

Box 3

local environment agency plan

KENTISH STOUR

ENVIRONMENTAL OVERVIEW

MAY 1999



ENVIRONMENT
AGENCY

Kentish Stour Area Key Details

General

Area (sq km) 1081

Administrative Details

Councils and the % of the Kent area they administer

Ashford	21.8
Canterbury	23.4
Dover	29.7
Maidstone	1.5
Shepway	13.0
Swale	0.6
Thanet	10

Population

Year	Population
1991	452 000
2001 (Estimate)	476 400

Water Resources

Rainfall	(mm/yr)
Average	246
Drought Conditions	125

Number of licensed Abstractions

Surface Water	216
Ground Water	127
Impoundments	2

Flood Defence

Coastline including main tidal waters 80.6

Main River including main tidal lengths 254.6

Sea Defences Agency Responsibility 17.9

Tidal Banks Agency Responsibility 38.1

Conservation

Sites of Special Scientific Interest	31
Water Dependant SSSIs	14
National Nature Reserves	3
Ramsar or Special Protection Areas	4
Water dependent Special Areas of Conservation	2
Sites of Nature Conservation Interest	18

Fisheries

Length of EC Designated Fisheries (km):

Freshwater	
Cyprinid	36.6
Salmonoid	4.5

Water Quality

River Ecosystem Classification as % of the Stour catchment between 1995-1997

Class	
RE1	0
RE2	37.33
RE3	50.34
RE4	1.90
RE5	10.43

Chemical GQA as % of sites in each class for the Stour catchment

Class	
A	2.94
B	61.01
C	2.61
D	9.71
E	0

Number of EC Designated Bathing Waters 12

Pollution Prevention and Control

Licensed Waste Sites	47
Processed Industry Regulations	7
Radioactive Substance Regulations (sites authorised to accumulate and dispose of radioactive waste)	10

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Note: Maps have been produced using the best information available at April 1999 and it is recognised that there may be some inaccuracies. More detailed information may be available from the original source.

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1. INTRODUCTION

This Environmental Overview has been prepared to provide supporting information to the Kentish Stour Local Environment Agency Plan (LEAP) Consultation Draft. It is a factual description and analysis of the Kentish Stour catchment environment, and the associated environmental stresses and strains. From this review a series of issues have emerged which have been carried forward into the LEAP Consultation Draft for consideration by the Agency, its partners and those individuals and organisations generally interested in the local environment.

An Area based LEAP *Kent Area Local Environment Agency Plan* has been produced which addresses strategic issues in the Kent Area. This is a catchment area LEAP which focuses upon local issues particular to the Kentish Stour catchment.

1.1 STRUCTURE OF THE ENVIRONMENTAL OVERVIEW

The framework for measuring the state of the environment has been derived from the Agency publication "Viewpoints on the Environment". This has identified six viewpoints from which the Agency monitors the environment:

- Land use and environmental resources;
- Key biological populations, communities and biodiversity;
- Compliance with environmental standards and targets;
- The health of the environment;
- Long term reference sites;
- Aesthetic quality.

These are described in Section 2 of the Overview. Each of these viewpoints is addressed in turn, and the stresses affecting each viewpoint are also discussed. Stresses are those phenomena or activities which have a real or potential impact on the quality of the natural environment, and which are therefore of concern to the Agency. The Agency has classified these stresses as follows:

- Natural forces;
- Societal influences;
- Abstractions and removals;
- Usage, releases and discharges;
- Waste arisings and disposal;
- Illegal practices.

The same classification of stresses has been adopted in the Environmental Overview where stresses on the environment are presented according to their natural, societal, abstraction, discharge, waste or illegal origin.

The assessment of the state of the environment and the pressures upon it has led to the identification of areas where actions are required to restore or improve the environment. These are noted as issues which are listed in the LEAP Consultation Draft as "Environmental issues" and "Proposed Options for Action".

In the Consultation Draft, these issues have been grouped according to the environmental concerns developed in the Agency's publication "*An Environmental Strategy for the Millennium and Beyond*", which are given as:

- Addressing climate change;
- Improving air quality;
- Managing our water resources;
- Enhancing biodiversity;
- Managing our freshwater fisheries;
- Delivering integrated river basin management;
- Conserving the land;
- Managing waste;
- Regulating major industries.

2. KENTISH STOUR CATCHMENT ENVIRONMENT

2.1 INTRODUCTION

This section of the Environmental Overview describes the key features which are responsible for determining the character of the Kentish Stour catchment.

2.1.1 Location, geology and topography

The Kentish Stour catchment, shown in Map 1, is the second largest catchment in Kent, encompassing a land area of 1081 km², and a "main river" length of 255 km including tidal lengths. This is the easternmost catchment in the county and includes the stretch of coastline between Folkestone and Herne Bay; a length of some 225 km. The Kentish Stour rises as two main tributaries on the Weald Clay and the Lower Greensand: the Great Stour at Lenham near Maidstone, and the East Stour near Folkestone. Downstream of their confluence at Ashford the river flows north east through the North Downs and reaches its tidal limit downstream of Canterbury at Fordwich. Beyond this point the narrow embanked estuary extends 33 km through low lying marshland before reaching the sea at Pegwell Bay.

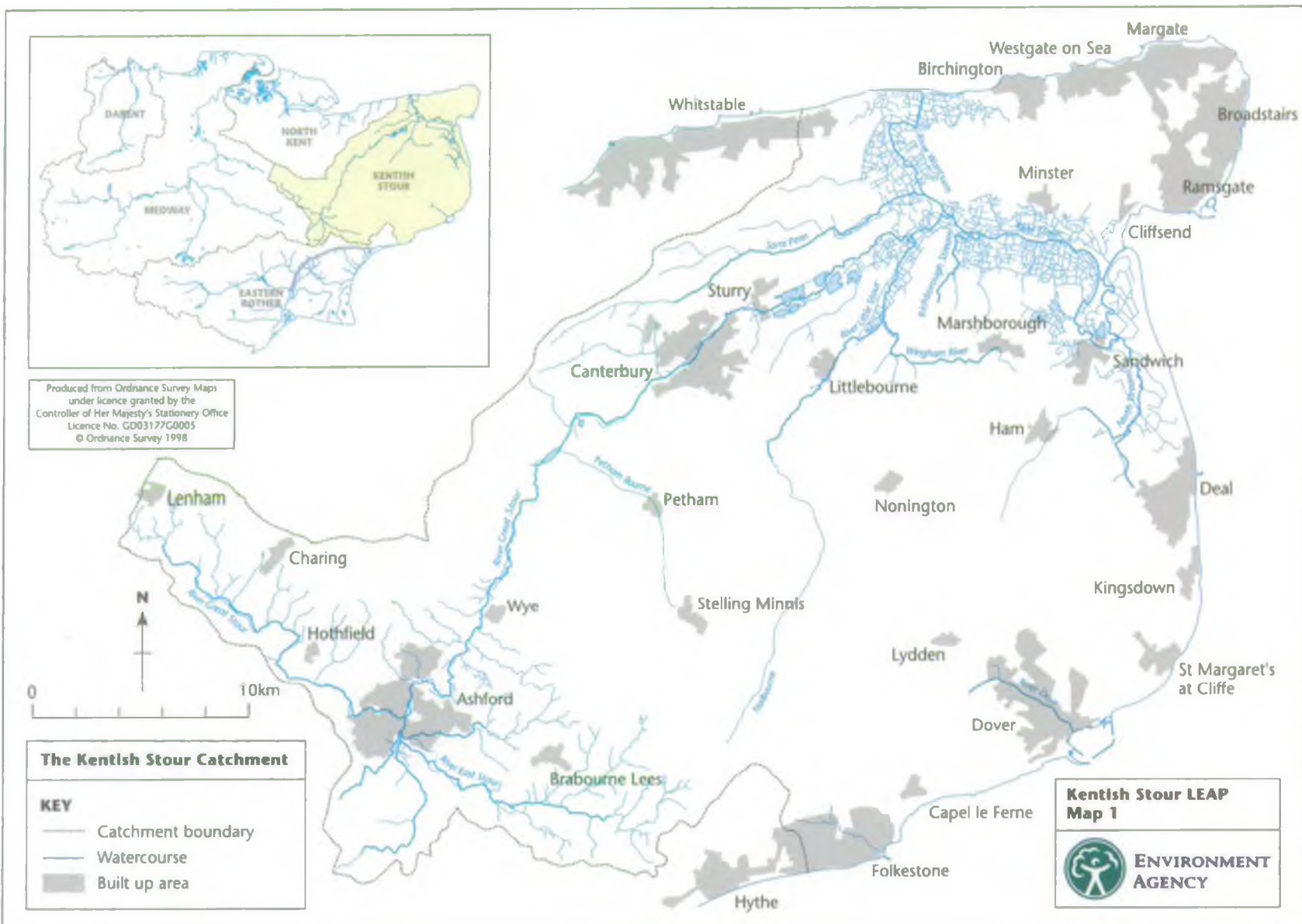
The Little Stour drains the chalk area to the south of Canterbury and due to historic subsidence water is pumped to the tidal Great Stour at Pluck's Gutter. Above its permanent source at Well Chapel Springs near Bridge the river, now known as the Nailbourne, can be traced as a winterbourne for up to 37 km, which runs only when groundwater levels are high.

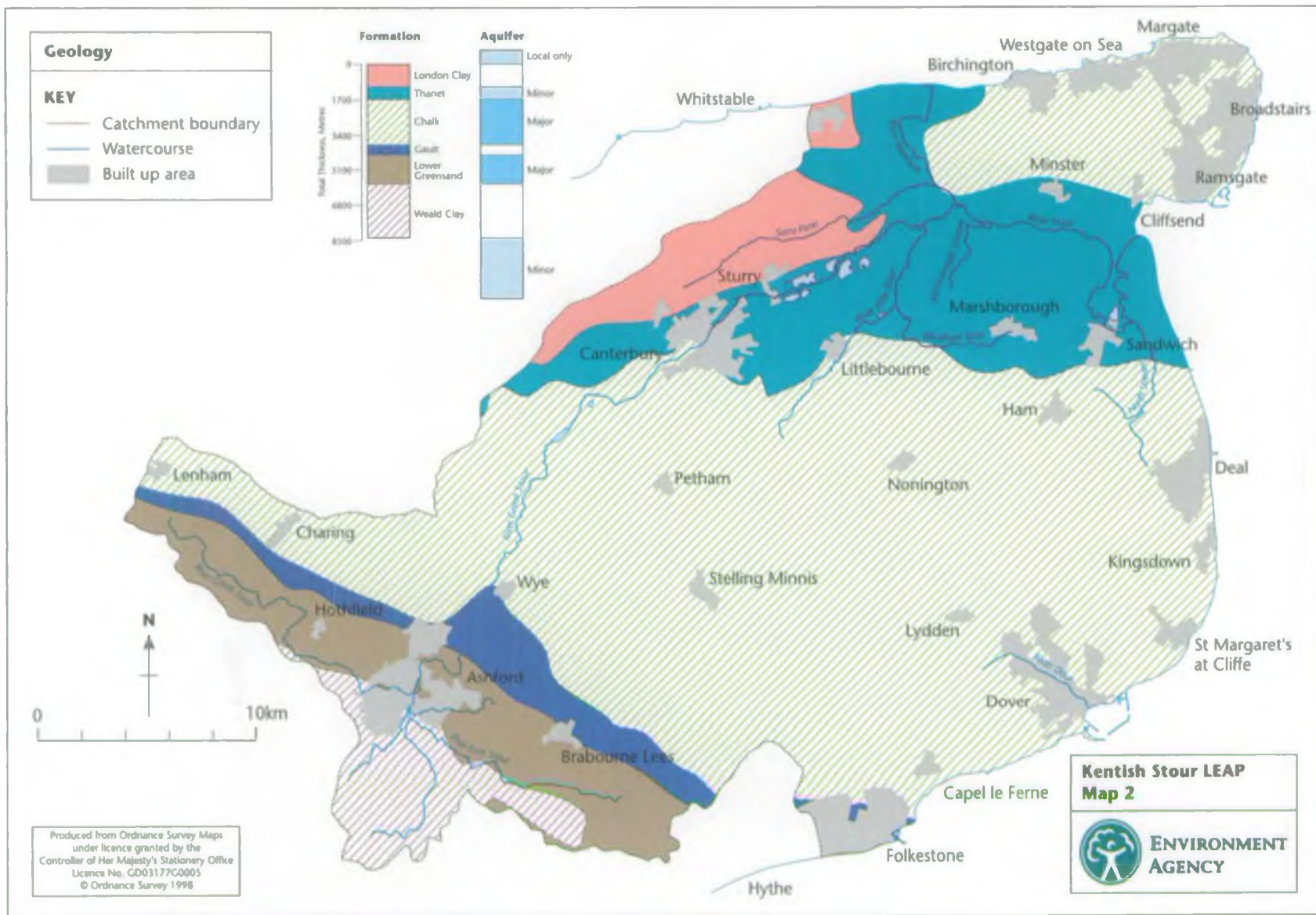
The River Dour is also located within the Kentish Stour catchment, and it is the only surface stream within the Dover chalk block. The Dour runs to the south of the Little Stour catchment and drains into the English Channel at Dover. The river runs for 5 km through the Lydden valley before meeting the perennial source at Temple Ewell. Groundwater abstraction for public supply greatly influences the flow of this river.

A major coastal spring known as Lydden Spout discharges from the cliffs to the west of Dover.

The geology of the catchment is predominantly chalk, overlain by Tertiary deposits in the north, although Gault Clay, Lower Greensand and Weald Clay outcrop on the south west margin of the catchment. The geology of the Stour catchment is shown in Map 2. Within the catchment the main geological areas are as follows:

- (i) Vale of Kent - The south eastern corner of the catchment incorporates a small area of the Vale of Kent which is characterised by lowlands of Weald Clay. The East Stour rises in this area.





- (ii) Ragstone Ridge - To the north of the Vale of Kent the Lower Greensand outcrops to form the Ragstone Ridge which rises to a height of 120 m Above Ordinance Datum (AoD) south of Maidstone. The Great Stour has its source in this area.
- (iii) Vale of Holmesdale - The lowlands of the Vale of Holmesdale are formed by a narrow band of Gault Clay which lies to the north of the Ragstone Ridge.
- (iv) North Downs - The chalk of the North Downs forms the main topographical feature of the catchment, rising from east to west, to a height of 180 m north of Maidstone. The chalk is the most important geological aspect in terms of water bearing potential; the springs which provide the baseflow for both the Stour and the Little Stour emerge in this area.
- (v) Stour Marshes - The Stour Marshes border the course of the Wantsum, Lower Stour and Lydden Stream where they flow over Thanet beds to the north of the North Downs.
- (vi) Thanet - The Isle of Thanet is an independent chalk block which is separated from the rest of the chalk of the North Downs by Tertiary and recent deposits in the Lower Stour Valley.
- (vii) London Clay and Coastal Marshes - Most of the North Kent coastal lowland is underlain by London Clay which spans to Herne Bay and Canterbury in the east. It is a region of heavy poorly drained soils supporting large expanses of marsh and wetland.

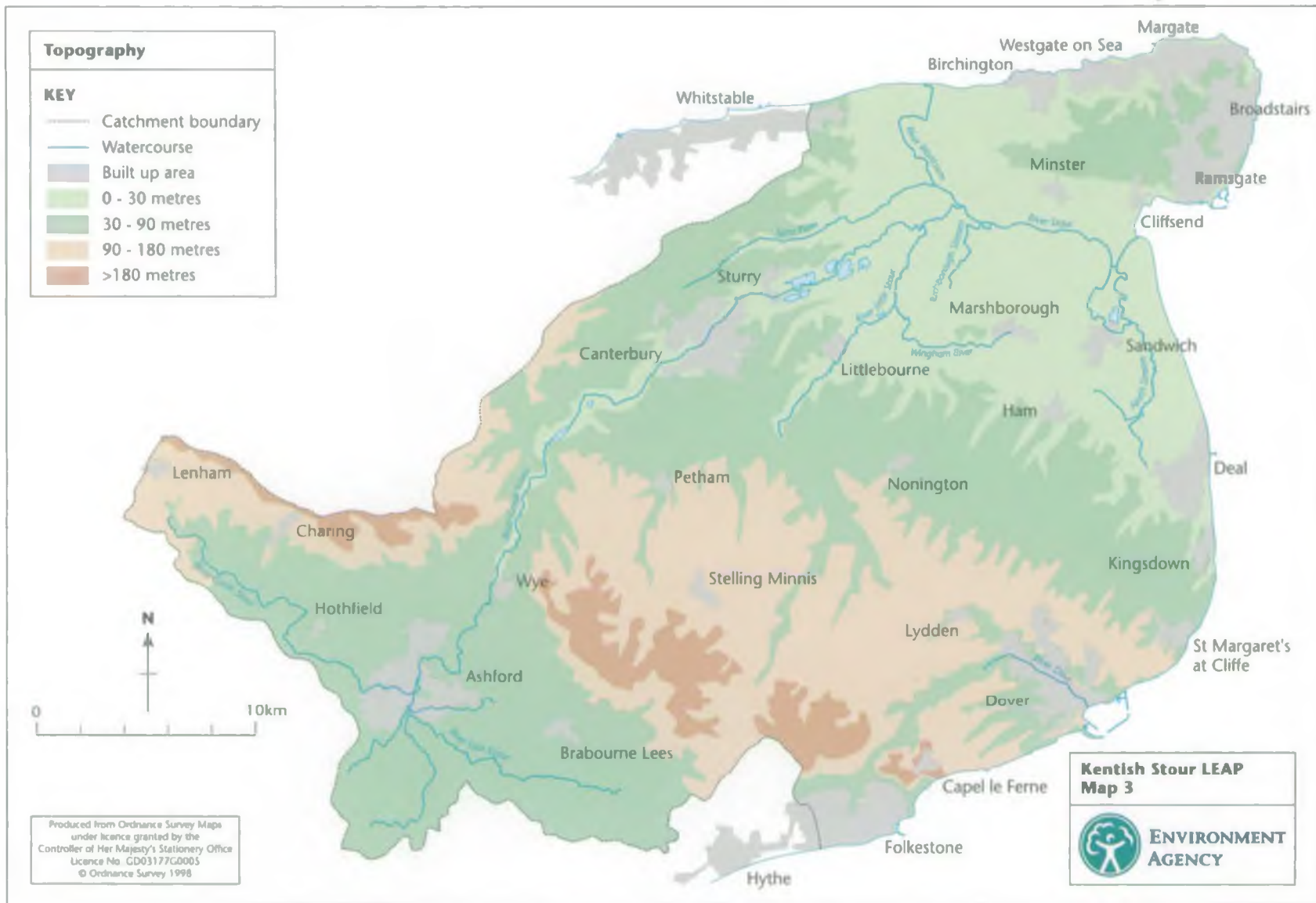
Topographical elevations in the catchment range from 0 m AoD at the coast to a maximum of 205 m along the North Downs. The topography of the Stour catchment is shown in Map 3.

2.1.2 Land use and management

The principal urban areas in the catchment are Folkestone, Dover, Deal, Ramsgate, Margate, Canterbury and Ashford. The population in the catchment is increasing due to a combination of natural increase and net immigration. The projected growth amounts to a 5.6% increase from 452,000 in 1991 to 476,000 in 2001.

The Stour catchment has an extensive history of heavy manufacturing industry, including chemicals and pharmaceuticals, and the paper industry. Major industrial complexes within the Stour catchment are centred around Ashford and Canterbury.

The Isle of Thanet has been designated as a Development Area because of the persistence and scale of the area's social and economic problems. The area



receives European Development Funding to aid its development and similarly much of the rural part of Thanet has been designated a Rural Development Area.

Agriculture forms the main land use outside the urban areas. Agricultural land use quality in the catchment is generally grade 2 (very good quality) or grade 3 (good to moderate quality). A band of grade 1 land (excellent quality) lies to the north of the catchment, corresponding to the geological area of Thanet. Patches of grade 4 agricultural land (poor quality) are scattered through the south and north of the catchment, while areas of grade 5 land (very poor quality) are restricted to locations around Pegwell Bay, north of Deal and Folkestone, and north east of Canterbury.

Until the 1950's the main agricultural use was grazing, but the introduction of spray irrigation led to the increased cultivation of vegetables and salad crops.

Minerals

The geology of Stour catchment gives rise to a rich mineral resource comprising near surface deposits of clays, building stones, sands and aggregates, and subsurface deposits of older rocks such as chalk and coal. Extraction of these minerals, particularly chalk, has left numerous voids which have either been filled with waste, left to naturalise or used for industry and commerce. The East Kent Coalfield exploited deep reserves at several mines but is now abandoned.

In order to reduce the demand on locally won supplies of aggregates for construction, a land bank of permitted reserves of sand, gravel and Ragstone is being maintained sufficient for at least ten years production. The sites proposed sites for inclusion within the catchment are as follows:

- Chartham (gravel and concreting sands)
- Highstead (gravel and concreting sands)
- Fordwich (gravel and concreting sands)
- Richborough (limestone)
- Harrietsham to Charing (building sands)
- north east of Ashford (gravel and concreting sands)

Contaminated land

Once suitably remediated, contaminated land sites offer an opportunity for redevelopment. This helps conserve land as a resource and reduces pressures on greenfield sites, thus conserving agricultural land and natural habitats. The aim is to ensure that sites presenting the greatest risks are dealt with first, and that risks are assessed in relation to the intended use of the land. The Government has confirmed that the proportion of housing development required to be located within brownfield sites (those previously developed) should increase from 50 to 60% over the next ten years. However, the number, extent and locations of contaminated sites in the catchment is unknown, which makes it difficult to plan for future development on such sites. (Issue No. 13).

2.1.3 Administrative areas and land use planning

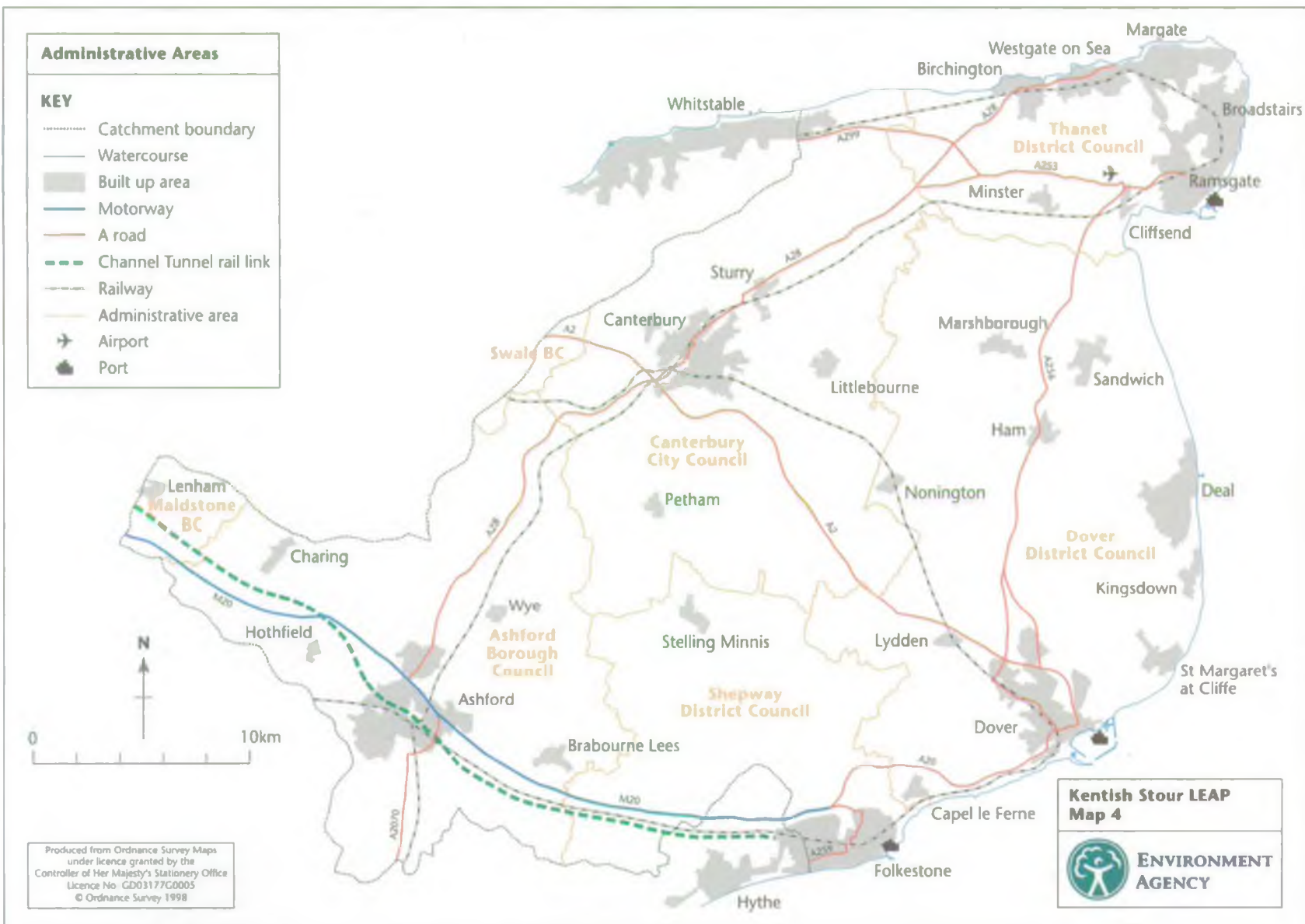
The Stour catchment falls entirely within the County of Kent. The majority of the catchment lies within the administrative boundaries of Dover District Council, Thanet District Council, Canterbury City Council and Ashford Borough Council. However, parts of Swale Borough Council, Maidstone Borough Council and Shepway District Council also lie within the Stour catchment. Administrative areas are shown in Map 4.

Planning guidance

Regional Planning Guidance, Structure Plans and Local Plans all provide guidance regarding the future development of the LEAP area. Relevant plans and their status are as follows:

- RPG 9: Regional Planning Guidance for the South East
- Kent Structure Plan, Adopted 1996
- Ashford Borough Local Plan, Deposit Draft 1996
- Canterbury District Local Plan, Deposit Draft 1994
- Dover District Local Plan, Deposit Draft 1996
- Maidstone Borough Local Plan, Deposit Draft 1997
- Shepway District Local Plan, Adopted 1997
- Swale Borough Local Plan, Deposit Draft, 1996
- Thanet District Local Plan, Adopted 1998

Key issues and stresses and strains associated with development in the catchment are highlighted in relation to the different Agency viewpoints.



2.2 ENVIRONMENTAL RESOURCES

2.2.1 Introduction

This section of the environmental overview outlines and describes the environmental resources of the Kentish Stour LEAP area that fall within the realm of the Agency's interests. It also considers additional concerns of the Agency in relation to the protection of people and property against flooding; recreation and the management of waste.

2.2.2 Landscape and cultural heritage

Landscape

The Countryside Commission and English Nature have produced a Character Map of England which divides the countryside into 181 different Character Areas and 120 Natural Areas on the basis of geology, landscape, wildlife, historical influences and natural features. The following Countryside Character Areas and Natural Areas are found within the Kentish Stour catchment:

- North Downs
 - North Kent Plain
 - Wealden Greensand
 - Low Weald
- (i) The North Downs landscape is characterised by rolling chalk hills, escarpments and dry valleys which typically support unexploited areas of the grass land and arable land. The Chalk downland habitat supports a diverse range of rare plant and animal species including rare orchid and butterfly species.
- (ii) The North Kent Plain is typified by an open flat landscape. A narrow band of gently undulating land is found where the North Downs give way to the North Kent Plain. The area supports a mixture of woodland, grassland and agricultural land. The North Kent Plain has great nature conservation interest and key landscape features include numerous dykes and drainage ditches.
- (iii) The Wealden Greensand area is predominantly characterised by arable farmland, although subsidence following coal mining has produced extensive marshes and wet pastures. In areas which are not used for arable agriculture, the landscape is comprised of lowland heathland and woodland.

- (iv) On the Low Weald human use of the land traditionally focused on hop gardens, orchards and ponds, but these features have largely been replaced by urban development. In areas free of urban development, the heavy damp soils support semi-natural woodland.

Due to the rich landscape, the Kentish Stour catchment supports a number of landscape designations. These designations are shown in Map 5.

Areas of Outstanding Natural Beauty

The landscape quality of areas such as the North Downs is recognised in their designation as an Area of Outstanding Natural Beauty (AONB). Only one area has been designated as an AONB within the Stour catchment, but it is extensive, covering much of the lower greensand and extending from Folkestone and Dover in the east to Lenham and Godmersham in the west.

Management of AONBs rests primarily with county councils, and the Agency works with AONB officers and others to secure the implementation of AONB management plans. In the Stour catchment the Agency is involved with the AONB officers through the Kentish Stour Countryside Project.

Special Landscape Areas

Special Landscape Areas (SLAs) are landscapes of strategic or county importance. SLAs are identified in the Local and Structure Plans, and are protected by planning policies. SLAs in the Stour catchment include the North Downs, Sandwich Bay/Pegwell Bay, the High Weald and the Low Weald.

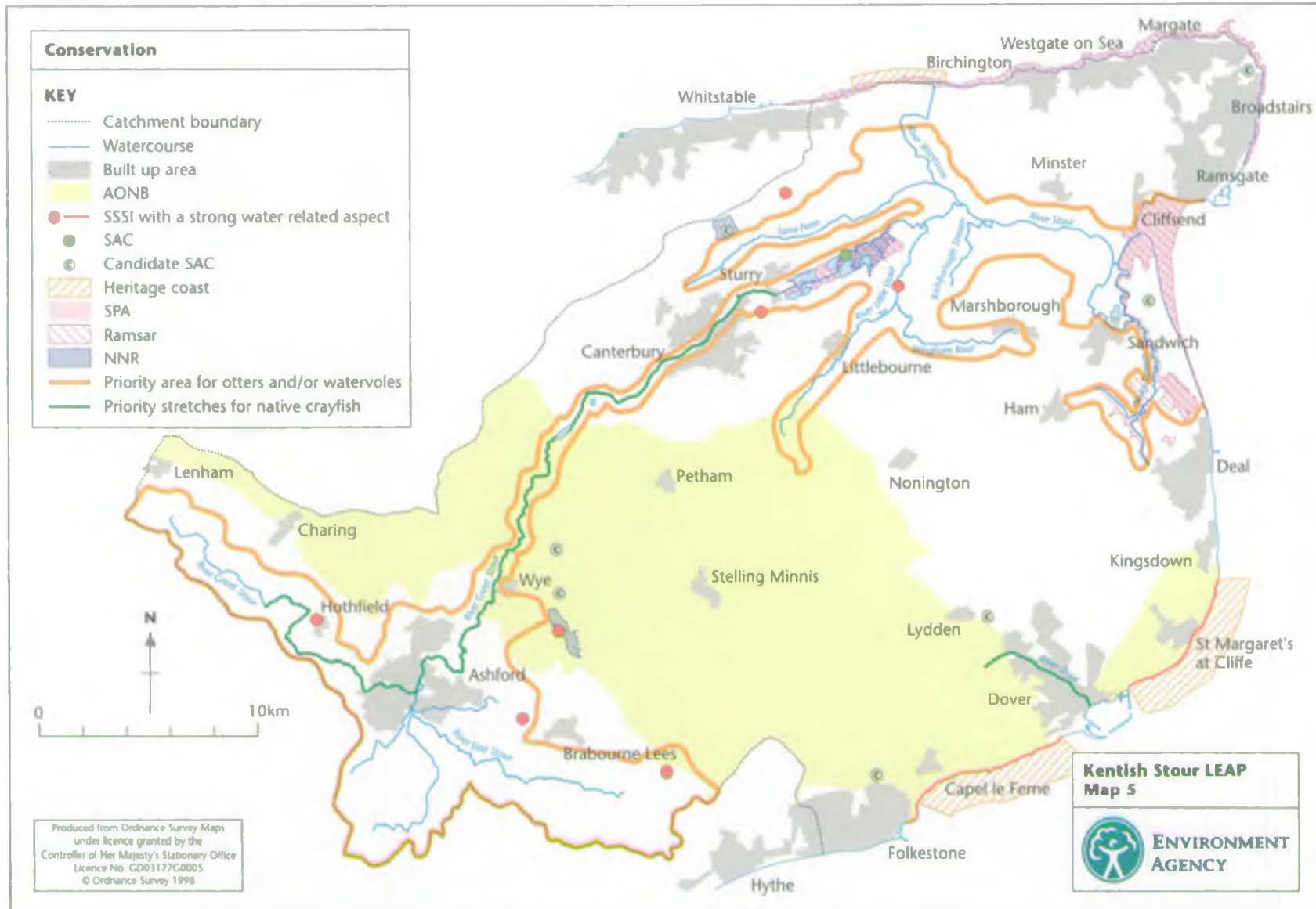
Local Landscape Areas

Local Landscape Areas are areas of local, rather than county value. Local Landscape Areas are often represented by green areas between towns, such as that between Broadstairs and Margate, and that separating Ramsgate to Broadstairs.

Heritage Coasts and Sensitive Marine Areas

The Heritage Coast designation aims to protect and conserve the beauty of the undeveloped coast, and a considerable portion of the coastline of the Kentish Stour catchment is covered by this designation. The North Downs meet the sea as spectacular chalk cliffs between South Foreland, Dover and Folkestone. These coastal stretches are designated as the Heritage Coasts of South Foreland, and Dover-Folkestone. Stretches of coastline at Reculver and Bishopstone are also designated.

The management of Heritage Coasts is implemented through Heritage Coast Management Plans, such as that governing the proposed marine nature reserve at Copt Point in Folkestone.



Cultural heritage

The Stour catchment contains a number of Scheduled Ancient Monuments (SAMs) including coastal defences, forts, bridges, castles and mills. These sites are designated and protected by English Heritage due to their National Importance. Other areas have also been identified by English Heritage where potentially significant archaeological features may be buried, particularly near the North Kent coast. Significant paleoenvironmental evidence may also be present in wetland areas such as the blocked Wantsum Channel which formerly separated the Isle of Thanet from the mainland of Kent.

Stresses on landscape and cultural heritage

The stresses on the landscape and cultural heritage of the Kentish Stour catchment are as follows:

Stresses from societal influences

Development

Development, whether it is for residential, agricultural or industrial purposes, exerts pressure on the landscape. Future stresses are likely to result from the need to provide for both housing and economic growth, as outlined in the Kent Structure Plan and relevant Local Plans. In particular the area around Ashford is likely to be affected as future development is to be concentrated in this area. (Issue No. 12).

The Agency considers landscape and aesthetic issues associated with its own development projects, for example flood defence schemes, through the project planning and environmental assessment process.

2.2.3 Air quality

The Environment Act 1995 (EA95) Part IV places responsibility for local air quality management on the local authorities. They are required to carry out a three stage review and assessment of air quality within their boundaries, taking into account factors from neighbouring areas. The Agency is a consultee to this process. The review must assess whether it is likely that air quality objectives laid down in the Air Quality Regulations (SI 1997 No 3043) will be complied with by 31 December 2005. If it is likely that one or more of the objectives will be breached, the local authority is required to designate that area where the breach is likely to occur as an air quality management area. An action plan must be prepared which sets out the measures required to achieve the objectives.

The Agency's role is one of liaison, support, technical consultation and provision of data relating to Part A IPC processes. The Agency's contribution to the achievement of air quality objectives is limited to its regulation of Part A IPC processes. Part B processes (those with lower potential to pollute) are

already regulated by local authorities under the Local Authority Air Pollution Control (LAAPC) provisions of the Environmental Protection Act 1990 (EPA90) Part I.

The Kent Air Quality Partnership is an existing forum which promotes co-operation and co-ordinated action on air quality issues. It is the custodian of an emissions inventory and air quality model which is now being used to facilitate member Local Authorities' Air Quality Reviews. The Agency is a full member of the Partnership and KCC provides secretariat facilities. The air quality model is also used by KCC to assist with planning decisions by evaluating the impact of proposed developments.

Stresses on air quality

Stresses from usage, releases and discharges

Industrial emissions

The process industries are the main source of sulphur dioxide (SO₂). Under the Environmental Protection Act (EPA 90), operation of a prescribed process (part A process) requires an Integrated Pollution Control (IPC) authorisation from the Environment Agency, while potentially less polluting processes (part B process) are authorised and regulated by Environmental Health departments of local authorities under LAAPC.

Under EPA 90 the following number of sites are authorised for each process type in the Stour catchment:

- Part A processes 6
- Part B processes 163

Part A processes are concentrated at 6 principal sites in the catchment. No major problems have been encountered in the LEAP area. IPC regulations are being met within the catchment area, and no issues have been identified in this area.

Energy production also results in atmospheric emissions. There is only one power station within the Stour catchment, a Combined Heat and Power Plant at Buckland Mill in Dover, with a declared net capacity of 10MW.

Transport emissions

Significant air pollution, apart from SO₂, is generated from traffic. Principal transport routes are shown in Map 4 on page 13. Further road infrastructure developments and strategic improvements to primary and secondary routes in the Kentish Stour catchment are planned for the A256 Whitfield to Eastry, and the A2070 South Ashford to Ham Street Bypass.

2.2.4 Water resources

The proper management of water resources to provide water for all reasonable needs and to enhance the environment, is a principal concern of the Agency. Water is abstracted from both rivers and groundwater in the catchment to supply a range of uses, including public water supply, industrial and agricultural purposes.

Rainfall

Within the Kentish Stour catchment the average annual rainfall during the period 1961-1990 was 714 mm with an effective rainfall (that which is not lost through evaporation and transpiration) of 266 mm. As is typical of the south east region, precipitation generally decreases from the south and south west to north east. Thus, the Dover area receives the highest average annual rainfall for the catchment at more than 800 mm, and the Thanet area receives the least, with less than 600 mm.

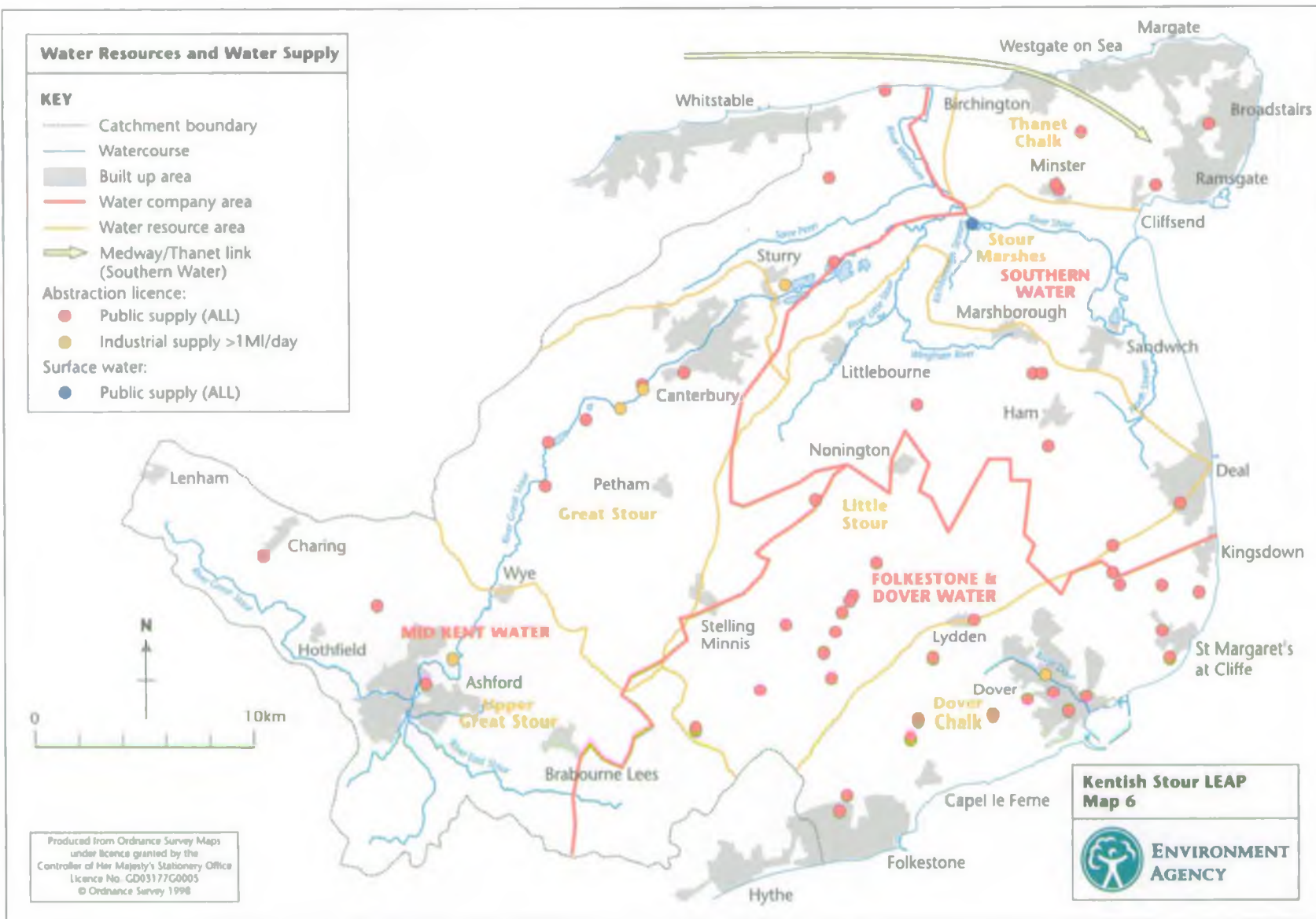
Hydrology

Surface drainage is strongly influenced by the permeable character of the catchment's geology, most of the area being underlain by chalk with Lower Greensand outcropping in the headwaters of the Great Stour, (see Map 3). These aquifers provide natural reservoirs replenished by winter rainfall and supporting a predominantly spring fed river upstream. There are few surface water courses and they all display a high degree of seasonal regulation; the effect of aquifer storage. This is reflected in the relatively small winter-to-summer flow ratio (less than 1 to 2) compared with a clay catchment. For example, much of the River Beult where the ratio is nearly 5 to 1.

The dependence of surface flow on the state of groundwater storage renders the Stour system vulnerable to large scale borehole abstraction with the result that two of the catchment's most important streams, the Little Stour and Dour, now feature in the National Environment programme for the allocation of low flows. Historic development of the Lower Greensand layer has similarly resulted in the depletion of headwater streams above Ashford and has inevitably reduced the dilution capacity of the Stour as a receiving water for sewage and trade effluent.

Water use and demand

Water resource management in Kent is based on areas corresponding either to river catchments or to subdivisions of the major aquifers. Periodic assessments of water resources take the form of audits or balances which are undertaken for these designated resource areas. The current water resource areas located within the Kentish Stour catchment, are shown on Map 6. For each area, authorised abstraction is expressed as a percentage of the average annual effective rainfall (rainfall minus actual evaporation).



The relative importance of groundwater can be readily appreciated from the fact that borehole abstraction accounts for more than 95% of the total quantity licensed for public supply. Development has historically been concentrated on the chalk and on the basis of current authorisations, more than 40% of the resource is committed to this purpose with a further 10% for other uses, which are mainly industrial and agricultural.

Consented effluent discharges amount to over half the volume of water abstracted but only a small proportion of this is returned to the aquifer as a re-usable resource.

Total authorised abstraction, and the percentage commitment, for each of the water resource areas in the catchment are shown in Table 2.1.

Table 2.1: Authorised abstraction and percentage commitment for catchment water resource areas

Resource Area	Total Available Resource (Average for 1961-90 ML/year)	Authorised Abstraction ML/a (as of April 1998)	% Commitment
Stour Marshes	27,505	14,550	53
Great Stour	42,410	24,588	58
Upper Great Stour	70,350	4,512	6
Little Stour	90,431	33,115	37
Thanet Chalk	13,896	10,572	76
Dover Chalk	52,660	35,551	68

The vulnerability of the groundwater resource was highlighted by the experience of the long drought of 1989-92. In recognition of this, the National Rivers Authority in 1993 introduced a Groundwater Management Policy, embodying a general presumption against licensing further increases in direct abstraction for consumptive purposes (including public water supply).

Public water supply

There are three water companies operating in the Stour catchment; Mid Kent Water Plc, Folkestone and Dover Water Services Ltd, and Southern Water. The areas within the catchment which are served by these companies are shown in Map 6.

Table 2.2: Summary of public water abstraction in the Stour catchment, (Mld)

Water Company	Authorised Abstraction*		Deployable Output^	
	Surface	Ground	Surface	Ground
Southern Water	10.00	85.83	2.74	62.22
Mid Kent Water Plc	0.00	87.72	0.00	77.59
Folkestone and Dover Water Services Ltd	0	79.16	0	44.91

* mean daily rate

^ average deployable output - the average output under drought conditions

Asset Management Plans

One of the Agency's roles as a consultee to OFWAT in the assessment of company investment programmes for water supply and environmental improvements is to negotiate future investment by the water companies, assisted by the Asset Management Plan (AMP). The third Periodic Review of water company price limits, which will decide the costs of water bill charges for the 2000-2005 period, was initiated in 1997. The Agency makes recommendations as to where money should be spent on environmental improvements. The Agency attempts to rationalise the maintenance programme by identifying reaches of the rivers in the catchment which are under or over serviced, and prioritising improvement works. The Agency is currently reviewing the situation in the Stour catchment.

Stresses on water resources

Stresses from natural forces

Climate change

Investigations undertaken at inland and coastal stations into the effects of climate change in the catchment yield different results. Coastal stations show no major trends in precipitation, but records for some inland stations do indicate small but significant decreases taking place in the last 100 years or so. There is also evidence pointing to a general increase in the rate of potential evaporation.

The 1996 Climate Change Impacts Review Group (CCIRG) report on the impacts of global warming concluded the following for water resources:

- increase in river flow in winter and decrease in summer;
- increased winter rainfall and wetter catchment conditions are likely to increase the frequency of riverine flooding;
- hotter, drier summer conditions and higher end of season soil moisture deficits;

- climate change might add a further 5% onto the predicted 12% increase in demand for public water supplies in Southern England between 1990 and 2021, largely due to increased usage in gardens;
- changes in the frequency of drought depend on changes in water availability and demand, and on the catchment geological conditions and the volume of storage available.

The 1996 CCIRG prediction of both drier conditions and increased variability of factors affecting river flows and groundwater recharge is already in evidence in Kent. These climatic change effects are predicted to be more pronounced in the south and south-east, with further drought episodes of comparable or greater duration and intensity than those of the last ten years. (Issue No. 1).

Stresses from societal influences

Water demand forecasts

There are two particular processes influencing public water supply demand:

- population growth and movement;
- per-capita increases in consumption.

The forecast growth in water demand for the Kent area is 15% until 2011. The whole of the Stour catchment is designated as a high priority area for abstractors to implement demand management measures. (Issue No. 5).

Development pressures are forecast to be greatest both in the Ashford area and in the vicinity of the Channel Tunnel Rail Link. The increase in both population, and economic and industrial activity in these areas will lead to greater demand for water supplies. The Isle of Thanet also has been designated by the European Union as a Development Area because of the area's economic and social problems. This designation is intended to promote economic growth in the area.

Industrial abstractions have reduced substantially in recent years and no longer represent a significant drain on water resources. This is due to reduced abstraction for industrial purposes resulting from the decline in manufacturing and industry in the catchment, and the implementation over recent years of environmentally sound procedures and advances in water use technology. Industrial and commercial demand for water is expected to stabilise in the future as the economic advantages of water reuse and waste minimisation are more widely realised. However certain areas, where development is due to be focused, such as Ashford, will experience locally elevated rates of water demand and usage for industrial purposes. (Issue No. 9).

A review of legislation controlling the abstraction of water for all purposes has been carried out. At present only spray irrigation requires a licence, but the Agency would prefer to see controls applied to all other categories including

trickle irrigation. The implementation of amendments suggested in the legislative review awaits the appropriate time in the parliamentary process.

The general presumption against consumptive-use abstraction from groundwater has encouraged some re-examination of the potential for the use of marginal quality sources. A scheme promoted by Southern Water and currently under consideration by the Agency entails the direct supply to farmers in Thanet from a borehole where the water quality has proved unsuitable for public supply. If successful this scheme would take some of the pressure off the main distribution network at times of peak demand.

Other societal pressures influencing water demand include the rising expectations of the public with regard to the quality of the service provided, but at the same time there is a growing appreciation of the need to protect the water environment. These additional factors contribute to the demand pressures on the water environment within the Stour catchment.

Demand management has taken several forms and has been actively promoted by the Agency. Leakage control and selective metering have been introduced by all water companies as part of their management programmes in an attempt to manage water resources.

The South East Region Strategy Group, consisting of the Environment Agency, water companies, and OFWAT, is currently developing a regional water resources strategy. This puts a high priority on demand management, water conservation and the maximum practicable use of opportunities for bulk supply agreements and transfers between water companies. Examples for the Stour include a proposed agreement between Mid-Kent Water and Folkestone and Dover Water Services Ltd using part of the Kingston borehole output, and the planned up-grading of the Southern Water Medway/Thanet trunk main.

Stresses from abstractions and removals

Low flows

Demand for water and associated abstraction has resulted in low flows in the catchment. Low flows give rise to a number of interacting environmental stresses including reduced water quality, changes in the flow regime and knock on effects upon aquatic ecology.

The National Environment programme includes low flow alleviation schemes for the Little Stour and Dour. Investigations are now in progress to provide data on the relationship between groundwater abstraction and low flows in the principal spring-fed Chalk streams. One likely outcome is that certain key sources will be identified as having a major environmental impact in this respect and require action. One option in such cases would be the closure and or re-siting of relevant boreholes.

A special area of concern regarding reduced dilution from decreased baseflow has already been identified in the Stour catchment on the Great Stour below Ashford.

2.2.5 Water quality

The achievement of a continuing and overall improvement in the quality of controlled waters through the prevention and control of pollution is a principal concern of the Agency.

Water quality is assessed through two main schemes: General Quality Assessment (GQA) and River Ecosystem (RE) Classification. For further information on the GQA and RE classifications, see section 2.4.7.

The water quality of the Kentish Stour is reported to be good at most sites in the catchment. Some of the marsh dykes have a restricted fauna due to low flows and inputs of fertilisers and pesticides from surrounding agricultural land. The upper reaches of the Dour are affected by low flows and the lower reaches by urban runoff and waste water. However, the water quality of the Dour appears to be improving due to the efforts of Southern Water to eliminate cross connections in surface water drains. Water quality for the Stour catchment is shown on Maps 7 and 8.

Assessment of estuary quality

The estuary of the Stour is one of the three principal estuaries in Kent. Eight points were sampled in 1995 for estuarial quality classification. Points for tidal classification are awarded under each of the headings of biological, aesthetic, and water quality. These scores are then amalgamated into four classes from A (good quality) to D (bad quality). All but one stretch in the Stour catchment, that at the Pfizer pumping station, scored the top A class.

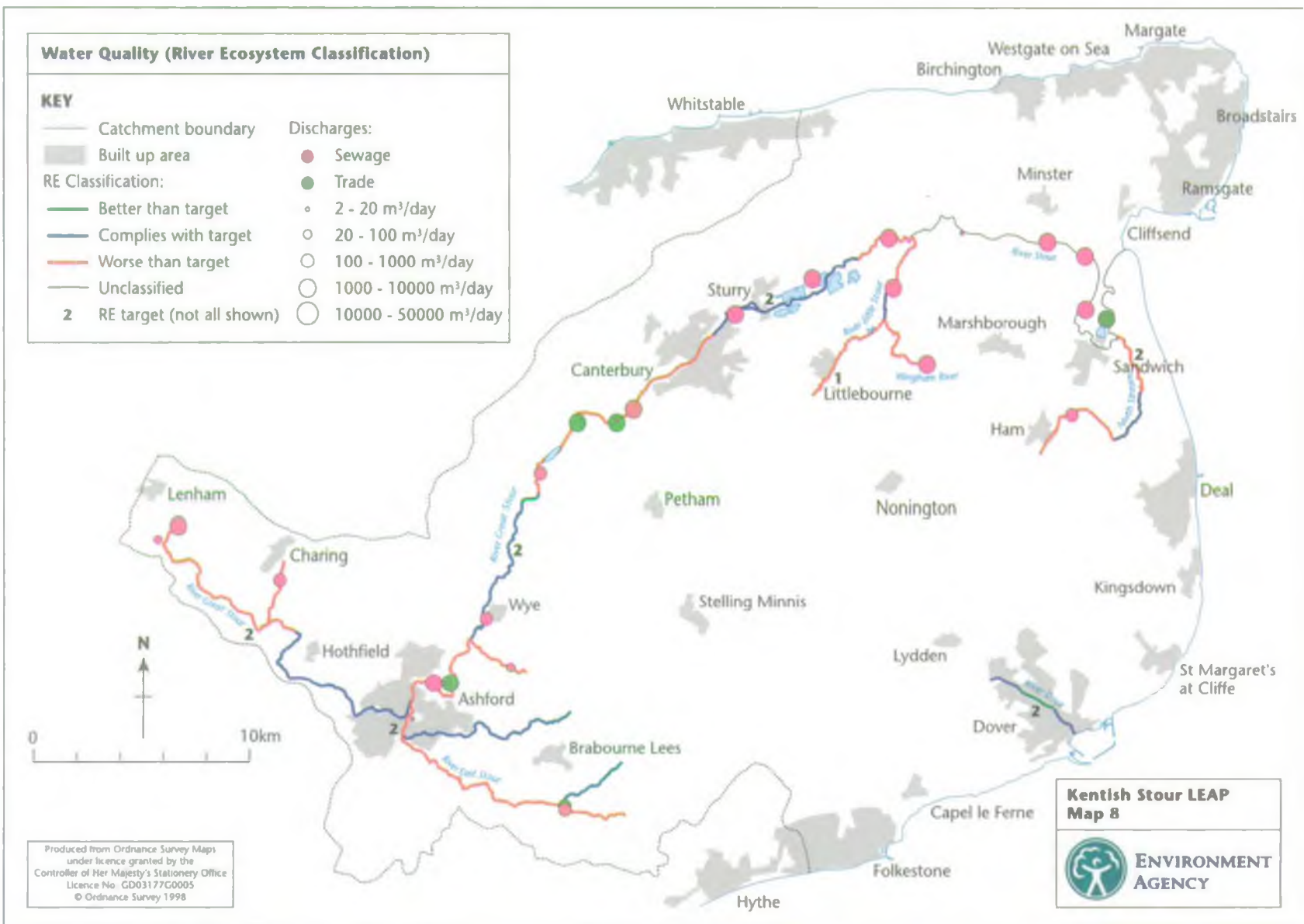
Groundwater protection

The vulnerability of groundwater is categorised by the Agency in terms of Source Protection Zones (I, most vulnerable, II, and III), and resource protection based upon aquifer type (Major, Minor, and None). The most important groundwater unit in Kent is the Chalk aquifer of the North Downs, which underlies part of the Stour catchment, although there is also a major aquifer located in the Folkestone beds of Lower Greensand, and a minor aquifer in the Thanet beds.

The Agency's policies are also supported by Groundwater Vulnerability Maps which are being produced nationally for England and Wales.

New European regulations on groundwater protection came into force on 1 January 1999. In order to implement the EC Groundwater Directive, member states are to take measures to prevent the introduction of List I substances, and reduce the introduction of List II substances to groundwater. The disposal or tipping of List I and II substances will be controlled by a new authorisation system where existing waste management licensing does not apply.





Consented discharges to water

Sewage treatment works

There are a total of 22 public and 16 private sewage treatment works (STWs) in the Stour catchment, which are consented and monitored by the Agency.

The two major sewage effluent discharges from sewage treatment works to freshwater are from Ashford and Canterbury. Many of the smaller sewage treatment works, particularly in the upper catchment, discharge to streams with low summer flows.

Stresses on water quality

Stresses on water quality are primarily from consented or unconsented discharges within the catchment. The sources of these intermittent discharges are varied in terms of frequency and impact and include accidental spillage from agriculture, industry, construction and transport routes together with diffuse sources such as runoff from land.

Stresses from usage, releases and discharges

Discharges from sewage treatment works

The low spring flow at the source of the Great Stour near Lenham has resulted in very little dilution of effluent from Lenham STW resulting in poor water quality in the head waters.

Water quality problems resulting from sewage treatment works in the catchment have been identified at several sites. Although the majority of effluent from Canterbury STW discharges down the southern arm of the Stour at Sturry, low flow has resulted in siltation of the northern arm causing problems in the White Mill Pool.

The performance of Dambridge STW, discharging to the Wingham River, is well within consented conditions. However, there is a three fold class degradation downstream of the works due to low flow from climate change and increased agricultural abstractions. (Issue No. 9).

Stresses from illegal practices

Pollution incidents

Pollution incidents which are illegal practices, include breaches of consent conditions, unauthorised discharges and vandalism. Pollution may also result from activities which are not in themselves illegal, such as accidents. (Issue No. 10).

Between 1995 and 1997 five major pollution incidents occurred in the Stour

catchment. These resulted mainly from sewage and farm waste activities, and have led to fish kills and high ammonia levels

The river through Ashford has been the subject of persistent intermittent accidental pollution from development within the area. Oil and hydrocarbon spillages have occurred from the construction of houses and industrial estates. As Ashford is close to continental road and rail links the town has expanded and developed as a distribution centre. Pollution from this type of industry has led to a permanent oil interception being built across a culverted tributary serving Cobbs Wood Industrial Estate. This structure has performed poorly over recent years resulting in poor water quality and biology immediately downstream.

Run off from the construction of the missing link of the M20 between Ashford and Maidstone has been identified as having contributed to the silting of the River Great Ouse. The same concern exists now the construction of the CTRL has commenced. The M20 section between junctions 9 and 10, previously the old Ashford Bypass, has been a source of pollution following accidents. No lagoons have been installed so drainage waters flow directly into the river.

The River Dour suffers from urban runoff and pollution from the combined sewerage system. Incidents are difficult to trace due to the vast catchment area and the culverted section of the main river. (Issues No. 10 and 11).

Stresses from abstractions and removals

Pressure on groundwater resources due to abstraction

Groundwater in Thanet is coming under increased pressure from the abstraction of water for agricultural and potable purposes. There is concern that declining underground water resources leaves this supply vulnerable to pollution. Diffuse pollution results mainly from agricultural fertiliser or pesticide application which is difficult to trace or monitor and therefore control.

Within the Thanet Chalk Block nitrate contours show concentration in excess of the maximum admissible limit for water supply. Four public water supply boreholes have been affected by high nitrate concentrations so much so that a denitrifying plant has been installed at one pumping station at the Lord of the Manor in order to blend abstractions from others to reduce nitrate levels to permissible levels.

The western area of the Thanet Chalk Block has been designated a Nitrate Vulnerable Zone which will limit the use of nitrate arising from double cropping patterns.

The Easry Chalk Block to the south of Thanet has suffered from previous mine working in the area. Although now abandoned, the practice of discharging saline water from the workings into the upper chalk has resulted in

ground water contamination over a large area of this sub-catchment. Recent test pumping of the Eastry borehole which was installed to confirm the pollution some thirty years ago has shown the source to be unusable without extensive treatment.

2.2.6 Protection against flooding

A key aim of the Agency is to provide protection against flooding with a risk to people and property, and to provide flood forecasting and warning.

Flood risk areas

Several areas of the catchment are at risk from either fluvial or tidal flooding. The structures in place to protect land from flooding are shown in Map 9.

Historically Ashford, Canterbury and Fordwich have been vulnerable to flooding although the construction of the flood relief systems around Ashford have reduced the threat to this town. Notable floods occurred in 1973, 1979, 1985, 1988, and Easter 1998. Other areas within the Stour catchment identified as low lying and at risk from flooding include part of the Herne Bay area and part of the Whitstable area.

Progress is being made locally with regard to a five year programme of flood risk mapping, and flood risk surveys are underway. To date surveys have been completed upstream of Ashford, while surveys of the Sandwich area and the middle reaches of the Stour will be finished in 1999.

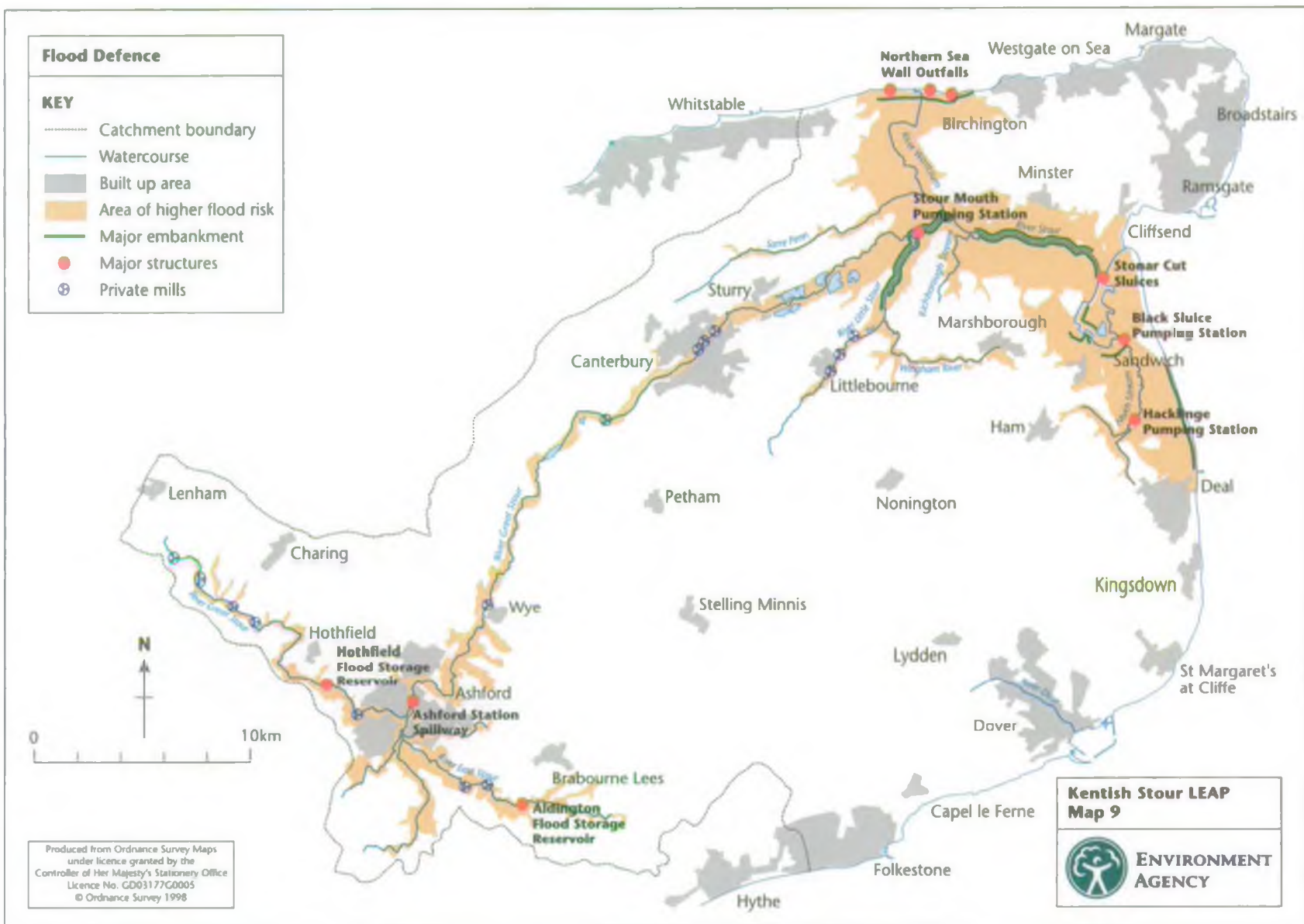
Inland flood defence

The Drainage District of the River Stour (Kent) Internal drainage Board (IDB) covers an area of 11,914 Ha, and has jurisdiction over all watercourses within the catchment which are not classed as "Main River". The IDB employs the Environment Agency (Kent Area Office) as its Engineering Agents to undertake programmes of weedcutting, and dredging and to maintain water control structures on a daily basis. The Agency also deals with enquiries concerning land drainage consent and planning application issues.

As part of the planning process, planning guidance states that all local authorities should consult with the Agency over any proposed development in the flood plain. The development planning processes of local authorities provide the opportunity to prevent development in the flood plain and impose conditions to restrict surface water run off thereby minimising an increase in the risk of flooding.

Agency owned structures

The Agency has responsibility for several structures within the Stour catchment. They include the sluices at Stonar Cut on the River Stour and 16 pumping stations.



In the 1980s a scheme was devised to alleviate flooding in the Ashford area through the construction of flood storage reservoirs. The Aldington Reservoir on the East Stour was designed to restrict the flow of the East Stour to bankfull flow downstream of the reservoir up to the 1 in 100 year flood flow. Any flow beyond the capacity of the downstream channel is held up behind the embankments and is gradually released over time. The Hothfield Reservoir has been designed to the same criteria but is constructed on the River Great Stour. These two structures have been put into operation on several occasions, and have reduced the flood flows and incidents of flooding in Ashford during heavy winter flows.

Privately owned structures

Privately owned structures also play an important part in the management of water resources and river flows, but can often be a cause for concern due to their state of repair or operation practices. The Agency wishes to educate and advise new owners of private sluices and maintains observation on those that are most important. (Issue No. 8).

Sea defences

With a long stretch of coastline within its boundaries, the Stour catchment contains many protective sea defence structures. Table 2.3 lists the types of coastal defences occurring in the catchment.

Table 2.3: Sea defence designations in the Stour catchment

Designation	Length (km)
Schedule 4*	80.6
Sea Defences (Agency)	17.85
Sea Defences (LA)	7.56
Tidal Banks (Agency)	38.05

*Under the Coast Protection Act 1949, Schedule 4 refers to the River Stour above the confluence of Stonar Cut and Flagstaff Reach, and includes the tidal reaches.

Up to date information, with regard to sea defences, is needed. Surveys are currently being undertaken in order to meet this need.

Shoreline Management Plans and Strategy Plans

Shoreline Management Plans (SMPs) set out strategies for coastal defence for a specified length of coast, giving consideration to natural coastal processes, environmental influences, human and other needs. The aim of SMPs is to help guide the long term sustainable protection of coastline. Two Shoreline Management Plans apply to the coastline of the Stour catchment; North Kent

SMP, and Foreland to Beachy Head SMP.

As an integral part of the SMPs, Strategy Plans are developed to investigate management options. The Strategy Plan for the stretch of coastline between Reculver and Minnis Bay is nearing completion, and the Sandwich Bay Strategy Plan is currently being produced.

Stresses on flood defence

The stresses on flood defences within the Kentish Stour catchment can be summarised as follows:

Stresses from natural forces

Sea level rise

A rise in sea level has been predicted for the South East of England as a result of two processes: climate variations in the form of global warming, and the tilting of the UK land mass. The combined effect is that sea levels are expected to rise, relative to sea defences, at a rate of 6 mm per year.

Stresses from societal influences

Lack of control of sluice operation

The Environment Agency does not have day to day control over private and Local Authority operated flood defence structures. This poses potential problems with regard to the provision of flood protection, and the maintenance of river flow levels. (Issue No. 5).

Development in the flood plain

The threat of fluvial flooding is a recurring problem, especially around Ashford and Canterbury where pressure for development is leading to increased development in the flood plain. Above Ashford the flow is controlled by the Hothfield Barrier and the Aldington Barrier, which reduce peak flows from the upper catchment. Peak flows are not such a problem in the lower catchment due to the feeding of the river by Chalk groundwater. (Issue No. 2).

The Pfizer site at Sandwich is a particularly sensitive area in terms of flood defence. Land allocated for the future needs of Pfizer Ltd. is identified on the local authority development plan. The Agency is working in liaison with the local authority and Pfizers to ensure that any development does not increase the flood risk to Sandwich.

2.2.7 Recreation

The Agency seeks to protect, improve and promote recreation on or near to water where appropriate or desirable. The Agency's main role in the field of recreation is the maintenance of a healthy aquatic environment through such activities as dredging, monitoring and reducing pollution, and flood alleviation.

Map 10 shows the principal recreational facilities in the Stour catchment, many of which are water related. There are, in total, 45 recreation sites in the catchment which are used for water related or other recreational activities.

The Stour catchment as a recreational asset

Despite a decline in tourism in some areas, such as the ports of Dover and Folkestone which have suffered since the opening of the Channel Tunnel, the Stour catchment remains a popular tourist destination. The catchment has high landscape quality, heritage coastline, and historic sites and monuments such as the World Heritage Site of Canterbury.

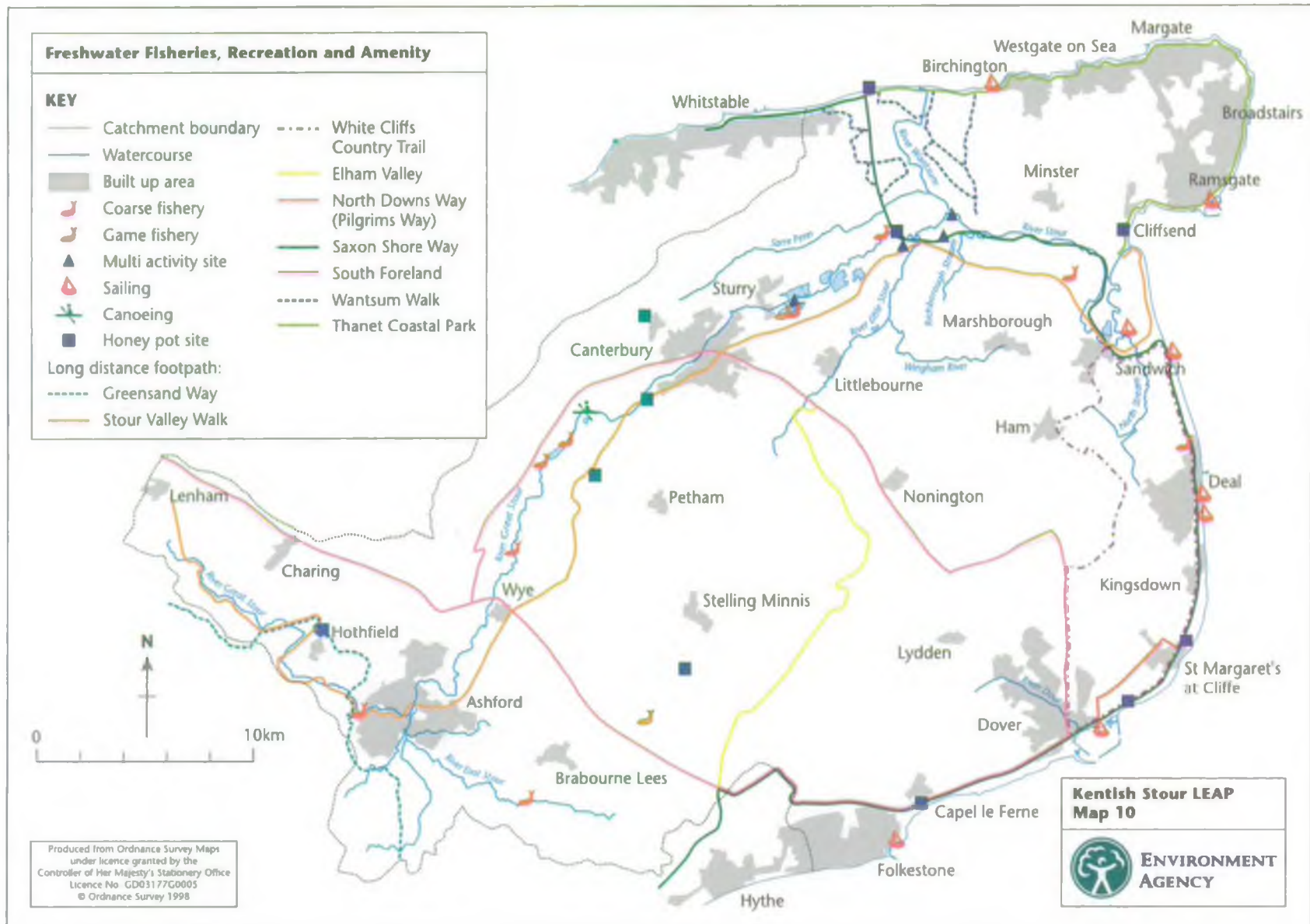
The River Stour is an important waterway for tourists and day visitors. The public right of navigation takes precedence over all other uses of the river and extends from the estuary through Sandwich and Fordwich to Abbott's Mill, Canterbury. The Sandwich Port and Haven Commissioners regulate navigation from the sea to Richborough Castle.

Grove Ferry Boat Club is the limit of navigation for larger river craft, but dinghies and other small craft can proceed up to Abbott's Mill. Siltation and weed growth restricts access to these reaches for large craft. Moorings are available at several locations along the Stour, including Grove Ferry and Plucks Gutter.

The most popular sites for water recreation within the Stour catchment are:

- the River Stour from Shell Ness to Fordwich;
- the coastal towns, particularly Whitstable, Deal, Sandwich, Dover, and Folkestone.

Angling is a principal recreational pursuit in the Stour catchment. Coarse fishing predominates upstream of Wye and Downstream of Fordwich, and trout fisheries are located in the middle reaches of the Great Stour and on the Little Stour. In addition, there are numerous other local sites which are used for a variety of activities, including dinghy sailing, yachting and swimming. Other recreational activities pursued in the Stour catchment include bird watching, horse riding and nature study activities.



*Stresses on recreation**Stresses from societal influences**Conflict between different users*

There is potential for conflict between the competing uses of land, rivers and footpaths, and nature conservation. A particular problem has arisen in Ashford where plans to position the Sustrans cycle route under existing bridges would reduce channel capacity and pose a potential flood risk. Additional pressures are imposed upon some local access routes utilise coastal defence structures, and the strength of these defences may be affected by the number of walkers using them. (Issue No. 11).

The Rivers Advisory Committee is utilised in order to aid co-operation rather than conflict between recreational users of river environments.

Lack of access

Long distance footpaths in the Stour catchment include the following:

- Stour Valley Walk
- North Downs Way
- Saxon Shore Way
- Thanet Coastal Path
- Wantsum Walk

However, the Kent area LEAP indicated that there is a lack of access to rivers in urban areas. Public access is limited or intermittent in the upper and middle reaches of the Stour. The Agency may work with local planning authorities to seek the creation of access points and riverside walks where deemed appropriate. Any proposals must be compatible with other interests.

Increasing pressure on river recreational resources

The number of craft using the Stour has increased in recent years, and the speed of such craft has also risen. River bank erosion resulting from jet skiing activities has been noted by Pfizer Ltd. If these trends continue in the future, the impact of navigation on the environment of the Stour catchment is likely to increase. (Issue No. 11).

2.2.8 Waste management

Waste places considerable strain on the environment, and the principal aim of the Agency is to achieve a continuing reduction in the production of waste and its impact on the environment. A further aim is to prevent pollution of the environment, harm to human health, and serious detriment to the amenities of the locality.

Waste planning

Information on waste arisings and waste planning and management in the Stour catchment can be obtained from the following documents:

- Waste Local Plan for Kent, adopted in 1998;
- Kent Structure Plan, adopted in 1996;
- District and Borough Local plans for Ashford, Canterbury, Dover, Maidstone, Shepway, Swale and Thanet.

However, statistics on waste arisings and recovery rates are not collected for the area defined by the Stour LEAP; and are only available on a district or county basis.

Licensed waste management sites

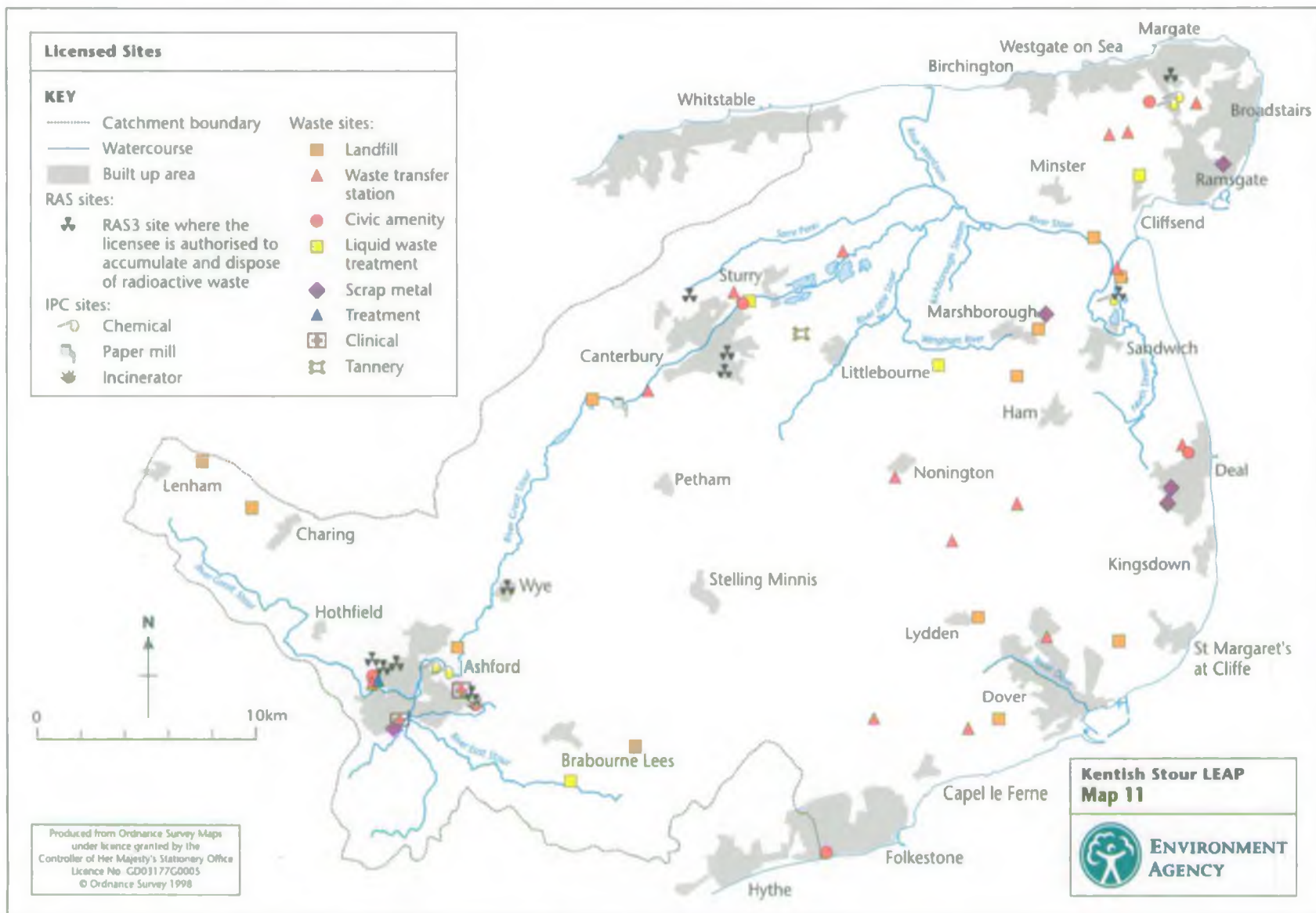
The development and location of waste management facilities is determined by the relevant planning authorities through the land use planning system. Within the Kentish Stour catchment there are 47 licensed waste facilities, which are shown on Map 11, and are classified as follows:

- 4 civic amenity sites
- 4 clinical waste transfer stations
- 1 composting site
- 13 landfill sites
- 4 liquid waste treatment
- 1 other site
- 6 scrap metal sites
- 1 treatment plant
- 10 waste transfer stations
- 3 multiple activity sites

In addition, there are also numerous activities for which an exemption from holding a Waste Management Licence has been claimed.

Each site is visited on a regular basis, in order to monitor compliance with licensing conditions.

Waste disposal sites, whether active or closed, can result in pollution of both the land and groundwater due to leachate. 26 sites within the Stour catchment have been identified as being at risk of groundwater contamination. However, landfill still remains the most significant waste management option in the Stour area.



Waste management sites exempt from licensing

Many waste management activities are exempt from licensing, although the Agency is notified about the majority of these. Such activities are held on a register, and inspections may be carried out to monitor and ensure compliance with the exemption regulations.

Waste minimisation

As part of the drive to achieve sustainable development, the Agency aims to reduce the amount of waste produced by industry and commerce (per unit of output produced) by focusing attention on priority waste streams. This in turn will increase energy efficiency and reduce polluting emissions.

Liaison and visits to companies form a key part of the Agency's role in waste minimisation projects around the catchment, and Local Agenda 21 schemes can also be of assistance in minimising waste. The Pfizer site within the Stour catchment took part in research undertaken as part of the Medway-Swale waste minimisation study.

Stresses on waste management

Stresses from waste arisings and disposal

Waste arisings

Household waste recycling schemes are promoted in several districts covered by the Stour LEAP but most waste arising from domestic practices continues to be disposed of to landfill. Concern has been raised regarding the possible exhaustion of available void spaces for disposal in the future.

Mining and quarrying wastes are currently excluded from the definition of controlled waste. As the majority of such waste is waste mineral, and it tends to have a low pollution potential, it is not considered to be an issue in the Stour catchment.

Agricultural waste is currently excluded from the definition of controlled waste, and often these wastes are disposed of on the agricultural premises. Naturally occurring agricultural waste such as plant and animal wastes can lead to elevated organic levels in rivers; while non naturally occurring agricultural wastes, such as pesticide containers and old farm machinery, can pose pollution problems.

The term used to describe the most hazardous waste is Special Waste. Special Waste can be defined as a controlled waste with hazardous properties. Within the LEAP area there is one special storage facility accepting oil.

The Kentish Stour catchment has no sites which are accredited as a reprocessor of packaging waste or other waste.

Disposal of controlled wastes at exempt sites

The introduction of the landfill tax in 1997 is thought to have led to an increase in the disposal of controlled wastes at exempt sites. It is also thought that the amount of flytipping, the illegal disposal of waste, has increased.

Metal recycling sites

There are 6 metal recycling sites within the catchment area, the majority of which are located around Thanet. The threat of pollution from these sites has been noted, and is a particular concern because of the vulnerability of the groundwater for public supply.

Landspreading of sewage and paper sludge

The use of sludge in agriculture is not regarded as a disposal operation, but a recovery operation. Landspreading of both sewage sludge and controlled wastes is allowed under certain conditions.

The spreading of sewage sludge is not currently seen as a major problem in the Stour catchment. However, proposals for the removal of solids from coastal discharges will be a future burden. The proposed sewage sludge plant at Weatherlees will produce granulated particles which should reduce current problems associated with leachate and odour in the future.

Of some concern to the Agency is the practice and extent of spreading paper sludge to agricultural land. A requirement through legislation is placed upon the producer to notify the Agency of proposed spreading areas and demonstrate that the application will have an agricultural benefit. Public complaints have been received following the storage of recycled cellulose fibre paper sludge over long periods prior to application.

Transfrontier shipments

Under the terms of the Transfrontier Shipment of Waste Regulations 1994, waste shipments destined for genuine recovery operations are permitted while shipments for disposal are not. Potentially hazardous wastes (amber or red listed) require prior issued consent before any shipment can take place, and prior notification for each shipment of waste once consent has been given. Inspections and spot checks are carried out to ensure that amber and red listed waste shipments are destined for genuine recovery operations and accompanied by appropriate paperwork.

Green listed wastes are generally not considered to be hazardous and no prior issued consent is required for these wastes. No pre-shipment checks can therefore be made to ensure that the waste is destined for a genuine recovery operation. Competent authorities are not provided with pre-notification of individual green listed waste shipments to enable routine inspections to be undertaken at the points of origin or recovery, or during transit. Where

possible, random road checks are carried out at key sites in Kent. These checks ensure that green listed wastes are destined for genuine recovery operations, are accompanied by the appropriate paperwork, and are suitable for inclusion on the green list (i.e. clean and uncontaminated).

The tracking and control of green listed waste shipments is of concern to the Agency and is an issue being considered at an international level. The provision of better information to the competent authorities regarding waste sources, routes and destinations would enable more efficient inspection.

The Port of Dover is an important entry and exit route for the United Kingdom to and from Europe and the rest of the world. Within the Stour catchment shipments are also transported through Ramsgate. None of the Kent destinations for recovery operations on these wastes are within the Stour catchment, but shipments transiting through these ports are destined for a wide range of recovery operations throughout the UK, predominantly in the West Midlands.

2.3 THE STATUS OF KEY BIOLOGICAL POPULATIONS, COMMUNITIES AND BIODIVERSITY

2.3.1 Introduction

Biodiversity is a term that refers to all species of plants and animals, and their genetic variation, as well as the ecosystems of which they are part. A principal concern of the Agency is to help conserve and enhance biodiversity for the benefit of both present and future generations.

2.3.2 Key habitats

The Stour catchment supports a range of wetland and riparian habitats which are hydrologically connected to the river. The most important examples of these habitats are protected through international, national and local designations and through management agreements such as Water Level Management Plans. Measures for their conservation are outlined in the Kent BAP.

The Agency is preparing water level management plans for important wetlands where it is the operating authority and advising others where its interests are likely to be affected.

Rivers and streams

The principal rivers in the Stour catchment are the Great Stour, the Little Stour, the East Stour and the Dour. The Great Stour and the Dour are typical chalk rivers; fast flowing with a gravelly bed. Chalk rivers are characterised by a wide diversity of plant and animal life, including brown trout. Low flows

are a problem in the Little Stour, but there are only a few places on the Great Stour where poor water quality has affected species diversity. A national costed action plan has been prepared for chalk rivers for which the national lead is the Environment Agency.

A complete River Habitat Survey, comprising 100 x 500m sections has been produced for the catchment upstream of Pluck's Gutter, although the survey data for the river upstream of Fordwich requires further collation and interpretation. A River Corridor Survey, which provides more detailed mapped information, was carried out for the Great Stour in 1998, with further surveys of the tributaries planned for 1999.

An objective of the Environment Agency in partnership with others, is to manage all catchments and maintain them in a condition which supports the appropriate range of flora and fauna, through improved water quantity and quality, and conserving the dynamic nature of rivers, their micro habitats and their associated flood plains.

Grazing marsh

Grazing marsh once occupied much of the low lying land on the Lower Stour Valley. Agricultural improvement has resulted in the loss of much of this important habitat which is now largely restricted to Stodmarsh and Sandwich Bay.

Grazing marsh is an important habitat for a variety of plant and animal species. In addition to the internationally important populations of breeding, wintering and passage birds, Stodmarsh supports the rare marsh dandelion, the silver barred moth and the shining ram's-horn snail which is a priority species for action under the UK BAP produced by the Environment Agency.

Much of Stodmarsh and Sandwich Bay receive protection under a range of national and international designations. Parts of both sites are SPA and SSSI. Areas of Sandwich Bay are also Ramsar site, cSAC, SSSI, and LNR. Areas of Stodmarsh, part of which is owned by the Agency, are designated a National Nature Reserve (NNR), and a proposal has been made for part of Sandwich Bay to be upgraded to NNR status.

The Water Level Management Plan has recently been prepared for Stodmarsh to balance the agricultural and nature conservation requirements within the site. Sensitive management of water levels is particularly important for the shining ram's-horn snail which occurs in ditches and depends on a supply of clean, calcareous water. Large-scale dredging operations, runoff from roads and agricultural land and lowering of water levels are the principal threats to the survival of this species.

It is the objective of the Agency, in partnership with others, to retain and enhance the management and extent of grazing marsh; and to create new habitat where practical and justified.

Reedbeds

Reedbeds are a nationally scarce habitat but are among the most important habitats for birds in the UK. In the Stour catchment this habitat is found within the river flood plains of the Great and Little Stour to the north east of Canterbury, and was formed as a result of coal mining subsidence. The Stodmarsh SSSI contains one of the largest tracts of reed in the country (149 Ha) and has been notified as an important breeding habitat for several birds including the rare bearded tit. It also supports several species of moth and a number of scarce fen plants.

In collaboration with the Environment Agency, English Nature, who manage the site at Stodmarsh as an NNR, are converting 39 hectares of land adjoining the site to a mosaic of grazing marsh and reedbed.

Amongst the smaller areas of reedbed within the catchment Preston Marshes SSSI represents the last remaining area of fen vegetation in the Little Stour Valley. The site has recently been 'ditched' and lowered to set back natural succession and encourage the growth of *Phragmites australis* reedbed.

The objectives of the Agency are to support and maintain any existing areas of reedbed, to expand existing areas and to explore the creation of new reedbeds, with particular reference to the Stodmarsh extension, in partnership with other organisations.

Standing water

Standing water is ubiquitous outside the chalk areas, with lakes concentrated along the Stour valley, mainly as a legacy of mineral exploitation. Standing water is particularly associated with low lying areas drained by a network of dykes and ditches. These standing water areas are particularly important for breeding and wintering waterfowl, including gadwall, shoveler, teal and mute swan. Scarce water beetles have also been recorded in standing waters within the Stour catchment.

Grant aid offered to farmers to restore ponds has recently been withdrawn threatening the future protection and restoration of this habitat.

The objectives of the Agency in partnership with others, are to retain the current area of standing water in Kent and to enhance its conservation interest.

Coastal and marine habitats

A number of the coastal habitats identified in the Kent BAP occur within the Stour catchment, the most important examples of which lie in the Sandwich Bay and Thanet coast area between Herne Bay on the north Kent coast and Deal on the east Kent coast. This stretch of coast is designated as a SPA under the EU Birds Directive and a Ramsar site under the Ramsar Convention. It has also been submitted as a possible SAC under the EU Habitats Directive

because it contains habitats and species which are threatened in a European context. Both Thanet coast and Sandwich Bay receive protection under UK legislation as SSSIs. The management of these areas is overseen by a LNR steering group.

The following marine and coastal habitats are represented within the Stour catchment:

- intertidal mud and sand flats,
- saltmarsh
- sand dune
- chalk cliffs
- rocky shore
- shingle
- reefs
- sea caves

Intertidal mud and sand flats

Intertidal mud and sand flats support a diverse invertebrate fauna which provides an important food source for birds. The Sandwich Bay and Thanet coast SPA supports internationally and nationally important populations of wintering waders and migratory passerine birds. Of particular note is the population of wintering turnstone which represents 3% of the British population.

Saltmarsh

Saltmarsh is a relatively scarce habitat within the Stour catchment. The small area which occurs within the mosaic of coastal habitats at Sandwich Bay and Hacklinge Marshes SSSI supports a number of rare wetland invertebrates and the nationally scarce plant, golden samphire.

The objective of the Agency in partnership with others, is to improve the quality of saltmarsh, and to promote the management of estuaries to permit the natural functioning of the estuary.

Sand dunes

The Sandwich Bay and Hacklinge Marshes SSSI contains the most important sand dune system and sandy coastal grassland in South East England. The dune system extends from the mouth of the Great Stour to Deal and supports a distinctive flora including a large proportion of the national population of lizard orchid, and a wide diversity of invertebrates. An embryo dune system, constrained by coastal squeeze, also occurs at Foreness Point in Thanet.

The objectives of the Agency in partnership with others, are to seek opportunities to ensure that there is no net loss of this habitat, to encourage a return to near-natural coastal processes wherever appropriate, and to maintain and enhance the biodiversity of the habitat.

Marine habitats

The sea caves and reefs of the Thanet coast, and the algal communities they support are recognised as important both in a European and UK context. Sea cliffs at Pegwell bay support both algal communities and a wide diversity of terrestrial plants. A number of nationally rare and scarce plant and invertebrate species occur on the shingle substrate of the foreshore and strand line

Stresses on habitats

Many of the stresses on the species and habitats of the Stour catchment are ubiquitous and relate to more than one habitat. Those which are frequently presented as problematic in the Kent BAP, and which are relevant to the biodiversity of the Stour catchment are outlined below. (Issue No. 6).

Stresses from natural forces

Sea level rise and coastal squeeze

Sea level rise and coastal squeeze (reduction in coastal land area principally due to erosion) result from climate change and the tilting of the land mass. These processes pose a particular threat to coastal habitats which are vulnerable to inundation.

Low river flows

Low river flows resulting from drought and climate change not only affect the river habitat itself but also other water-dependent habitats such as standing water, and grazing marshes, and the species dependent upon them.

Stresses from societal influences

Management of the river channel and riparian habitats

The management of river channel and bankside vegetation can disturb the habitats of the river and surrounding land. Weed cutting, for example, can reduce the amount of shelter available for fish and other species, and physical disturbance from dredging has been reported by the public to be responsible for disturbing the riparian habitat.

Agricultural practices and intensification

Agricultural practices and intensification can lead to disturbance, and a reduction in river water quality through increased siltation and pollution. Some

of the marsh dykes have a restricted fauna partly due to inputs of fertilisers and pesticides from surrounding agricultural land.

The Kentish Stour Valley is one of the key MAFF/FRCA Countryside Stewardship target areas and land management agreements which involve enhancement of water related conservation and biodiversity issues are highly likely to be generated in the future.

Recreational pressure

Recreational pressure can disturb not only the soils and vegetation of habitats, but also the species within them. The provision of increased access to the water's edge poses problems of disruption to bankside habitats.

Stresses from abstractions and removals

Low river flows

Low river flows resulting from water abstraction can reduce the dilution capability of the water, causing greater problems of pollution. The problem of restricted fauna in some of the marshes ditches arising from agricultural inputs has been exacerbated by low river flows.

Stresses from usage, releases and discharges

Changes in water quality

Changes in water quality due to pollution from various sources have been noted in the Stour catchment. A principal factor affecting the riparian habitat is the release of effluent from sewage treatment works. The release of effluent from the Lenham STW has resulted in poor water quality affecting the riparian habitat downstream, while the northern channel downstream of Canterbury STW has been affected by progressive siltation.

2.3.3 Key species

In 1992 at the Earth Summit in Rio the UK signed the convention on biological diversity which required signatories to produce national biodiversity action plans. The UK Government published the UK action plan in 1994 and set up a steering group to produce costed action plans. Costed action plans have now been produced for key species and habitats. The Agency is the lead organisation for the conservation of these species and habitats, which are strongly related to the water environment. In 1996 a BAP partnership was established for Kent and a Kent BAP was produced in 1997. Species which are relevant to the work of the Agency within the Stour catchment, and which are mentioned in the Kent BAP are:

Water vole (Arvicola terrestris)

The South East of England represents the stronghold of the water vole, and the species is present along the Great Stour and its tributaries. A survey of water voles is planned for the catchment as part of the development of an action plan for the species.

The water vole has now been included in Schedule 5 of the Wildlife and Countryside Act 1981. In the Stour catchment extensive water vole habitat is found in the Aldington area, and important strongholds are located at Stodmarsh, Preston Marshes and on the Sarre Penn. It is the objective of the Kent Biodiversity Action Plan to arrest the decline in the water vole population in Kent by the year 2000.

The Environment Agency is the lead Agency with regard to the conservation of the water vole.

Otter (Lutra lutra)

The otter is listed on Annexes 2 and 4 of the Habitats Directive, and as globally threatened on the International Union for the Conservation of Nature (IUCN) / World Conservation Monitoring Centre (WCMC) Red Data List. The species is protected under Schedule 5 of the Wildlife and Countryside Act 1981.

It is an objective of the Agency to protect the existing populations, and to encourage natural expansion through good habitat management.

Extensive surveys and monitoring have been carried out both by the Environment Agency and the South East Otters and Rivers Project. The project officer post for this initiative funded by the Agency is based with the Kent Wildlife Trust. Otters are known to be present at several locations within the catchment, although these locations are confidential.

The Environment Agency and the Kent Wildlife Trust are the lead agencies regarding the protection of otters under the Kent BAP. There is a complementary national action plan for the European otter, for which the Environment Agency is the national lead.

White-clawed crayfish (Austropotamobius pallipes)

This is the only species of freshwater crayfish which is native to the UK, and is listed in Appendix III of the Bern Convention and Annexes II and V of the EU Habitats Directive. It is classed as globally threatened by IUCN/WCMC, and is protected under schedule 5 of the Wildlife and Countryside Act 1981.

The native crayfish has been identified as a priority species for conservation by the English Nature Priority Species Action Programme, and a survey of the species is underway in the Stour catchment. The designation of sites containing suitable habitat within the Stour catchment as SSSIs and SNCIs

offer the principal means of protection for the species. White clawed crayfish have been found in the Bucksford area near Ashford, and around Shalmsford Street.

The Environment Agency and Kent Wildlife Trust are the lead agencies regarding the protection of white-clawed crayfish under the Kent BAP. There is a UK action plan for the white-clawed crayfish, for which the Agency is the national lead. It is an objective of the Agency to prevent further loss of the native crayfish in Kent.

Shining ram's-horn snail (Segmentina nitida)

Historically, East Kent has been one of the species' strongholds and the shining ram's-horn snail is found within the Stour catchment at Stodmarsh and on the Ash Levels. The population in the Ash Levels is vulnerable to changes in water levels and siltation from dredging, and as yet there are no control mechanisms in place to safeguard it. In the Kent BAP the Agency is the lead organisation for the preservation of this species. The species is considered rare and endangered in Europe and has been placed in category 1 (endangered) *British Red Data Books: Invertebrates other than insects*. However, the shining ram's-horn snail is not legally protected in the UK.

A PhD thesis assessing the major factors influencing the species' distribution is being funded by the Agency. Further survey work has also been proposed for the Stour Marshes for which joint funding by the Agency and English Nature is being considered.

Marsh warbler (Acrocephalus palustris)

The marsh warbler is specially protected under Schedule 1 of the Wildlife and Countryside Act 1981 and EC Birds Directive and is listed on Appendix II of the Bern Convention. It is also the subject of a Biodiversity Action Plan.

Two important colonies of the species occur on the Kent coast within the Stour catchment at St Margaret's-at-Cliff and Capel-le-Ferne. Although little has been done within Kent for the marsh warbler local volunteers have monitored the population and provided information on features of breeding habitat. The RSPB, the White Cliffs Countryside Project and local volunteers have also carried out small-scale habitat management, in some instances with some support from the Environment Agency.

The RSPB and Kent Wildlife Trust are the lead agencies for marsh warbler, although the Environment Agency are the principal contact.

Great crested newt (Triturus cristatus)

The great crested newt is listed under Annexes II and IV of the EC Habitats Directive and Appendix II of the Bern Convention. It is protected under schedule 2 of the Conservation (Natural Habitats, etc.) Regulations 1994,

(Regulation 38) and Schedule 5 of the Wildlife and Countryside Act 1981.

The species is most numerous to the west of the county, although there are a few records of the great crested newt east of Canterbury and north of Dover.

English Nature is the lead organisation for the great crested newt.

Stresses on species

Several of the stresses are common to more than one species of the Stour catchment. Factors listed in the Kent BAP as currently affecting the species, and which have been noted in the Stour catchment are outlined below. For further information on the particular issues in the Stour catchment. (Issue No. 6).

Stresses from natural forces

Non-viability of present populations

Several BAP species are present in the Stour catchment in limited numbers and fragmented and isolated locations, including the marsh warbler, the white-clawed crayfish and the otter.

Predation

Predation has been noted as a stress on the populations of several species in the Stour catchment. In particular the depletion of fish stocks has been partly attributed to predation by cormorants; and the water vole, among other species such as stoats and owls, falls prey to mink, an invasive species.

Stresses from abstractions and removals

Lowering of the water table

Over-abstraction and drought resulting in the lowering of the water table can not only exert a pressure on species which rely on certain water levels, but can also exacerbate other stresses such as pollution by reducing the dilution capacity of the water. The appropriate management of water levels is particularly important for the maintenance of the shining ram's-horn snail which lives in ditches, and which is vulnerable to reduced water levels.

Stresses from usage, releases and discharges

Nutrient enrichment

The nutrient enrichment of watercourses due to inputs of fertilisers from agricultural practices and the discharge of effluent from sewage treatment works is a particular problem for fish and other species dependent on the river. Eutrophication has been noted at Wye on the River Stour. (Issue No. 6).

*Stresses from illegal practices**Pollution incidents*

Between 1995 and 1997 five major pollution incidents occurred in the Stour catchment resulting from sewage and farm waste inputs. These incidents led to fish kills and high ammonia levels in the receiving waters.

2.3.4 Fisheries

Fisheries in the catchment comprise game (salmonid) and freshwater (coarse cyprinid) fisheries in inland waters as well as sea fisheries in the estuaries and around the coast. The operation of these fisheries is overseen by the Stour Catchment Fisheries Consultative Group for inland waters and the Kent and Essex Sea Fisheries Committee for coastal waters. Principal fisheries in the Stour catchment are shown in Map 10.

The length of the river designated under the EC Freshwater Fisheries Directive is given overleaf.

Table 2.4: Fisheries designations in the Stour catchment

	Freshwater (km)
Cyprinid designation	36.6
Salmonid designation	4.5

The designation relates to the quality of the river water needed to support these categories of fish.

The headwaters of most rivers in Kent have stocks of wild brown trout. A decline in the brown trout stocks has been noticed in the River Great Stour above Ashford and the River Little Stour, but it is unknown whether this is due to siltation, drought, over abstraction or a combination of these factors. Good populations exist in the River East Stour and the River Dour. Extensive stocking with takeable trout preceded by a coarse fish and pike cull is an annual feature of the fisheries management in the middle reaches of the River Great Stour.

A few sea trout and fewer salmon run the River Great Stour but neither the Stour nor its tributaries are principal salmon rivers. Salmon, sea trout and eels are the main migratory fish found in the catchment. (Issue No. 7). Five fish passes have been constructed in the River Great Stour in an attempt to facilitate the passage of migratory fish.

The middle and lower reaches of the rivers are principally populated by quality coarse fisheries with species such as roach, bream, perch, pike, and eel. The Great Stour tideway is nationally renowned for its coarse fishery, particularly

bream, although the coarse fisheries are reported to have declined recently. Cormorants attend the fishery mostly during the winter months and complaints are received from anglers about the heavy predation on stocks. The distribution of coarse fish has become clumped over the past 15 years. The cause of this phenomenon is unknown.

A Fisheries Strategy was produced for the Stour catchment in 1994, and currently a national brown trout strategy and coarse fish strategy are in preparation.

It has been suggested that additional fish passes should be installed further upstream to allow access to the upper reaches of the river. Specifically, access for sea trout upstream of Chilham Mill may need to be considered albeit an alteration in the composition of the existing fish communities would occur which could compromise the headwater wild brown trout stocks. Habitat improvement works are underway within the Stour catchment to restore lost pool and riffle sequences which provide the environmental variability vital to sustain quality fisheries. Structures such as weirs and deflectors have been placed at Barnfield, Rippers Cross, Godinton, Ashford, Trimworth, Godmersham, Chilham, Pickledon and Tonford. A low weir is planned for Wincheap and consideration is being given to structures in the River Little Stour and East Stour.

Stresses on fisheries

Stresses from use, releases, and discharges

Reduced river flows and siltation

Poor habitat for fish and invertebrates has been noted between Ashford and Wye in a section of river which receives extensive discharges from Ashford Sewage Treatment Works and urban drains. Farming of the adjacent land right up to the edge of the river bank has also led to siltation and pollution. Buffer strips are seen to be badly needed to counteract the agricultural diffuse pollution, and the enforcement of an Environmental Protection Statute prohibiting farmers from operating close to the bank edge is favoured by the Agency. (Issue No. 6).

Stresses from societal influences

Barriers to fish passage

Weirs and sluices, some of them ancient, present a barrier to the passage of fish and sea trout migration may be inhibited by the elevated water temperatures of Chartham Mill during warm summer months. The upstream migration of elvers is obstructed at the pumping station at West Stourmouth, and sea trout occasionally attempt to access the River Dour from Dover Harbour, but are unable to ascend.

Subsidence of the river bank in the lower reaches of the Stour at Chislet, known as "The Gaps" has enabled fish to enter a large lagoon adjacent to the river. Whilst the lagoon provides shelter for fish from being washed down the river during flood events, large fish are often exposed when the tide ebbs, especially during low flow periods. The Stour Catchment Fisheries Consultative Group has lobbied for "The Gaps" to be closed in the belief that fish preferentially move into the lagoon where their members can not fish. If "The Gaps" are to remain, deepening of the lagoon would give better protection to the trapped fish. (Issue No. 7).

Legislative proposals

New Fisheries Bylaws have been confirmed for the protection of salmon following a disastrous fishing season in 1997. The Stour contains few salmon and is therefore unlikely to be affected by the legislation albeit the mandatory catch and release of salmon and restrictions on the use of natural bait for salmon fishing is imposed before 16 June.

Stresses from illegal practices

Fish poaching

Limited poaching occurs in the Stour catchment. During the past five years the number of poaching events using instruments other than rod and line (such as nets) brought to the attention of the Agency is one or two *per annum*. Sea trout and eel netting activity has been identified in the lower part of the river estuary and into Sandwich Bay. The theft of valuable coarse fish, such as specimen carp, from private fisheries is also recorded.

The Agency, Kent Police and anglers in the Great Stour have formed a "Waterwatch" group (similar to "Neighbourhood Watch" groups). The respective parties communicate by telephone but in addition post information onto an electronic mailboard to maintain a useful flow of intelligence. The partners also have specific joint arrangements for addressing poaching incidents. The Stour Waterwatch group has been successful in detecting incidents but a greater Kent-wide scheme has been proposed to increase the level of intelligence.

Employing a wider definition of poaching, including the taking of fish using unlicensed rod and line, approximately eighty cases have been reported *per annum* over the last five years.

Fisheries monitoring

A national standard fisheries classification scheme has been introduced in order to improve the reporting of fisheries, and monitoring activities undertaken in the Stour catchment include the following:

- A rolling five year programme to establish the performance of fisheries in rivers, inland water ways, and estuaries. Most of this activity is achieved using electrofishing apparatus but some surveys in the wider estuary and adjacent lakes have been accomplished with horizontal side scanning sonar. A status report detailing the results of these surveys will be produced once every five years.

Electrofishing surveys have also been undertaken by the Environment Agency as a means of monitoring population trends in the salmon and sea trout fishery. Some fishermen have perceived this method to be harmful to the fish. (Issue No. 7).

Channel Tunnel Rail Link contractors have also been gathering fisheries information in the upper tributaries of the Stour.

Fishery regulation takes the form of controlling the transfer of fish and the use of nets and electrofishing apparatus to sample or survey fish populations. Target fishery checks are undertaken to audit these operations and enforce fisheries byelaw and licensing requirements. Quarterly reports are produced to cover all of these aspects.

2.3.5 Designated nature conservation areas

English Nature is responsible for proposing sites for designation under national and international legislation, such as the Wildlife and Countryside Act and the EU Birds Directive and Habitats Directive. Local sites such as Sites of Nature Conservation Importance and Local Nature Reserves are identified by the local authority and are afforded protection through the local plan. The locations of designated sites are shown on Map 5.

The legislation under which sites are designated in the UK is outlined below. Details of the nature conservation interest of these sites are provided in section 2.3.2.

EU Birds Directive (79/409): Special Protection Areas (SPAs)

A Special Protection Area is a site designated under the EC Birds Directive 79/409 as the most suitable sites for the conservation of bird species protected by the Directive. Development plans which will affect the integrity of a classified SPA can only be approved, in the absence of alternatives, on the grounds of overriding public interest. Sites which have been recommended as a Special Protection Area but have yet to be classified by the EC are known as 'potential SPA's' (pSPA). Whilst under the Directive they are not afforded full protection from development the UK Government has issued guidance stating that they should be 'considered in the same way as if they had already been classified' (DoE, 1994).

Three Special Protection Areas have been identified in the Stour catchment:

- Thanet Coast and Sandwich Bay,
- Swale Coast
- Stodmarsh.

EU Habitats Directive (92/43/EEC): Special Area for Conservation (SACs)

The EU Habitats Directive is enacted under UK law as the Conservation (Natural Habitats & c.) Regulations, 1994. Under the terms of the Directive member states must identify sites within their country which support habitats and species which are representative within that region. The aim is to create a network of sites throughout Europe, known as Natura 2000, which together offer the entire range of habitats and species which naturally occur in the continent.

Sites which have been identified and issued for public consultation but have not yet been submitted to the European Commission are known as possible SACs (pSAC). Once they have been formally submitted to the Commission they are termed candidate SACs (cSAC). In planning terms pSACs and cSACs are treated in the same way as pSPAs. Those sites identified as possible SACs must first be designated as Sites of Special Scientific Interest (see below)

The Special Areas for Conservation with a strong water related aspect identified in the Stour catchment are:

- Sandwich Bay (pSAC)
- Stodmarsh
- Thanet coast - proposed as a marine SAC. If accepted this will become the first marine SAC. The designation will restrict development below the low water line.

Ramsar sites

Ramsar sites are listed under the Convention on Wetlands of International Importance (1974).

The following Ramsar sites lie within the Stour catchment:

- Thanet Coast and Sandwich Bay
- Stodmarsh

Sites of Special Scientific Interest (SSSIs)

31 sites within the Stour catchment have been designated SSSIs under the Wildlife and Countryside Act 1981.

In order to satisfy a wide range of amenity and conservation interests dependent on the maintenance of flows, three classes of site have been identified based on the water regime characteristics and habitat:

- Water dependent SSSIs
- Water dependent conservation sites
- Low flow alleviation

The Agency has produced Water Level Management Plans (WLMP) for agreed SSSI sites in the Kent area. These plans provide a means by which the water level requirements for a range of activities in a particular area, including agriculture, flood defence and conservation, can be balanced and integrated. WLMPs have been prepared for the following SSSIs in the Stour catchment:

- Sandwich Bay and Hacklinge Marshes SSSI,
- Stodmarsh SSSI,
- Preston Marshes SSSI.

The Agency will be working with English Nature, RSPB, Kent Wildlife Trust and the various landowners/consultees to implement the actions identified in the plans. However, funding to implement the plans is known to be very limited.

National Nature Reserves (NNRs)

NNRs are sites of national importance for the conservation of wildlife or geological or natural features. They are declared by the statutory conservation agencies under the National Parks and Access to the Countryside Act 1949 or the Wildlife and Countryside Act 1981. NNRs must first be designated as SSSI's and are usually the most outstanding examples of these sites. The NNRs in the Stour catchment are:

- Stodmarsh
- Blean Woods,
- Wye

Local Nature Reserves

Whereas NNRs are designated under the Wildlife and Countryside Act 1981, Local Nature Reserves are designated under section 21 of the National Parks and Access to the Countryside Act 1949. There are six Local Nature Reserves in the Kentish Stour catchment, which include Pegwell Bay/Sandwich Bay, and Folkestone East Cliff. The Pegwell Bay/Sandwich Bay LNR may be upgraded to an NNR in 1999.

Sites of Nature Conservation Interest (SNCIs)

SNCIs are designated by the local authority and are protected through the local plan. They are often owned and managed by conservation groups. 18 have been identified by the Kent Wildlife Trust within the Kentish Stour catchment.

Sensitive Marine Areas

Sensitive Marine Areas are defined by English Nature in order to protect the marine environment below the water mark. Most of the north and east Kent coastline has been designated as a Sensitive Marine Area.

Stresses on conservation sites

The stresses on conservation sites within the Stour catchment are as follows:

Stresses from societal influences

Development

The pressure for development, particularly around Ashford and the route of the Channel Tunnel Rail Link, will lead to increased stresses on conservation due not only to increased land take for development, but also increased water demand and abstraction. (Issue No. 12).

Recreation

Whilst the high landscape quality and conservation sites of the Stour catchment are an important tourist attraction, recreational activities can have serious impacts on the ecology of sensitive sites if improperly managed. Trampling and damage to vegetation by excessive visitor numbers and disturbance to birds by visitors and their dogs are the principal areas of conflict between nature conservation and recreation. Increased levels of litter may have an impact not only on the conservation sites themselves, but also on people's enjoyment of those sites. (Issue No. 11).

2.4 COMPLIANCE WITH ENVIRONMENTAL QUALITY STANDARDS, TARGETS AND POLICIES/STRATEGIES

2.4.1 Air quality standards

The Environment Act 1995 (EA95) Part IV places responsibility for local air quality management on Local Authorities. They are required to carry out a three stage review and assessment of air quality within their boundaries, taking into account factors from neighbouring areas. The Agency is a consultee to this process. The review must assess whether it is likely that air quality objectives laid down in the air quality regulations (SI 1997 No 3043) will be complied with by 31 December 2005. If it is likely that one or more of the objectives will be breached, the Local Authority is required to designate that area where the breach is likely to occur as an air quality management area. An action plan must be prepared which sets out the measures required to achieve the objectives.

The Agency's role is one of liaison, support, technical consultation and provision of data relating to Part A IPC processes. The Agency's contribution to the achievement of air quality objectives is limited to its regulation of Part A IPC processes. Part B processes (those with lower potential to pollute) are already regulated by Local Authorities under the Local Authority Air Pollution Control (LAAPC) provisions of the Environmental Protection Act 1990 (EPA 90) Part I.

The Kent Air Quality Partnership is an existing forum which promotes co-operation and co-ordinated action on air quality issues. It is the custodian of an emissions inventory and air quality model which is now being used to facilitate member Local Authorities' Air Quality Reviews. The Agency is a full member of the partnership and KCC provides secretariat facilities. The air quality model is also used by KCC to assist with planning decisions by evaluating the impact of proposed developments.

2.4.2 Process Industries Regulation (PIR)

The Environmental Protection Act 1990 (EPA 90) as amended by the Environment Act 1995 (EA 95) introduced the system of IPC. Integrated Pollution Control (IPC) is concerned with the prevention and control of emissions to all three media of the environment: air, land and water. The industrial processes regulated under this system are the Part A prescribed processes, defined in regulations made under EPA 90. They are the most technically complex and potentially most polluting industrial processes.

Operation of a prescribed process requires an IPC authorisation and the Agency is responsible for implementing IPC and regulating these processes. Less polluting processes (Part B processes) are authorised and regulated by local authorities under LAAPC for releases to air only. Non-compliance with the conditions of an authorisation can result in enforcement action.

Details of IPC authorisations are held on the public register at the Agency's Regional office at Worthing and on Public Registers held by the Local Authorities.

2.4.3 Waste management and regulation

The Agency has a key role in implementing the government's proposed national statutory waste strategy, which is required under the EA 1995. Currently the strategy is based on three key objectives:

- to reduce the amount of waste that society produces;
- to make best use of the waste produced;
- to minimise risks of harm to human health and environmental pollution.

In order to prepare this strategy, the Agency and the Department for the Environment, Transport and the Regions (DETR) are working to produce accurate statistics which will be required on the amounts of different types of waste arisings.

The Agency licences and monitors waste management facilities, and registers and monitors activities which are exempt from the requirement to obtain a waste management licence.

2.4.4 Radioactive Substances Regulation (RSR)

The Environment Agency is responsible for regulating the storage, use and disposal of radioactive materials under the Radioactive Substances Act 1993 (RSA 93), as amended by the Environment Act 1995 (EA 95). There are two main types of certificate granted in relation to RSA 93: Registrations regulate storage and use of radioactive materials, and are usually associated with smaller users; while Authorisations regulate the accumulation and disposal of radioactive wastes and are associated with larger users such as hospitals and research facilities.

Within the Kentish Stour catchment the principal users and storers of radioactive substances are universities and hospitals.

2.4.5 Flood defence

Standards of Service for flood defence have been established by the Environment Agency based upon land use and the estimated financial value of resources in the flood plain. Each land use band is allocated a target for a maximum flood risk to which it should be exposed, and these standards of service are shown in Table 2.5, on the following page.

Table 2.5: Flood protection standards of service

Land Use Band	Description	Target Standard (return period)	
		Fluvial River	Saline Sea/Tidal
A	Urban	1:50 - 1:100	1:100 - 1:200
B	Lower Density Urban	1:25 - 1:100	1:50 - 1:200
C	Isolated Rural Communities	1:5 - 1:50	1:10 - 1:100
D	Isolated Properties, intensive farming	1:1.25 - 1:10	1:1.25 - 1:20
E	Low Grade Agricultural Land	<1:2.5	<1:5

Project Appraisal Guidance Notes, produced by MAFF, for flood and coastal defences set out procedures for justification, in cost/benefit terms, of proposed flood defence schemes with recommendations for appropriate standards of protection. No problems or issues have been raised with regard to compliance with these standards in the Stour catchment.

Flood warning standards of service

The Environment Agency operates a warning system based on colour codes which advise of the likely severity of imminent flooding, as follows:

- Yellow: risk of flooding to some farmland near rivers or the sea.
- Amber: risk of flooding to farmland or isolated properties near rivers or the sea.
- Red: risk of serious flooding to many properties and roads, and large areas of farmland.

The National Performance Target is used to assess the operation of flood warning systems, which stipulates that 80% of members of the public affected by flooding must have received a warning by telephone using the Automatic Voice Message (AVM) System. In the Stour catchment it is difficult to meet this target because not everyone wishes to be included in the scheme, but warnings are also issued via the local radio and television networks. The provision of a two hour warning of the commencement of flooding, wherever practicable, has been achieved within the Stour catchment.

2.4.6 European Water Quality Directives

Certain Directives contain standards that are relevant to water quality. The Agency is required to ensure compliance with certain elements of the Directives cited below.

Surface Water Abstraction Directive (75/440/EEC)

This directive ensures that water abstracted for public supply meets certain standards and is given adequate treatment before entering public water supplies. There is one abstraction site within the Stour catchment at Plucks Gutter on the Stour, and this complied with the directive standards.

Bathing Water Directive (76/160/EEC)

This directive protects the environment and the health of bathers by reducing pollution entering the identified bathing area. The directive contains standards for 19 microbiological, physical and chemical parameters to assess quality. Compliance is assessed by the Department for the Environment, Transport and the Regions (DETR). The Agency is required to sample and analyse bathing waters in accordance with the requirements of this directive and report the results annually to the DETR.

Of the 18 bathing waters in the Stour catchment only Folkestone does not meet the mandatory requirements. Improved treatment (primary treatment) will be commissioned by the end of 2000.

The Margate scheme, which addresses the Urban Waste Water Treatment Directive, will also be designed to improve bathing water further.

Freshwater Fisheries Directive (78/659/EEC)

This directive specifies a certain quality of water to protect freshwater fish. There are different standards for game and coarse fisheries. The vast majority of the Stour freshwater catchment is designated.

There was one failure at Blue Bridge on the Little Stour for the year 1997. The failure was for dissolved oxygen levels in August and was due to reduced summer flows.

Dangerous Substances Directive (76/464/EEC)

This directive covers the control of substances released to the aquatic environment based on their toxicity, persistence and potential to accumulate in organisms. There are specific families of compounds cited, such as metals, pesticides and solvents which are controlled from point discharges and must not exceed specified concentrations in the environment.

The directive describes two lists of compounds. Those on List 1 are regarded as particularly dangerous, and the long term aim is to eliminate these from the environment. Those on List 2 are regarded as less dangerous but these can still have a harmful effect on the environment and must be minimised.

There were no recorded failures for this directive in the Stour catchment for the years 1995 to 1997.

Urban Waste Water Treatment Directive (91/271/EEC)

This directive is intended to protect the environment from being adversely affected by the disposal of insufficiently treated urban waste water. Current arrangements for the treatment and disposal of sewage have become subject to the requirements for treatment to standards specified within this directive.

Under this directive Ashford Sewage Treatment Works now undertakes nutrient stripping of its effluent. The provision of secondary treatment is also required at both Margate/Broadstairs and Dover Folkestone Sewage Treatment Works under this directive. The date for the completion of this secondary treatment provision is to be determined by the Department for the Environment, Transport and the Regions.

Shellfish Waters Directive (76/923/EEC)

This directive requires the quality of water around shellfish beds to achieve a certain quality. There are currently no designated waters in the area at present.

Shellfish Hygiene Directive (92/49/EEC)

This Directive establishes the health conditions for the production and placing on the market of live bivalve molluscs to protect the health of consumers. There are cockle sites at Pegwell Bay and Sandwich Flats, which are classified as Class B, but the monitoring of these is the responsibility of MAFF and the local authorities rather than the Agency.

Groundwater Directive (80/68/EEC)

The Groundwater Directive seeks to prevent pollution of groundwater from certain dangerous substances. The substances are split into two lists. List I contains the most dangerous substances and these must be prevented from entering groundwater. List II are less dangerous but their entry into groundwater must be limited such that it does not cause pollution of the groundwater.

The Government has developed the Groundwater Regulations, which transpose the Directive into British law. This was enacted on 1 April 1999 and requires the Agency to authorise any disposal of materials containing List I or II substances that could impact on or reach groundwater. People wishing to carry out an activity which includes the discharge of List I or II substances to the ground or groundwater after 1 April must apply for an authorisation prior to undertaking the activity. Failure to do so is a criminal offence.

Nitrates Directive (92/676/EEC)

The EU Nitrates Directive is concerned with the protection of groundwater against pollution caused by nitrates from agricultural sources. Groundwater sources with nitrate concentrations exceeding or trending towards the Directive limit and where the nitrate is of agricultural origin have had their catchment zones reviewed. MAFF have converted the catchment zones into geographical zones and have designated them Nitrate Vulnerable Zones (NVZs). Reviews of existing and potential NVZs are carried out on a four year basis. Within the Stour catchment NVZs are located at Minster, Sparrow Castle and Thurnham.

Proposed EU Water Framework Directive

The Proposed Water Framework Directive encourages a focus on river basin management, and to produce river basin management plans. Once in force, it will be directly relevant to the work of the Agency.

2.4.7 UK Water Quality Objectives and Standards

The background to the development of the UK Water Quality Objectives is given in the Kent Area LEAP.

River Ecosystem classification

The Agency uses the River Ecosystem Classification to establish long term targets for water quality. These RE objectives set standards relating to the chemical quality requirements for different aquatic ecosystems. The scheme is divided into different objective classes each containing chemical standards to protect certain water users, which are outlined in Table 2.6.

Table 2.6: River Ecosystem classes

Class	Description
RE1	Water of very good quality suitable for all fish species
RE2	Water of good quality suitable for all fish species
RE3	Water of fair quality suitable for high class coarse fish populations
RE4	Water of fair quality suitable for coarse fish populations
RE5	Water of poor quality which is likely to limit coarse fish populations
Unclassified	Water of bad quality in which fish are unlikely to be present, <u>or</u> insufficient data available by which to classify water.

In recent years problems of compliance with the RE classification have been due to reduced rainfall and low river flows, resulting in lower dilution rates for effluents discharged into the river.

The RE grades achieved within the Stour catchment in 1995-1997 are shown in Table 2.7, and in Map 8.

Table 2.7: RE grades achieved in the Stour catchment 1995-1997

Sample Point	RE target	RE Class	Failed Parameter	Reason for Failure
Newtown Road	2	3	BOD	urban -vulnerable to pollution
Westwell Road	2	3	BOD	to be investigated
Torrington Road	2	3	DO	low flow in summer
Aldington Road	2	3	DO	pollution from piggeries (now resolved)

Horton Priory Dyke	4	4	PASS	-
Littlebourne	1	2	DO	low flow in summer
Blue Bridge	2	3	DO	low flow in summer
Eastry	2	5	DO	low dilution for Eastry STW
Ham Bridge	2	3	DO	low dilution for Eastry STW
Hacklinge	2	2	PASS	-
New Cut Junction	2	3	BOD	to be investigated
Lenham STW	2	5	DO, BOD, NH3	low dilution for Lenham STW
Little Chart	2	3	BOD	farms inspected but intermittent pollution still occurs
Rippers Cross	2	2	PASS	-
Bucksford	2	2	PASS	-
Longport Bridge	3	4	DO	low flow in summer, poor dilution for Ashford STW
Wye Bridge	3	3	PASS	-
Godmersham	2	2	PASS	-
Shalmsford Street	1	2	BOD, NH3	agricultural remedial work undertaken
Horton	1	2	BOD	low dilution of paper mill discharge
Vauxhall Bridge	2	2	PASS	-
Blackmill Bridge	3	3	PASS	-
Whitemill Bridge	3	3	PASS	-
Bretts Bridge	2	2	PASS	-
Grove Ferry	2	3	NH3	low dilution for May Street Sewage Works
Stour Confluence	2	3	DO	low flow in summer
A257 Wingham	2	5	DO, NH3	low dilution for Dambridge effluent
Durlock	2	5	DO	low dilution for Dambridge effluent
Pencester Gardens	2	2	PASS	-
D/S Buckland Paper Mill	2	1	PASS	-
Kearsney	1	1	PASS	-

DO Dissolved Oxygen

BOD Biochemical Oxygen Demand

NH3 Ammonia

General Quality Assessment

The Agency routinely obtains chemical and biological data through its monitoring programmes. Periodic assessment is now undertaken by applying the General Quality Assessment Scheme (GQA), which provides a general measure of water quality and allows national comparisons. The assessment is based on water chemistry and the biological diversity of the watercourse

The chemistry GQA reflects the degree of pollution at the time of sampling and comprises six water quality grades which reflect different levels of pollution (A= Very Good to F= Very Bad). These grades are listed in Table 2.8.

Table 2.8: GQA chemical grading

Water Quality	Grade	Dissolved Oxygen (% saturation) 10-percentile	Biochemical Oxygen Demand (mg/l) 90-percentile	Ammonia (mgN/l) 90-percentile
Very Good	A	80	2.5	0.25
Good	B	70	4.0	0.6
Fairly Good	C	60	6.0	1.3
Fair	D	50	8.0	2.5
Poor	E	20	15.0	9.0
Bad	F*	<20	-	-

* Quality does not meet the requirements of Grade E for one or more of the determinands.

Using the GQA classification 43 km achieved Class C, 1.9 km achieved Class D and 12.1 km achieved Class E. All five stretches in the lower quality grades of Classes D and E were affected by low flows which reduced the dilution of sewage treatment works effluents. Low oxygen levels due to low, shallow flows were also a problem within the catchment. Three investigations of instances of high BOD concentrations are to be undertaken.

The Biology GQA assesses the health of river stretches through the diversity of macro-invertebrates that live on the river bed. This provides a longer term picture of river health and the best overall guidance to the health of the river ecosystem. The biological water quality is based upon the diversity and abundance of particular species of macro-invertebrates. Biological grades are assigned to rivers based on values of Ecological Quality Index (EQI). EQI is a ratio which is calculated by expressing biological quality as a fraction of the predicted biological quality that would be found in a clean river. The biology GQA applies a water quality grading scheme comprising of six grades, which are shown in Table 2.9.

Table 2.9: Biology GQA grades

Grade	Outline Description
a - very good	Biology similar to (or better than) that expected for an average and unpolluted river of this size, type and location. High diversity of Families, usually with several species in each. Rare to find dominance of any one Family.
b - good	Biology falls a little short of that expected for an unpolluted river. Small reduction in the number of Families that are sensitive to pollution. Moderate increase in the number of individuals in the Families that tolerate pollution.
c - fairly good	Biology worse than expected for an unpolluted river. Many sensitive Families absent, or number of individuals reduced. Marked rise in the number of individuals in Families that tolerate pollution.
d - Fair	Biology shows big differences from that expected for an unpolluted river. Sensitive Families scarce and contain only small numbers of individuals. A range of pollution tolerant Families present, some with high numbers of individuals.
e - Poor	Biology restricted to pollution tolerant species with some families dominant in terms of the number of individuals. Sensitive Families rare or absent.
f - Bad	Biology limited to a small number of very tolerant Families such as worms, midge larvae, leaches and water hoglouse, present in very high numbers. In the worst cases there may be no life present in the river.

The majority of sites in the Stour catchment were classified as of good biological quality under the GQA scheme, with a few stretches classified as very good. The stretches of river with the poorest biological quality were classified as fair, with no stretches classified as poor or bad.

Twenty three sites are monitored on a biannual basis for biological quality. Every five years all sites are surveyed as part of the GQA suite of sites. A report covering all of the sites is produced every two years.

The GQA monitoring points in the Stour catchment, and the Grades achieved for both chemical and biological GQA schemes, are shown in Table 2.10, and on Map 7.

Table 2.10: Chemical and Biological GQA classifications achieved 1995-1997

Sample Point	GQA Chemical	GQA Biological
Newtown Road	C	b
Westwell Road	C	b
Torrington Road	C	a
Aldington Road	C	b
Horton Priory Dyke	C	b
Littlebourne	B	b
Blue Bridge	C	b
Eastry	E	d
Ham Bridge	C	c
Hacklinge	B	c
New Cut Junction	C	b
Lenham STW	E	d
Little Chart	C	b
Rippers Cross	B	a
Bucksford	B	a
Longport Bridge	D	c
Wye Bridge	C	b
Godmersham	B	a
Shalmsford Street	B	b
Horton	B	b
Vauxhall Bridge	B	a
Blackmill Bridge	C	b
Whitemill Bridge	C	b
Bretts Bridge	B	b
Grove Ferry	C	b
Stour Confluence	C	b
A257 Wingham	E	c
Durlock	E	c
Pencester Gardens	B	b
D/S Buckland Paper Mill	A	c
Kearsney	A	b

2.4.8 Water resources, objectives and standards

Water abstraction licensing

The principal mechanism for managing water resources is through the abstraction licensing system which attempts to balance the competing demands on water resources, and the needs of the environment.

Holders of abstraction licences are visited periodically to ensure that they understand and comply with the terms and conditions of their licences. No data are available for abstraction licence compliance, but it was not raised as an issue by the Agency.

There is a general presumption against the grant of licences for abstraction from the chalk for consumptive uses. This would normally include public supply and spray irrigation schemes.

Drought Orders and Drought Permits

At times of extreme water shortage, water companies may apply to the DETR for a Drought Order to relax abstraction licence conditions and/or the level of service that they are required to provide to their customers. The Agency can also apply for Drought Orders in order to reduce abstraction to conserve water resources and protect the environment.

In 1997, as a result of more recent continuing dry weather, the Government required water companies to prepare drought contingency plans. The Agency also provides guidance on framing Drought Orders in terms that would be acceptable from the stand-point of water conservation and environmental protection. For example, short periods of river abstraction at rates greater than normal may be permitted during winter months if this would result in reduced dependence on the more drought sensitive ground water resource in the following summer period of peak demand.

Unfortunately, the Stour catchment, with its heavy emphasis on groundwater and lack of available storage, offers few opportunities for this form of conjunctive management. (Issues No. 1 and 3).

Environment Agency National and Regional Water Resources Strategies

These strategies are directed towards the objectives of securing a sustainable balance between water use and environmental requirements, and achieving a progressive enhancement of the water environment.

Further to the water management strategy guidance produced by the previous Government in 1996, *Water Resources and Supply: Agenda for Action*, the Labour Government produced a ten point action plan in 1997. The actions included a review of water charging systems, new regulations to improve water efficiency, and the setting of mandatory targets on water company leakage.

The 1997 update of the water resources strategy for the Southern Region, *Sustaining our Resources*, concluded that there was little significant change in the distribution of resources across the Southern Region since 1994, but that the overall surplus was likely to have declined due to an increase in demand.

National programme for the Alleviation of Low Flows (ALF)

The 1991 NRA investigation of rivers and wetlands suffering from low flows due to over-abstraction identified two low flow rivers in the Stour catchment, namely the Little Stour and the Dour. Progress has since been made on identifying and implementing solutions. Low flow alleviation schemes are in progress on the Little Stour centred on Wickhambreaux, and further schemes are planned for both the Little Stour and the Dour.

Other groups, including English Nature and Biodiversity Challenge, have since investigated the ecological effects of over-abstraction and have identified additional sites affected by or at risk from over-abstraction. Those identified within the Stour catchment are Hothfield Common and Preston Marshes. (Issue No. 3).

2.4.9 Fisheries

The Agency has a statutory duty to maintain, improve and develop fisheries. However, there are few targets against which fishery performance is evaluated and the level of current information regarding fish stocks is insufficient to provide an adequate baseline for assessment.

2.4.10 Recreation

Under the Environment Act 1995 the Agency is required, where desirable, to promote the recreational use of all inland waters and associated land. It is also a duty of the Agency to preserve public access to places of natural beauty and to make the best possible recreational use of land and water under Agency control.

The consultation draft of the Water Related Recreational Strategy for the Southern Region was published in 1997. This was produced jointly by the Environment Agency and English Sports Council with the aim of promoting good practice in the planning and management of water related recreation. Whilst there are no specific targets or objectives for recreation within the Stour catchment, the recommendation made in the strategy for increasing recreational provision, particularly in relation to water based recreation, should be pursued.

For information regarding the general provision of recreational sites and facilities in the Stour catchment, see section 2.2.7.

2.4.11 Biological populations, communities and biodiversity

With regard to the conservation of biodiversity the Agency has a number of duties under the Environment Act 1995. Primarily, the Agency has responsibility under the following:

EU Habitats Directive 1992 and EU Habitats Regulations 1994

Phase one of the Habitats Directive Review of Existing Authorisations has now been completed for the Stour catchment, which required the identification of licences, consents and authorisations which need further work in order to establish whether any adverse impact has resulted or is likely to result.

The Environment Agency is currently awaiting national guidance as to how to proceed with the next stage of the implementation of this aspect of the Habitats Directive.

Other policies which have an impact on the environment and conservation could now be reviewed in the light of the increased emphasis on conservation objectives. For example, the Stour Marshes (Green Line) Policy, which is concerned with the abstraction of water from the Stour Marshes, was last amended in 1992 and could be reviewed in order to integrate conservation objectives more fully.

Biodiversity Action Plans (BAPs)

In 1994 Biodiversity: The UK Action Plan was published in response to commitments made at the 1992 Convention on Biological Diversity which was signed at the Earth Summit in Rio. In addition to action plans produced for priority species and habitats, local Biodiversity Action Plans (BAPs) have been identified as a key mechanism for delivering the UK national biodiversity strategy. Whilst they have no statutory power, local BAPs provide a means by which local people can become involved in the protection of habitats and species.

Details of priority species and habitats and the actions proposed to protect them can be found in both the Kent BAP and the Kent Area LEAP. The Agency is considering a catchment BAP to provide a focus for the protection of aquatic and riparian species on the Stour.

The Kent Biodiversity Action Plan, produced in 1997, outlines both the threats to specific species within the Kent area, and the objectives and targets established by the Environment Agency, and other organisations such as English Nature, to protect them. Information regarding the location of key habitats and species, and the protection afforded to them by different legislative acts, are given in sections 2.3.3 and 2.3.4. The extent to which targets and objectives for Kent BAP habitats and species are being met in the Stour catchment are outlined below.

Habitats

With regard to rivers and streams, the Environment Agency is the lead Agency under the Kent BAP. A fisheries strategy and a River Catchment Management Plan have been produced for the Stour catchment. Water Level Management Plans have been completed for the SSSIs at Stodmarsh, Sandwich Bay, Preston Marshes and Hacklinge Marshes.

Two measures have been identified to protect and enhance remaining areas of grazing marsh. English Nature and Kent County Council are to review the status of the remaining marsh areas in the light of the North Kent Marshes survey and the report on the Romney Marsh Level with a view to identifying priorities for action. Canterbury City Council and Thanet District Council are to establish the extent of interest in areas such as the Chislet Marshes and the Ash Levels and to prepare an action plan.

Monitoring and research were recommended in the Kent BAP with reference to reedbeds. The extent of reedbed in Kent and potential sites for reed bed creation are to be reviewed using aerial photography; and the use of reedbeds as an option for effective and environmentally sensitive water treatment systems is to be investigated where this does not compromise their nature conservation importance.

The Agency has suggested that wetland habitats such as reedbeds and grazing marsh could provide additional winter water storage, thus enhancing water storage and conservation.

One of the most significant impacts on standing waters is pollution caused by fertiliser and pesticide run-off from surrounding agricultural land. The Agency aims to provide advice to landowners on measures to minimise pollution and to promote good practice in relation to agriculture.

No specific actions have been established for the Agency within the LEAP area for intertidal mud and sand flats, salt marsh, sand dunes or marine habitats. Actions specified by the Kent or National BAP are to be undertaken by other agencies or organisations, such as English Nature and Kent Wildlife Trust.

Species

A detailed survey is proposed to establish the distribution and status of water vole and mink populations every five years, including a project on the two species' coexistence at Stodmarsh Nature Reserve.

The Kent BAP specified that targets for the conservation of the otter should be included in catchment LEAPs, especially in the Stour catchment where there is a small residual population. A ten year target to increase the number of otters, and a two year target to provide management advice to all riverside owners have been set for the Stour catchment.

The Kentish Stour Countryside Project, and the South Eastern Otters and Rivers Project (SEORP) have also been highlighted as playing a role in the future status of otter populations in the catchment, with suggested actions to liaise with mink hunters to ensure otter safety and to minimise habitat damage. The Otters and Rivers Project is entirely funded by the Agency and is one of its key actions to fulfil its obligations. An otter survey for the catchment is currently under production.

Three principal actions have been proposed for the Agency to enhance the status of the white-clawed crayfish in the Stour catchment. The first of these is the protection of aquatic habitats through the role of the Agency to provide comments on planning applications and authorisations. Such comments can include the Agency's opposition to development proposals in the absence of provision for damage mitigation. Secondly, the Agency should provide advice to landowners, anglers and the general public regarding the conservation and management of crayfish populations. Further, surveys of the species are also recommended on the Stour in order to identify key crayfish sites.

Due to the presence of the shining ram's-horn snail in the Stour catchment a number of specific measures have been proposed to protect and enhance existing populations:

- site specific plans should be developed to safeguard all sites where the species is present, or is likely to recover or recolonise;
- a ditch management cycle should be established that allows the recolonisation of cleared stretches from adjacent, but otherwise uncleared sections;
- all site owners should be educated regarding the presence of the species and the need to implement ditch management strategies to ensure its survival;
- surveys should be undertaken of all historic locations to discover if populations are still present.

The Agency is currently producing guidelines on managing sites for the benefit of the marsh warbler.

2.5 HEALTH OF THE ENVIRONMENT

2.5.1 Introduction

Current practice employed for measuring the health of the environment has been addressed in the Kent Area LEAP, and includes techniques such as ecotoxicology as well the traditionally used dissolved oxygen assessments. Those issues which are of key note to the health of the Stour catchment are highlighted below.

2.5.2 Water

The 1996 Agency biology survey identified eutrophication at Wye in the Stour, downstream of Ashford, with extensive growth of filamentous algae. Agency biological surveys identified that the area is subject to nutrient enrichment from agriculture and sewage works. Reduced river flow, resulting from groundwater abstraction and drought conditions, may exacerbate problems of algal growth by reducing the dilution capacity of the watercourses. (Issue No. 9).

Sandwich and Hacklinge SPA report a decline in pollution by sewage discharge but also a decline in bird attendance, which has been remarked upon by the RSPB. The Agency's approach is that eutrophication supporting high levels of species should not be tolerated even if the reversal of pollution reduces the species variety.

2.5.3 Indicator species

Indicator species are those which, when present, are indicative of certain parameters. These can include water quality, geology, or a particular type of habitat.

Otters are indicative of a high quality riverine environment because they rely exclusively on fish as a food resource and require good quality riparian habitat for "lying up". The species has already been surveyed and recorded and is found in only small numbers in the Stour catchment. The water vole is also an indicator of good quality riparian habitat, and this species is widespread, although not numerous, throughout the catchment.

2.5.4 Invasive species

Invasive species are introduced non-native species which threaten native plants and animals either through competition for space and resources, or through direct predation. A number of invasive species are listed on Schedule 9 of the Wildlife and Countryside Act 1981, and it is an offence to allow their spread.

It has been noted that growing numbers of fish are being introduced from abroad, with subsequent problems of altered communities and the introduction of diseases.

Several invasive plant species are commonly found on river banks. They are giant hogweed (*Heracleum mantegazzianum*), Japanese knotweed (*Fallopia japonica*), and Himalayan balsam (*Impatiens glandulifera*). No surveys of these species have yet been conducted. The Agency does not perceive there to be a problem with the presence of giant hogweed due to its virtual absence, although the Japanese knotweed is more prevalent. (Issue No. 6).

A number of invasive animal species occur in the Stour catchment including Chinese mitten crabs and the signal crayfish. Reports have been received of large numbers of mitten crabs inhabiting the Polders at Sandwich. A distribution survey of the mitten crab is conducted on a biennial basis, and is due again in 1999. Signal crayfish represent a risk of infection of the "crayfish plague" to native crayfish as well as competition.

Mink cause particular problems in the Stour catchment due to their predation on water vole, a BAP species which is already preyed upon by stoats, cats, barn owls, and other species. The mink is very effective at overcoming the escape strategies of the water vole, and this invasive species is strongly implicated in the decline of the water vole.

2.6 LONG TERM REFERENCE SITES

As outlined in greater detail in the Kent Area LEAP, long term monitoring of the environment is necessary if sustainable development is to be achieved and if long term changes are to be detected.

Long term reference sites are employed to monitor to measure factors including air quality and environmental change.

The Environmental Change Network (ECN) is a long-term integrated monitoring network established in 1993 and managed by the Natural Environmental Research Council. Within the Stour catchment there are no monitoring points with regard to the National Environmental Change Network.

Air quality monitoring is conducted in the Stour catchment at Folkestone, Dover, Wingham, Thanet and Ashford.

2.7 AESTHETIC QUALITY OF THE ENVIRONMENT

2.7.1 Introduction

The preceding sections of this Environmental Overview have assessed the state of the environment of the Stour catchment from a series of technical viewpoints. However, the qualitative and aesthetic aspects of the environment are also important.

The links between the Agency's responsibilities and the aesthetic quality of the environment are often indirect, but an appreciation of people's perceptions of an important is an important aspect of the LEAP process. The aspects considered here are landscape quality and tranquillity, for which further background information can be found in the Kent Area LEAP.

2.7.2 Landscape quality

Although the Government's main advisor on landscape protection is the Countryside Commission, the Agency has a direct role in maintaining the appearance of landscape features, and the Agency maintains strong liaison with the Countryside Commission, local planning authorities and other interested groups.

Landscape assessment is the principal tool for assessing landscape character rather than quality. The landscape character areas of the Stour catchment range from chalk downland to woodland and marshes, and were outlined in section 2.2.2. Although the Stour marshes are valued for their ecological significance, they are not considered to be of high landscape quality. The North Downs, designated at the national level for their landscape quality, are considered to be a high quality landscape.

2.7.3 Tranquil areas

Development pressures have resulted in a decrease in the number and extent of areas considered to be tranquil ("unspoilt by urban influences") within the Stour catchment. The number of such areas has reduced since the 1960s, and North Kent in particular has suffered. The Ashford/M20 corridor has become a focus of activity but there remain significant parts of the Kent Downs and the High Weald areas which are regarded as tranquil. This is confirmed on the map of tranquil areas produced by the Council for the Protection of Rural England and the Countryside Commission.

3. SUMMARY OF ISSUES TO BE ADDRESSED

3.1 INTRODUCTION

This section provides a summary of the issues emerging from the Environmental Overview of the Kentish Stour LEAP area which have been carried forward in the Kentish Stour LEAP Consultation draft. The issues are grouped around the nine principal concerns of the Environment Agency outlined in *An Environmental Strategy for the Millennium and Beyond* (Environment Agency 1997).

3.2 SUMMARY OF ISSUES

Environment Agency Concern*	Issue
Addressing Climate Change	1. Climate change implications for the future balance of water resources in the Kentish Stour
	2. Flood defence provision and operation in the Stour catchment needs to be reviewed to address the increased flood risk due to the predicted effects of climate change
Improving Air Quality	No issues identified
Managing Water Resources	3. Deterioration in the balance of catchment water resources
	4. Need for a comprehensive drought contingency plan
	5. Need to promote good water resource conservation practice by making best use of marginal resources
Enhancing Biodiversity	6. Pressure on the Stour catchment biodiversity and how to achieve the Agency's biodiversity objectives
Managing Freshwater Fisheries	7. Changes in migratory fish populations
Delivering Integrated River-Basin Management	8. Impact of the operation of privately owned sluice gates
	9. Reduced river flow unable to sustain consented and unconsented discharges
	10. Difficulties in controlling pollution from non-consented discharges

Environment Agency Concern*	Issue
	11. Underprovision and regulation of recreational resources in the catchment
	12. Environmental stresses caused by land development pressures, particularly in the Ashford area
Conserving the Land	13. Awareness of contaminated sites to enable risks to be established when developing brownfield sites
Managing Waste	No issues identified
Regulating Major Industries	No issues identified

* From: An Environmental Strategy for the Millennium and Beyond (Environment Agency 1997)

APPENDIX 1: CONSULTATION UNDERTAKEN

In addition to extensive consultation with members of the Environment Agency, consultation was also undertaken with external consultees. These included the Local Authorities whose jurisdiction falls within the LEAP area, and various interest groups.

The following organisations were consulted during the preparation of this LEAP:

Ashford Borough Council*
Canterbury City Council*
Dover District Council*
English Nature (Kent)*
Farming and Rural Conservation Agency*
Folkestone and Dover Water Services Ltd
Kent County Council
Kentish Stour Countryside Project
Kentish Stour Internal Drainage Board*
Maidstone Borough Council
Mid Kent Water
Pfizer Ltd
Southern Water
Shepway District Council
Thanet District Council*
Whitecliffs Countryside Project*

* = Response received

Meetings were held with the following organisations:

Ashford Borough Council
Canterbury City Council
Dover District Council
English Nature (Kent)
Kent County Council
River Stour (Kent) Internal Drainage Board
Shepway District Council
Thanet District Council

APPENDIX 2: GLOSSARY

Abstraction	Removal of water from surface water or groundwater, usually by pumping.
Abstraction License	License issued by the Environment Agency under Section 38 of the Water Resources Act 1991 to permit water to be abstracted.
Aquifer	A layer of underground porous rock which contains water and allows water to flow through it.
Catchment	The total area of land which contributes surface water to a specified watercourse or water body.
Effective rainfall	The rain remaining as runoff after all losses by evaporation, interception and infiltration have been allowed for.
Environmentally Sensitive Area	An area defined by MAFF for which grant aid is available for appropriate agricultural and water/land management.
Flood plain	This includes all land adjacent to a watercourse over which water flows or would flow, but for flood defences, in times of flood.
Flytipping	The unregulated and, hence, illegal, dumping of waste.
Groundwater	Water which is contained in underground rocks (aquifers).
Heritage Coast	Stretches of the most undeveloped coastline, designated by the Countryside Commission, in order to protect and conserve the coast's vulnerable beauty, and enhance people's enjoyment of the coast without risking its conservation.
Internal Drainage Boards	Autonomous public bodies under the control of board members (including those elected by agricultural ratepayers and those nominated by Local Authorities), with responsibilities and powers for flood defence on ordinary watercourses (non-Main Rivers) under the Land Drainage Acts.

Main River	All watercourses are designated as either "Main River" (defined in maps held by the Environment Agency and MAFF) or ordinary watercourse ("non-Main River"). Main Rivers include all watercourses which contribute significantly to a catchment's drainage. The Agency has powers to carry out works to protect land and property from flooding by improving the drainage of Main Rivers only, under the Water Resources Act 1991.
Ordinary watercourse	All watercourses are designated as either "Main River" or ordinary watercourses. Ordinary watercourses are Non-main river, and although they are not deemed to contribute significantly to a catchment's drainage, they may be significant locally. Local authorities (and in some areas Internal Drainage Boards) have powers for flood defences on ordinary watercourses, and the Agency has a supervisory role.
Ramsar sites	Internationally important wetland sites adopted from the Ramsar Convention on Wetlands of International Importance especially as waterfowl habitats (1971) and ratified by the UK government in 1976.
Sea defences	Natural or man-made features protecting land below 5m AoD contour.
Site of Special Scientific Interest	A site given statutory designation and protection by English Nature because it is particularly important, on account of its nature conservation value under the Wildlife and Countryside Act 1981 as amended.
Special Area for Conservation	Internationally important nature conservation site designated under the EEC Habitats Directive.
Special Protection Areas	Internationally important nature conservation sites designated under the EEC Wild Birds Directive. All SPAs are also SSSIs.
Sustainable development	'Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs' (definition from World Commission on Environment and Development, 1987. Our Common Future - The Brundtland Report).

APPENDIX 3: ABBREVIATIONS

AMP	Asset Management Plan
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
AQMS	Air Quality Management System
AQR	Air Quality Review
AVM	Automatic Voice Message
BAP	Biodiversity Action Plan
CCIRG	Climate Change Impacts Review Group
CPRE	Council for the Protection of Rural England
CTRL	Channel Tunnel Rail Link
DETR	Department of the Environment, Transport and Regions
DoE	Department of the Environment
ECN	Environmental Change Network
EN	English Nature
EPA	Environmental Protection Act
EPS	Environmental Protection Statute
EU	European Union
FRCA	Farming and Rural Conservation Agency
FWAG	Farming and Wildlife Advisory Group
GQA	General Quality Assessment
IPC	Integrated Pollution Control
IDB	Internal Drainage Board
IRBM	Integrated River Basin Management
IUCN	International Union for the Conservation of Nature
KCC	Kent County Council
KWT	Kent Wildlife Trust
LA	Local Authority
LAAPC	Local Authority Air Pollution Control
LEAP	Local Environment Agency Plan
LNR	Local Nature Reserve
LPA	Local Planning Authority
MAFF	Ministry of Agriculture, Fisheries and Food
MRF	Minimum Residual Flows
NFU	National Farmers Union
NNR	National Nature Reserve
NRA	National Rivers Authority
NVZ	Nitrate Vulnerable Zones
OFWAT	Office of Water Services
PAGN	Project Appraisal Guidance Notes
PIR	Process Industries Regulation
RAC	Rivers Advisory Committee
RE	River Ecosystem
RQO	River Quality Objective
RSA	Radioactive Substances Act
RSPB	Royal Society for the Protection of Birds
RSR	Radioactive Substances Regulation
SAC	Special Area of Conservation

cSAC	candidate Special Area of Conservation
pSAC	possible Special Area of Conservation
SAM	Scheduled Ancient Monument
SEORP	South Eastern Otters & Rivers Project
SERSG	South East Region Strategy Group
SLA	Special Landscape Area
SMA	Sensitive Marine Area
SMP	Shoreline Management Plan
SNCI	Site of Nature Conservation Interest
SO ₂	Sulphur Dioxide
SPA	Special Protection Area
pSPA	potential Special Protection Area
SPZ	Source Protection Zones
SSSI	Site of Special Scientific Interest
STW	Sewage Treatment Works
UWWTD	EC Urban Waste Water Treatment Directive
WCMC	World Conservation Monitoring Centre
WLMP	Water Level Management Plan

APPENDIX 4: FURTHER INFORMATION

Further information may be obtained from the following publications which have been produced by the Environment Agency:

Sustaining Our Resources. Southern Region, Worthing. 1997

An Environmental Strategy for the Millennium and Beyond. Bristol. 1997

Policy and Practice for the Protection of Floodplains. Bristol. 1997

Viewpoints on the Environment. Bristol. 1997

Waste Minimisation and Waste Management, Bristol. 1997

The Agency's Contribution to Sustainable Development, Bristol. 1997

Water Related Recreation Strategy for the Southern Region. Consultation Draft. Southern Region/English Sports Council, Worthing. 1997

Environment Agency Corporate Plan 1998-99. Bristol. 1998

Saving Water: Taking Action. Bristol. 1998

Saving Water: On the Right Track. Bristol. 1998

Fishing in the South. Southern Region, Worthing.

Policy and Practice for the Protection of Groundwater. Bristol. 1998

Guidance for the Control of Invasive Plants near Watercourses, Bristol.

Action Plan for Land Quality, Bristol 1998.

An Action Plan for Recreation, Bristol 1998.

Money for nothing - your waste tips for free, Bristol 1998.

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