Topic Paper 3

The Natural Environment

ldf

Version 1.0

Swale BOROUGH COUNCIL
NORTH KENT COAST

The Natural Environment Topic Paper

This topic paper is one of a series, prepared by the Council, to support preparation of its Local Development Framework (LDF). The topic papers in the series currently comprise:

1. Demography and Social Trends
2. Policy Context
3. The Natural Environment
4. The Built Environment
5. The Economy
6. Tourism
7. Retail
8. Housing
9. Leisure and Open Space
10. Water
11. Transport

The purpose of the papers is to provide all parties who may wish to participate within the Local Development Framework process access to the same baseline information that the Council intends to use in the preparation of its Development Plan Documents and Supplementary Planning Documents. They provide a digest, rather than a substitution, for fuller information obtained from other sources. Other topic papers may be added over time.

Should you have any questions relating to the content of these papers, please contact planningpolicy@swale.gov.uk.

This paper covers the natural environment, whilst the built environment and water are dealt with in separate topic papers.

1 Introduction

1.1 Swale's natural environment has evolved over many hundreds of years and is one of its major assets. It has been created by the interaction of the natural environment and human activities, in particular the combination of physical, biological and cultural influences.

1.2 A Local Development Framework needs to provide policies that will guide development proposals in respect of a whole range of environmental issues, ranging from climate change, flooding, and pollution through to the protection and enhancement of environmental assets. It will also need to address those parts of the Borough with poorer environmental quality, urban regeneration opportunities and landscape and ecological restoration.

1.3 There have been a number of studies undertaken which will form evidence base for the LDF. Those relevant to the natural environment include:

- Sustainable Design and Construction
- Strategic Flood Risk Assessment
- Landscape Character and Biodiversity Assessment

2 Outline of Swale's Natural Environmental Assets

2.1 Swale borough covers an area of 364 square kilometres. Whilst part of Swale is within the Government's Thames Gateway Growth Area, it is nevertheless a predominantly rural Borough, with diverse communities, landscapes, and habitats. Much of the borough is rural and includes attractive landscape of the North Downs and the remote Swale and Medway marshlands, including significant areas of international wildlife importance. The borough is semi rural with the principle towns surrounded by villages and extensive tracts of countryside. The majority of the borough's countryside is of an extremely high quality.

2.2 Swale has significant environment assets with some 26% (approx 10,900 ha) of land in the Borough designated either for its international or national value for biodiversity, with some 5% of this identified for its County (local) value. Some 59% (approx 24,800 ha) of the Borough's landscape was designated by the 2008 Local Plan for its national, county, or local landscape quality. The Borough also contains large swathes of nationally important best and most versatile agricultural land. In addition, much of the lower lying land is at risk of tidal flooding.

2.3 Agriculture continues to shape the nature and character of the countryside and Swale remains associated with a long history of fruit production. Agriculture shapes much of the diversity of the Borough's environmental resources too, including internationally important estuarine and coastal habits in the North Kent Marshes, the central plain of orchards and arable land, the wooded clay outcrop of The Blean, and the southern woodlands and dry chalk valleys of the North Downs dip-slope.

2.4 The Borough's maritime influence is a product of its 111 km long coast – the longest of any Kent district. It includes the soft clay cliffs of Sheppey, its coastal marshes and mud, its inlets and creeks, the latter providing the basis of industries, such as barge building, and in modern times, tourism and leisure.

2.5 There is dereliction and poor environmental quality in parts of the Borough needing to be tackled, notably, Milton Creek, Queenborough/Rushenden, Sheerness and Blue Town, whilst the character of the countryside is affected by development and changes in the agricultural and forestry economies.

3 Existing Planning Policy

3.1 There is a swath of policy guidance on the natural environment. The policy context for the natural environment can be seen in Topic Paper 2.

3.2 However, the general policy direction of travel for this issue is the need for Council's to both protect and enhance their environmental assets, locate development outside areas of high flood risk, minimise the loss of best and most versatile agricultural land, promote renewable energy schemes and work towards more sustainable development to help mitigate against climate change. There is also an emphasis on promoting the natural environment as a resource for recreation and the associated health benefits.

4 Geology

3.3 The diversity of the Borough's landscapes, and thus its overall natural environment, can be largely attributed to its very rich and varied geology and soils (see figure1). The upper chalk of the North Downs dip slope dominates the southern area of the Borough. Over the majority of its area it is overlain by clay-with-flints on the higher ground and head deposits in the valley bottoms. The fine loamy and silty soils of the clay-with-flints support cereals, permanent grassland and deciduous woodland. In the valleys the thinner well-drained calcareous soils generally support grassland. To the north of the chalk is a band of Thanet, Oldhaven and Blackheath beds overlain with a complex mix of brickearths and gravels. The main areas of settlement, including Sittingbourne and Faversham are located within this band, along with the Roman Road of Watling Street. The deep, well drained, often stoneless, fine silty soils throughout this area have traditionally supported a variety of crops, most notably apples and other top fruit with some hops.

3.4 London clay forms the geology of the northern and far eastern parts of the Borough, including the Isle of Sheppey. The London clay gives rise to two contrasting landscapes. Where it is low lying it is overlain with alluvial deposits, which form an almost continuous belt of marshland along the north edge of the mainland and across southern Sheppey. London clay also forms the higher ground of northern Sheppey, capped with a small area of Bagshot beds around Minster and the distinctive clay ridge of the Blean in the east.

3.5 On the marshland ditches and pumps drain deep stoneless clayey soils. Traditionally these soils support grazing, although some areas have been sufficiently drained to support cereals. The mudflats and saltmarshes are categorised as unripened gley soils. Some of these soils are flooded at high tide and generally they are conserved as saltmarsh habitats with some summer grazing.

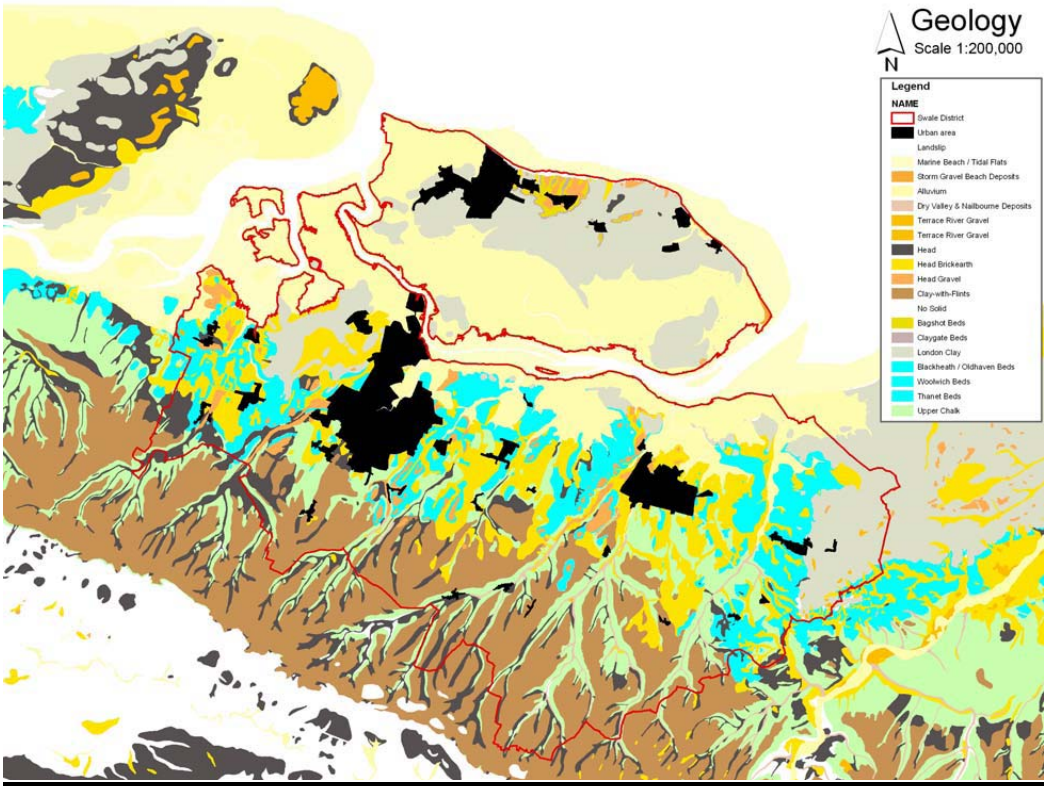

Figure 1: Geology of Swale

5 Landscape

Landscape character is identified by a series of character areas defined firstly for England, than at more detail for Kent, and again for Swale.

English Landscape Character Areas

5.1 The Borough's landscape is varied, reflected by three distinct broad character types - the flat, open marshland of the Greater Thames Estuary in the northern part of the Borough, the orchards, arable land, woodland and dry valleys of the North Kent Plain and the dipping slope, valleys and downland woodland of the Kent Downs (See figure 2 below.) Historically the landscape was predominelty shaped by agriculture and remains so today.

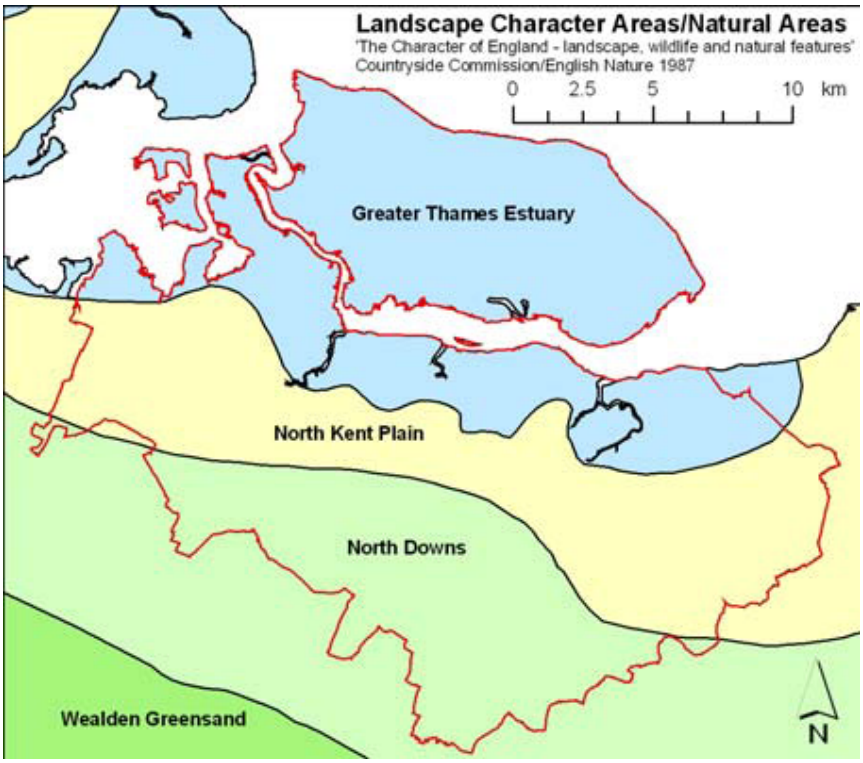

Figure 2: Landscape Character Areas - England

Greater Thames Estuary Character Area/Natural Area

5.2 Most of the land of Swale Borough is within the Greater Thames Estuary Natural Area. Soft sediments, forming extensive saltmarshes and mudflats, dominate the intertidal zone. These are separated along most of its length by man-made sea defences from the low-lying land. These areas were formerly subject to more frequent flooding, but are now mainly arable land, with much grassland and still some substantial areas of grazing marsh and its network of ditches, dykes, creeks and fleets. The value of this landscape is recognised in the designation of undeveloped parts of the North Kent coast as an Environmentally Sensitive Area. The marshland areas themselves are characterised by a lack of major settlements. Farmsteads and villages are located on higher ground within and on the edge of the marshes, whilst the large towns, industry, housing, caravan sites, transport routes and other structures now occupy what are often highly visible sites around the edges.

North Kent Plain and Woodlands Character Area/Natural Area

5.3 This land, includes some of the most fertile and productive farmland in southeast England. It also includes large areas of woodland (such as the Blean Complex) and remnant orchard. A few small woodland blocks add variety to the horticultural landscape. Significant woodland cover with outstanding nature conservation interest is confined to pockets of higher ground around at Newington and, more significantly, at Blean where heavy

acidic London Clay soils support one of the largest continuous woodlands in England. The more common species such as sweet chestnut, sessile oak, hornbeam and beech cover are found amongst the enclosed pasture and arable fields. Within the central North Kent Plain, mixed farmland and arable landscapes of the Borough, the features of the present agricultural landscape probably began to be developed as the light soils were cleared during the Neolithic period and Roman times. Within the countryside, agriculture is still a predominant activity, although it continues to undergo great change, both economically and in the way the landscape is shaped by it.

North Downs Character Area/Natural Area

5.4 Chalk grassland is the most distinctive of downland habitats, along with scrub and woodland.

5.1 Kent and Swale Landscape Character Areas

5.1.1 Kent has a well-developed framework of landscape character maps, which refines and subdivides the national character areas (see Figure 3) into 10 sub-areas. The Council's own Landscape Character Appraisal in 2005 produced a further sub-division of 42 separate character areas reflecting the diverse landscape character of the Borough. Each area is described, its key features identified, and its sensitivity and condition assessed, leading to an overall guideline and series of related guidelines. The Landscape Area Character map is shown, for illustration, in Figure 3 below. Both the draft character map and guidelines were subject to consultation and the document adopted by the Council as a Supplementary Planning Document in March 2005. This document is currently being updated.

5.1.3 At the county level Kent County Council have further refined and subdivided these character areas. For details of the descriptions of each of these character areas see the Swale Landscape Character Assessment.

The map on the next page shows the character areas which fall wholly or partly within Swale Borough:

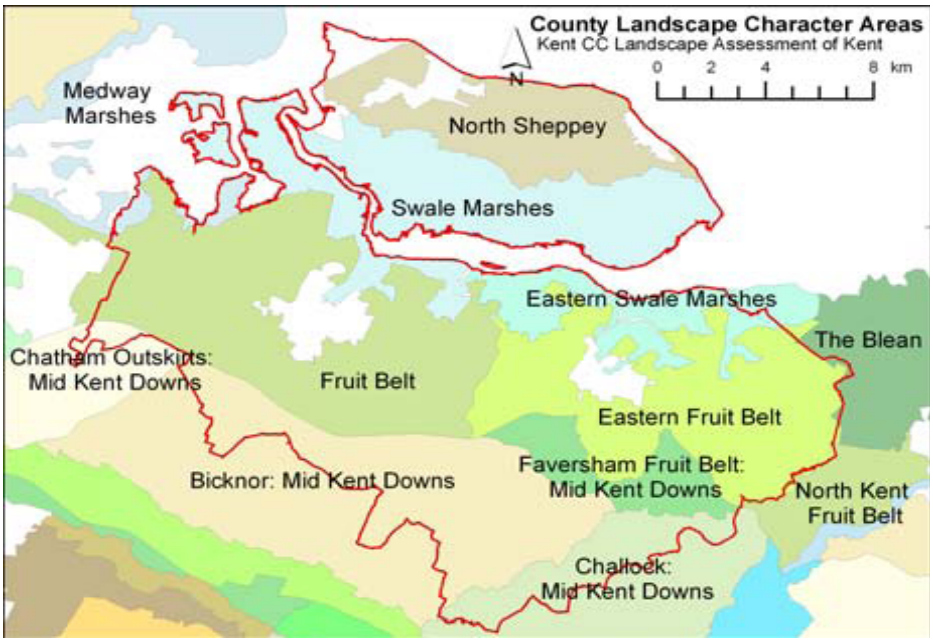

Figure 3: Kent Landscape Character Areas

5.1.4 The northern coast of the Isle of Sheppey has a very distinct character. Beaches and eroding cliffs provide a stark contrast to the south of the Island, whilst gently undulating hills, punctuated with chalet and caravan parks are a prominent feature of the coast.

5.1.5 The Swale Marshes are coastal marsh with isolated low hilly outcrops with a remote, wild and isolated feel, characterised by creeks and marshland vegetation and grazing animals and birds.

5.1.6 The Fruit Belt is a rural/agricultural landscape with complex fruit, hops, pastoral and arable divided by small woodlands, with a rolling landscape with distinct valleys and large pockets of flat, open farmland, especially in coastal areas.

5.1.7 The Downs are chalk grassland which is one of the most distinctive of downland habitats, along with scrub and woodland.

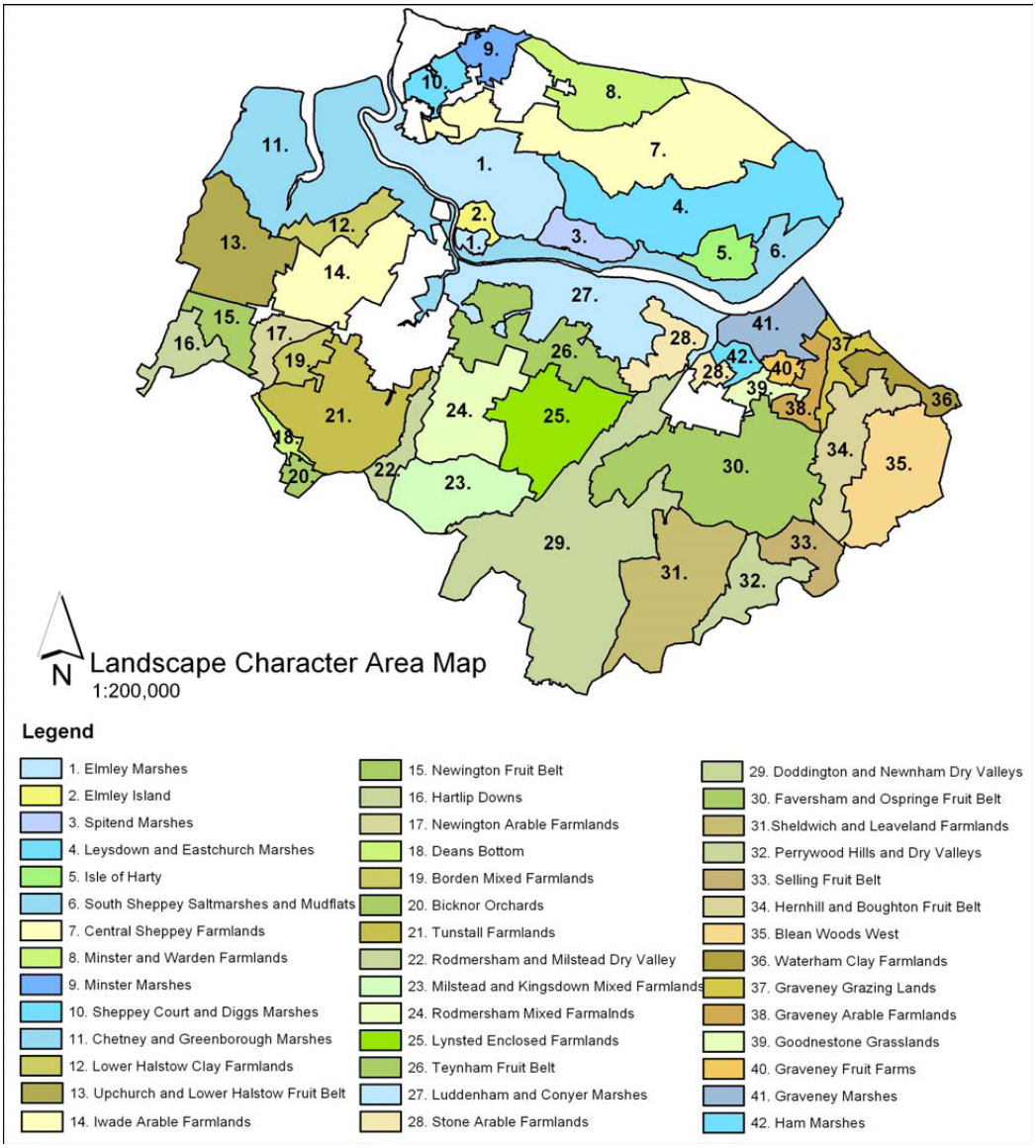

Figure 4: Summary Landscape Guidelines for Swale Borough.

5.2 Landscape Designations

5.2.1 Landscape designations are areas which have been given special status by the planning system for their landscape quality.

5.2.2 There are a number of landscape designations that cover Swale Borough. Most of the landscape south of the M2 forms part of the nationally designated Kent Downs Area of Outstanding Natural Beauty (AONB). The Kent Downs are the eastern half of the North Downs covering nearly a quarter of Kent, stretching from the White Cliffs at Dover up to the Surrey and London borders. The ANOB covers 878sq.km. It is a diverse and vibrant landscape with its dramatic chalk escarpments, secluded dry valleys, networks of tiny lanes and historic hedgerows, ancient woodlands, traditional orchards, locally

distinctive villages, unique and precious wildlife and many sites of historic and cultural interest to explore. All these make up a landscape that is such a valuable national asset that it was nationally designated an Area of Outstanding Natural Beauty in 1968.

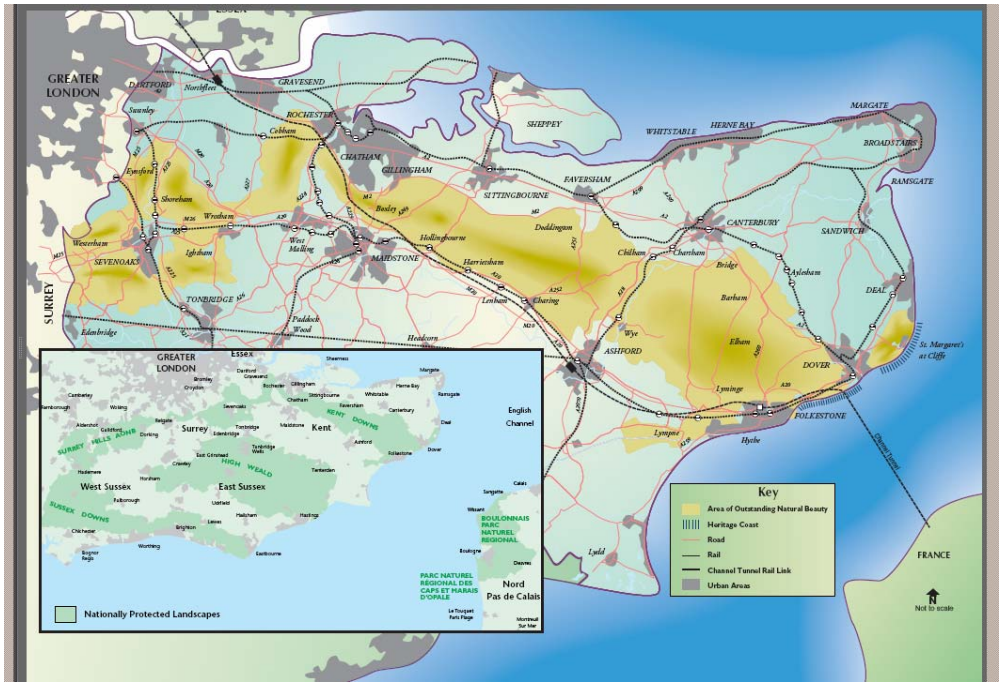

Figure 5: The Kent Downs ANOB

5.2.3 The Kent Downs ANOB Management Plan was adopted in December 2008. The ultimate goal of the Management Plan is to ensure that the natural beauty, special character and vitality of communities within the Kent Downs AONB are recognised, maintained and strengthened well into the future. It is accompanied by an action plan to implement the aspirations of the management plan.

5.2.4 Across Kent, the County Council previously recognised a series of landscapes that were important strategic assets at the County level. These were called Special Landscape Areas (SLA). Outside the AONB in Swale, the lower dip slope, together with some of the dry valleys, are SLA's. The majority of the marshlands in the north of the mainland and south Sheppey form part of the North Kent Marshes SLA, which continues from the Medway Marshes to the west of the Borough to the Seasalter Marshes to the east. In the east of the Borough is the Blean Woods SLA. This comprises of ancient woodland, the majority of which extents into neighbouring Canterbury District. These landscapes were given formal protection by both the Kent and Medway Structure Plan (KMSP) and the Swale Borough Local Plan 2008. Approval of the South East Plan has resulted in the removal of the KMSP from the development plan, but they remain, currently, part of the Local Plan as local landscape areas.

5.2.5 The Council has also designated other local landscapes in its adopted Local Plan (as Areas of High Landscape Value (AHLV)). The future of both the SLA and AHLV landscape designations are to be reviewed as part of the LDF.

6 Changes to the Landscape

6.1 The dramatic decline in traditional orchards and hop gardens over the last 20 years has resulted in only a few examples remaining around Watling Street. After a period of decline, the number of dwarf orchard trees planted has increased dramatically, with the soft fruits, top fruits and horticulture industries experiencing something of a renaissance in Swale. Many are grown under a sea of polythene or poly tunnels, now appearing across the landscape.

6.2 Pressures on the wider countryside can arise from the growth of towns, especially 2within Thames Gateway. The Thames Gateway's role as a major communications corridor, with future increases in traffic, will increase pressure for new road schemes and improvements which have the potential for widespread visual intrusion.

6.3 Although there are pockets of species-rich unimproved chalk grassland, there are also large areas of the chalk grassland on the scarp and valley sides that have been ploughed for arable use.

6.4 Tourism and formal recreation related uses of the Estuary such as boating, water and jet skiing, new marinas and increasing visitor pressure have acted to influence the general feeling of remoteness and wilderness. Pressures on the landscape have resulted from new roads and the development of industrial complexes and their ancillary structures. The influence of the Thames Gateway is likely to further increase these pressures in the future. Such developments are particularly visible within the flat landscape of the Estuary.

6.5 Historic widespread fragmentation and loss of marshland has largely ended, although threats from development at its fringes remain. Pressures for change have resulted mainly from changes in the agricultural economy and, in the longer term, from global warming and sea-level rise. In some locations pressures to adopt strategies of abandonment of sea-defences may lead to controlled sea inundation.

6.6 Economically, an increasing number of businesses are being encouraged to operate within rural communities. The quality and character of the countryside also has a value, both for those who live, work and visit, but also an economic one for the businesses who wish to locate there and the tourists who come to stay.

7 Biodiversity

7.1 Some 26% (approx 10,900 ha) of land in the Borough is designated either for its international or national value for biodiversity, with some 5% of this identified for its County (local) value.

7.2 Swale's environment is particularly diverse, with a range of semi-natural and man-made habitats which include the sea, coastal mudflats, coastal shingle, soft cliffs, grazing marsh, chalk grassland, scrub, broad-leaved woodland, open freshwater, rivers and streams, arable land, orchards, conifer plantations, parks, gardens, urban areas and post-industrial land. These habitats contain a vast array of biodiversity and support a countless number of wild species, many of which are noted as being rare or threatened in the UK; the first Swale Biodiversity Action Plan (BAP) listed more than 130 such species.

7.3 The mixture of saltings, mudflats, sand and shingle beaches beyond the sea walls is an important habitat for a wide range of waterfowl. Virtually no trees or hedges grow on the exposed marsh except for a few isolated specimens on higher ground and some very localised scrub encroachment along road verges, railway embankments and some sea walls.

8 Biodiversity Designations

8.1 A significant part of the Borough is designated for its nature conservation importance, as illustrated by Figure 6 below. They comprise designated sites with a statutory status and those without.

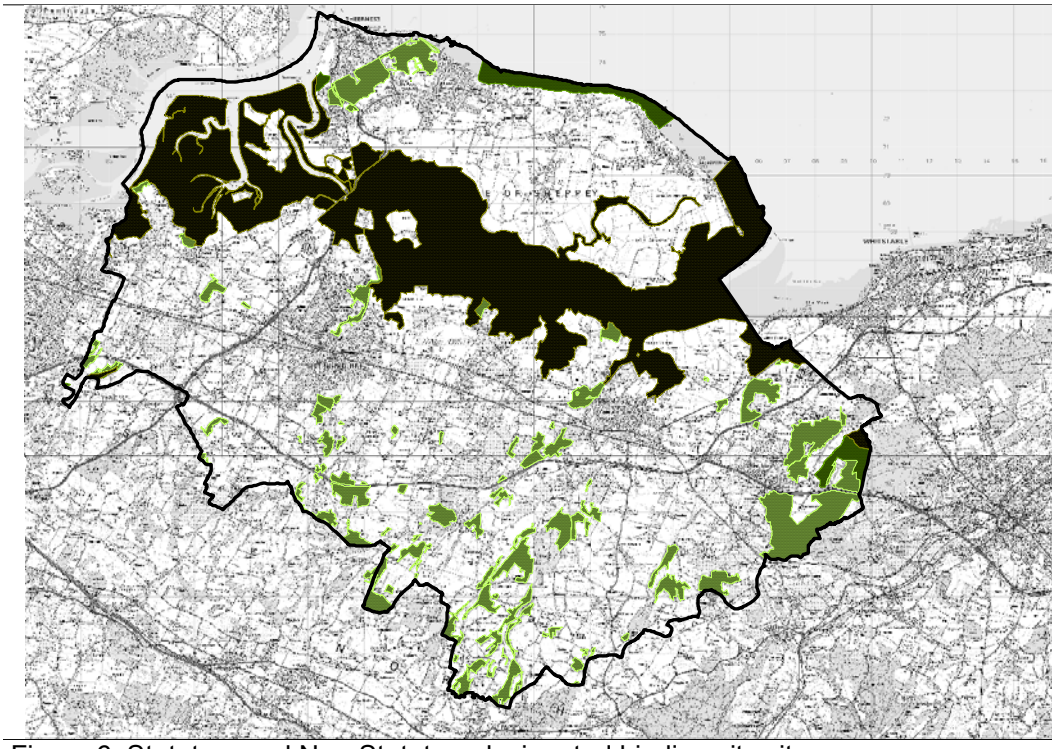

Figure 6: Statutory and Non-Statutory designated biodiversity sites.

Internationally and Nationally Important Sites for Nature Conservation

8.2 One of the major areas of ecological importance within the Borough is the Swale and Medway, which includes two National Nature Reserves (NNR). They are areas of international and national importance and have been designated as a:

● Site of Special Scientific Interest (SSSI) (A national designation of areas identified by English Nature under the Wildlife and Countryside Act 1981.);

● Special Protection Area (SPA) (designated under the European Commission Directive on the Conservation of Wild Birds);

● Ramsar Site, which means that they are a wetland of international importance; and

● A Special Area of Conservation (SAC) designated under the EC Habitats and Species Directive for the protection of habitats and (non-bird) species.

8.3 These areas include the largest remaining areas of freshwater grazing marsh in Kent and are representative of the estuarine habitats found on the north Kent coast. The habitats comprise chiefly mudflats, saltmarsh, and freshwater grazing marsh; the latter being intersected by extensive dykes and fleets. The area is particularly notable for the internationally important number of wintering and passage wildfowl and waders and there are also important breeding populations of a number of bird species. Associated with the various constituent habitats of the area are outstanding assemblages of plants and invertebrates.

8.4 An important issue, which Natural England are keen to highlight, is that any planned development can only take place in Swale in a manner that does not adversely affect the internationally and nationally protected nature conservation sites that are in, or are immediately adjacent to Swale. Any strategic plan for housing allocations will also need to be subject to Appropriate Assessment under the Natural Habitats (Conservation, &c.) Regulations 1994 (as amended) ("the Habitats Regulations"). Natural England advise that increased recreational pressure on nature conservation sites is likely to mean that development will need to be located sufficiently distant to protected sites. Natural England state that any increased housing will also have an effect on Swale's bio-diversity. This will need to be addressed early in the Core Strategy process.

8.5 A Special Area of Conservation (SAC), designated under the EC Habitats and Species Directive for the protection of habitats and (non-bird) species, is present at Queendown Warren in the south west of the Borough. It is also designated as a SSSI and is a fine example of unimproved calcareous grassland, particularly important for orchids.

8.6 Swale Borough also shares another SAC with Canterbury District. The Blean Complex, one of the largest areas of woodland in England, is also designated as an SSSI. As a whole this area represents a mosaic of ancient

semi-natural woodland with mixed coppice with oak standards, sweet chestnut coppice and conifer plantation. The diverse ground flora includes some species indicative of a long history of woodland cover. The area is also noted for birds with over 50 species of breeding bird having been recorded and for its invertebrate interest with nationally rare species of butterflies such as the heath fritillary.

8.7 The North Sheppey Coast is solely designated as a Site of Special Scientific Interest for both nature conservation and geological reasons.

8.8 The Sheppey Cliffs and Foreshore SSSI, Queendown Warren SSSI and Purple Hill SSSI are all in favourable condition. Parts of The Swale SSI are in favourable condiotion but parts are unfavourable with no change. The Church Woods, Blean SSSI has both favourable and unfavourable but recovering condiotions. The Medwat Esturay and Marshes SSSIU which adjoins Swale is in a favourable condition.

Regional, Local Sites and Other Important Natural Habitats

8.9 Within the Borough there is a network of more localised nature conservation interests. These include the County Wildlife Trust Sites of Nature Conservation Interest, statutorily designated Local Nature Reserves, and (when declared) Regionally Important Geological/Geomorphological Sites. Swale also has other National and Local Nature Reserves which are not statutorily designated.

8.10 Additionally, ancient woodland, as identified by Natural England, is a significant resource within the Borough.

The following Local Nature Reserves are within Swale -

- The Swale National Nature Reserve
- Queendown Warren Nature Reserve
- Cromers Wood Nature Reserve
- Saxon Shore Way
- The Blean
- South Swale Nature Reserve
- Oare Marshes
- Elmley Marshes Nature Reserve.

Local and other areas of Biodiversity Interest

8.11 The biodiversity objectives for many sites are increasingly being pursued in documents such as Biodiversity Action Plans and these may lead to sites, not currently statutorily designated, enjoying additional weight in planning decisions. Biodiversity Action Plans include the following priority habitats present in Swale:

- *UK Biodiversity Action Plan* : Chalk grassland, wood-pasture and historic parkland, vegetated shingle, maritime cliffs, reedbeds, cereal field margins, coastal and floodplain grazing marsh, mudflats, saltmarsh and ancient/and species rich hedgerows; and
- *Kent Biodiversity Action Plan* : Ancient and/or species rich hedgerows, built-up areas and gardens, cereal field margins, coastal and floodplain grazing marsh, coastal saltmarsh, coastal vegetated shingle, standing open water, wet woodland, lowland calcareous grassland, maritime cliff and slope, mixed broadleaved woodland and plantations, lowland wood-pasture and parkland, mudflats, old orchards, reedbeds, and lowland meadow.
- *Swale BAP 2008* - provides a basis for local action to conserve, protect and enhance the biodiversity of the Borough. The Swale BAP has actions relating to land-use planning with the as well as specific habitat actions for priority habitats and actions directed at supporting and encouraging local communities to take action for wildlife. The key actions within the swale BAP are -

  1) The Swale Local Development Framework will include policies to protect BAP habitats.
  2) As far as possible, all sites supporting habitat of county importance will be designated as Local Wildlife Sites.
  3) The importance of 'brownfield' sites for wildlife will be taken into account in planning policies and decisions. This will involve identification of the most important brownfield sites and ensuring that development proposals for brownfield sites give consideration to conservation of wildlife.
  4) The provision of support and advice to site owners and/or managers will ensure that there is a net increase in the number of Local Wildlife Sites in positive conservation management.
  5) There will be an inventory of council-owned sites supporting semi-natural habitats, together with a programme for the preparation and delivery of site management plans for each site: priority will be given to i) sites designated as Local Wildlife Sites and ii) sites within target landscape units.

9 Changes in Bio-diversity

9.1 Global pressures on biodiversity are mirrored in the UK. Habitat biodiversity trends are mixed. Some 80% of Sites of Special Scientific Interest (SSSI), which cover around 7% of the country, are in a 'favourable' or 'unfavourable recovering' condition. But habitats outside SSSI appear to be faring less well and are generally in a poorer condition. Indeed, the composition of the countryside appears to be changing with significant gains to built-up and garden habitats and fen, marsh and swamp habitats, but some 97% of our flower-rich meadows have been lost since World War II.

This mixed picture is also found in species biodiversity. The historic dramatic decline in bird species now appears to have stabilised—although, the number of common farmland birds are still half what they were a generation ago.

Some species have started to recover, such as the otter, but some are still rapidly declining, such as the water vole. Of priority Biodiversity Action Plan species (those of conservation concern), 28% are still clearly declining, 12% are increasing and 34% are considered stable, with no clear trend for the remaining species. (Select Committee on Environmental Audit Thirteenth Report).

9.2 Climate change poses both a threat, and some opportunities, to our bio-diversity. Kent County Council has undertaken a BRANCH project to look at climate change's impact on our bio-diversity. (http://www.branchproject.org/)

9.3 Kent Biodiversity Opportunity Areas

The Biodiversity Oppotuniry Area (BOA) maps can be seen as a spatial reflection of the Kent Biodiversity Action Plan (BAP). They indicate where the delivery of Kent BAP targets should be focused in order to secure the maximum biodiversity benefits. The BOA maps also show where the greatest gains can be made from habitat enhancement, restoration and recreation, as these areas offer the best opportunities for establishing large habitat areas and/or networks or wildlife habitats. As such, they will be useful to local planning authorities in the development and delivery of positive nature conservation policy in line with the South East Plan. The BOA statement documents will provide guidance on the conservation priorities which should be adopted in each area.

9.4 The Swale BAP identifies some trends occurring in Swale which are in need of action:

- Most remaining old orchards are no longer commercially managed. Swale has the highest concentration on non-intensive orchards of any Kent district, though only occupying 10% of the county's land surface, Swale has a third (458ha) of non intensive orchards in Kent. The majority of traditional apple orchards have been grubbed with almost all the remaining old orchards being cherry. Community orchards are seen as ways to try and combat this decline.

- The number of ponds has dropped enormously in the last 100 years and those that remain are badly affected by pollution.

- Estuary habitats continue to be threatened. Sea-level rise, particularly at the rate expected under future climate change, is leading to 'coastal squeeze'. Impacts can be direct, through development of the habitats themselves, or indirect, through increased need for hard sea defences, increased pollution, or alteration of the complex dynamics of the currents and sediments which maintain the character and wildlife of Swale's coast.

- Pressure from amenity use is continuing to increase, particularly from recreational use of boats and from walkers using the coast and sea-walls. This can lead to disturbance of breading birds.

- Ancient woodland has continued to decline slowly and those that remain are small and isolated.

- There has been a substantial long-term loss of wildflower grasslands which has been associated with agricultural change.

10 Agriculture

10.1 Swale contains, proportionately, some of the most significant levels of the highest quality agricultural land in the UK. Around 80% of Swale's land is managed through agriculture. Although agriculture is carried out across the borough, it's best and most versatile land is located within a central mainland belt running approximately east west (but not exclusively) around the A2 Watling Street. This reflects the wind blown deposits of brickearth that are especially conducive to growing a wide range of crops and made the area renowned for its fruit growing. An extract indicating the broad range of agricultural land in Swale is shown in Figure 7 below.

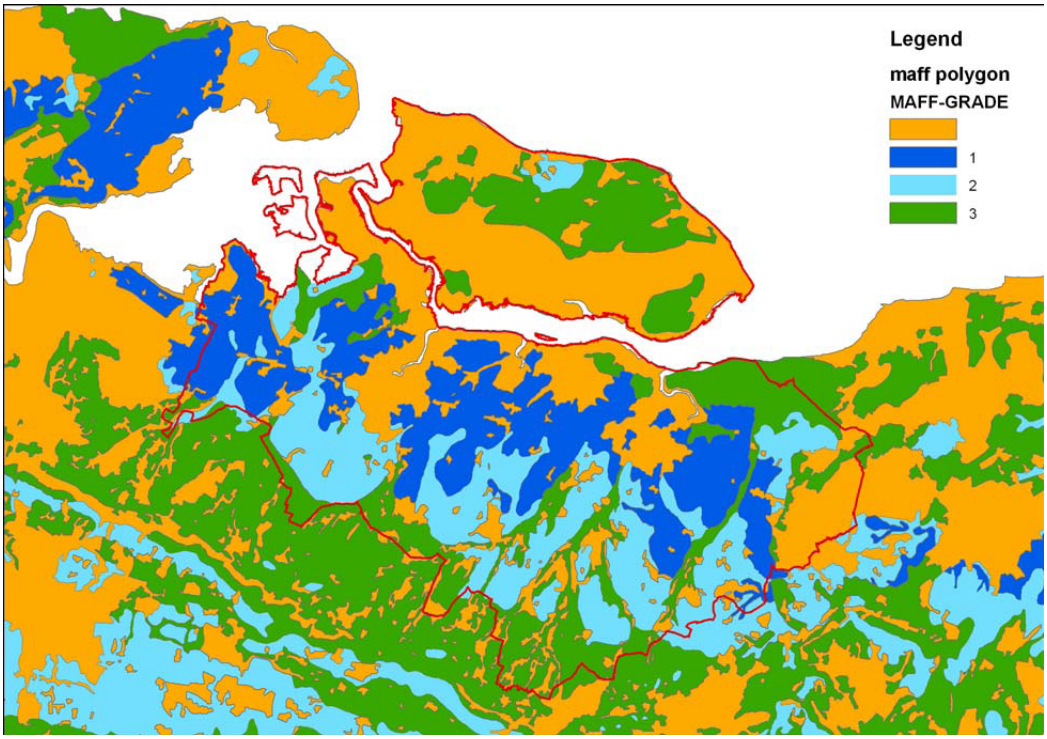

Figure 7: Indicative agricultural land classification in Swale

10.2 On Sheppey, agricultural land quality is relatively poor, except in isolated pockets on the higher ground. However, even here, agriculture is the mainstay of the nationally important North Kent Marshes Environmentally Sensitive Area.

10.3 Productive loams occurring on the marsh alluvium have encouraged the conversion of extensive areas of former unimproved wet grazing pasture to intensive arable cropping of wheat and barley within the sea walls, although

this is now a declining trend. Tracts of traditional, unimproved, wet grassland remain; sheep and cattle mostly graze the grassland although, around the fringes of some urban areas in particular, the grazing of horses is prevalent.

10.4 Large and exposed intensively cropped fields are common while hedgerows and individual trees are generally limited with few areas of unimproved pasture. The regular patterns and rectangular shapes of the fields are defined by the various crop types rather than by hedgerows. Limited poplar and alder shelterbelts are associated with small settlements and farmsteads and are also found around orchards of soft fruits and other horticultural crops.

10.5 Production of soft and top fruits is high in Swale and is gradually increasing. This increased demand for locally produced fruit will lead to increased need for modern farming techniques to guarantee crops. This will raise issues around polytunnels, large scale greenhouses and pack houses. These are all issues which will need to be addressed through the LDF.

11 Coastal Processes and the Undeveloped Coast

11.1 The Borough has a considerable and varied coastline – the longest in Kent at 71km. The mainland and southern coast of the Isle of Sheppey comprise low lying marshland, forming the Medway and Swale Estuary. The coastline is largely undeveloped, except within its creeks and in a section of the Swale between Ridham and Milton Creek and the north-west coast of the Isle of Sheppey. Most of the coast is of wildlife and landscape importance and is documented in other sections of this Topic Paper. The northern coast of the Isle of Sheppey is of a very different character. Beaches and eroding cliffs provide a stark contrast to the south of the Island, whilst gently undulating hills, punctuated with chalet and caravan parks are a prominent feature of the coast.

11.2 Other natural processes are also at work including drainage, flooding and climate change, linked with sea level rise.

11.3 A wide range of economic, land and water recreational uses concentrate at and near the coast, with the deep water Port of Sheerness, perhaps being the most obvious. Natural processes have a strong influence on the area, with large areas of land subject to tidal flooding and erosion.

11.4 The influence of the coast extends, in places, far inland, through distant views or areas liable to tidal flooding. With the geographic extent and influence of the coast so wide, impacts on the coast will have a considerable impact on the economic and recreational resources of the Borough.

11.5 For the LDF, Government guidance requires the Council to define a ‘coastal change management area’ in order that inappropriate development can be avoided.

12 Flooding (Please also see the Water Topic Paper)

12.1 Flooding is a big issue in Swale and affects large parts of the borough. For Swale's 2009 Strategic Flood Risk Assessment please see www.swale.gov.uk.

12.2 The principal water feature in the borough is The Swale, an estuarine area, separating the Isle of Sheppey from the rest of the Borough. It is a complex of brackish and freshwater floodplain grazing marsh with ditches, and intertidal saltmarshes and mud-flats. The underlying geology dictates how the natural drainage catchment responds to rainfall, which in turn dictates the natural course of rivers. Urbanisation and engineering work on watercourses have altered the runoff characteristics of the catchment, changing the pattern of, and in some cases increasing the risk of flooding.

12.3 The final portion of the River Medway forms a tidal estuary and runs along the north-west border of Swale Borough.

12.4 In addition to these, the Borough contains extensive areas of marshland along the borders of the Swale and around the Isle of Sheppey, which is covered by a network of small creeks and drainage ditches.

12.5 Whilst the south of the borough lies over Chalk bedrock, much of this is covered over by clay-with-flints deposits so that the chalk tends only to be exposed in the valleys. Chalk is usually highly permeable so under normal conditions it is able to absorb most of the rainfall, but following periods of prolonged rainfall it becomes saturated so that further rainfall cannot infiltrate, or even if the rainfall falls in another area the water table may rise to the surface so that groundwater flooding or ephemeral springs appear. Chalk is also known for acting as an aquifer so that even when the land is apparently dry, considerable amounts of water are stored underground and can provide baseflows to rivers by releasing water slowly over a long period.

12.6 The northern part of the borough is low-lying land with the clay areas featuring as 'islands' amongst the deposits of alluvium. As in the south of the borough, the clay areas are impermeable The flat topography and saturated soil of the marshlands leads to water either forming wetlands or running overland in numerous small creeks, rather than concentrated in a few larger watercourses. In Swale, many of the creeks and drainage ditches are man-made to aid drainage so that land can be used for farmland.

12.7 Urbanisation alters the response to rainfall, as the increased amount of impermeable surfaces, along with constructed sewer systems, causes larger volumes and faster rates of runoff. Where runoff exceeds the capacity of the sewer system, or if maintenance issues results in blockages then flooding can occur following heavy rainfall. Development in a catchment can also affect groundwater, for example public supply and agricultural water abstraction from the Chalk aquifers tends to increase their buffering effect, thereby suppressing the frequency at which ephemeral springs occur.

12.8 The most significant flood events within the borough occurred in 1953 and 1978, and were primarily tidal flooding:

12.9 In February 1953, overtopping of tidal defences occurred at Sheerness and along the western border of the Isle of Sheppey, either side of the Swale near Sittingbourne, at Warden, and around the Isle of Harty (although the Island itself was not flooded). Some flooding of property occurred.

12.10 In January 1978, the tidal defences along the western marshes (Barksore, Chetney and Horsham) were overtopped, and the defences north of Faversham. In addition the tidal defences around the Isle of Harty were breached/failed resulting in flooding around the Isle (although again, the Isle itself mostly escaped the flood). The defences were breached/failed east of The Lilies with flooding occurring along Conyer Creek. Flooding also occurred further up Faversham Creek, but this was considered to be fluvial (rivers) in nature. No residential or business property is indicated as being flooded.

12.11 Climate change will lead to more severe events become more frequent. Comparison of the flood extents with the current flood zones shows that, in the areas where flooding occurred, it reached within less than 500m of the Flood Zone 3 extents, and in some areas (notably the 1953 event at Sheerness and the 1978 event at the Isle of Harty) it proceeded further inland than even Flood Zone 2.

12.12 Most of the main rivers have at least some measure of protection along most of their length which helps prevent flooding. Also most of these rivers flow through areas where there are numerous other small watercourses and drainage ditches which can intercept and carry runoff, thus reducing the amount concentrated in the main rivers. In addition, most of the main rivers do not flow through built up areas so that even if the rivers do overtop their banks there is plenty of unoccupied floodplain area – and if this does occur, it may not be noticed or reported. However, it should be noted that much of the rivers' floodplains fall within the tidal floodplain such that, in large events such as 1953 and 1978, it may be expected that the tidal flooding which occurred overwhelmed any fluvial contribution.

12.13 A further concern in relation to groundwater is the closure of Sittingbourne Paper Mill, the impact of which has been assessed by Consultants. The former mill is located in the centre of Sittingbourne, at the upstream end of Milton Creek, which is a low lying part of Swale. Prior to its closure in January 2007, groundwater extraction by the Mill operated for many years and probably maintained groundwater levels in this area below their natural level. There is now a concern that the closure will lead to raised groundwater levels, resulting in the re-emergence of springs and streams and of groundwater flooding below ground structures (the area of influence of groundwater flooding is shown

12.14 Faversham Creek runs through the centre of Faversham, with a floodplain typically 100 to 200m wide. Three tributaries of the creek also run through the outskirts of the town. The centre of Faversham is subject to tidal

flooding, which runs up Faversham Creek, and the creek can also indirectly cause flooding from the sewer system due to water backing up when it cannot get into the creek quickly enough.

12.15 Milton Creek runs through Sittingbourne, and Iwade Drain through Iwade, but there are no incidents of fluvial flooding from either of these. Whilst Sittingbourne is virtually on The Swale, there is a short stretch of coastline in the north-west, and The Lilies ponds in the north-east, which are designated areas.

12.16 The centres of the towns of Queenborough and Rushenden themselves were not flooded in 1953, some of the outskirts were, and Sheerness and the surrounding countryside were extensively flooded. The 1978 flood did not affect Sheerness, Queenborough or Rushenden.

12.17 The Council has recently prepared a new Strategic Flood Risk Assessment in partnership with the Environment Agency and Lower Medway Internal Drainage Board.

13 Landform and Drainage

13.1 The underlying geology dictates how the natural drainage catchment responds to rainfall, which in turn dictates the natural course of rivers. Urbanisation and engineering work on watercourses can alter the runoff characteristics of the catchment, changing the pattern of, and in some cases increasing the risk of flooding. Whilst the south of the borough lies over Chalk bedrock, much of this is covered over by clay-with-flints deposits so that the chalk tends only to be exposed in the valleys. Chalk is usually highly permeable so under normal conditions it is able to absorb most of the rainfall, but following periods of prolonged rainfall it becomes saturated so that further rainfall cannot infiltrate, or even if the rainfall falls in another area the water table may rise to the surface so that groundwater flooding or ephemeral springs appear. Chalk is also known for acting as an aquifer so that even when the land is apparently dry, considerable amounts of water are stored underground and can provide baseflows to rivers by releasing water slowly over a long period. Rainfall falling on chalk catchments whilst the ground is frozen can also caused flooding. Clay on the other hand is relatively impermeable, so tends to be more predictable with little infiltration of rainfall occurring under any conditions

13.2 The northern part of the borough is low-lying land with the clay areas featuring as ‘islands’ amongst the deposits of alluvium. As in the south of the borough, the clay areas have very low. The flat topography and saturated soil of the marshlands leads to water either forming wetlands or running overland in numerous small creeks, rather than concentrated in a few larger watercourses. In Swale Borough, many of the creeks and drainage ditches are man-made to aid drainage so that land can be used for farmland.

13.3 Urbanisation alters the response to rainfall, as the increased amount of impermeable surfaces, along with constructed sewer systems, causes larger

volumes and faster rates of runoff. Where runoff exceeds the capacity of the sewer system, or if maintenance issues result in blockages then flooding can occur following heavy rainfall. Development in a catchment can also affect groundwater, for example public supply and agricultural water abstraction from the Chalk aquifers tends to increase their buffering effect, thereby suppressing the frequency at which ephemeral springs occur.

14 Pollution

14.1 Many of the regulatory aspects of pollution control are outside the direct influence of the Local Development Framework, but it can reduce the potential risk from some types of pollution by influencing the location and design of new developments. Some pollution aspects are also controlled by the imposition of planning conditions. Some types of pollution are considered below, with the Council generally taking a precautionary approach to their likely impacts:

14.2 ***Noise:*** Pollution from noise has become a matter for concern to people, the background noise levels are perceived to have increased with road sources from increased traffic as being a particular issue. To date, no measurements have been specifically taken to confirm this but there is an intention to carry out noise mapping in the borough which would establish a benchmark for future monitoring. Reducing traffic overall, will reduce noise and further benefits will be an improvement in air quality and road safety. Localised noise can come from individual commercial or residential premises and there is legislation to control this where it impinges on the amenity of residential property. Industry can be a big influence on noise levels too. When considering new development proposals, the Council seeks to minimise the impact of noise between new and existing uses.

14.3 ***Water:*** The Environment Agency is responsible for protecting water quality, however the Council seeks to protect watercourses and surface and ground waters from potentially polluting developments. Supply sources are given protection from some types of development by the Environment Agency's Source Protection Policy. Sustainable drainage techniques are being actively encouraged in Swale, to both reduce these problems and create attractive environments and opportunities for wildlife.

14.4 Groundwater quality in Swale is generally classed as good, with no detectable evidence of saline intrusion. It is possible that the groundwater under Sittingbourne and other urban areas along the coast have been affected by the long history of industrial activity. Marginal quality water can be found in the confined Chalk and Lower Tertiaries aquifers due to ion-exchange. The use of fertilisers and pesticides on the upper parts of the catchment could potentially affect groundwater quality. Please see the Water Topic Paper for a map of source protection zones.

14.5 ***Air:*** Air pollution does not recognise administrative boundaries and the Borough can be affected by pollution from sources both within and outside it. The Government's National Air Quality Strategy requires local authorities to carry out a review and assessment of the air quality in their areas to see if national limits for air quality are met. In areas where limits cannot be met, Air Quality Management Areas should be established with measures to reduce levels put in place. The Council has one Air Quality Management Area at Newington. This was designated in early 2009. The Local Development Framework can reduce the potential risk of air pollution by influencing the scale, location, and use of new developments.

14.6 Swale Borough Council have identified pollutants for which there may be a risk of exceedence. It was identified that for Particles (PM10) and Nitrogen dioxide (NO2) further investigation at two locations in the Borough was required; Sheerness and Ospringe. Two continuous monitoring stations were commissioned at these locations.

14.7 In Swale air quality is currently monitored at:

- Sheerness (urban background) – at the car park accessed from Pepys Avenue.

- Swale Ospringe Roadside 2 - outside the yard of Barkaways, The Butchers, Ospringe Street.

- Swale Newington - this site was operational in 2008 and we are presently looking for a new permanent location in Newington High Street.

14.8 Results illustrate that Swale achieves the air quality targets for those pollutants monitored. However, there are significant 'micro hot spots' at Ospringe and St Pauls Street Sittingbourne and also in the centre of Newington.

14.9 ***Light:*** Problems associated with outdoor lighting can arise from the environmental and visual nuisance caused by glare and light spillage, but also through wasted energy and resultant increased running costs from the use of inappropriate lighting. Of particular concern are the potential impacts of lighting upon residential amenity, rural areas, the nocturnal environment, and biodiversity.

14.10 Technology has much improved and there is far greater emphasis on preventing unwanted light spill by correct design and mounting. Cost saving has also become important, both in terms of efficient light units and leaving lights on. The biggest impact comes from large scale development and roads.

15 Waste

15.1 The Environmental Protection Act 1990 identified waste as any substance that constitutes a scrap material, an effluent or other unwanted surplus. This definition was amended by the Waste Management Licensing Regulations 1994 to define waste as 'any substance or object which the producer or the person in possession of it, discards or intends or is required to discard'.

15.2 Controlled wastes are subject to regulation since the 1990 Act and include industrial, commercial or household wastes. Some of these wastes are defined as hazardous and are those that have irritant, toxic, harmful, carcinogenic or corrosive properties. These must be handled and treated in specific ways. Non-controlled wastes, from agriculture, mines and quarries, are subject to their own regulations.

15.3 Swale Borough Council has responsibility for waste collection; however waste planning and waste disposal are the responsibility of Kent County Council.

Key Messages

Biodiversity

- Enhancement and expansion of wildlife and nature conservation sites will need to be brought forward through the LDF programme. In particular the identification of strategic level biodiversity habitat enhancement areas will need to be identified so that regional targets can be contributed to.

- Existing wildlife and nature conservation sites will need to be protected from new development and the effects arising from those developments. In particular, in combination and secondary impacts arising from projects around the Medway/Swale estuary will need careful assessment for their impacts upon European habitats. A strategic level response to this issue may be required by way of compensation/mitigation.

Landscape

- The LDF will need to respond to revisions to its landscape character assessment and consider the issues of landscape enhancement integrated with that for biodiversity.

- Questions relating to the future of local landscape designations will need to be considered.

- Using the LDF as a positive means to implement the AONB Management Plan will need to be considered.

- Coastal change management areas will need to be identified.

Other

- Flood risk will be an important consideration when allocating new development sites.

- There is an increasing need for the protection of agricultural land for future food security issues. Issues around agriculture and the provision of support services will need to be addressed through the LDF.

- The LDF will need to ensure that growth and regeneration is managed in a sustainable way.

- Development, especially in Newington and Ospringe, will need to be mindful of air quality issues.