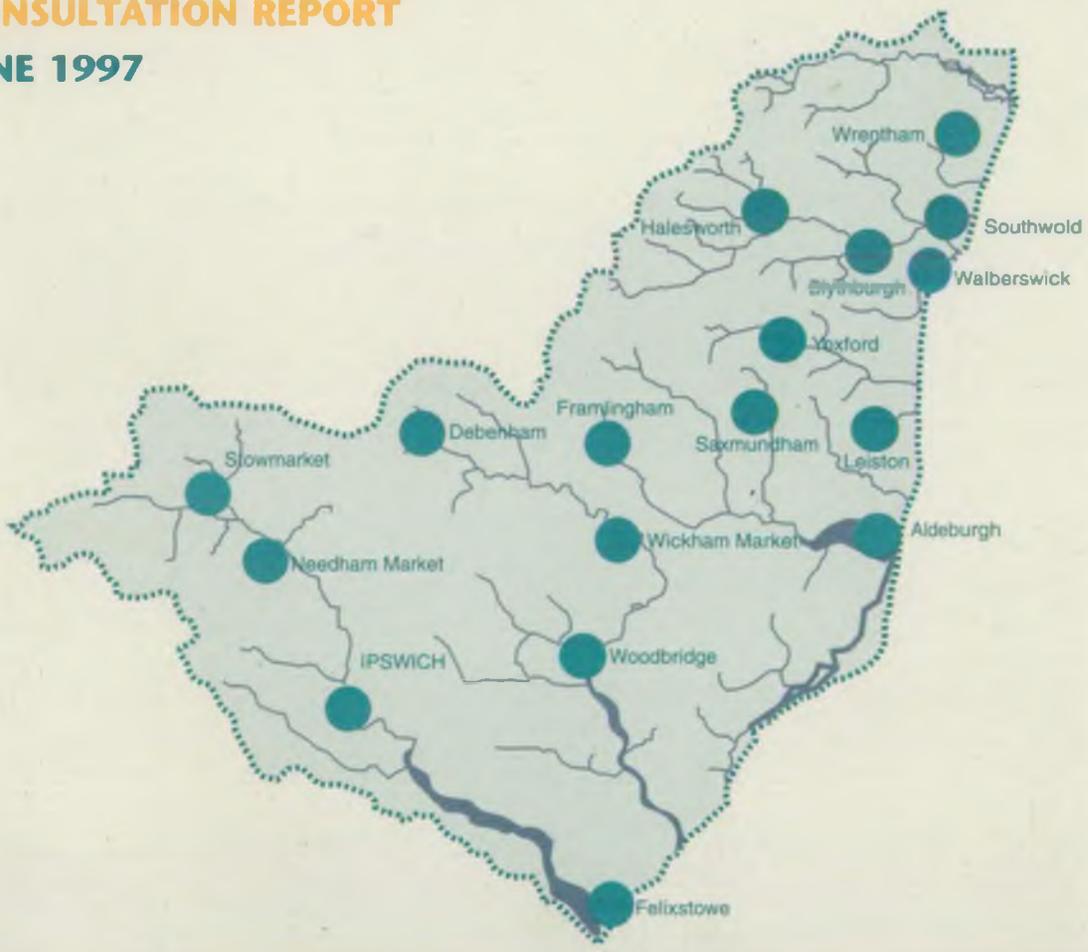




# local environment agency plan

## EAST SUFFOLK CONSULTATION REPORT JUNE 1997



ENVIRONMENT  
AGENCY

# key details

## General

Land Area	1,595 km <sup>2</sup>
Length of Coastline	78 km
Population	293,659 (Mid 1994)

## Main Towns and Populations (Estimates - Mid 1994)

Ipswich	116,130
Felixstowe	23,500
Stowmarket	13,360
Woodbridge	7,490
Leiston	5,500
Halesworth	4,430
Needham Market	4,380

## Administrative Details

County Council	Suffolk
Borough/District Councils	Ipswich BC Suffolk Coastal DC Mid-Suffolk DC Waveney DC Babergh DC St Edmundsbury BC
Environment Agency	Anglian Region, Eastern Area
Water Utilities	Anglian Water Services (AWS) and Essex & Suffolk Water (ESW)
Sewage Treatment Works	AWS: 76 Private: 34 (>10m <sup>3</sup> /day)
Significant Sewage Works	AWS: 27 (>250 people)
Industrial Discharges	Total: 43
Internal Drainage Boards	Lothingland, River Blyth, Minsmere, Upper Aide, Fromus Aide & Thorpeness, Middle Alde, River Deben (Upper), Lower Alde, Alderton, Hollesley & Bawdsey, River Deben (Lower) and River Gipping
Flood Defence Committees	Norfolk and Suffolk Flood Defence Committee

## Water Resources

There are a total of 692 licensed abstractions in the East Suffolk Plan area with 11 supplying water for Public Water Supply. A majority of the licences abstract from the groundwater resource.

There is no summer surface water available for development in the area. However there is limited winter surface water available in some locations. Nominal groundwater resources are potentially available in some locations, subject to a full environmental assessment.

## Integrated Pollution Control/Radioactive Substances

Integrated Pollution Control authorisations	15
Radioactive Substances authorisations	6

## Water Quality

Length (km) of River in General Quality Assessment classifications, 1995

CHEMICAL		BIOLOGICAL	
Class A	6	Class a	21.5
Class B	17.5	Class b	181.3
Class C	162.5	Class c	108.5
Class D	89.5	Class d	12
Class E	58	Class e	10
Class F	0	Class f	0

Length (km) of Estuary in Coastal and Estuarine Working Party Grades

Class A	58
Class B	6
Class C	9
Class D	0

## Waste Management

Number of licensed waste management facilities:

Landfill sites	17
Scrap yards	13
Waste transfer stations	8
Waste treatment (Treatment/Transfer stations)	2
Lagoons	2
Storage	1
(Lagoons/Storage)	1

## Flood Defence

Length of Designated Main River

Fluvial	470.1 km
Tidal	78.9 km

Length of Environment Agency

Maintained Sea Defences	38.7 km
-------------------------	---------

## Conservation

Numbers of:	
Sites of Special Scientific Interest	72
National Nature Reserves	4
Ramsar Sites	5
Special Protection Areas	5
Candidate Special Areas of Conservation	4
County Wildlife Sites (Total)	374
Water-Dependent CWS's	101
Scheduled Ancient Monuments	120

## Length of River in Each Fisheries Class

	Coarse	Trout	Total
Class A	20	0	20
Class B	38	8	46
Class C	0	8	8
Class D	8	0	8
Total	64	16	82

## Navigation

The Environment Agency, Anglian Region, does not have a statutory responsibility for Navigation within the East Suffolk Plan area.





# your views

This Plan is the basis for consultation between the Environment Agency and all those organisations with an interest in the East Suffolk Plan area. The Environment Agency would welcome your comments and ideas on the future management of this Plan area.

Please consider:

- **The Vision for the catchment.**
- **The Issues and Options Identified in the Report.**
- **Alternative Options for resolving identified Issues.**
- **Raising additional Issues not identified in the Report.**
- **Raising anything else you feel is important.**

*Any comments that are received will be treated as public information unless you specifically state otherwise in your response.*

All comments received on the Consultation Report will be considered in preparing the next phase, the Action Plan. The Consultation Report will not be rewritten as part of the Action Plan process. The purpose of the Plan is to stimulate thought, discussion and feedback, during the formal consultation period.

We intend that the Plan should influence the policies and action of our key partner organisations as well as assisting in the day to day management of the Plan area.

**Comments on the Consultation Report should be sent to:**

**Dr Jonathan Wortley  
Environment Agency  
Anglian Region  
Cobham Road  
Ipswich  
Suffolk  
IP3 9JE**

**All contributions should be made in writing by  
1 October 1997.**

If you or your organisation need further information or further copies of this Report, please contact Sarah Robson at the above address, or by telephone on:

(01473) 727712 Ext. 4044.

ENVIRONMENT AGENCY



128367

## **FOREWORD**

The Environment Agency is the major environmental organisation responsible for regulating waste disposal to land and industrial releases to the atmosphere and for safeguarding and improving the natural water environment. It is our overall aim to protect and enhance the environment, taken as a whole, in order to contribute to the world-wide environmental goal of sustainable development.

This Consultation Report is the first stage in the Local Environment Agency Plan (LEAP) process for the East Suffolk Plan area. The Plan identifies practical environmental issues and seeks to develop integrated and holistic strategies and actions to secure environmental improvement. Whilst the Plan will be a focus for the Environment Agency's actions, partnership, public participation and the involvement of business communities will be essential to secure success.

This Plan includes relevant information about the East Suffolk area and lists the issues that the Environment Agency have identified and which need to be addressed. We look forward to receiving comments and contributions from interested organisations and individuals. We also hope that this Plan will enable a wider public understanding and debate of environmental issues that are of local, national and global importance.

**Grainger Davies**  
Regional General Manager

## **THE VISION FOR THE EAST SUFFOLK PLAN AREA**

The Environment Agency's vision is to maintain a better environment in England and Wales for present and future generations. We will protect and improve the environment as a whole by effective regulation, by our own actions and by working with others. This vision will be achieved on a local scale by promoting sustainable development and working in partnership with other organisations and individuals to implement schemes that are of tangible benefit to the local environment.

The East Suffolk Plan area is predominantly rural in nature, although centres of significant industrial activity exist mainly in the southern half. The population is small, the coastal fringe is vulnerable to flooding and the small rivers are susceptible to environmental pressures. The majority of the low-lying coastal land is of national and international importance in terms of conservation and this is reflected in the high number of conservation designations. The coastal landscape value is protected through designation as an Area of Outstanding Natural Beauty (AONB) and as part of the Heritage Coast. Agriculture and its associated activities, in addition to prospective development within the Plan area, are both important for the maintenance and future of the local economy. However, they also provide a threat to the local environment. In particular, the demand on water resources within the catchment is significant.

The Environment Agency's challenge is to ensure the correct balance is struck between the many catchment uses and activities and the protection of the environment. This will be achieved by implementing prevention and control legislation to ensure that the impact of waste materials entering land, air and water (both surface and ground) is minimised. At the same time, water resources will be protected, effective flood defences will be provided and opportunities to improve recreation and conservation will be actively sought.

Over the next ten years our prime aims for the East Suffolk Plan area are to:

- seek opportunities to improve the conservation value of the area, particularly with respect to protecting wetland and coastal habitats and associated flora and fauna;
- provide effective flood defences, and where possible raise standards of protection, to maintain the integrity of the catchment's freshwater rivers and the coastal fringe, through the implementation of the Suffolk Shoreline Management Plan;
- manage water resources to achieve a proper balance between the needs of the environment and those of abstractors and other users. One important objective is to alleviate historical low flow problems associated with the freshwater River Deben by reviewing the nature of existing abstractions;
- protect areas of groundwater that are vulnerable to pollution;
- liaise with local authorities by contributing to the production of Local Air Quality Management Plans where required;
- provide effective regulation of industry, having regards to its needs while ensuring appropriate protection of the environment;

- develop and act on the National Waste Strategy and seek partnerships to encourage the reduction, reuse and recovery of waste in preference to disposal;
- maintain, develop and improve fisheries by meeting appropriate fisheries biomass target classes on freshwater rivers, and by the promotion of sound fisheries management policies on all still waters;
- maintain and improve water quality, particularly where water quality targets are not being achieved; and,
- interact with, listen and respond to the community and make a positive contribution towards sustainable development.

The Environment Agency will actively seek to reconcile the conflicting demands on the East Suffolk environment and target resources where they are most needed. This vision will be realised through establishing strong links with local communities, working together with conservation organisations, agriculture and industry and increasing public awareness of the need to protect our environment.

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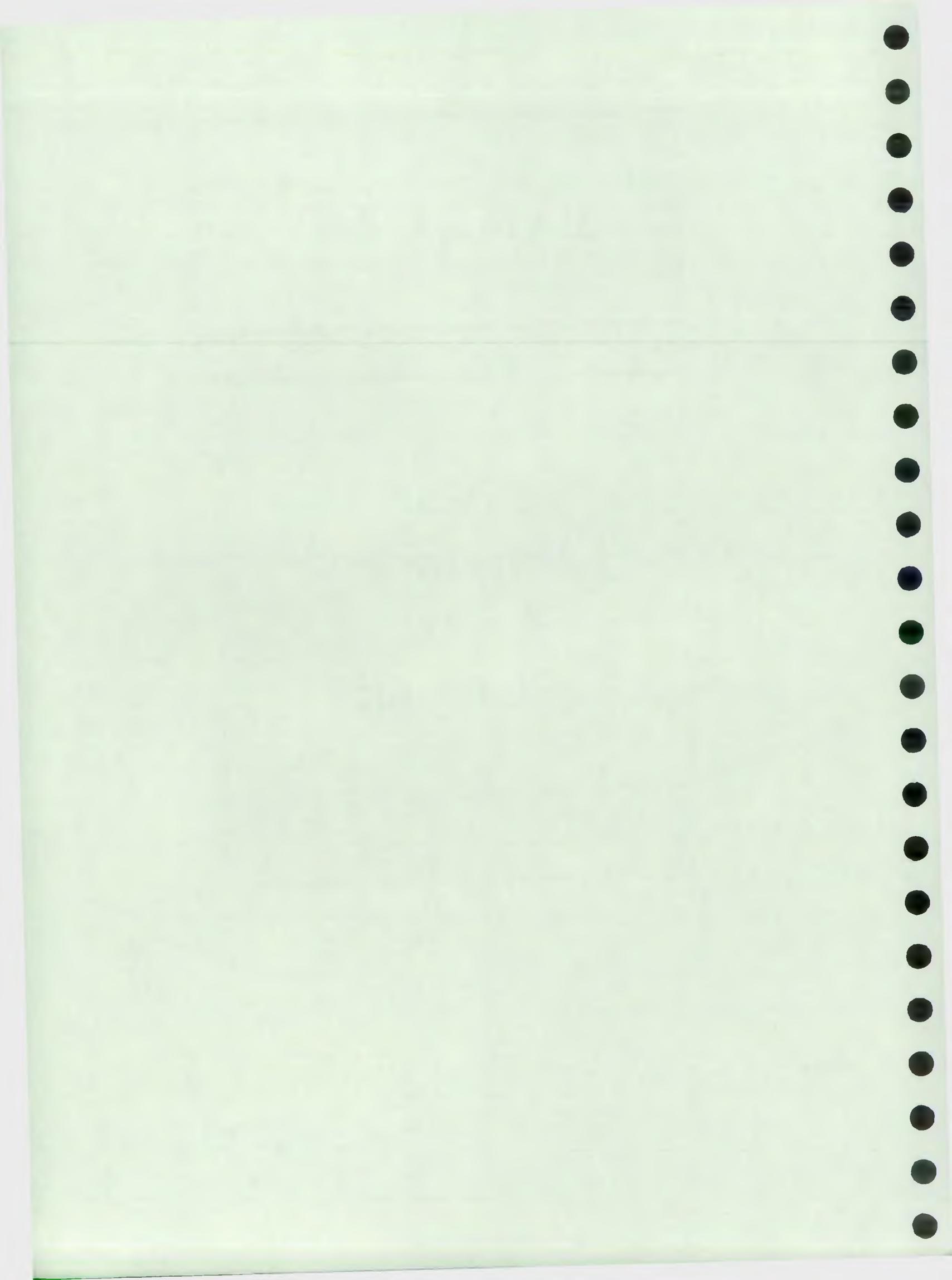
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# PART ONE

## Section One

# Local Environment Agency Planning

An introduction to the Environment Agency and  
the process of Local Environment Agency  
Planning.



## **1.1 The Environment Agency**

The Environment Agency is one of the most powerful environmental regulators in Europe. Our principal aim, as set out in the *Environment Act 1995*, is to protect and enhance the environment, taken as a whole, in order to play our part in attaining the objective of sustainable development.

### **1.1.1 Environment Agency Objectives**

The Environment Agency works towards sustainable development through seven objectives, set by Ministers:

- An integrated approach to environmental protection and enhancement, taking into consideration the impact on all activities and natural resources.
- Delivery of environmental goals without imposing disproportionate costs on industry or society as a whole.
- Clear and effective procedures for serving its customers, including the development of single points of contact within the Environment Agency.
- High professional standards, using the best possible information and analytical methods.
- Organisation of its own activities to reflect good environmental and management practice and provision of value for money for those who pay its charges, as well as for taxpayers as a whole.
- Provision of clear and readily available advice and information on its work.
- Development of a close and responsive relationship with the public, including Local Authorities, other representatives of local communities and regulated organisations.

### **1.1.2 The Environment Agency's Work**

The Environment Agency aims to conduct its environmental regulation duties in a proactive manner, whilst remaining an independent, impartial and firm regulator at all times.

It has responsibilities for:

- regulating over 2000 industrial processes with the greatest polluting potential, using the best available techniques not entailing excessive cost to prevent or minimise pollution;
- advising the Environment Secretary on the Government's National Air Strategy, and providing guidance to Local Authorities on their Air Quality Management Plans;
- regulating the disposal of radioactive waste at more than 8000 sites, including nuclear sites, and the keeping and use of radioactive material and the accumulation of radioactive waste at non-nuclear sites only;
- regulating the treatment and disposal of controlled waste, involving 8000 waste management sites and some 70,000 carriers so as to prevent pollution or harm to human health;
- implementing the Government's National Waste Management Strategy for England and Wales in its Waste Regulation Work;
- preserving and improving the quality of rivers, estuaries, groundwaters and coastal waters through its pollution control powers, including 100,000 water discharge consents and regulation of more than 60,000 sewage treatment works;
- action to conserve, re-distribute and augment to secure the proper use of water resources, including 50,000 licensed water abstractions;
- supervising all flood defence matters, involving over 43,000 kilometres of defence works;
- maintaining and improving salmon, trout, freshwater and eel fisheries, including the issue of some 1,000,000 angling licences;
- conserving the water environment, including areas of outstanding natural beauty or environmental sensitivity, extending to nearly four million hectares, and promoting its use for recreation where appropriate;
- maintaining and improving non-marine navigation, including the licensing of some 40,000 boats;

- regulating the management and remediation of contaminated land designated as 'special sites';
- providing independent and authoritative views on a wide range of environmental issues which may involve analysis and comment beyond the Environment Agency's specific regulatory remit;
- liaison with international counterparts and governments, particularly within the European Union, to help develop consistent environmental policies and action world wide; and,
- liaison with District Councils and County Councils to comment on planning applications of interest to the Environment Agency's work and provide positive input into Structure Plans and Local Plans.

## 1.2 The Local Environment Agency Plan Process

One of our corporate aims sets out our intention to maximise the benefits of integrated river basin management. Local Environment Agency Plans (LEAPs) are the mechanism to achieve this on a local scale. The LEAP process is a forward planning process which builds on Catchment Management Plans, developed by the former National Rivers Authority (NRA). We have taken the principal of Catchment Management Plans and developed LEAPs on a river catchment basis throughout England and Wales.

Local Environment Agency Plans integrate planning initiatives relevant to the Environment Agency's responsibilities within the geographical boundaries of a catchment. The Environment Agency also take a lead role in Shoreline Management Plans and Water Level Management Plans and works closely with external organisations on developing Plans such as Estuary Management Plans, Biodiversity Action Plans, Local Plans and Structure Plans. All of these inform and are influenced by the development of a particular LEAP.

The Local Environment Agency Planning process includes the production of a Consultation Report, a Statement of Consultation and an annually reviewed Action Plan. The Consultation Report describes a vision for each catchment, identifies issues and acts as a focus for consultation between us and other partners. Comments on this Report can be submitted between June and September 1997. Following consultation, the Statement of Consultation document identifies the main views expressed by all the consultees and our response to those views. In March 1998 the Environment Agency will produce an Action Plan with an agreed vision, strategy and detailed activity plans. Progress will be monitored and reported on annually, by means of an Annual Review. After five years,



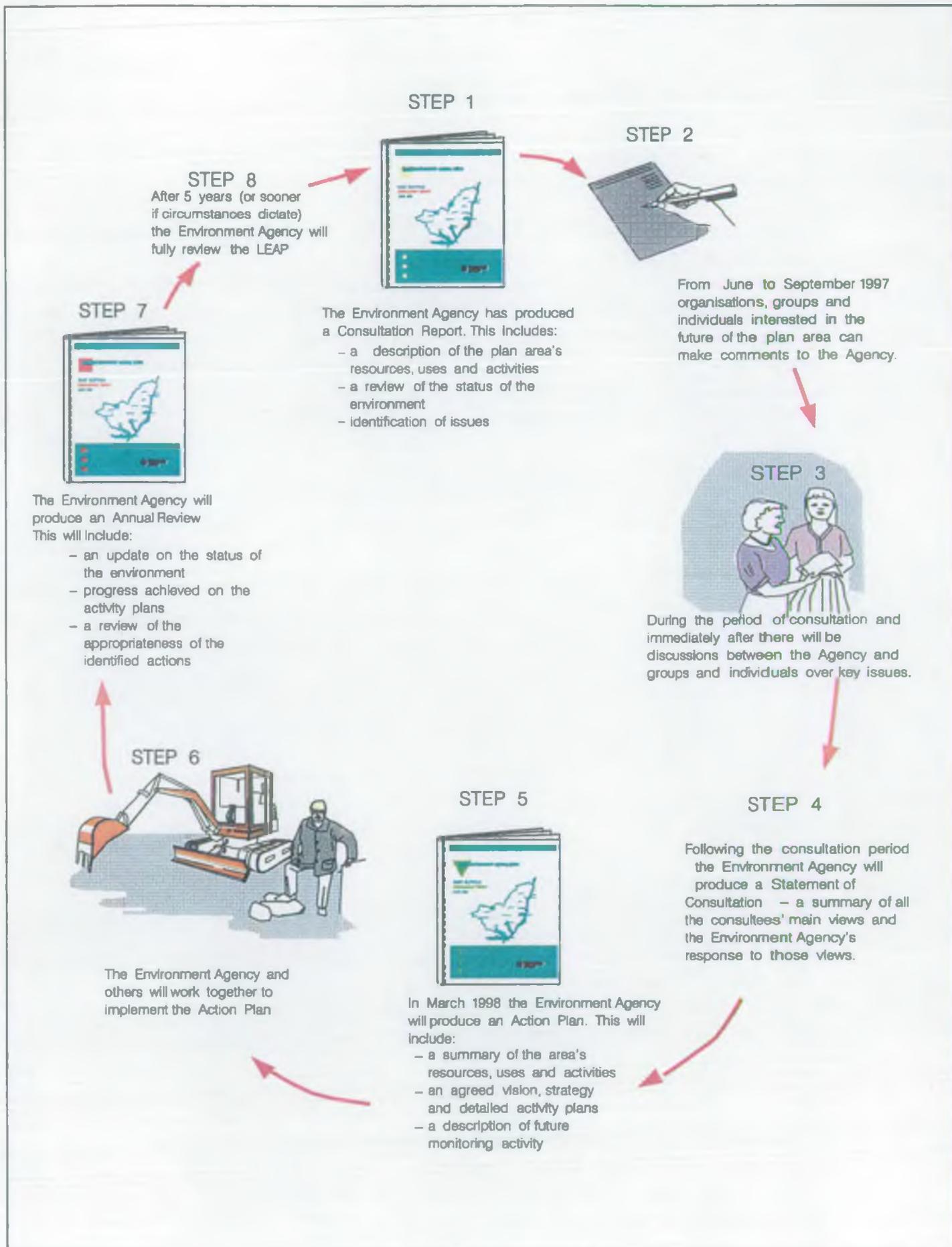


Figure 1: The Leap Process

or sooner if circumstance dictate, the Environment Agency will fully review the LEAP. For more detail of the LEAP process please refer to Figure 1.

The Norfolk and Suffolk Area Environment Group (AEG) have overseen the production of this Consultation Report. One of their many roles is to advise the Environment Agency and its statutory committees on proposals and priorities for LEAPs and advise and comment on LEAP Consultation Reports prior to public release. The independent members of this group each have particular environmental interests, but none are direct employees of the Environment Agency. The Group members are:-

**Mrs Sheila Ashford (Chairman)**

Ms Jane Madgwick  
Mr George Alderson  
Cllr Mrs Rita Carter  
Prof. John Lester  
Mr George Steele  
Cllr Ms Julie Craven  
Mr Mark Williams

Cllr Peter Baldwin  
Mr Richard Clements  
Ms Iris Webb  
Mr Paul Woodcock  
Mr David Ritchie  
Mr Colin Palmer  
Cllr Mrs Viv Mason  
Mr Anthony Duckworth-Chad

Mr John Brown  
Ms Janette Ward  
Mr Stan Alden  
Cllr Brian Morrey  
Mr Tony Preston  
Dr Ian Shepherd  
Mr Trevor Jolley

The National Rivers Authority (NRA) produced the Gipping/Stour Catchment Management Plan, the Consultation Report of which was published in February 1993 and the Action Plan in December 1993. This has consequently been reviewed twice. The most recent Annual Review was published in July 1996. This Catchment Management Plan concentrated on issues related to the water environment. Part of this area, including the Orwell estuary, the Gipping valley and the rivers tributaries, now form part of the East Suffolk LEAP Area, in addition to the river valleys and estuaries to the north.

The East Suffolk Plan is bordered by three other Local Environment Agency Plan areas, namely the Yare and North Essex catchments and the Ely Ouse catchment in our Central Area. Former Catchment Management Plans will be converted to LEAPs by the Environment Agency and it is envisaged that all LEAP Consultation Reports will be complete and in place by the end of 1999.

### 1.2.1 Partnerships and Local Environment Agency Plans

These Plans rely to a large extent on building and promoting partnerships. Where improvement works are required to overcome local issues, we aim to work with other

organisations and individuals to initiate joint funding opportunities. The Environment Agency often have no powers to directly control all identified actions and the other responsible parties may be companies who see little or no financial benefit in carrying out the actions. We therefore strive to build partnerships and encourage public participation, to increase awareness of environmental issues and promote a feeling of ownership.

The achievement of some objectives will also depend upon the planning policy of the County, Borough or District Councils. The Environment Agency is a statutory consultee to their policy formation, but we recognise that the Councils are subject to many other constraints, under the Town and Country Planning Act, and whilst striving to promote sustainability will not always be able to put environmental needs first. Land use within this Plan area is obviously a major contributor to the state of the environment. In area terms, by far the largest land use is agriculture. Where farming practice will need to change to permit environmental improvements it will be necessary to obtain the support of the landowners concerned and for them to make such changes voluntarily, where these are not a statutory requirement.

The achievement of some of the Plan objectives requires the agreement and cooperation of others but it is nevertheless essential that these objectives should still be set and pursued for. Alternative means of achieving them might be identified, or the simple identification and publication of objectives may bring about the necessary pressure to encourage those involved, either individually or collectively, to work towards their achievement.

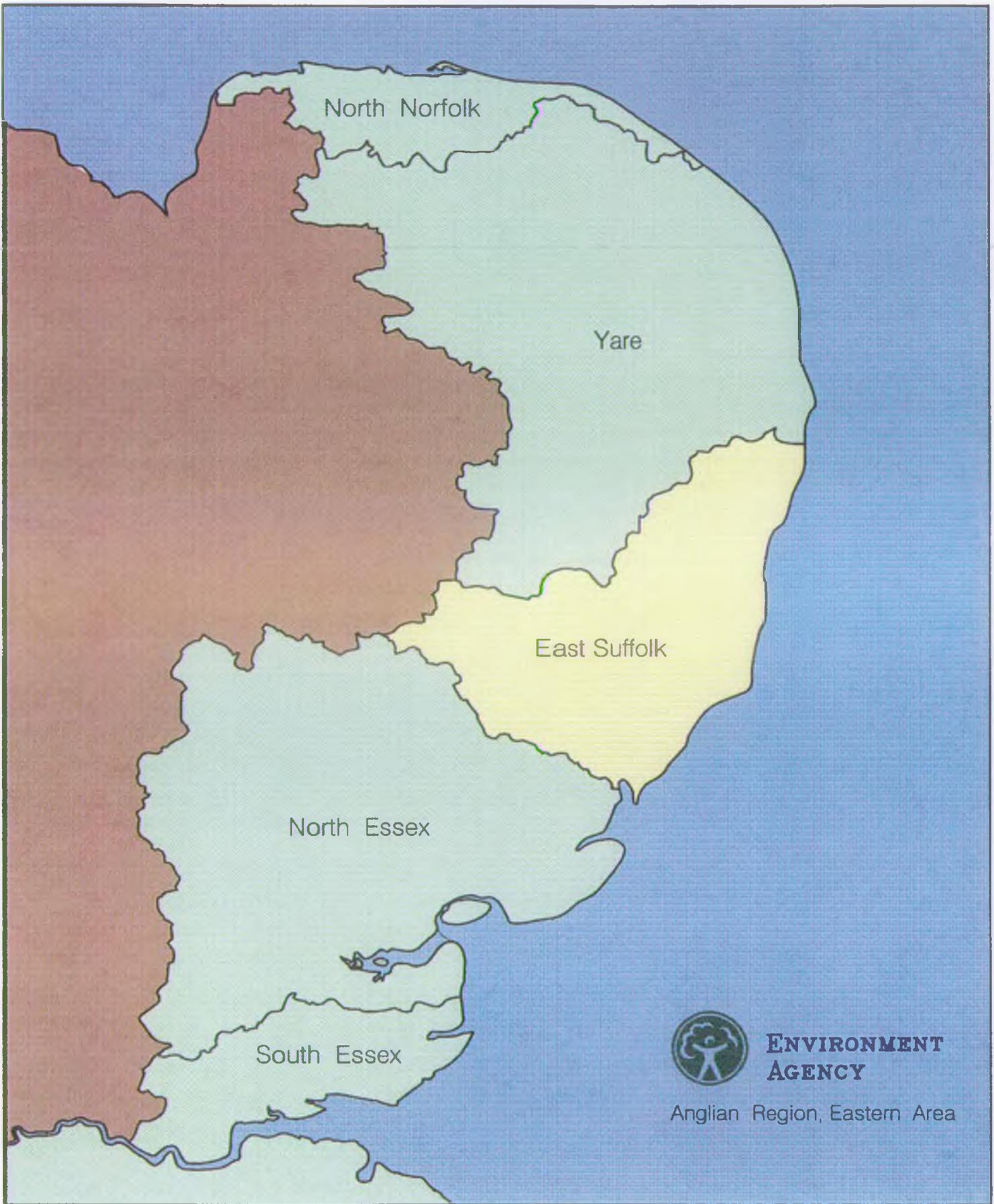
### 1.3 Sustainable Development

The Environment Agency's overall aim of protecting and enhancing the environment contributes to the Governments and the world-wide environmental goal of sustainable development, which has been defined as:

**“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland definition, Earth Summit, Rio de Janeiro, June 1992); and,**

**“Improving the quality of life while living within the carrying capacity of supporting ecosystems” (Caring for the Earth, World Conservation Union, UN Environmental Programme and World Wide Fund for Nature, 1991).**

These definitions of sustainable development recognise that it is the natural environment which provides the fundamental resources through which society meets its needs.



**ENVIRONMENT  
AGENCY**

Anglian Region, Eastern Area

Economic, social and environmental issues are intrinsically linked and all form part of a dynamic global system that is in constant metamorphosis. Since the natural environment is the context and source of all human activity, it follows that if this environment is not sustained, then ultimately there can be no society or economy. Economic and social development will be unable to take place if the global environment is destroyed or irreparably damaged.

The Environment Agency's vision statement requires economic and social activities within England and Wales to have due regard to potential environmental implications. Action, regulation, education and enforcement all have a part to play in working towards sustainable development by the Environment Agency and others. Integrated environmental management is a means by which the Environment Agency can promote sustainable development and LEAPs are the mechanism to achieve this at a local scale. The Environment Agency will make a positive contribution towards sustainable development to ensure that it is achieved on a local scale, by:

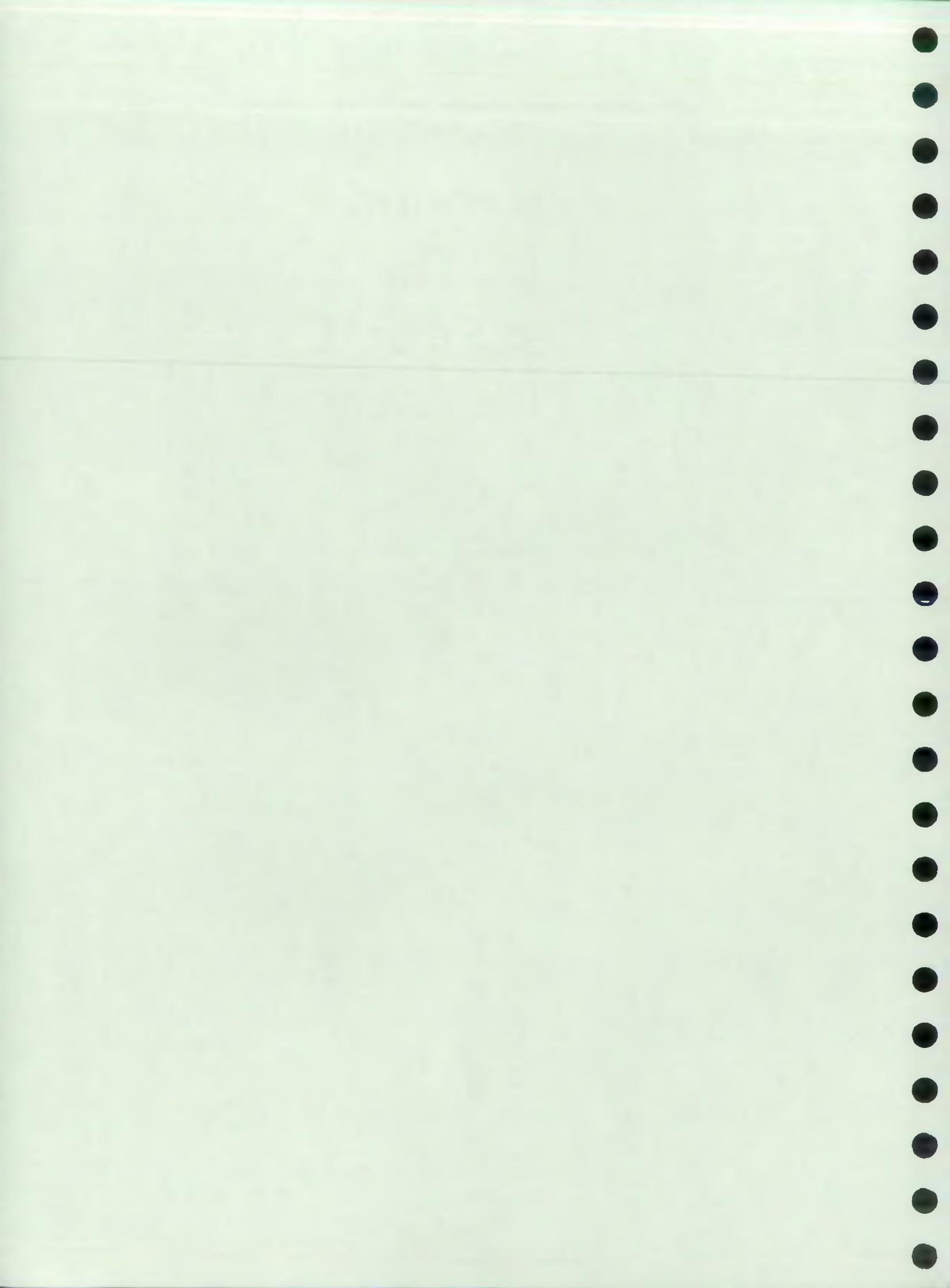
- taking an integrated approach that considers the environment as a whole;
- adopting a long-term perspective that has regard to the needs of future generations and which anticipates risk;
- basing its decisions on sound science;
- recognising that precautionary action may be necessary where uncertainty exists and the consequences appear likely to be irreversible or reversible only at high cost;
- seeking to maintain and enhance biodiversity and wildlife heritage through our actions;
- ensuring that our actions are appropriately assessed with regard to their likely costs and benefits, including costs to the environment;
- recognising the need for collaboration and co-operation with other bodies, regulated organisations and the public to ensure that necessary action is progressed;
- providing high quality information and advice which informs and enhances debate and decision-making processes;
- maximising the scope for cost-effective investment by business through improved technologies and management techniques;

- making a contribution to the protection of global atmosphere, having regard to the Government's commitments under the United Nations Framework Convention on Climate Change; and
- ensuring that our approach is relevant, proportionate, pragmatic and transparent, and using and developing general guidelines.

Section Two

Overview  
Of The  
East Suffolk  
Plan Area

This section gives a brief overview of the East Suffolk Plan area.



## 2.0 Overview of the East Suffolk Area

The Plan area includes a large section of eastern Suffolk and most of the county's coastline (a stretch of 78 km) from Kessingland to Felixstowe. The boundary is based on river catchments which include the valleys, tributaries and estuaries of the Rivers Gipping, Deben, Alde, Thorpeness Hundred, Yox, Blyth and Lothingland Hundred. Many of these rivers are small and typically rely on groundwater to sustain their flows during the summer months. Exceptionally low rainfall over recent years has resulted in naturally lower groundwater levels and river flows, but these rivers still maintain important habitats and wildlife.

Approximately 10,000 hectares of Suffolk are below sea level and effective sea defences are therefore essential to protect people, property and important wildlife habitats from the effects of tidal flooding. Types of coastal defence range from natural features such as low crumbling cliffs and shingle ridges to hard engineered structures such as seawalls. For centuries, this low-lying coastal fringe has been protected by seawalls, whilst tidal saltmarsh has been reclaimed from the sea to provide agricultural land.

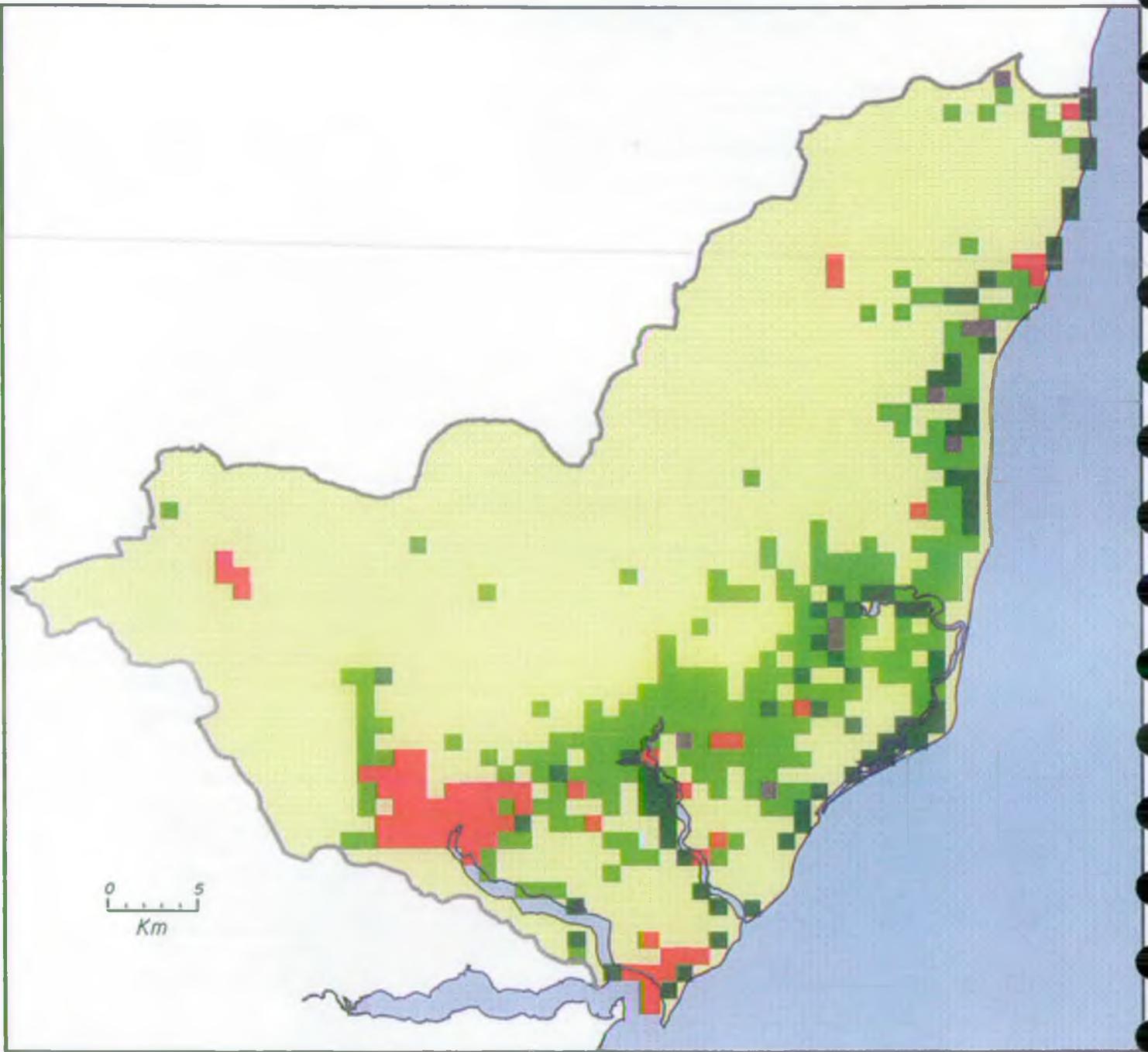
Suffolk has a long history of supporting a prosperous farming community and agriculture continues to be the predominant land use on nearly 80% of the land today. Arable cropping and livestock husbandry are the main farming activities within the Plan area. Although agriculture is the major industry in East Suffolk, other industries including nuclear power generation, manufacturing and chemical, are found in the area. The nuclear power stations located on the coast at Sizewell are the most high-profile installations, while the majority of the other industrial sites are found along the Gipping valley at Ipswich, Stowmarket and Felixstowe. The two ports in the Plan area are located at Felixstowe and Ipswich. Both ports provide container services to Europe and destinations around the world, with Felixstowe being the largest port of its type in the United Kingdom.

Tourism plays an important role within the Plan area and is a significant industry. The recreational and amenity potential of the region, especially linked with the coast, has long been recognised. The vast expanse of coastal habitats, the rural and unspoilt hinterland and the variety of recreational activities provide major attractions.

The area is rich in landscape and wildlife heritage and parts of the coast are of international importance for conservation. Within Suffolk some rich and varied wildlife has survived despite the changes that have occurred as a result of agriculture, forestry and increased urbanisation since the 1940's. Important semi-natural habitats include ancient woodland, unimproved grassland, heathlands, fens, mudflat and saltings. The diversity of habitats, the associated plant communities and the breeding and wintering bird populations are of international importance. As well as the geomorphological significance of the shingle structures of Orford Ness and Benacre Ness, they also support

# Predominant Land Cover

Map 2



0 5  
Km



ENVIRONMENT  
AGENCY

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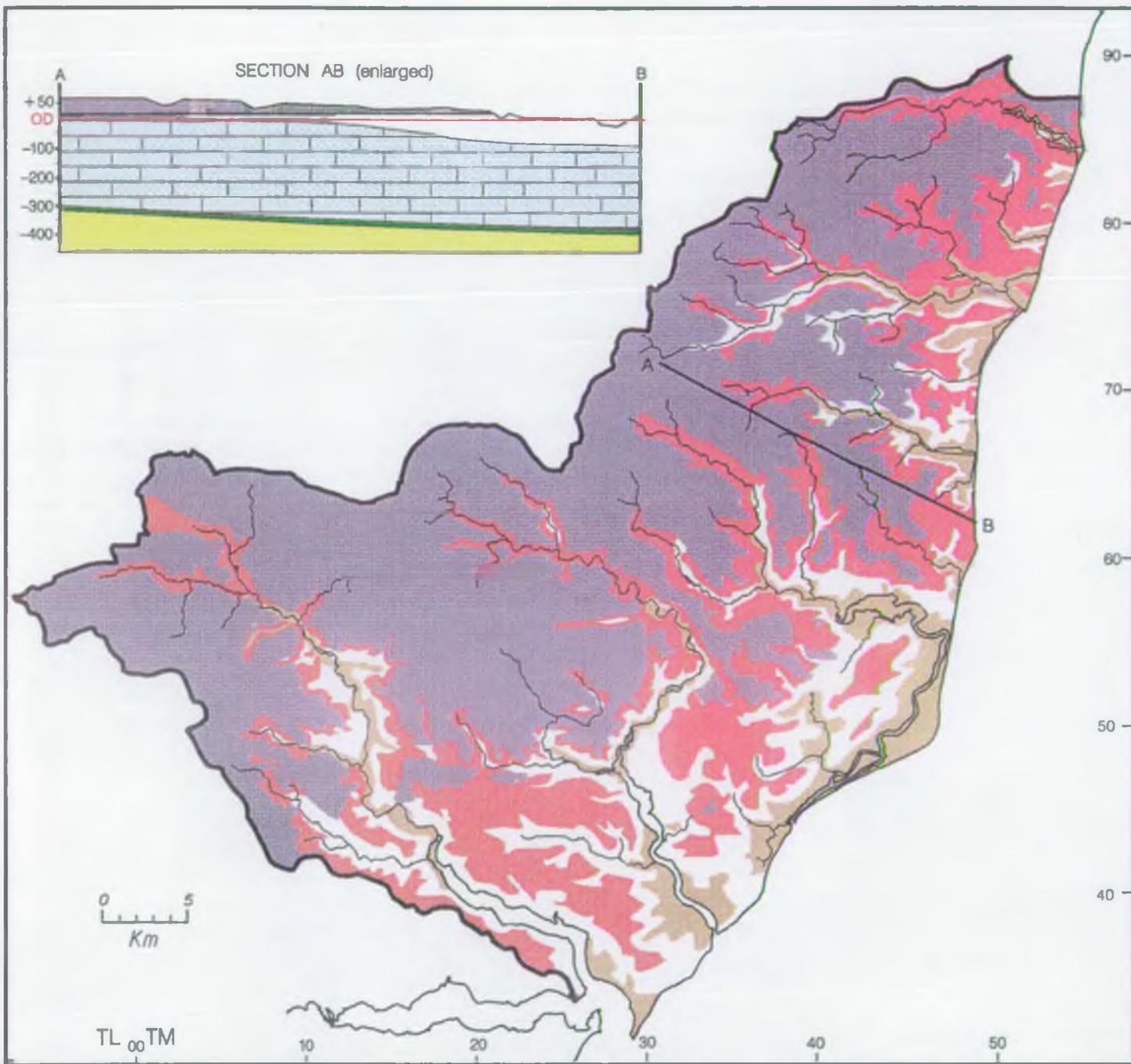
— Main River  
— Coastline  
— Catchment boundary

■ Grassland  
■ Moorland /heath  
■ Arable  
■ Urban /bare ground  
■ Woodland

June 1997

# Surface Geology

Map 3



**ENVIRONMENT  
AGENCY**

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June 1997

- MAP**
- Main River
  - Boulder Clay
  - Glacial Sand and Gravel
  - Alluvium
  - Crag

- SECTION**
- Ordnance datum level
  - Boulder Clay
  - Crag
  - Chalk
  - Lower Cretaceous
  - Lower/Middle Silurian

rare undisturbed plant communities and nationally important breeding bird populations.

Many of the river valleys and much of the coast is designated as part of the Suffolk River Valleys Environmentally Sensitive Area (ESA) which encourages landowners to manage their land by traditional methods, which can benefit wildlife and landscape conservation. The Plan area contains the majority of the Suffolk Coast and Heaths Area of Outstanding Natural Beauty and is also part of the Heritage Coast.

Woodland is an important habitat and landscape feature within east Suffolk. Forests at Rendlesham, Tunstall and Dunwich constitute large woodland expanses which are managed by the Forest Enterprise.

Important freshwater fisheries occur in rivers and lakes throughout the Plan area. These are dominated by coarse fish species, although trout are also found in a number of locations. Many of these fisheries are regularly exploited by anglers for recreational purposes. The popularity of angling as a sport ensures that there is always a great demand for both angling venues and facilities.

Activities within the Plan area create a mixture of household, commercial and industrial wastes, including 'Special Wastes' which are hazardous and are regulated under separate legislation. Landfill is the disposal method for the vast majority of waste that is produced. Active and closed landfill sites are located throughout the Plan area and are especially numerous within the Gipping valley and around Ipswich. Their location is strongly influenced by the geology of the land and many former mineral workings are utilised as landfill facilities.

The hydrogeology in this area is influenced by the relatively impermeable Eocene deposits of London Clay and the Woolwich and Reading Beds. The effective recharge to the aquifer and interflow to the rivers is influenced by the surface geology (see Map 3). To the west of the Eocene limit (see Map 4) the aquifer system is principally chalk overlain by Sands and Gravels, Boulder Clay and Crag. To the east of this limit the unconfined Crag aquifer overlays the Eocene which in turn confines the Chalk aquifer.

The Chalk and Crag aquifers are important to the overall area as they provide baseflow to rivers, as well as supporting significant abstractions for potable supply, industry and agriculture. Within the Glacial Sand and Gravel water is also used for local domestic supplies as well as some small scale agricultural activities. Chalk water levels vary from around +20 m AOD (Above Ordnance Datum) in the west to sea level in the east. The movement of Chalk water is therefore predominantly in an easterly direction towards the coast. Crag water levels vary from around +15 m AOD to sea level with the movement being dependent on the topography of the Eocene.

Although the Crag is considered to have a large storage capacity, the dry weather

conditions of 1996/97 have depleted the overall groundwater levels to such an extent that the Environment Agency is increasingly having to investigate many complaints of drought-related well failures. Water quality in both aquifers is predominantly good, although the Chalk water is characterised by high chloride levels to the east, while the Crag can have high levels of nitrate and iron.

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

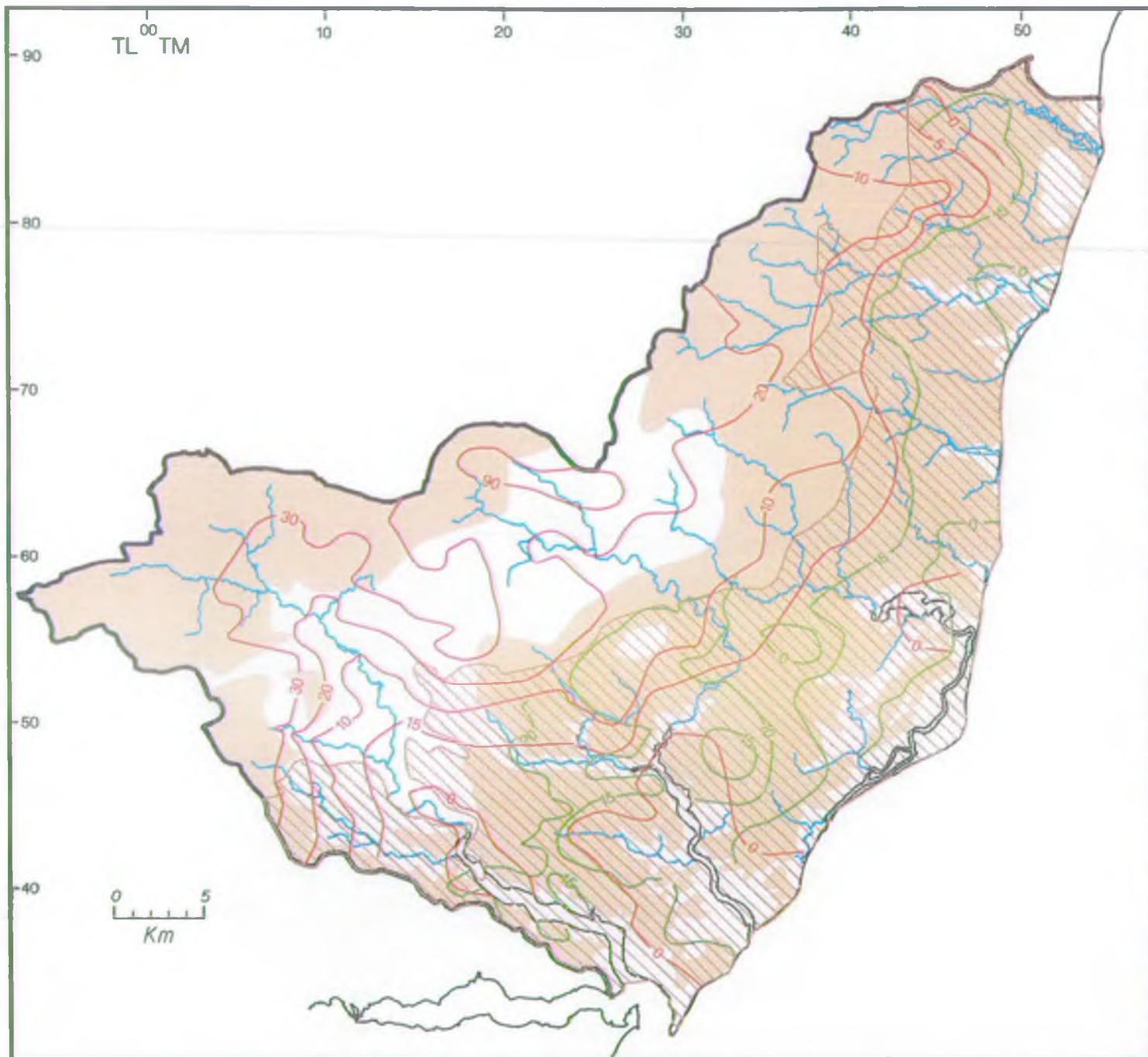
Water resources are critical in the East Suffolk Plan area, with no further surface water available for abstraction during the summer and only some summer surface water available for abstraction during the winter months, subject to an environmental assessment. There is nominal groundwater potentially available in two sections of the Plan area (the Blyth and Tidal Deben), but only where groundwater abstraction would not be detrimental to the water environment.

Water quality in the East Suffolk rivers has improved since 1990. The General Quality Assessment (GQA) surveys of 1990 and 1995 have shown that whilst a number of stretches have deteriorated (19%), a more significant number have improved (26%), indicating an overall improvement within the East Suffolk Plan area. A large proportion of water quality problems are related to low flows and low dissolved oxygen levels, but the overall improvement in water quality is linked to pollution prevention initiatives and increased investment in effluent treatment.

The East Suffolk Plan area lies wholly within the county of Suffolk, and embraces the administrative areas of Suffolk Coastal District Council, Ipswich Borough Council and parts of Babergh District Council, Mid-Suffolk District Council, Waveney District Council and St. Edmundsbury Borough Council. The built environment in Suffolk retains its own particular identity within the towns, villages and small hamlets. The population of the area has increased partly through natural change, but mainly through an excess of inward migration over outward migration, a statistic that is applicable to East Anglia generally. Net inward migration is expected to comprise the main component of population growth in Suffolk, although the volatile nature of migration and substantial variations from one year to the next suggest uncertainty as to future pressures. Ipswich forms the only large conurbation (population 116,000) within the Plan area, although the towns of Felixstowe (23,000) and Stowmarket (13,000) are also of considerable size. The remaining Plan area is characterised by small towns and villages often having special architectural, archaeological and historic interest.

# Solid Geology

Map 4



**ENVIRONMENT  
AGENCY**

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-  Main River
-  5 - Chalk contours 1976
-  5 - Crag contours 1976

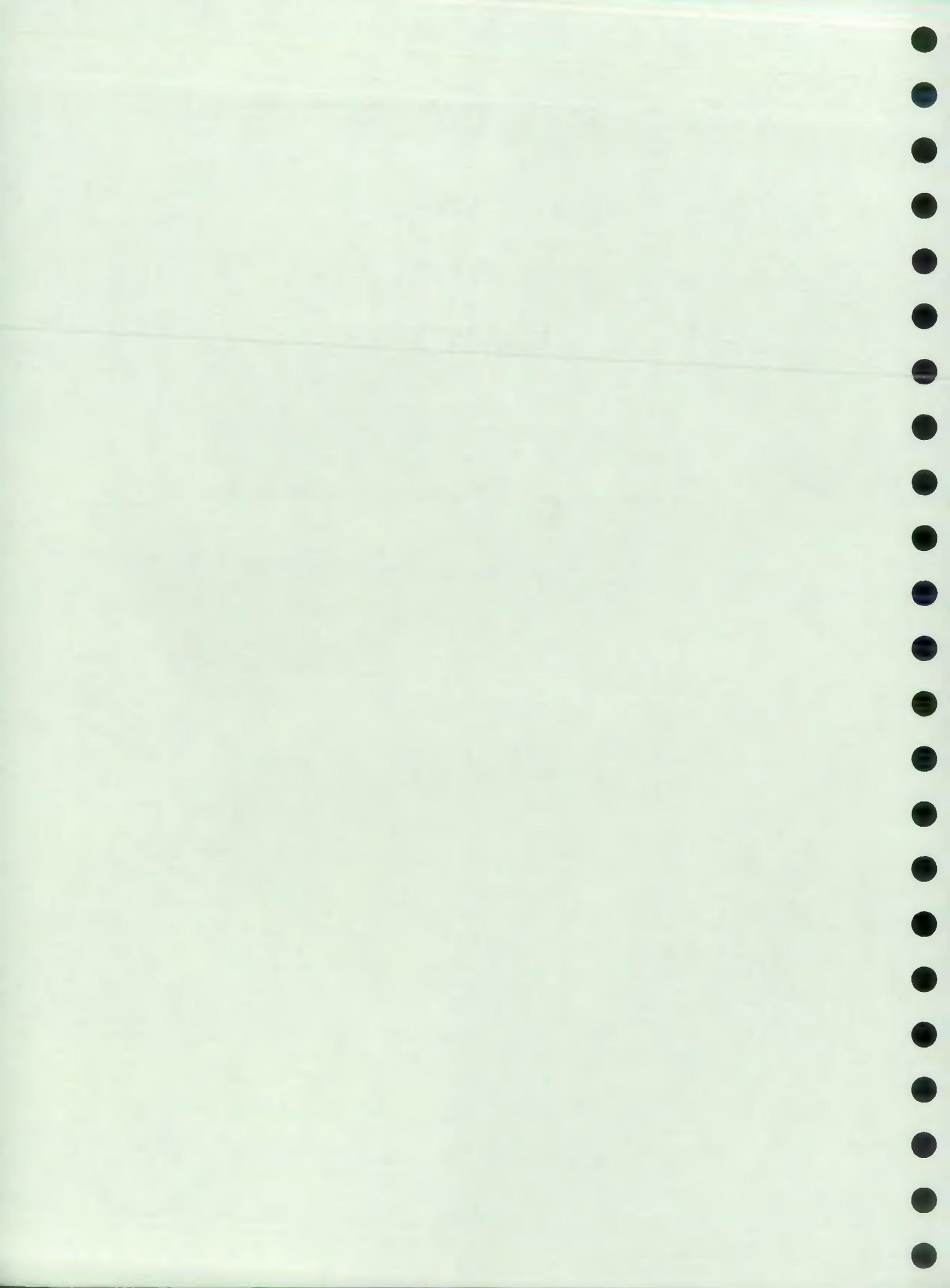
-  Chalk
-  Crag
-  Eocene

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Section Three

Issues  
And  
Options

This section details specific issues that have been identified in the Plan area and provides options for their resolution.



## A) ECOLOGICAL AND ENVIRONMENTAL NEEDS

**Issue A1: Impacts on the environment arising from land use in parts of the Sandlings area (see Map 5).**

### Background

The Sandlings is an area of East Suffolk stretching from the Deben to the Alde. London Clay does appear on the surface in a few places around the river estuaries but for the most part, the visible landscape of the Sandlings is formed by sands known as Craggs, laid down over a period of two million years, three and half million years ago. The light soil types of this area support heathland and woodland vegetation. Since the Second World War successful agricultural development has taken place, with root and market crops becoming dominant. The continued development of agriculture and forestry in part of the Sandlings area has, however, resulted in a number of impacts on the natural environment. Land use changes have continued and the repercussions for the aquatic environment should now be appraised, in an integrated manner, with interested parties from this area. The impact on the water environment should be considered for both groundwaters and surface waters:

### *Groundwaters*

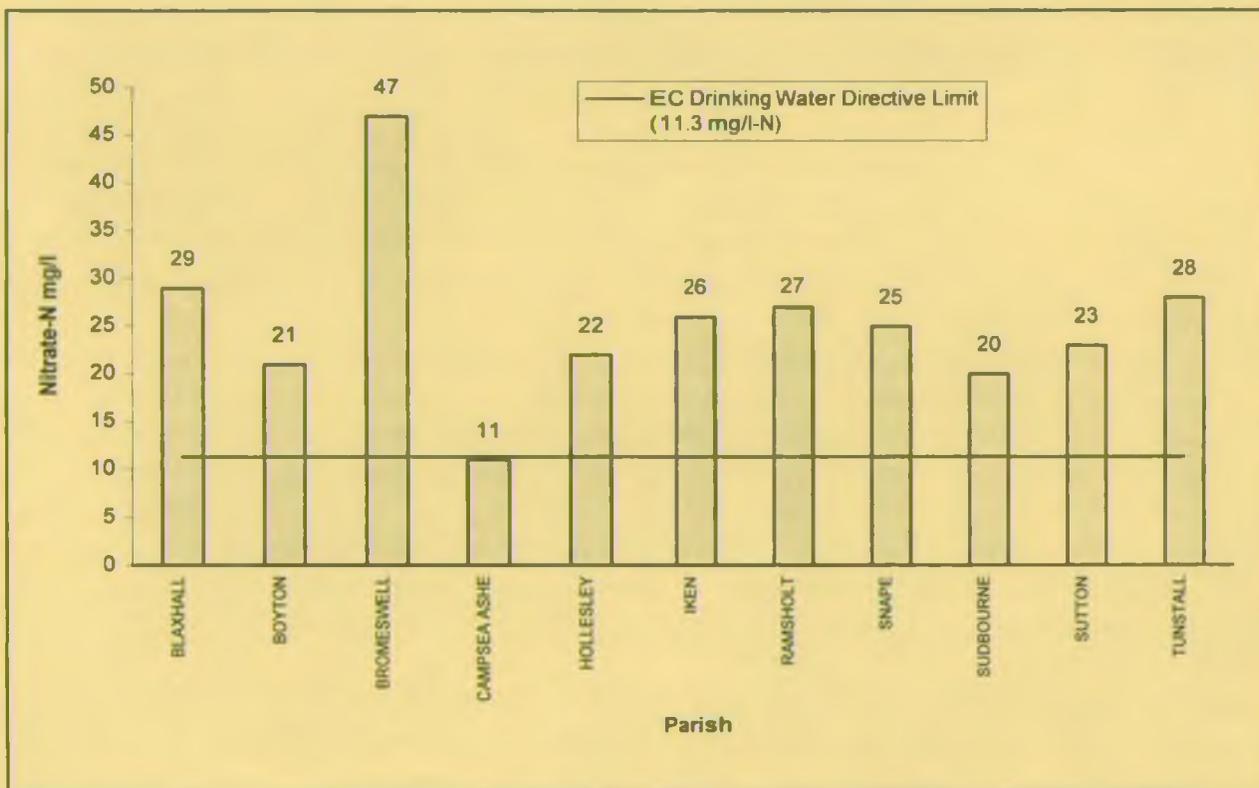
There is evidence of elevated nitrogen levels (nitrate) and potential pesticide contamination in groundwaters. The disposal of both farm and sewage effluents into soakaways and by land spreading is known to be a potential source of contamination to groundwaters. These discharges are regulated by the Environment Agency. However, it is also known that direct application of agricultural fertiliser is a significant nitrogen source to the aquifer and this is not controlled by the Environment Agency. Potential for pesticide contamination of groundwaters is also of concern to the Environment Agency and this pollution pathway needs to be monitored. For potential applications for abstraction licences, groundwater resources are fully committed, apart from the Deben catchment in the lower part of the Sandlings area. Within this sub-catchment nominal resources are potentially available (hydrometric area 35/10), subject to environmental considerations and existing users. Elsewhere in this part of the Sandlings area we believe that further groundwater abstraction would have an unacceptable impact on freshwater wetland environments and their ecology.

### *Surface Waters*

Similar to the contamination of groundwaters, the threat of elevated nitrogen levels (nitrate) and pesticides is also imposed upon surface waters. The progressive control of nutrient and sediment inputs from agriculture requires an integrated management approach. Siltation of surface waters leads to a deterioration in water quality through the elevation of chemicals adsorbed onto the silt particles (eg. phosphates and pesticides), and this is evident in this part of the Sandlings area. Although the quantity of silt entering watercourses in the entire Plan area is not a significant problem, systems that are susceptible to siltation are the Bologney, Twin Banks and Hollesley watercourses and the River Tang. All these surface water systems are within the part of the

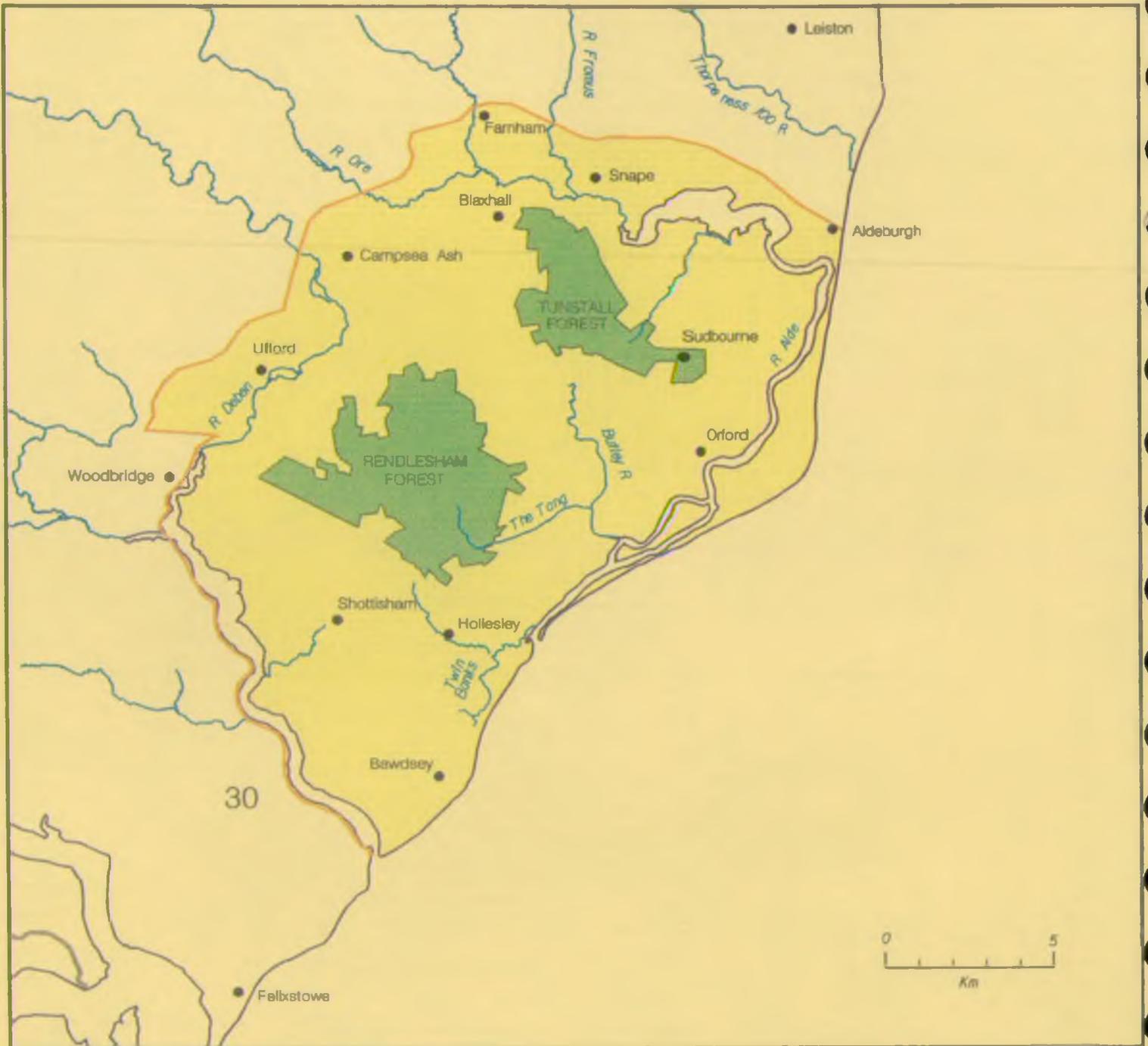
Sandlings area considered by this Issue and therefore are susceptible to diffuse pollution. The Rivers Butley and Tang have significantly failed their River Ecosystem target classes (identified through Issue A2), thus requiring further investigation. Summer surface water resources are fully committed throughout the Plan area and therefore no new abstraction licences will be considered by the Environment Agency due to their potential impact on the aquatic environment.

As forestry land use is extensive in this part of the Sandlings area the environment Agency needs to develop a better understanding of the environmental management principals with Forest Enterprise. Areas that we need to clarify include pesticide usage, cropping programmes and mitigation measures to minimise siltation impacts. The continued adoption of the principles outlined in 'Forests and Water Guidelines' does much to reduce environmental impacts from forestry activities. Similarly, we need to work with MAFF, the Farming and Rural Conservation Agency, the National Farmers Union, the Country Landowners Association and landowners to ensure that land use management practices are sensitive to the environment, minimising the impact of diffuse pollution and optimising the use of the existing licensed water resource.



**FIGURE 2: MEAN NITRATE CONCENTRATIONS IN PRIVATE WELLS AND BOREHOLES IN THE SANDLINGS AREA, BY PARISH**

Options	Responsibility	Advantages	Disadvantages
1. Set up working group with interested parties	Environment Agency, English Nature, MAFF, NFU, Forest Enterprise, Local Authorities, SWT and CLA	Integrated approach Builds partnerships	Consensus needs to be reached
2. Expand monitoring network to quantify the extent of the problem in ground and surface waters	Environment Agency	Quantify extent of problem	Cost Timescales
3. Increase enforcement and pollution prevention visits	Environment Agency	Immediate improvements seen	Not an integrated solution Cost
4. Work with the Forest Enterprise towards the adoption of a 'best practice' strategy	Environment Agency, Forest Enterprise	Largest land user in area Builds partnership	Cost to Forest Enterprise
5. Do nothing			Continued impact on the environment



**ENVIRONMENT  
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-  Main River
-  Coastline
-  Area of The Sandlings

June 1997



**TABLE 1 SUMMARY OF LONG TERM NON-COMPLIANCE AGAINST THE RIVER ECOSYSTEM TARGET - CHEMICAL (RELATED TO ISSUE A2)**

Issue	River	Stretch	Parameter failure (& RE target - Chemical)	Longevity of RE non compliance (based on 84-96 data )	1995 GQA* Biological Classification	Comments regarding non-compliance
A2	Butley	Eyke to Butley Mill	Dissolved Oxygen (RE1)	Long-term	b	Requires further investigation
	Tang	U/S Valley Farm to Butley River	Dissolved Oxygen and Biochemical Oxygen Demand (RE1)	Long-term	b	Requires further investigation
	Earl Soham Watercourse	Kenton to River Deben	Dissolved Oxygen (RE2)	Long-term	c	Potential farm inputs
	Lark	Otley to Boot Street Bealings	Dissolved Oxygen (RE2)	Recent	b	Requires further investigation
	Deben	U/S Debenham (Derrybrook) to Debenham Bridge	Un-ionised ammonia (RE3)	Long-term	d	Previous minor pollution (Sample point dries out)
	Gipping	Sproughton Intake to Horseshoe Sluice	Dissolved Oxygen and Biochemical Oxygen Demand (RE2)	Long-term	Not sampled	Elevated BOD and large Dissolved Oxygen fluctuations due to summer algal blooms
	Gipping	Ordanance Bridge to Quintons Mill Blakenham Mill to B1113 Road Bridge Claydon	Dissolved Oxygen (RE2)	Recent	b	Dissolved Oxygen concentrations have declined in recent years. Further investigation required
	Belstead Brook	Belstead Bridge to Bourne Sluice	Dissolved Oxygen (RE2)	Long-term	b	Sample point location in ponded section

**Issue A2: A number of river stretches fail to achieve their existing river ecosystem target class (see Table 1) for unknown reasons.**

Background

A number of river stretches have poor water quality, either for dissolved oxygen or for dissolved oxygen combined with other parameters. The failure to achieve the assigned River Ecosystem (RE) target cannot be directly attributed to natural factors and, hence, further investigation is required.

Options	Responsibility	Advantages	Disadvantages
1. Carry out further investigations to ascertain reasons for failures	Environment Agency	Quantifies problem	Cost
2. Consideration for instigating pollution prevention campaign	Environment Agency	Potential for elimination of input sources	Cost Timely
3. Do nothing			Continued failure of RE target

**Issue A3: A number of river stretches fail to achieve their existing river ecosystem target class due to factors that cannot be attributed to point-source pollution.**

### Background

This issue relates to river stretches where the only failure against the River Ecosystem (RE) target is for Dissolved Oxygen (DO) and a review of the data has shown that DO levels have not deteriorated over the last fifteen years. Only sites which have no significant consented effluents upstream of the sample point have been included in this category.

The lower levels of DO measured are not associated with pollution but are a result of the lowland nature of the rivers. River flows are often naturally low resulting in slow flowing watercourses with little re-aeration occurring. This may be further exacerbated by increased nutrient levels resulting in increased vegetation and algal growth causing large fluctuations in DO levels.

Hence, at a number of sites dissolved oxygen levels achieve values substantially lower than the assigned target (see Table 2). The other measures of water quality (BOD and Ammonia) readily achieve the RE target. In these rivers it is improbable that the targets will ever be achieved for the reasons given above. Table 2 shows the levels of dissolved oxygen currently measured against the RE target.

As these oxygen levels are historically those that were sustained in these low flow rivers, the ecology and fish community have adapted and we have no reason to believe from our biological monitoring that adverse impacts have taken place.

Options	Responsibility	Advantages	Disadvantages
1. Introduce a derogation for Dissolved Oxygen but ensure that 'no deterioration' policy applied	Environment Agency	RE compliance achieved  BOD and Ammonia will not deteriorate	None
2. Reconsider length of classified rivers in light of flow criteria	Environment Agency	Focus monitoring and management on significant stretches	Change in length of classified river
3. Downgrade River Ecosystem target	Environment Agency	RE compliance achieved for all parameters	Downgrading of other compliant parameters, may permit deterioration of existing quality for BOD and Ammonia
4. Initiate investigations into oxygen loss routes in river systems	Environment Agency	Understanding of natural processes with the river systems	Topic area currently not defined  Cost
5. Introduce physical structures with re-aeration characteristics, e.g the reinstatement of natural riffles (see Issue A6)	Environment Agency	Improve chemical and biological quality	Lack of gradient  Cost
6. Do Nothing		None	Continuing non-compliance

**TABLE 2: SUMMARY OF LONG TERM NON-COMPLIANCE AGAINST THE RIVER ECOSYSTEM (RE) TARGET - CHEMICAL**

Issue	River	Stretch	Parameter failure (& RE target - Chemical)	Longevity of RE non-compliance (based on 84-96 data )	1995 GQA* Biological Classification	Comments regarding non-compliance
A3	Alde	Brundish to River Alde	DO (RE2)	Long-term	c to b	Natural factors
	Lothingland Hundred	Ilketshall St Andrews to Suffolk Wildlife Park	DO (RE3) <i>(Freshwater Fish Directive failure in 95 for DO)</i>	Long-term	a	Natural factors
	Minsmere	Sibton to Yoxford A12 Road Bridge	DO (RE2)	Long-term	e	Natural factors
	Minsmere	Reckford Bridge to Minsmere River	DO (RE2)	Long-term	b	Natural factors
	Fromus	Kelsale to Benhall Green Bridge	DO (RE4)	Long-term	c	Natural factors
		Benhall Green Bridge to River Alde	DO (RE3)		c to b	Natural factors
	Thorpeness Hundred	Harrow Farm to Coldfair Green	pH (RE4)		b	
	Thorpeness Hundred	Coldfair Green to Thorpeness Sluice	Dissolved Oxygen and pH (RE3)	Long-term	b	Natural factors
Mill	Monument Farm Bridge to Kirton Sluice	Dissolved Oxygen (RE1) + <i>Freshwater Fish Directive failures in 93 and 95 for Dissolved Oxygen</i>	Recent	b	Natural factors	

**Issue A4: Flows in the River Deben decline to an environmentally unacceptable level during the summer period.**

Background

The River Deben frequently suffers from low summer flows. Recorded incidents date back to 1959, predating both the abstraction licensing system and the flow gauging record at Naunton Hall. Problems that have historically arisen include low dissolved oxygen levels, fish kills, excessively low water flows and levels, and complaints from the public and local conservation bodies.

The causes have been identified as peak abstraction of water in the summer, direct from the river, exacerbated by other aspects (groundwater abstraction for public supply, natural catchment conditions and past river channel management for land drainage purposes). Most of the spray irrigation licences were issued as licences of right under the *Water Resources Act 1963* and do not contain effective cessation controls to protect the environment.

The River Deben has been confirmed as one of the Environment Agency's 'top 40' Alleviation of Low Flow (ALF) sites and the problem is being addressed in the Deben Low Flow Alleviation Scheme project (DLFAS).

Options	Responsibility	Advantages	Disadvantages
1. Set River Flow Objectives defining the actual river requirements	Environment Agency	Provides better understanding of in-river needs  Improved resource management  Confirm/identify stretches of river concerned  Partially achieved in Phase 1 of DLFAS	Cost of investigation  Data collection required
2. Provide River Support	Environment Agency	Flows maintained during low flow periods  Environmental enhancement	Water abstracted may be at expense of river flows during other periods in the year  Cost  Water quality may be impacted by the water introduced
3. Improve river channels	Environment Agency	Improve river habitat	Only partial solution
4. Revoke all or some licensed abstractions	Environment Agency	May solve problem of abstraction induced low flow	Cost of reimbursing  May not solve the problem completely  May not be accepted as a solution by the abstractors
5. Relocation of abstraction points (surface water abstraction moving to groundwater)	Environment Agency	Less direct impact on the river  More reliable source of water for abstraction	Abstractors may not cooperate with voluntary programme of relocation  Cost  Timescale
6. Do nothing			Not environmentally acceptable

**Issue A5: Concern over the potential impact of declining flows of small streams running across intertidal areas within Special Protection Areas (SPAs).**

Background

A majority of the estuaries in Eastern Area have been designated as Special Protection Areas because of their international importance for over-wintering wildfowl. A research project funded by the Environment Agency found a strong statistical link between the distribution of certain species and the presence of the freshwater streams. Further research is currently underway to identify the environmental factors that make these sites important for waders.

As an interim measure, the Environment Agency is discouraging applications for all winter, summer surface and groundwater abstraction from streams that feed intertidal creeks, until our understanding of the reason for their importance is identified (see Map 6). To this end, the Environment Agency, along with English Nature and Suffolk Wildlife Trust are undertaking further research.

Options	Responsibility	Advantages	Disadvantages
1. Carry out hydrological and ecological surveys to research the environmental needs	Environment Agency, English Nature (contribute to ecological research), SWT	Allow needs to be quantified and targets to be set  Precautionary approach  Improve water resources management	Cost  Timescale  Delay in formal applications being processed
2. Review Policy - with the possibility of changing current policy	Environment Agency (CLA, NFU)	Protection of intertidal areas  Improved water resources management	Timescale  Delay in formal applications being processed
3. Applicant for formal abstractions applications must undertake the environmental assessment	Applicant	Cost  Applied to the local area where possible impact may occur	Timescale  Full understanding of the issue may not be achieved
4. Do nothing			Potential damage to the environment  May result in ineffective water resource management

# Restricted Areas For Winter Storage Reservoirs

Map 6



**ENVIRONMENT  
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- Main River
- Coastline
- Catchment boundary

Area where winter abstraction (for storage) is not currently being considered

June 1997

**Issue A6: There is a lack of habitat diversity both within rivers and their floodplains.**Background

Until recently river management across the region was driven by agricultural policies to improve drainage within the floodplain and hence maximise the production of cereals. These activities have resulted in the loss of many in-channel and floodplain habitats. It is typically the case for the East Suffolk Plan area that most rivers are suffering from a lack of habitat diversity. Recent changes in land-use policies, as a result of reforms to the Common Agricultural Policy and the introduction of the Suffolk River Valleys Environmentally Sensitive Area (ESA) Scheme, provide the potential to restore the ecology of some sections of the rivers through a variety of enhancement techniques, where this does not undermine agricultural land-use in the floodplain.

A study is currently being carried out on the River Deben, as part of the Deben Low Flow Alleviation Scheme (see Issue A4) to identify restoration proposals that will result in significant ecological improvements to the river channel. Many of the proposals will be aimed at physical enhancements that have a neutral or even beneficial impact on the standards of flood defence in the catchments.

To achieve Biodiversity Action Plan targets for various riverine species (e.g. otters, water voles and crayfish) improvements will be required to a number of riverine habitats. These have been identified as Options below.

Options	Responsibility	Advantages	Disadvantages
1. Identify and implement river/floodplain restoration projects and habitat enhancements	Environment Agency and conservation bodies	Fulfils duties under legislation to further conservation	Cost and staff resources
2. Identify specific enhancements to improve fish habitat and spawning sites	Environment Agency and conservation bodies	Fulfils duties under legislation to maintain, improve and develop fisheries	Cost and staff resources
3. Identify the need to provide fish passes for access through mills, weirs, tide flaps and other control structures	Environment Agency and conservation bodies	Fulfils duties under legislation	Cost and staff resources
4. Do nothing			Habitat diversity not improved

**Issue A7: Ensure that Environment Agency activities comply with new and existing EU Directives concerning nature conservation.**

Background

The *EC Habitats Directive* became law in the UK under the *Conservation (Natural Habitats, & c.) Regulations 1994* and is considered to be the most significant piece of nature conservation legislation since the *Wildlife and Countryside Act 1981*. The Directive is particularly important in this Plan Area since a significant proportion of the coastal strip has been put forward as candidate Special Areas of Conservation (SACs) and parts are already Special Protection Areas (SPAs). The legislation will have a significant impact on current Environment Agency procedures and operational activities in the catchment since it strengthens protection from activities occurring both inside and outside site boundaries (for instance abstractions or effluent discharges). Furthermore operations formerly covered under General Development Orders (for instance many flood defence operations) will come under increased scrutiny (see Map 7 for details of SACs and SPAs).

The Directive requires the Environment Agency as a "Competent Authority", to review existing consents and authorisations which might affect the conservation objectives of any designated site, and either affirm, modify or revoke them. This requirement has specific implications for water abstraction licences, discharge consents and waste management licences.

There are a number of brackish lagoons within the Plan area, the majority within candidate Special Areas of Conservation (e.g. Covehithe and Easton). These are highlighted as priority habitats in the *Habitats Directive* (the only Habitat Directive priority habitat present within the Plan area). There is therefore concern over the impact of abstraction on the freshwater supply to these important sites.

Option	Responsibility	Advantages	Disadvantages
1. Where appropriate ensure sustainable protection of habitats through Shoreline Management Plans and future sea defence activities	Environment Agency	Complies with legislation	Cost and staff resources
2. Investigate, with partners, the development of compensatory habitat where habitats may be lost due to the implementation of the Shoreline Management Plan preferred options and subsequent sea defence works	Environment Agency, Suffolk Wildlife Trust, English Nature & landowners	Complies with legislation	Cost and staff resources

Option	Responsibility	Advantages	Disadvantages
3. Develop a programme to review all discharge consents and abstraction licences that may potentially impact on SACs and SPAs (subject to guidance from NHO and RHO)	Environment Agency	Adherence to international law	Cost and staff resources
4. Undertake formal Environmental Assessments to identify the impact of Environment Agency activities on SAC/SPAs, in close liaison with English Nature and Local Authorities (where appropriate)	Environment Agency, English Nature, LAs	Complies with legislation	Cost and staff resources
5. Liaise closely with English Nature, and other consultation bodies, over all operations and activities that may influence the SACs/SPAs	Environment Agency, English Nature	Complies with legislation	Cost and staff resources
6. Assess the level of impact of water abstraction on the freshwater supply to brackish lagoons and identify the significance of ecological impact	Environment Agency	Fulfilment of conservation duties	Cost and staff resources
7. Do nothing			Failure to comply with national and international laws

**Issue A8: Investigate and where possible ameliorate failures in fisheries biomass targets.**Background

A number of river stretches in the East Suffolk Plan area fail to achieve their fisheries biomass target class. Current failures occur on the Mill River, the River Wang and the Lothingland Hundred. These failures require investigation, firstly to ensure that the target classes are appropriate and secondly to identify any remedial measures which may be necessary.

Options	Responsibility	Advantages	Disadvantages
1. Investigate failures in fisheries targets, confirm that the targets are appropriate, and identify remedial measures	Environment Agency	Complies with Environment Agency duties and legislation	Staff time and cost
2. Where appropriate implement remedial measures	Environment Agency	Complies with Environment Agency duties and legislation	Staff time and cost
3. Do nothing			Continued failure of targets

**Issue A9: There is a need to assess and where appropriate protect the ecological status of the headwaters of rivers.**

**Background**

Headwaters of rivers contribute significantly to their biodiversity. There are, for instance, many macro-invertebrates that are exclusive to, or predominantly found in headwaters (a number of these species are rare). Similarly headwaters can provide valuable habitat. Our knowledge of the status of headwaters is very limited, as is our understanding of the impact of agricultural practices, water quality and resource issues.

Options	Responsibility	Advantages	Disadvantages
1. Assess the level of data on headwater and identify priorities for completing species level surveys of selected headwaters	Environment Agency	Fulfilment of conservation and fisheries duties. Protection of riverine biodiversity	Staff time
2. Identify a strategy for the protection of headwaters	Environment Agency	Fulfilment of conservation and fisheries duties. Protection of riverine biodiversity	Staff time
3. Do nothing			Headwaters won't be protected

**Issue A10: Operation of Blyford Water Control Structure has implications for the upstream ecology, fishery and water quality impacts.**

Background

Seasonal operation of this water control structure results in significant adverse impacts upstream because of saltwater ingression inland and physical changes to the river levels. In the winter months, the flood gate is lowered for lengthy periods, resulting in impacts as far upstream as Mells Bridge.

Options	Responsibility	Advantages	Disadvantages
1. Automatic control by installation of new tilting gate	Environment Agency	Protection of upstream river ecology	Cost
2. Modify existing gate	Environment Agency	Protection of upstream river ecology	Minimal control of gate
3. Revise gate operating procedures	Environment Agency	Minimal cost	Structure can not be controlled finely
4. Do nothing			Continued environmental degradation

## B) HUMAN NEEDS

**Issue B1: Threat of pollution to the public water supply abstracted from surface and groundwater sources in the River Gipping catchment.**

### Background

Recent pollution incidents have demonstrated that there is a shortfall in facilities and pre planning detail for effective management and control of pollution incidents in this important water supply catchment.

Specific gaps in our knowledge include the lack of information regarding time of travel of pollutants and the need to provide an automatic water quality monitoring station in the mid Gipping. Contingency plans for minimising impacts from chronic pollution events also need to be prepared.

Options	Responsibility	Advantages	Disadvantages
1. Construct Automatic Water Quality Monitoring Station (AWQMS) at Needham Market	Environment Agency	Continuous warning for intake	Limited number of parameters
2. Undertake time of travel studies	Environment Agency	Provides vital information that is currently unknown	Not all flow ranges covered
3. Prepare contingency plans for the River Gipping	Environment Agency	Facilitates correct management of pollution incidents	None
4. Pollution prevention campaign and remediation as appropriate in Groundwater Protection Zones (GPZs)	Environment Agency	Reduces and controls pollution	Cost to industry
4. Do nothing			Fail to meet statutory duties effectively

**Issue B2: Requirement to provide estuarial, coastal and fluvial flood protection.**Background

The sea defences along the Suffolk coastline were constructed to protect low lying communities and to reclaim agricultural land. Over the centuries a number of coastal towns and villages have been badly eroded by the sea.

By 1286, 400 houses had been destroyed at Dunwich. A plan from 1594 shows three streets running parallel with the present sea front at Aldeburgh. In 1748 one street was washed away. Today only a small percent of the original inhabited areas of Dunwich and Aldeburgh remain.

There have been many improvements to the seawalls, particularly following the 1953 flood disaster. The continual erosion of localised beaches and foreshores and the loss of shingle and sand from defence frontages is exacerbated by global rises in sea level. This loss of protective foreshore can lead to both an increase and frequency of wave and tidal attack which damages and degrades defences, and causes gradual reductions in the level of protection these defences provide for people and property.

The management of flood defences is carried out by the Environment Agency routinely through the maintenance programme. Capital flood defence schemes are set out by our Long Term Plan and are enclosed in Appendix 16. The development and implementation of the Long Term Plan is overseen by the Norfolk and Suffolk Local Flood Defence Committee.

Option	Responsibility	Advantage	Disadvantage
1. Delivery of Flood Defence improvement/replacements as identified in the Long Term Plan	Environment Agency	Improvements to flood defence standards through Capital expenditure  Protection of people and property from flooding	LFDC may approve/prioritise schemes outside the Plan area, within Norfolk and Suffolk  Cost
2. Implement Suffolk Shoreline Management Plan	Environment Agency, Local Authorities, MAFF	Integrated management of defences	Cost  May result in loss of some defended areas
3. Maintain existing defences	Environment Agency	Maintain status quo	Fragmented approach to flood defence needs  Cost
4. Do nothing except emergency response	Environment Agency	Cost	Deterioration in defence standards  Risk of sudden inundation

## C) CONTROL OF RELEASES TO THE ENVIRONMENT

**Issue C1: Impacts on the environment from contamination originating from Wangford I landfill site.**

### Background

The Wangford I landfill site was an unlined landfill site where household, commercial and industrial wastes were deposited. Leachate (formed as putrescible material degrades) is now entering the groundwater beneath the site although it has not yet affected nearby springs; in addition, landfill gas is migrating from the former landfill site into the surrounding soil.

Since the completion of Wangford I there has been further landfilling activity on an adjoining site, and part of the Wangford I site is still operational; the present site was licensed by Suffolk County Council as Waste Regulation Authority, and is an engineered site fitted with gas and leachate control measures. The methane produced by this landfill is to be used for power generation under the Non Fossil Fuel Obligation.

Some remediation measures have been proposed for the former landfill site, but so far the County Council and the landowner have not been able to reach an agreement over the work to be carried out.

Options	Responsibility	Advantages	Disadvantages
1. Trench interception of contaminated groundwater	Requires agreement between landowner and Suffolk County Council	Likely to be very effective in preventing migration of contaminated groundwater	Cost of installation  Disposal or treatment of very large volumes of contaminated water
2. System of boreholes to intercept contaminated groundwater	Requires agreement between landowner and Suffolk County Council	Cheaper to install than trench interception system  Lower volumes of water requiring treatment or disposal	May be less effective than Option 1 -it can be difficult to calculate the exact location of boreholes to ensure removal of contaminated groundwater
3. Capping of site with impermeable material	Requires agreement between landowner and Suffolk County Council	Would slow down leachate production	Existing groundwater contamination will remain
4. Install gas extraction system (could be an extension of the system installed at the current landfill site)	Requires agreement between landowner and Suffolk County Council	Would resolve the problem of gas migration from the site	Cost of installation
5. Do nothing			Contamination of the groundwater and production of landfill gas will continue until all putrescible material within the site is fully degraded

**Issue C2: Concern over the effect of a closed landfill site at Tuddenham on the River Fynn.****Background**

The landfill site at Tuddenham was an unlined site which was licensed for the disposal of inert material (construction and demolition waste). However, putrescible wastes were also deposited at the site before it was closed in 1991, and the leachate arising from this material as it degrades is causing significant contamination of the groundwater. In addition, some of the contamination is almost certainly due to the deposit of ammonium sulphate fertiliser waste at the site during the early 1970's. The contamination is impacting on springs which feed the River Fynn, causing it to fail its River Ecosystem target [See Table 3].

Options	Responsibility	Advantages	Disadvantages
1. Removal of all waste deposited at the site	Environment Agency, Landowner	Would halt any further contamination	Cost  Does not resolve the issue of existing contamination
2. Site investigation of the old landfill to locate the most highly-contaminated areas of the site (for removal of those areas of waste)	Environment Agency, Landowner	Cheaper than Option 1  Likely to halt any further contamination	Resource implications  Does not resolve the issue of existing contamination
3. Trench interception system (with possible discharge to sewer)	Environment Agency, Landowner	Likely to be very effective in preventing migration of contaminated groundwater	Cost of installation  Disposal or treatment of very large volumes of contaminated water  Disruption of the road which runs close to the site  Loss of groundwater flow to springs  Does not remove the source of contamination
4. Reed bed creation	Environment Agency, Landowner	Environmentally friendly - creation of wetland habitat  More cost-effective than Options 1 - 3	Subject to agreement of landowner, which may not be forthcoming  Does not remove the source of contamination
5. Do nothing			Contamination of the groundwater and the River Fynn will continue until all putrescible material is fully degraded and ammonium from the fertiliser has been flushed through - the timescale for this is unknown but is likely to run into decades

**TABLE 3: SUMMARY OF LONG TERM NON-COMPLIANCE AGAINST THE RIVER ECOSYSTEM TARGET - CHEMICAL**

Issue	River	Stretch	Parameter failure (& RE target-chemical)	Longevity of RE non compliance (based on 84-96 data )	1995 GQA Biological Classification	Comments regarding non compliance
C2	Fynn	Henley to Tuddenham Bridge	Dissolved Oxygen, Ammonia and Unionised Ammonia (RE2)	Long term	c	Disused tip impacts groundwater under the site. Contamination leaches, via springs, into the river
C4	Deben	Debenham Bridge to Tidal limit	Dissolved Oxygen (RE2)	Long term	c to a	Probably due to eutrophication impacts combined with low flows, but further evaluation required
C7	Leiston Beck	Leiston to Minsmere Sluice	Dissolved Oxygen and ammonia (RE3)	Long-term	d	Leiston sewerage storm overflow discharges
C8	Wenhaston Watercourse	Holly Tree Farm, Bramfield to River Blyth	Dissolved Oxygen (RE3)	Long-term	c	Wenhaston STW discharges into this low dilution stream
	Easton Broad River	Wrentham Church to Easton Broad River	Dissolved Oxygen and ammonia (RE2)	Long-term	c	Wrentham STW discharges into this low dilution stream

**Issue C3: The presence of toxic and persistent chemicals disposed of on Orford Ness have had an adverse impact on the groundwater and local ecosystem.**

### Background

Assorted materials were disposed of on Ministry of Defence land on Orford Ness when its use was discontinued, over a decade ago. Two of these dump sites have been quantified and material will be removed from grossly contaminated areas. Monitoring boreholes are to be set up enabling surveys of the local groundwater to be undertaken to assess the extent of contamination. To date PCBs (polychlorinated biphenyls) have been identified as the most significant pollutant and these have also been detected in marine sediments in the vicinity of the dumps. Action needs to be taken to ensure that there is no further seepage from the area into the local ecosystem. Consideration will be given, in due course, to designate this area as a special site under Section 57 of the *Environment Act 1995*.

The source of PCBs is known to be transformers that were removed from a radar station currently in the ownership of the Foreign and Commonwealth office, although the MOD have financed remedial work to date, in view of the historic defence use of this site. Orford Ness is now largely in the ownership of the National Trust and we will continue to resolve this problem in partnership with them.

Options	Responsibility	Advantages	Disadvantages
1. Remove contaminants	Foreign and Commonwealth Office	Removes source of pollution	Cost Disposal Route
2. Set up monitoring network	National Trust, Environment Agency	Quantifies problem and defines potential solutions	Long term timescale
3. Undertake further site surveys	Foreign and Commonwealth Office	Locate other dump sites of contaminants	Cost
4. Do nothing			Accept that localised contaminated land will remain

**Issue C4: Concern regarding eutrophication of the freshwater environment of the River Deben.**

Background

Concerns have been raised regarding eutrophication of the River Deben. At present, there is very little specific monitoring data available to enable the Environment Agency to assess the status of the river adequately. There are a number of indicators which suggest that the river may be eutrophic:- luxuriant macrophyte growth in the upper river, dissolved oxygen fluctuations in the summer months and algal smothering of the river surface. Additionally, a number of sites fail to achieve their River Ecosystem targets for dissolved oxygen and these are detailed in Table 3.

As this river system is not within the scope of candidates for designation under the *EC Urban Waste Water Treatment Directive* it is unlikely that remedial measures can be implemented in the near future although we need to quantify our concerns in respect of its current eutrophic status.

The implementation of the Deben Low Flow Alleviation Scheme (DLFAS) programme (see Issue A4) may help to alleviate the situation by increasing flows in the river, particularly during the summer months. See Table 3 for details of river ecosystem failures.

Options	Responsibility	Advantages	Disadvantages
1. Instigate adequate monitoring programme and identify potential nutrient sources	Environment Agency	Defines problem Establishes status of river	Cost Time considerations
2. Subsequently investigate feasibility of controlling nutrient sources (if appropriate)	Environment Agency, Landowners, AWS	Reduces nutrient load to river	Cost
3. Increase river flows (DLFAS project) [option is related to Issue A4)	Environment Agency	Improves river flows and hence dilution of nutrient load	Cost Does not remove nutrient total
4. Do nothing			Concern over eutrophic state of river will remain

**Issue C5: Concern over nutrient loadings to the Deben Estuary and the frequent occurrence of algal blooms.**

### Background

There is concern from river users and other members of the public in respect of the excessive algal blooms and associated scums in the upper and middle estuary. Surveys by the Environment Agency have demonstrated that the River Deben has a high incidence of significant algal blooms, when compared to other estuaries in the Region.

This estuary has recently been assessed for designation as a potential candidate Eutrophic Sensitive Area under the *EC Urban Waste Water Treatment Directive*. The case presented was as to whether the status should apply to the Deben Estuary, but it was felt that insufficient chronic eutrophication effects had been found in the studies undertaken.

A water quality model, developed by the Water Research Council (WRC), along with associated research by Essex University during 1996/97, will be utilised to develop management strategies for the estuary into the next century, including the derivation of river need consents for Melton and Woodbridge Sewage Treatment Works. Review of these consents will be phased with Special Area of Conservation (SAC) requirements and AMP 3 priorities.

Options	Responsibility	Advantages	Disadvantages
1. Designate estuary as a Eutrophic Sensitive Area	Environment Agency/ DoE	Impose nutrient reduction regime	Cost to AWS
2. Develop water quality model	Environment Agency	Defines status of estuary	Cost
3. Propose management strategy for estuary	Environment Agency	Management of environmental factors	Long term
4. Do nothing		None	Problems continue

**Issue C6: Poor water quality in receiving surface waters downstream of Leiston.**Background

Inadequate sewerage facilities for the town of Leiston result in frequent pollution of the receiving watercourse and give rise to public complaints. Storm overflows on the sewers in the town frequently operate and allow crude sewage to enter the watercourse, resulting in sewage debris and litter deposition.

The receiving watercourse, Leiston Beck, runs through Sizewell Belts, an SSSI, before joining the Minsmere River system. This area is currently being developed as a nature reserve by Suffolk Wildlife Trust in partnership with the landowners, British Energy. Water quality in the receiving watercourse does not comply with its assigned River Ecosystem (RE) target, details of which are given in Table 3.

Options	Responsibility	Advantages	Disadvantages
1. Candidate for AMP3 in respect of sewerage improvements	Environment Agency, AWS	Permanent solution achieved	Cost Work not carried out immediately
2. Negotiate immediate improvements to forestall further pollution	Environment Agency, AWS	Immediate solution	Not currently costed or planned
3. Consider population growth for Leiston catchment and potential for phased planning controls	Environment Agency, SCDC	Constrains existing problem	Impact on local developments
4. Do nothing			Continued RE failure

**Issue C7: Concern over potential deterioration of river water quality, where present effluent quality is better than the current legal consent.**

Background

Effluent quality is controlled by the current legal consent. Dischargers are required to ensure effluent quality is compliant. In some situations a sewage effluent treatment plant may be producing an effluent quality that is considerably better than the legal consent, termed 'over-performing'. In this situation there is a risk that the effluent quality from these 'over-performing' works may deteriorate to the legal consent standard and potentially cause a failure of water quality targets downstream.

A number of selected STWs were checked for over-performance by looking at the impact on downstream water quality if the discharge were at its legal consented load. Where this showed there would be an adverse effect on downstream river quality, these works are listed in the Table below. The 'Index of Over-Performance' is also presented to give a numerical measure of how far current effluent quality is from its legal consent limit. For each STW the Index of Over-Performance for a particular determinand is given. A high value indicates that current effluent quality is significantly better than the Legal Consent limit, compared to a low value which indicates current effluent quality is close to its Legal Consent limit. See Table 3 for details of River Ecosystem failures.

STW	Receiving Watercourse	WQ parameter and target at risk of failure	Index of Over-performance	
			BOD	Ammonia
Wickham Market STW	River Deben	RE2 - Ammonia <i>Freshwater Fish Directive</i>	-	95
Debenham STW	River Deben	RE3 - BOD and Ammonia	71	89
Benhall STW	River Fromus	RE3 - BOD and Ammonia	20	21
Leiston STW	Sizewell Belts	RE3 - Ammonia	-	90
Wrentham STW	Easton Broad River	RE2 - Ammonia	-	32
Wenhaston STW	Wenhaston watercourse	RE3 (No ammonia limit currently in place)	50	-
Thorpeness STW	Thorpeness Hundred River	RE3	54	91
Stowmarket STW	River Gipping	RE3	-	26
Needham Market STW	River Gipping	RE2	39	20

- indicates that STW not over-performing for this parameter

Additionally a number of STWs which discharge into rivers that are designated under the *EC Freshwater Fish Directive* do not currently have a consent limit for ammonia and hence, the river is at risk of failing the Directive ammonia standard. These are also identified below. It is our intention to introduce ammonia limits at the earliest opportunity.

STW	Receiving Watercourse
Yoxford STW	Minsmere River
Westleton STW	tributary of Minsmere River
Kessingland STW	tributary of the Lothingland Hundred River

Options	Responsibility	Advantages	Disadvantages
1. Develop priority listing based on impacts, with subsequent need to impose River Needs Consent (RNC) in the next AMP3 review	Environment Agency, AWS	Target river class is maintained through cost effective investment	RNC may not be supported by statutory objective
2. Do nothing			Risk of a failure of river target class will continue

**Issue C8: A high proportion of pollution incidents are derived from livestock sources.**Background

MAFF data shows that pig density per hectare in this catchment is the highest in the UK, along with Humberside Northbank. It is generally in the range of 2-3 head per hectare compared to the rest of the UK which is generally less than 0.5 head per hectare.

The Environment Agency have actively been working with the farming community to control pollution from these sources. There is a need to continue this work with particular emphasis on control of diffuse effluent and nutrient inputs. MAFF statistics show that BOD loading from livestock in parts of this area can exceed 1000 mg of BOD per hectare per day although the majority of this organic load is disposed of in an appropriate manner.

Analysis of pollution incident statistics show that agricultural sources constitute 66% of all incidents and that within that 44% are from pig sources.

This data highlights the need to continue to develop our pollution prevention strategy for livestock sources to minimise and reduce the numbers of such incidents.

Options	Responsibility	Advantages	Disadvantages
1. Increase pollution prevention inspections	Environment Agency	Reduces numbers of incidents	Cost Time
2. Joint initiatives with interested parties	Environment Agency, NFU, Farmers Cooperatives, MAFF, CLA	Cooperation of all bodies involved	Time to implement
3. Education and awareness campaign	Environment Agency, NFU, CLA	Proactive approach	Cost Time
4. Do nothing			Unacceptable level of incidents may continue

**Issue C9: Disposal of waste to agricultural land.**Background

The disposal of certain types of controlled wastes on agricultural land may be carried out as an exemption from the *Waste Management Licensing Regulations 1994*, providing that specified criteria are met. The Environment Agency must receive prior notification of the activity, and requires analyses to be taken of the wastes and the soil where the material is to be deposited. The Environment Agency must give written approval for the disposal activity before it is allowed to begin.

This type of activity has historically been common in the Plan area; however, since the requirement for waste and soil analyses was introduced, the Environment Agency has received no notifications that landspreading of wastes is to be carried out. It seems unlikely that disposal of wastes in this way would simply cease, and therefore it may be necessary for the Environment Agency to carry out an intensive investigation of this type of activity in the area.

Options	Responsibility	Advantages	Disadvantages
1. Increase inspection and enforcement presence in the area	Environment Agency	May locate some unauthorised activity	Unlikely to be able to halt all unauthorised activity because of the sheer size of the area
2. Obtain information from waste producers about disposal methods and contractors	Environment Agency	May identify some unauthorised activity	Will only confirm disposal of waste material from known producers
3. Investigate contractors who have historically disposed of waste in this way	Environment Agency	May identify some unauthorised activity	Will only confirm disposal methods used by known contractors
4. Do nothing			Unauthorised and potentially polluting activity will continue

**Issue C10: Adverse impacts originating from port and shipping activities in the Ipswich, Felixstowe and Harwich areas.**

Background

Many minor incidents occur in these areas every year arising from port activities. Some are subject to control activities by the appropriate authorities to minimise environmental impact. Incidents can originate from ships or landside activities. There is a need to further develop contingency plans to ensure that such incidents are effectively controlled and to progress pollution prevention work in these areas.

Equipment has recently been purchased by the Environment Agency and Harwich Haven Authority to enable us to effectively deal with moderate sized oil spills in the harbour areas. This is in accordance with our responsibilities under the Memorandum of Understanding (July 1995) which has resulted in the formation of the Haven Oil Working Group.

We work with the shipping companies and Local Authorities to control and minimise impacts arising from litter in these areas. Although we have no statutory responsibilities in this area we continue to work with partners to address the problem. The recent provision of fine screens on the sewage effluent discharges at Felixstowe and Ipswich has already resulted in a significant reduction in recorded litter on the estuary foreshore.

Options	Responsibility	Advantages	Disadvantages
1. Contingency planning	Environment Agency, HOWG	Adequate response to incidents	Time Cost
2. Pollution prevention inspections	Environment Agency	Control of diffuse pollution sources	Time Cost
3. Education campaigns with shipping companies	Environment Agency, Port Authorities	Defines good practice to operators	Time Cost
4. Construct boom-anchorage points	Environment Agency	Equipment ready for emergencies	Cost
5. Do nothing			Potential for major incident to have significant environmental effect  Minor incidents continue unabated

### Issue C11: Concerns with respect to elevated copper and zinc levels in the Orwell Estuary.

#### Background

The Environment Agency remains concerned about high levels of dissolved metals in this estuarine system and its record of non compliance with EC Directives with particular respect to copper and zinc.

Direct discharges to the estuary of sewage and trade effluents containing List I and II metals are controlled via their 'Consent to Discharge' although negotiations are continuing to ensure that loads of these metals are reduced to minimum acceptable loads.

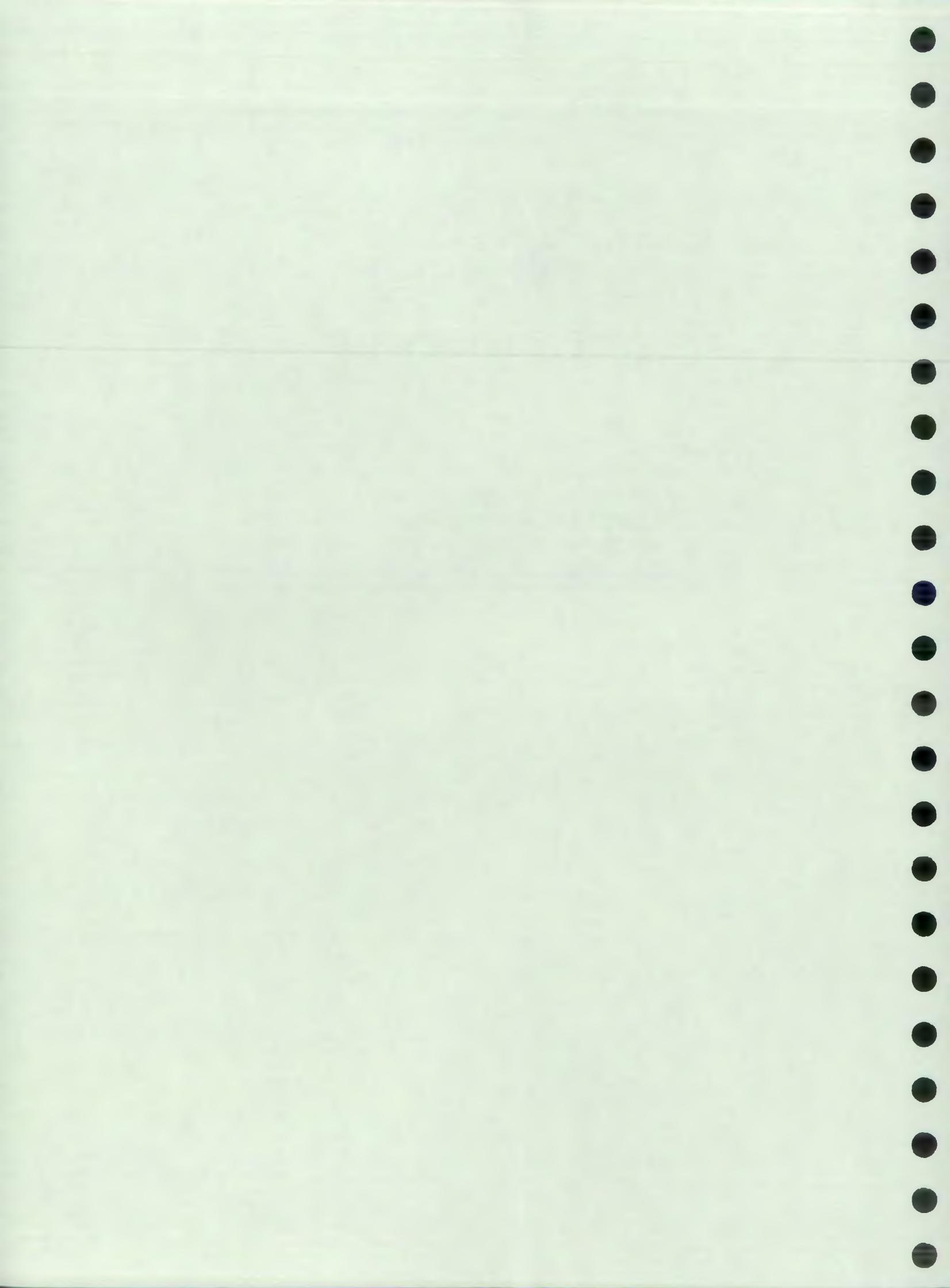
It has also been established that diffuse sources are a significant load contribution, principally from boating activities. Contamination arises due to the copper in anti-fouling paints and zinc in the sacrificial anodes. As this estuary is a high amenity boating area little direct action can be taken to limit this problem. However, we will work with marinas to achieve best practices to reduce inputs and the expansion of marinas and other leisure complexes could be potentially controlled in light of these problems.

Options	Responsibility	Advantages	Disadvantages
1. Control metals in direct discharges	AWS, Environment Agency, Industry	Input can be controlled and reduced	Cost to industry
2. Develop best practices with marinas and boat yards in estuary system	Environment Agency	Minimises further contamination	Time Cost
3. Develop metals budget for Upper Estuary	Environment Agency	Quantifies existing situation.	Cost
4. Initiate further monitoring to identify other sources	Environment Agency	Identifies unknown sources	None
5. Control future expansion of boating facilities to minimise these problems	Environment Agency, District / Borough Councils	Minimises further contamination	Constrains expansion of leisure facilities
6. Do nothing			Continued high levels of heavy metals will remain

Section Four

# Protection Through Partnership

This section will allow environmental issues to be identified, which the Environment Agency addresses or seeks to address in partnership, but which do not meet the criteria for inclusion as Issues within the Issues and Options section.



## 4.1 Introduction

The 'Protection through Partnership' section provides the opportunity to address longer-term management issues in partnership with others. It looks at how the Environment Agency can work with others for the benefit of the local environment. The timescales for action will depend upon our ability to work effectively with other groups, and requires a commitment from all to improve the environment.

This section identifies environmental issues, which the Environment Agency will address, or seek to address in partnership, but which do not meet the criteria for inclusion into the LEAP 'Issues and Options' section. The 'Issues and Options' section is aimed at catchment specific issues or perceived issues which can be resolved through SMART actions (specific, measurable, agreed, realistic and time-based) within a confined timescale of 5 - 10 years. Issues that do not fit this criteria include those that: can only be resolved over the longer-term, are not specific to this catchment (often Area, Region or Nation-wide problems) and those that involve actions which are part of our routine business of environmental regulation or monitoring the impacts upon the environment. These issues are more appropriately progressed as part of this 'Protection through Partnership' section.

We are well placed to influence activities affecting the environment through the *Environmental Protection Act 1990*, the *Water Resources Act 1991*, the *Environment Act 1995* and other associated legislation. However, for land use changes, development and activities outside this legislation, there is a need to create and maintain close partnerships with other organisations.

We are currently involved in many projects and activities that rely on partnerships. Close links are already established with Local Authorities, water companies, industry, angling clubs, conservation bodies, port authorities, recreation and landscape bodies. New partnerships will be sought, both with these organisations and with others. It is hoped that joint funding initiatives and joint ownership of projects will provide a more secure basis for environmental protection.

### **PROTECTION THROUGH PARTNERSHIP OPPORTUNITIES;**

Some of the major 'Protection Through Partnership' opportunities that the Environment Agency is leading on, or are contributing to, are outlined below:

#### Development Control

As a statutory consultee under Town and Country Planning legislation, the Environment Agency seeks to ensure that Local Planning Authorities (LPAs) are aware of the environmental implications of an individual development when deciding on whether to grant planning permission. In some cases we will ask the LPA to impose conditions on a development, to ensure that the impacts on the environment are minimised. Suffolk Coastal District Council are committed to a programme of enhancement for village and town centres. One of these is a scheme for Saxmundham, which potentially involves re-profiling the River Fromus. We will be supporting the council to ensure that the benefits to the town are in harmony with the river environment. We will endeavour to work with the relevant District/Borough Councils to ensure that any development is sensitive to the needs of the local environment.

### Possible Construction of A Tidal Barrage in the Ipswich Dock Area

Ipswich Borough Council are promoting a regeneration package for land on the shore of the Orwell Estuary. A feasibility study brief is being compiled and a consultant will be investigating options, issues, concerns, partnerships and funding. In our Long Term Plan we have plans to improve the tidal flood defences through part of Ipswich. In principle, we are prepared to enter a partnership with the Borough Council (and others) and place the funding earmarked for our scheme into a larger flood barrage proposal (incorporating a new road crossing). All additional funding would need to be raised by others, and the alternative proposal would need to be in place within a suitably agreed timescale. A full environmental appraisal, carried out by the partnership bodies, will be needed to assess the scheme.

### Future Development of Redundant Airfields

Of particular concern to the Environment Agency is a number of redundant airfields within the catchment. We will work with developers and Local Authorities to ensure that there is control over development and use of these airfields with respect to the surface water drainage discharges. There are a number of redundant MoD airfields, see Map 13, in the catchment where changes have taken place or are proposed. The surface water drainage systems at most of these sites are complicated and the drains generally have not been mapped. A number of significant pollution incidents arising from these airfield sites have occurred in the past. Without adequate control over any potential uses, these sites pose a substantial pollution risk. Redundant airfields are located at: Debach, Ellough (part), Parham, Leiston, Holton, Martlesham, Rattlesden, Mendlesham (part), Bentwaters, and Woodbridge.

### Development and Water Supply

Water resources in this Plan area are critical, with no further summer surface water available for abstraction and only nominal groundwater resources potentially available for abstraction in two of the ten sub-catchments (for reference to the sub-catchments see Map 21).

The Environment Agency works closely with Anglian Water Services and Essex & Suffolk Water in order to manage water resources in the area to achieve the proper balance between the needs of the environment and other water users. We operate our abstraction licensing system to regulate the water companies and other abstractors to ensure sustainable use of water resources and to protect the environment. Where water resources are fully committed locally, water can usually be supplied from elsewhere for public supply. However, it is vital that development does not proceed ahead of the necessary resources and infrastructure and that the full costs (including social and environmental) are considered. The Environment Agency will work with the relevant water supply companies and planners to ensure this is achieved. We will want sustainable water supplies to be agreed and demonstrated before development takes place.

The Environment Agency is also placing greater emphasis on demand management where this will reduce pressures on the environment or prevent the need for the development of new resources. We encourage measures such as Anglian Water Service's leakage control and metering programmes and initiatives to build water conservation into new developments - for example through low water use appliances.

### Standing Conference of East Anglian Local Authorities (SCEALA)

SCEALA is made up of planning representatives from councils in Suffolk, Norfolk and Cambridgeshire. The members of SCEALA have produced a strategy for regional development which was used by the Secretary of State to inform the Government Regional Planning Guidance Note (RPG6). This document stated inter alia that the overall objective for East Anglia must be to achieve environmentally sustainable growth and that this should be the key theme when updating Structure Plans. The Environment Agency has been involved in discussion on the Technical Panel of SCEALA. In particular, this has focused on the issue of water supply and whether future development may be restricted by this vital resource. These discussions, which also include talks on the economy, the general environment, development and transport are ongoing.

### Local Agenda 21

Local Agenda 21 (LA21) has been adopted to ensure that sustainable development is achieved on a local scale. Within the East Suffolk Plan area, LA21 is at varying stages of production. The future involvement of the Environment Agency on these issues will very much depend on the status of LA21 within each of the Local Authority areas.

Suffolk Coastal District Council have responded to Local Agenda 21 through the establishment of a "Greenprint Environment Forum" and the development of a greenprint guide of seventeen environmental policies to promote the conservation and sustainable use of resources. This will form the basis of a detailed environmental action plan. The Environment Agency has had considerable input as part of the forum. The Mid Suffolk Environment Forum have produced a document called "Making A Difference", outlining the history behind Local Agenda 21 and listing seven steps to sustainability. Other Local Authorities are also formulating Local Agenda 21 strategies.

The Environment Agency will, where practicable and relevant to our work, provide environmental information and work with others to achieve the objectives of sustainable development. We intend to support and contribute towards Local Agenda 21 initiatives within the Plan area. The Consultation Report and the consultation period within the LEAP process, positively reinforce the message of building partnerships, emphasising the importance of local action and assisting with achieving a greater sense of continuity.

### Biodiversity Action Plans

As part of the Environment Agency's input into Local Agenda 21 we are part of the Anglian Regional Biodiversity group aimed at translating the national initiative of biodiversity into a Regional context. At a local level Local Authorities and environmental organisations, including the Environment Agency, are compiling a Suffolk Biodiversity Action Plan with targets for specific habitats and species, many of which are relevant to this catchment. We are in a key position to influence many of these targets since Action Plans will be concerned with coastal habitats, wetlands and aquatic species (*i.e.* reedbeds, brackish lagoons, otter and crayfish). As such we are playing an active role in the production of the Biodiversity Action Plan and taking on specific responsibility to progress Action Plans for key species and habitats. The conservation of biodiversity will be a key indicator of the successful implementation of sustainable development in the Plan area.

### Litter

Although each Local Authority has specific responsibilities for litter control and clearance, the Environment Agency will endeavour to work with them, on tidal sections of beaches, to implement strategies to minimise this particularly acute problem. We have worked with Local Authorities at Waldringfield, Orwell, Felixstowe and Kessingland as part of our overall environmental strategy.

### Air Quality

The *Environment Act 1995* extends responsibilities of Local Authorities to establish action target standards for certain air pollutants so as to improve air quality. This may involve more extensive measures involving parties other than those regulated by local authorities as operators of processes prescribed for their control, "Part B processes", by the *Environmental Protection Act 1990*. The Environment Agency in its regulation of processes prescribed for its control, "Part A processes", will be required to participate in the setting and achievement of such local standards. Local Authorities will introduce assessments for local air quality in due course and, where it is shown to be necessary according to nationally agreed criteria, prepare Local Air Quality Management Plans for operation in defined areas where targets are unlikely to be met. The "alert" threshold for any pollutant or combination of pollutants would define the level at which there is a potential risk of exceedence of any air quality standard. If the level were reached or approached in a particular area, it should therefore trigger a mandatory obligation on the relevant pollution control authorities, including the Environment Agency, to investigate and where appropriate take remedial action.

### Shellfish Harvesting

Responsibility for compliance with the *EC Shellfish Hygiene Directive 91/492/EEC* lies with the District Council Environmental Health Department. However, the Environment Agency and Environmental Health Officers liaise regularly to discuss problems and promote investigations.

Within the Plan area the only commercial shellfish operation is at the Butley Oysterage, near Orford. Other estuary sites have the potential for shellfish harvesting and occasional gathering takes place at these locations.

### Oil Spill Contingency Plans

Control of marine oil spillages that occur within the Plan area will be subject to actions and procedures with our partners, in a similar manner to those currently developed for the Harwich Haven complex, where a Memorandum of Understanding exists between the Port Authorities and the Environment Agency.

In the event of a significant oil spill the County and District/Borough Councils and the Marine Pollution Control Unit will all be involved with the Environment Agency in protecting and cleaning operations.

### Education

Environmental education is a central means of furthering our commitment to sustainable development. Education offers people the capacity to address environmental issues which is vital to achieving a sustainable society. Education in its broadest sense means personal awareness, experience and interest developed over a period of time, whether at home, school, college or university, at work, or in the wider community.

The Environment Agency considers environmental education to be vital and we are actively developing an education service to help schools and colleges at all levels of the curriculum. We encourage local liaison and project-related work in the environment and provide several resource packs and data sets for students to use within their studies.

It is also part of the Environment Agency's routine business to promote environmental education in other sectors of society, including business and industry, local authorities and other key players. The Local Environment Agency Plan process positively contributes towards education in a fundamental way. The Environment Agency also undertake pollution prevention visits, attend road shows and science fairs, provide speakers, distribute educational documents and generally work in a pro-active way to protect the environment.

### Investment by the Water Companies

The Environment Agency continually influences the water companies to ensure that capital investments for environmental improvements to infrastructure are prioritised. Our influence on these matters is exerted through discussions with the water companies, the Department of the Environment (DoE), and the Office of Water Services (OFWAT), over statutory and non-statutory requirements.

### Artificial River Support from Effluent Discharges

Many of the rivers in this area carry a high proportion of effluent, which effectively artificially supports the river. If this effluent was ever to be diverted, this often critical input into a river catchment could disappear, leading to a consequent loss of resource. Although we have little influence on potential changes to these inputs, the Environment Agency will seek early consultation with Anglian Water Services, so that they inform us if they are thinking of making such changes.

### Waste Minimisation Schemes

As part of the Government's waste strategy, we are taking a key role in promoting waste minimisation within industry, and in the Agency's Eastern Area a number of initiatives are either underway or at the planning stage.

The project on which we have been working with Bernard Matthews Foods Limited and UK Waste Management Limited is thought to be the first of its kind. Our officers have conducted audits at six of Bernard Matthews' processing sites, and a series of recommendations - which include identifying potential savings - have been made to the company. One of the sites is within the Plan boundary and the audits we have undertaken have allowed us to develop expertise in this field which will eventually be applicable to the entire Plan area. However,

it is already apparent that this work will identify opportunities for significant waste reductions.

We already offer advice to companies on how to reduce the use of raw materials, water and energy, as well as recycling of waste materials such as packaging waste, and intend to develop this work. We are currently trialing the "Waste Minimisation and Waste Management Best Practice Guide" produced by the Agency, and hope that some companies in the Plan area will be involved in this. The Guide demonstrates how companies can go about establishing waste minimisation initiatives, and is supported by visits and telephone advice from Agency staff as needed. If the trial is successful it is intended that the document will be published in the autumn of 1997, and will be used as the basis for expanding our work with industry in this field.

We also intend to become involved in minimisation of household waste, and it is hoped that it will be possible to set up a community-based scheme in the Plan area in partnership with Suffolk Coastal District Council and possibly other relevant bodies. This project is still at a very early stage.

#### Conservation Enhancement Projects

The Environment Agency has developed many partnerships to implement environmental enhancement. We have carried out improvements to Darsham Marsh Nature Reserve in conjunction with Suffolk Wildlife Trust, improved the management of Easton Valley (part of Benacre to Easton Bavents Special Protection Area) in partnership with English Nature and landowners (supported by a European LIFE fund), surveyed and improved the management of riverine trees with the Gipping Countryside Management Project and improved the management of Penning Valley Nature Reserve with Mid-Suffolk District Council.

#### Fisheries Enhancement Projects

Fisheries management partnerships have also been developed, for instance, through the funding of platforms for disabled anglers on the River Gipping.

#### Coastal Protection

Within the framework of the Shoreline Management Plan, we are continuing to develop liaison processes with the relevant District Councils who have responsibilities for cliff erosion under the *Coast Protection Act 1945*. This will ensure that our respective coastal and sea defence activities are complementary and do not have any adverse effect on adjacent frontages.

#### Stour and Orwell Estuaries Management Plan

The Stour and Orwell Estuaries Management Plan was coordinated by a sub-group of the Suffolk Coast and Heaths Partnership whereby each partner aims to coordinate their work to conserve and enhance the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB). This sub-group is collectively known as the Estuaries Group and includes the Environment Agency. The shared objectives formulated in the document are to maintain and enhance wildlife conservation and landscape, improve and extend facilities for recreation, resolve existing conflicts between interests and support and encourage sustainable agriculture. As a member of the Estuaries Group, we are aware of, and aim to achieve, the objectives set out by the Estuaries

Management Plan and will work in partnership with the other members of the Group to protect this area of East Suffolk.

### Recreational Opportunities

The Environment Agency works closely with many countryside management projects, for instance, through our involvement in the Suffolk Coast and Heaths partnership, the Gipping Valley Countryside Project and the Greenways project, to improve recreational opportunities in the Plan area.

### Water Level Management Plans

The implementation of Water Level Management Plans (WLMPs) requires partnerships between all individuals and organisations who have an interest within a Plan area such as English Nature, Wildlife Trusts, the Royal Society for the Protection of Birds (RSPB), the Farming and Rural Conservation Agency (FRCA) and owners and occupiers. As the operating authority, the Environment Agency has prepared eight separate WLMPs for parts of the East Suffolk LEAP area. These WLMPs can be seen in Appendix 17. The Environment Agency aim to integrate the views of all the relevant interests at the site to ensure that a balanced and sustainable water level regime is adopted. Other operating authorities are also producing WLMPs and the Environment Agency work closely with these bodies, to ensure full consultation and appropriate objectives are reached. The implementation of the WLMPs objectives depends upon the approval and cooperation of all the relevant interests and initiatives for joint funding between the interested parties to ensure that these wetland conservation sites are protected and enhanced.

### Summary

Many other partnerships occur or are planned within the Environment Agency, all of which are designed to deliver the mutual objectives of the partners involved. The Environment Agency has a diverse network of relationships with many national, regional and local organisations as well as landowners and the general public. One significant area for future development will be the building of partnerships to aid environmental education. It is through these partnerships that we are able to fully contribute towards the goal of sustainable development.

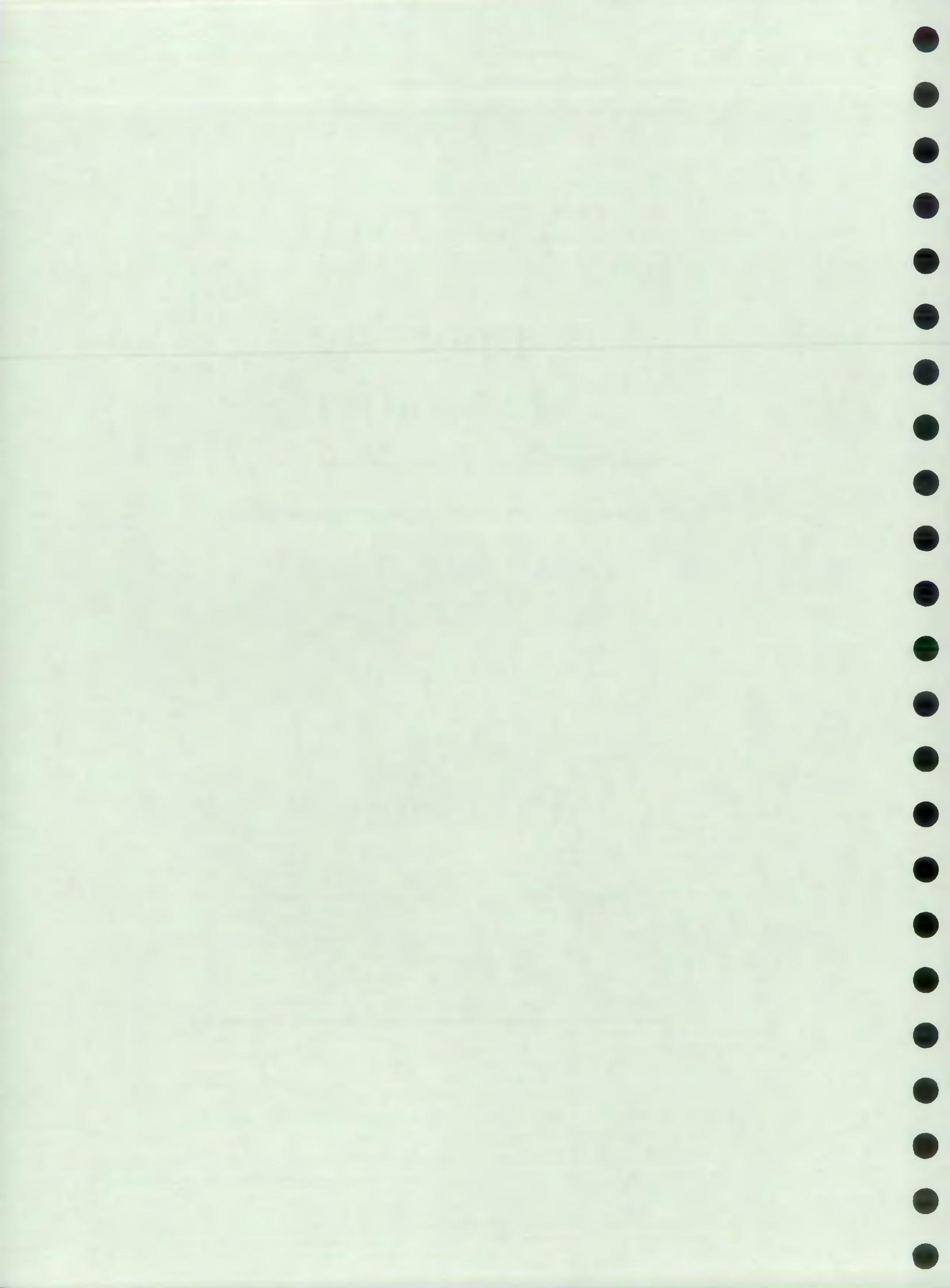
# PART TWO

## Supporting Information

### Section Five

## Uses, Activities And Pressures

This section identifies the major activities within the Plan area. It also outlines the environmental pressures that these activities place upon the East Suffolk Plan area, together with a description of the Environment Agency's responsibilities.



## 5.1 INTRODUCTION

The purpose of this section is to identify and summarise the uses, activities and pressures in the Plan area which exert an influence upon the wider environment. This information consolidates the understanding of the Plan area against which future actions will be considered.

The information presented in this section is limited to those activities and pressures upon which the Environment Agency has direct or indirect influence.

## 5.2 THE NATURAL ENVIRONMENT

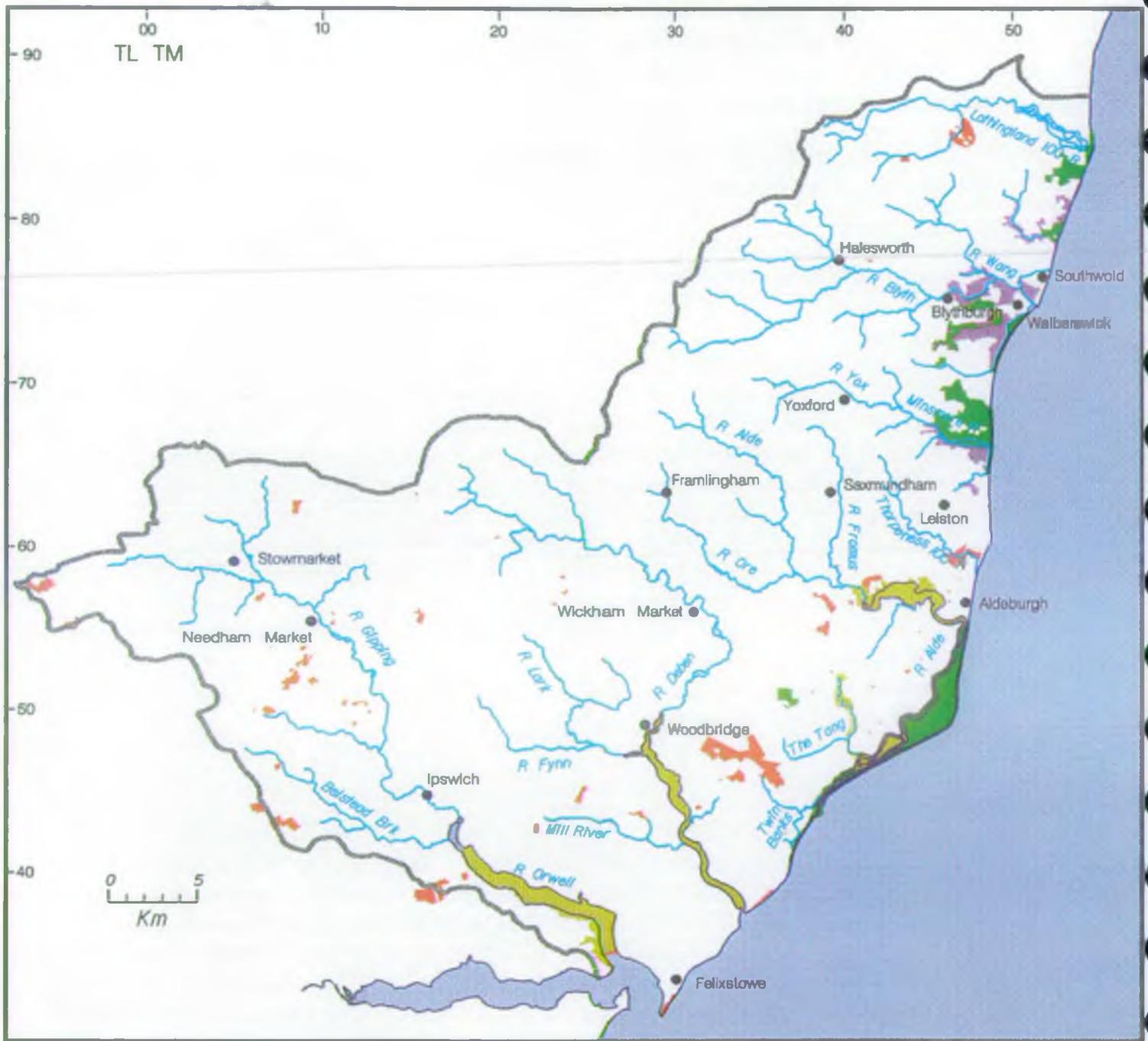
### 5.2.1 General

The Environment Agency, through both its regulatory and operational activities, has a significant impact on the natural environment. This is particularly so where wetlands, rivers and coastal habitats are involved. Whilst implementing our flood defence, water resource and pollution prevention functions the *Environment Act 1995* places a duty upon the Environment Agency to conserve and enhance natural beauty, flora and fauna whilst promoting recreation. These duties are particularly relevant in areas of high value for wildlife or landscape and archaeology which are recognised and formally protected through various designations. East Anglia is particularly rich in wildlife with over one third of the key species and important habitats identified in the "UK Biodiversity Action Plan" found here. However over the past decades, dramatic declines in habitat and species have occurred, making what remains even more precious.

### 5.2.2 Local Perspective

The coastal zone of the East Suffolk Plan area is recognised as being of considerable national and international importance. The value for nature conservation lies in the intricate mosaic of wildlife habitats, from coastal habitats to grazing marsh, reedbeds, large tracts of Sandlings heathland and woodland. Many of these habitats support rare and threatened plants and animals, in some cases of national and international importance. Large sections of the coast have been put forward as candidate Special Areas of Conservation (cSACs) in recognition of its international importance (*i.e.* Minsmere, Walberswick and Benacre), whilst other areas are designated as Special Protection Areas under the *Wild Birds Directive 79/409/EEC* (*i.e.* the Deben and Orwell estuaries - see Map 7). In addition to internationally important sites there are also numerous Sites of Special Scientific Interest (over 7000 ha) and County Wildlife Sites within the area.

Whilst only relatively small areas of the river catchments are of national importance in terms of their ecology (*i.e.* SSSIs), there are many County Wildlife Sites (CWS). A number of the smaller rivers in the catchment are not main river, but are still of importance for wildlife. Whilst the Environment Agency does not undertake any maintenance work on these minor watercourses they still require recognition and



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AGENCY**

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-  Main River
-  Coastline
-  Catchment boundary
-  SSSI

Designations within SSSIs

-  Special Protection Area (SPA), proposed or designated
-  SPA & Ramsar, proposed or designated
-  cSAC, SPA and Ramsar

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protection through management of water resources and pollution prevention activities. Similarly the coastal wetlands are fed by numerous springs issuing into dykes that feed the marshes. Protection of the water resources upon which these springs rely must be considered by the Environment Agency when managing water resources.

### **Coast**

The habitats of the Suffolk coast consist primarily of intertidal mudflats, saltmarshes and shingle banks. In some places there are small sand dunes, with extensive areas of brackish lagoons, reedbeds and grazing marshes either behind seawalls or natural defences (*i.e.* sand dunes/shingle formations). The Suffolk coast is recognised as an outstanding area for wildlife and natural features. The diversity of habitats, the associated plant communities and the breeding and wintering bird populations are of international importance.

In recognition of this nearly all of the coastline has been designated as a SSSI, an Area of Outstanding Natural Beauty (AONB) and a National Heritage Coast under domestic legislation. Many sites have been declared as Ramsar sites under international conventions and/or as candidate Special Areas of Conservation or Special Protection Areas under European legislation.

The area is particularly valued for a number of rare species some of which are specifically protected under international law (for instance river and brook lamprey, otter, and numerous species of wader, all listed in the *Habitats Directive 94/43/EEC* as requiring special measures of protection). In addition a high concentration of nationally rare and threatened species are present in the catchment, for instance the plants hogs fennel, native cord grass, red-tipped cudweed and sea heath. Red Data Book species of bird include breeding bittern, avocet, marsh harrier, redshank, sandwich tern and little tern, all of which are strongly influenced by our operational activities.

The coast is of great geomorphological interest, in particular for the shingle formations, examples being at Orford Ness (the largest vegetated shingle spit in Europe) and Benacre Ness. Brackish lagoons are a priority habitat in an international context and a number of important sites exist along the coast behind shingle ridges (*i.e.* Benacre, Covehithe and Shingle Street).

The Suffolk estuaries are of particular note and have all been designated as Special Protection Areas (SPAs), primarily for their importance for over-wintering waders and wildfowl.

### **Freshwater Catchment**

The Plan Area contains many small rivers, a number of which are important for wildlife, and in particular certain rare and threatened species (for example river water dropwort, otter and lamprey). Approximately 10% of river length in Plan area (43 km) has been classified with County Wildlife Site status because of its interest for either rare species or plants of invertebrate communities.

The catchment of the Lothingland Hundred river drains part of the coastal area of north east Suffolk. The area is predominantly agricultural, although towards the lower

reaches of the river, grazing marshes drained by numerous reed fringed dykes occur. The Hundred river itself is of considerable botanical interest with several aquatic species indicative of good water quality. Within the catchment eight water dependent CWSs exist including the large expanse of Kessingland levels grazing marsh (see Map 8).

Easton Broad River flows through the Benacre to Easton Bavents SSSI (also a SPA and Ramsar site). The site consists of coastal lagoons, fringed by extensive reedswamp and is of international importance because it regularly supports, marsh harrier and little tern. The valley is the subject of a joint project between the Environment Agency and English Nature and is part funded through the European LIFE fund to improve the management of water levels and the ecological quality of the reedbed. This project is linked to the Easton Bavents WLMP.

The catchment of the River Blyth meets the sea close to Southwold. The majority of the catchment is agricultural land, across which small tributaries run. In these watercourses, channel features and ecological interest are limited and some sections have dried out completely. The Blyth itself has riffles along its length and is lined with trees. Other rivers have considerably greater ecological interest, with reedbeds adjacent to parts of the River Wang (a County Wildlife Site), Hensham Park Watercourse, Bramfield Watercourse and the Dunwich River. The Dunwich River lies within the Minsmere/Walberswick Heaths and Marshes SSSI (also a Special Protection Area, a Ramsar site and a National Nature Reserve) which is of international importance for the number of wildfowl and waders it supports. There are nineteen water dependant County Wildlife Sites within the catchment of this river system.

The main interest within the Minsmere Catchment rests with the large reedbeds, adjacent to and through which a number of rivers flow. These reedbeds are part of the larger Minsmere/Walberswick Site of Special Scientific Interest (also a candidate Special Area of Conservation, a Special Protection Area and a Ramsar site). The western third of the Minsmere Valley is designated as a County Wildlife Site as it forms perhaps the last unspoilt and least improved of Suffolk's large marshland river valleys and contains several county-rare plant species. Also within this catchment are several scattered alder woodlands and marshes which add to the ecological interest of the area. Elsewhere however, the rivers tend to be of limited ecological interest, mainly due their small size.

The River Alde catchment drains an area of coastal east Suffolk. The Alde, Ore and upper Fromus have relatively abundant channel features along considerable lengths of their courses. The other watercourses in the catchment are small channels that are typically dry in places, with their ecological interest being limited to the belts of trees and shrubs which form corridors through the surrounding farmland. Scattered throughout the catchment are small alder woodlands, adjacent to which a number of the streams flow. A few sections of the upper Alde are of note for the presence of the native black poplar. The main ecological interest within the area is the Alde-Ore Estuary SSSI (also a candidate Special Area of Conservation, a Special Protection Area and a Ramsar site) but the river valley and catchment does contain a small number of water-dependant County Wildlife Sites. The latter includes the historic mere at Framlingham Castle and a number of important coastal grazing marshes adjacent to the

estuary, but outside the designated conservation areas.

The Deben catchment drains an area of agricultural land, meeting tidal waters above Woodbridge. The smaller tributaries are generally narrow channels with limited ecological value. The River Fynn, the Hasketon Watercourse and the Deben itself possess a number of channel features along their length and support nationally and county-rare plant species. The lower reaches of the Deben have locally extensive fringing vegetation, part of which is included in the Deben Estuary SSSI (also designated as a Special Protection Area and Ramsar site). Scattered throughout the catchment, adjacent to the rivers are occasional open water bodies, marshes and wet woodlands many of which are County Wildlife Sites. The Mill River is designated as a County Wildlife Site for its overall conservation value with adjacent reedswamps around its lower reaches, and marshes and alder carrs upstream.

The Gipping Catchment drains part of the East Suffolk Plan area. The River Gipping meanders in a south easterly direction through the county to become the tidal River Orwell in Ipswich. Many of the stretches of the Gipping between Stowmarket and Ipswich are of considerable conservation value and are therefore designated County Wildlife Sites. Scattered throughout the catchment, adjacent to the larger rivers are occasional open water bodies, marshes and wet grasslands many of which are designated SSSIs or CWSs. The lower end of Belstead Brook is bounded by reedbeds and marshy grasslands (designated CWSs) which form an important wildlife corridor with links to the River Orwell SSSI (also a SPA and Ramsar site).

### 5.2.3 Regulatory Framework

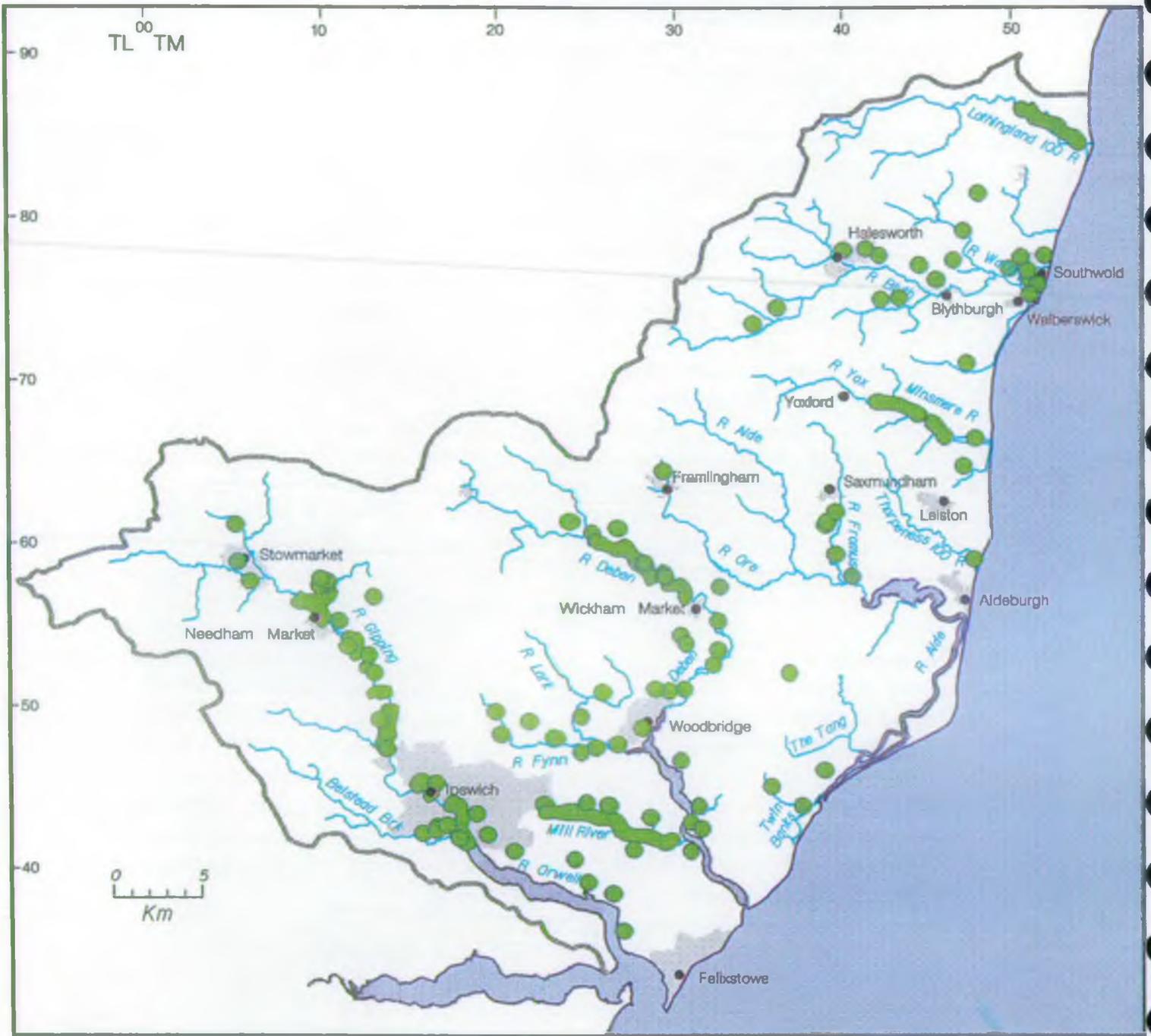
#### Role of the Environment Agency:

We have a general duty under Section 7 of the *Environment Act 1995* in formulating "any proposals relating to any function ... to further the conservation and enhancement of natural beauty and the conservation of flora and fauna". With regard to proposals relating to pollution control functions it is the duty of the Environment Agency "to have regard to the desirability of ... conserving and enhancing natural beauty and of conserving flora and fauna".

In a national context the most important sites for nature conservation in the United Kingdom are protected as Sites of Special Scientific Interest (SSSIs) under the *Wildlife and Countryside Act 1981*. Some SSSIs are considered to be of international importance and have been designated as Special Protection Areas (SPAs) under the *EC Birds Directive 79/409/EEC* to protect important populations and species of birds, or put forward to the European Union as candidate Special Areas of Conservation (cSACs) under the new *EC Habitats Directive 92/43/EEC* to protect internationally important species and habitats. This additional layer of protection binds the Environment Agency to ensure that none of its activities (for instance discharge consents, abstraction licences or flood defence operations) cause significant damage or deterioration to sites proposed or designated as SACs or SPAs. Furthermore, we are charged with reviewing and subsequently affirming, modifying or revoking past and present consents, permissions and other authorisations, with a duty to change these if a site is significantly affected.

# Water Dependent County Wildlife Sites

Map 8



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-  Main River
-  Coastline
-  Catchment boundary
-  Urban area

 County Wildlife Site

County Wildlife Sites are non-statutory areas identified as being important in a county or regional context. Whilst having no statutory protection it is important for the Environment Agency to recognise the presence of these areas in order to fulfil our general conservation duties to protect and enhance flora and fauna. Other regulatory organisations (*i.e.* Local Authorities) also recognise the importance of protecting these sites.

Other organisations that have a regulatory responsibility for nature and landscape conservation include English Nature, MAFF, the Countryside Commission and Local Authorities and the Environment Agency works closely with these organisations to fulfil its duty under the *Environment Act, 1995*.

### 5.3 LANDSCAPE AND ARCHAEOLOGY

#### 5.3.1 General

The historic landscape and archaeological assets of the environment include features such as hedges, walls, ditches and hay meadows, and archaeological features including megalithic monuments, castles, churches, deserted villages, great halls and bridges. Some sites, protected or managed for their historic interest, are also valuable for wildlife because they form important habitats.

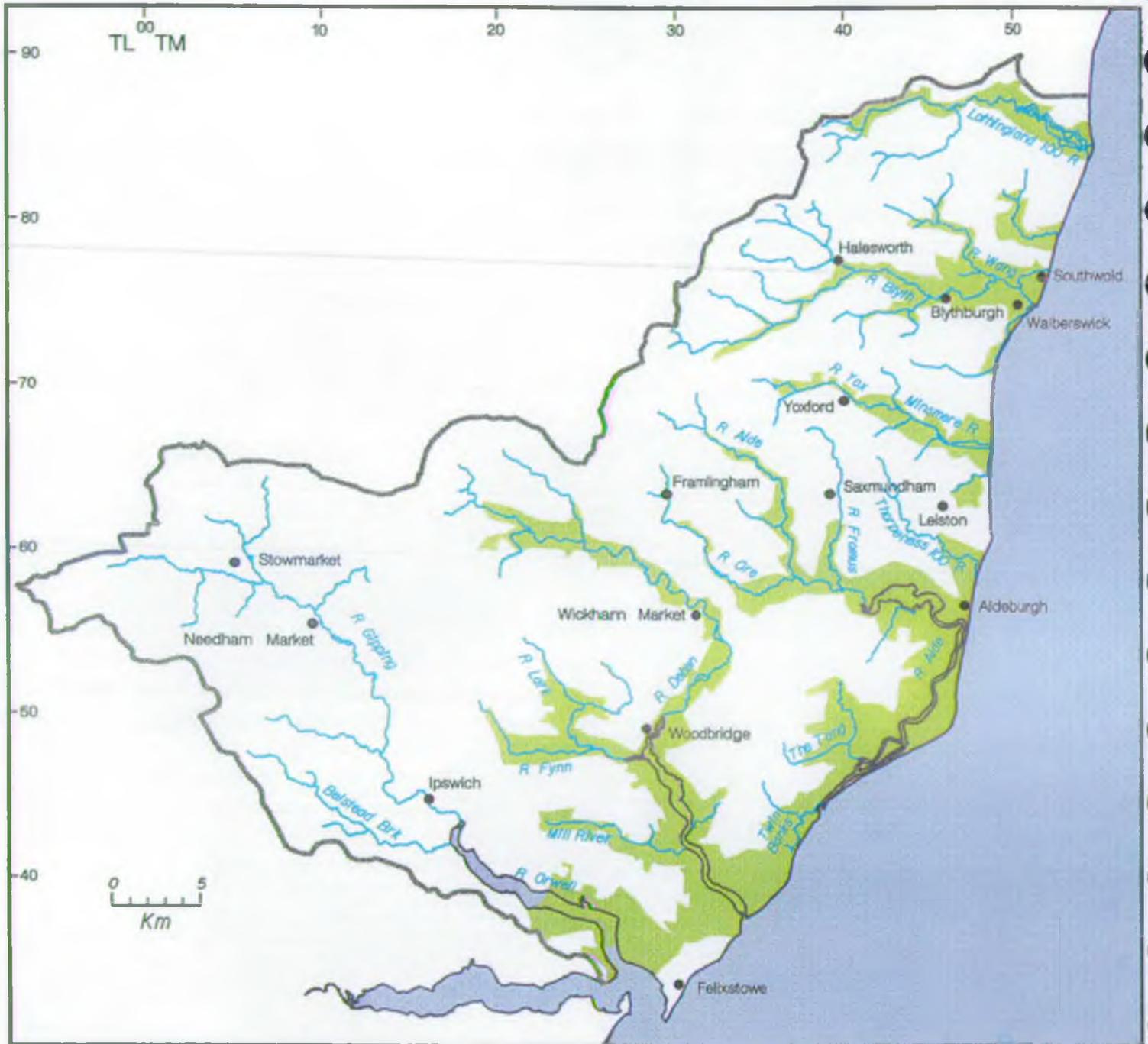
Change of land use and development (including farming practices and flood defence works) may result in ground disturbance and alter water table levels. Such change exerts a constant pressure on our landscape and archaeological heritage. Rivers, lakes, wetlands and alluvium-covered areas can be important in terms of archaeology because of the types of site preserved and the possibility of anaerobic conditions permitting the preservation of organic materials. Archaeological remains in these environments are possibly the least well documented because, until disturbed, remains preserved in these areas are among the best protected in the country. Water levels may be critical to preserving remains, as an increase may result in erosion and a decrease may lead to the destruction of previously water-logged deposits.

#### 5.3.2 Local Perspective

The river valleys of the east Suffolk coast, although varying in size and form, all share certain common characteristics and add greatly to the variety and diversity of the whole landscape. The rivers are generally narrow in width and meander peacefully through well-defined valleys. The rivers flow down into significant coastal marshes with particular landscape value. The coastal strip, with its wide variety of habitats and nature reserves, provides considerable attraction for visitors.

The area is renowned for its wealth of historic buildings and archaeological sites. The County Sites and Monument Record covers many sites of interest and, in addition, there are many unidentified archaeological sites. There is much public interest in our historic heritage and some sites (*i.e.* Orford Castle, Framlingham Castle and Sutton Hoo) attract many visitors.

# Suffolk River Valleys Environmentally Sensitive Area Map 9



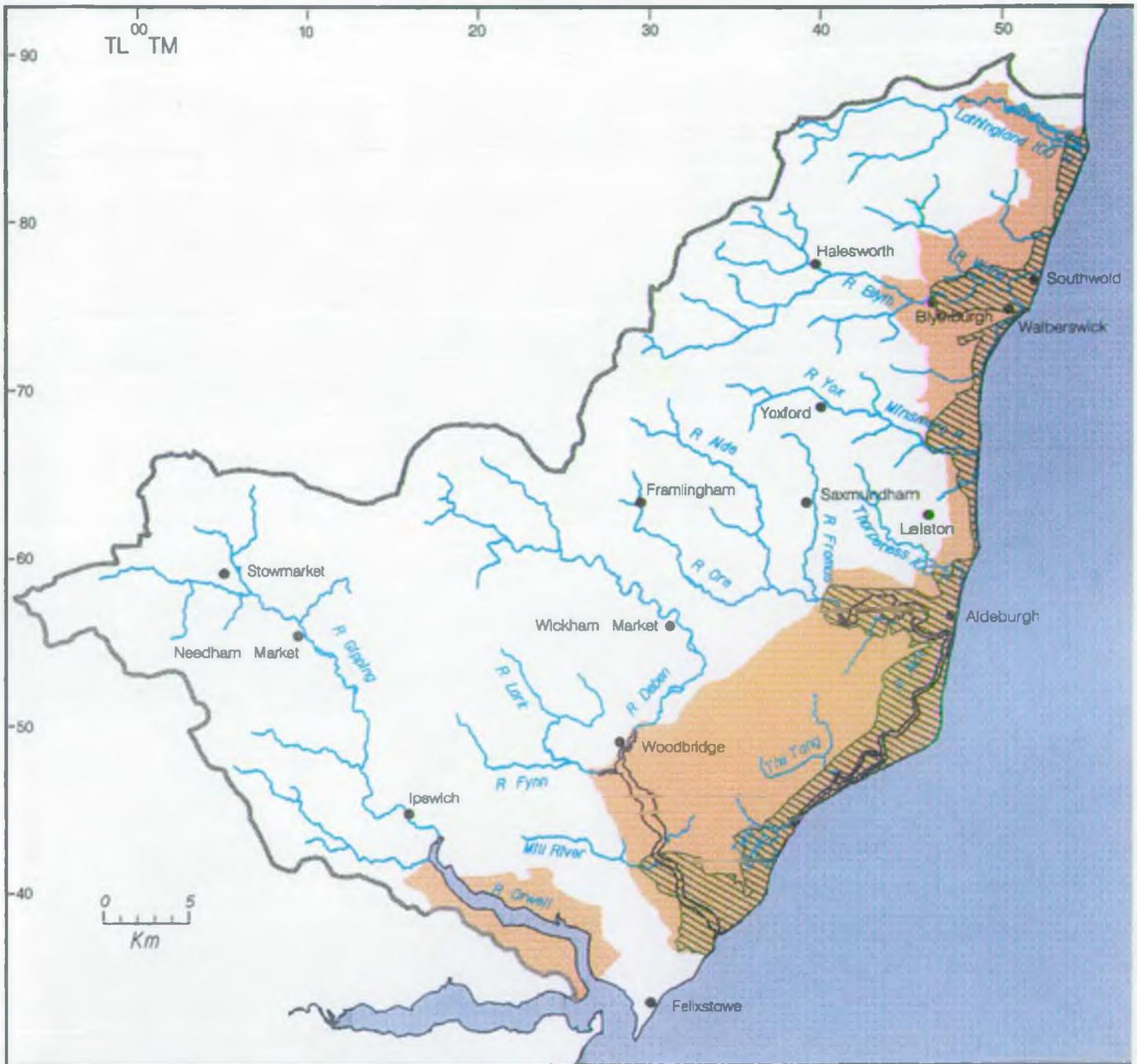
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- Main River
- Coastline
- Catchment boundary

- Suffolk River Valleys Environmentally Sensitive Area

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-  Main River
-  Coastline
-  Catchment boundary

-  Area Of Outstanding Natural Beauty
-  Suffolk Heritage Coast

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The Suffolk river valleys and hinterland are of considerable archaeological interest as the sandy soils and access to water facilitated early settlement. At present there are several hundred sites within the catchment, representing settlements and finds from the Palaeolithic period (pre 10,000 BC) to the post medieval period (AD 1500 onwards).

The County Sites and Monument Record includes a number of sites which are identified as being of national importance and which are designated as Scheduled Ancient Monuments (SAMs). There are 120 SAMs in the Plan Area. The number of these sites may increase over the next few years as a result of English Heritage's Monument Protection Programme.

Within this Plan area lies the Suffolk Coast and Heaths Area of Outstanding Natural Beauty, the Heritage Coast and the Suffolk River Valleys Environmentally Sensitive Area (ESA).

### 5.3.3 Regulatory Framework

Under Section 7 of the Environment Act 1995 the Environment Agency has a duty in "formulating... any proposals relating to any function to further the conservation and enhancement of natural beauty". This duty is particularly important when operating within the Area of Outstanding Natural Beauty and Heritage Coast where we consult closely with the Local Authorities and the Suffolk Coast and Heaths Project.

We also have a duty under Section 7(I) of the Environment Act "to have regard to the desirability of protecting and conserving buildings, sites and objects of archaeological, architectural, engineering or historic interest" and consult closely with Local Authorities over these issues.

The principal legislation affecting monuments in England is contained in the *Ancient Monuments and Archaeological Areas Act 1979*, which was subsequently amended by the *National Heritage Act 1983*. Scheduled Ancient Monuments are designated by the Department of National Heritage upon advice from English Heritage. They are therefore afforded statutory protection through the planning process.

## 5.4 DEVELOPMENT

### 5.4.1 General

Development within our cities, towns and countryside, and in particular the urbanisation of greenfield sites (land which has not been developed) has the single most significant impact on our environment. Development may include new building works, changes in land use, and the development of communication systems and other infrastructure.

Development can result in an increased risk/occurrence of flooding as a consequence of changes to surface water drainage and unsuitable development in the floodplain. The overall aim of the Environment Agency's flood defence policies (as set out in 'Policy and Practice for the Protection of Floodplains') is to secure and, where necessary,

restore the effectiveness of floodplains for flood defence and environmental purposes.

There is also an increased risk to water quality from effluent discharges to surface water and groundwaters and from increased pressure upon the sewerage infrastructure. Development leads to an increased demand on water for industrial use, public water supply and the potential loss to flora and habitats as a consequence, directly or indirectly, of remedial flood defence works and/or water quality problems.

The predicted change in land use is identified through Structure Plans and Local Plans. These development plans are increasingly recognising the importance of sustainable development and acknowledging that land is a finite resource of fundamental importance, both to the economy and the local environment. Many policies exist to protect the environment as a result. This may include bringing areas of vacant, derelict and under-used land within existing built-up areas (brownfield sites) into productive use, since this helps to reduce the requirement to find greenfield sites for new development, which inevitably involves some loss of natural resources within the countryside.

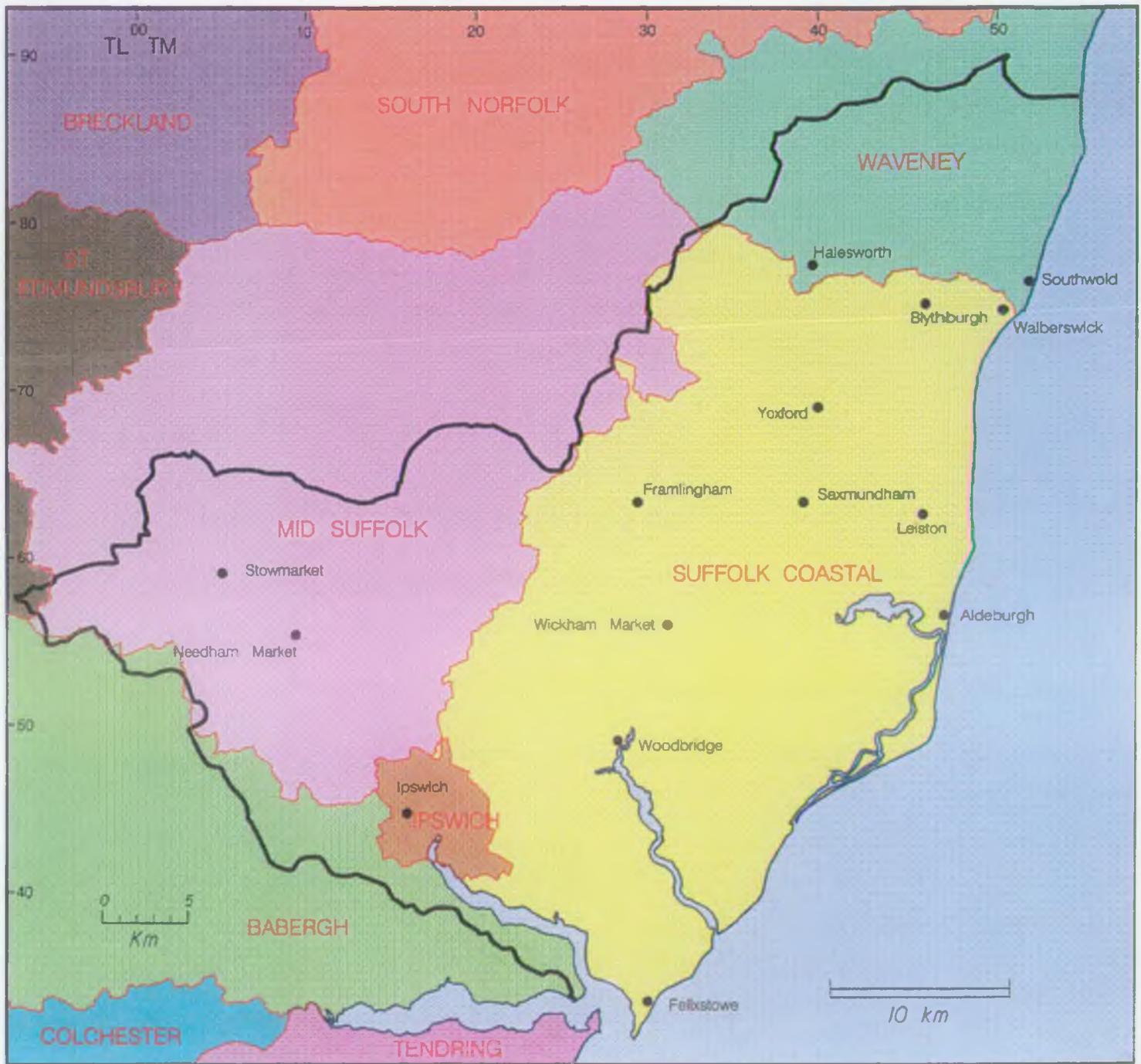
It is the intention of the Environment Agency to ensure that these development plans reflect the needs of the environment and contain policies that ensure environmental protection. Local authorities are key players in environmental management. They have the key planning role, which is fundamental to many of our internal functions and also play a central role in promoting local sustainable development initiatives. Successful environmental management at the local level will be critically dependent upon the ability of Local Authorities and the Environment Agency to work together. We therefore attach great importance to building such relationships with Local Authorities.

#### **5.4.2 Local Perspective**

All authorised development should seek to be sustainable, including all services which supply the development needs, and all products and waste produced. This adopts a holistic approach in the management of the environment. The Town and Country Planning system provides for development plans at two levels, Structure Plans and Local Plans. The status of these development plans within east Suffolk is shown in Appendix 18.

First, the Suffolk Structure Plan sets out key strategic policies as a framework to feed into local planning by District Councils, as well as providing guidance to statutory and other organisations for their own plans and programmes. This is prepared by Suffolk County Council and after a consultation period, a deposit plan, an examination in public and a statement of proposed modifications, will be formally adopted.

Second, the Local Plans prepared by the relevant District/Borough Councils set out more detailed policies and specific proposals to guide development in their areas. These are prepared by the respective Local Planning Authorities and, after a consultation period, a deposit plan, a public local enquiry and a statement of proposed modifications, will be formally adopted. The preparation of district-wide Local Plans is mandatory for all areas and the Government expected to see substantially complete coverage by the end of 1996. With regard to the state of development plans in the East



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- Catchment boundary
- Local Authority boundary

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Suffolk Plan are, approximately two thirds of them are formally adopted.

There are six Local Plans which cover the East Suffolk Plan area. These are the Waveney Local Plan, the Suffolk Coastal Local Plan, the Mid Suffolk Local Plan, the Ipswich Borough Local Plan, the St. Edmundsbury Local Plan and the Babergh Local Plan. There is also one Structure Plan, the Suffolk Structure Plan. More details of these Plans can be seen in Appendix 18.

From these Plans it can be seen that residential development has been restricted to the existing built-up areas, with modest growths at Halesworth, Saxmundham and Woodbridge. Growth at Stowmarket, Needham Market and Debenham has also been indicated in the Mid Suffolk Local Plan. The major allocation, however, has been allocated to the Ipswich fringe areas. The pattern of employment allocations has followed a similar trend, with 0.5 acres of new industrial land zoned at Halesworth, and sizable employment development at Bentwaters and the Ipswich area which includes Sproughton Road, Boss Hall Road, Hadleigh Road Industrial Estate, Claydon Industrial Park and the Copdock Industrial Zone.

A summary of the major development that is presently being constructed/planned within each of the District/Borough Council administrative areas is outlined in Appendix 19. In general, trends appear to show that there is an increased confidence in development and a large increase in enquiries. This would seem to follow with national trends that show that there is a national resurgence of development.

#### 5.4.3 Regulatory Framework

One of the most important statutory means available to Local Planning Authorities for the protection of the landscape from unnecessary or inappropriate forms of development is in the use of development control powers through the Town and Country Planning Act. It is the Government's intention that development will now be plan-led, setting out policies against which the Local Planning Authorities consider development proposals. Guidance for future development is contained in Regional Planning Guidance Notes (RPGs), Planning Policy Guidance Notes (PPGs), Department of the Environment (DoE) Circulars, Structure Plans, Minerals & Waste Plans and Local Plans.

The Environment Agency is a statutory consultee under planning legislation and advises County and Local Planning Authorities on development proposals which may have an effect on matters relevant to our interests. Our purpose is the protection of the environment and the prevention or mitigation of any adverse effects associated with development and land use change. It must be remembered however that the final decision on planning matters rests with the Local Planning Authorities, who have to work within the Town and Country Planning framework.

## 5.5 INDUSTRY AND TRANSPORT

### 5.5.1 General

Industry can impact upon the environment in many different ways. We aim to work with industry in a regulatory and advisory capacity to ensure that the environment is protected. The development and construction of industrial infrastructure can have a localised impact on the land and water environments. Industrial processes produce waste products that may be disposed of to the land, air or water environments (unless they have an alternative use or can be recycled). Such wastes that enter the water environment are considered in the 'Effluent Disposal' Section (5.7). The disposal of solid wastes is considered in the 'Waste Management' Section (5.8). This section introduces the variety of industry within the East Suffolk Plan area and considers the processes in terms of their emission to the air environment.

It should be noted that although there are small clusters of industry in the Plan area, the predominant activity is that arising from agriculture. The production of cereals and the rearing of livestock combine to form the two dominant farm types.

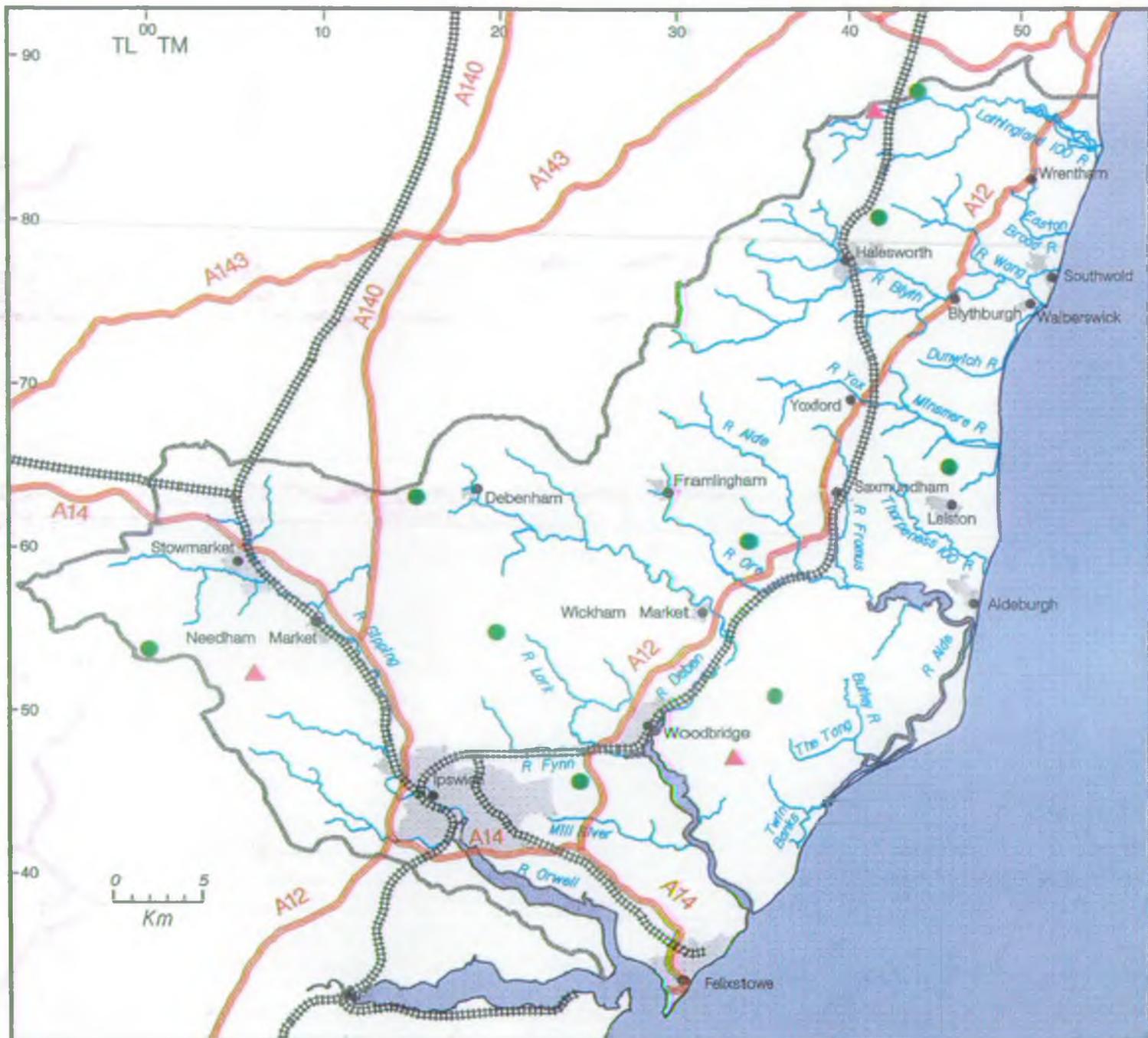
In addition to the development of residential, commercial and industrial areas, the development of transport and communication networks to serve these centres impose a threat on the environment in terms of emissions to the atmosphere.

Atmospheric pollution, resulting from man's activity on earth, is of local, national and global concern because it potentially affects the health of the human population and impacts upon the environment in general. Air pollution can occur from a number of sources and may be in the form of gas or particulate matter. The dispersion and dilution of pollutants depends upon various factors, including the physical characteristics of the release, wind direction and climatic conditions. Air pollution does not respect administrative or hydrological boundaries.

Air pollutants are considered to be reducing the atmosphere's natural protection against harmful radiation, whilst greenhouse gases are believed to be accelerating changes in the climate and potentially exacerbating sea level rise. Acid gas releases can contribute to the deterioration of historic buildings by chemical erosion caused by acid rain. Certain air pollutants can aggravate respiratory problems such as asthma and bronchitis.

The main sources of sulphur dioxide and nitrogen oxides (the most important gases contributing to acid rain) are emissions from road transport, conventional fossil-fuelled power stations, industry and the burning of fossil fuels for domestic purposes. Emissions from road transport also have a wide variety of environmental effects. Geographically, direct effects are normally limited to the main area near the road. However, many motor vehicle pollutants react to form secondary pollutants which can cause photo-chemical smog.

# Communication and Transport



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- Main River
- Coastline
- Catchment boundary
- Urban area
- Primary route
- Railway (passenger)
- Operating airfield
- Redundant airfield

### 5.5.2 Local Perspective

#### *Heavy Industry*

The Gipping valley, including Ipswich, has a substantial grouping of heavy industry, although the rest of the predominantly rural East Suffolk Plan area has a limited distribution of such development. Map 14, illustrating Pollution Incidents, demonstrates the grouping of industrial installations within the Gipping valley and the high number of incidents. Installations range from paint manufacturing, malt, sugar and cement production to the traditional heavy engineering companies. Several of these companies have Integrated Pollution Control (IPC) authorisations for prescribed processes. Examples of these are ICI, Blue Circle Cement and British Sugar.

Pressures normally arise from the disposal of treated trade effluent directly into the Rivers Gipping and Orwell or via the Sewage Treatment Works. A mechanism for managing these inputs and impacts exists with our water quality modelling simulations, that have been used in the management of river water quality in the Gipping. Occasional pollution incidents into this water supply river are an additional pressure that is addressed through a pollution prevention campaign with all companies.

In the past groundwater and soil pollution has occurred in some parts of the area as a result of traditional heavy industry processes. The Environment Agency is currently proactive in the management of existing groundwater and soil contamination at the remaining sites of concern.

Contamination of groundwaters has historically occurred from heavy industrial sources due to a lack of regulatory controls. Waste deposited in landfill sites and on waste ground such as at Tuddenham and Orford Ness are examples of this type of problem that now gives rise to pollution (see Issues C3 and C5).

#### *Light Industry*

Light industry is present in many of the smaller towns throughout the area, most notably in and around Ipswich. Common examples of firms in this category are light engineering/fabrication, food repackaging/wholesaling, electronics/computing specialists and marine-related companies.

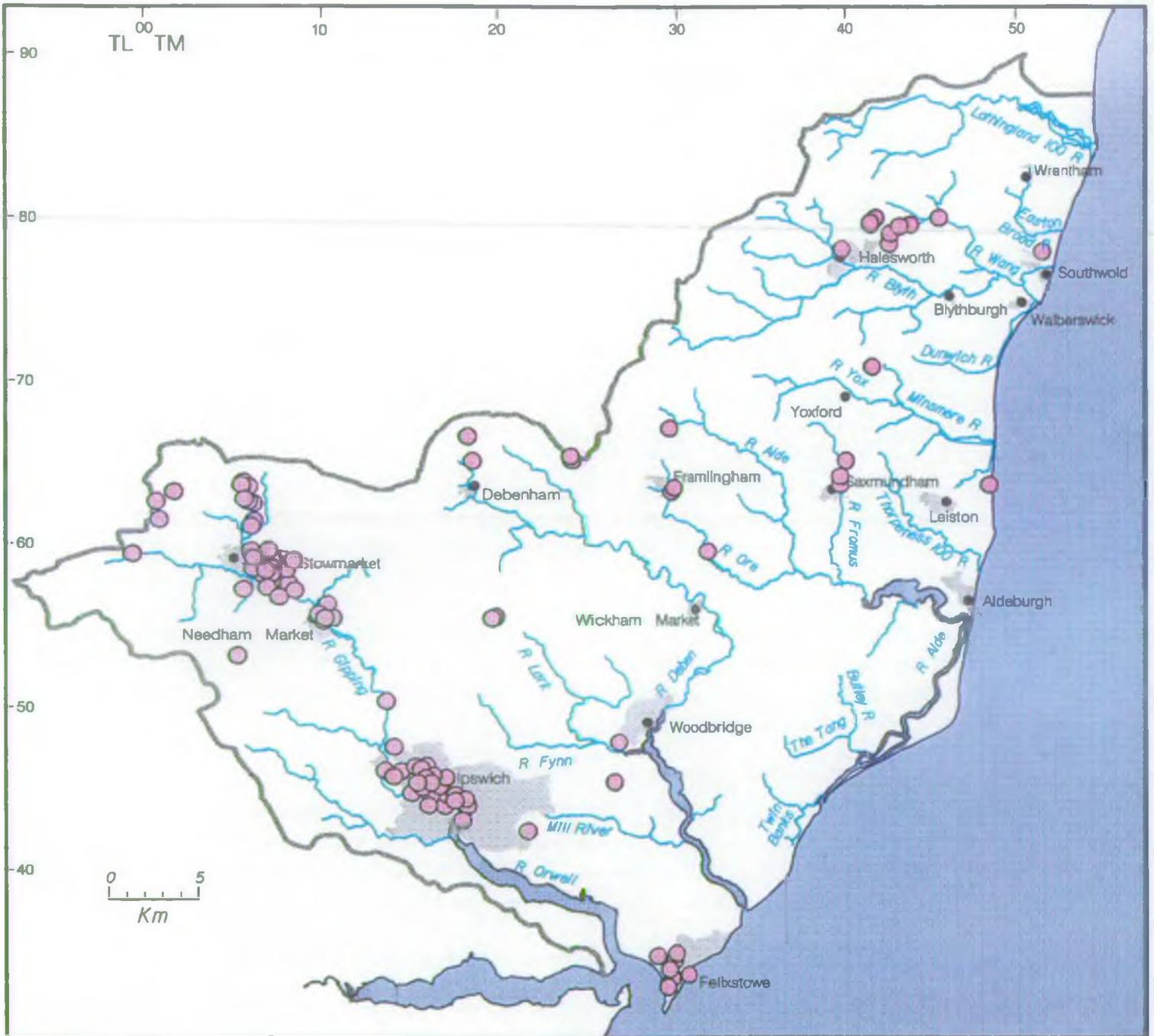
Although the Environment Agency undertakes pollution prevention work in cooperation with such companies, it is the impact of oil spillages that is still the most common problem. To this end, we continue our work to improve storage and handling arrangements. The quantities and types of wastes involved are considered in the 'Waste Management' Section (5.8).

#### *Power generation*

##### Nuclear Power

The nuclear power stations, Sizewell A and Sizewell B, are probably the area's highest profile industrial sites. The Sizewell A station has twin reactors of the Magnox type, each with a gross capacity of 250 Megawatts of Electrical Output (MWe). The station is owned and operated by Magnox Electric and first provided power in 1966. The Sizewell B station is the UK's newest commercial nuclear power station, and began

# Water Pollution Incidents – Industrial Sources (1991–96) Map 14



**ENVIRONMENT  
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June 1997

-  Main River
-  Coastline
-  Catchment boundary
-  Urban area

 Source of pollution

providing power to the national grid in 1995. The station has a single pressurised water reactor with a gross capacity of 1258 MWe. The station is owned and operated by Nuclear Electric Ltd, part of British Energy plc.

For both stations, authorisations to dispose of certain radioactive wastes, under the *Radioactive Substances Act 1993*, have been granted, including authorisations to dispose of liquid wastes to the North Sea and gaseous wastes to the atmosphere. Sizewell B also has authorisations under the Environmental Protection Act 1990 for combustion and incineration processes. Regulatory responsibility for all of these authorisations rests with the Environment Agency, while regulatory responsibility for safety matters and the storage of radioactive wastes on site lies with Her Majesty's Nuclear Installations Inspectorate, part of the Health and Safety Executive.

The discharge of conventional cooling water from Sizewell B is the largest daily volume into UK waters and its impact on the surrounding waters and fishery has been widely researched and modelled. Thermal impact is restricted to the immediate mixing zone area although long term studies continue. Control of this discharge is exercised through a combination of self-regulatory monitoring, passed to the Environment Agency on a regular basis and audit visits by our staff for independent sampling checks.

#### Hydropower

There are four potential hydropower sites on the River Gipping to be found at Baylam Mill (TM 112 528), Sroughton Mill (TM 125 452), a mill at Bramford (TM 126 483) and a weir in Ipswich (TM 154 442). At present, there are no definite plans for the development of these sites. Their development is unlikely under present electricity trading conditions. However, there is potential for it to become commercially attractive in the future.

#### *Transport*

An effective transport system is essential to benefit both the local and national economy. However, continuing growth in road transport and its consequent environmental impacts prevent a major challenge when faced with the concept of sustainable development. As Suffolk is predominantly a rural County nearly three quarter's of its total highway length is unclassified. The major A-Roads within the Plan area are the A12, A14 and A140. Map 13 identifies the main transport links. The Department of Transport's Road Programme does not identify any major road transport schemes within the Plan area in the near future. The rail network in Suffolk centres on Ipswich with lines to Norwich, via Stowmarket, to Cambridgeshire via Bury St Edmunds, and to London and Felixstowe. As can be seen from Map 13 the rail network follows similar routes to the primary road network and provides services for passengers and freight. The majority of the freight via road and rail is transported to destinations throughout Europe and further afield via the Ports of Felixstowe and Ipswich. More details on these container ports can be found in the 'Ports, Harbours and Commercial Navigation' Section (5.15).

### 5.5.3 Regulatory Framework

#### **Role of the Environment Agency:**

The *Environmental Protection Act 1990* assigned responsibilities for regulation and control of releases to the environment from a variety of industrial processes, and introduced a regulatory approach to Integrated Pollution Control. The regulation of the 2500 (national figure) most potentially polluting processes was assigned to the Environment Agency. These are known as Part A prescribed processes. The Environment Agency must be satisfied that such processes meet the objective of ensuring that the Best Available Techniques Not Entailing Excessive Costs (BATNEEC) are used to prevent, minimise and render harmless releases of prescribed substances to any environmental medium for which the substance is prescribed, and to render harmless all other substances that may be released. A further requirement is to have due regard to the Best Practicable Environmental Option (BPEO) available in respect of those substances which may be released. In this context, consideration of BATNEEC and BPEO are, primarily, site specific.

The Environment Agency is required to ensure that statutory Environmental Quality Standards are not exceeded. Although standards have been established for releases to air and water, there are no standards for depositions to land. Environmental Quality Standards for air are set for several substances including Nitrogen Dioxide, Sulphur Dioxide, Suspended Particles, Benzene, 1.3 Butadiene, Carbon Monoxide, Ozone and Lead.

Under the *Water Industries Act 1991*, referrals from Sewage Undertakers for trade effluent discharges to sewer involving prescribed substances, from processes which are not subject to IPC, are managed by the Environment Agency. These involve the application of the Best Technical Means Available (BTMA) to protect the sewage works itself and the controlled waters receiving the final discharge.

#### **Role of the District/Borough Councils:**

A further 8000 (national figure) processes were assigned to Local Authorities for control of releases to air only, using the same concepts of BATNEEC. These are known as Part B processes. A small number of these processes have been transferred, on direction from the Secretary of State, to Environment Agency control for releases to air only. Such directions have been made, typically, where the Environment Agency already regulates the process under other legislation, thus avoiding duplication or potentially conflicting requirements being placed on an operator.

## 5.6 RADIOACTIVE MATERIALS - STORAGE, USE AND DISPOSAL

### 5.6.1 General

Radioactive substances can be used in many ways that are beneficial to mankind. These include the generation of electricity, medical diagnosis and therapy, scientific research and specialised industrial applications. However, most operations involving the use of radioactive material generate radioactive wastes, which need to be controlled appropriately. These wastes can occur as gases, liquids or solids. Airborne and liquid

waste may be discharged to the environment, after treatment if necessary, while solids are disposed of to appropriate sites or stored until a suitable disposal route becomes available.

Radioactivity can also occur through natural sources. Most radiation exposure to the population is through cosmic rays, gamma rays from the earth, radon and thoron decay products in the air, and various radionuclides in foodstuffs. Very little exposure (less than 0.1%) results from the discharge of airborne or liquid radioactive waste. The volume of solid radioactive waste is small in comparison with other wastes, accounting for only 0.02% of the total annual waste production in the UK, and nearly four fifths of the radioactive waste that is produced contains only a relatively small amount of radioactivity.

### 5.6.2 Local Perspective

Radioactive materials are used for a variety of purposes within the catchment, including power generation (see Section 5.5.2), medical diagnosis and therapy, research and industrial uses.

### 5.6.3 Regulatory Framework

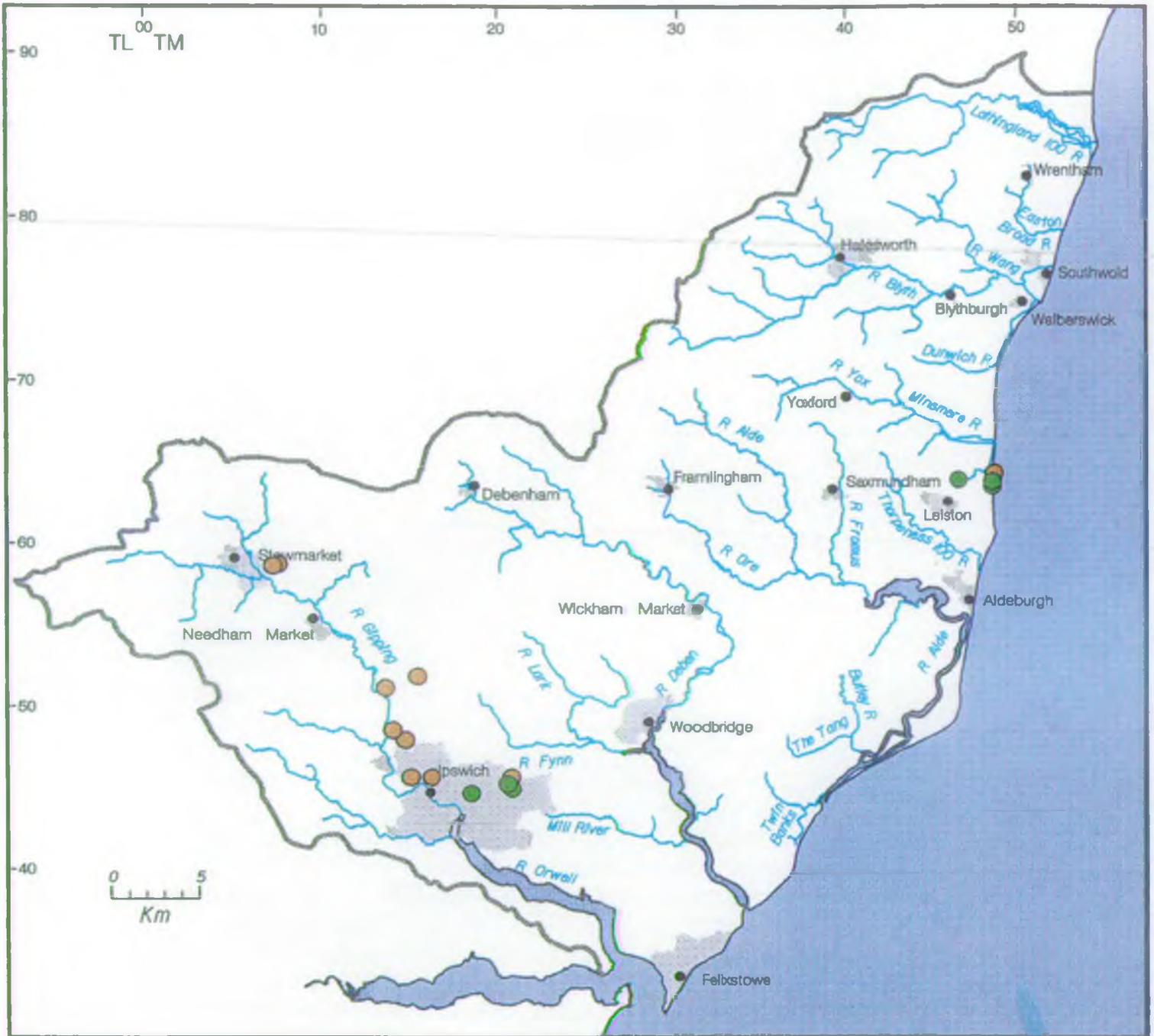
The Environment Agency regulates the keeping, use and disposal of radioactive substances under the *Radioactive Substances Act 1993*.

Users of radioactive materials, and premises where radioactive sources may be kept and used, are registered by the Environment Agency. Conditions are imposed to ensure that holding and transfer is properly recorded and supervised, and that correct procedures are in place for ensuring the proper disposal at the end of the useful life of the sources.

The Environment Agency is responsible for issuing authorisations for those undertakings which generate and dispose of radioactive waste, whether to air, the aquatic environment, landfill, or specified repositories. The Environment Agency ensures that proper assessments of the impact on the environment are carried out and that the disposal is carried out in such a way so as to prevent harm to humans or to the environment. We also ensure that the disposals conform to the requirements of Government policy.

Various exemption orders made under the Acts permit the holding and disposal of radioactivity where the usage is widespread and where the quantities involved are of such low magnitude so as not to present any risk to the public or the environment (eg. domestic smoke detectors). Users working under exemption orders are still subject to compliance inspections by Environment Agency inspectors.

In the context of radioactivity, the guiding principle is 'As Low As Reasonably Achievable' (ALARA) and, because radioactivity can be measured accurately in very low concentrations, the standards to be achieved are high.



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-  Main River
-  Coastline
-  Catchment boundary
-  Urban area

-  Integrated Pollution Control site
-  Radioactive Substance site

June 1997

## 5.7 EFFLUENT DISPOSAL

### 5.7.1 General

Effluents are principally treated sewage and industrial discharges although, under particular conditions, discharges of untreated effluent may also occur. In this Plan area the majority of discharges are those arising from small to medium sized population centres. The treatment systems for domestic sewage are well proven and the majority of these fall into traditional categories of percolating filters and aeration units. Industrial treatments, however, invariably have specific units for that particular process, although the majority of industry in this Plan area will not generate effluent in any quantity.

Untreated effluent sources include those discharges from consented emergency and storm water overflows from sewerage systems. Emergency overflow discharges occur due to electrical or mechanical breakdown of pumps which transfer sewage to the Sewage Treatment Works. These overflows are necessary to prevent foul sewage flooding properties when pumps fail. Storm water overflows are constructed on foul drainage systems which receive surface water in addition to sewage. These combined sewerage systems are often found in older parts of towns and cities, but more modern developments have separate foul and surface water systems.

In rural areas many properties are not served by public utility Sewage Treatment Works. In such areas, properties make use of small, private treatment plants and septic tanks. These discharge to land and/or a watercourse and can impact on ground and surface water quality.

Consents for sewage works can consist of two types. Numeric consents are usually applied to larger works and have limits for suspended solids, biochemical oxygen demand and ammonia, commonly known as sanitary determinants. When treatment works are known to receive trade inputs, consideration of the need for standards to control dangerous substances will be required. Descriptive consents (which have no numeric conditions), are usually applied to smaller works and generally consist of statements describing the type of treatment necessary.

### 5.7.2 Local Perspective

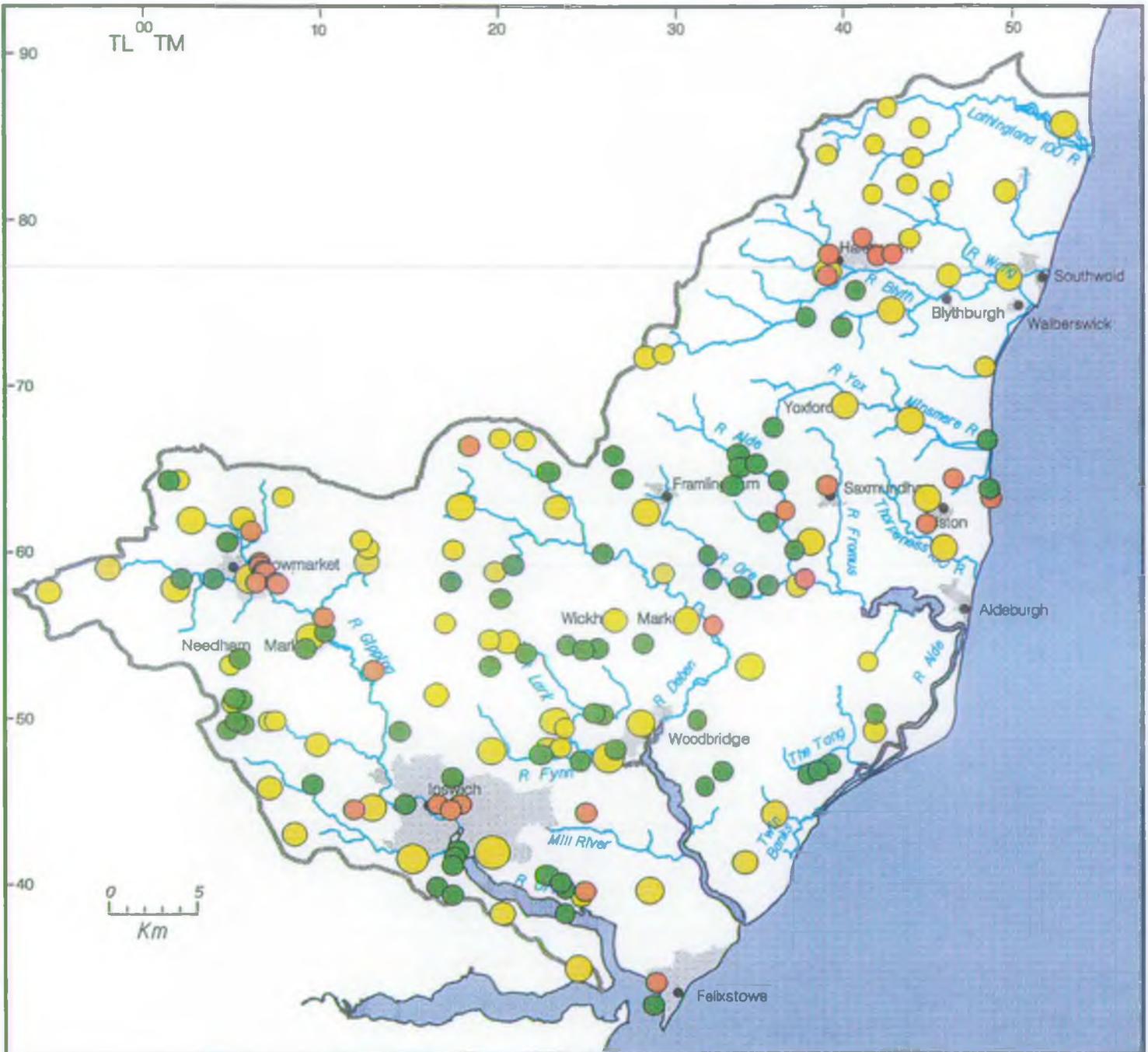
#### **Sewerage and sewage treatment**

In this Plan area most of the large sewage treatment works are operated by AWS. All of these discharges are controlled in terms of quality and quantity by consents issued by the Environment Agency.

Treated sewage discharges into the freshwater rivers are all subject to secondary biological treatment with stringent consent conditions due to the lack of dilution in these small rural rivers. For example the treated discharges from the towns of Stowmarket, Framlingham and Leiston all enter the headwaters of rivers and consequently have to meet tight consent standards in order that river quality objectives are maintained downstream. Map 16 shows the distribution of such works within the Plan area, revealing many small to medium sized conventional sewage treatment works across the

# Discharges To Controlled Waters

Map 16



**ENVIRONMENT  
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-  Main River
-  Coastline
-  Catchment boundary
-  Urban area

Anglian Water Services  
Population equivalent:

-  < 250
-  250-1,000
-  1,000-10,000
-  10,000-20,000
-  > 20,000

-  Private sewage discharges
-  Industrial discharge points

entire area.

Consideration is currently being given to the levels of the nutrient phosphorus in the River Gipping and the requirement of the *Urban Waste Water Treatment Directive* in respect of reducing these nutrients from the larger works within the Plan area. Phosphorus reduction is being planned for the two largest STWs in the River Gipping catchment at Stowmarket and Needham Market.

The coastal discharge at Aldeburgh is untreated, but is adequately dispersed by a long sea outfall, therefore not impacting on the quality of local bathing beaches. This small town is below the threshold requiring treatment improvements under the *Urban Waste Water Treatment Directive*. Secondary treatment facilities are being constructed for remaining estuarine and coastal discharges to meet the requirements of the Directive.

Although many treated sewage effluent discharges achieve a quality significantly better than the legal consent standard, development pressures in some of the towns will have potential impacts on river water quality and therefore on our management strategy. Negotiations with AWS will establish priorities for those areas most at risk from such pressures.

#### **Intermittent Discharges**

Associated with most sewerage systems are sewage pumping stations and combined sewer overflows. These discharges of untreated sewage are only permitted in the event of plant failure or heavy rainfall when damage to installations or property would result.

Problems do exist in respect of crude sewage discharges from storm overflows in the towns of Framlingham and Leiston. Storm overflows from the Ipswich sewers have significantly impacted on the river water quality of the Gipping and Orwell. The Ipswich sewerage scheme, developed by AWS in conjunction with the Environment Agency, will resolve many of the system's historic problems. The frequently occurring overflows into the Gipping and Orwell will be reduced to such a frequency that will ensure that water quality objectives and targets are met.

Much of the sewerage scheme will be completed by the end of 1997, with contaminant tanks and associated screening in place on all the major overflows. However, a tunnel to relieve inadequate sewers in west Ipswich will not be completed until 1999, due to the complexity of this major tunnelling project.

Anglian Water Services have developed a comprehensive improvement scheme for Ipswich to address water quality and flooding issues. In many cases they have gone beyond their statutory obligations in order to achieve an overall environmental improvement.

**Industrial and trade waste water disposal**

Within the Plan area there are three significant treated discharges into the River Gipping and these are treated to meet river needs standards. Two other discharges that enter the River Orwell are currently subject to negotiations in respect of appropriate consent standards derived from our water quality models. An integrated management strategy for all trade and sewage discharges into the Gipping and Orwell has proved essential to ensure that our water quality targets in these rivers are going to be met.

In the River Wang catchment the treated discharge from Bernard Matthews Ltd constitutes a large proportion of the river flow. Following substantial investment by the company, significant improvements in discharge quality in recent years mean that the river is now compliant with its River Ecosystem targets.

Other trade effluents are commonly discharged into Anglian Water Services' Sewage Treatment Works and as capacity exists to fully treat these inputs environmental impacts are minimised. Involvement with expanding and developing industry is essential if the environmental impacts of such proposals are to be minimised and controlled in a satisfactory manner.

**5.7.3 Regulatory Framework**

The Environment Agency's ability to maintain and improve the water environment is set out in both EC and UK legislation. The *Water Resources Act 1991* supersedes previous pollution control legislation including the *Control of Pollution Act 1973* and the *Water Act 1989*. Other legislation gives the Environment Agency powers in respect of applications for planning permission and the authorisation of industrial processes.

**Role of the Environment Agency:**

The Environment Agency controls continuous discharges such as those from STWs and treated industrial effluent, by issuing and enforcing permissions (discharge consents/notice and IPC authorisations). These permissions specify limits on the quality and quantity of materials which may be discharged. Discharge conditions are calculated by taking into account upstream water quality and the dilution available in the receiving watercourse. As a minimum, the conditions imposed in new permissions are designed to ensure that downstream water quality remains acceptable for its many uses and compliant with prescribed water quality standards.

Historically, some discharges have permissions which are less stringent than those required by modern day standards. We are progressively reviewing these discharges with a view to future improvements, which will be negotiated with the discharger.

The Environment Agency implements its enforcement policy to minimise the impact of intermittent pollutions by requiring people in control of pollutants, such as fuel oil and pesticides, to take preventative measures. The Environment Agency has the powers to alleviate the effects of pollution and to recharge the costs if the polluter can be

identified. Prosecution through a Court of Law, both of those responsible for isolated pollution events and of those dischargers who repeatedly contravene their discharge conditions, may be undertaken.

The *Environment Act 1995* has put a new responsibility on water companies to provide a public sewerage system for settlements, provided the necessary criteria are met. We have two roles in the process. Firstly we provide factual information from our records to aid Anglian Water Services in their assessment of an application and, secondly, we have a separate independent role as the arbiter in the event of a dispute, between the Local Authority and AWS, in respect of the decision made.

**Role of Dischargers:**

The most significant dischargers of effluent to the water environment are the Water Undertakers, in this case Anglian Water Services. Continuing improvements in their sewage effluent treatment and disposal facilities are the subject of their Second Asset Management Plan (AMP2), which has been developed in close liaison with the Environment Agency. This has to take account of compliance with existing and new EC and UK legislation.

**Role of the Government and the Ministry of Agriculture, Fisheries and Food:**

Agricultural effluents from silage and intensive rearing of livestock are potentially highly polluting and typically expensive to treat. Because of this MAFF have set out guidelines for dealing with the disposal of these pollutants in their 'Codes of Good Agricultural Practice' series.

## **5.8 WASTE MANAGEMENT**

### **5.8.1 General**

The generation of waste is an inevitable consequence of many human activities, arising from sources including the home, industry and agriculture.

Waste disposal has the potential to harm the environment through contamination of air, land and water in a number of ways:

- the pollution of ground or surface water by leachates escaping from landfill sites;
- the escape of landfill gases such as methane;
- the contamination of land on which waste management and other industrial activities have taken place;
- nuisances such as litter, odours and vermin; and,
- uncontrolled emissions from incineration.

Waste is disposed of in many different ways. By far the greatest proportion of waste is currently sent to landfill within the Plan area. Landfill sites can only accept certain types of wastes, specified by each Waste Management Licence. The potential to harm the environment is controlled by the issue of licences and authorisations to carry out waste management activities.

The Government's White Paper on waste, 'Making Waste Work', described a waste hierarchy intended to provide a policy framework within which waste management decisions can be taken. The first priority is to reduce the production of waste to a minimum, and particularly the production of hazardous waste components. At the second level of the hierarchy is the re-use of products so that they do not become waste in the first place. Recovery (including materials recycling, composting and recovery of energy from waste) forms the third tier, while disposal is the least attractive waste management option.

### **5.8.2 Local Perspective**

*n.b. The information on waste in this Section does not specifically relate to the East Suffolk Plan area, but to political/administrative boundaries, such as those of County Council's.*

#### **5.8.2.1 Waste arisings:**

##### **Household waste**

Household waste collected from domestic premises, together with the proportion of it reclaimed via bottle banks, can banks and other similar facilities, represents only a very

small proportion of the total waste produced in the County. In 1994/5, for example, it formed less than 10% of the total.

The Borough and District Councils in Suffolk, as waste collection authorities, are responsible for collecting household waste. The authorities responsible for the collection of household waste in the Plan area are Babergh District Council, Ipswich Borough Council, Suffolk Coastal District Council, St Edmundsbury Borough Council, Mid Suffolk District Council and Waveney District Council.

The composition of household waste in Suffolk was the subject of a 1993 study. Although the information is now slightly out of date, it provides a useful guide as to the likely components of household waste in the Plan area and thus the potential which exists for recycling in line with the waste hierarchy. Appendix 9 shows the results of the analysis for the districts and boroughs in the Plan area.

Household waste sites (also known as Civic Amenity Sites) are licensed to accept bulky household waste, such as garden waste, old furniture or household appliances. Many of them also provide facilities such as can banks or oil banks, so that particular materials may be separated from the main waste stream. There are currently 18 such sites in Suffolk, eight of them within the Plan area and they are operated by Suffolk Waste Disposal Company Ltd under contract to Suffolk County Council. Appendix 9 gives a breakdown of waste collected in tonnages.

#### **Commercial and industrial waste**

The majority of commercial waste is collected by private waste disposal contractors, although a small percentage is collected by the waste collection authorities along with household waste and road sweepings. All industrial waste is collected by private contractors.

It is difficult to provide an accurate estimate of current arisings of this type of waste over the Plan area, as the last available survey information is for 1993/94. A nationwide survey of commercial and industrial waste producers is to be undertaken this year and should provide more accurate data, although it will not provide information specifically relating to LEAP boundaries.

#### **Special waste**

'Special' waste may loosely be defined as waste which displays one of the hazards (such as corrosivity, toxicity or carcinogenicity) specified in the *Special Waste Regulations 1996*, or which is a 'prescription-only' medicine. A full definition of the term may be found in Appendix 10. The Regulations also prescribe a consignment note procedure to control (at all stages) the movement and disposal of waste which is classified as special.

Only a small percentage of Suffolk's special waste is disposed of within the County, as there are very few suitable facilities. Certain landfill sites are licensed to accept asbestos waste (all types of which are now special under the new Regulations) and a site at Claydon is licensed to accept interceptor waste (which may now be special, depending

on the percentage of oil it contains). There are, however, no facilities which are able to accept the large volumes of liquid special waste produced by industry in the area. Much of this is disposed of at landfill sites outside the County. A site at Pitsea in Essex, for example, generally receives around 50% of the industrial special waste produced in Suffolk.

There are two solvent transfer stations within the Plan area which store and bulk up this type of waste prior to onward shipment for recycling or disposal out of the area. These sites were licensed facilities, but are now exempt under the *1994 Licensing Regulations*.

#### **5.8.2.2 Waste management facilities**

The distribution of licensed waste management facilities currently operating in the Plan area are shown in Map 19. The locations of landfill sites in particular are strongly influenced by the geology of the area. These generally exist in former mineral workings now being utilised for waste disposal. Other facilities may be more strongly influenced by population distribution, the location of industry and the road network.

##### **Landfill sites**

Landfill is the disposal method for the vast majority of waste produced in the County. The main sites are those operated by Suffolk Waste Disposal Company at Foxhall and Wangford, Haul Waste at Great Blakenham and Hales Waste Control Ltd at Bramford.

The sites operated by Suffolk Waste Disposal Company and Haul Waste between them receive much of the waste collected by the District and Borough Councils. The only other site in the County contracted to accept this type of material is outside the Plan area, at Lackford (also operated by Suffolk Waste Disposal Company). These are licensed to take household, commercial and dry, non-special industrial wastes and asbestos. The areas currently in active use are lined to prevent gas and leachate migration and monitoring equipment has consequently been installed. Site licences require monitoring of gas, leachate and groundwater to be carried out at regular, specified intervals. The other landfill sites in the area are all unlined, and the majority of these are licenced only to accept inert material such as soil and rubble (category A wastes).

##### **Closed landfill sites**

There are 101 known former landfill sites within the Plan area, some of which were subject to licensing controls before closure. The majority, however, were landfill sites which were closed before the introduction of controls over waste disposal in 1974. It is also quite likely that others exist of which we have no record. Most of these sites cause no problems, but there are some former landfills still generating landfill gas which can cause problems for development. Sites which are known to be generating gas are monitored to ensure that no hazard results.





**Transfer stations**

There are currently three transfer stations in the Plan area, licensed to receive a range of materials including household, commercial and approved industrial wastes. These facilities separate certain materials from the main waste stream, some for recycling or re-use and others (inert materials) for disposal in unlined, rather than contained, landfill sites.

**Incineration**

There are no municipal waste incinerators in Suffolk. The rural nature of the County and the low population density would not support the high throughput of waste required to make an incinerator financially viable. There is a clinical waste incinerator at Ipswich Hospital. Clinical waste and prescription-only medicines are brought to this facility from a wide area, including some which is imported from Ireland, for safe disposal in this Country.

**Scrap yards**

There are thirteen licensed scrap yards within the Plan area, as well as two which have registered, or have applied to be registered, as exempt. It is likely that there are also other scrap yards which are currently operating illegally, in that they are unlicensed or have not registered with the Environment Agency as they are required to do. This is an issue which will be addressed as these sites are brought to the Environment Agency's attention.

**Treatment facilities**

A site at Binder, Claydon is licensed as a treatment plant and associated transfer station. The licence is for the separation of oil from interceptor waste with subsequent treatment and discharge of the effluent, as well as the temporary storage of sewage on behalf of Anglian Water Services. A newly-licensed Composting Plant facility at Cliff Quay will process green waste, organic soils and digested sewage sludge inside a purpose-designed building.

**Other facilities**

Blue Circle has obtained an authorisation to burn waste solvents as fuel at its cement factory at Great Blakenham. This will be closely monitored by the Integrated Pollution Control (IPC) section of the Environment Agency.

### 5.8.3 Regulatory Framework

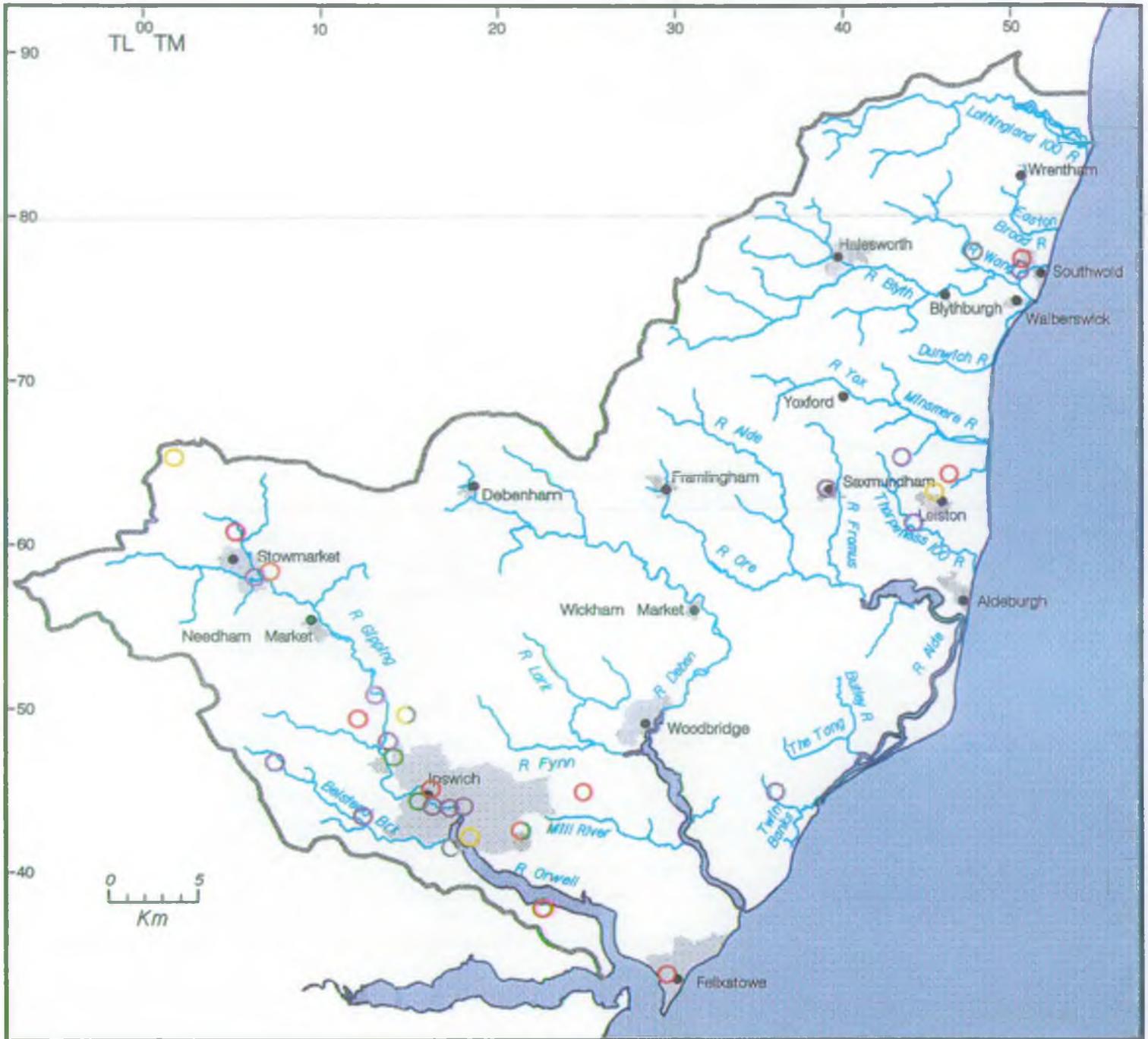
**Role of the Environment Agency:**

Powers afforded to the Environment Agency under the *Environmental Protection Act 1990* and the *Waste Management Licensing Regulations 1994*, enable us to require improved waste management standards to be adopted, with greater care exercised when handling or disposing of waste material.

Our principal role in protecting land is through waste management licensing. This is

# Waste Management Facilities (Excluding Landfill)

Map 19



**ENVIRONMENT  
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-  Main River
-  Coastline
-  Catchment boundary
-  Urban area

-  Lagoon
-  Civic amenity site
-  Storage
-  Transfer station
-  Waste treatment & transfer station
-  Scrapyard
-  Storage

achieved through the granting of licences for the deposit, treatment, keeping or disposal of waste and through the supervision of licensed activities to ensure licence conditions are complied with. Various sanctions are available to the Environment Agency to apply against both licence holders who do not fulfil their licence conditions and against those who carry out illegal waste disposal activities.

A range of waste management activities has been exempted from the normal licensing regime. In general such activities are small scale, have minimal pollution risk, possess considerable waste recycling/recovery potential, or are subject to an authorisation by another regulator. These exempt activities are required to be registered with us and may be inspected periodically.

The protection of groundwater against discharges of dangerous substances is required by the *EC Directive (80/68/EEC)*. All new sites taking potentially polluting matter must be engineered to contain and control leachate generation to protect groundwaters, in line with our Groundwater Protection Policy.

Waste management licences ensure waste disposal sites are controlled during both operational and post-closure phases. For those sites closed post-May 1994 the surrender of a Waste Management Licence is only permissible when a site no longer poses a risk of pollution and if it does not pose a risk to human health.

Under the *Waste Management Licensing Regulations 1994*, liquid industrial wastes which can be shown to benefit agriculture may be deposited on land, subject to our approval and written consent. Sewage sludge may be deposited on land under the above regulations or under the *Sludge (Use In Agriculture) Regulations 1988*, also enforced by the Environment Agency.

Special Waste Regulations, which were adopted in September 1996, extended our controls over special wastes.

Anyone who handles waste that was not produced by their own activities must be registered to carry waste under the *Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991*.

In general waste not regulated by the Environment Agency includes waste from mining and quarrying operations and waste from premises used for agricultural purposes. New regulations are proposed which may bring a degree of regulation over these wastes.

The requirement to produce Waste Management Plans was contained in Section 50 of the *Environmental Protection Act, 1990*. The requirement was on County waste regulation authorities, but was repealed on 1 April 1996 in favour of provisions for a National Waste Strategy. The task of replacing Waste Management Plans now rests with the Environment Agency and we have dedicated staff working on their production (the national commercial and industrial waste arisings survey is one of the first stages in this process). The Environment Agency will then be replacing Section 50 Plans with

our own documents. The information contained within these Plans will feed directly into development planning (Waste Local Plans) and the DoE and their National Waste Strategy.

We also take a pro-active stance with industry, working in partnership and liaising with companies over waste minimisation programmes, special wastes visits and their producer responsibility for packaging.

**Role of County, District and Borough Councils:**

County Councils can influence waste disposal in their area through either their Waste Local Plans or Structure Plans. District and Borough Councils are responsible for all domestic refuse collection and street cleansing, as well as keeping clean any land under their control.

**Role of Private Operators:**

Waste disposal operations, including the management of sites handling industrial and domestic waste, may be undertaken by the private sector. Most waste collection is carried out by private operators, especially the removal of industrial, construction and demolition waste.

## **5.9 MINERAL EXTRACTION**

### **5.9.1 General**

Attractive landscapes are often made up of geologically rich areas containing mineral resources and the East Suffolk Plan area is no exception. The extraction of materials such as sand, gravel and limestone from quarries and mines can damage both underground and surface water resources and can indirectly impact upon water quality. The damaging effects of mineral extraction are often long term and sometimes permanent. The impact of quarrying on the water table may be extensive, affecting water supplies from groundwater sources and flows to springs and rivers (and therefore on the natural environment).

During extraction dewatering can cause suspended solids to be discharged to rivers and the industrial nature of the activity poses other pollution risks such as oil contamination. The use of settlement ponds to reduce levels of suspended solids is a proven mechanism to control these discharges. Any lake created by extraction can, if directly connected to the river, seed the river with algal material, causing unacceptable changes in the downstream water quality.

The manner in which site restoration is undertaken can also impact on the environment. Backfilling with low permeability material will decrease the storage capacity of the aquifer, whilst leaving the site to open water will cause a loss of resource due to evaporation losses being greater than precipitation gains. Restoration to low level agriculture may require continual pumping which is not a sustainable use of resources.

The subsequent use of mineral extraction sites for landfill may also pose a significant threat to groundwater quality. Many disused gravel pits are ultimately developed to create lakes, natural habitats and recreational areas.

Minerals can also be extracted from off-shore sites. Marine sand and gravel production amounts to 11% of sand and gravel production in England and Wales. Extraction of these marine aggregates becomes more feasible as landward resources are exploited. To date we have no evidence to suggest that the impacts of these activities will adversely affect the near shore area ecology, as the majority of licences granted are for working areas that are twelve to fifteen miles offshore.

### 5.9.2 Local Perspective

A variety of mineral resources are found within Suffolk. The most widespread is sand and gravel which is extracted for aggregate. There are three main economic deposits of sand and gravel in the Plan area; river terrace, glacial sand and gravel and crag. In particular extensive sand and gravel workings can be found in the Gipping valley. Deposits of crag have also been important, varying from the quartz rich sands to the east of Ipswich to the flint pebble beds at Wangford.

There are a number of licensed dredging areas off the coast of Suffolk. The majority of these have been licensed for the Thames Estuary and are located in the upper part of the outer estuary, off the coast of north Essex and south Suffolk. A number of sites are concentrated off the coast of Orford Ness and Felixstowe. There are additional sites off the coast of Lowestoft and Great Yarmouth to the north-east of the Plan area. The majority of the dredged aggregate is exported to the continent and used in the construction industry and for coastal protection. Over the last five years around 50% of materials extracted from the East Coast and Thames area has been exported to Continental Europe. In 1996, actual removal of aggregate from the East Coast amounted to 9,306,920 metric tonnes, nearly twice as much as the next biggest category (south coast).

### 5.9.3 Regulatory Framework

#### **Role of Suffolk County Council:**

The County Council, as Mineral Planning Authority has responsibility for all mineral planning matters. Suffolk County Council produced a Mineral Plan as required under the *Town and County Planning Act 1990*, in accordance with Planning Policy Guidance Note 12. The Environment Agency, as a statutory consultee, made comments upon the Suffolk Minerals Local Plan, Deposit Draft, which was published in April 1996.

#### **Role of the Environment Agency:**

Under the *Water Resources Act 1991*, dewatering of mineral workings is exempt from the need to obtain an abstraction licence but requires a discharge consent under the same Act. However, Section 30 of the Act, allows us to issue a 'Conservation Notice' to the

Mineral Extraction Company in order to conserve water in the dewatering process. These powers are limited and cannot be used to prevent mineral extraction.

**Role of the Crown Estate and MAFF:**

The principal regulatory roles in this area rest with the Crown Estate and MAFF although the Environment Agency is consulted on these applications in an advisory capacity. When licences are granted, stringent conditions are stipulated in respect of benthic monitoring in the affected areas for a considerable period of time.

## **5.10 WATER RESOURCES ABSTRACTION**

### **5.10.1 General**

Within the Environment Agency there is a requirement to balance the varied and competing needs for water resources. These include human needs, such as potable water supply, industry and agriculture and those needs of the water environment for rivers, springs and wetlands. It is therefore important to manage this valuable and fragile resource in a sustainable manner.

Water supplies within a catchment are derived from both surface and groundwater sources. Water resources in the area are assessed by calculating a water balance for each catchment to allocate water to the various uses. This is fundamental to the process of determining applications for water abstraction licences, which are managed and regulated through the licensing process.

The water balance of a catchment is determined by calculating the volume of effective rainfall which lands on a catchment. Effective rainfall is essentially the proportion of the annual rainfall which is not lost to evaporation and as a result infiltrates into the recharge zone. Once the environmental needs have been calculated and deducted from the effective rainfall, the remainder is potentially available for abstraction. However, all abstraction applications will undergo further environmental appraisals in order to ascertain that there is no unacceptable impact on the water environment and existing users. More details on this procedure are given in Appendix 13.

### **5.10.2 Local Perspective**

The use of water resources by humans falls into three main categories;

- potable water supply - abstractions for human consumption;
- agriculture - spray irrigation and general agriculture; and,
- industry and cooling.

In total there are 692 licences in the area, authorised to abstract almost 200MI/d (mega

# Public Water Supply Abstractions

Map 20



**ENVIRONMENT  
AGENCY**

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-  Main River
-  Coastline
-  Catchment boundary
-  Urban area

-  Surface water abstraction point
-  Groundwater abstraction point

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litres per day). This section discusses how they are distributed within the categories. All abstractions require a licence except those made by private individuals for their own domestic use, unless the abstraction is greater than 20 cubic metres per day.

#### Potable Water Supply

Potable water is water abstracted for human consumption (such as drinking and washing). In the Plan area, there are a number of wells and boreholes constructed into the aquifers.

The Chalk and Crag are the two main aquifers in the area. However, small amounts of water are also abstracted from the overlying sands and gravels. Public water supply abstractions are operated by Anglian Water Services and Essex & Suffolk Water, who both abstract water from the Crag and Chalk aquifers. Map 20 shows the locations of the public water supply abstraction points.

There are 11 public water supply abstractions in this area. The largest licensed quantity authorised to be abstracted is by Anglian Water Services with a total licensed quantity of 15,251 thousand cubic metres per annum (tcma) from a number of sources located in the Chalk, as well as surface water abstractions from the Bucklesham Mill River and Newbourne Stream. AWS also operate a surface water supply abstraction from the Gipping at Sproughton. The total licensed quantity is 10,783 tcma and the licence also contains a clause to protect the river environment, downstream flows and water quality. This licence allows water to be transferred to Alton Water where it also provides recreational and amenity facilities prior to subsequent treatment and redistribution to the Ipswich area. Anglian Water Services has authorisation to abstract 80% of the total public water supply licensed abstraction in the Plan area, authorised under three licences. Essex & Suffolk Water abstract the remainder, authorised under eight licences.

#### Agricultural and Industrial Abstraction.

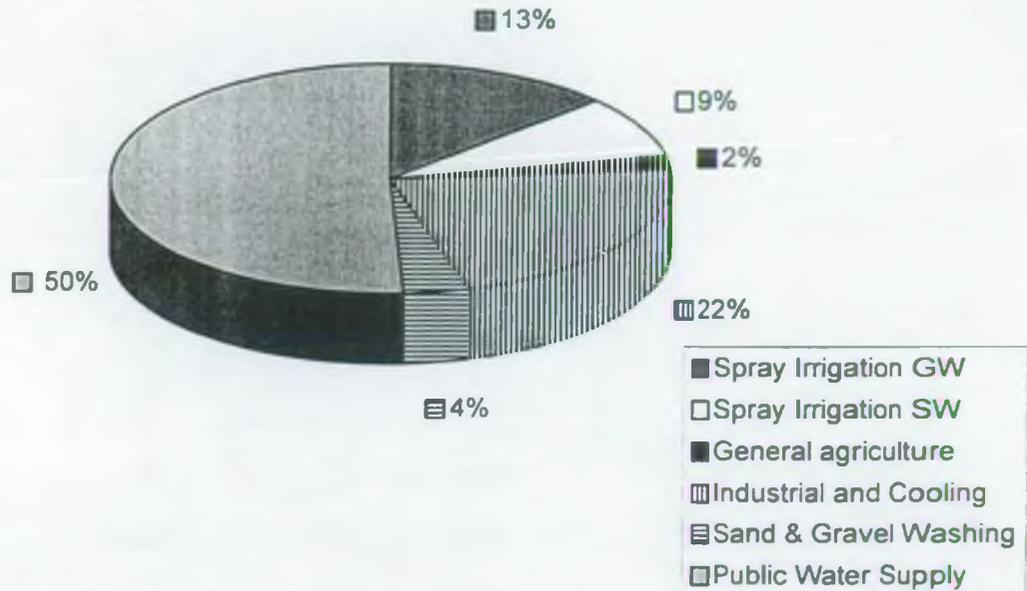
This use relates to the abstraction of water from ground and surface sources for agricultural purposes, both for general agriculture (stock watering, chemical spraying of crops) and spray irrigation. Industrial processing, cooling and mineral washing uses also exist within the catchment. All uses except those for general agricultural abstractions of less than 20 cubic metres per day, from surface sources, require an abstraction licence.

#### *Spray Irrigation*

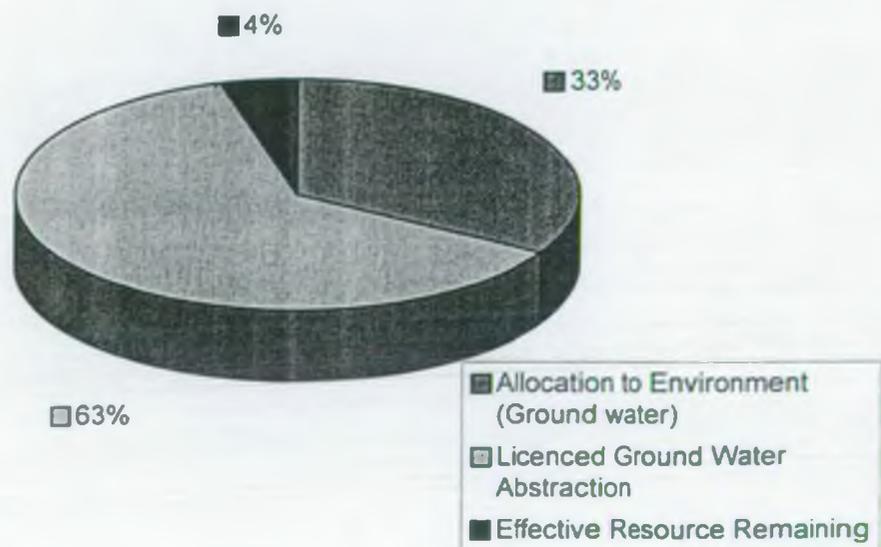
Spray Irrigation is widely practised across the Plan area. Abstractions are licensed for both surface and groundwater source and are illustrated in Map 22. There are 178 groundwater abstractions in this area licensed to abstract a total of just over 25 Ml/d and 132 surface water abstractions licensed to abstract almost 18 Ml/d.

Use of water for spray irrigation is virtually wholly consumptive, *i.e.* it is not returned to the system after use and is therefore considered a total loss of the resource. Spray irrigation also represents 22% of all licensed abstractions in the area. This use is typically concentrated in the summer months when demand is at its highest and

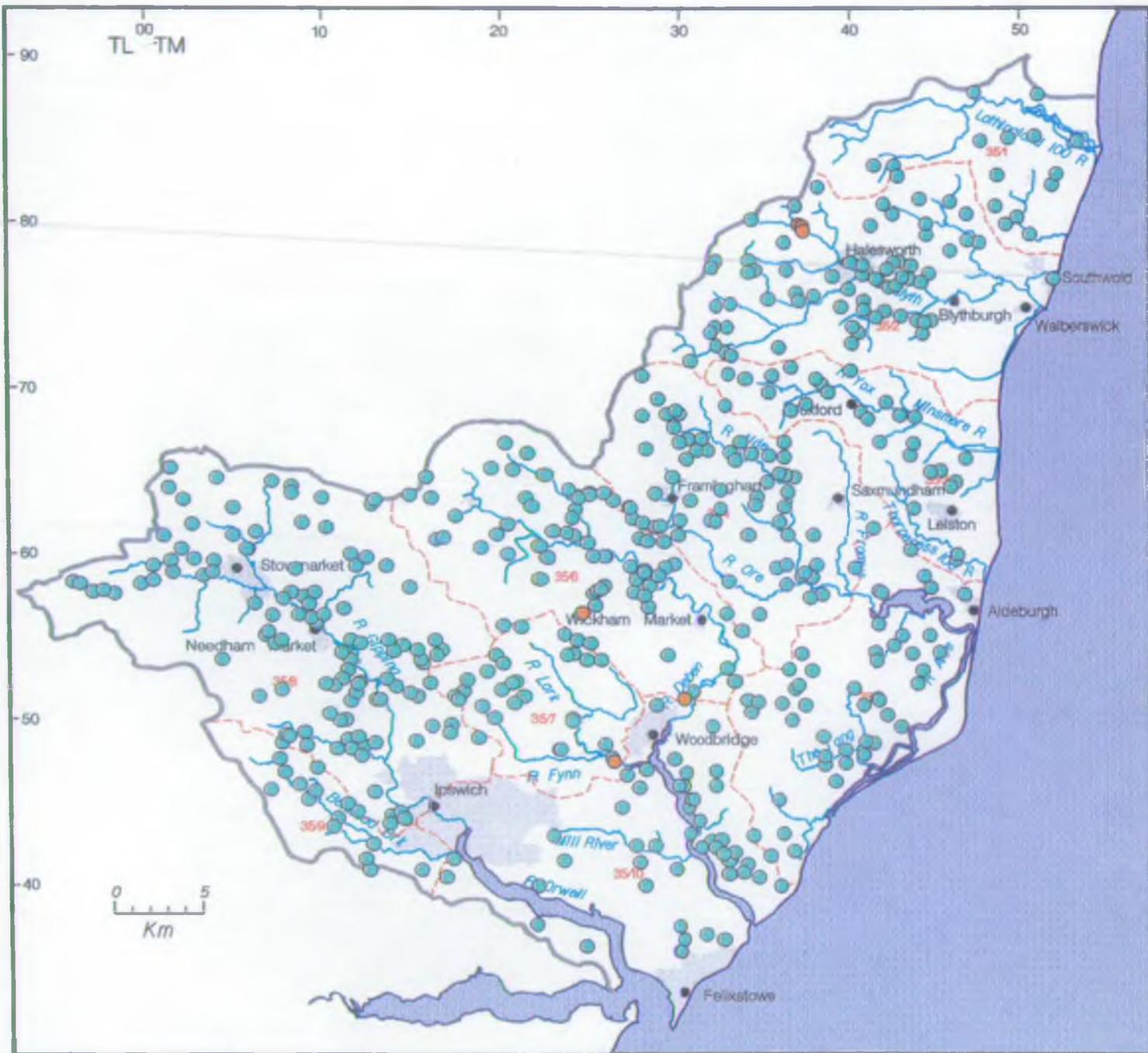
**Figure 3: Water Use as a Percentage of all Licensed Abstractions in the Plan area**



**Figure 4: Resource Balance and Allocation to the Environment**



# General Agricultural Abstractions (Excluding Spray Irrigation) Map 21



**ENVIRONMENT  
AGENCY**

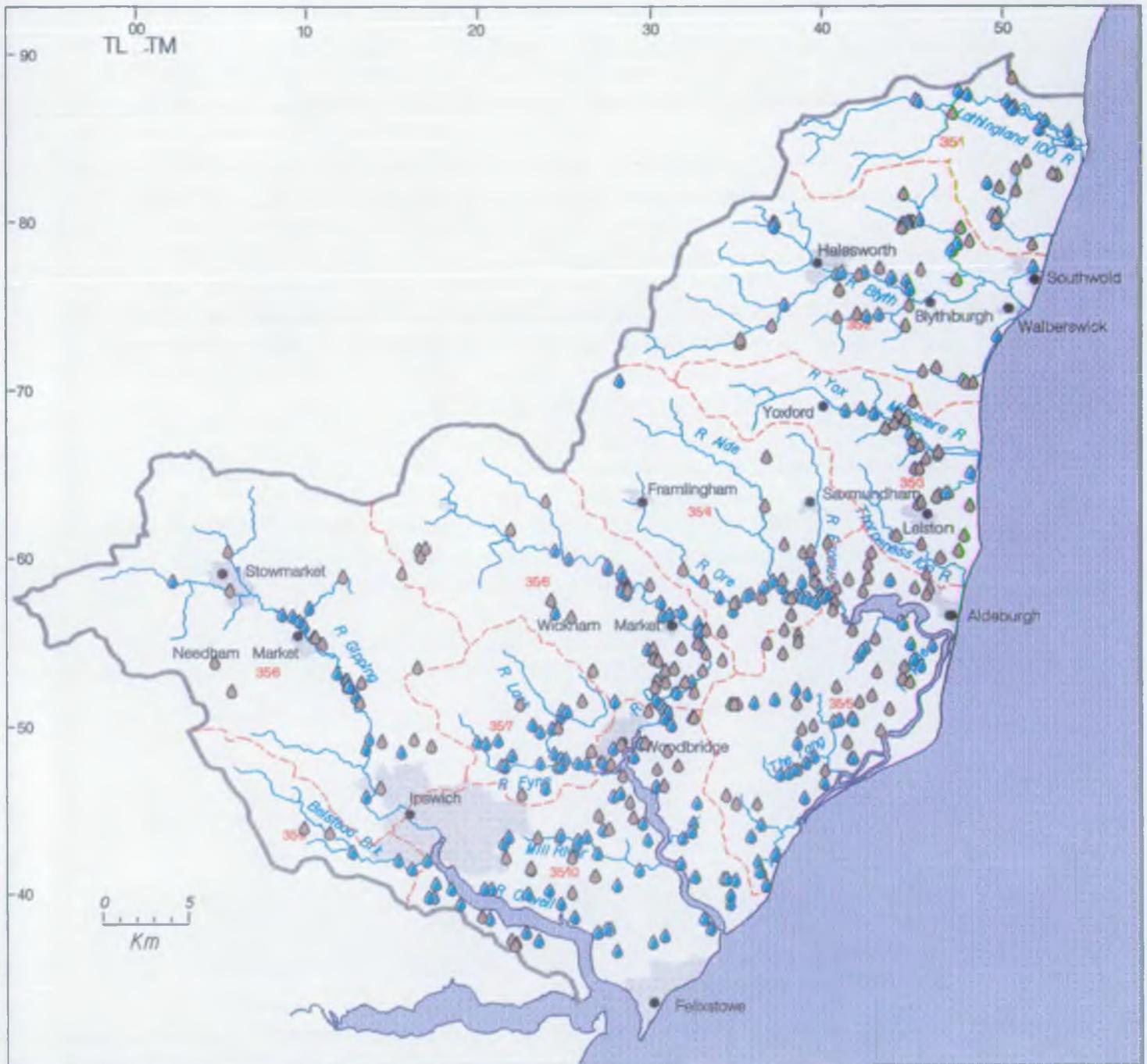
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- |   |                    |   |                        |
|---|--------------------|---|------------------------|
|  | Main River         |  | Surface water          |
|  | Coastline          |  | Groundwater            |
|  | Catchment boundary |  | Sub-catchment boundary |
|  | Urban area         |   |                        |

# Agricultural Abstractions (Spray Irrigation)

Map 22



**ENVIRONMENT  
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-  Main River
-  Coastline
-  Catchment boundary
-  Urban area
-  Surface water
-  Groundwater
-  Sub-catchment boundary

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resources are at their most strained. Future spray irrigation demands for new abstraction licences within the Anglian Region as a whole are estimated to rise by around 50% over the next 25 years. This increase could be met from groundwater sources in the area where limited resources are still available, or from water abstracted from rivers in the winter and stored in reservoirs for subsequent use in the following summer. Due to the limited volume of groundwater available for licensing, it is likely that winter storage will become increasingly important in the future. The favourable geology in the lower parts of some of the valley areas may be suitable for the construction of winter storage reservoirs. In areas where this is not so artificial linings may be used. However, this is likely to significantly increase the construction costs. Whilst winter storage is generally promoted by the Environment Agency, there are concerns in some coastal areas about the potential impact of decreasing flows of streams, a problem which could be exacerbated by winter abstraction from streams that feed intertidal creeks, thus affecting wintering wildfowl. This is discussed in Issue A5.

The Environment Agency can encourage the use of winter storage reservoirs but cannot enforce use and have no control over where they are sited and what the design is. We will seek to improve procedures between ourselves, the Local Authorities and conservation bodies to optimise these resources as potential habitats and recreational facilities and ensure that they are environmentally sustainable.

#### *General Agriculture*

There are 373 general agricultural licences in the area. These abstractions tend to involve small quantities, amounting to 3.5 MI/d.

#### *Industrial and Cooling*

There are 33 industrial and cooling licences in the area. There are also nine licences for sand and gravel washing.

### 5.10.3 Regulatory Framework

#### **Role of the Environment Agency:**

We have the responsibility of managing water resources in a sustainable and effective manner, ensuring that abstractions do not exceed replenishment. The Environment Agency manages this resource to achieve the right balance between the needs of the environment and those of the abstractors and other water users. With a few exceptions, all abstractions for water require a licence issued by the Environment Agency (or its predecessors) under the Water Resources Act 1991. A concise guide to the licensing procedures and policy can be found in the Abstraction Licensing and Water Resources leaflet, 'A Guide For Potential Abstractors'.

Present abstraction licensing policy for the area is;

- that there is no additional summer surface water available to be licensed. Winter surface water is available but likely to be subject to controls to protect the



environment and downstream water users; and

- groundwater abstractions may still be considered where water resources are identified as nominally available. This will still require rigorous technical appraisal of the impacts of any further licensed abstractions on the local environment and existing licensed sources.

It is becoming common practice nowadays for licences to be time limited and include specific clauses to protect the water environment.

In determining a licence application the Environment Agency will require a statement from the applicant to support each application, that includes:

- examining the overall availability of water for abstraction - abstraction will not be authorised unless there are sustainable resources available;
- examining the need of the abstraction in terms of its quantity and necessity and if there may be alternative ways to satisfy the need eg, leakage reduction and demand management;
- considering the potential effect on river flow - abstractions will not be allowed if they caused a unacceptable reduction in the river flows;
- investigating the potential effect on wetlands - abstractions would not be authorised if the water levels in such sites were to be unacceptably affected;
- consulting with relevant statutory bodies as appropriate;
- considering the potential effects on neighbouring abstractions - abstractions will not be authorised if they derogate existing abstraction rights, unless suitable arrangements are made in respect to the derogation site; and,
- issuing time-limited licences with the appropriate monitoring requirements in cases where there are any doubts in the overall assessment of the application.

In general the applicants for abstraction licences must advertise their proposals twice in the local newspaper and once in The London Gazette, thus publicising the proposal and providing the public with an opportunity to make any representation to the Environment Agency. For larger applications, the Environment Agency may request that the applicant conducts a full environmental assessment. Items to be covered by the assessment will be advised by the Environment Agency in consultation with statutory bodies.

## 5.11 AGRICULTURE AND FORESTRY

### 5.11.1 General

#### *Agriculture*

There is significant scope for agriculture to affect the environment, and particularly the water environment, with over 80% of the land in England and Wales utilised for this purpose. Current methods can have detrimental effects on water quality, impact on water resources and affect the wider environment, such as:

- the use of fertilisers influences surface water quality, enriches it with nutrients and encourages its eutrophic state. This can also impact on land drainage by increasing weed growth and on groundwater quality by increasing nitrate levels;
- there is a pollution potential to surface and groundwaters from pesticides and other farm related effluents;
- the abstraction of water for irrigation affects water levels;
- maintenance practices undertaken on watercourses, and water levels maintained to ensure effective land drainage, have a marked effect upon flora and fauna;
- soil erosion can impact both on water and air quality; and,
- disposal of wastes to agricultural land.

Agricultural pollution sources are varied, they include point sources such as those relating to, inadequate oil storage, unsatisfactory slurry storage systems and drainage from silage clamps, to the diffuse pollution deriving from the widespread application of fertilisers and pesticides. The disposal of wastes to land can have benefits where it acts as a soil conditioner and/or fertilizer.

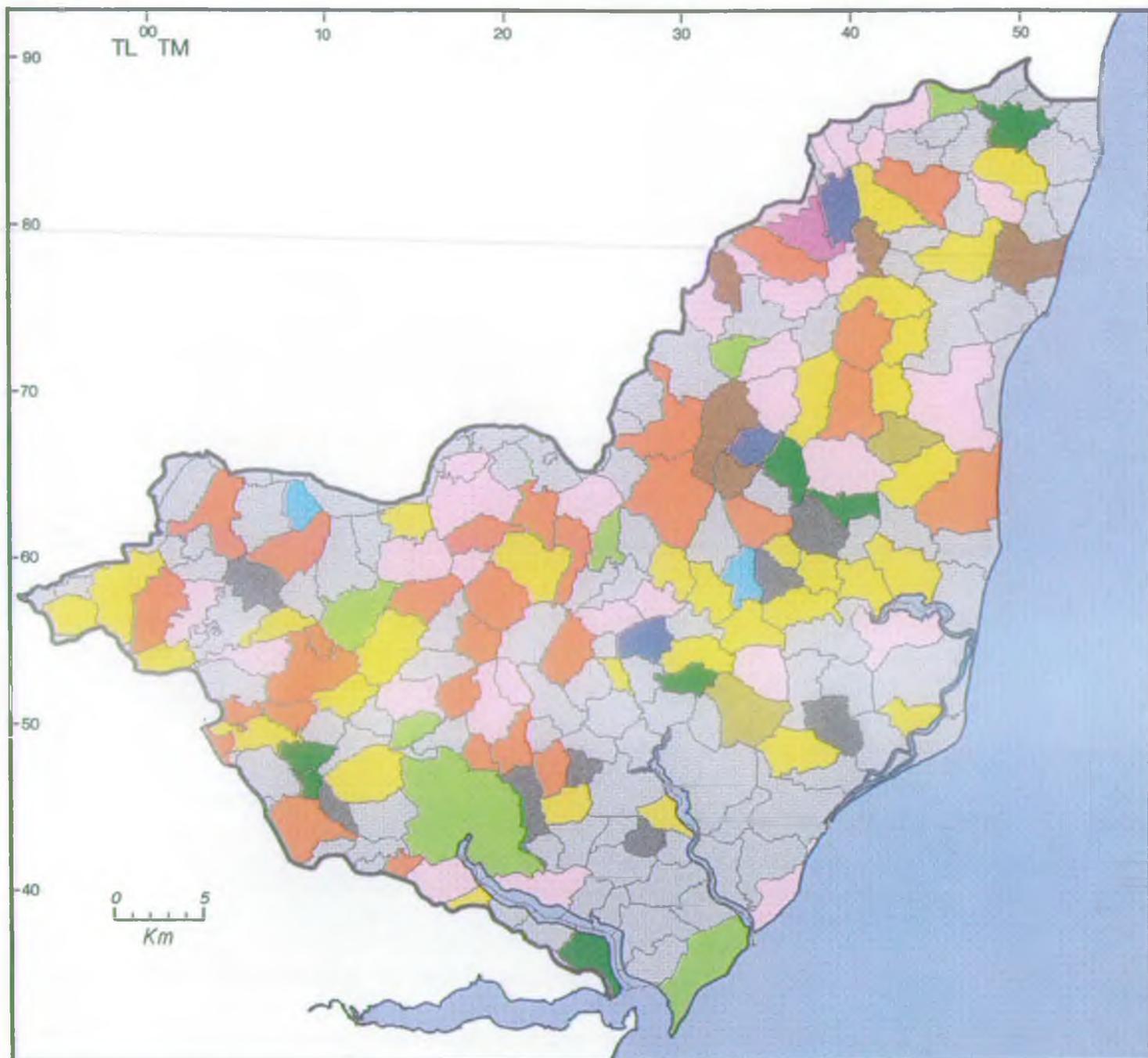
The Ministry of Agriculture, Fisheries and Food classifies land by grade according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. These limitations affect flexibility of cropping, level of yield, the consistency of yield or the cost of obtaining it. Under this system, land is classified into one of five grades (grade 1 being of excellent quality and grade 5 being of very poor quality). The higher grades of agricultural land are described as the best and most versatile agricultural land in Planning Policy Guidance (PPG) Note 7. Such land is recognised in land use planning terms as a national resource for the future, having a special importance.

#### *Forestry*

Well managed forestry can often bring significant benefits to the environment. Once established, new woodland and even individual trees can significantly enhance the landscape. This may be particularly important in areas where there has been a recent

# Dominant Farm Type By Parish

Map 24



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- |   |                       |   |                                      |
|---|-----------------------|---|--------------------------------------|
|  | Specialist Dairy      |  | Cropping: Mostly Cereals             |
|  | Mainly Dairy          |  | General Cropping                     |
|  | Mostly Cattle         |  | Predominantly Fruit                  |
|  | Cattle & Sheep        |  | General Horticulture                 |
|  | Predominantly Poultry |  | Mixed                                |
|  | Pigs & Poultry        |  | No Agricultural Data/Data Suppressed |

June 1997

 Catchment boundary

loss of tree cover. However, in certain circumstances, forestry development and management can cause problems, including potential soil erosion, pollution, increased flooding risks and damage to wildlife habitats.

### 5.11.2 Local Perspective

#### *Agriculture*

Much of the catchment is agricultural in nature. The prevailing soil types split the agricultural aspect of the catchment into four areas. Inland is generally boulder clay capped and grain predominates with some vining peas and break crops such as oilseed-rape and sugar-beet. Small but established vineyards are also situated in this area. Stock is housed intensively with a predominance of pigs and poultry.

In the north of the area Beccles Series soils support the majority of the dairy units in the area. This is a more varied soil as is the lower Gipping Valley where chalk outcrops occur such as in the Belstead Brook catchment. Both areas provide for a more mixed arable farming and livestock husbandry.

The Sandlings is a more distinct area and is a light, well-drained soil derived from sandy drifts and marine crags. Here the land supports natural heath, marsh and saltings, commercial forestry and, when irrigated, intensive agriculture. Crops are most commonly grown in the milder coastal belt or under glass at Newbourne. Potatoes and root crops tend to feature more further from the coast. As with other lighter land areas the trend towards outdoor pig husbandry is particularly evident in the Sandlings. Impacts from this development are currently subject to Environment Agency research.

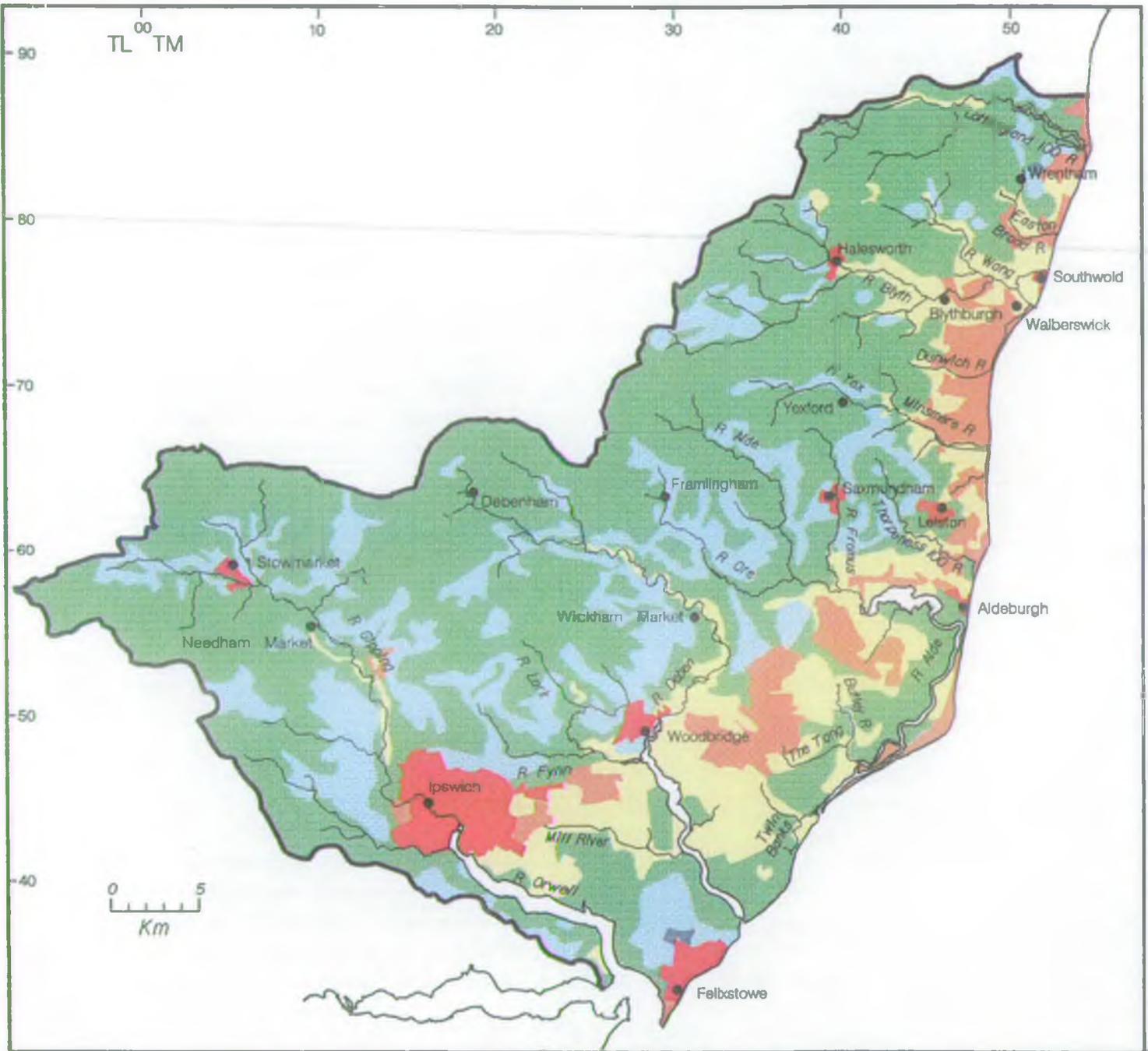
Residues from pesticide, fertiliser and stock waste application to the land can in some circumstances reach the watercourses from land drainage in the upper clay catchment, potentially impacting upon river quality. Groundwater also receives residues from the lighter land where high nitrate levels and pesticide contamination are known to influence potable groundwater. The intensive nature of agriculture on the lighter land, especially in the Sandlings area, has a considerable demand on water resources. The necessity to retain the natural freshwater environment, particularly in areas close to the coast plays an important part of the Environment Agency's consideration of any abstraction application. When the land here is cultivated, replacing the natural vegetation, water and wind erosion of topsoils can become a problem. Silt derived from land tillage impacts the rivers across the Sandlings area changing the natural physical features of these rivers and streams at some sites.

#### *Forestry*

Forestry land use is also a significant part of the Sandlings area. Largely coniferous plantations are now mature and felling operations are common place. Although pesticides are used in day to day forest management, the implications for the water environment need to be assessed and discussed with Forestry Enterprise. Some changes in streams and their chemistry below forestry areas, are impacts that may need to be considered in this context.

# Agricultural Land Classification

Map 25



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**AGRICULTURAL LAND**

-  Grade 1
-  Grade 2
-  Grade 3
-  Grade 4

**NON-AGRICULTURAL LAND**

-  Land predominantly in urban use
-  Other land primarily in non-agricultural use

### 5.11.3 Regulatory and Advisory Framework

The Ministry of Agriculture, Fisheries and Food (MAFF) promotes a number of measures to encourage farmers to conserve and enhance the rural environment and its natural resources, including the water environment.

MAFF's *Codes of Good Agricultural Practice for the Protection of Water, Soil and Air* documents are guidelines that should be used in areas of arable farming, where careful timing in the application of nitrates and pesticides is important. Heavy rainfall can result in nitrate and pesticide residues from arable farming being washed into rivers. Similarly, pesticides applied during wet periods, or prior to heavy rain, can result in river pollution at any time of the year.

Schemes designed to assist with the conservation and enhancement of the environment include:

- *The Habitat Scheme* which was introduced to encourage farmers to create, protect or enhance a range of wildlife habitats by managing land in an environmentally beneficial way. A requirement of the habitat scheme is that land is kept out of agricultural production for a fixed period of time.
- *The Countryside Stewardship Scheme* encourages farmers to manage land in a way sympathetic to wildlife and public access.
- *The Environmentally Sensitive Area (ESA) Scheme* promotes traditional methods of farming and encourages landowners to manage their land, if within an Environmentally Sensitive Area, as permanent grassland to optimise the landscape and the habitat for wildlife; and,
- the designation of *Nitrate Sensitive Areas (NSA)* and *Nitrate Vulnerable Zones (NVZ)* are specifically aimed at protecting water from nitrate contamination (although no areas have been designated within the East Suffolk catchment).

**The Environment Agency's** role with respect to agriculture includes:

- the control of acute agricultural pollution, such as farm effluent discharges, currently under the provisions of the *Water Resources Act 1991*.
- the prevention of pollution from certain agricultural practices through the enforcement of the *Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991* and associated guidance.
- to promote the designation of water protection zones and prohibition of certain activities within them. Nitrate Sensitive Areas are an example of this.
- the control of land spreading of wastes as an exemption from the *Waste Management Licensing Regulations 1994*.

- the licensing of schemes that impact upon the drainage of land under the *Land Drainage Act, 1991*.
- seek to control siltation in an advisory capacity and through consultation with landowners.

The Health and Safety Executive (HSE) works with us in adopting a pollution prevention philosophy in respect of the storage and use of pesticides. HSE are the enforcement agency for pesticides under the *Food and Environmental Protection Act (FEPA)* and *Health and Safety at Work Act (1974)*. We have concerns about diffuse sources of pesticides and we are undertaking research in this area. Acute river or groundwater pollution from a pesticide source can be subject to a prosecution by the Environment Agency under the *Water Resources Act 1991*.

## 5.12 FLOOD DEFENCE AND COASTAL PROTECTION

### 5.12.1 General

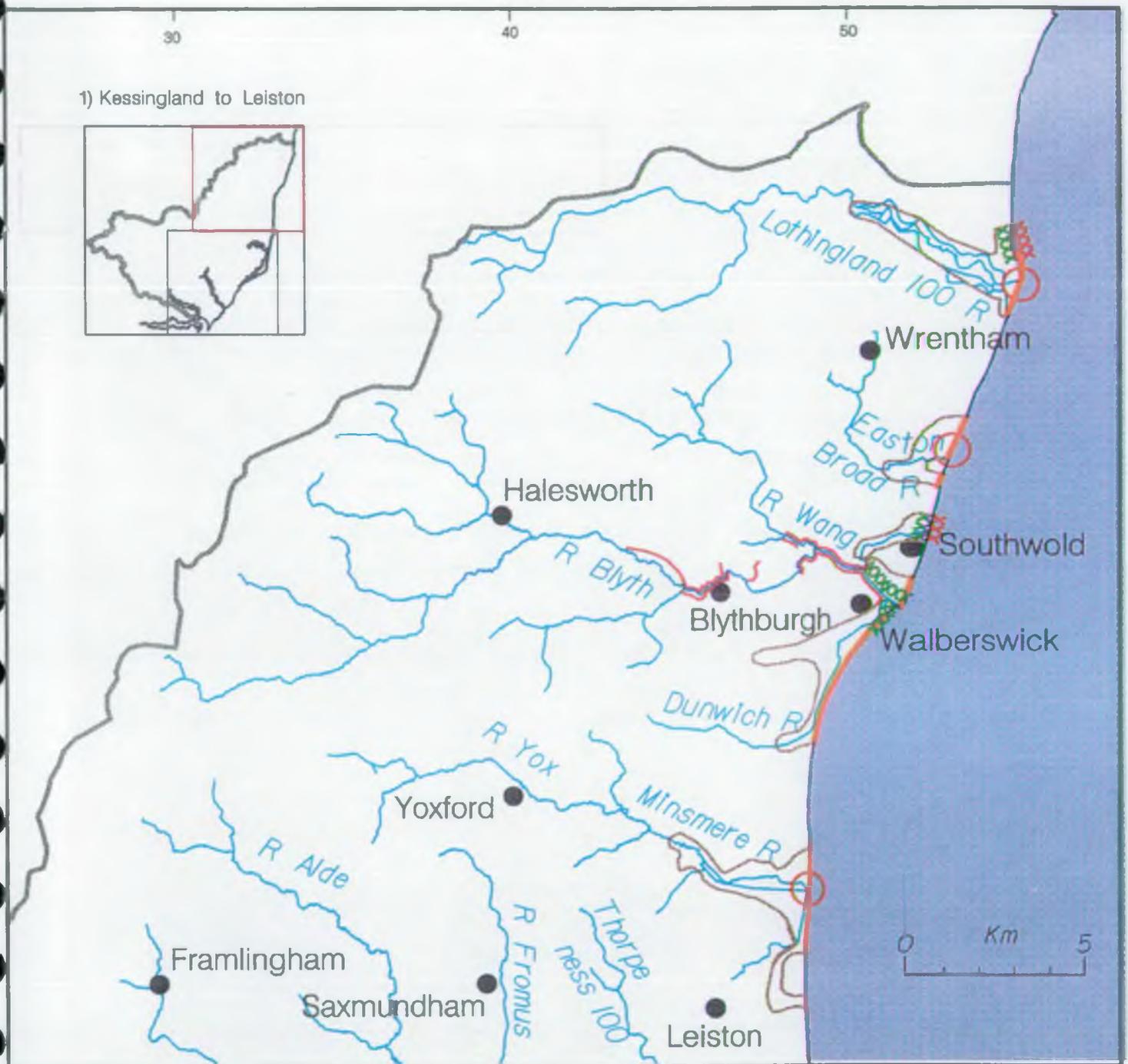
Flood Defence deals with the provision of effective defences for people and property against flooding from rivers and the sea. Normally flooding is a result of extreme climatic conditions, such as very heavy rainfall or tidal surges. Flood events are described in terms of the frequency at which, on average, a certain severity of flood is exceeded. This frequency is usually expressed as a return period in years *e.g.* 1 in 50 years. A similar approach is used to measure the effectiveness of flood defences and the level of protection is given as the likelihood of the defences being overwhelmed. It is clear that different types of land use, for example, urban areas such as Felixstowe, and pasture found on the rural frontages around Minsmere justify different levels of effectiveness for the defences. In addition, it is recognised that the standard of flood protection offered by any particular defence is likely to decrease if maintenance is not undertaken.

#### *Coastal Defences*

Much of the land bordering the coastal waters in Eastern England is low lying and protected against flooding by sea defences. These have been built and rebuilt over many years by the Environment Agency's predecessors. Tidal surges with their origins in the North Sea, can give extremely high water levels, particularly at times of spring tides.

#### *Fluvial Defences*

The natural river systems of Eastern England have been radically altered over the centuries. Where once all the rivers would have drained naturally across the coastal plains into the sea, the improvement and reclamation of land for agricultural purposes has necessitated the embankment of river channels and lowland drainage systems which together have created an artificial environment which can have a relatively restricted wildlife and habitat diversity.



1) Kessingland to Leiston

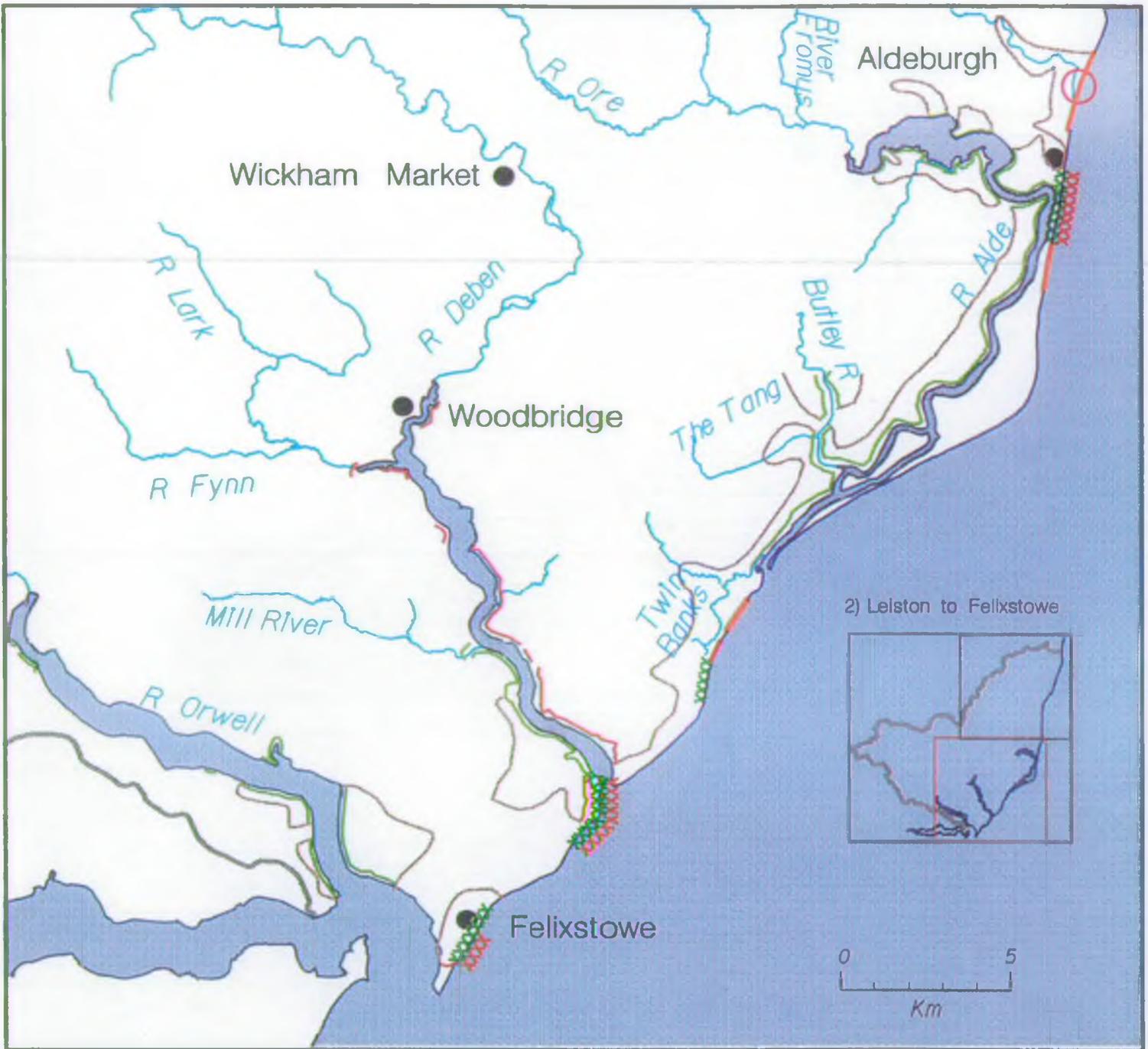


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- Main River
- Clay walls (not revetment)
- Clay walls (revetted)
- Shingle bank
- - - - - Groynes
- - - - - Concrete/steel walls
- Protected areas (subject to tidal inundation)
- Outfall sluice



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- |   |                            |   |   |
|---|----------------------------|---|---|
|  | Main River                 |   | Groynes                                       |
|  | Clay walls (not revetment) |   | Concrete/steel walls                          |
|  | Clay walls (revetted)      |   | Protected areas (subject to tidal inundation) |
|  | Shingle bank               |  | Outfall sluice                                |

# Sea Defences Responsibility

Map 26



**ENVIRONMENT  
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- Main River
- Coastline
- Catchment boundary
- Urban area
- Waveney District Council
- Suffolk Coastal District Council
- Environment Agency

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The maintenance of river systems is essential to prevent flooding of property and risk to life. It is also necessary to facilitate the use of land for agricultural purposes. The practice of maintaining river channels for these purposes is often a source of conflict because of its impact upon the flora and fauna associated with the water environment.

### 5.12.2 Local perspective

#### *Historical Background*

Throughout history, the danger of inundation by North Sea surge tides has been an ever-present threat to the people living in low lying areas along the coast in East Suffolk. Not only tidal and freshwater flooding events, but erosion and landslides have threatened their homes, their livelihoods and sometimes, their lives.

For centuries, the vulnerable coastal fringe has been protected by seawalls, whilst tidal saltmarsh was reclaimed from the sea to provide valuable agricultural land.

Major surges in 1953, 1978, and more recently in 1988 and 1993, have demonstrated the continuing need to provide and sustain a framework of sea defences to protect people and property, in areas at risk of tidal inundation.

Fluvial flooding in freshwater river valleys has affected both property, communications and infrastructure, in addition to the agricultural industry which have all developed over the years in the floodplain. Extensive flooding occurred in Ipswich in 1939 and again in 1947 and a major event in October 1993 caused extensive flooding throughout the East Suffolk Plan area with numerous properties affected and communications severed.

#### *Coastal Defences*

The East Suffolk coastline is predominantly made up of soft materials (shingle and silt) with several sections of the coastline dominated by cliffs made up of soft sands and shelly crag. The low lying stretches between the cliffs are mostly protected by shingle banks and sand dunes. Coastal towns such as Southwold, Aldeburgh and Felixstowe are protected by concrete wave walls fronted by groyne systems on the foreshore.

Clay walls form the most common type of protection to the low lying marshland along the tidal estuaries. Many of these walls now have an armoured face to reduce the effect of shipwash and wave action in the more exposed reaches. Vulnerable towns such as Ipswich and Woodbridge, with high populations and commercial development around the water front areas, are protected by concrete and steel sheet piled walls to make maximum use of the limited space available.

A large proportion of the East Suffolk coast is protected for nature conservation under European and International legislation. There is a need to balance these requirements with the flood defence needs. The long-term nature conservation interest of this area is very dependent upon the management of coastal defences. Whilst some defences protect important habitat (*i.e.* Walberswick, Minsmere and Hazelwood marshes) other defences

are preventing the natural development of saltmarsh landward resulting in the "coastal squeeze" and loss of habitat as sea level rises.

### Fluvial Defences

The main freshwater rivers are the Lothingland Hundred, Easton Broad River, Blyth, Minsmere, Alde, Thorpeness Hundred, Deben and Gipping. These are mainly rural lengths of channel generally passing through agricultural land, predominantly pastoral, and inset in the floodplain of the river valley. The rivers and their catchments are described in more detail below.

### Lothingland Hundred River

The Main River length including tributaries is 52.9 km with a fall of 35 metres from its source to the pumping station at Benacre. The river flowed unrestricted into the North Sea until the inlet was closed by a shingle bank early in the 14th Century. The east coast floods of 1953 destroyed the old pumping station. A new pumping station was built and commissioned in 1955. During 1994/95 the station was completely refurbished including new electric pumps to replace the old diesel ones. The station is now fully automatic and complete with a standby generator in case of power failure. Summer water levels are retained upstream of the pumping station by means of controls at Latymer Dam and Rushmere Arch.

### Easton Broad Watercourse

The length of Main River including tributaries is 7.6 km with a fall of 7 metres from the source to Potter's Bridge. The upper reaches of the watercourse bisect Wrentham Village and although this length of the channel is dry for most of the summer months many of the riverside properties are at risk of flooding following extreme rainfall in the catchment, such as occurred in October 1993.

### River Blyth

The Main River length including all tributaries is 96.4 km with a fall of 53 metres from the source to Blythburgh Bridge. Although the upper reaches of many of the tributaries are dry throughout most of the summer months riverside properties in Chediston, Wissett and Halesworth are at risk of flooding following extreme rainfall in the catchment. Properties in Bramfield are also at risk most especially if the outfall from Bramfield watercourse into the River Blyth becomes tide locked.

### Minsmere River

The Main River length including tributaries is 39.8 km with a fall of 27.5 metres from its source to Minsmere Sluice. Isolated properties at Eastbridge are at risk of flooding during times of peak flows when water inundates the flood plain due to the Minsmere Sluice being tide locked. There are also some properties at risk in Yoxford following

extreme rainfall.

### River Alde

The Main River length including tributaries is 72.7 km with a fall of 31 metres from its source to Snape Sluice. The river system includes a number of small tributaries many of which are often dry throughout the summer months. There are a number of towns and villages such as Framlingham, Saxmundham, Badingham and Bruisyard where riverside properties are at risk from flooding following extreme rainfall in the catchment.

### Thorpeness Hundred

The Main River length is 13.8 km. Most of the watercourse runs through open countryside to outfall into the North Sea via Thorpeness Sluice, the notable exception being Knodishall where there are several riverside properties at risk of flooding following extreme rainfall in the catchment.

### River Deben

The Main River length including tributaries is 89.9 km with a fall 46 metres from its source to the tidal limit at Ufford Mill. The upper reaches of many of the tributaries are dry throughout the summer months but following extreme rainfall riverside properties at places such as Debenham, Framsdon and Great Bealings are at risk of flooding.

The floodplain in the lower reaches of the river is prone to inundation following extreme flows in the catchment, particularly when the system becomes tide locked at Melton. There are also isolated properties in Loudham at risk of flooding during this period.

### River Gipping

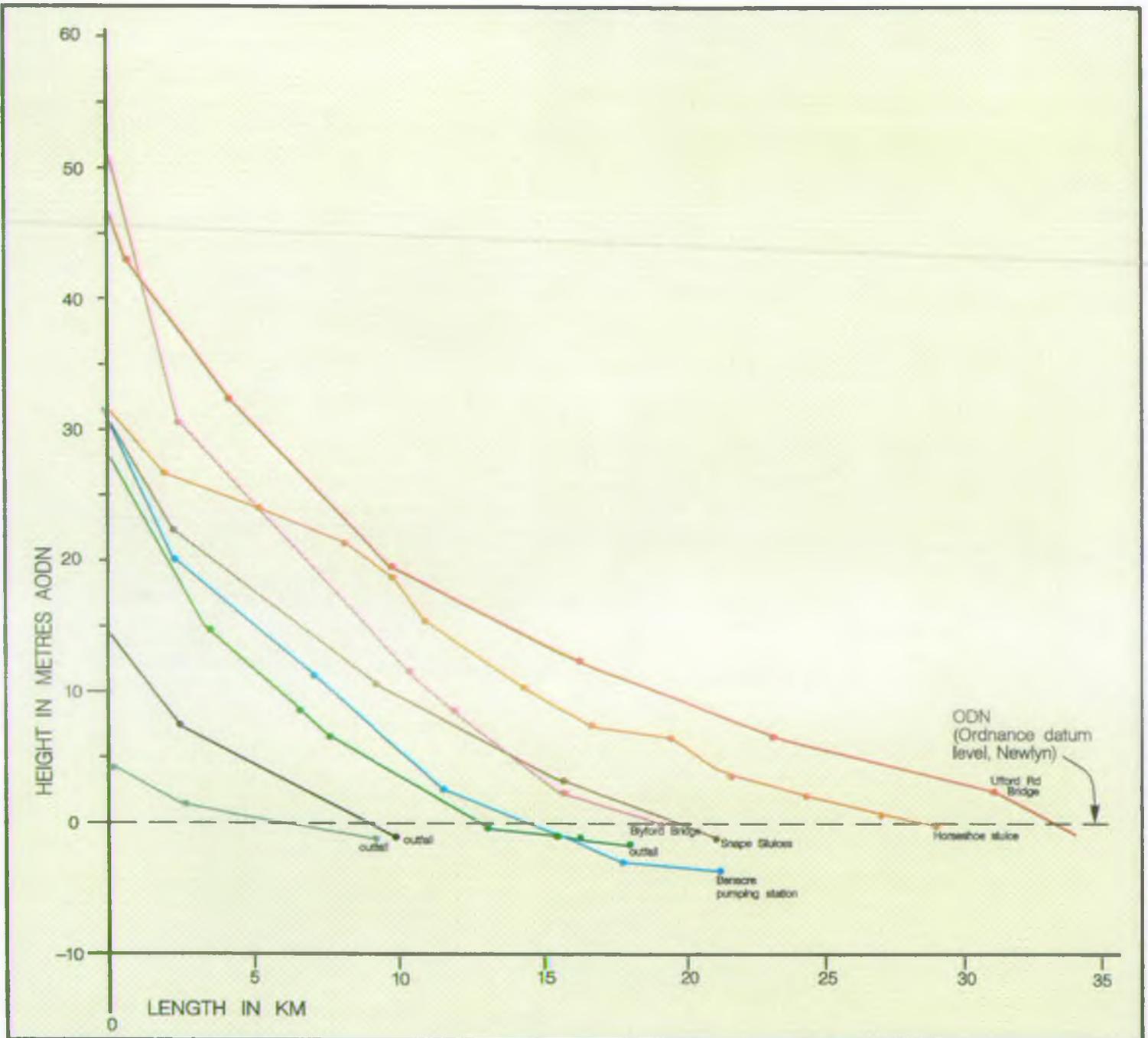
The Main River length including tributaries is 89.4 km with a fall of 33 metres from its source to the tidal limit in Ipswich. The upper reaches of many of the tributaries are often dry during the summer months. Extreme rainfall can put riverside properties in areas such as Finborough, Rattlesden and Somersham at risk of flooding. A flood alleviation scheme to protect Stowmarket including the construction of two flood storage reservoirs was completed in the late 1980's. The River Gipping Comprehensive Scheme to protect Ipswich from both tidal and fluvial flooding was completed in 1982.

### *Maintenance Programme*

The Environment Agency does not own watercourses (except in a few specific locations where flood defence structures have been constructed and their ownership retained). The ultimate responsibility for the upkeep of a watercourse rests with the person who



Figure 5: Main River Profiles



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- Lothingland 100 River
- Easton Broad River
- River Blyth
- Minsmere River
- Dunwich River
- River Alde
- River Deben
- River Gipping

owns the land on the side of the river (also known as the riparian owner). We have permissive powers, on Main River, to undertake works and exercise our powers in this respect according to available resources and priorities. Regular maintenance is essential if the river system and sea defences are to operate properly at times of high water levels. Such maintenance works include vegetation control, repairs to earth embankments and other floodwalls, obstruction and blockage removal and dredging. Maintenance works help preserve the integrity of the coastal defences and maintain the flood discharge capacity of the Main Rivers, thereby significantly reducing the risk of flooding.

An essential element of the annual maintenance works, is the requirement to design and implement these in a sensitive and environmentally acceptable way. Whilst carrying out flood defence works and in liaison with our environmental functions, opportunities are sought to incorporate environmental enhancement features wherever possible, in relation to the extent and expenditure of the flood defence maintenance scheme. Under the legislation three main areas have to be considered, namely to take into account the impact of proposals on natural features, to have regard to protection features of historic interest, and to further the conservation and enhancement of flora, fauna and other natural features.

Minimum recommended maintenance frequencies for identified river lengths and sea defences are shown in Appendix 14. These frequencies are desirable but are not mandatory. The revenue maintenance programme is funded principally by a levy on Suffolk County Council and the Internal Drainage Boards, and supported by general drainage charge contributions within the Norfolk & Suffolk Flood Defence Committee area.

The East Suffolk fluvial rivers are generally of a natural channel section, (with the exception of embanked sections upstream of mills) and require little in the way of maintenance, other than annual weedcutting, selective de-silting and the removal of obstructions.

Maintenance of the coastal defences consists mainly of reforming the lengths of soft defences following storm damage, and in the case of hard defences ensuring that groyne systems on the foreshore and floodgates in the walls are kept in good working order.

In addition to general maintenance work, we can build new flood defences if flooding is a serious problem in a particular area. Nowadays we usually only build new defences to protect built up areas from flooding. All schemes must be technically, economically and environmentally sound.

Subject to the above criteria being met, schemes are then funded on a priority basis with currently up to 65% grant aid from the Ministry of Agriculture, Fisheries and Food, and the balance is once again funded by a levy on Suffolk County Council and the Internal Drainage Boards.

Recent Capital Works expenditure within the East Suffolk Plan area include the

following:-

- Between 1990 - 1992. Construction of a new groyne system and a 400 metres rock armour transition bank for Aldeburgh, at a cost of £5 million.
- Between 1990 - 1993. Construction of improved tidal defences to protect Woodbridge and Melton to a standard of 1 in 250 years at a cost of £4 million.
- In 1994 - 1995. Replacement and upgrading of pumping and control equipment at Benacre Pumping Station at a cost of £400,000.

To identify the future needs of the catchment for improved and replacement flood defences, a Long Term Plan has been produced, for the Norfolk & Suffolk Local Flood Defence Committee. A list of capital flood defence schemes from the Long Term Plan are shown by Appendix 16. Projects have been identified within the East Suffolk Plan area and prioritised for the years 1996 - 2006 and they represent the Committee's capital needs for expenditure over the next ten years. This is a strategic document which is used for consultation with both MAFF and Local Authorities to gain Grant Earning Ceiling Allocations, and as a basis of discussions with Suffolk County Council regarding precept funding for flood defence. One of our current major schemes in the East Suffolk Plan area is the placing of some 12,000 tonnes of rock armour at East Lane Bawdsey to hold the existing line of defence and protect about 25 properties in Bawdsey and Shingle Street at a cost of £500,000.

#### *Shoreline Management Plan (SMP)*

A Shoreline Management Plan is a document which sets out a strategy for coastal defence for a specified tidal frontage taking account of natural coastal processes and human and other environmental influences and needs.

Recent research has suggested that the coastline of England and Wales can be divided into 11 major sediment cells. A sediment cell is defined as a length of coastline which is relatively self contained as far as the movement of sand and shingle is concerned and where interruption to such movement would not have a significant effect on adjacent sediment cells.

SMPs provide the vehicle for the long term sustainable protection of our coastlines. The objectives of SMPs are to improve our understanding of coastal processes, to work in partnership with all interests and organisations and to prepare an agreed framework for the long term planning of coastal defences.

The East Suffolk coast falls into Sediment cell 3, from the Wash to the Thames. Although this cell forms a discrete unit it has been divided into sub-cells to provide a more practical basis for the initial production of a Shoreline Management Plan. The East Suffolk coast falls into Sub-cell 3c from Lowestoft to Harwich, the Suffolk SMP, and is divided into four natural management units.

#### *Land Drainage*

For watercourses which are not designated as Main River, Local Authorities have powers under the *Land Drainage Act 1991*, to maintain or improve existing works or

construct new works. These powers are permissive and do not relieve riparian owners of their duties and responsibilities. In general you must accept water from your upstream neighbour and pass it on, together with drainage from your property, to your neighbour downstream. The ultimate responsibility for maintenance of the watercourse, including the banks, rests with the riparian owner. This could include clearing obstructions, repairing the banks, protecting vegetation and trees and removing rubbish. In addition, the Internal Drainage Boards are responsible for certain designated 'Main Drains', which are found in all the East Suffolk river valleys, apart from the Twin Banks watercourse.

Any works which may affect the flow in a watercourse require the consent of the Environment Agency under either Section 109 of the *Water Resources Act 1991* or Section 23 of the *Land Drainage Act 1991*. We operate Bylaws which additionally require the issuing of consents for works which may affect the effectiveness and operation of its assets. Such approval is required for works on or adjacent to seawalls, flood embankments and Main Rivers. By exercising these powers we seek to ensure that standards of flood defence and drainage are not compromised, and in determining all river works which need its approval, we must also consider the environmental effects of any proposed works. The Environment Agency has permissive powers to enter and to carry out works in pursuit of their flood defence role as resources allow. However, the ultimate responsibility for repair and maintenance of river systems rests with landowners. We have prepared a booklet, the *Riverside Owners Guide*, which gives advice to people living near rivers and streams, and is available from our Area offices.

#### *Flood Risk Areas*

The relevant authority for controlling development in the floodplain is not the Environment Agency but the Local Planning Authorities through the *Town and Country Planning Act 1990* process. Local Planning Authorities and ourselves are required by the Department of the Environment in Circular 30/92, on Development and Flood Risk, to liaise closely on flooding and surface water run-off matters. The aim is to ensure that flooding risks that might arise from a development are recognised and made an integral part of the decision making process undertaken by Local Planning Authorities. Flooding and drainage issues are also to be taken fully into account during the preparation of land use development plans. In this respect we have responsibility to prepare surveys under Section 105 of the *Water Resources Act 1991* to define the nature and extent of flood risks.

#### *Flood Warning*

The Storm Tide Warning Service is run by the Meteorological Office at Bracknell and monitors and predicts tidal surge conditions that may affect the east coast of England. This gives sufficient advanced warnings of areas likely to be affected by tidal flooding, in order that effective action can be taken.

When appropriate, flood warnings are issued by the Environment Agency to the public, the police, emergency services and the media, and messages are put on FLOODCALL, our flood enquiry telephone service (0645 88 11 88).

In order to ensure that timely warnings are issued to the right people, we operate a system of Flood Warning Standards of Service. By defining lengths of river, or reaches, with common land use interests, those areas with a high population concentration can be treated as priority. It is our aim to provide a two hour warning of commencement of flooding wherever practicable.

During flood flows, mobile patrols keep structures and sluices clear of debris, whilst reporting on the flooding situation to our Emergency Incident Room.

### 5.12.3 Regulatory Framework

MAFF have overall responsibility for Flood Defence policy in England and Wales. The aim of this policy is to:

“reduce risks to people and the developed and natural environment from flooding by encouraging the provision of technically, environmentally and economically sound and sustainable defence measures”.

The Ministry seeks to achieve this by - establishing a policy framework for the relevant organisations to provide flood warnings and carry out defence, drainage and maintenance works; and by the provision of Government grant for cost-effective flood defence works and flood warning systems.

#### **Role of the Environment Agency:**

Under the *Water Resources Act 1991*, we have a duty to exercise general supervision over all matters relating to flood defence. Both for inland flooding and inundation by the sea. We may also construct new works and undertake improvement and maintenance works on, or in connection with, main rivers and sea defences. We are empowered to maintain and improve defence systems on Main River and the coast to reduce the incidence of flooding to people and property. In such instances, it must ensure all works comply with environmental requirements.

**Local Authorities:** have powers to undertake works on ordinary watercourses, under the general supervision of the Environment Agency. These powers are permissive and do not relieve riparian owners from any obligations to which they were subject by reason of "tenure, custom, prescription or otherwise". Liaison with Local Authorities by Environment Agency and planning developments is critical in the proactive role of preventing the creation or extension of flooding risks.

Local Authorities are also responsible for coastal defences along the lengths of frontage not subject to flooding (for example cliffs). Parts of the coast, as shown by Map 12, are managed by the District Council's of Waveney and Suffolk Coastal under the *Coast Protection Act 1945*.

There are a few coastal frontages within the Plan area where the landowner has a private responsibility to maintain coastal defences. Sizewell and Orford Ness are two such

examples of sea defences where the Environment Agency and the Suffolk Coastal District Council have no responsibility.

**Internal Drainage Boards:** have a duty to exercise general supervision over all matters relating to the drainage of land and in particular the responsibility for designated Main Drains within a defined drainage district. There are eleven IDB's, within the East Suffolk Plan area of which four (Fromus, Alde and Thorpeness, Minsmere, Upper Alde and Blyth) are administered by the Environment Agency. A full list of all the IDB's is shown in the Key Details section at the front of this document.

## 5.13 ANGLING

### 5.13.1 General

Angling is said to be the most popular recreational activity, in terms of participating numbers, within Britain. It is undertaken both for relaxation, and occasionally as a competitive sport, in all of its three principal disciplines, namely coarse, game and sea angling.

Coarse and game angling is practised on freshwater rivers, lakes and reservoirs, whilst sea angling takes place on estuaries, from beaches and in coastal waters. Freshwater venues may be privately owned, commercial, syndicated or association waters, many of which are managed voluntarily by both owner and tenant angling clubs.

### 5.13.2 Local perspective

#### Freshwater

Organised brown trout fishing takes place on the Rivers Fynn, Lark and the Mill River where trout populations are regularly supplemented by the addition of stocked fish. There are several put and take still water trout fisheries in the catchment including Lakeside Leisure Park at Saxmundham and Willow Lakes near Halesworth, both of which offer day permit fishing.

There are organised coarse fisheries along most of the River Gipping downstream of Stowmarket, on the River Deben at Wickham Market and on the River Hundred at Kessingland. A good variety of coarse fish species typical of rivers are regularly taken, including occasional individuals of specimen size.

There are many still waters in the catchment which offer coarse fishing. These include Alderson Lake, Barham Pits, Bridge Farm, Holton Pit, Needham Lakes, Reydon Pits and Sibton Lake. The usage rate of these waters is moderate, and most of them are open on a day permit basis. Most species of coarse fish can be found in a number of these venues.

There are a number of freshwater angling clubs based in the Plan area. These include the Framlingham and District, Gipping Angling Preservation Society, Gipping Valley, Saxmundham, Southwold and District Freshwater Angling Preservation Society, Kessingland and Woodbridge and District Clubs.

#### Saltwater

The existence of a public right to fish in tidal waters means that most saltwater angling takes place on an informal basis. Saltwater angling can and does take place from the shore in almost any location where access is possible. The extensive saltings and mudflats that occur along the estuarine areas can, however, inhibit access at low water.

A diverse range of fish species are captured by anglers fishing around the coast. Flatfish such as plaice, dab, flounder and sole are regularly caught by beach anglers. Cod and whiting are commonly caught species in the autumn and winter, whereas bass tend to be captured in the summer and autumn. Popular areas for beach fishing are Aldeburgh, Dunwich, Minsmere, Southwold and Thorpeness. There is good boat fishing for tope, smooth hound, cod, bass and thorn back ray, with several boats based at Southwold and Felixstowe.

Digging of baits for saltwater fishing along the foreshore is a controversial activity which is potentially damaging, particularly if undertaken mechanically and/or on a commercial scale. Bait digging within coastal SSSIs/SACs/SPAs can threaten their conservation value by reducing the food resource available to other wildlife and creating disturbance to waders and wildfowl.

### 5.13.3 Regulatory Framework

#### **Role of the Environment Agency:**

We have a duty under Section 25 of the *Salmon and Freshwater Fisheries Act 1975* to regulate the taking of salmon, trout, freshwater fish and eels by rod and line for recreational (or commercial) purposes, by means of a system of licensing. The *Anglian Region Fisheries Byelaws* define the area of our jurisdiction, and specify demarcation points, generally at the limits of tidal waters, downstream of which licences are no longer required (this is only because freshwater fish are not generally found in tidal waters in the plan area; it is not due to any exemption from the licencing requirement).

#### **Role of others:**

In addition to their rod licences, freshwater anglers also require authority to fish from the owner or controller of the fishing rights on the water in question.

Rod Licence duties proposed by the Environment Agency are subject to prior approval by MAFF.

The capture of brackish or salt water species in estuaries and coastal waters is not regulated by licensing or other means, although certain bylaws enacted by various statutory bodies can impinge on its conduct. There is a public right to fish in virtually

all tidal waters, which was established by *Magna Carta*.

## 5.14 FISHERIES - FRESHWATER

### 5.14.1 General

Fish populations are affected both by the quality and the quantity of water, and by the physical suitability and structure of the aquatic ecosystem. The presence of a thriving fish stock is therefore a good indicator of a satisfactory water environment.

Freshwater fisheries uses include -

- Game fisheries - those supporting breeding population of salmonid fish.
- Coarse fisheries - those supporting breeding populations of coarse fish.
- Maintained fisheries - those supporting non-breeding populations of fish maintained solely for recreational exploitation (represented mainly by "put and take" rainbow trout fisheries).
- Fish Farms - those sites supporting the artificial propagation and growing on of fish under controlled conditions for commercial and/or management purposes, or providing holding or transit facilities in connection with the live fish trade.

### 5.14.2 Local perspective

Salmonid fish stocks are not widely distributed in East Anglia. East Suffolk area is no exception to this generality, with brown trout stocks occurring only in the Rivers Finn and Lark, Mill River and Belstead Brook. Salmon and sea trout do not enter the freshwater rivers, although sea trout in particular are recorded in coastal waters.

Coarse fish stocks are dominant in most locations, and can be found throughout all catchments comprising the plan area. Roach, bream, pike, perch, carp, chub, dace and tench are widespread in the larger rivers, whilst lesser streams may only support the smaller species, such as stone loach, bullhead, minnow and stickleback. Brook lampreys have been recorded from Mill River and the River Alde.

Reservoirs, lakes and ponds supporting fish stocks occur everywhere; there are too many of them to identify or characterise individually. Little precise data exist on these stocks, although it is abundantly clear that they represent an important and large scale resource. Maintained "put and take" rainbow trout fisheries are included in this category.

Fish farming is no longer a significant activity, following the recent closure of a common carp production unit. Remaining businesses are primarily concerned with the restocking of enclosed fisheries, using surplus stocks obtained from other lakes and ponds.

### 5.14.3 Regulatory Framework

#### **Role of the Environment Agency:**

We have a duty under Section 6(6) of the *Environment Act 1995* to maintain develop and improve salmon fisheries, trout fisheries, freshwater fisheries and eel fisheries. The Environment Agency's written consent is required under Section 30 of the *Salmon and Freshwater Fisheries Act 1975* for the introduction of fish or spawn of fish into any inland waters (other than registered fish farms). The written consent of the Agency is also required by the *Anglian Region Fisheries Byelaws* for the removal of fish from inland waters, and for the use of various instruments for the taking of fish in connection with scientific or fisheries management purposes. An additional consent under Section 5 of the *Salmon and Freshwater Fisheries Act 1975* is necessary if electric fishing methods are to be used. We also have powers under the *Salmon and Freshwater Fisheries Act 1975* to help ensure the unobstructed migration of salmon and sea trout between the sea and their spawning grounds. These include the power to require the construction of fish passes on weirs or other dams.

The *EC Freshwater Fish Directive 78/659/EEC* sets water quality objectives for designated stretches of water, which enable fish to live continuously or breed in favourable conditions.

The Environment Agency must notify the Ministry of Agriculture, Fisheries and Food (MAFF) of the occurrence of known or suspected outbreaks of any notifiable fish disease. We also have discretionary powers to remove dead or dying fish from inland waters, although these would only be exercised in respect of rivers, without the previous consent of the riparian owner.

#### **Role of others:**

The Ministry of Agriculture, Fisheries and Food are responsible for the administration of the *Diseases of Fish Acts of 1937 and 1983*, and for the control of fish imports under regulations made to give effect to relevant EC Directives, especially the *EC Fish Health Directive 91/67*.

MAFF approval is also required in respect of any new or amended Fisheries Byelaws that may be proposed by the Agency in accordance with the *Water Resources Act 1991*. Fisheries Byelaws may be nationally or regionally applicable.

## 5.15 FISHERIES - COMMERCIAL AND MARINE

### 5.15.1 General

Extensive use has always been made of the exploitable fish stocks which occur within and around Great Britain, and commercial fin fisheries are one of our most prominent traditional food industries.

The requirements of commercial fisheries are that the biological, chemical and physical characteristics of the fishing areas are maintained and managed in such a way as to allow the exploitation of the commercially viable stocks on a long term and sustainable basis.

### 5.15.2 Local Perspective

There is very little commercial fishing activity on inland waters in the plan area, although some eel fishing may occasionally take place. Sea fisheries occur all along the coast. Although these primarily exploit fully marine and estuarine species, rather than the salmonid fish, freshwater fish or eels for which the Agency has responsibilities, a small number of sea trout are taken regularly.

Sea trout taken off the Suffolk coast do not spawn in any of the local rivers, but instead comprise a mixed stock of fish whose spawning grounds lie elsewhere, outside of the plan area, and indeed outside of the Anglian Region as a whole.

### 5.15.3 Regulatory Framework

#### **Role of the Environment Agency:**

We are responsible under Section 25 of the *Salmon and Freshwater Fisheries Act 1975* for regulating commercial fishing for eels, salmon and migratory trout in all waters, by means of a system of licencing. However, the *Anglian Region Fisheries Byelaws* specify demarcation points, generally at the limits of tidal waters, downstream of which an excusal from eel fishing licence duties has been granted. The Agency also has powers under Section 26 of the *Salmon and Freshwater Fisheries Act 1975* to propose Net Limitation Orders (NLO's) to limit the number of salmonid net licences to be issued in any year.

Water Quality Objectives for tidal waters are likely to be formulated nationally to protect both local and migratory fish populations of all species. Water quality would then be improved or maintained to meet these objectives.

#### **Role of others:**

Commercial eel fishing upstream of the byelaw demarcation points may only be conducted with the permission of the owner or controller of the fishing rights.

Net licence duties and NLO's proposed by the Agency are subject to approval by MAFF.

The control and management of marine fin fisheries in the catchment is undertaken by MAFF and/or the Eastern Sea Fisheries Joint Committee.

## 5.16 SHELLFISHERIES

### 5.16.1 General

Coastal waters and estuaries are also used for both crustacean and molluscan shellfisheries. Oysterages differ from other shellfisheries in that they now depend largely on the laying of juvenile stocks for subsequent harvesting, once they have reached a marketable size.

### 5.16.2 Local Perspective

Within the Plan area several minor shellfisheries exist, although the only significant one in use is located within Butley Creek. This rural site is well removed from any treated sewage inputs and it is not significantly subject to external influences. The shellfishery is currently classified as Class A under the Shellfish Hygiene Regulations.

Potential for development at other locations includes the River Deben (Lower), Blyth estuary, Alde estuary (Upper) and River Orwell (Mid). The coastal waters are currently not utilised as a commercial molluscan shellfishery although some potential exists in limited areas.

### 5.16.3 Regulatory Framework

#### **Role of the Environment Agency:**

We are responsible for implementing the *EC Shellfish Waters Directive 79/923/EEC* in tidal waters.

Shellfisheries may be classified as A, B, or C under the *EC Shellfish Hygiene Directive 91/492/EEC*, which is administered and enforced by the Local Authorities. That is they may either go direct for human consumption (Class A), or they must be heat treated, depurated or relaid before consumption (Class B). Where a C classification occurs, the shellfish must be relaid for at least two months in cleaner water, or heat treated. Our duty is to work with the Local Authority to maintain current classes under this Directive.

#### **Role of others:**

The control and management of crustacean shellfisheries in the catchment is undertaken by MAFF and/or the Eastern Sea Fisheries Joint Committee, in conjunction with the Environment Agency.

# Shellfish Harvesting Areas

Map 30



**ENVIRONMENT  
AGENCY**

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June 1997

-  Main River
-  Coastline
-  Catchment boundary
-  Urban area

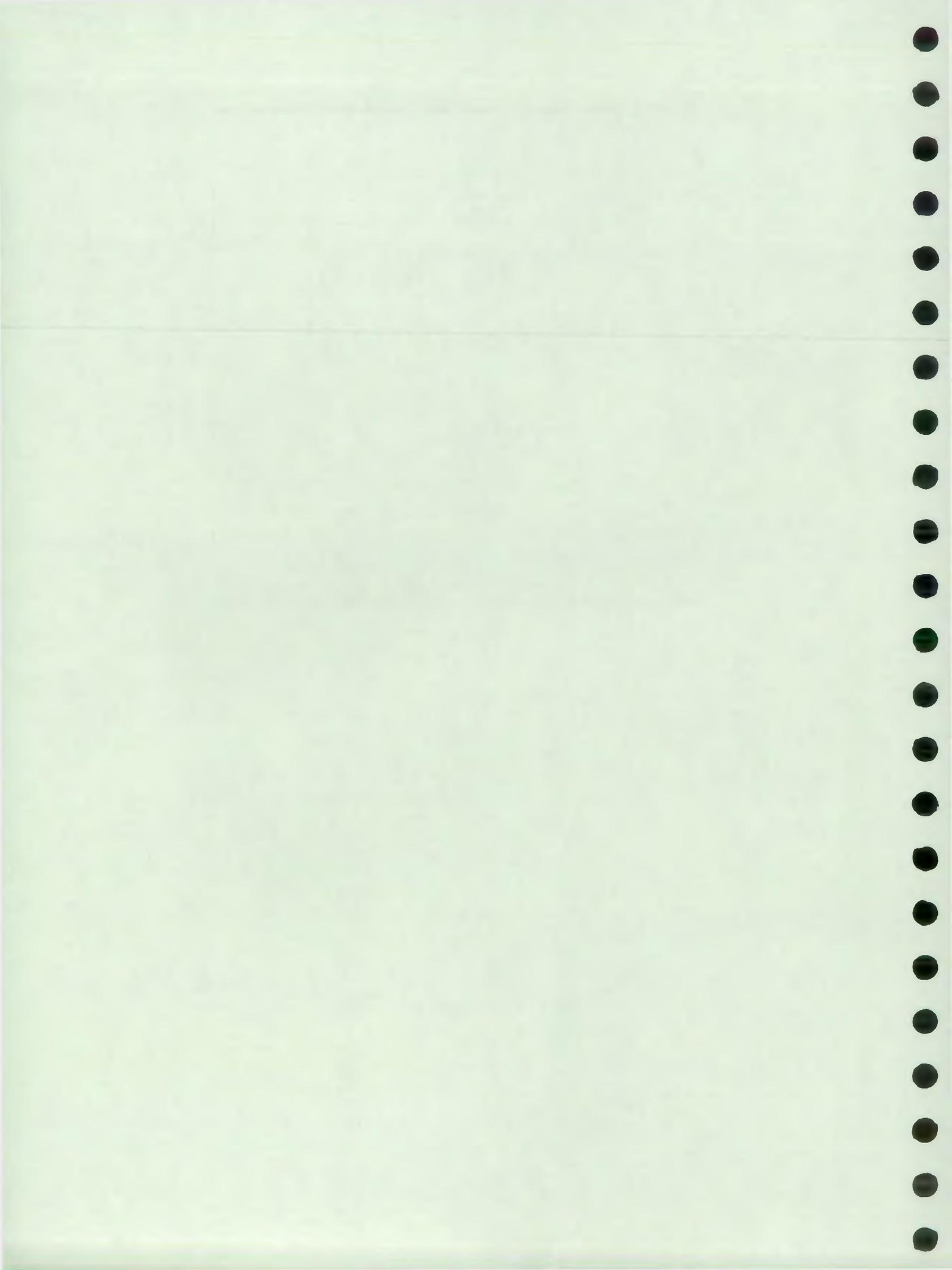
-  Commercial site
-  Disused site
-  Occasional/potential site



Section Six

# State Of The Environment

This section provides information on the current state of the East Suffolk environment. Shortfalls may be identified when the current state is assessed against targets. Many of these shortfalls are addressed through the East Suffolk LEAP and have been linked to the Issues in Section Two.



## 6.0 State of the Environment

The Environment Agency is committed to reporting on the State of the Environment (SoE) and has a duty to form an opinion of the state of pollution of the environment under the *Environment Act 1995*. SoE reporting will look at pressures placed on the different environmental media individually and as a whole, and should help to identify and assess trends which should assist in establishing overall priorities.

The Environment Agency is using this approach to provide data to others, such as Local Authorities with whom it will work closely, and to inform others about environmental matters. The Environment Agency assist with this by supplying data where appropriate. The Environment Agency is also currently investigating setting up its own set of indicators.

Where possible, environmental targets should be defined for suitable environmental indicators. These, if met, would help to ensure that each activity and use proceeds in a manner which sustains, or increases local resources, while not impacting unacceptably upon other activities, uses and the local environment.

We regularly monitor many environmental parameters as part of our routine business to identify the status of the environment. It is in this context that statutory or mandatory targets can be set to ensure protection and enhancement to the environment.

The State of the Environment section will aim to set out the **Monitoring, Targets, Status & Shortfalls, Trends and Data Availability** for the listed environmental indicators or parameters. It is our aim to relate these factors to the legislative framework and the data that are specific for the East Suffolk Plan area. Local Environment Agency Plans consider environmental indicators that relate to the protection of land, air and water environments.

The environmental indicators have, where possible, been split into categories of Water, Land, Air and Wildlife.

## WATER

### 6.1 The Quality of Rivers

#### GENERAL

The Environment Agency is responsible for water quality monitoring and has a specific duty to carry it out under the *Water Resources Act 1991*.

#### MONITORING

The principal objectives of carrying out monitoring are to obtain information on the general status of water quality and to look at any changes that have occurred over time. Monitoring is also carried out to assess compliance with statutory standards arising from National or European legislation and to answer specific questions arising, *i.e.* evidence for negotiation with dischargers, investigational research and pollution incidents.

In this Plan area much of the monitoring is carried out for the purposes of our General Quality Assessment (GQA) scheme (see Appendix 1) and to assess compliance with the River Ecosystem (RE) classification scheme. Classified rivers are sampled on a routine basis and to each sample point, a stretch of river is assigned which that sample point will characterise. Data from each sample point is then used to assess the river quality in that stretch. Sampling is also carried out at 12 points for the purposes of assessing compliance with EC Directives and these are shown in Map 32. Baseline monitoring from which data for the GQA and RE classification schemes is used consists of the following parameters; pH, turbidity, conductivity, Biochemical Oxygen Demand (BOD), ammonia, Total Oxidised Nitrogen (TON), chloride and total reactive phosphorus (orthophosphorous), sampled monthly. At sites where an EC Directive applies, monitoring will be carried out according to the requirements of that Directive. The parameters monitored are varied but details can be obtained in Appendices 1 to 3.

#### TARGETS

Targets are used for planning the management of river quality and helping to sustain the use of rivers for recreation, fisheries, wildlife and to protect the interests of abstractors. They are also used as a basis for setting consents to discharge effluent into rivers and guide decisions on the Environment Agency's other actions to control and prevent pollution.

Water quality targets can be divided into those that are statutory and non statutory. Statutory standards in this Plan area are set by the following EC Directives; the *EC Freshwater Fish Directive (78/659/EEC)*, the *EC Bathing Water Directive (76/160/EEC)*, the *Shellfish Waters Directive (79/923/EEC)* and the *EC Dangerous Substances Directive (79/464/EEC)*. Although water is abstracted from the Gipping and Mill Rivers and passed to Alton Water, the EC surface water abstraction point is not in the Plan area.

The DoE has published proposals for a statutory scheme of Water Quality objectives but until these are formally established by Legal Notice served by the Secretary of State, they will be applied on a non statutory basis. The DoE proposals include a range of River Quality Objectives RQOs reflecting a range of different river uses. Standards defining one component, the River

# Water Quality – EC Directive Sampling Points

Map 32



**ENVIRONMENT  
AGENCY**

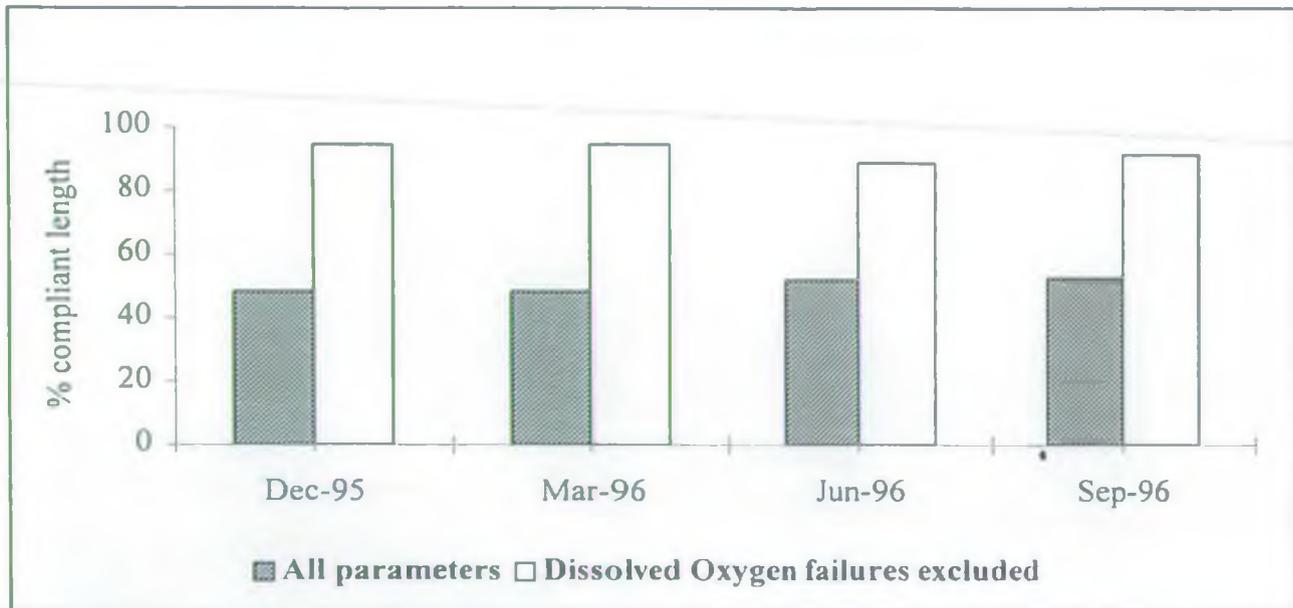
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June 1997

-  Main River
-  Coastline
-  Catchment boundary
-  Urban area

-  Freshwater Fish Directive
-  Shellfish Waters Directive
-  Shellfish Hygiene Directive
-  Bathing Waters Directive
-  Freshwater fish directive (stretches)

Ecosystem scheme, were introduced by the *Surface Waters (River Ecosystem) (Classification) Regulations 1994*. These address the chemical quality requirements of different types of aquatic ecosystems with the standards reflecting differing degrees of pollution by organic matter and other common pollutants which can influence the natural biotic community. A more detailed explanation can be found in Appendix 1.



**FIGURE 6: PERFORMANCE OF RIVERS AGAINST RIVER ECOSYSTEM (RE) TARGETS FOR THE THREE YEAR PERIOD UP TO SEPTEMBER 1996 SHOWING (COMPLIANCE AGAINST ALL PARAMETERS EXCLUDING DISSOLVED OXYGEN).**

#### STATUS AND SHORTFALLS

Within the Plan area water quality is generally fair with very few problems encountered that can be attributed to discharges. Compliance with RE targets for the three year period up to September 1996 are shown in Map 33. The majority of RE non-compliance in the Plan area is solely due to Dissolved Oxygen concentrations not achieving the assigned target. This is illustrated in Figure 6 which shows that when failures due to Dissolved Oxygen only are excluded the percentage length of compliant river increases from approximately 50% to 90%. This is addressed in Issue A3 of the 'Issues and Options' section. Analysis of long term trends show dissolved oxygen levels to have been in these ranges for the past 15 years and that there has been no deterioration in concentrations.

Compliance with EC Directives are given in Table 4 below. There have been sporadic failures at a number of sites. Dissolved Oxygen failures will be addressed via Issues A2 and A3. Those in the Orwell estuary are addressed in Issue C11.

# Water Quality – Compliance Against River Ecosystem Targets Map 33



**ENVIRONMENT  
AGENCY**

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- Coastline
- Catchment boundary
- Urban area

- Compliant
- Fails significantly
- Main River with no target class

June 1997

**Table 4: EC Directive Failures from 1991 to 1995**

SITE NAME	DIRECTIVE	YEAR				
		1991	1992	1993	1994	1995
RIVER DEBEN, WHITE BRIDGE, LOUDHAM	FRESHWATER FISH DIRECTIVE	pass	pass	pass	pass	pass
LOTHINGLAND HUNDRED RIVER, KESSINGLAND DAM	FRESHWATER FISH DIRECTIVE	pass	pass	pass	pass	FAIL (DO)
BUCKLESHAM MILL RIVER, IPSWICH WATER INTAKE	FRESHWATER FISH DIRECTIVE	pass	pass	FAIL (DO)	pass	FAIL (DO)
MINSMERE RIVER, RECKFORD BRIDGE	FRESHWATER FISH DIRECTIVE	pass	pass	pass	pass	pass
BUTLEY RIVER OYSTERAGE (ORE/ALDE ESTUARY)	SHELLFISH WATERS DIRECTIVE	pass	FAIL (Zn)	FAIL (Cu & Zn)	pass	pass
RIVER ORWELL, WOOLVERSTONE MARINA	DANGEROUS SUBSTANCES DIRECTIVE LIST II	FAIL (Cu & Zn)	pass	pass	FAIL (Cu)	pass
RIVER ORWELL, LANDGUARD POINT	DANGEROUS SUBSTANCES DIRECTIVE LIST II	pass	pass	FAIL (Cu)	FAIL (Cu)	pass

### TRENDS

Trends in river quality are best examined by using the Environment Agency's General Quality Assessment scheme, which is explained in more detail in Appendix 1. The results of the 1995 survey are shown in Maps 34 and 35. A number of river stretches showed an improvement in quality compared to the 1990 GQA survey. Overall 26% improved with 11% of stretches improving significantly (>75% probability of improvement in grade). The upper section of the River Wang has improved from F to C due to additional treatment being installed at Bernard Matthews factory at Holton resulting in improved effluent quality. Overall, improvements in water quality are probably due to a combination of pollution prevention initiatives, increased investment in effluent treatment and increased river flows since the drought of 1989-1992,

In 19% of stretches there was a downgrade in quality compared to 1990, 4% of these were significant (>75% probability of deterioration in grade). The downgrades in these 4% of stretches also link with non compliance with RE targets and are addressed by Issue A2.

### COMMENT ON QUALITY AND AVAILABILITY OF DATA

Under current legislation the Environment Agency must maintain a set of Public Registers. Information is held in a combination of paper and computer files which may be inspected at our Regional office. Quality monitoring data is held on the Water Quality and Pollution Control Register.

General Quality Assessment (GQA) Classification – Chemistry Map 34



**ENVIRONMENT  
AGENCY**

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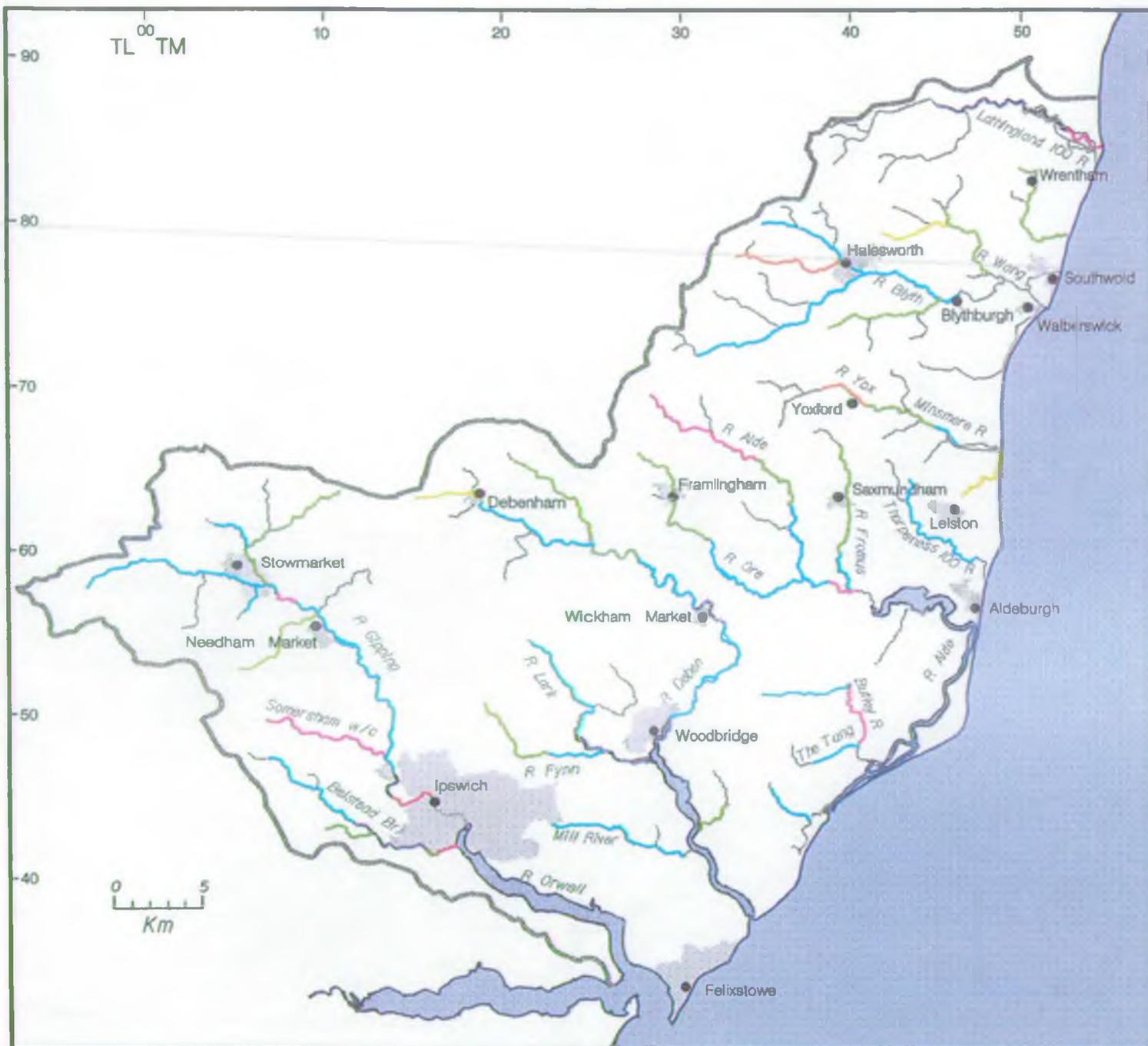
June 1997

- Main River (not classified)
- Coastline
- Catchment boundary
- Urban area

**CHEMICAL RIVER QUALITY SURVEY 1995**  
According to the General Quality Assessment (GQA)  
and Classification of Estuaries Working Party (CEWP) Schemes

- | River and Canal Quality | Estuary Quality  |
|-------------------------|------------------|
| — Grade A               | — Class A        |
| — Grade B               | — Class B        |
| — Grade C               | — Class C        |
| — Grade D               | — Class D (none) |
| — Grade E               |                  |
| — Grade F (none)        |                  |
| — Not sampled           | — Tidal limit    |

# General Quality Assessment (GQA) Classification – Biology Map 35



**ENVIRONMENT  
AGENCY**

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June 1997

- Main River (unclassified)
- Coastline
- Catchment boundary
- Urban area

BIOLOGICAL RIVER QUALITY SURVEY 1995  
According to the  
General Quality Assessment (GQA) scheme

- River and Canal Quality
- Grade a
  - Grade b
  - Grade c
  - Grade d
  - Grade e
  - Grade f (none)
  - not sampled

## 6.2 Pesticides in the Aquatic Environment

### GENERAL

Pesticides are used to kill and control pests and include fungicides, herbicides, insecticides and other compounds such as wood preservatives, plant growth regulators and masonry biocides. At present around 450 active ingredients are available in England and Wales. Many crops, especially fruit and vegetables are treated with multiple applications, and most cereals, vegetables, fruits and other crops are routinely sprayed with a number of different pesticides. In addition, there are many non agricultural uses of pesticides such as weed control on roads and pavements, pest control in parks, gardens and golf courses, and anti-fouling paints on boats.

The majority of pesticides applied are held for a time on soil/plant surfaces, although most naturally degrade some may find their way into watercourses either via drainage ditches into surface water or through permeable soils into groundwater.

In 1995, the former NRA, published the report 'Pesticides in the Aquatic Environment'. This report showed that pesticides are detected at low concentrations in the water environment but that exceedences are relatively infrequent. A large number of recommendations were made, including the need to develop a national strategy aimed at minimising pollution of the water environment. Within such a strategy it recognises the need for active participation from other pesticide users, producers and distributors.

Prediction of Pesticide Pollution in the Environment (POPPIE) was developed by the former NRA's Toxic and Persistent Substances (TAPS) Centre. It is an integrated system consisting of national pesticide databases linked to digital maps and environmental fate models. The system will facilitate inter-catchment analyses and definition of high risk areas, identification of changes in pesticide usage through time, presentation of measured concentration in rivers and groundwaters, prediction of expected concentrations and associated vulnerability, and targeting of problematical chemicals.

### MONITORING

Pesticide monitoring is carried out by the Environment Agency at a number of sites within the Plan area and usually consist of surface water sites. Analysis is also carried out in the Plan area by Anglian Water Services and Essex & Suffolk Water at their boreholes used for public water supply. Data from these monitoring sites are passed to the Environment Agency where they are held on the Anglian Region Pesticide database. Local Authority monitoring of private wells and boreholes used for potable supply is undertaken as part of the *EC Drinking Water Directive* and will include pesticide analysis. It is their duty to liaise with users of such sources to ensure wholesomeness of supplies.

Our monitoring sites are generally selected according to the following criteria: the site is downstream of a discharge known to contain pesticides, the site is a point of abstraction identified for the purposes of the *EC Directive on Surface Water Abstraction (75/440/EEC)* or is a water designated under the *EC Directive on Shellfish Waters (79/923/EEC)*. Additional monitoring has also been carried out at a number of sites on the River Gipping over the last year

as part of a Research and Development project.

### TARGETS

Research is ongoing as to the potential of pesticides to pollute the aquatic environment and, as a result, a large number of environmental quality standards exist. Environmental Quality Standards (EQS's) are derived such that the levels set will ensure that aquatic life is protected. Of those set, eight relate to individuals and groups of List I Pesticides, under the *EC Dangerous Substances Directive*. The Department of the Environment has also proposed values for a further 14 pesticides. Further statutory limits are imposed in the *EC Directive on Surface Water Abstraction (75/440/EEC)* and the *EC Directive on Shellfish Waters (79/923/EEC)*.

### STATUS AND SHORTFALLS

Based on the data held in the Anglian Region pesticide database there have been no Environmental Quality standard exceedences within the Plan area.

Some Anglian Water Services public water supply boreholes have had pesticide levels that exceed the *EC Drinking Water Directive* limit, 0.1ug/l. Although, in most cases, additional treatment or reconstruction of the borehole will resolve the problem, the Environment Agency is proactive in pollution prevention to minimise the impacts on water supply sources. Research is currently continuing into diffuse pesticide inputs into the Gipping catchments.

### TRENDS

National research shows that diffuse pesticide influences on many rivers are an important issue and investigational work will continue in this area. Within the Plan area there have not been any reported exceedences of defined Environmental Quality Standards. Trends for most pesticides in the environment show a gradual rise over several decades. Recent research shows pesticide runoff from agricultural land to be a significant problem.

### COMMENT ON QUALITY AND AVAILABILITY OF DATA

In many respects the surface monitoring network does not give comprehensive coverage of the catchment as sampling for pesticides is driven according to those reasons given in the Monitoring section above.

Much information in respect of groundwater is passed to us under reciprocal arrangements between the Environment Agency, water companies and Local Authorities. Therefore, geographical coverage is not comprehensive and our understanding of pesticide contamination of aquifers continues to be developed.

Under current legislation the Environment Agency must maintain a set of Public Registers. Information is held in a combination of paper and computer files which may be inspected at our Regional office. Quality monitoring data is held on the Water Quality and Pollution Control Register. Further information can be obtained from 'Pesticides in the Aquatic Environment' (1994), published by the former National Rivers Authority.

### 6.3 Algal Blooms

#### GENERAL

Algae are a very diverse group of organisms ranging from the microscopic to visible filamentous mats, including seaweeds. They are natural inhabitants of many inland waters, estuaries and the sea. However, increased algal growth in rivers, lakes and estuaries can often give rise to a number of problems for example the production of toxins and the depletion of vital dissolved oxygen levels.

Populations of blue-green algae, so called because of their colour, can under suitable conditions, in still freshwaters, grow to extremely high densities and form visible scums on the water surface. Some of these algae are known to produce chemicals which are toxic to mammals, including man.

Blooms of suspended microscopic algae can also occur in rivers and often colour the water brown or green. Such blooms usually occur during the spring and summer period. Later in the season mats of filamentous algae can develop which are often seen attached to the river bed or submerged macrophytes within the river channel. These blooms of algae can impact upon the dissolved oxygen levels within the river causing a wide fluctuation between very elevated levels during the day to reduced levels at night. Under certain conditions, particularly during periods of prolific algae growth, the reduced night time levels can result in, for example, fish mortality.

The factors leading to such blooms of algae are many and complex. However, it is known that excessive growth of algae is promoted by high levels of the nutrients nitrogen and phosphorus, the principal sources of which are from sewage treatment works and agriculture. Such enrichment is commonplace within Anglian Region and is termed eutrophication.

#### MONITORING

Algal populations are not routinely monitored by the Environment Agency. However, samples for blue-green algae are collected on a 'reactive' basis in response to reports of suspected blooms in water bodies. Where water samples are found to contain populations of potentially toxic algae at, or above, specific concentrations, letters are sent by the Environment Agency to the owner, to the relevant Local Authority Environmental Health Officer, MAFF and to the local Medical Officer of Environmental Health. An information leaflet is also available offering guidance on what to do and contains important messages from the Department of Health and from the Ministry of Agriculture.

On some watercourses *chlorophyll a* concentrations are determined to provide an indication of the levels of algae. This additional work is carried out by the Environment Agency on controlled waters which are either candidate or designated Sensitive Areas (Eutrophic) under the *Urban Waste Water Treatment Directive*. Within the Plan area both the River Gipping and the Deben Estuary are candidate Sensitive Areas (Eutrophic) and *chlorophyll a* monitoring has been carried out for the past two years on the River Gipping and three years on the Deben estuary.

*The Urban Waste Water Treatment Directive 91/71/EEC* sets out specific requirements for the

minimum standards of treatment for sewage at works falling within its remit and has been implemented through *The Urban Waste Water Treatment (England and Wales) Regulations 1994*. These standards are derived to prevent the environment from being adversely affected, and depend on:

- the size of the discharge;
- the nature of receiving water (river, estuary or coastal); and,
- the sensitivity of the receiving water

For works serving a population equivalent greater than 10,000, additional stringent treatment (including phosphorus reduction) can be required if they discharge to 'Sensitive Areas'. Such areas include waters which have been shown to be suffering from an undesirable disturbance to the balance of organisms as a result of nutrient enrichment. The DoE have defined in some detail the definition of a 'Sensitive Area'. The status of both candidates is to be reviewed during 1997. In addition to the Deben estuary *chlorophyll a* monitoring has also been carried out on Blyth, Ore/Alde and Orwell estuaries for the past three years.

#### CURRENT STATUS & TRENDS

Within the Plan area a total of five confirmed reports of blue-green algal blooms within lakes and ponds have been received over the last five years indicating that they are not a problem.

Like many nutrient enriched lowland rivers the River Gipping exhibits a spring algal bloom which is reflected by a peak in recorded *chlorophyll a* concentration. These blooms only persist throughout the summer in the slower flowing lower reaches. In the upper and middle reaches the elevated nutrient status can result in the development of mats of filamentous algae and dense macrophytes beds. The River Deben is also perceived to follow this trend.

A fish kill on the River Gipping in 1996 was attributed to the reduction in night time oxygen levels as a result of algal blooms within the river.

Analysis of data collected from the estuaries in the Plan area shows most evidence of eutrophication in the Deben. The other estuaries had low *chlorophyll a* concentration and minimal associated algal impacts were found. Filamentous algae is a developing problem in some estuaries and is particularly evident in the Blyth estuary.

#### COMMENTS ON THE QUALITY AND AVAILABILITY OF DATA

*Chlorophyll a* data is available on the Public Register, which under current legislation the Environment Agency must maintain. Information is held in a combination of paper and computer files which may be inspected at our Regional office. Quality monitoring data is held on the Water Quality and Pollution Control Register.

Additional advisory leaflets are available upon request from the Environment Agency.

The report on Water Quality model of the River Deben Estuary is held at the Ipswich office and available upon request.

## 6.4 Freshwater Invertebrates

### GENERAL

The monitoring of freshwater invertebrates using the biological GQA system compliments the results of the chemical GQA surveys as a water quality monitoring technique. The chemical GQA may achieve a good grade in spite of pollutants not included in the chemical GQA or intermittent pollution not detected by the occasional samples taken for chemical analysis. The biological class of a section of river is based on the species diversity and tolerance of the invertebrate life found within a sample. If the river is polluted, even for only a few minutes, then some or all of these may die. Recovery may take several months. This means that biology provides information about pollution that may have been missed by chemical sampling.

Invertebrates are sampled from 65 sites within the catchment to provide a biological indication of water quality. A methodology has been devised to assess this data from a conservation perspective by looking at species rarity and community richness. This information compliments the results of the River Corridor and River Habitat Surveys.

### MONITORING

Invertebrates are regularly monitored at sampling points along the length of rivers which are monitored for GQA. One sampling point is placed in each stretch of river identified by chemical GQA monitoring. Samples are taken from each monitoring point twice in each year, in spring and autumn. The data from both seasons are pooled to give information on water quality and conservation status. Appendix 1 shows the full details of the biological GQA scheme.

### CURRENT STATUS

The results of the 1995 biological GQA survey are shown in Map 35. The majority of river stretches (54%) fall in the top two grades indicating good or very good quality. Grade a quality was recorded in the Lothingland Hundred River and parts of the Deben, Lark and Belstead Brook.

The lowest recorded quality, grade e (poor) occurred on only two stretches. These are the headwaters of the Minsmere River, sampled at Yoxford, and the River Blyth, sampled at Halesworth.

High conservation scores were recorded at three sites due to the presence of rare species. A RDB 2 snail (*Valvata macrostoma*) was found in Thorpeness Hundred, giving a CCI of 25. In the River Tang, a similarly rare beetle (*Laccophilus obsoletus*) raised the CCI to 27. Another beetle, this time of RDB 3 status (*Helophorus dorsalis*), was found in the River Bat, a tributary of the Gipping, giving a CCI of 24. A further 21 (33%) sites scored between ten and twenty, indicating some conservation interest.

### TRENDS

A large number of river stretches showed an improvement in quality compared to the 1990 GQA survey. Overall 57% improved with 40% of stretches improving significantly (>75% probability of improvement in grade). This is similar to the degree of improvement recorded in chemical

water quality. Several stretches improved by two grades, e.g. an improvement from e to c in the River Gipping above Stowmarket. The overall improvement is probably due to the same factors affecting chemical water quality, *i.e.* a combination of pollution prevention initiatives, increased investment in effluent treatment and increased river flows since the drought of 1989-1992.

A downgrade in quality occurred in only four stretches and was significant for only two. Non-significant downgrades (or upgrades) may be due to normal variation in the data. Of the two significant downgrades, one is mentioned above (Minsmere River at Yoxford, c to e), the other is the Hintlesham Watercourse (a to c). The reasons for these changes will be investigated further, although Hintlesham Sewage Treatment Works effluent has been of poor quality in recent times.

Due to the recent introduction of the Community Conservation Index, no trends are yet available.

#### COMMENTS ON THE QUALITY AND AVAILABILITY OF THE DATA

Collection of invertebrate samples for GQA is only carried out by trained and experienced staff. The sorting of samples in the laboratory and identification of animals is subject to internal and external Quality Control checks. All data is held on computer databases and is available on request either from the Ipswich office for small data sets or from the Regional Headquarters in Peterborough for larger requests.

## 6.5 Fisheries - Freshwater

### GENERAL

The overall objective of the Environment Agency is to maintain, improve and develop coarse fish and brown trout populations appropriate to the fluvial fisheries within the catchment area. Due regard should also be given to the maintenance of the smaller species of fish in minor watercourses, and of all species of fish in reservoirs, lakes and ponds.

The Environment Agency has a specific duty to assess the state of, and safeguard, freshwater fisheries and the waters which they inhabit. The *EC Freshwater Fish Directive 78/659/EEC* sets water quality objectives for designated stretches of water, to enable fish to live continuously or breed in favourable conditions. Two categories of water are identified; those suitable for salmonid fish (salmon and trout), and those suitable for cyprinid fish (eg carp, tench, barbel, rudd, roach, pike). The former category is characterised by fast flowing rivers which have a high oxygen content and a low level of nutrients, whereas the latter waters are slower flowing, commonly nutrient rich, have a lower oxygen content, and frequently pass through intensively managed agricultural land.

### MONITORING

Fish population surveys are undertaken on all major rivers in the plan area according to a regular rolling programme. Extensive data on the fish stocks are available, and these are used to derive a fisheries classification scheme based on the biomass (grams per metre squared of water surface area - gm<sup>2</sup>) of the stocks present. The classification comprises of four biomass classes (see Map



36).

A new river fishery classification scheme is currently being introduced, that considers a variety of both biological and physical parameters. This new scheme, which takes account of river type and species richness, as well as population measures of density and biomass, should in future provide a more meaningful assessment of the status of our rivers and their fish populations.

The Agency has more recently started a programme of monitoring upper reaches and minor streams to determine the full distribution of rarer species of fish, and to identify the importance of these fisheries within the Area as a whole.

The *EC Freshwater Fisheries Directive 78/659/EEC* provides a list of water quality determinands to be measured, together with associated requirements of analytical methods and minimum sampling frequencies. This work is incorporated into the water quality monitoring programme.

#### TARGETS

Fish stock biomass targets are founded on the assumption that all water (with the exception of intermittent flowing waters) included in the fishery survey are capable of supporting at least 5 gm<sup>-2</sup> of fish where physical conditions may be limiting and at least 10 gm<sup>-2</sup> where no such limits exist. Thereafter, scope exists for setting increased targets where experience has shown that greater stock levels have been sustained over a minimum of a seven year period, as represented by three consecutive surveys. The target classes thus provide both a minimum acceptable standard and a means of ensuring that a higher and regularly achieved standards are not allowed to erode unnoticed, through lack of an appropriate benchmark. Map 37 illustrates the targets for the catchments in the plan area.

A number of rarer fish species, some of which are found in the plan area, are listed in the *EC Habitats Directive 94/43/EEC* as requiring special measures of protection. To identify the distribution and habitats of these species within the East Suffolk rivers, and to ensure their protection during all Environment Agency activities, is a specific target for fisheries work.

The *EC Freshwater Fish Directive 78/659/EEC* sets various standards in relation to salmonid and cyprinid fish, including imperative values for dissolved oxygen, pH, non-ionised ammonia, total ammonium, total residual chlorine, zinc and, where thermal discharges occur, temperature. Guideline values are also set for various other chemical parameters. Monitoring for compliance is carried out on a monthly basis.

#### STATUS & SHORTFALLS

The East Suffolk Plan area has a diverse range of fisheries with varying fish communities and species. Some 82 km of water are included in the current rolling programme of river fisheries surveys, of which 66 km meet or exceed their biomass target class. The majority of the classified water supports coarse fish populations only, but brown trout occur in c.20% of the monitored river length.

# Freshwater Fisheries – Target Classifications

Map 37



**ENVIRONMENT  
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June 1997

-  Main River
-  Coastline
-  Catchment boundary
-  Urban area

### Biomass targets classifications

-  Class A
  -  Class B
  -  Class C
- (Derived from 1984–1996 data)



Three waters do not currently meet their biomass target class, namely the Lothingland Hundred, Wang and Mill Rivers (see Map 38). Water quality and flow constraints, the impact of drought, the quality of the habitat, and the operational regime of these rivers are all possible contributory factors, which require some further investigation. The target class B set for the Mill River may be overly ambitious in relation to the physical habitat availability, and this possibility needs to be carefully examined.

Various reaches of the Alde, Ore, Blyth and Mill Rivers, together with Belstead Brook, have been identified as supporting significant populations of fish species listed in the *EC Habitats Directive 94/43/EEC*. The network of County Wildlife Sites, which provides some local protection to important habitats, is currently being extended and is likely to include these reaches.

Possibly significant fisheries may occur in some East Suffolk catchments not currently included in the established monitoring programme. These rivers will be examined by the new programme of headwater and minor stream monitoring, and will be incorporated into the mainstream work should their status justify such inclusion.

Both the Wang and Mill Rivers have shown recent failures against *EC Freshwater Fish Directive 78/659/EEC* standards, which may have had an impact on the stocks that they support.

#### TRENDS

Most rivers in the area have stable fish stocks, which have met or exceeded current their target classes in all surveys since 1984. The River Gipping and Belstead Brook have achieved target class promotions to A and B respectively, based on the presence of consistently good stocks during this period. However, some recent declines have been observed, particularly in the Lothingland Hundred but also in the Mill River, and these are under investigation.

Although figures which specifically relate to East Suffolk are not available, it is probable that the large and ongoing increase (>100% since 1990) in applications for consents to introduce and/or remove fish noted for Eastern Area as a whole is fully reflected within the Plan area. This is believed to be due to increasing demand for stocks to supplement or establish lake, reservoir and pond fisheries, which has been reflected particularly in greater coarse fish trading activity.

#### COMMENTS ON THE QUALITY AND AVAILABILITY OF DATA

Fisheries survey data are held in a combination of paper files and computer databases, and in reports describing the results obtained from each river included in the programme. The latter are available from the Area Office at Ipswich, upon request. Supporting data can be made available in a variety of formats, also available upon request.

The availability of water quality compliance data in relation to the *EC Freshwater Fish Directive 78/659/EEC* is given elsewhere.

## 6.6 Fisheries - Commercial & Marine

### GENERAL

A Net Limitation Order (NLO) for the East Coast Salmonid Fishery, proposed by the Environment Agency as part of its policy of phasing out migratory salmonid fisheries exploiting mixed stocks, was confirmed by MAFF following a public enquiry in May 1995. The NLO came into effect on 1st January 1996, from which date licences could only be issued to fishermen who had held them in 1995.

The excusal of eel fishing from licence duties downstream of the Byelaw demarcation points, the geographical flexibility of eel netting licences for inland waters, the low level of eel fishing activity, and the lack of any requirement for catch returns of eels from all waters, serve to limit the Agency's regulatory role for eel fisheries to a minimal level in this Plan area.

### MONITORING

Holders of salmonid net licences are required to make catch returns to the Agency at the end of each season. These returns represent the only means of monitoring the status of the stocks themselves.

In order to monitor the conduct of the fishery, the Agency is arranging a Service Level Agreement (SLA) with the Eastern Sea Fisheries Joint Committee. They are currently authorised to monitor the NLO as part of their routine programme, but it is intended that the SLA will increase both bailiffing activity and the total number of authorised bailiffs.

Monitoring of eel stocks levels in rivers is an integral part of the freshwater fisheries survey programme, and is reported through that avenue.

### TARGETS

Under the terms of the NLO, no new licences will be issued as existing licensees leave the fishery. This will progressively reduce the number of licences and ultimately eliminate the fishery throughout the NLO area.

### STATUS AND SHORTFALLS

The mixed status of sea trout (and salmon) off the Suffolk Coast means that stocks evaluation is very difficult, and is determined primarily by factors operating in other geographical areas.

### TRENDS

There is an established general declining trend for catches of migratory salmonids made within the Anglian Region as a whole. Specific data for the East Suffolk area are not available.

### COMMENTS ON THE QUALITY AND AVAILABILITY OF DATA

Catch statistics for migratory salmonid fish throughout England and Wales are collated and published annually by the Agency. Copies of the reports are available from the National Head Office.

## 6.7 Pollution Incidents

### GENERAL

Under Section 85 of the *Water Resources Act 1991* it is an offence to cause or knowingly permit any poisonous, noxious or polluting matter or any solid waste matter to enter controlled waters. Pollution incidents are categorised by both source and type of pollution.

### MONITORING

Pollution report information is compiled on a database by investigating officers. The Environment Agency is primarily dependant upon the general public to notify suspected pollutions. To this end a freephone telephone number of 0800 807060 is a valuable addition to local contacts.

Other organisations such as the emergency services and local councils also play a part. Environment Agency staff may also report pollutions and a considerable number of incidents may come to light during pollution prevention campaigns.

It is our aim under our standards of service to attend all reported incidents within 2 hours during office hours and 4 hours at other times. Our prosecution policy determines procedures against those identified as responsible for serious pollution incidents.

Under the 'Polluter Pays Principle' the Environment Agency recharges identified polluters where total costs exceed £50. Where legal action is brought the courts may allocate other costs.

### CURRENT STATUS

Annual data (see Table 5 below) of pollution incidents shows that oil is the most common pollutant recorded in controlled waters. Private sewage also constitutes an important pollutant in terms of numbers of incidents but as it principally relates to septic tank problems in rural areas there is minimal impact on the water environment.

**TABLE 5: POLLUTION INCIDENTS**

POLLUTANT SOURCE	1991	1992	1993	1994	1995	1996
Oil	48	44	51	62	43	48
Private Sewage	26	34	29	23	14	33
Agriculture	41	29	25	43	13	14
AWS Sewage	16	16	23	32	29	331
Industry	16	22	19	25	10	14
Transport	NOT USED	NOT USED	NOT USED	7	1	11
General	22	28	39	18	47	36
Pollution not found	54	55	58	42	52	40
Total Pollutions	169	173	186	210	157	187

Agricultural incidents are consistently greater than those from industry, again reflecting the rural nature of the Plan area. Map 39 shows the distribution of pollution incidents during 1996.

The seriousness of an incident is determined by its impact and this includes assessment of its potential impact, public and media concern together with actual damage to the environment. Five serious and significant incidents occurred in the Plan area during 1996. These consisted of crude sewage, low flow and fire water impacts, nitrogen fertiliser loss and a heavy fuel oil spillage.

#### TRENDS

Many factors affect the number and type of pollution incidents reported. There is generally an increasing awareness on the part of the public, industrialists and farmers regarding pollution of the environment. We do find a trend of an increasing number of minor pollution incidents being reported and it is perceived that significant incidents have reduced in recent years.

We believe that agricultural pollution prevention campaigns promoted nationally along with the *Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991* have reduced the occurrence of careless disposal of farm effluent to watercourses. However, the impact of soakaways contaminating the groundwater has yet to be fully addressed and investigated. (Issue A1). Farm effluent pollution of watercourses following its irrigation to land in inappropriate conditions is an increasing cause of agricultural pollution incidents and we now know from our statistics that diffuse pollution incidents outnumber chronic events.

Nationally it can be shown that oil is one of the most common pollutants of controlled waters. Therefore, a national Oil Care Campaign was instigated to increase the overall awareness of the problems arising from the handling of oil. The bunding of storage tanks is slowly being accepted and legislation is due to come into force in 1997. Map 39 shows oil pollution incidents are related to population density, as would be expected. In the Plan area there are additional incidents arising from shipping activities.

### COMMENTS ON THE QUALITY AND AVAILABILITY OF DATA.

Details regarding the nature and location of pollution incidents are made available to the public upon request. It is the practice for our staff to inform persons reporting pollution on our subsequent actions and findings.

Various publications detailing national pollution incident statistics are available from the Environment Agency's Head Office or HMSO.

## 6.8 The Quality of Groundwater

### GENERAL

Environment Agency policy on the protection of groundwater is explained in the Groundwater Protection Policy published in 1992. The main objectives of the Policy are to ensure that all risks to groundwater are dealt with in a common framework and to provide a basis for decisions affecting groundwater resources. This will enable the management and protection of groundwater in a sustainable manner.

About a third of public water supply in England and Wales is obtained from groundwater and in the Anglian region the proportion is 50%. Groundwater can be particularly vulnerable to pollution and the clean up of such an occurrence is extremely difficult, if not impossible, to achieve. Under section 85 of the Water Resources Act 1991 it is an offence to pollute groundwater and the EC Groundwater Directive (80/68/EEC) also prohibits the direct or indirect discharge into groundwater of List I and limits discharges of List II substances. A recent publication by the Environment Agency "Groundwater Pollution" details the extent and character of groundwater pollution from point sources in England and Wales.

Groundwater protection is achieved through the evaluation of vulnerability and risk. The vulnerability of groundwater to pollution is a function of the presence and nature of the overlying soils and drift, the geology and depth to water table. These physical characteristics define the vulnerability of all underground waters and, for the Suffolk area, are mapped on Sheet 40 of the Groundwater Vulnerability Map series. The Environment Agency document "Policy and Practice for the Protection of Groundwater (PPPG)" sets out our approach on this subject. This includes the definition of protection zones around key boreholes, the classification of aquifers depending on their vulnerability and a list of specific contaminative activities requiring high standards of control. Certain controls are available to the Environment Agency and local authorities who can play a major role in influencing the locations of development which may pose a potential risk to groundwater.

The Policy also describes the groundwater source protection zones which have been defined for large Public Water Supplies and industrial abstractions associated with food production. These are intended to guide planning and development around each abstraction source in order to minimise future risks of groundwater contamination.

## MONITORING

Background groundwater quality is monitored as part of the Agency's national clean groundwater monitoring network. Three categories of sampling points exist; the primary network comprised of major Public Water Supply sources with a national coverage of 1 per 250 km<sup>2</sup>, a secondary network consisting of large licenced or private groundwater sources and a tertiary network made up of minor abstractions or springs chosen to cover local groundwater issues or minor aquifer quality. The majority of monitoring points relate to the Chalk aquifer because of its importance for water supply.

The frequency of monitoring is dependent on aquifer flow characteristics but is generally 1 or 2 times per year. Routine monitoring currently undertaken is based on a ferruginous groundwater suite which includes the determination of the following chemical characteristics: electrical conductivity, pH, Total Organic Carbon, calcium, magnesium, potassium, sodium, chloride, sulphate, nitrate, alkalinity, phosphate, iron and fluoride. It is intended to develop the network further in future and to expand the range of chemical characteristics determined.

## CURRENT STATUS

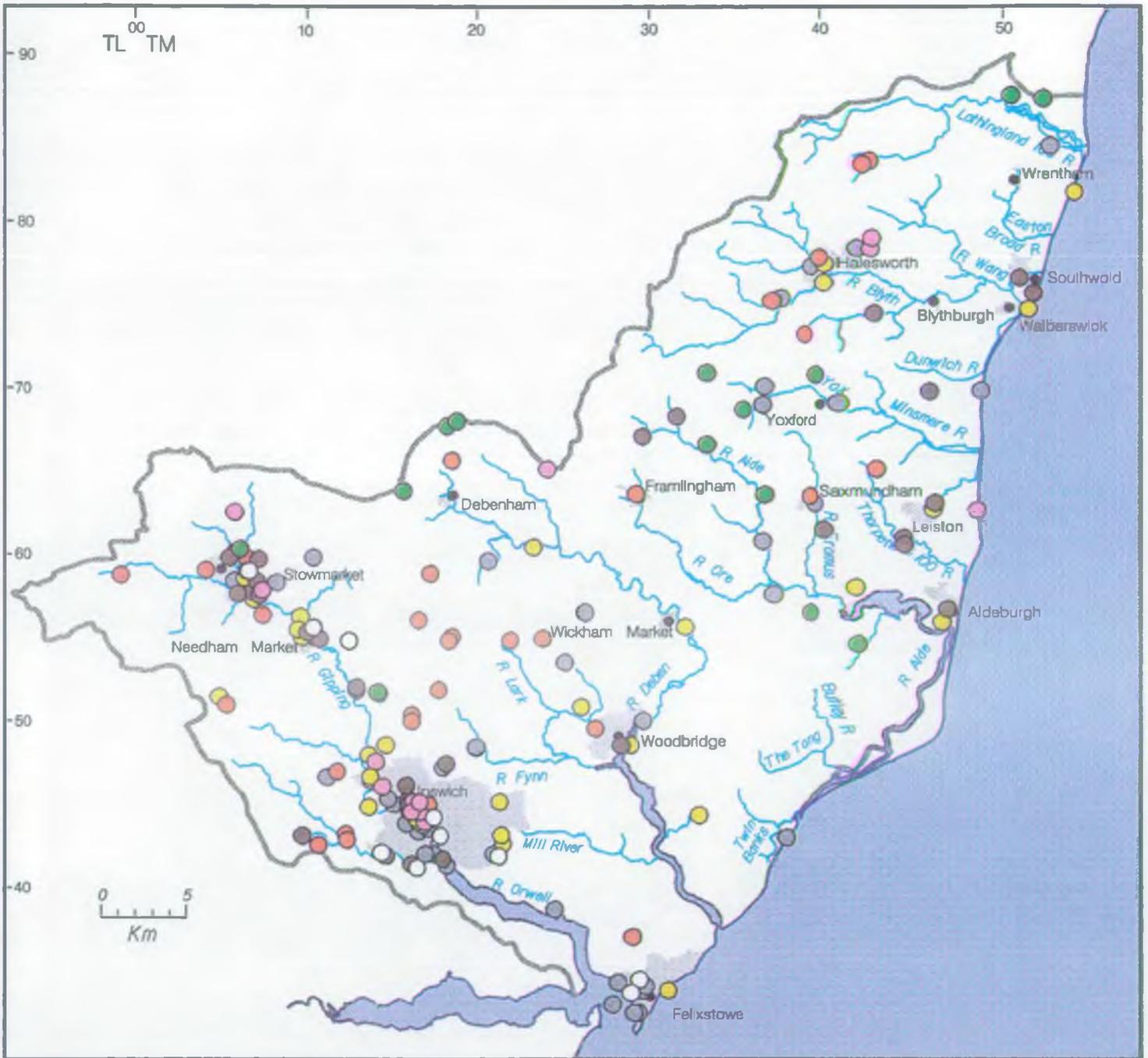
There are currently no statutory water quality objectives for groundwater because it is naturally variable and dependent on natural hydrochemistry. The current network has been set up to characterise groundwater chemistry and to monitor trends. The area covered by this Plan includes eleven monitoring points two monitoring the Chalk aquifer, two monitoring the sand and gravel aquifer and six in the Crag aquifer. The network has been sampled since 1995.

## COMMENTS ON THE QUALITY AND AVAILABILITY OF DATA

Under current legislation the Agency must maintain a set of Public Registers. This information is held in combination of paper and computer files which may be inspected at our Regional Office. Miscellaneous historical groundwater data and results of groundwater monitoring around landfill sites is held at the Ipswich Office.

# Pollution Incident Sources 1996

Map 39



**ENVIRONMENT  
AGENCY**

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-  Main River
-  Coastline
-  Catchment boundary

-  Industry
-  Agriculture
-  Oil
-  Anglian Water Services sewage
-  Private sewage
-  General
-  Transport

June 1997



## 6.9 Water Resources

### GENERAL

The Environment Agency has the responsibility of managing water resources in a sustainable and effective manner, (ensuring long-term abstractions do not exceed long term replenishment), to achieve the right balance between the needs of the environment and those of the abstractors and other water users. Management of water resources and regulation of abstractions are controlled by the abstraction licensing system. With a few minor exceptions, all abstractions of water require a licence issued by the Environment Agency or its predecessor under the Water Resources Act 1991. Before issue, applications are subject to strict checks to ensure that they do not affect existing users or the water environment.

### CLIMATIC CHANGE.

Climatic change is having a measurable effect but there is still uncertainty as to whether climatic change will result in an increase or decrease in water resources within the UK. It is thought that water demand will increase above current levels. There will be seasonal and regional distortions to climatic conditions. The DoEs Climatic Change Impacts Review Group (CCIRG) has identified the climatic change implications to be considered by the Environment Agency. There is agreement that the winters will be wetter/stormier and the summers warmer and dryer especially in south. The Environment Agency will consider the implication of climatic change in the formulation of policy and in the delivery of its duties.

### MONITORING

The Environment Agency has a statutory duty under the Water Resources Act 1991 to monitor water resources. This is achieved in the area by monitoring a number of locations where hydrometric information is gathered. Table 6 shows the type and numbers of sites in the East Suffolk area where information is gathered on rainfall amounts, tide levels, groundwater levels and river levels at 15 minute intervals. At a majority of sites, the information is processed and archived for future use and analysis.

Type of Monitoring Location	Number Sites in Plan Area
Rainfall measuring sites	8 telemetered and 43 daily recorded
River Level sites	16
Current meter sites	25
Tide Level sites	5
Groundwater level sites	53
Wetland monitoring sites	12

**TABLE 6: NUMBER AND TYPES OF HYDROMETRIC SITES.**

The information gathered and archived from these sites is used in the licence determination process to assist in ascertaining the possible impact of an abstraction. The historical hydrological information needs to be examined in order to assess the current status. This includes calculating the need of the water by the environment for example to maintain wetland sites or low flows in summer. The data is gathered on a frequent basis and is archived at the Environment Agency. A number of sites have records going back to the 1950's. In general the quality of the data is extremely good and is available to the public.

It has been identified that some areas lack the necessary hydrometric information. These areas are being addressed in a number of Area and Regional projects. For example, the Environment Agency tried to address the lack of site data for specific wetlands through the "Hydrological Monitoring of Wetlands Project". This project has resulted in the installation of hydrological monitoring in 52 of the most sensitive wetlands in the Anglian Region with the intention of monitoring them for at least 10 years. The sites were chosen in consultation with English Nature.

#### TARGETS

With regard to the availability and demand on water resources, PWS demands are not forecast to rise significantly within the term of this Plan for Anglian, however, demands from Essex & Suffolk Water are forecast to rise, based on the strategic business plan 1994.

The Environment Agency has set targets including;

- Managing water resources to achieve the right balance between the needs of the environment and those of the abstractors and other water users.
- Ensuring the proper use of water.
- Conserving water resources.
- Augmenting and/or redistributing water resources, where appropriate to meet water demands to appropriate standards of reliability.

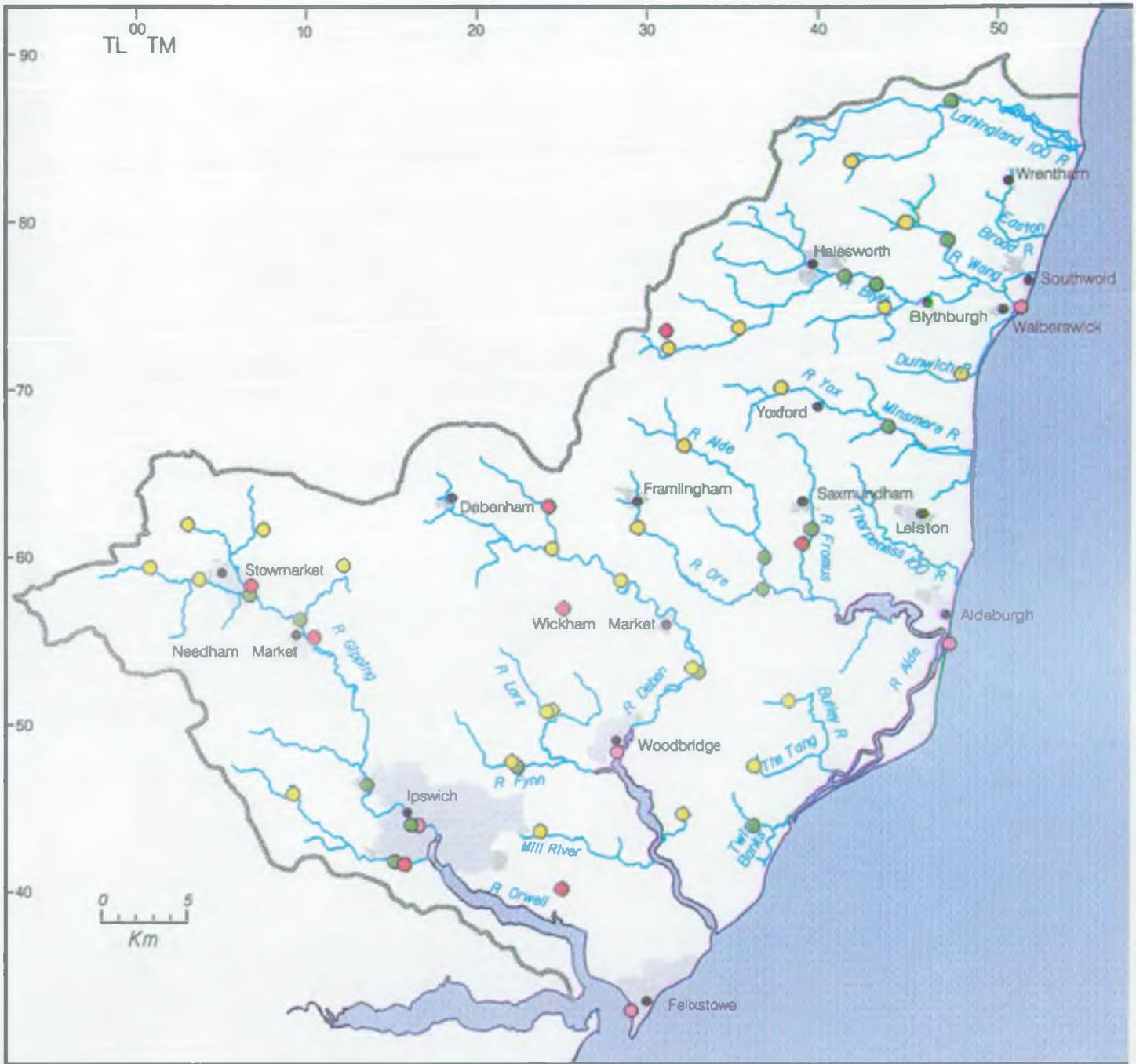
It is believed that effective management of water resources is not being achieved in the Deben catchment where the water resources are not "in balance", resulting in unacceptable low flows during the summer months. Issue A4 will address these problems.

The Environment Agency also believes that to achieve these targets, In River Needs studies are required, which can then be translated into river flow objectives to identify a flow regime to satisfy these needs. For the Deben the in rivers needs are not fully understood or quantified and low flows are being exacerbated by seasonality of rainfall and surface water abstraction for spray irrigation at a time when flows are naturally lower.

#### CURRENT STATUS

There are 10 surface water sub-catchments within the Plan area (see Map 21). Where the catchment is referred to as fully committed, no further applications for water abstractions will be considered. If resources are available, applications will be considered, but subject to strict detailed local appraisal to assess the impact of the proposals on the local environment.

# Hydrometry – Surface Water



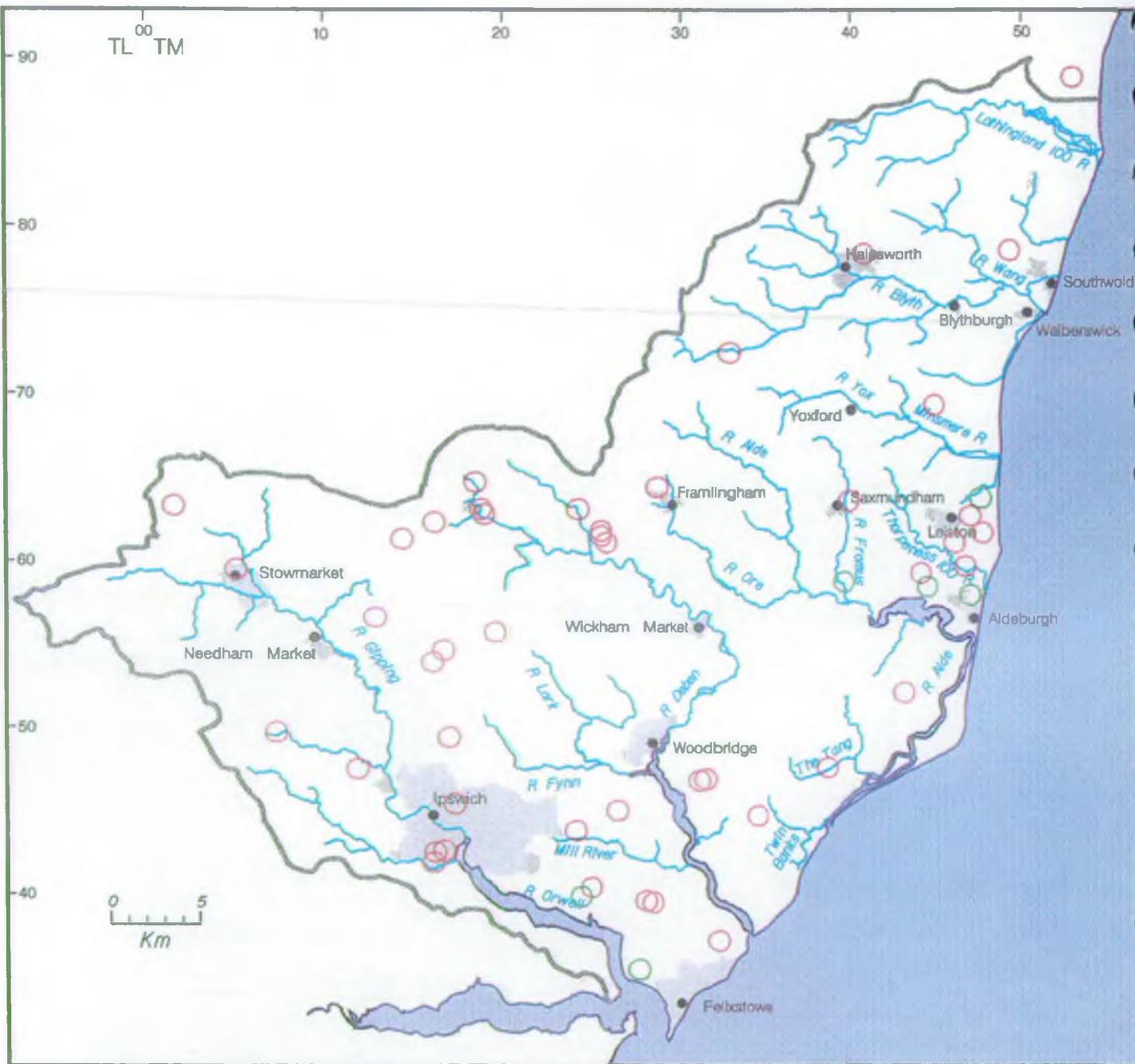
**ENVIRONMENT  
AGENCY**

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- Main River
- Coastline
- Catchment boundary

- River gauging station
- Current metering site
- Tide level monitoring site
- Rainfall monitoring site

June 1997



**ENVIRONMENT  
AGENCY**

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June 1997

-  Main River
-  Coastline
-  Catchment boundary
-  Urban area

-  Groundwater observation borehole
-  Wetland site observation borehole

### Groundwater Resources

Areas where nominal groundwater resources are potentially still available, subject to an assessment of the local impact, are;

- the Blyth (35/2) where water is potentially available in parts of the Crag aquifer; and,
- the tidal Deben (35/10) where again water is potentially available in parts of the Crag aquifer.

The rest of the catchments covered by the Plan have no groundwater resource available and are classed as fully committed.

### Summer Surface Water

There is no further summer surface water available in the catchments covered by the Plan. They are fully committed.

### Winter Surface Water

Some additional surface water may be available during the winter periods when flows are generally higher. Abstractors are encouraged to store water in reservoirs for subsequent use in the following summer. These abstractions would also have to undergo analysis to ascertain the impact on the local environment. The abstraction of water for winter storage may not be allowed in certain areas where the flows pass over mudflats of high conservation value. This latter point is addressed in Issue A5.

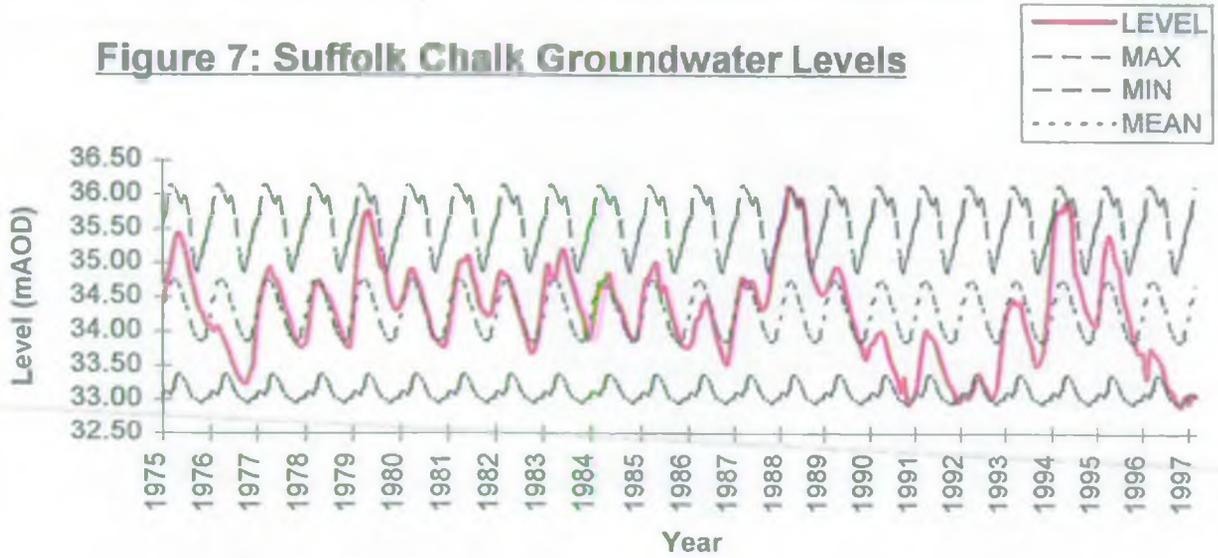
## TRENDS

Over the last ten years river flows and groundwater levels have tended to be lower reflecting the drought of 1989-1993 and the subsequent drought which started in 1995 and looks set to continue into 1997. During this period rainfall has been below the annual average for five out of the past eight years (see Figure 9). If the area does not receive significant rainfall the aquifers will not recharge which will ultimately decrease the amount of baseflow discharged naturally to the river system.

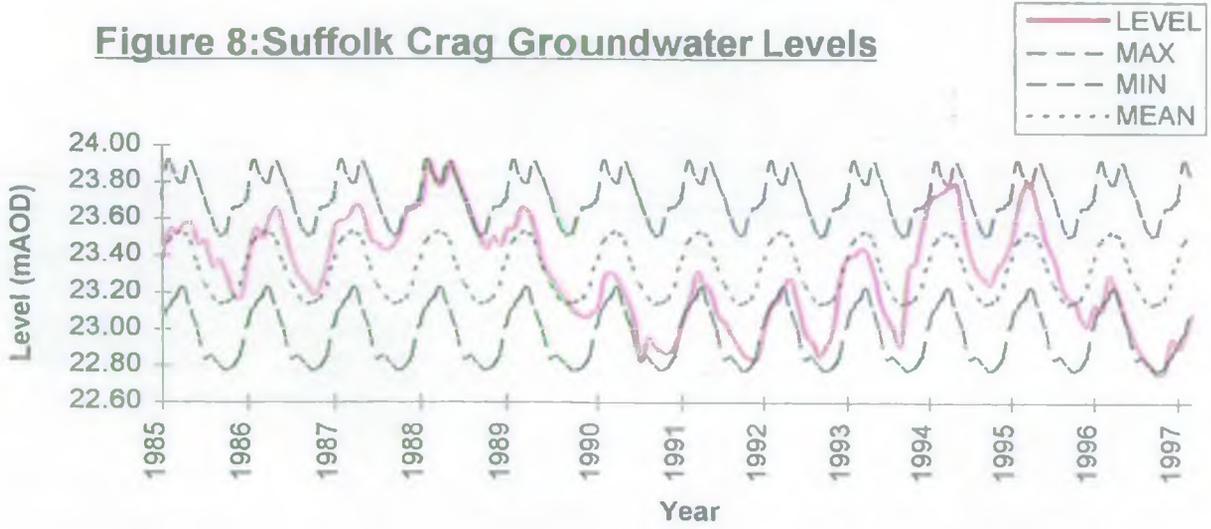
Suffolk rivers typically rely on groundwater from winter rainfall recharge to sustain flows, especially during the summer months. Low rainfall amounts, especially in the late 1980's and early 1990's led to drought conditions within the Region. Over long time periods droughts are relatively rare events even though they may seem a common occurrence at the present time.

Figure 7 illustrates the Chalk groundwater levels in Suffolk since 1975. Figure 7 also illustrates that aquifer levels are currently at their all time lowest. A similar situation can be seen in Figure 8 which illustrates the Suffolk Crag record since 1985.

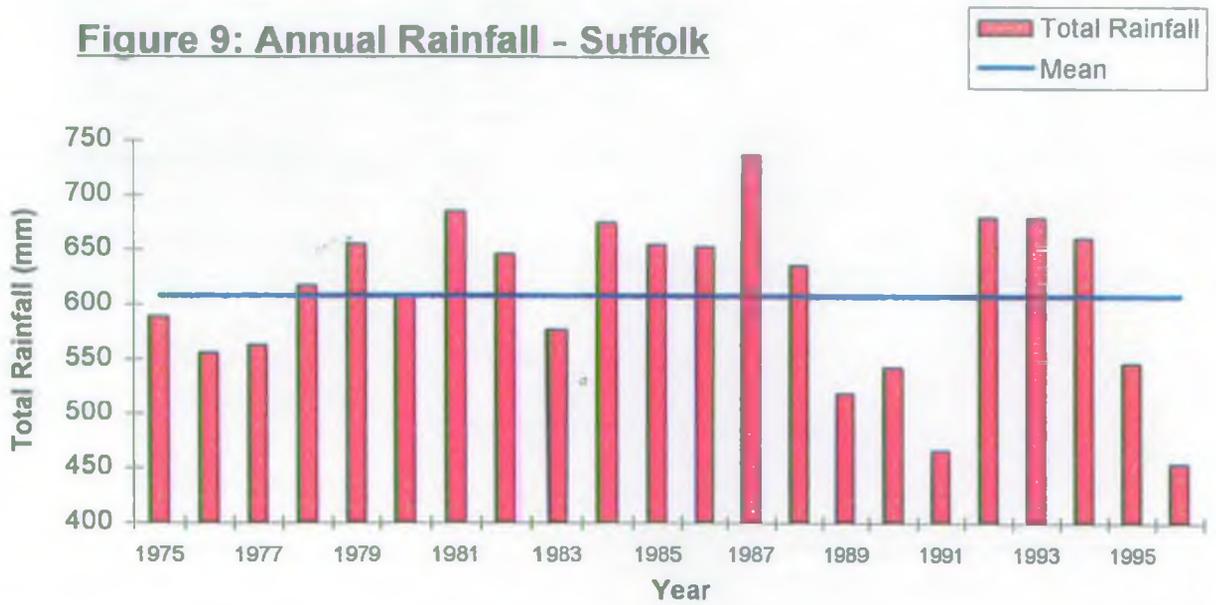
**Figure 7: Suffolk Chalk Groundwater Levels**



**Figure 8: Suffolk Crag Groundwater Levels**



**Figure 9: Annual Rainfall - Suffolk**



## 6.10 The Quality of Estuaries and Coastal Waters

### GENERAL

A General Quality Assessment (GQA) scheme is currently being developed for estuaries although the Environment Agency continues to use the Coastal and Estuarine Working Party classification system (CEWP).

### MONITORING

Under the CEWP scheme stretches of estuaries are allocated points depending on their biological, aesthetic and chemical quality. There are four classes ranging from A to D which classify each stretch of the estuary as good, fair, poor and bad respectively. The classification is detailed in Appendix 5. Other criteria have also been developed, such as in the Orwell, to protect recognised local uses. All the estuaries in the Plan area are surveyed on a routine basis to determine the chemical and bacteriological status of those waters. In addition where particular problems exist or needs to be quantified studies are undertaken as required. Biological assessments are undertaken according to a five year rolling programme of monitoring.

### TARGETS

The CEWP classification is used in the decision making process to allocate resources to ensure improvements to the water quality of estuaries. The Environment Agency works with the water companies and industry to improve discharges which have a significant and adverse impact upon estuarial quality. Modelling of the estuaries is used to demonstrate the scale of the impact of major discharges and to determine consent standards appropriate to river needs requirements.

Further to the CEWP scheme statutory targets exist under the *EC Dangerous Substances Directive (76/464/EEC)*. The statutory objectives for dangerous substances apply to all water stretches and are aimed at protecting aquatic life, although monitoring is only carried out in the river downstream of points likely to or known to discharge these substances. Monitoring for dangerous substances is carried out in the Orwell estuary due to the nature of some of the discharges entering the estuary.

### CURRENT STATUS

The majority of estuaries in the Plan area are classified as Class A, examples of this being the Blyth, Alde-Ore and the Deben. Although the middle reaches of the Orwell are Class A the upper river deteriorates from Class B to C in the Dock area. Improvements in discharges in this area and at Felixstowe should result in an upgrading at the next annual assessment.

Exceedences of limits of List II metals as determined under the *Dangerous Substances Directive* and the *Shellfish Waters Directive* have been a cause of concern, particularly in the Orwell estuary. This is identified as a separate issue and is to be investigated as a project.

### TRENDS

The biological surveys provide a basis for an evaluation of the biological status of the estuary and are related to what type of animal community would be expected in a given salinity/sedimentation regime. It is a cause for concern when statistical analysis shows there to

be a clear departure from this expectation. In 1994 the Upper Orwell showed a clear departure from that expected in a clean estuary and it is probably linked to organic enrichment arising from the primary settled effluent from Ipswich STW.

#### COMMENTS ON THE QUALITY AND AVAILABILITY OF DATA.

Under current legislation the Environment Agency must maintain a set of Public Registers. Information is held in a combination of paper and computer files which may be inspected at our Regional office. Quality monitoring data is held on the Water Quality and Pollution Control Register.

The biological data is held at the Ipswich office, either in paper reports or as computer files, and is available upon request.

### 6.11 Bathing Water Quality

#### GENERAL

The *EC Bathing Water Directive 76/160/EEC* imposes statutory objectives on bathing waters. Waters covered by its provisions are identified by the DoE.

#### MONITORING

Monitoring is carried out by the Environment Agency and reported to the DoE, who assess compliance on a calendar year basis. The bathing season in England and Wales is taken to be from 15th May to the 30th September; bathing water sampling begins two weeks before the start of the season and continues throughout the season. A number of parameters are monitored including the main microbiological indicators. These parameters are sampled / assessed in all 20 samples throughout the year apart from: pH, dissolved oxygen, salmonella and enteroviruses (only sampled when bathing water has failed Directive in the previous year), each of which are sampled twice in the season. The imperative and guideline values for all the above parameters are shown by Appendix 7.

#### TARGETS

The weekly samples are analysed for total coliform bacteria, and for faecal coliform bacteria - the latter being indicative of the presence of traces of human sewage. The imperative standards exist for the two coliform parameters, which should not be exceeded, are 10,000 total coliforms per 100 ml of water and 2,000 faecal coliforms per 100 millimetres (ml) of water. In order for a bathing water to comply with the EC Directive, 95% of the samples (ie at least 19 out of the 20 taken) must meet these standards, plus other criteria. Appendix 7 gives details of the determinants and standards.

#### CURRENT STATUS

Two identified bathing waters exist at Felixstowe. Historical problems with bathing water quality have resulted in the initiation of a comprehensive improvement scheme for the Felixstowe area with the elimination of the 'North' untreated sewage discharge. This was completed in the spring of 1997. A further identified bathing water is located at Southwold.

Figure 10 : Bathing Water Directive Results 1991-96 (Total coliforms)

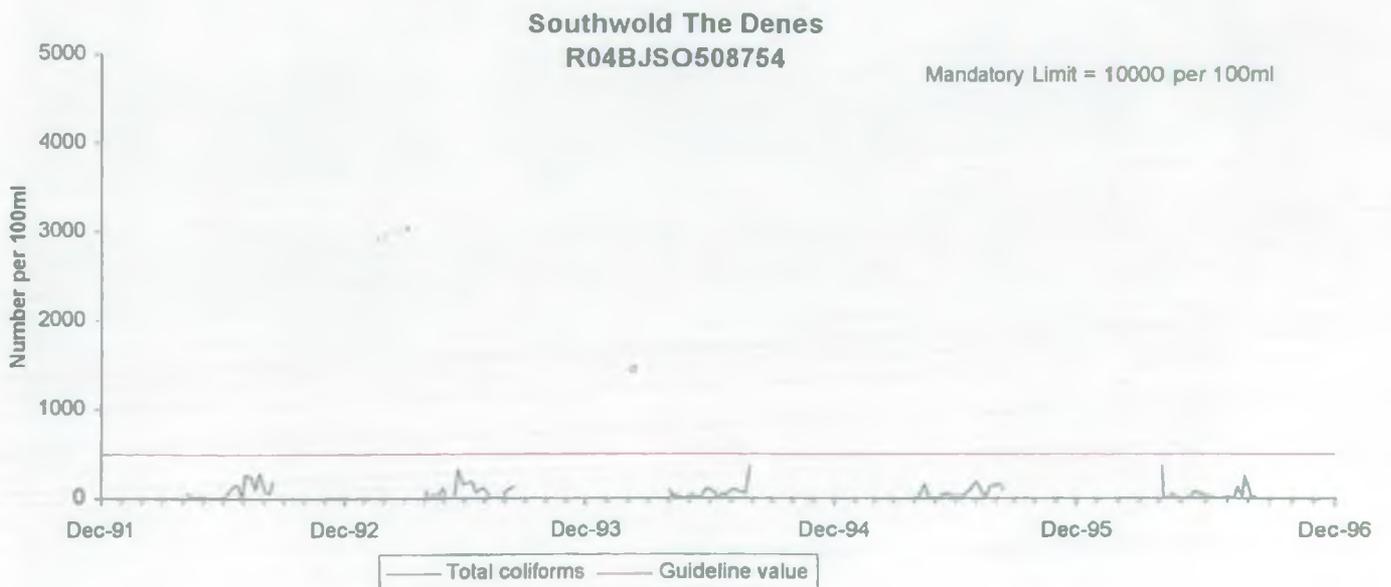
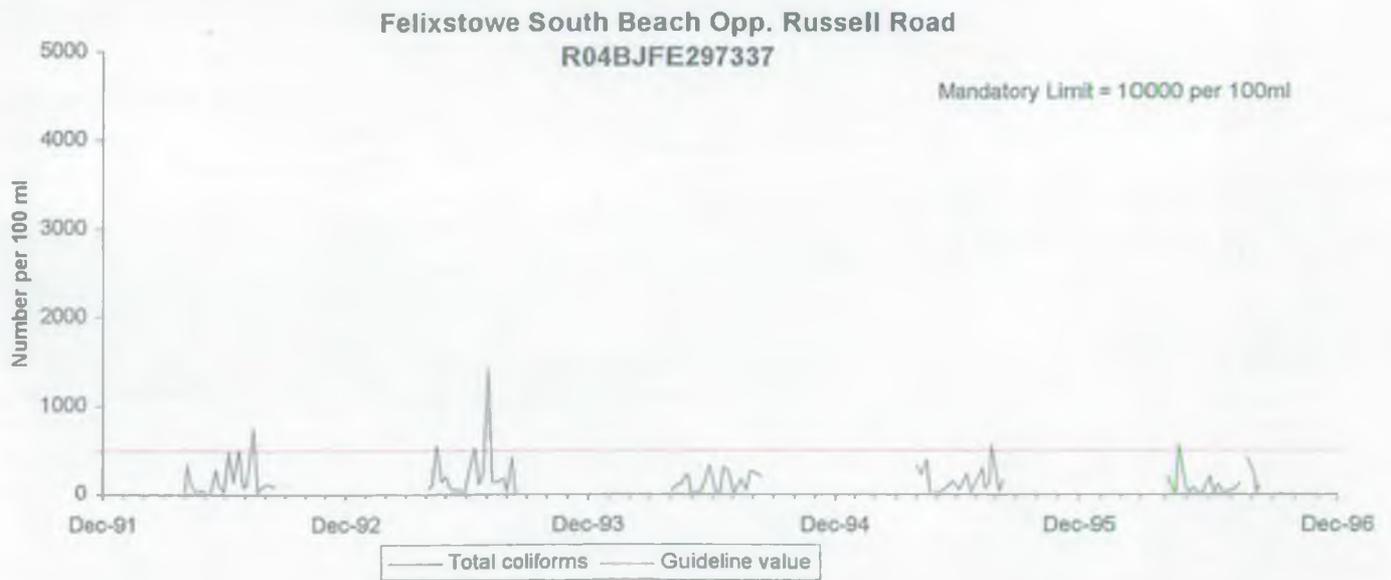
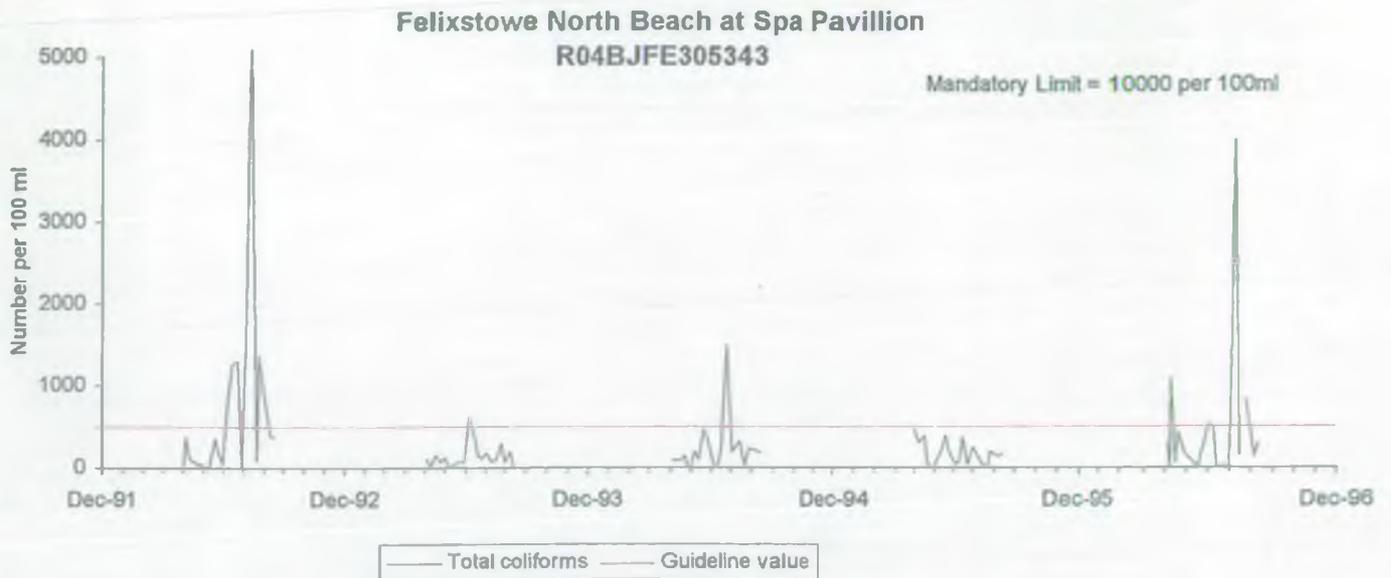
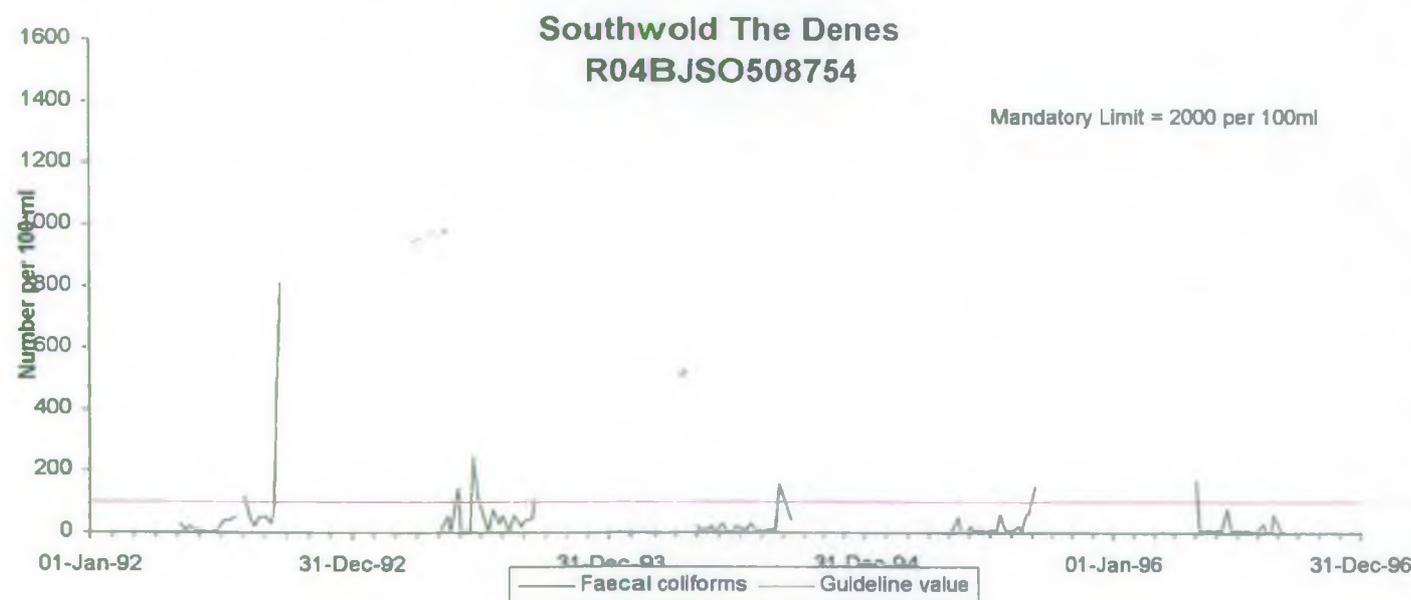
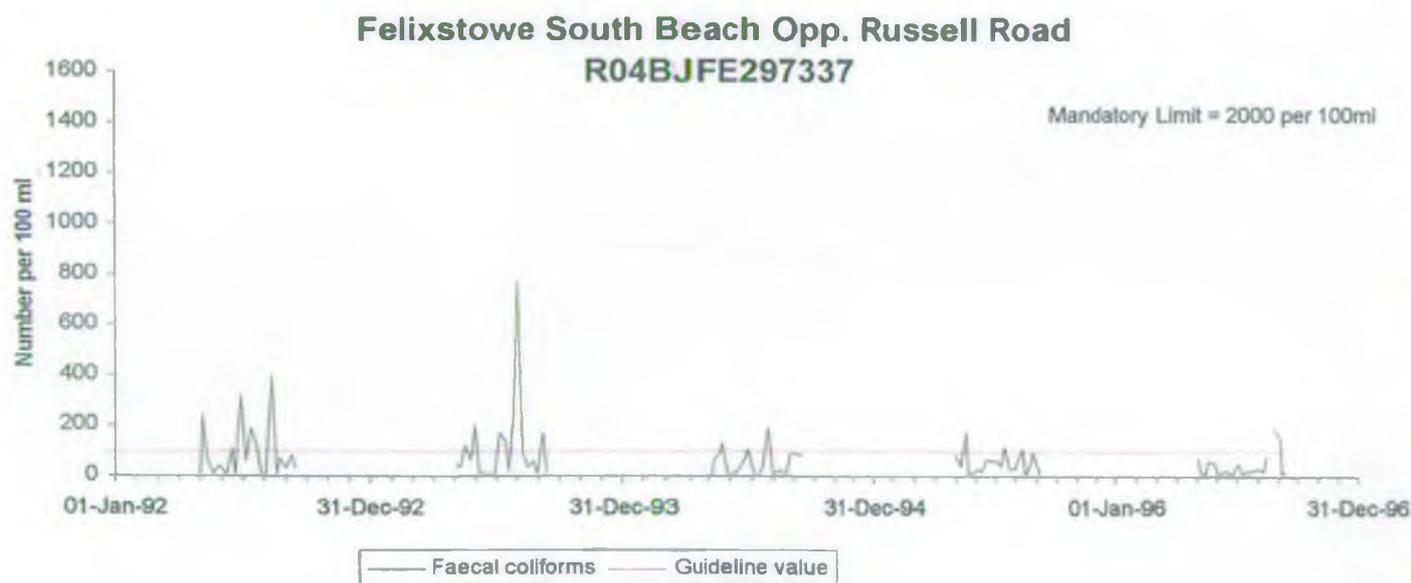


Figure 11 : Bathing Water Directive Results 1991-96 (Faecal coliforms)



This beach has passed guideline limits for a number of years (leading to Blue Flag status).

Many non identified bathing waters exist in the Plan area as for example Aldeburgh. Bacterial sampling by Suffolk Coastal District Council indicates that the majority of these sites would pass the guideline EC bathing water standards (*EC Directive 76/160/ECC*). The Environment Agency is committed to a policy of no deterioration in respect of the quality of these amenity coastal waters. The following sites are regularly monitored during the bathing season by the District Council although the majority of these are not designated sites under the *EC Bathing Water Directive*:

Three sites at Felixstowe (Manor End, the Pier and Cobbold Point), and at Aldeburgh, Thorpeness, Sizewell, Dunwich and Walberswick have samples taken on a weekly basis throughout the bathing season.

#### COMMENTS ON THE QUALITY AND AVAILABILITY OF DATA

Information on the quality of bathing waters is available from the public register. Many sea-side resorts also display this information at popular public access points.

## 6.12 Shellfisheries

### GENERAL

The *EC Shellfish Waters Directive (79/923/EEC)* aims to protect layings by imposition of statutory water quality objectives for designated areas. In the Plan area only Butley oysterage is designated under this Directive and it has a good compliance record with the Directive limits

The *EC Shellfish Hygiene Directive (91/492/EEC)* is administered by the Local Authorities and lays down health conditions for the production and placing on the market of live bivalve molluscs, principally the bacteriological quality. The Environment Agency has a responsibility to help maintain current class for layings under this Directive and investigate and control pollution inputs as appropriate.

### MONITORING

The *EC Shellfish Waters Directive* requires the designated waters to be routinely monitored for a large range of determinants. The sampling frequency depends upon the parameter but ranges from monthly to twice yearly.

### TARGETS

Environmental Quality Standards and minimum sampling frequencies have been established for shellfish waters under the *EC Shellfish Waters Directive (79/923/EEC)*.

### STATUS AND SHORTFALLS

The Butley Creek oysterage, which is in a remote area, has excellent water quality and is currently fully compliant with the *EC Shellfish Waters Directive (79/923/EEC)* although it did fail in 1993. It is currently classified as Class A under the *EC Shellfish Hygiene Directive*

(91/492/EEC). The disused layings in the Blyth estuary are influenced by the River Wang and were classified as Class B under the *EC Shellfish Hygiene Directive (91/492/EEC)* historically. Occasional gathering of cockles takes place on the Orwell and is not classified under the *EC Shellfish Hygiene Directive (91/492/EEC)*. They are likely to be of dubious quality due to the close proximity of Cliff Quay STW.

#### COMMENTS ON THE QUALITY AND AVAILABILITY OF DATA.

Under current legislation the Environment Agency must maintain a set of Public Registers. Information is held in a combination of paper and computer files which may be inspected at our Regional office. Quality monitoring data is held on the Water Quality and Pollution Control Register.

Data on classification under the *EC Shellfish Hygiene Directive (91/492/EEC)* can be obtained from Local Authorities (in this Plan area this will be Suffolk Coastal District Council).

### 6.13 Flood Defence

#### GENERAL

Flood Defence powers and responsibilities are set out in the *Land Drainage Act 1991*, and the *Water Resources Act 1991*. In addition, the Environment Agency's sea defence bylaws set out operational powers to preserve the integrity of these defences.

The powers relating to sea defences are permissive. Works are carried out under the auspices of the Local Flood Defence Committee (LFDC), who are responsible for raising and approving the annual flood defence budget and expenditure, and the Long Term Capital Plan (LTP). The LTP identifies the future needs of the catchment for improving and replacing flood defences, involving capital expenditure.

Both the revenue maintenance and capital programmes are developed within the framework of the following management documents; Shoreline Management Plans (SMPs), Anglian Region Flood Defence Target Standards and Flood Defence Maintenance Frequencies. Although SMPs do not have legal status, the preferred options from each plan influence the promotion of capital projects and the production of future Long Term Plans. There are eight sub-cells to the Anglian Region coastline with Shoreline Management Plan being prepared. The Anglian Region Flood Defence Target Standards and Flood Defence Maintenance Frequencies set out target standards for defending against fluvial and tidal flooding.

Sea level rise will have a major influence on many important coastal habitats and in particular shingle, estuarine habitats and those areas of reedbed, lagoon and freshwater grazing marsh protected by natural or man-made sea defences should they fail. The Shoreline Management Plan identifies the options for coastal management. Under the *Habitats Directive* there is a requirement to assure that compensatory measures are taken to preserve the overall coherence of SAC/SPAs in the country. It was not the intention of the SMP to address the issue of replacement habitats to compensate for those lost due sea level rise and the developing sea

defence strategy. However the Environment Agency clearly has a role to play in the identification and creation of compensatory habitat if this is deemed to be appropriate under the legislation and as the result of Flood Defence works.

### MONITORING

The Anglian Region is developing a Standards of Service exercise for flood defences. This involves the determination of flood defences and the risk associated with those defences in protecting from floods (*i.e.* 1 in a 100 year risk or 1 in a 25 year risk of flooding). These risks are determined on previous flood information, tidal levels and fluvial flows.

The hydrometric network has an important role to play in the warning of imminent fluvial or tidal flooding. Since September 1996 the Environment Agency has inherited the responsibility from the police to disseminate flood warning information to the public. The hydrometric network is used extensively to provide the necessary information to disseminate warnings of risk to the public.

The monitoring of tidal levels in the long-term will allow the Environment Agency to make a judgement as to the scale and extent of sea level rise through global warming, if such a phenomenon exists. To retain the same flood defence standards in the event of sea level rise seawalls and other coastal defences will have to be raised and improved to ensure that present standards are maintained.

### TARGETS

The National Flood Defence Target Standards sets out minimum target standards of flood protection expressed as a flood return period. These standards have been adopted by the Regional Flood Defence Committee (see Appendix 17).

The Norfolk & Suffolk Local Flood Defence Committee have agreed recommended maintenance frequencies for flood defence works (Flood Defence Maintenance Frequencies). These targets, whilst not mandatory, will help determine the need for works and the delivery of our flood defence objectives, (see Appendix 18).

In terms of flood warning the Environment Agency aims to disseminate information as quickly, accurately and as comprehensively as possible.

### STATUS, SHORTFALLS AND TRENDS

Much of the open coastline and estuaries are suffering from severe erosion. Furthermore future sea level rise will exacerbate this phenomena and create many problems for the sustainable management of sites protected by sea defences. The Shoreline Management Plan for the Suffolk coast highlight the likelihood of numerous freshwater habitats, many of which are internationally important (*i.e.* Benacre/Covehithe and Easton valley brackish lagoons, Minsmere), being lost due to the likely failure of natural (*i.e.* shingle barriers and ridges) and man-made defences.

### COMMENTS ON THE QUALITY AND AVAILABILITY OF DATA

Risk of flooding is not assessed. Flood defence maintenance (Capital and Revenue) is prioritised on a needs basis.

## 6.14 Conservation

### GENERAL

This Plan area is recognised as an outstanding part of the country for wildlife. As a result numerous surveys conducted by different organisations have been completed to identify the status of habitats and species in the Plan area.

The Environment Agency has a duty under the Environment Act 1995 to have regard to the desirability of conserving natural beauty, flora and fauna with respect to all of its pollution control and waste management functions, and to further the conservation and enhancement of natural beauty, flora and fauna with regard to all its other activities. In order to play its role in achieving the objective of sustainable development, it has been requested to pay particular attention to its conservation duties.

Conserving biodiversity is a measure of sustainable development. Nature conservation is concerned with safeguarding for future generations our heritage of plants, wildlife, geological and physiographic features. At the United Nations Conference on the Environment and Development held at Rio de Janeiro in 1992, the UK Government signed up to the "Convention on Biological Diversity" aimed at conserving the diversity of global species. As a consequence of this the Government produced a report in 1993 called "The UK Biodiversity Action Plan" with a commitment to produce national targets and action plans for key species and habitats. Some of these were launched in December 1995 and are relevant to this Plan and the work of the Environment Agency. We are committed to contributing to Biodiversity Action Plans at a local level. Biodiversity Action Plans are currently being prepared for target species and habitats in Suffolk. A number of these species and habitats are related to the aquatic and coastal environment which is of particular concern to the Environment Agency in East Suffolk.

### MONITORING

In order to characterise Main River in terms of its conservation value the Environment Agency uses a classification system using River Corridor Survey (RCS) data. This data forms the Rivers Environmental Database (REDs) and provides information to assess the ecological quality of the rivers in a catchment, Area and Regional context. The RCS survey catalogues the botanical species in the river, on the banks and within the adjacent 10 metre corridor as well as some ornithological data. Surveys have been completed for every 500 metre section of Main River in Anglian Region and 490 km in East Suffolk. Information on fisheries, freshwater invertebrates and other species specific surveys (*i.e.* otter, water voles, crayfish, breeding waders) are used in conjunction with REDs to identify the most important stretches as riverine CWSs.

A national River Habitats Survey (RHS) methodology is currently being used to complement the RCS, and classifies the environmental condition of rivers with regard to physical features such as riffles, pools, wet shelves, cliffs and other habitat features. Both the RCS and RHS are aimed at identifying degraded as well as important stretches of river in order to protect valuable features/wildlife and identify opportunities to rehabilitate and enhance degraded habitats.

The species of plant living within a river can also give an indication of water quality, particularly



with regards to nutrient enrichment. A national methodology has been devised, called Mean Trophic Ranking, to identify changes in plant communities that can be attributed to the nutrient status of the water. This analysis will be completed for all rivers in the Eastern Area using RCS data, allowing for a comparative assessment of nutrient enrichment.

Invertebrates are monitored twice a year to provide a biological indication of water quality. A methodology has been devised to assess this data from a conservation perspective looking at species rarity and community. This analysis feeds into the process for identifying CWS river stretches.

Environmental Assessments are required for water abstraction licenses that could impact upon wetlands as well as for capital Flood Defence schemes undertaken by the Environment Agency. Ecological and, for abstraction licences, hydrological monitoring, is often an integral part of many projects/licences to ensure that the natural environment is not damaged. In addition to the above, monitoring of the conservation resource has and will be carried out in partnership with many other organisations (for instance breeding wader and wildfowl of grazing marsh, saltmarsh and shingle surveys in 1997) providing essential data to ensure Environment Agency activities protect and where possible enhance the natural environment..

## TARGETS

With regards to the ecological quality of rivers the baseline target is one of no deterioration which can be measured against past River Corridor Survey data and species specific surveys. In addition we have a long-term target to increase the length of river that qualifies as CWSs to 20% of river length by 2010. Analysis of the REDs focuses our long-term activities to conserve the most important sections, enhance those that are of moderate ecological quality and restore those that appear to be of little importance. Opportunities for protection and enhancement are sought through our routine regulation of all Environment Agency water related functions including Water Quality, Water Resources and Flood Defence activities. A Project reviewing the liaison procedures between the Flood Defence and Conservation functions has recently proposed a number of measures that are currently being implemented which will improve the delivery of ecological enhancements to all rivers during river and coastal maintenance works.

Many more precise targets will be drawn up over the next few years in partnership with other organisations through the production of a Local Biodiversity Action Plan for Suffolk. Threatened species (*i.e.* otter, bittern) will be covered by these targets as well as important habitats (*i.e.* reedbeds, saltmarsh and brackish lagoons). In addition to these Action Plans and as a general principle for all wetlands and coastal habitats influenced by the Environment Agency, a target of sustainable management of biodiversity is the underlying objective with positive enhancements sought where appropriate.

It is expected that the Environment Agency will have the primary influence over many Biodiversity targets, particularly through the implementation of the Shoreline Management Plans and our influence on coastal and estuarine habitats, water resources and river management.

Until the Biodiversity Action Plans for species and habitats are completed long-term targets for this Plan area will include a number of specific targets aimed at rare/threatened and indicator

species characteristic to the catchment and/or significantly influenced by Environment Agency operations or activities.

#### Interim Targets :-

##### *Species*

1. Otters breeding in every catchment by 2010
2. Expansion of the breeding redshank and snipe populations within the river valleys from 1988 levels, attributable to Environment Agency activities.
3. 20% increase in the distribution of river water dropwort by 2010
4. Aquatic/emergent plant species diversity to be greater than 25 species per 500 section in 10% of river sections.
5. 25% increase in the distribution of crayfish by 2010 from 1996 levels

##### *Habitats*

1. No nett loss of vegetated shingle (for areas managed/influenced by the Environment Agency)
2. No nett loss of the total area of saltmarsh from 1993 levels.
3. No nett loss or deterioration of brackish lagoons from 1997 levels.
4. 20% of river length to qualify as CWS by 2010

#### STATUS AND SHORTFALLS

Many data sets can be used to identify the status of the area covered by the East Suffolk Plan.

##### *Rivers*

Most of the rivers in the area are of relatively poor ecological quality with none having SSSI status. Only 43 km have been identified as CWS. Rare species of note include invertebrates, lamprey and bullhead, otter, water vole, river water dropwort and flowering rush.

##### *Estuaries and Coastal Habitats*

The majority of the coastline within the Plan area is recognised as of the highest ecological status. All the estuaries have been designated as SPAs or candidate SACs whilst the majority of the open coast is either SAC or SSSI. Many of the areas not covered by these international and national designations are CWSs (see Map 8).

#### TRENDS

Ecological information accurately identifying trends is hard to come by, but with the present programme of surveys (both internal and external) trends will become more identifiable in the near future.

Of the few historical data sets available it is clear that of the species identified in the targets above the otter is experiencing a comeback and is expanding its range. River water dropwort on the other hand experienced a 83% decline on the River Deben in between 1981 and 1989. Similarly snipe and redshank are known to have declined significantly in the river valleys, but the latter is probably increasing as the influence of the Suffolk River Valley ESA encourages the return of more traditionally managed wet grassland.

Most coastal habitats are experiencing a decline primarily due to sea level rise and coastal

erosion. Saltmarshes, for instance, are estimated to be eroding in Suffolk by 1.1 % (13ha) per year (2% per annum on the Orwell). Similarly brackish lagoons are threatened by erosion, the lack of opportunity to move landward and potential impacts from water abstractions. A future emphasis on more sustainable sea defence options and the protection afforded many coastal habitats within the SAC/SPAs provides many opportunities to address these trends.

## LAND

### 6.15 Derelict and Contaminated Land

#### GENERAL

The Environment Agency has specific duties under the *Environment Act 1995* with respect to contaminated land. For a site to be classified as contaminated land there must be significant harm, possibility of significant harm or contamination of controlled waters. This interpretation is subject to guidance by the Secretary of State. We aim to secure, with others, the remediation of contaminated land. Once a site has been identified as fulfilling the legal definition of contaminated land, the regulator must determine a technically appropriate scheme of remediation. Some sites may become designated as 'special sites', and these will become the responsibility of the Environment Agency. Following a Local Authority inspection these sites will be passed to the Environment Agency as the primary regulator. Special sites are defined in the legislation for two main purposes - either because they are causing or are likely to cause serious harm or serious pollution of controlled waters (*i.e.* by hazardous chemicals) or because the main expertise for regulation purposes rests with the Environment Agency. The Secretary of State can also determine other sites to be 'Special Sites', e.g MoD sites. No 'Special sites' have yet been designated. Until guidance on 'special sites' is provided contaminated sites will not be cleaned up by the Environment Agency.

We will also collate information relating to contaminated land and produce reports on the State of the environment in this respect, organise a national research program for contaminated land, act as a centre of expertise and provide expert advice to Local Authorities on site-specific issues. It is envisaged that the Environment Agency will be able to offer a supportive and advisory role to Local Authorities.

## 6.16 Waste Management

### GENERAL

Section 42 of the *Environmental Protection Act 1990* requires the Environment Agency to supervise licensed waste management activities. The Environment Agency regulate waste management facilities which are developed and operated so as to prevent pollution of the environment, harm to human health, and serious detriment to the local amenity. Local Authorities also have a role to play in the protection of human health and the local amenity.

### MONITORING

The monitoring of waste management facilities is a statutory duty and the guidance is set out by the Department of the Environment as part of Waste Management Paper No. 4. Monitoring frequency is established by this guidance and site visits are dependant on the category and risk of each facility. The licence conditions for landfill sites requires the site operator to monitor for landfill gas, leachate levels and the quality of groundwater and surface water (other indicators include air quality, noise, dust, smell, and litter, depending on the characteristics of each site). Licence conditions are established for other types of waste management facility depending upon the risk that each operation imposes. The monitoring carried out by site operators is audited by the Environment Agency.

### TARGETS

There are no catchment wide targets for waste management facilities. Targets are site specific and established as part of their licence conditions. The licence conditions for landfill sites set trigger levels for groundwater quality and regular exceedance will require remediation initiatives. Leachate indicators that are monitored in groundwater include; ammonium, chloride, sodium, potassium, conductivity, dissolved oxygen, chemical oxygen demand, total organic carbon, and pH. Minimum standards have been established by the Waste Management Paper No. 4 for the open and closed phases of site operation. Surface water conditions may also form part of a waste management licence but these may also require a Water Quality Consent under the *Water Resources Act 1991*. Landfill gas is monitored for three main parameters; methane carbon dioxide and oxygen and once again minimum standards have been established.

## 6.17 Radioactivity

### GENERAL

The greatest source of radiation exposure to the public in England and Wales is that which arises from natural background. Background radiation is not the only source of radiation to which the population is routinely exposed. Medical and occupational exposures both add to the average dose rates, as does residual fallout from the atmosphere testing of nuclear weapons. Collectively these anthropogenic exposures add about another 0.3 milli-Sieverts per year to the average annual exposure to the general public of 2.2 milli-Sieverts. Radioactive discharges from nuclear sites account for only about 0.0004 milli-Sieverts per year to the average member of the public. Discharges of radioactive wastes to the environment are very carefully controlled.

The Environment Agency is the organisation currently charged with regulating use of radioactive materials and disposal of radioactive wastes under the provisions of the *Radioactive Substances Act 1993* (RSA93), which consolidated and superseded the *Radioactive Substances Act 1960*. In summary, the usage / disposal of radioactivity is grouped by the RSA93 into four main areas and registrations / authorisations are issued by the Environment Agency in respect of these activities:

- Section 7: Registration of users of radioactive materials and premises where radioactive materials may be kept and used.
- Section 10: Extension of the registration provisions of section 7 to mobile radioactive apparatus and the release of radioactive materials into the environment for the purposes of environmental studies. It should be noted that the responsibility for regulating the transport of radioactive materials and / or wastes rests with the Department of Transport.
- Section 13: Authorisation of the disposal of radioactive wastes to air, water (including sewers), landfill, or specified repositories.
- Section 14: Authorisation of the accumulation of radioactive wastes prior to disposal.

The Environment Agency also ensures that all applications to keep and use radioactive materials are justified and that the amounts of radioactive materials used and hence the quantities of wastes generated, are commensurate with the proposed uses of the radioactive materials. Some users of radioactive materials are exempted from the requirements for registration/authorisation under RSA93 by Exemption Orders made under the Act by the Secretary of State. Operations carried on under Exemption Orders generally involve small quantities of radioactivity in common usage (e.g. smoke detectors). Many Exemption Orders contain limits and conditions, and operators are liable to compliance inspections by Environment Agency staff.

### TARGETS

The International Commission for Radiological Protection make recommendations on the system of radiological protection, including dose limits. The principles underpinning the Government's policy on radiological protection take account of these recommendations and on the advice of the National Radiological Protection Board. The limit for exposure of the public from all man-made sources of radioactivity (other than medical exposure) is 1 milli-Sievert per year which,

although very much less than the background rate, is considered to reflect a low-level of acceptable additional risk for members of the public. Because man can be exposed simultaneously to both internal and external radiation, the dose received is assessed by adding together both internal and external radiation exposures.

Limits on the quantity and type of radioactivity which may be discharged are set by the Environment Agency in authorisations. In the case of authorisation for nuclear licensed sites, e.g. nuclear power stations, "quarterly notification levels" (QNL) may also be set on specific radionuclides or groups of radionuclides, at values close to routine discharge levels to provide a further performance indicator. Nuclear site authorisations additionally impose an overriding requirement on operators to use "best practicable means" to limit discharges of radioactive waste.

#### MONITORING

On a national scale the Radioactive Incident Monitoring Network (RIMNET) constantly takes recordings of gamma dose rates. There are 90 or so RIMNET monitoring stations throughout the country, of which about 10 are in Anglian Region. If one RIMNET station has a high reading twice or adjacent stations have high readings then an alert will be initiated at the Department of the Environment. The RIMNET network was installed after the Chernobyl accident in 1986 to monitor the scale of any international radioactive release upon the UK in addition to compiling background radiation levels.

Site specific monitoring is carried out for all nuclear installations by the site operator, MAFF and the Environment Agency. Radiation levels are tested throughout each site and in particular the perimeter fence monitoring points are seen as especially important. In addition, depending upon the characteristics of each station, sampling is routinely monitored at/on beaches, fish, shellfish, aerial deposits and for agriculture (sampling of both herbage and milk levels). Samples are predominantly taken by the station operators and MAFF. The station reports all data to the Environment Agency on a regular basis, depending upon the monitoring schedule.

The Environment Agency does not routinely carry out monitoring for non-nuclear sites with RAS authorisations, for example industrial, research or medical use of radioactive materials. The Environment Agency has the power to request the monitoring of the usage/disposal of waste from other operators. However, the majority of authorisations use radioactive materials in small quantities with relatively short half-lives which provides a low dose risk to the public. Therefore monitoring to scrutinise the majority of these disposal pathways is not seen as necessary by the Environment Agency. Operators are liable to compliance inspections by Environment Agency staff.

#### COMMENTS ON THE QUALITY AND AVAILABILITY OF DATA

Monitoring results for nuclear installations is available through public registers.

## 6.18 Soils

### GENERAL

Soil erosion is a complex process, with many factors having an influence. Erosion is a two-phased process, consisting of the detachment of individual particles from the soil mass and their transport either by running water or wind. Rainfall can detach soil through rainsplash and transport it as part of run-off and wind can transport soil by making it airborne. This silt load can be transported into the aquatic environment thereby causing siltation and diffuse pollution of fluvial rivers and stillwaters.

Other factors that influence this process include soil erodibility, slope and crop cover. Crop cover depends on land use which effects the risk of erosion. Arable cropping poses the main risk of erosion, especially during parts of the season where the fields are bare (*i.e.* after ploughing or after harvesting).

For silt to reach the aquatic environment, not only must there be appropriate condition of soil erosion in the field, but also a path for the water flowing from the field to reach the river without check. Often this pathway of run-off from the fields reaching the river is via tracks and roads, through surface water drainage systems, often directly discharging to the river.

For effective control of nutrients and sediment pollution the problem needs to be tackled at source, through effective land management (*i.e.* nutrient management planning and control of soil erosion). Riparian buffer strips may have a role to play in reducing siltation to watercourses in some circumstances. The key is that they need to intercept the pollution pathway but in practice this may be difficult to achieve because buffers are easily by-passed by land drains, surface water drains and channelled overland flow. Buffer strips should not therefore be seen as the primary tool for reducing diffuse pollution because of the fact that they are easily by-passes or overwhelmed.

### MONITORING

There is currently no monitoring or research on-going within the East Suffolk Plan area although some national research is investigating this issue. This National R & D project is a Sediment Study which is investigating the siltation loads and rates entering the River Piddle in Dorset, within our South-West Region. Anglian Region is seeking to gain from this experience and possibly implement practical measures and adopt methodologies to tackle this issue in our own rivers, as a result of this research. Anglian Region are proposing to establish a multi-functional working group to investigate this problem in Eastern Area. The 'case study' river is likely to be the River Wensum in Norfolk. This trial will hopefully identify the extent of the problem and possible solutions, and enable the measures to be implemented for rivers in East Suffolk where siltation rates are high.

### TARGETS

Not applicable.

### CURRENT STATUS

Areas where we would expect to encounter water quality siltation problems due to the high arable land use and the sandy soil-type are the Rivers Bologney, Tang, Twin Banks and Hollesley, but this siltation does not typically cause flood defence problems. Specific siltation problems may occur at sluices within the Plan area but, although it is the responsibility of the Environment Agency to ensure that the structures are operational, it is the responsibility of upstream landowners to de-silt them.

The Farming and Rural Conservation Agency (FRCA) aim to promote to farmers the wider benefits to water quality of their Environmentally Sensitive Area (ESA) scheme. Within the ESA scheme, the reversion of arable land to permanent grassland has been shown to reduce sediment input to water and the reduced fertiliser applications will also reduce nutrient pollution.

### TRENDS

The Environment Agency do not currently measure siltation rates, but a monitoring programme is planned. English Nature and the Environment Agency need to be closely involved in the development of MAFF policy on controlling diffuse pollution and there is a need to further develop the policy of agri-environmental schemes (ESA) to encompass the control of diffuse pollution better.

## AIR

### 6.19 Air Quality

#### GENERAL

The quality of air can be diminished by a number of different factors influencing a number of different chemical parameters. The type of pollutants that affect air quality include; ozone, sulphur dioxide, nitrogen oxide(s), carbon monoxide, carbon dioxide, benzene, lead, particulates (PM<sub>10</sub>), and 1,3 Butadiene. The Environment Act 1995 has laid the foundations for a nationwide system of local air quality management, in which local authorities are obliged to review and assess the quality of air in their areas and to take action where air quality standards or objectives are breached or at risk of being breached.

In addition to the sources of air pollution regulated by the Environment Agency other sources exist including, processes regulated by local authorities, domestic, road transport, railways, civil aircraft, shipping and agriculture. It must be emphasised that the vast majority of air pollutants arise from diffuse sources, predominantly from traffic.

#### MONITORING

Authorisations issued by the Agency for IPC processes include, where appropriate, conditions which require the Operator to carry out monitoring of releases from authorised processes. Monitoring may be implemented as "spot" sampling or continuous monitoring integrated into the process. Such monitoring is subject to auditing during inspections by Agency staff. Additionally, check monitoring may be carried out independently by the Agency or its contractors. Where considered appropriate, Operators are also required to carry out ambient air monitoring as part of their IPC authorisation conditions. Monitoring results are placed on public registers.

Nationally, the Department of the Environment has Urban, Rural and Hydrocarbon automatic air pollution monitoring networks. These networks have about 50 monitoring sites of which one exists within the Plan area at Sibton where Ozone levels only are monitored. This site has been in operation since 1973. Results from this network are published annually.

#### TARGETS

The *Environment Act 1995* extends responsibilities of Local Authorities to establish action target standards for air pollutants so as to improve the environment. This may involve more extensive measures involving parties other than those regulated as operators of Part B processes. The Environment Agency in its regulation of Part A processes, will be required to participate in the setting and achievement of such local standards.

Eventually it is intended that these targets will be set at two main levels of air quality. One will be a guideline figure to represent the level at which the pollution has been rendered harmless to health or the environment, or at which it is unlikely that any significant further benefit could be obtained by expending further reasonable cost on abatement, because of background sources or other factors. The other, a level higher than the guideline figure, will be a trigger level which

distinguishes when air quality is so poor that an immediate response would be justified to prevent serious damage.

#### STATUS, SHORTFALLS & TRENDS

The Government intends to introduce in due course mandatory duties on Local Authorities to assess local air quality and, where it is shown to be necessary according to nationally agreed criteria, prepare local air quality management plans for operation in defined areas where targets are unlikely to be met. The "alert" threshold for any pollutant or combination of pollutants would define the level at which there is a potential risk of immediate serious damage. If the level were reached or approached in a particular area, it should therefore trigger a mandatory obligation on the relevant pollution control authorities, including the Environment Agency, to take remedial action.

Air quality within the UK has been improving in recent years and these improvements are set to continue over the next decade. The new systems for dealing with industrial pollution introduced by the *Environmental Protection Act 1990*, new vehicle standards, and other measures aimed at mitigating the environmental effects of traffic are addressing the reduction of emissions. The UK confidently expects to meet its existing international commitments for reductions in emissions of NO<sub>x</sub>, SO<sub>2</sub> and volatile organic compounds.

There remain, however, important challenges and uncertainties. For example, the recurrence of ozone episodes, particularly in summertime, and the recent publication of research into the effect on mortality of the wintertime smog episode of December 1991 have again raised public concern about air quality.

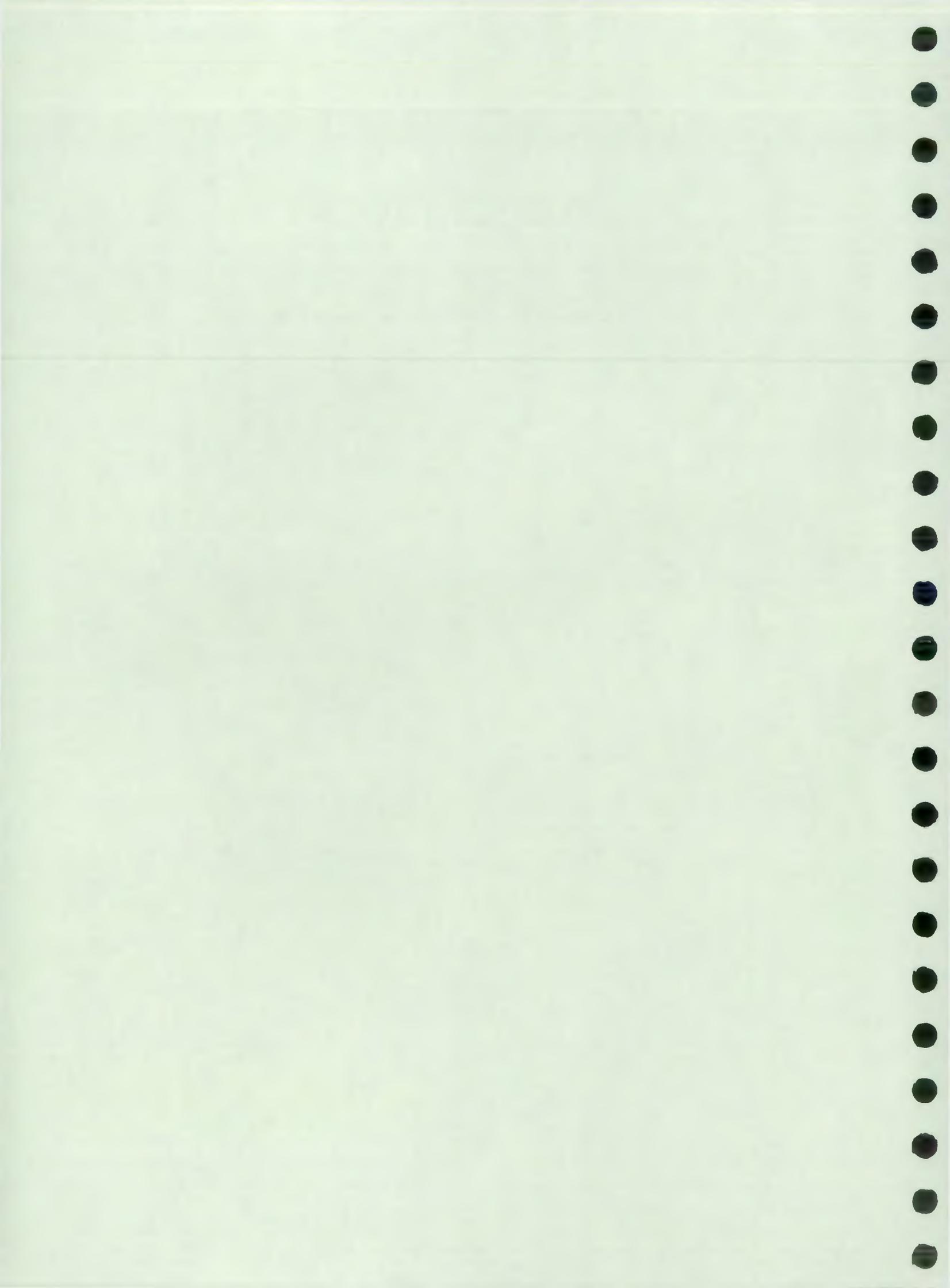
#### COMMENTS ON THE QUALITY AND AVAILABILITY OF DATA

There are national, regional, and local networks which often utilise differing methodologies of analysis. Comparisons between the national and local data which has been assimilated using different criteria can not easily be achieved. In addition, bordering local networks which use different methodology for the same parameter are difficult and often unreliable to compare. It is complicated to establish trends when the data is assimilated in this way

Section Seven

# Appendices

Appendices and Index.



## APPENDIX 1

**Length (km) of River in General Quality Assessment Classification 1993-1995**

The GQA scheme is used to make periodic assessments of the quality of rivers in order to report trends over time across England and Wales. The scheme provides a snapshot of the current quality of rivers and is a means of assessing and reporting upon the general state of controlled waters in a manner which is nationally consistent and independent of the uses to which the waters may be put.

The GQA scheme consists of a number of water quality assessments, each providing a separate window through which water quality is viewed. In this report the chemistry and biology windows are considered.

The table below details the parameters and limits used in the chemical scheme.

Water Quality	Grade	Dissolved Oxygen	Biochemical Oxygen Demand (ATU <sup>1</sup> )	Ammonia
		(% saturation) 10 percentile	(mg/l) 90 percentile	(mg N/l) 90 percentile
Good	A	80	2.5	0.25
	B	70	4	0.6
Fair	C	60	6	1.3
	D	50	8	2.5
Poor	E	20	15	9.0
Bad	F <sup>2</sup>	-	-	-
1 as suppressed by adding allyl thio-urea				
2 quality which does not meet the requirements of Grade E in respect of one or more determinants				

**Chemical Classification**

Class	Quality	Alde Catchment	Blyth Catchment	Deben Catchment	Gipping Catchment	Other Catchments	Total
A	Good	0	0	0	6	0	6
B		0	0	3	14.5	0	17.50
C	Fair	14	40.5	41	49.5	17.5	162.50
D		24	17	24.5	11.5	12.5	89.50
E	Poor	19.5	0	6.5	7	25	58.00
F	Bad	0	0	0	0	0	0.00
<b>Total</b>		<b>57.50</b>	<b>57.50</b>	<b>75.00</b>	<b>88.50</b>	<b>55.00</b>	<b>333.50</b>

**Biological Classification**

Class	Quality	Alde Catchment	Blyth Catchment	Deben Catchment	Gipping Catchment	Other Catchments	Total
a	Excellent	0	0	8.0	5.0	8.5	21.50
b	Good	33.3	26.0	43.5	65.0	13.5	181.30
c	Fair	21.7	13.5	28.0	32.8	12.5	108.50
d	Moderate	0	4.5	3.0	0	4.5	12.00
e	Poor	0	6.0	0	0	4.0	10.00
f	Bad	0	0	0.0	0	0	0.00
<b>Total</b>		<b>55</b>	<b>50.00</b>	<b>82.50</b>	<b>102.80</b>	<b>43.00</b>	<b>333.30</b>

## APPENDIX 2

**River Ecosystem Classification**  
**Water Quality Criteria**

Class	Dissolved Oxygen % saturation 10 percentile	BOD (ATU) mg/l 90 percentile	Total Ammonia mg N/l 90 percentile	Un-ionised Ammonia mg N/l 95 percentile	pH lower limit as 5 percentile; upper limit as 95 percentile	Hardness mg/l Ca CO <sub>3</sub>	Dissolved Copper ug/l 95 percentile	Total Zinc ug/l 95 percentile
RE1	80	2.5	0.25	0.021	6.0-9.0	≤ 10 >10 and ≤ 50 >50 and ≤ 100 >100	5 22 40 112	30 200 300 500
RE2	70	4.0	0.6	0.021	6.0-9.0	≤ 10 >10 and ≤ 50 >50 and ≤ 100 >100	5 22 40 112	30 200 300 500
RE3	60	6.0	1.3	0.021	6.0-9.0	≤ 10 >10 and ≤ 50 >50 and ≤ 100 >100	5 22 40 112	300 700 1000 2000
RE4	50	8.0	2.5	-	6.0-9.0	≤ 10 >10 and ≤ 50 >50 and ≤ 100 >100	5 22 40 112	300 700 1000 2000
RS	20	15.0	9.0	-	-	-	-	-

**Compliance with targets**

Compliance is assessed using recognised parametric statistical methods. From the preceding three years data percentiles and confidence limits are calculated. Confidence limits are the limits within which the 'real' quality is assumed to lie. Use of confidence limits allows us to state, with a known degree of confidence, that a failure to achieve the relevant standards has occurred. The level of confidence chosen for assessment of compliance with RE targets is 95%. Failure against a target can be defined as either marginal or significant and below is a summary of what this means.

**Marginal Failure**      We are 50% to 95% confident that the river stretch has failed its class.  
**Significant Failure**      We are 95% confident that the river stretch has failed its class.

For a more detailed explanation please refer to the document *Water Quality Objectives: Procedures Used by the National Rivers Authority for the Purpose of the Surface Waters (River Ecosystem) (Classification) Regulations 1994*.

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**APPENDIX 3****Biological Classification of Water Quality**

Rivers vary in their size, flow and in the background geology and topography. This means that the life found in rivers varies even when pollution is absent. Some invertebrates are more susceptible to pollution than others and so the presence of sensitive species is a sign that water quality is good.

For GQA assessment, invertebrate species are linked together into 85 groups (taxa) which vary in their sensitivity to pollution. A score is assigned to each group with the most sensitive animals scoring 10 and the most tolerant 1. The sum of these scores for all taxa present gives the Biological Monitoring Working Party (BMWP) score, from which the Average Score Per Taxon (ASPT) is calculated. Thus higher values of these scores indicate better water quality. The River Invertebrate Prediction and Classification System (RIVPACS) is used to interpret this data. It uses physical details about the sampling site, e.g. water depth, distance from source, to predict the invertebrates which would be expected to be present in undisturbed, unpolluted conditions. From this it generates the expected BMWP score, ASPT and Number of Taxa. By comparing the ratio of the observed to expected values, a series of grades of quality are defined. There are six grades (the same number as for chemical GQA), ranging from a (very good) to f (bad). Lower case letters are used to distinguish from chemical GQA grades. The use of this system to set water quality targets is currently under development.

In order to assess the conservation value of a monitoring site, invertebrates are identified to species. Each species has a conservation score which increases from 1 for very common species to 10 for Red Data Book 1 endangered species. The Average Conservation Score for all the species in a sample is used, along with information about the BMWP score and the highest conservation score, to calculate a Community Conservation Index (CCI). High CCI values can result from the presence of very rare species or very diverse communities. Values over 20 probably indicate very high conservation interest.

## APPENDIX 4

**Coastal and Estuarine Working Party (CEWP)**  
**Target Classes for Saline Waters**

DESCRIPTION	Points Awarded if the Estuary Meets this Description
<b>Biological Quality (scores under a, b, c &amp; d to be summed)</b>	
a) Allows the passage to and from freshwater of all relevant species of migratory fish, when this is not prevented by physical barriers.	2
b) Supports a residential fish population which is broadly consistent with the physical and hydrographical conditions.	2
c) Supports a benthic community which is broadly consistent with the physical and hydrographical conditions.	2
d) Absence of substantially elevated levels in the biota of persistent toxic or tainting substances from whatever source.	4
Maximum number of points	10
a) Estuaries or zones of estuaries that either do not receive a significant polluting input or which receive inputs that do not cause significant aesthetic pollution.	10
b) Estuaries or zones of estuaries which receive inputs which cause a certain amount of pollution but do not seriously interfere with estuary usage.	6
c) Estuaries or zones of estuaries which receive inputs which result in aesthetic pollution sufficiently serious to affect estuary usage.	3
d) Estuaries or zones of estuaries which receive inputs which cause widespread public nuisance.	0
<b>Water Quality (score according to quality)</b>	
Dissolved Oxygen exceeds the following saturation values:-	
60%	10
40%	6
30%	5
20%	4
10%	3
below 10%	0
The points awarded under each of the headings of biological, aesthetic and water quality are summed. Waters are classified on the following scale.	
Class A Good Quality 24 to 30 points	Class B Fair Quality 16 to 23 points
Class C Poor Quality 9 to 15 points	Class D Bad Quality 0 to 8 points

## APPENDIX 5

**Length (Km) of Estuary in Coastal and Estuarine Working Party Grades**

Class	Quality	Orwell	Deben	Alde/Ore	Blyth	Total
Class A	Good	6.5	16	35.5	7	65
Class B	Fair	6	0	0	0	6
Class C	Poor	9	0	0	0	9
Class D	Bad	0	0	0	0	0
<b>Total</b>		<b>21.5</b>	<b>16</b>	<b>35.5</b>	<b>7</b>	<b>80</b>

## APPENDIX 6

**Freshwater Fish Directive 78/659/EEC****Mandatory Standards from Directive****Sampling Frequency - Monthly (Weekly for Thermal Discharges)**

Parameter	Salmonoid Imperative Standard	Cyprinid Imperative Standard	Notes
Dissolved Oxygen (mg/l O <sub>2</sub> )	≤ 9	≤ 7	50% of samples must meet this standard.
	≤ 6	≤ 4	Absolute minimum.
pH <sup>1</sup>	6 - 9	6 - 9 (O)	Derogation allowed in naturally acidic areas.
Non-ionised ammonia (mg/l NH <sub>3</sub> )	≤ 0.025	≤ 0.025	Calculated from temperature, total ammonia and pH.
Total ammonium <sup>2</sup> (mg/l NH <sub>4</sub> )	≤ 1	≤ 1	Relaxed standard of 3 mg/l can be applied where there is good evidence of healthy fish populations.
Total zinc (mg/l Zn)			Derogation allowed in areas of high mineralisation, natural enrichment or abandoned mines.
Water Hardness (mg/l CaCO <sub>3</sub> )			
≤ 10	≤ 0.03	≤ 0.3	
> 10 and ≤ 50	≤ 0.2	≤ 0.7	
> 50 and ≤ 100	≤ 0.3	≤ 1.0	
> 100	≤ 0.5	≤ 2.0	
Temperature at thermal discharge (°C)	≤ 1.5 ≤ 21.5 (O) ≤ 10 (O)	≤ 3 ≤ 28 (O) ≤ 10 (O)	Temperature change. Maximum absolute limit. Maximum during breeding periods if cold water needed for reproductions for certain species of fish.
Total residual chlorine (mg/l HOCl)	≤ 0.005	≤ 0.005	A suitable test is not yet available for this parameter.

**COMPLIANCE:** 11 out of 12 samples must meet standards for pH, non-ionised ammonia, total ammonium, and total zinc. Where sampling frequency less than 12, all samples must meet the standard.

<sup>1</sup> Artificial pH variations with respect to the unaffected values shall not exceed ±0.5 of a pH unit within the limits falling between 6.0 and 9.0 provided that these variations do not increase the harmfulness of other substances present in the water.

<sup>2</sup> In particular geographical or climatic conditions and particularly in cases of low water temperature and of reduced nitrification or where the competent authority can prove that there are no harmful consequences for the balanced development of the fish population. Member States may fix values higher than 1 mg/l.

(O) Derogations possible in accordance with Article 11.

## APPENDIX 7

**Bathing Water Quality**  
**The Bathing Waters (Classification) Regulations 1991**

**Sampling Period: 1 May to 30 September**

<b>Parameter</b>	<b>Parametric value</b>	<b>Minimum sampling frequency</b>	<b>Numbers of samples</b>
<b>Microbiological</b>			
Total coliforms	10,000/100 ml	Fortnightly	20 samples per season per site
Faecal coliforms	2,000/100 ml	Fortnightly	20 samples per season per site
Salmonella	Absent in 1 litre		2 samples per season per site
Enteroviruses	No plague forming units in 10 litres		2 samples per season per site required at sites which during the previous season were non compliant with the coliform standards
<b>Physio-chemical</b>			
pH	6 to 9		Minimum of one on site measurement
Colour	No abnormal change in colour	Fortnightly	
Mineral Oils	No film visible on the surface of the water and no odour	Fortnightly	Visual and olfactory inspection. Sample to be taken if oil film visible.
Surface-active substances reacting with methylene blue	No lasting foam	Fortnightly	Visual inspection Lasting foam, believed to originate from a discharge, should be sampled and analysed.
Phenols (phenol indices)	No specific odour $\leq 0.05$ mg/litre (C <sub>6</sub> H <sub>5</sub> O)	Fortnightly	Olfactory Inspection. If phenols suspected a sample should be taken for lab analysis
Transparency	1 metre	Fortnightly	Secchi disc used on site

## APPENDIX 8

**Comparison of the Dissolved Oxygen concentrations versus the RE target for those sites indicated in Issue A3**

Issue	River	Stretch	Target* value (% Saturation)	Actual* quality (% saturation)	Difference expressed as a percentage
A3	Alde	Brundish to Bruisyard arch	70	47.87	32
		Sweffling Bridge to Farnham Bridge	70	55.42	21
		Sweffling Bridge to River Alde	70	55.92	21
		Farnham Bridge to Langham Bridge	70	67.39	3
		Langham Bridge to Snape Sluice	70	67.78	3
	Lothingland Hundred	Ilketshall St Andrews to Suffolk Wildlife Park	60	44.65	22
		Suffolk Wildlife Park to Benacre Pump	60	58.33	3
	Minsmere	Sibton to Yoxford A12 Road Bridge	70	67.37	4
		Reckford Bridge to Minsmere River	70	42.15	40
	Fromus	Kelsale to Benhall Green Bridge	50	39.49	21
		Benhall Green Bridge to Snape Watering	60	29.81	50
		Snape Watering to River Alde	60	46.81	22
	Thorpeness Hundred	Harrow Farm to Coldfair Green	50	49.17	2
		Coldfair Green to Thorpeness Sluice	60	49.17	18

\* Target and actual value expressed as 10 percentile

**APPENDIX 9****Waste collected by the District/Borough Councils in 1994/5 (Quantities in Tonnes)**

District or borough	Commercial waste	Litter & sweepings	Household waste	Reclaimed materials	Total
Babergh	2667	599	29556	1849	34661
Ipswich	3128	1003	39678	1312	45121
Mid Suffolk	51	626	22269	1572	24518
St Edmundsbury	4320	1648	31984	3302	41254
Suffolk Coastal	2700	1803	30100	2437	37040
Waveney	1420	4341	40202	1768	47731
<b>Total</b>					

**APPENDIX 10****Waste Categories**

Category Number	Type of Waste
1	Solid wastes which either do not degrade or degrade very slowly, consisting of materials from the following list: subsoil, topsoil, clay, chalk, hardcore, brickwork and mortar, stone, concrete, sand, silica (excluding finely powdered waste), excavated road material (road planings), glass, pottery, china, enamels, ceramics, mica and abrasives.
2	Solid wastes which may degrade and cause pollution if allowed to enter ground or surface waters, consisting of materials from the following list: ash and clinker, boiler scale, paper, cardboard and fibreboard, plastics, plasterboard, leather, floor sweepings, natural and man-made fibres, shot blasting residues, silicate slag, ferrous metals, non-hazardous non-ferrous metals, tar, pitch and bitumen wastes in solidified form, carbon, kieselguhr, diatomaceous earth, calcium carbonate, calcium sulphate, calcium chloride, magnesium carbonate, cement, trees, bushes, weeds and grass, wood and wood products, waste food or materials that include food or vegetable matter, rubber, household waste and empty containers.
3	<p>Waste specified in (a) to (h) below which does not constitute Special Waste within the meaning of the Control of Pollution (Special Waste) Regulations 1980, or requires special procedures in its disposal due to the nature and physical characteristics of the material.</p> <p>(a) inorganic acids (hydrochloric acid, sulphuric acid, nitric acid, phosphoric acid)  (b) organic acids and related compounds (aliphatic acids, aromatic acids, acid anhydrides, acid chlorides)  (c) alkalis (hydroxides of sodium, potassium or calcium, oxides of sodium, potassium or calcium, carbonates of sodium or potassium, proprietary alkaline cleaners)  (d) non-toxic metal compounds (iron, titanium, chromium)  (e) non-toxic organic compounds (dyestuff wastes)  (f) polymeric materials precursors (resins and unfinished polymeric materials, latex, latex and rubber solutions and suspensions, synthetic adhesive wastes, ion exchange resins)  (g) miscellaneous (commercial or industrial waste: paint, varnish, lacquer, synthetic adhesive wastes, incinerator ashes, lighting lamps and tubes, transformers with oil cooling systems, car batteries, sewage sludge, car fragmentiser waste, non-prescription pharmaceutical products, contaminated soils, bonded asbestos, empty pressurised gas containers.  (h) Waste containing materials itemised under Category 4 but which, due to the concentration of those materials, is not a 'Special Waste' under the Control of Pollution (Special Waste) Regulations 1980.</p>
4	Special waste, as defined in the Control of Pollution (Special Waste) Regulations 1980, by virtue of any of the following: antimony and antimony compounds, arsenic and arsenic compounds, barium and barium compounds, boron and boron compounds, cadmium and cadmium compounds, copper compounds, chromium compounds, lead and lead compounds, mercury and mercury compounds, nickel and nickel compounds, phosphorous and phosphorous compounds, selenium and selenium compounds, silver compounds, tellurium and tellurium compounds, thallium and thallium compounds, vanadium and vanadium compounds, zinc compounds, acids, alkalis, biocides and phytopharmaceutical substances, laboratory chemicals, pharmaceutical and veterinary compounds, tarry materials from refining and tar residues for distilling, heterocyclic organic compounds containing oxygen, nitrogen or sulphur, hydrocarbons and their oxygen, nitrogen and sulphur compounds, inorganic cyanides, inorganic halogen containing compounds, inorganic sulphur containing compounds, organic halogen compounds, any medicinal product available only on prescription, asbestos fibres... (Contd. overleaf)

Category Number	Type of Waste
5	<p>Clinical waste as defined in the Controlled Waste Regulations 1992 as detailed below:</p> <p><u>Group A</u></p> <p>(a) All human tissue, including blood, animal carcasses and tissue from veterinary centres, hospitals or laboratories and all related swabs and dressings</p> <p>(b) waste materials, where the assessment indicates a risk to staff handling them, for example, from infectious diseases</p> <p>© soiled surgical dressings, swabs and other soiled waste from treatment areas</p> <p><u>Group B</u></p> <p>Discarded syringe needles, cartridges, broken glass and any other contaminated disposable sharp instruments or items.</p> <p><u>Group C</u></p> <p>Microbiological cultures and potentially infected waste from pathology departments (laboratory and post-mortem rooms) and other clinical or research laboratories.</p> <p><u>Group D</u></p> <p>Certain pharmaceutical products and chemical wastes.</p> <p><u>Group E</u></p> <p>Items used to dispose of urine, faeces and other bodily secretions assessed as not falling within Group A. This includes used disposable bed pans or bed pan liners, incontinence pads, stomach bags and urine containers.</p>

**APPENDIX 11****List of Integrated Pollution Control Authorisations**

District Council	Company	NGR	Process Type
Babergh	British Sugar Plc Ipswich Sugar Factory Sproughton Road Ipswich	TM 1365 4482	Combustion, cement/lime manufacture and acid process
Ipswich	Delta (Manganese Bronze) Ltd Handford Works Hadleigh Road Ipswich	TM 1480 4480	Non-ferrous metals process
Ipswich	Hewlett Packard Ltd White House Road Ipswich	TM 1330 4710	Inorganic chemical process
Ipswich	White Rose Environmental Ipswich Hospital Heath Road Ipswich	TM 1940 4480	Incineration
Mid Suffolk	Blue Circle Industries Claydon Ipswich	TM 1220 5030	Cement/lime manufacture
Mid Suffolk	Climax Molybdenum UK Ltd Stowmarket	TM 0620 5790	Non-ferrous metals process
Mid Suffolk	ICI Paints Needham Road Stowmarket	TM 0590 5780	Manufacture and use of organic chemicals and di- isocyanate process
Mid Suffolk	Levington Horticulture Limited Bramford Ipswich	TM 1260 4770	Chemical fertiliser production
Mid Suffolk	Redland Aggregates Barham Quarry Ipswich	TM 14 51	Recovery process
Suffolk Coastal	Nuclear Electric Plc Sizewell B Power Station	TM 4740 6350	Combustion process

**APPENDIX 12****List of RAS Authorisations**

District Council	Company	NGR
Ipswich	Suffolk College Rope Walk Ipswich	TM 1710 4430
Ipswich	The Ipswich Hospital NHS Trust	TM 1930 4475
Ipswich	White Rose Environmental The Ipswich Hospital	TM 1930 4475
Suffolk Coastal	Magnox Electric Sizewell A Power Station Leiston	TM 4738 6320
Suffolk Coastal	Nuclear Electric Sizewell B Power Station Leiston	TM 4738 6350
Suffolk Coastal	Magnox Electric District Survey Lab Leiston	TM 453 636

## APPENDIX 13

Process in Determining Abstraction Licence ApplicationsA: SECTION 32/3 CONSENT TO DRILL AND TEST A BOREHOLE

WHAT	HOW	BY WHO
PRELIMINARY ENQUIRY	Informal. Environment Agency may comment in writing in some cases	Applicant or representative
APPLICATION FORM NOTES SENT		Environment Agency
APPLICATION MADE		Applicant or representative
PRELIMINARY ASSESSMENT	Study resource availability, environmental considerations, consider need/timing for EAP/ environmental report	Environment Agency
SURVEY INSTRUCTION ISSUED	Specify survey area and need for extended environmental report where applicable	Environment Agency
SURVEY	Report on prescribed form all water features within given radius  Environmental report provided as necessary	Applicant provides, Environment Agency checks, assesses
CONSENT ISSUED	Specification of borehole construction, pump tests and measurements, other special conditions	Environment Agency
TEST PUMPING CARRIED OUT	Collect and return groundwater data, river flow data, geological data	Applicant, Environment Agency checks
DATA ANALYSED	Depends on qualification and experience of consent holder  Review need for environmental report with full licence application	Applicant or Environment Agency  Environment Agency

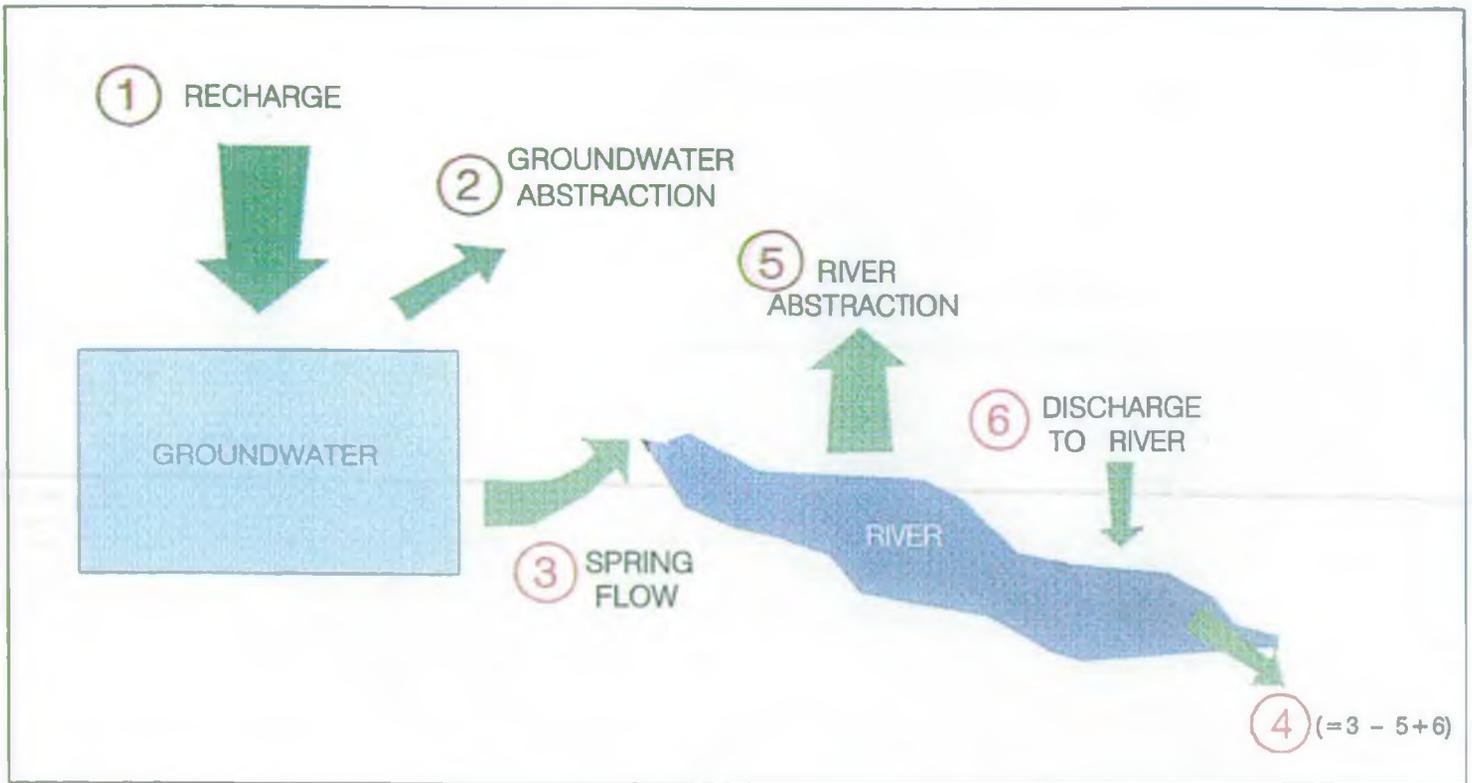


Figure 12: Groundwater Balance Methodology

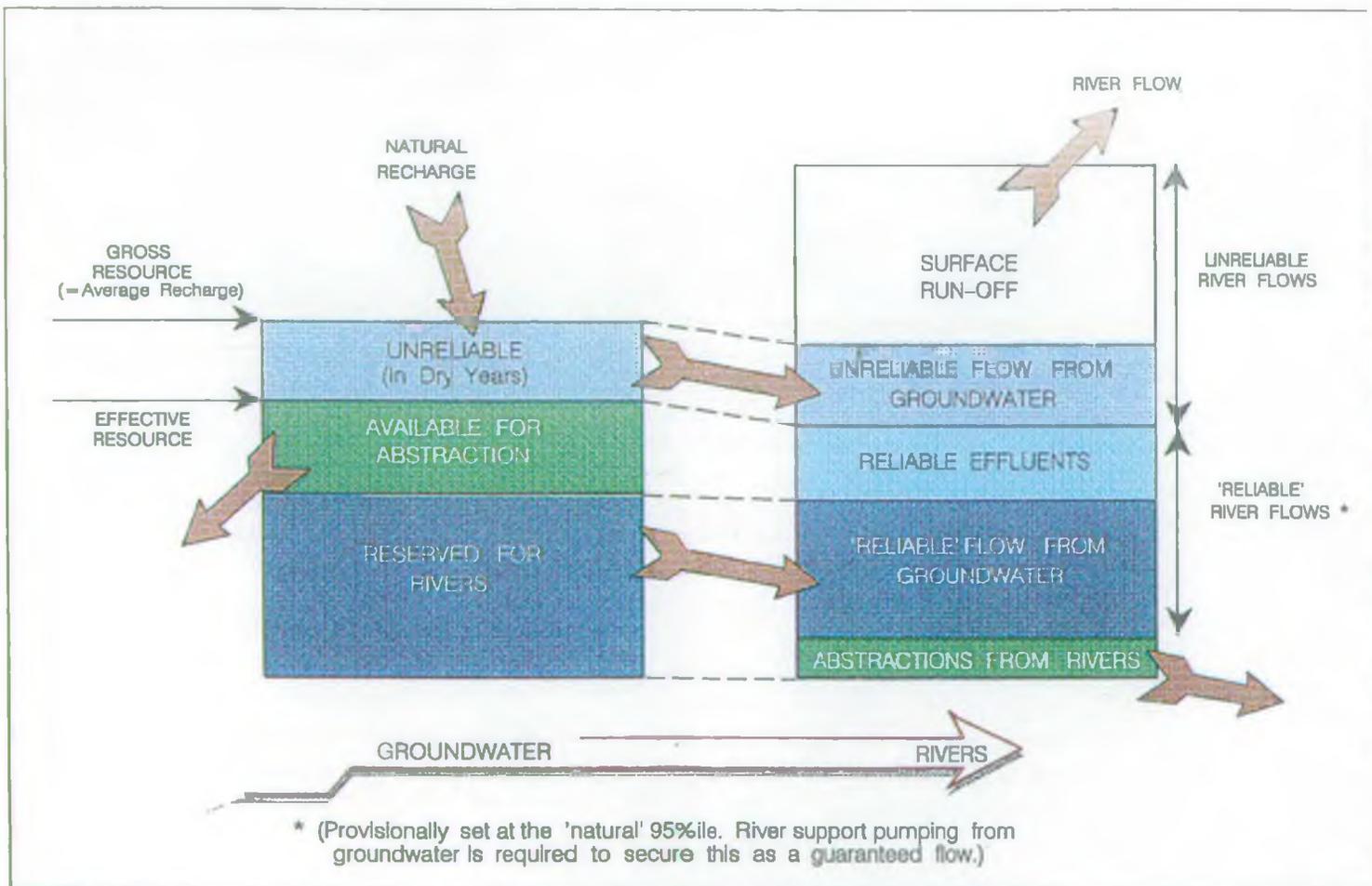


Figure 13: The Allocation of Groundwater to Rivers

**B: ABSTRACTION LICENCE APPLICATION PROCEDURES**

<b>WHAT</b>	<b>HOW</b>	<b>BY WHO</b>
ADVERTISE PROPOSALS (when appropriate)	In local newspaper (to be agreed with the Environment Agency) and in the London Gazette.	Applicant
SUBMIT FORMAL APPLICATION FOR ABSTRACTION LICENCE	Submission of appropriate application forms to Environment Agency	Applicant
CONSULTATION	Within Environment Agency English Nature Conservation bodies (When appropriate)	Environment Agency
TECHNICAL ASSESSMENT	Assess results of pumping test and assess the impact on water features and protected rights	Applicant/Environment Agency
AUDIT OF TECHNICAL ASSESSMENT	Environment Agency reviews the results of the technical assessment	Environment Agency
DETERMINATION	Determine application in the light of the technical assessment, public and internal consultation. Recommend refusal or issue of licence, possibly with licence conditions *.	Environment Agency
NOTIFICATION	To licence applicant To consultees on the Authorities decision	Environment Agency

Note: The order and extent to which each of these activities are carried out may vary from application to application. Re-consultation may also take place at any stage during the licence application process.

\* Where appropriate, the licence applicant may be required to carry out remedial works to protect licensed abstractions and water features, before a licence can be granted.

**APPENDIX 14****Flood Defence Maintenance Frequencies**

The Norfolk & Suffolk Local Flood Defence Committee have agreed recommended maintenance frequencies for Flood Defence works. These targets whilst not mandatory, apply to all sea, estuary and tidal reaches maintained by the Environment Agency, and to those fresh water reaches and features identified as requiring regular maintenance attention.

Factors such as the identified need for works, available finance, conservation and recreational requirements, and landowner requests, influence the extent and timing of works.

The achievement of these target standards of maintenance will help deliver the following objectives:

1. Provision of the maximum designed flood protection to people and property within the economic viability of the area protected.
2. The design life of flood defences and river channels.
3. A reduction in selected routine maintenance costs.
4. The potential for environmental enhancement works whilst carrying out flood defence works.

The following frequencies are those recommended by the Norfolk & Suffolk Local Flood Defence Committee to be applied to all sea, estuary and tidal reaches; and to those fluvial reaches and features identified as requiring regular maintenance attention.

<b><u>ACTIVITY</u></b>	<b><u>TASK</u></b>
Sea Defences	Inspect twice a year. Maintenance as required.
Tidal/Estuary Banks & Embankments	Inspect once a year and following a major surge/meteorological event. Maintenance as required.
Structures	Health & Safety Inspection once a year. Mechanical & Electrical Inspection twice a year. Civils Inspection once every five years.
Pumping Stations	Health & Safety Inspection once a year. Mechanical & Electrical Inspection twice a year. Civils Inspection once every five years.
Dredging	Tidal/Estuary, as required. Fluvial (large rivers), every 10-12 years. Fluvial (small rivers), every 6-8 years.
Banks & Embankments	A. Grass Cutting Sea, estuary, tidal once a year. Fluvial, flood storage reservoirs and urban areas, twice a year. Fluvial, rural areas, once a year. B. Vermin Control Sea, estuary, tidal embankments, twice a year. Fluvial embankments, twice a year.
Weed Control	Rivers and watercourses through urban and sensitive areas, twice a year. Rivers and watercourses through rural areas, once a year.
Obstructions	Inspect/clear channels, once a year. Additional clearance in sensitive urban areas, as required.

**APPENDIX 15****National Flood Defence Target Standards of Service**

Current Land Use	Indicative Standards of Protection (return period in years)	
	Tidal	Non-Tidal
High density urban containing significant amount of both residential and non-residential property	200	100
Medium density urban. Lower density than above, may also include some agricultural land	150	75
Low density or rural communities with limited number of properties at risk. High productive agricultural land	20	50
Generally arable farming with isolated properties. Medium productivity agricultural land	20	10
Predominantly extensive grass with very few properties at risk. Low productivity agricultural land	5	1

**APPENDIX 16****Capital Flood Defence Schemes for East Suffolk within the Environment Agency's Long Term Plan**

Flood Defence Scheme	1996/97	1997/8	1998/9	1999/2000
Sudbourne Beach Wall			50,000	
Bawdsey Sea Defences	530,000			
Felixstowe Ferry Sea Defences				240,000
Aldeburgh Groyne Refurbishment				500,000
Southwold The Denes Sea Defences				250,000
Ipswich Flood Defences	6,000		210,000	
Hollesley Pumping Station				200,000
Shoreline Management*	100,000	100,000	100,000	100,000
Suffolk Tidal Estuaries		14,000	22,000	

Extract from the Environment Agency's Flood Defence Long Term Plan.

Costs shown in £

\* Denotes that expenditure shown is not all within this Plan area.

## APPENDIX 17

Water Level Management Plans (WLMPs)

Water Level Management 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. The highest priority has been given to internationally important sites such as those SSSI's which qualify as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites. Water Level Management Plans being prepared for the East Suffolk catchment are detailed below.

SSSI	PLAN	PRIORITY	DATE COMPLETED
<b>Minsmere/ Walberswick Heathes and Marshes</b>	Minsmere	HIGH	12-96
	Home Covert Marshes	HIGH	03-97
	Southwold Town Marshes	HIGH	03-96
	Tinker's Marsh	HIGH	03-96
	Westwood & Dingle Marshes	HIGH	03-96
<b>Orwell Estuary</b>	Shotley Marshes	HIGH	12-96
<b>Benacre to Easton Bavents</b>	Easton Valley	HIGH	03-96
<b>North Warren &amp; Thorpeness Meare</b>	1 Plan	MEDIUM	IMS
<b>Sizewell Marshes</b>	1 Plan	MEDIUM	4-98

All of the above Plans have been prepared by the Environment Agency - Anglian Region (Eastern Area) in consultation with other interested parties. The Environment Agency, as operating authority, are responsible for preparing these Plans and further Plans in the future. The Plans will be reviewed on a regular basis and updated or revised if the objectives are unable to be met, or if circumstances change.

## APPENDIX 18

Status of Statutory Development Plans

Local Authority	Plan Status	Date
Babergh District Council	Babergh Local Plan, Alteration No. 1	June 1995
Ipswich Borough Council	Ipswich Local Plan - <i>Adopted</i>	November 1996
Mid Suffolk District Council	Mid Suffolk Local Plan - <i>Inspector's Report</i>	Spring 1997
St Edmundsbury Borough Council	St Edmundsbury Local Plan - <i>Modifications</i>	March 1997
Suffolk Coastal District Council	Suffolk Coastal Local Plan - <i>Public Consultation.</i>	Spring 1997
Suffolk County Council	Suffolk Structure Plan - <i>incorporating Alterations 1, 2 and 3</i>	June 1995
	Suffolk Minerals Local Plan - <i>Deposit Draft</i>	April 1996
Waveney District Council	Waveney Local Plan - <i>Adopted</i>	November 1996

## APPENDIX 19

**MAJOR DEVELOPMENTS WITHIN EAST SUFFOLK**

District/ Borough Council	Town/Village	Name/Place of Development	Type of Development		
			Resid- ential	Indus- trial	Comm- ercial
IBC	Ipswich	Ransomes Europark	✓ (1000)	-	✓
IBC	Ipswich	West End Road	✓	✓	-
IBC	Ipswich	Pinebrook development	✓	✓	-
BDC	Ipswich	Thorington Hall	✓ (100)	-	-
SCDC	Aldeburgh	Perriers Close	✓	-	-
SCDC	Framlingham	Two residential developments	✓ (100)	-	-
SCDC	RAF Bentwaters	Mixed development	✓	✓	✓
SCDC	Saxmundham	-	✓ (150)	-	✓
SCDC	Kessingland	-	✓	-	-
SCDC	St. Audreys	-	✓	-	-
SCDC	Felixstowe	Martello Tower	✓	-	-
SCDC	Rushmere St Andrew	-	✓	-	-
SCDC	Ipswich	Foxhall Road	✓	-	-
MSDC	Stowmarket	Takers Lane	-	-	✓
MSDC	Stowmarket	Violet Hill	✓	-	-
WDC	Halesworth	Dukes Drive	✓	-	-

IBC Ipswich Borough Council  
SCDC Suffolk Coastal District Council

BDC Babergh District Council  
WDC Waveney District Council

The part of the East Suffolk Plan area within St Edmundsbury Borough Council has no proposals for major development.

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The Environment Agency delivers a service to its customers, with the emphasis on authority and accountability at the most local level possible. It aims to be cost-effective and efficient and to offer the best service and value for money.

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**0645 333 111**

The 24-hour emergency hotline number for reporting all environmental incidents relating to air, land and water.

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