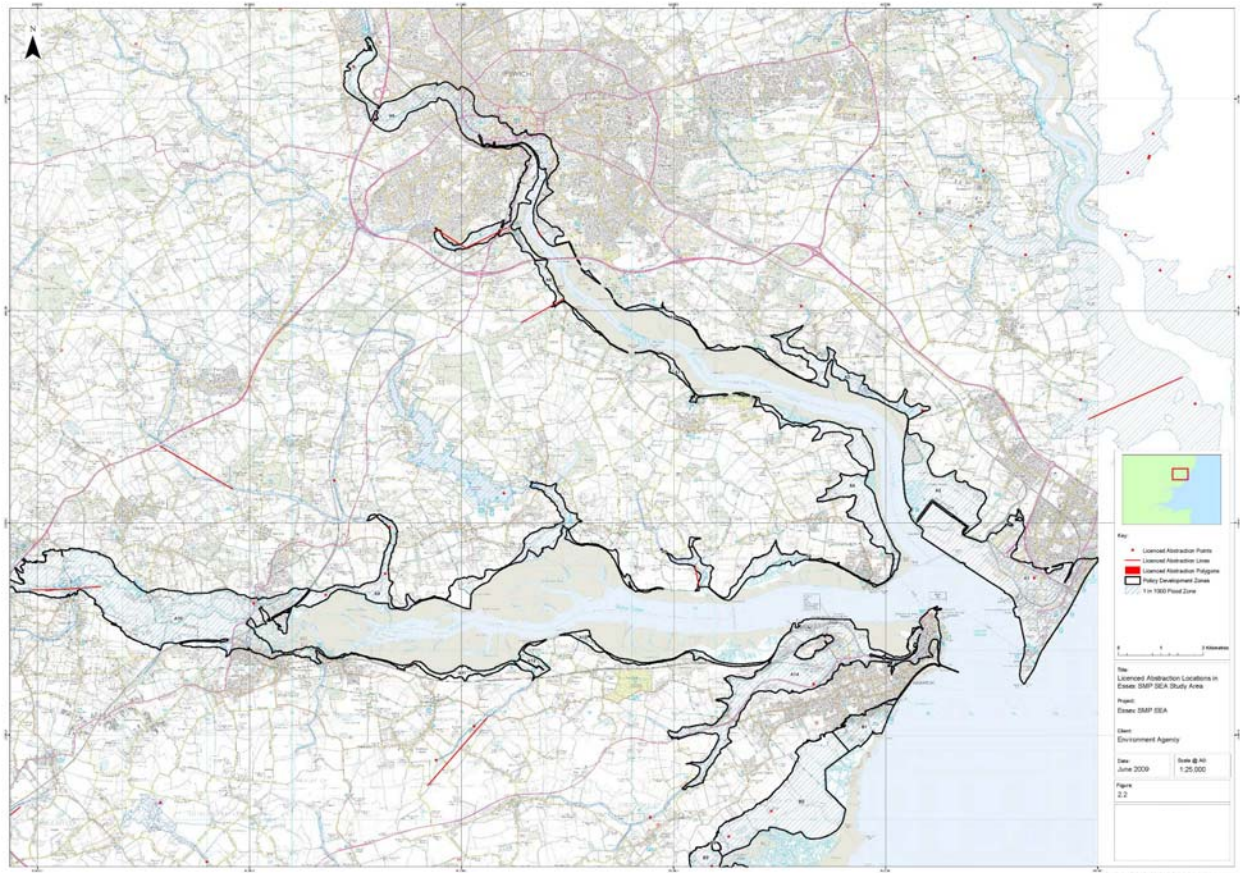


Figure 2.3 Licensed Abstraction locations of the Essex coastline (Section 2)

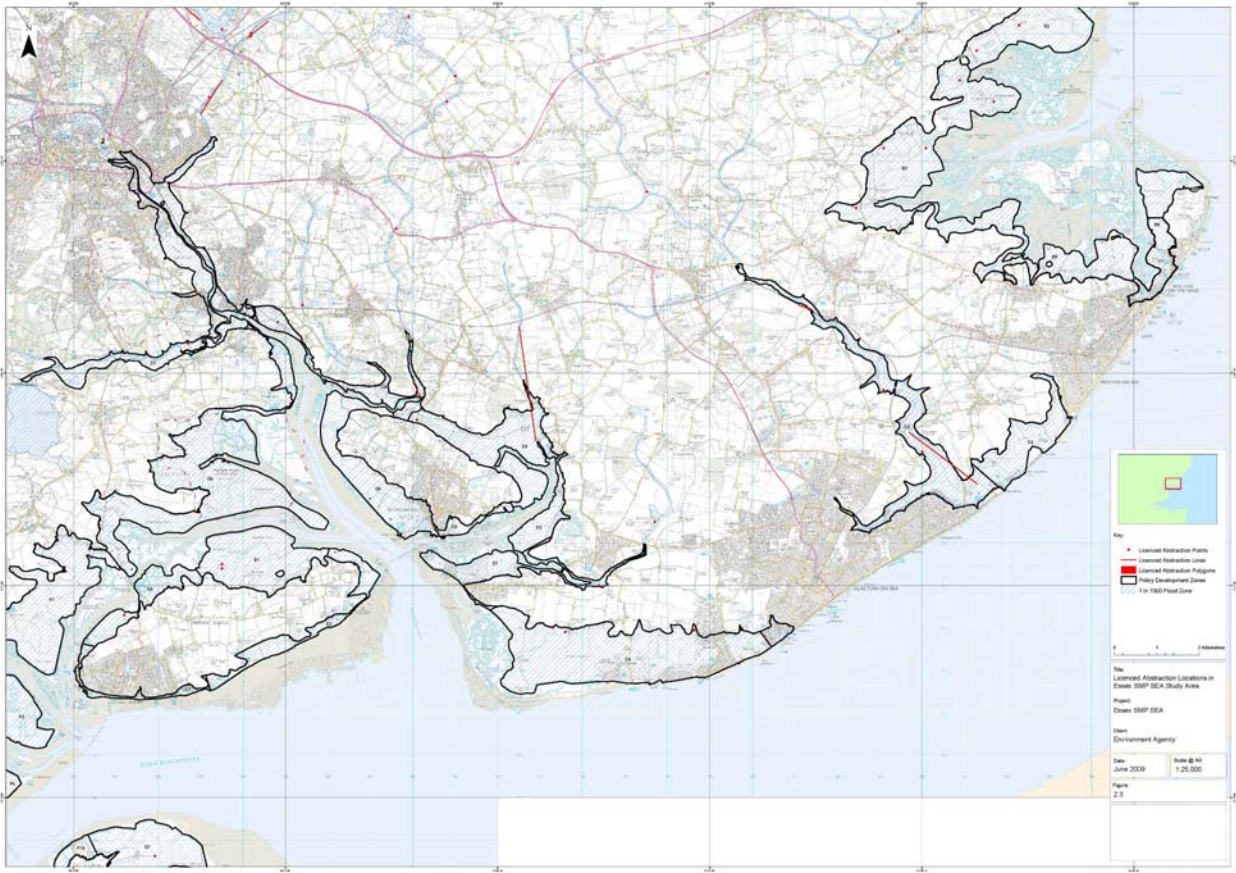


Figure 2.4 Licensed Abstraction locations of the Essex coastline (Section 3)

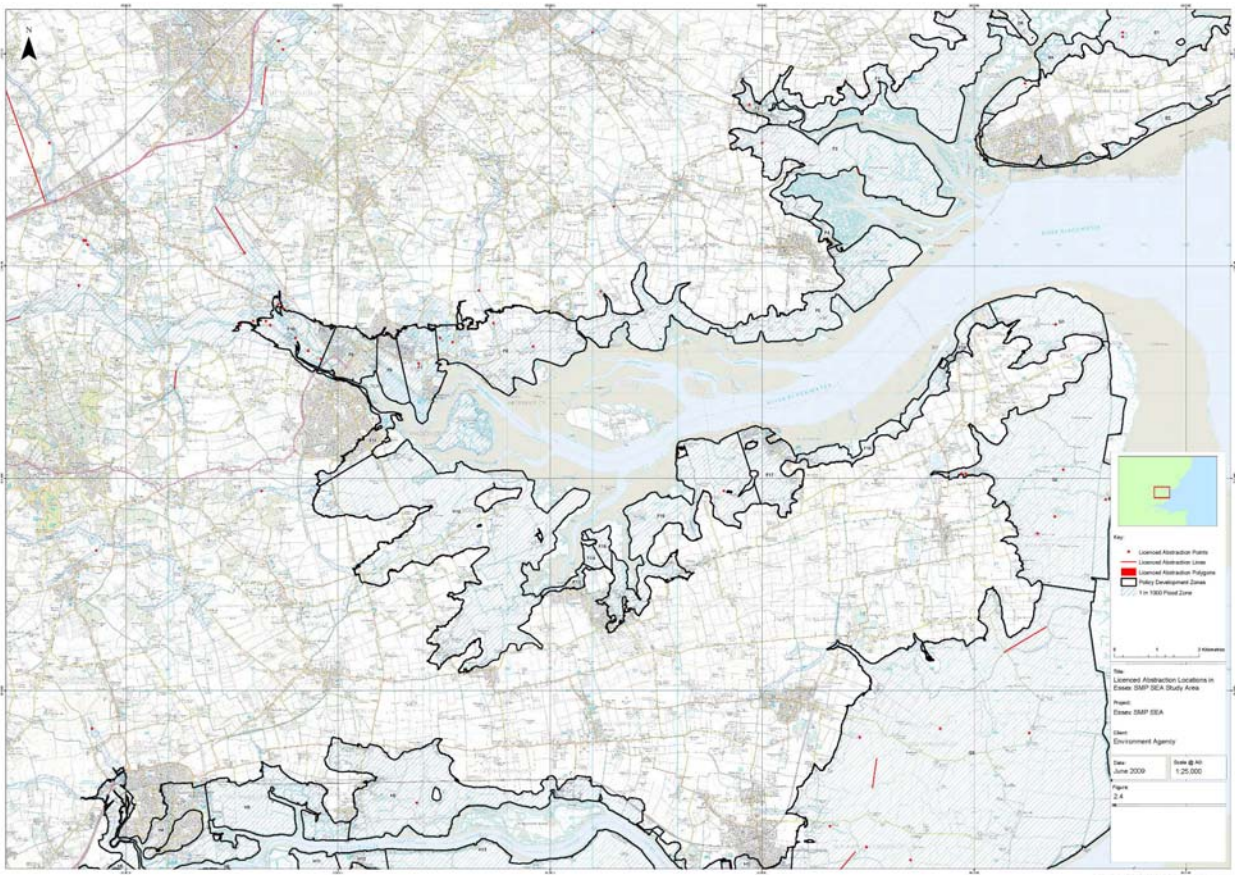
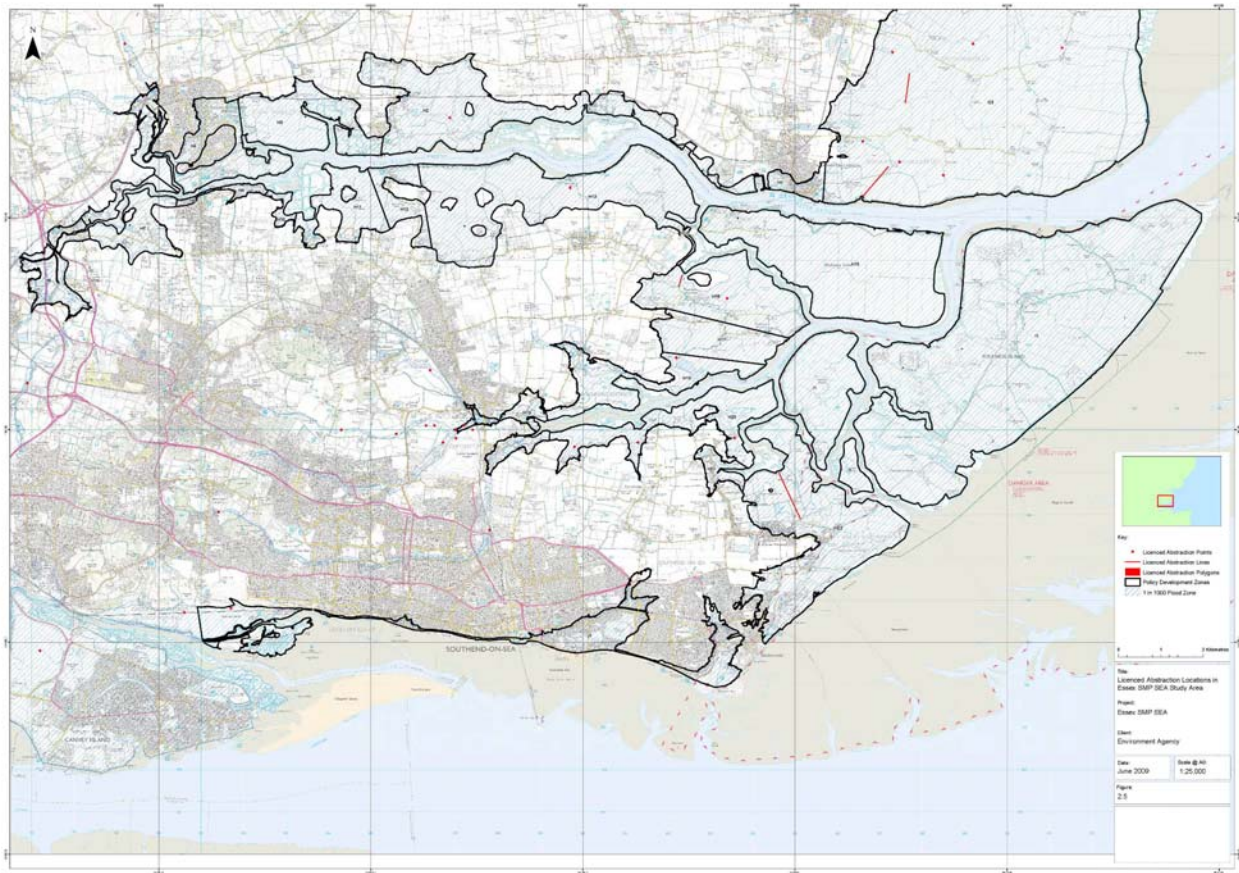




Figure 2.5 Licensed Abstraction locations of the Essex coastline (Section 4)



## **L10.4**    **Landscape**

### L10.4.1    Landscape Character Assessment

Essex has one of the longest coastlines of any county in England comprising complex estuary systems, extensive salt marsh and intertidal areas of international conservation importance. It still has a small but active fishing fleet and, largely due to its proximity to London, has been a traditional holiday area for over a century (Essex County Council, 2005).

Large scale reclamation has taken place over the recent past, with large areas of grazing marsh being at or below sea level. Overall the coastline is predominantly low lying and protected by earth clay flood embankments with sea facing revetment works or sea walls together with groynes. Essex has an unusual coastline, which is formed of a series of interlinked estuaries, these being the Stour and Orwell, Hamford Water, Colne and Blackwater, the Crouch / Roach and the Thames. These estuary systems are interrupted by discrete units of open coast - Walton to Colne Point, the Dengie Peninsula and the Maplin / Foulness shore. Much of the estuarine areas are dominated by muddy intertidal flats and saltmarshes, whereas in areas of open coast there is a mixture of features including London Clay sea cliffs and shingle, sandy and muddy beaches.

In places the junction between the coastal marshlands and the low hills is perceived as a gradual transition, such as the marshland at St Osyth and southeast of Maldon. Elsewhere, as at Fingringhoe, above the Mersea Flats at Cudmore Grove and above St Lawrence Bay, the land rises more steeply to around 20m AOD, to give a distinct backdrop to the horizontal planes of the coastal marsh (Essex County Council, 2005). This topographical difference is most striking at Creeksea, where the higher land comes to the river's edge as low cliffs, and behind Bridgemarsh Island where the land rises steeply to 50m.

The undeveloped coast of Essex exhibits a strong relationship between its ecology and landscape, perhaps more than anywhere else in the county (Essex County Council, 2005). More than any other attribute apart from landform, the ecology of the coastland gives it a unique and distinctive quality. The Landscape Character Assessment of the Essex coast (Essex County Council, 2005) provides the following list of features characteristic of the Essex coastline:

- A dynamic system of muds, sands, shingle and shells between the tides;
- Rich habitat for invertebrates and molluscs;
- Extensive feeding grounds for wildfowl and waders; basking areas for seals;
- Archaeological and historic remains;
- A large-scale open landscape with extensive views of estuary and coast;
- Big skies giving keen sense of the weather; and
- A sense of remoteness.

The Landscape Character Assessment of the Essex coast (Essex County Council, 2005) also provides the following list of key issues in regards to the Essex coastline:

- Danger of pollution of intertidal habitat;
- Disturbance of habitat by inappropriate recreation;

- Loss of traditional commercial maritime trade and distinctive sailing craft;
- Erosion of diversity and distinctiveness of seaside beach huts;
- Need for recording or conservation of archaeological and historic features;
- Restricted access;
- Views inland cluttered by scattered development; and
- Night-time remoteness damaged by lighting at urban fringes.

#### L10.4.2 Area of Outstanding Natural Beauty (AONB)

There are two Areas of Outstanding Natural Beauty in the study area:

- Dedham Vale; and
- Suffolk Coasts and Heaths

Dedham Vale, on the Suffolk-Essex border is an exceptional example of a lowland river valley. Undulating slopes fall gently to the slow-flowing, meandering River Stour and in its hedged water meadows, copses and riverbank willows, the landscape has been described as the epitome of the farmed English countryside. The designated area of the AONB stretches upstream from Manningtree to within one mile of Bures. However, the landscape quality of the remainder of the Stour Valley has resulted in its designation as a potential AONB or Special Landscape Area and countryside management takes place within this wider framework.

The landscape was famously captured by John Constable over 200 years ago and is in part due to a desire to maintain the landscapes he painted and wrote about that led to the creation of the AONB. It was designated as an AONB in 1970 and covers approximately 90km<sup>2</sup>. The Dedham Vale AONB and Stour Valley Management Strategy sets out the management actions to be taken by the relevant local authorities and organisations between 2004 and 2009, as well as containing a “vision up to 2030” (Dedham Vale AONB, 2004-2009).

The Suffolk Coast and Heaths AONB covers an area of 405km<sup>2</sup> and like Dedham Vale, was designated in 1970. It runs from Kessingland in the north to just south of the River Stour near Manningtree, and includes the towns of Southwold and Aldeburgh, Orford Ness and Rendlesham Forest. The Suffolk Coast and Heaths AONB Management Plan seeks to co-ordinate the action of the organisations that make up the AONB Partnership, while setting a framework for any organisation or individual whose activities will have an impact on the objectives for the area. In addition, the Management Plan also has a role in supporting the Local Development Frameworks (LDFs) of the local authorities, identifying issues, aims, objectives and actions that are relevant to the AONB and that can be underpinned by planning policy. Both management plans have been used within this assessment to provide direction for the development of SEA criteria (Suffolk Coasts and Heaths AONB, 2009). The AONBs within the study area of the Essex Coastline are shown in **Figure 2.6**.

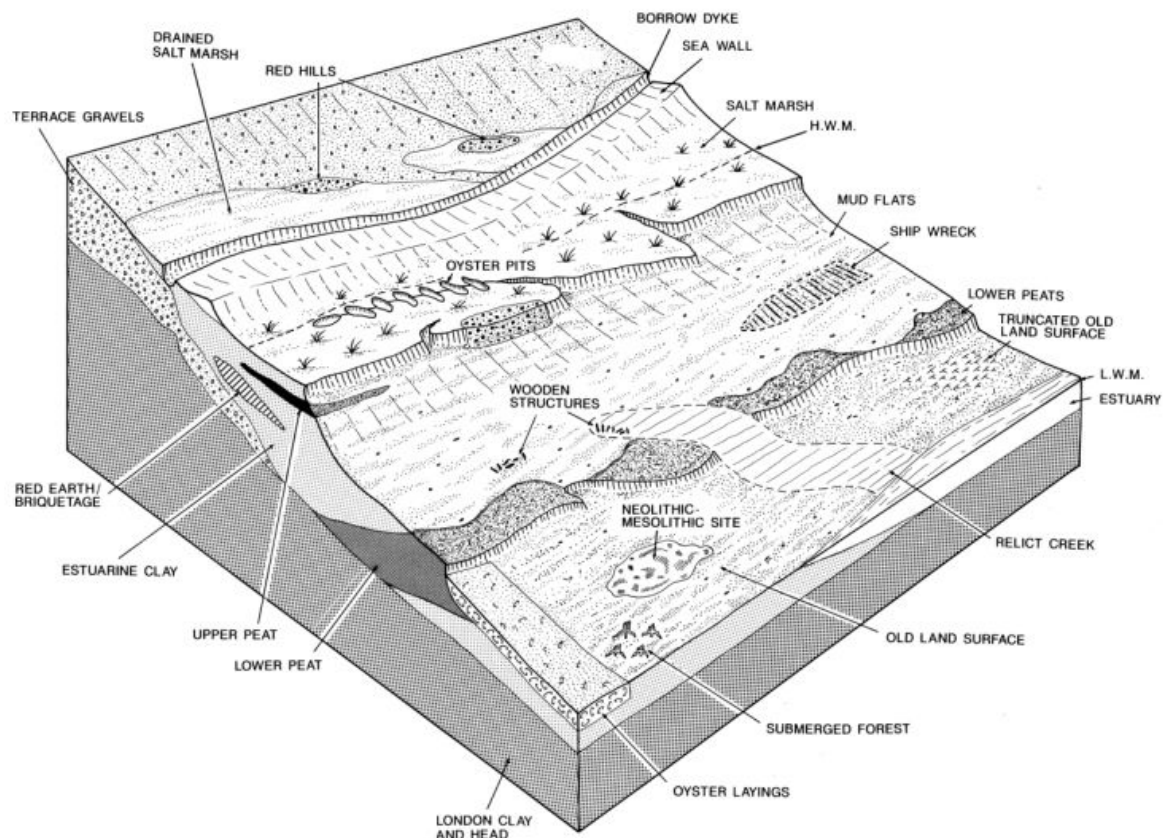
Figure 2.6 Areas of Outstanding Natural Beauty on the Essex coastline



## L10.5 The historic environment

From the end of the last glaciation, a combination of rising sea levels and subsidence of the North Sea basin led to submergence of former coastal lowlands. Rising and falling sea levels from 10,000 years ago led to the inundation of previously occupied sites by estuarine sediments, thus protecting the sites from further weathering. Archaeological surveys of the area have revealed some of the best quality, and most extensive, evidence of prehistoric settlements in England. In particular there are extensive areas of Neolithic land surface preserved within the intertidal zone.

Land use has historically been agricultural with archaeological evidence indicating that the production of wool and dairy produce was common from the Bronze Age. In the later Iron Age and Roman periods extensive salt production resulted in the creation numerous 'Red Hills' low mounds on the marshes composed of the debris from salt manufacture. These mounds were reused for hundreds of years as the location of camp sites for shepherds and dry areas for stock compounds.



**Plate 1.** An example cross section of the Essex and south Suffolk coast showing the underlying geology and archaeological features that are found along this section of coastline.

Settlement was historically largely sited on the higher ground, close to the interface with the marsh, in order to maximise access to resources, with some farms, fishing villages and small ports being established within the marshland itself. The Essex and south

Suffolk coast was a centre of oyster production in the Roman period. In the Saxon period very large timber fish-traps, whose remains can be seen at low tide at many locations, were constructed at a time when urban ports first develop, most notably at Ipswich at the head of the Orwell. Throughout later prehistory - the Roman and Saxon periods - the marshes were used for grazing. This was on the open saltmarsh; it was not until the medieval period that they began to be enclosed by sea walls and converted to managed grazing marshes, a process that continued for centuries. Thus by the late 18<sup>th</sup> century almost the whole of the coastline was fringed by embanked and managed grazing marsh. Grazing was the dominant farming pattern for centuries although areas were used at times for arable agriculture. Fishing, hunting wildfowl and the harvesting of shellfish have also been practiced for centuries. It has been estimated that in the region of 80% of the coastal grazing marsh has been lost since the end of the Second World War, some of which is being restored through agri-environment schemes.

Almost every village and farm in the coastal region was connected to the creeks and estuaries; many were provided with their own wharfs or landing stages. In a 16th century survey of 'all the Ports Creeks and Landing Places in England and Wales' Essex was recorded as having 135 compared with 29 in Sussex, 18 in Kent, 17 in Suffolk and 12 in Norfolk. The proximity of this coast to the European mainland has resulted in a wide range of fortifications, defences and military infrastructure being built, from Roman times to the Cold War.

In Essex there are over 300 Scheduled Monuments (SMs), of which 27 are cited by English Heritage as being at risk. Although protected by law, scheduled monuments are threatened by a wide range of human activities and natural processes. SMs within the study area are presented in **Table 2.1**. It must be recognised that this represents only a tiny fraction of the archaeological sites and deposits present, and by no means all that are most significant. In recognition of the significance and complexity of the historic environment of the Essex coast; the whole of the Blackwater estuary, and upper Crouch estuary, have recently been included on the English Heritage list of nationally significant sites as part of its *Heritage Management of England's Wetlands initiative*.

**Table 2.1 Scheduled Monuments within the 1 in 1000 year flood zone (MAGIC, 2008)**

Name	Easting	Northing
Landguard Fort and associated field works	628452.613349	231782.541217
Area of middle and late Saxon town	616526.77499	244147.283559
Shotley Battery	625039.330501	233960.63118
Martello Tower 'L'	624830.055248	233655.768502
Ring Ditches south west of Reed Island	608621.520682	232704.46818
Napoleonic coastal battery at Bath Side, 400m west of Tower Hill	625873.712856	232441.358846
Harwich Lighthouse	626116.041222	232436.962
The Harwich Treadwheel Crane	626215.181816	232468.603682
The Dovercourt Lighthouses and causeway	625384.588263	230822.020861
Beaumont Quay, Hamford Water: 19 <sup>th</sup> Century quay & lime kiln	618964.772389	224004.877658
Martello Tower 'K' and associated battery south west of Walton Mere	625078.16506	222007.128186
Martello Tower 'K' and associated battery south west of Walton Mere	625149.124419	222048.167563
Lion Point Decoy 810m SE of Cockett Wick Farm	613941.065847	213291.882531
Martello Tower 'C', St Osyth Beach, Clacton-on-Sea	613618.313692	212752.986822
Martello Tower 'A' & associated battery, Stone Point	608299.517748	215691.959609

Martello Tower 'A' & associated battery, Stone Point	608235.812851	215669.78953
Coastal Fish Weirs at West Mersea, 570m south of St Peter's Wall	600995.320932	211931.420825
Coastal Fish Weir at northern end of the Nass	599953.799625	211038.435533
Square Decoy Pond 260m south of Pennyhole Fleet, Old Hall Marshes	598661.893456	211804.663933
Decoy Pond immediately north of Pennyhole Fleet, Old Hall Marshes	598280.540836	212339.328615
Gore Decoy 760m south of East Lauriston Farm	592600.224062	208247.758999
Mound E of Basin Road	587165.93785	207514.433412
Coastal Fish Weir 440m North West of Pewet Island	598750.7171	208132.961674
Saxon Coastal Fish Weir	603354.586317	209376.442142
Saxon shore fort and Anglo-Saxon monastery, Bradwell-on-Sea	603117.033578	208188.311166
Decoy Pond 700m north of Marsh Farm House	601942.573663	204201.393608
Medieval Saltern adjacent to Hawbush Creek	582338.011299	196297.468501
Romano-British burial site on Foulness Island	597910.18613	190520.399983

None of the SMs listed in **Table 2.1** are deemed to be at risk from coastal processes (English Heritage, 2009). Other historic environment features of interest are presented in **Figures 2.7 – 2.10**, with these figures showing the following features:

- Scheduled Monuments (SMs);
- Listed Buildings;
- Registered parks and gardens; and
- Battlefields

As highlighted by **Figures 2.7 – 2.10** this area does include a number of Listed buildings in areas that may be at risk through coastal processes. Such features are typically found in existing settlements, which are therefore likely to be protected (both historically and via SMP policy), however it is evident that along the entire coast, examples can be found of isolated Listed Buildings near to the foreshore. Clearly therefore, SMP policy evaluation will need to have regard to the effects on local Listed Buildings wherever a policy of managed realignment or no active intervention is considered.

In addition to the features listed above, the marshes of Essex and estuarine areas are considered to contain a variety of non-designated historical features. Such features may currently be unknown/undiscovered and may be at risk where the foreshore is expected or intended to move landward (through realignment or erosion). The typical approach to this issue in the SMP process is to include English Heritage in the process of evaluating areas that may be lost, so that a process of investigation and evaluation is provided (with adequate time and resources).

#### L10.5.1 Conservation areas

Conservation areas vary greatly in their nature and character, ranging from the centres of our historic towns and cities, through fishing and mining villages, eighteenth and nineteenth century suburbs, model housing estates, and country houses set in their historic parks, to historic transport links and their environs, such as stretches of canal.

Conservation areas give broader protection than listing individual buildings: all the features listed or otherwise, within the area, are recognised as part of its character.

Local authorities have the power to designate as conservation areas in any area of

'special architectural or historic interest' whose character or appearance is worth protecting or enhancing. This 'specialness' is judged against local and regional criteria, rather than national importance as is the case with listing. Conservation areas within the SMP areas are presented in **Table 2.2**.

**Table 2.2 Conservation areas along the Essex coast and lying wholly or partially within the 1 in 1000 flood zone.**

<b>District Council</b>	<b>Conservation area</b>
Tendring District Council (10 in total)	Brightlingsea
	Brightlingsea Hall & All Saints Church
	Clacton Sea Front
	Frinton
	Harwich
	Manningtree & Mistley
	Thorpe-le-Soken Station & Maltings
Maldon District Council (10 in total)	Burnham on Crouch
	Goldhangar
	Heybridge basin
	Langford
Colchester District Council	Wivenhoe
Rochford District Council (10 in total)	Foulness Churchend
	Great Wakering
	Paglesham East End
	Paglesham Church End
	Rochford
Southend Borough Council	Leigh Old Town
	Seafront
	Shoebury Garrison

Further background information on the Essex coastline which has been used in this assessment is provided as **Appendix D**.



Figure 2.7 Historic environment map of the Essex coastline (Section 1)

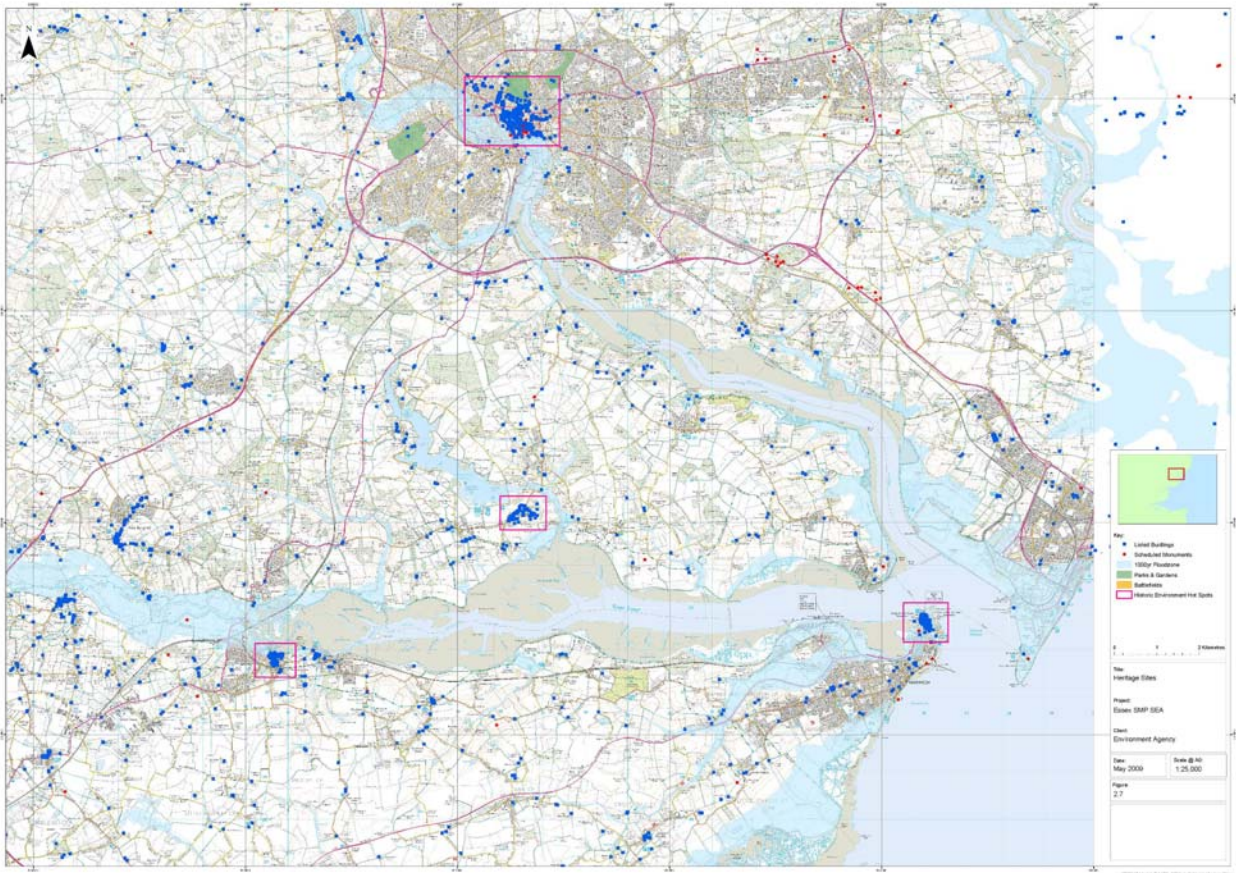


Figure 2.8 Historic environment map of the Essex coastline (Section 2)

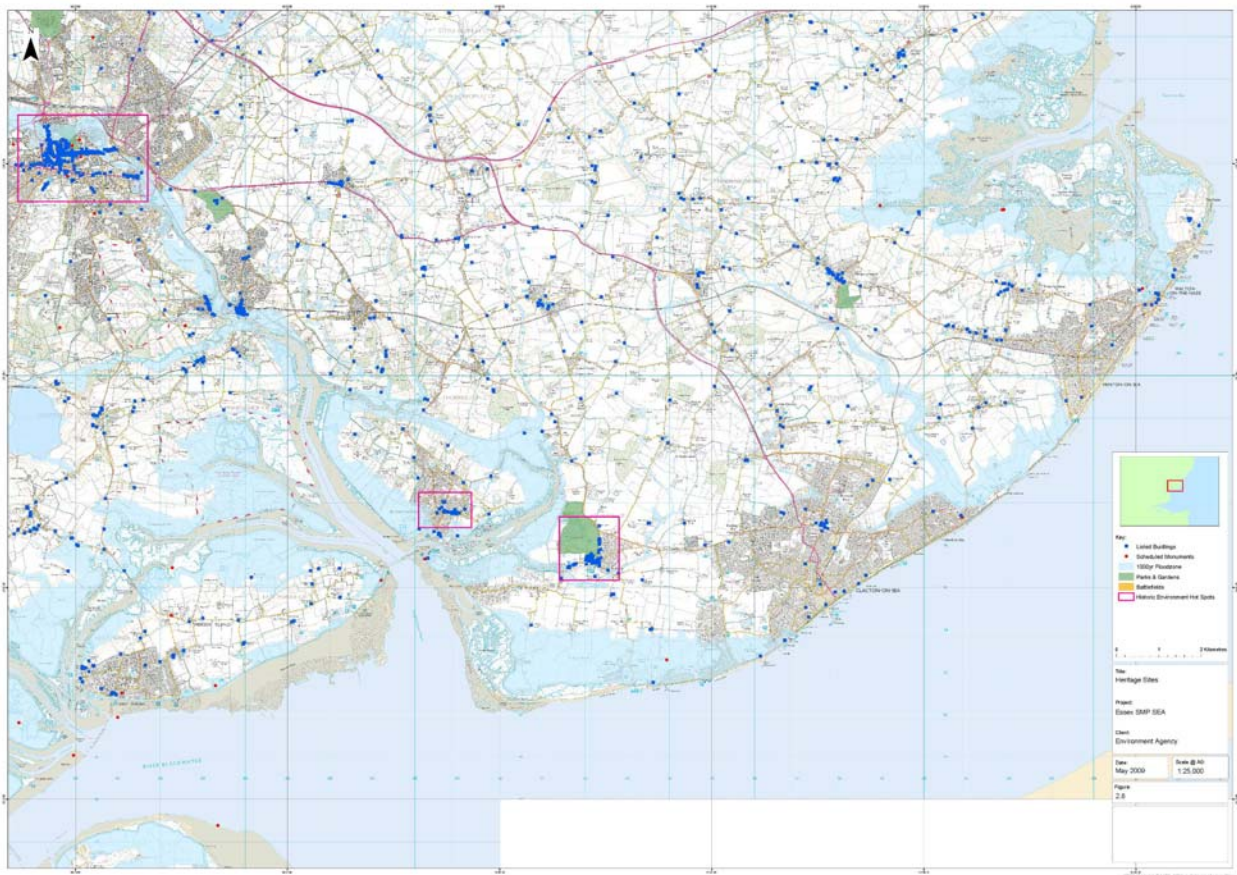


Figure 2.9 Historic environment map of the Essex coastline (Section 3)



Figure 2.10 Historic environment map of the Essex coastline (Section 4)



## **L10.6 Habitats & species**

### **L10.6.1 Statutory International Designations**

The largely undeveloped Essex coast is home to a wide range of species and habitats and is of particularly high conservation value. It is also a vulnerable coastline. Sections of coastline are suffering from 'coastal squeeze' where the intertidal zone is trapped between the coastal defence (flood bank or sea wall) and rising sea levels. As a result many of the salt-marshes are in decline, exposing the defences to increased wave attack and causing concern for engineers and environmentalists alike. Each of these habitats in turn supports a range of species of high conservation value, including birds, plants and invertebrates. The high conservation value is reflected in the fact that the majority of the coastline is subject to statutory nature conservation and landscape designations. These designations have important implications for any prospective developments, management or policies relating to the Essex Coast.

Broadly speaking, nature conservation designations seek to conserve designated areas and the habitats and species which are the basis of their statutory designations. However, different designations are derived from different pieces of legislation, which each vary in the nature and mechanisms of their protection. The statutory designations which apply to the Essex Coast SMP2 area, their implications and requirements, are detailed in the forthcoming section. Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites are covered by the provisions of the Conservation Regulations 1994 (the Habitat Regulations). This entails stringent requirements that 'plans or projects' not directly connected with or necessary for the management of the (SAC, SPA or Ramsar) site, can only proceed where it can be demonstrated by the competent authority for consenting the plan or project that it will not adversely affect the integrity of the site. Shoreline Management Plans come under the definition of 'plan or project', and must therefore pass this test, via an 'appropriate assessment'.

The inherently dynamic nature of coastal environments, and the potential of flood risk management structures and practices to both constrain (e.g. by holding or advancing the line) and create (e.g. from no active intervention or managed realignment) habitat means that SMP policy has a highly significant bearing on natural habitats and designated sites. Where plans or projects (policies within the SMP in this context) can not be determined as having no adverse effect on site integrity, they may nonetheless proceed if no alternative solutions exist, and they are deemed necessary on the basis of having imperative reasons of over-riding public importance (IROPI). Where projects are allowed to proceed on this basis, compensatory measures must be secured to ensure that the overall coherence of the Natura network (SPAs and SACs) is maintained. In the context of coastal habitats, this might include the creation of new habitat on adjacent coastal areas by managed realignment.

All Internationally designated sites within the study area (either coastal or within the 1 in 1000<sup>§</sup> year coastal flood zone) are presented in **Table 2.3**.

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<sup>§</sup> The 1 in 1000 year flood zone indicates that any land within this zone has a 0.1% probability of tidal inundation per annum.

**Table 2.3 Internationally designated sites within or adjacent to the study area**

International site type	Legislation site designated under	Site name	Area (ha)
Ramsar	Ramsar Convention	Stour & Orwell Estuaries	3,672.64
		Hamford Water	2,185.76
		Colne Estuary	2,713.99
		Crouch & Roach Estuaries	1,745.11
		Blackwater Estuary	4,395.15
		Dengie	3,134.01
		Benfleet & Southend Marshes	2,283.96
		Foulness	10,942.13
		Abberton Reservoir	726.2
Special Area of Conservation (SAC)	Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive)	Essex Estuaries	46,109.95
Special Protection Area (SPA)	Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive)	Stour & Orwell Estuaries	3,672.64
		Hamford Water	2,185.76
		Colne Estuary	2,719.93
		Blackwater Estuary	4,403.40
		Dengie	3,134.01
		Benfleet & Southend Marshes	2,283.96
		Foulness	10,942.13
		Abberton Reservoir	726.2

The Stour Estuary forms the south-eastern part of Essex/Suffolk boundary. The Orwell Estuary is a relatively long and narrow estuary with extensive mudflats and some saltmarsh, running from Ipswich in the north, southwards towards Felixstowe (JNCC, 2008a). The Stour and Orwell Estuary is a wetland of international importance, comprising extensive mudflats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. It provides habitats for an important assemblage of wetland birds in the non-breeding season and supports internationally important numbers of wintering and passage wildfowl and waders. The area also forms an important habitat for seven nationally scarce plants and five British Red Data Book invertebrates (JNCC, 2008a).

Hamford Water is a large, shallow estuarine basin comprising tidal creeks and islands, intertidal mud and sand flats, and saltmarsh supporting rare plants and internationally important species and populations of migratory waterfowl (JNCC, 2008b).

The Colne Estuary lies about 3 km south-east of Colchester on the north Essex coast (JNCC, 2008c). The Colne Estuary is a comparatively short and branching estuary, with five tidal arms which flow into the main river channel. The estuary has a narrow intertidal zone predominantly composed of flats of fine silt with mudflat communities typical of south-eastern estuaries. It is a site of international importance for wintering Brent geese *Branta bernicla bernicla* and black-tailed godwit *Limosa limosa*, as well as being of

national importance for breeding little tern *Sterna albrifrons* and five other species of wintering waders and wildfowl. The variety of habitats which include mudflat, saltmarsh, grazing marsh, sand and shingle spits, disused gravel pits and reedbeds, support outstanding assemblages of invertebrates and plants (JNCC, 2008c).

Abberton Reservoir is a large, shallow, freshwater storage reservoir built in a long, shallow valley and is the largest freshwater body in Essex. It is one of the most important reservoirs in Britain for wintering wildfowl and waders feeding in adjacent estuarine areas. The site is also important for winter feeding and autumn moulting of waterbirds. The margins of parts of the reservoir have well-developed plant communities that provide important opportunities for feeding, nesting and shelter. Abberton Reservoir is also important especially as an autumn arrival area for waterbirds that subsequently spend the winter elsewhere (JNCC, 2008d).

The Blackwater Estuary is the largest estuary in Essex north of the Thames and is one of the largest estuarine complexes in East Anglia. A large number of nationally and internationally important species are supported by the saltmarsh-fringed mudflats found along the Blackwater. Of additional conservation interest are the surrounding terrestrial habitats including ancient grazing marsh with its associated fleet and ditch systems and semi-improved grassland. This rich mosaic of habitats supports an outstanding assemblage of nationally scarce plants and a nationally important assemblage of rare invertebrates. There are 16 British Red Data Book species and 94 notable and local species (JNCC, 2008e).

Dengie is a large and remote area of tidal mudflat and saltmarsh at the eastern end of the Dengie peninsula, between the Blackwater and Crouch Estuaries. The saltmarsh is the largest continuous example of its type in Essex. The foreshore, saltmarsh and beaches support an outstanding assemblage of rare coastal flora. The site hosts internationally and nationally important wintering populations of wildfowl and waders, and in summer supports a range of breeding coastal birds including knot *Calidris canuta*, hen harrier *Circus cyaneus* and brent goose. The formation of cockleshell spits and beaches is of geomorphological interest (JNCC, 2008f).

The River Crouch and the River Roach are between the Dengie Peninsula and Southend-on-Sea (JNCC, 2008g). The River Crouch occupies a shallow valley between two ridges of London Clay, whilst the River Roach is set predominantly between areas of brick earth and loams with patches of sand and gravel. The intertidal zone along the Rivers Crouch and Roach is 'squeezed' between the sea walls of both banks and the river channel. This leaves a relatively narrow strip of tidal mud that provides important habitat for a significant numbers of birds. The site is an internationally important location for the hen harrier and brent goose. Additional interest is provided by the aquatic and terrestrial invertebrates and by an outstanding assemblage of nationally scarce plants (JNCC, 2008g).

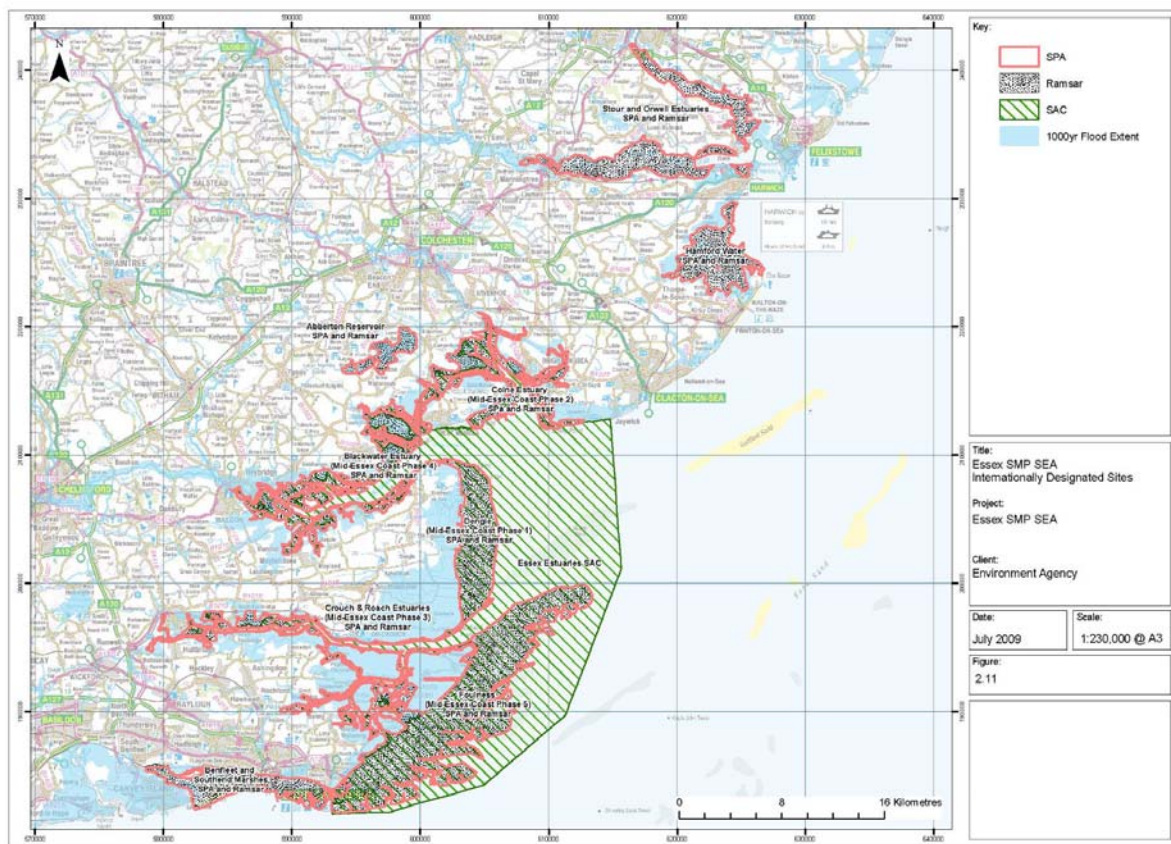
Foulness is part of an open coast estuarine system at the wide northern mouth of the Thames estuary comprising grazing marsh, saltmarsh, intertidal mudflats and sandflats. The site includes one of the three largest continuous sand-silt flats in the UK. These habitats support nationally rare and nationally scarce plants, and nationally and internationally important populations of breeding, migratory and wintering waterfowl (JNCC, 2008h).

Benfleet and Southend Marshes comprise an area of foreshore with a tidal creek system and an area of grazing marsh. The marshes form an important internationally designated habitat for species including the brent goose, knot and ringed plover *Charadrius hiaticula*. The south-facing slopes of the downs of composed of London Clay capped by sand, and represent the line of former river cliffs with several re-entrant valleys.

The effect of the designations listed in **Table 2.2** is that large areas of the Essex coastline are covered by one designation or more. **Tables 1 – 19** in **Appendix C** present the qualifying features for all statutory internationally designated sites within the Essex SMP area. **Figure 2.11** presents an overview of the designated conservation areas along the Essex coastline.



Figure 2.11 Internationally designated sites along the Essex coast SMP SEA study area



## L10.6.2 Statutory National Designations

The Essex coastline also contains several sites designated under national legislation, with these being presented in **Tables 2.4 – 2.5** and **Figure 2.12** with qualifying information for these sites being presented in **Table 2.6**.

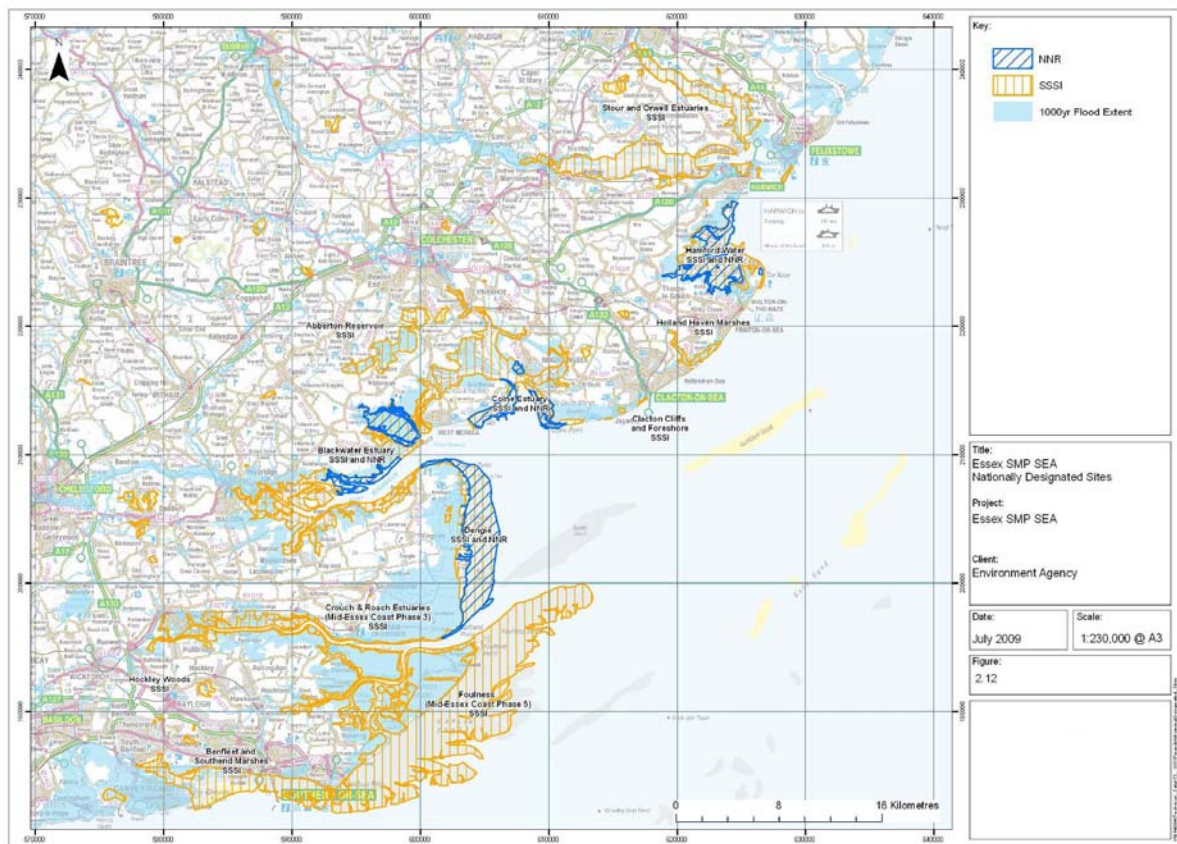
**Table 2.4 Sites designated SSSI under national conservation legislation on the Essex coast**

<b>SSSI name</b>	<b>Area (ha)</b>
Landguard Common	30.49
Orwell Estuary	1335.52
Stour Estuary	2248.01
Cattawade Marshes	89.22
Stour & Cooperas Woods, Ramsey	78.17
Harwich Foreshore	10.32
Little Oakley deposit channel	2.95
Hamford Water	2185.76
The Naze	24.06
Holland Haven Marshes	210.63
Holland On Sea Cliff	0.09
Clacton Cliffs and Foreshore	26.28
Colne Estuary	2986.46
St Osyth Pit	0.06
Upper Colne Marshes	113.19
Blackwater Estuary	4403.46
Dengie	3132.43
Sandbeach Meadows	29.38
Foulness	10946.14
Crouch and Roach Estuaries	1745.98
Benfleet & Southend Marshes	2373.68

**Table 2.5 Sites designated NNR under national conservation legislation on the Essex coast**

<b>NNR name</b>	<b>Area (ha)</b>
Blackwater Estuary	1031
Colne Estuary	576
Dengie	2366
Hamford Water	1448
Leigh	257

Figure 2.12 Nationally designated sites within the Essex SMP SEA study area



**Table 2.6 Qualifying information for sites designated under national conservation legislation on the Essex coast**

SSSI name	Site Features
Landguard Common	Landguard Common is a sand and shingle spit protecting the northern entrance to the haven ports of Harwich and Felixstowe. It consists of a loose shingle foreshore backed by a stabilized, vegetated beach, earth banks and scrub. Pioneer shingle plants and vegetated shingle beaches are fragile and nationally scarce habitat type. The site is also of some ornithological interest as a landfall site for passage migrants and for breeding shorebirds. The north part of the foreshore is protected by sea defences but this and the beach crest further south is sea washed and provides bare shingle for colonizing shingle species. This includes a large population of Sea Kale <i>Crambe maritima</i> as well as Sea Pea <i>Lathyrus japonicus</i> , Yellow-Horned Poppy, Sea Sandwort and Sea Campion. The bare shingle is also used by nesting Little Tern and Ringed Plover.
Orwell Estuary	The Orwell Estuary is of national importance for breeding avocet <i>Recurvirostra avosetta</i> , its breeding bird assemblage of open waters and their margins, nine species of wintering waterfowl (including black-tailed godwit <i>Limosa limosa islandica</i> ), an assemblage of vascular plants and intertidal mud habitats.
Stour Estuary	The Stour Estuary is nationally important for 13 species of wintering waterfowl and three species on autumn passage. The estuary is also of national importance for coastal saltmarsh, sheltered muddy shores, two scarce marine invertebrates and a vascular scarce plant assemblage. The Stour Estuary includes three nationally important geological sites. These provide exposures of early Eocene sediments containing the volcanic ash formations between Harwich and Wrabness. The same rocks are also important for the fossil fruits and seeds that they contain. At Stutton, much younger Pleistocene sediments have yielded an important and rich fossil vertebrate fauna.
Cattawade Marshes	At the head of the Stour Estuary, between freshwater and tidal channels of the river Stour. These grazing marshes with associated open water and fen habitats are of major importance for the diversity of their breeding bird community, which includes species that have become uncommon throughout lowland Britain as a result of habitat loss. The site has benefited from a sympathetic management regime aimed at enhancing the ornithological interest. The marshes are also of value as a complement to the adjacent Stour Estuary SSSI where breeding habitats for birds are relatively scarce.
Stour & Cooperas Woods, Ramsey	Stour and Cooperas Woods together comprise the largest area of woodland in north-east Essex. They are ancient woods lying on glacial sands and gravels on the southern shore of the Stour Estuary between Wrabness and Ramsey. They have a coppice-with standards structure and contain the only example in the county where coastal and woodland habitats meet. The woodland is mainly Chestnut <i>Castanea sativa</i> coppice with Pedunculate Sessile Oak <i>Quercus robur</i> and <i>Q. petraea</i> standards and some ash <i>Fraxinus excelsior</i> . Hornbeam <i>Carpinus betulus</i> , hazel <i>Corylus avellana</i> and small-leaved lime <i>Tilia cordata</i> form the other coppice species with maple <i>Acer campestre</i> on the woodland edge. The chestnut stools are exceptionally large. Holly <i>Ilex aquifolium</i> and butcher's broom <i>Ruscus aculeatus</i> occur near the margins. Cooperas Wood, whose seaward boundary is an eroding wooded cliff, contains in addition an area of cherry <i>Prunus avium</i> and aspen <i>Populus tremula</i> . The ground flora of the woods is dominated by bramble <i>Rubus fruticosus</i> agg. with bluebell <i>Hyacinthoides non-scripta</i> , wood anemone <i>Anemone nemorosa</i> and honeysuckle <i>Lonicera periclymenum</i> widespread. There are large patches of yellow archangel <i>Lamiastrum galeobdolon</i> and dog's mercury <i>Mercurialis perennis</i> is found locally.
Harwich Foreshore	This locality yields the only fossil flora that is with certainty attributable to the lowest division of the Eocene London Clay. Its composition is typical of the formation and specimens are abundant. Association of the plants with ash bands within the Clay may aid correlations

SSSI name	Site Features
	elsewhere in the basin since they form useful marker horizons. It is a recently discovered site with great research potential.
Little Oakley Deposit Channel	Little Oakley Channel Deposit provides a reserve of Pleistocene interglacial channel-fill sediments, unique in Britain, and currently attributed to part of the Cromerian complex of interglacials recognized in the Netherlands. Excavations and borings at Little Oakley have yielded abundant faunal and floral remains, including numerous mammalian bones (many of extinct species), molluscs, ostracods, as well as a fine pollen record. The site is of great importance for Quaternary studies, not only because it seems to represent an early Middle Pleistocene interglacial unknown elsewhere in Britain, but also because it is associated with the early Thames drainage system, and therefore assists in the establishment of a link between the Pleistocene successions in the Thames Valley and East Anglia.
Hamford Water	Hamford Water is a tidal inlet whose mouth is about three miles south of Harwich. It is a large and shallow estuarine basin comprising tidal creeks, intertidal mud and sand flats, saltmarshes, islands, beaches and marsh grasslands. The site is of international importance for breeding Little Terns and wintering dark-bellied Brent Geese, wildfowl and waders, and of national importance for many other bird species. It also supports communities of coastal plants which are rare or extremely local in Britain, including Hog's Fennel <i>Peucedanum officinale</i> which is found elsewhere only in Kent.
The Naze	The main interest of this site is in the excellent cliff exposures of the earliest (Waltonian) subdivision of the Pleistocene Red Crag, which is here rich in marine Mollusca and other invertebrate fossils. This overlies older Tertiary sediment. This is the type of site for the earliest recognised stage of the British Pleistocene sequence, the Waltonian. The site provides unrivalled sections in the Waltonian Crag essential to studies of Pleistocene stratigraphy, particularly with relevance to the lower limit of that period. The site yields abundant plant material from the Tertiary London Clay. Sections here in the A1 and A2 divisions of the formation offer a unique opportunity to study the flora in situ. This is the only locality to yield angiosperms preserved as carbonaceous compressions, invaluable for the study of small seed fossils. A key Tertiary palaeobotanical locality.
Holland Haven Marshes	Holland Haven Marshes in an area of reclaimed estuarine saltmarsh and freshwater marsh situated between Holland-on-Sea and Frinton-on-Sea. The site is bisected by Holland Brook and its tributaries, from which an extensive ditch system radiates. The ditch network represents an outstanding example of a freshwater to brackish water transition intimated by the aquatic plant communities, which include a number of nationally and locally scarce species. The adjoining grasslands are of botanical importance in their own right as well as acting as a buffer zone to the ditch system. Further interest is provided by the aquatic and terrestrial invertebrates and the birds which frequent the area, especially in winter.
Holland-On-Sea Cliff	Cliff exposures at Holland-On-Sea comprise an important stratigraphic site closely related to the diversion of the Thames. The latter event, of great significance to the geomorphological evolution of the London Basin, was the result of blocking of the early Thames Valley across central Essex by the Anglian Glaciation. At Holland two gravels are exposed, the site representing the type locality of both and therefore representing a stratigraphic site of considerable importance.
Clacton Cliffs and Foreshore	Foreshore and cliff exposures and excavations in the Clacton district have provided opportunities for the study of one of the most important Pleistocene interglacial deposits in Britain. The celebrated Clacton channel deposits are a sequence of freshwater and estuarine sediments occupying a channel cut into an earlier gravel accumulation and the underlying Tertiary London Clay. They have yielded abundant molluscan and mammalian fossil remains, fossil plants and pollen, all of which indicate a Hoxnian interglacial age. The deposits also contain the type site of the internationally significant Clactonian Industry which, based on a crude working technique, is believed to be stratigraphically earlier than the

SSSI name	Site Features
	Acheulian culture. The relationship between the Clacton Channel deposits and the other Pleistocene sediments of the area is poorly understood. There is need for further study of this critical site, which provides important comparisons, in a British context, with Hoxne and Swanscombe.
Colne Estuary	The Colne Estuary is comparatively short and branching, with five tidal arms which flow into the main river channel. The estuary is of international importance for wintering Brent Geese and Black-tailed Godwit and of national importance for breeding Little Terns and five other species of wintering waders and wildfowl. The variety of habitats which include mudflat, saltmarsh, grazing marsh, sand and shingle spits, disused gravel pits and reed beds, support outstanding assemblages of invertebrates and plants. Two areas of foreshore at East Mersea are of geological importance. Colne Point and St. Osyth Marsh are of geomorphological interest.
St Osyth Pit	St. Osyth Pit comprises an important sequence of Pleistocene deposits related to the diversion of the Thames during the Anglian glacial period. The lower part of the succession consists of Thames gravel of the pre-diversion 'Kesgrave' type i.e. deposited before the Thames was diverted by Anglian ice. This is overlain by sand and very fine gravel, the composition of the latter showing it to be distal outwash (deposited by meltwater from ice which had therefore arrived in the Thames catchment). The recognition of a comparable sequence elsewhere and of its relation to the terraces of the Tendring Plateau has shown that the outwash at St. Osyth reflects a brief period when the Thames was actually blocked by ice. The site is therefore of considerable stratigraphic importance in reconstructing the events of the Anglian glacial period.
Upper Colne Marshes	The Upper Colne Marshes lie along both sides of the River Colne and Roman River, south east of Colchester. The site consists of grazing marshes with associated ditch and open water habitats, a series of tidal salt marshes behind old flood defence walls following a number of breaches, the sea walls themselves, and a small area of intertidal mud. It is considered to be of special interest as it supports an outstanding assemblage of nationally scarce plants and an unusual diversity of brackish ditch-types. Additional interest is provided by the terrestrial and aquatic invertebrates found within the site, and breeding and wintering birds.
Blackwater Estuary	The Blackwater Estuary is the largest estuary in Essex north of the Thames and, indeed, is one of the largest estuarine complexes in East Anglia. Its mud flats, fringed by saltmarsh on the upper shores, support internationally and nationally important numbers of waterfowl which overwinter here. Shingle and shell banks and offshore islands are also a feature of the tidal flats. The surrounding terrestrial habitats - the sea wall, ancient grazing marsh and its associated fleet and ditch systems, plus semi-improved grassland - are also of high conservation interest. This rich mosaic of habitats supports an outstanding assemblage of nationally scarce plants and a nationally important assemblage of rare invertebrates, with 16 Red Data Book species and 94 notable and local species.
Dengie	Dengie is a large and remote area of tidal mudflat and saltmarsh at the eastern end of the Dengie peninsula, between the Blackwater and Crouch Estuaries. The saltmarsh is the largest continuous example of its type in Essex. Foreshore, saltmarsh and beaches support an outstanding assemblage of rare coastal flora. It is a resort for internationally and nationally important wintering populations of wildfowl and waders, and in summer supports a range of breeding coastal birds including rarities. The formation of cockleshell spits and beaches is of geomorphological interest.
Sandbeach Meadows	Sandbeach Meadows lie on alluvial deposits at the north-eastern end of the Dengie peninsula. The area of grassland is virtually all that remains of the once extensive grazing marshes which formed the hinterland of the nearby Dengie coastline. The seven fields are

<b>SSSI name</b>	<b>Site Features</b>
	sympathetically managed and support nationally important number of dark-bellied brent geese during the winter.
Foulness	Foulness lies on the north shore of the Thames Estuary between Southend in the south and the Rivers Roach and Crouch in the north. It comprises extensive intertidal sand-silt flats, saltmarsh, beaches, grazing marshes, rough grass and scrubland. The flats are of national and international importance as winter feeding grounds for nine species of wildfowl and wader, with the islands, creeks and grazing land forming an integral part as sheltered feeding and roosting sites. The shell banks support nationally important breeding colonies of Little Terns, Common Terns and Sandwich Terns. The complex matrix of habitats also supports nationally important numbers of breeding Avocets along with plants and invertebrates. Numerous species are locally restricted in their distribution and nationally uncommon or rare.
Crouch & Roach Estuaries	The rivers Crouch and Roach are situated in South Essex. The River Crouch occupies a shallow valley between two ridges of London Clay, whilst the River Roach is set predominantly between areas of brickearth and loams with patches of sand and gravel. The intertidal zone along the rivers Crouch and Roach is 'squeezed' between the sea walls on both banks and the river channel. This leaves a relatively narrow strip of tidal mud in contrast with other estuaries in the county. This however is used by significant numbers of birds, and together with the saltmarsh and grazing marsh which comprise the Crouch and Roach Estuaries SSSI regularly support internationally important numbers of one species, and nationally important numbers of three species of waders and wildfowl. Additional interest is provided by the aquatic and terrestrial invertebrates and by an outstanding assemblage of nationally scarce plants.
Benfleet & Southend Marshes	Benfleet and Southend Marshes comprise an extensive series of salt marshes, mudflats, scrub and grassland which support a diverse flora and fauna. The south-facing slopes of the downs, composed of London Clay capped by sand, represent the line of former river cliffs with several re-entrant valleys. At their foot lies reclaimed marshland, with its associated dyke system, based on alluvium. Outside the sea walls there are extensive salt marshes and mud-flats, on which wintering wildfowl and waders reach both nationally and internationally important numbers. Nationally uncommon plants occur in all of the habitats and parts of the area are of outstanding importance for scarce invertebrates.
<b>NNR name</b>	<b>Site Features</b>
Blackwater Estuary	<p>Blackwater Estuary NNR is approximately 15 km south of Colchester and comprises two main areas: Tollesbury Flats and Old Hall Marshes. Tollesbury Flats is managed by Natural England and consists of a coastal strip close to the town of Tollesbury. This part of the reserve is closed to the public as it is a sensitive intertidal zone. Old Hall Marshes is managed by the RSPB and comprises the Old Hall Marshes Peninsula close to the village of Salcott. The marshes surround a lagoon called Pennyhole Fleet. The two areas are separated by an estuary, the Tollesbury Fleet.</p> <p>Tollesbury Flats supports a variety of invertebrates and is an important feeding area for many waterfowl including cormorants, brent geese, oystercatchers and plovers.</p> <p>Old Hall Marshes is home to a range of breeding and over-wintering waterfowl and a population of breeding bearded tits. The site also supports a number of nationally important plant and invertebrate species.</p>

SSSI name	Site Features
Colne Estuary	<p>Colne Estuary NNR comprises of three areas: Brightlingsea Marsh, East Mersea and Colne Point.</p> <p>Brightlingsea Marsh is an area of low-lying grazing marsh. The largest part of the site comprises unimproved grassland which is interspersed with a series of fleets (shallow creeks) and dykes.</p> <p>East Mersea is part of Mersea Island (separated from Brightlingsea by the Colne River estuary). The NNR area is a strip of coastal land that has been shaped by erosion and deposition. Cliff erosion has exposed important fossil remains and the site (which includes areas of saltmarsh) supports a number of rare plant species and large numbers of wintering wildfowl and waders.</p> <p>Colne Point comprises an extensive shingle spit system, a saltmarsh that has formed in the lee of the spit, and large areas of shell beds and shingle banks that are only exposed at low tide. The Point is important as a geomorphological feature and for the diverse plant and animal populations it supports.</p>
Dengie	<p>The Dengie peninsula consists of shall and gravel banks and an extensive area of saltmarsh. Amongst the species found at the site are Oystercatcher, Ringed plover, Redshank, Reed bunting, Hen harrier, Marsh harrier and Meadow pipit. The site is currently closed to the public.</p>
Hamford Water	<p>The reserve is a large estuarine basin comprising tidal creeks, intertidal mud and sand flats, and saltmarshes. Hamford Water is home to wintering populations of Dark-bellied brent geese, Black-tailed godwit, Redshank, Ringed and Grey Plover, Shelduck, Teal and Avocet. There is also a large breeding colony of Little Terns. During severe winter weather the area is an important refuge for wildfowl and waders.</p> <p>The reserve's saltmarshes support one of Britain's rarest coastal plants; Sea hogs fennel.</p>
Leigh	<p>The mud flats at Leigh NNR have a dense, vigorous growth of eel grass species which, together with their invertebrate populations, support large numbers of Dark-belled brent geese and waders such as Knot and Grey Plover. The saltmarshes are noted for their abundant plant life, in particular the five species of glasswort that grow there. The lower marshes are home to Sea aster, Small cordgrass and Glasswort species, while the upper marshes are dominated by Sea Purslane.</p>

### L10.6.3 Vulnerable freshwater / terrestrial sites

Much of the Essex coast is low lying and consists of reclaimed marshland, being protected from tidal inundation by a series of coastal defence structures. As a high proportion of this land is at or below mean sea level (MSL), it is at risk in the face of rising seas levels. **Table 2.7** presents those freshwater marshes which are either located wholly or partially within the 1 in 1000 year flood zone.

**Table 2.7 Freshwater marshes located within the 1 in 1000 year flood zone within the study area.**

Name	Designation
Trimley Marshes	Orwell Estuary SPA / SSSI
Holland Haven Marshes	Holland Haven Marshes SSSI
Horseley Island	Hamford Water SPA / SSSI
St Osyth Marsh	Colne Estuary SPA / SSSI