

local environment agency plan

LOUTH COASTAL

ACTION PLAN

OCTOBER 1998



ENVIRONMENT AGENCY

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ANGLIAN REGION

Kingfisher House, Goldhay Way,
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ENVIRONMENT
AGENCY

KEY FACTS AND STATISTICS

Total Area:	1040 km ²	
Population:(Approximate)	(Residential) 90,000	(Additional at Peak Season) 150,000
Main Towns (populations):	Residential	Summer (Estimate)
Louth	14,248	
Skegness	16,355	38,000
Mablethorpe & Sutton on Sea	10,253	33,000 (including Trusthorpe)
Environment Agency Offices:		
Anglian Region, Northern Area Office, Lincoln.		Tel. No. (01522) 513100
Catchment Office Manby		Tel No. (01507) 328102
Water Utility Companies:		Anglian Water Services Limited
Internal Drainage Boards:		Lindsey Marsh Drainage Consortium (Louth, Alford & Skegness)
Length of Statutory Main River:	225.4 km	
Length of Navigable River:	0 km (Potential for 21.5 km - Louth Navigation)	
Length of Coarse Fishery:	108.1 km	
Length of Trout Fishery:	83.1 km	
Length of Embanked Fluvial River:	113.8 km	
Length of Embanked Tidal River:	4.6 km	
Length of Sea Defence:	62.0 km	
Area of land below highest astronomical tide:	376.0 km ²	
Flood Storage Reservoirs:	3	
Water Quality:		Sites of Special Scientific Interest: 25
		Scheduled Monuments: 77
		Waste Management Facilities:
		Licensed Landfill Sites 7
		Licensed Transfer Stations 7
		Licensed Treatment Plant 0
		Licensed Scrap Yards 5
		Waste Landfilled 1997 (Thousand Tonnes):
		Cement Bonded Asbestos 119
		Construction and/or Demolition Waste 19657
		Contaminated General Wastes 774
		Household 43932
		Industrial 21037
		Sanitary Wastes 53
		Water Resources:
		Annual Rainfall 653 mm
		Total Licensed Abstraction Groundwater 26188 TCMA
		Surface water 42243 TCMA
Integrated Pollution Control		
Authorisation Sites:		
Conoco (UK) Limited, Theddlethorpe		
Conoco Ltd, Tetney Tank Site		

PLAN AREA



FOREWORD

The Environment Agency was established to protect, monitor and improve the environment in its broadest sense - ultimately contributing to the worldwide goal of sustainable development. We have become one of the most powerful environmental regulators in the world. By exerting our influence on the regulation of air, land and water, we have a unique opportunity to look at our environment in an integrated and holistic manner.

Local Environment Agency Plans (LEAPs) set out a vision for the quality of the environment in a particular area and how that may be achieved through appropriate management. The plans focus particularly on issues which have been raised through our consultation with the local communities affected. Many of these issues and other opportunities for improvement cannot be tackled by the Agency alone, so the Plan also acts as a platform for partnership with other interested parties.

Whilst the Vision, by its very nature, is not constrained by the practicalities of budgets and resources, the Activity Plans set out our firm proposals for the delivery of real improvements to the local environment - as steps towards achieving that Vision. Consequently, LEAPs are becoming one of the cornerstones to how the Agency plans its business.

We hope that you will find this document useful and informative. Readers' opinions and suggestions are, as always, welcomed. We look forward to working with you to make this Plan a reality.

A handwritten signature in dark ink, appearing to read 'R. Linfield', with a horizontal line underneath the name.

Ron Linfield
Northern Area Manager

EXECUTIVE SUMMARY

Situated within the County of Lincolnshire and extending over an area of some 1040 km² the Plan covers the East Coast between Tetney and Wainfleet All Saints, and inland to the Lincolnshire Wolds. It is predominantly rural in nature, home to some 90,000 people - a figure which can increase by the influx of holiday makers during the summer season to over 240,000. Tourism is vital to the wealth of this area a factor influenced by the quality of its seven E.C. identified bathing waters all of which comply with the mandatory standards. Skegness and Mablethorpe are focal points for the holiday industry; the main inland urban area is the market town of Louth.

The principal water resources are the Chalk and Spilsby Sandstone aquifers and the local surface water systems of the Louth Canal (Covenham Reservoir), Great and Long Eau, Waithe Beck, River Lymn and River Steeping. We continue to work to protect and enhance these valuable assets for all users of the water environment.

The range of land drainage patterns from, swift flowing streams to sluggish fenland drains, reflects the varying topography of the area. Together with Internal Drainage Boards we work to ensure adequate discharge of water to sea and appropriate fluvial defences are in place to protect people and property during periods of high river flow.

Heavily engineered tidal defences along the East Coast protect the most densely populated areas between Mablethorpe and Skegness. On an ongoing basis these are being augmented with beach nourishment to replace the sands which are constantly being eroded by coastal processes. To the north of Mablethorpe and south of Skegness natural defences in the form of sand dunes supplemented by man-made clay banks protect the low lying land behind.

Pressures due to the production of waste which must be disposed of safely and sustainably are evident in the Plan area. A challenge for example, being the issue of landfill gas emanating from Kenwick Landfill site. We will seek to resolve this by working together with site operators to provide an appropriate solution.

Water quality is generally fair to good, reflecting the Catchment's rural nature and the lack of major effluent discharges to its main watercourses. Air quality is also relatively good and has been improving in recent years. This positive trend is set to continue over the next decade.

The coastline of the LEAP area contains habitat of national and international importance for many wildfowl, waders and species such as the natterjack toad and breeding colonies of grey seal. Local river systems offer opportunities for flora and fauna to flourish, however, over two hundred years of land drainage activity and the needs of flood defence have left plant diversity along river corridors generally low. The Area's watercourses support stocks of many fish species including trout, roach, bream, tench and pike, all of which attract anglers to this part of Lincolnshire. Continuing with this theme, both the coastal fringe and Wolds are popular recreational areas containing a wide variety of walks, cycle routes and bridle ways.

Many of the issues identified in this Plan, relating to the sustainable use of resources, biodiversity, the illegal disposal of waste and the recreational use of the water environment, will be addressed and resolved through a partnership approach between ourselves, local authorities, organisations and individuals.



VISION

Our Vision for the Louth Coastal Plan area is to see valuable environmental assets associated with this location protected from pressures caused by human activity. Within the next 10 to 15 years we aim to ensure the current range of habitat, flora and fauna supported within the Plan area is maintained and wherever possible enhanced. This can be achieved whilst balancing human use of the environment and maintaining protection against flooding in the face of long term predictions for rising sea levels.

To accomplish this Vision we will work with local communities and others towards the sustainable management of the area, balancing the interests of all users. To achieve this the following objectives will be pursued:

- to maintain and improve water quality, with particular emphasis on the quality of the River Lud/Louth Canal;
- to maintain and enhance, through initiatives such as Biodiversity Action Plans (BAPs), the conservation value of the area and the coastline in particular, which contains habitat of national and international importance;
- to maintain a high standard of flood defences and, where necessary, improve levels of protection for people and property in low lying areas;
- to progress towards a better understanding of the links between lack of flow in spring fed watercourses and its impact on flora and fauna;
- to encourage sustainable solutions which improve waste management, particularly with respect to the issue of landfill gases;
- to promote the recreational value of the Plan area, without compromising the needs of the environment;
- to work with all parties in order to implement the principles of sustainable development particularly by establishing stronger links with local communities;
- to balance the needs of industrial, urban and agricultural development through our own work, and in partnership with other interested parties; and,
- to manage the water resources of the Chalk and Spilsby Sandstone, Louth Canal (Covenham Reservoir), Waithe Beck, Long and Great Eau, River Lymn and River Steeping in a sustainable manner.

It is through establishing strong links with local communities, working together with industry, the water company and agriculture, and increasing public awareness of the need to protect our environment, that this Vision will become a reality.

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ACKNOWLEDGEMENTS

We would like to thank all those organisations and individuals who facilitated the preparation of this Plan and especially those who attended consultation meetings and responded to the Consultation Report.

We would like to thank all those Agency staff who invested many hours of hard work to create this Plan and also the important contribution to the process made by members of the Lincolnshire Area Environment Group.

1.0 THE ENVIRONMENT AGENCY

The Environment Agency (Agency) has a wide range of duties and powers relating to different aspects of environmental management. It is required and guided by Government to use these duties and powers in order to help achieve the objective of sustainable development. The Brundtland Commission defined sustainable development as

“....development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

At the heart of sustainable development is the integration of human needs and the environment within which we live. Indeed the creation of the Agency itself was in part a recognition of the need to take a more integrated and longer-term view of environmental management at the national level. The Agency therefore has to reflect this in the way it works and in the decisions it makes.

Taking a long-term perspective will require the Agency to anticipate risks and encourage precaution, particularly where impacts on the environment may have long-term effects, or when the effects are not reversible. The Agency must also develop its role to educate and inform society as a whole, as well as carrying out its prevention and enforcement activities, in order to ensure continuing protection and enhancement of the environment.

Although the Agency only has duties and powers to protect some environmental resources, it will need to contribute to other aspects of environmental management even if these are, in the first instance, the responsibility of others. The Agency can only do this effectively by working in partnership with and through others in order to set common goals and to achieve agreed objectives.

Much of the UK's environmental legislation originates from the European Union. To date there have been five EC Environmental Action Programmes which have collectively given rise to several hundred pieces of legislation of relevance to environmental protection, one of the most recent being the Directive on Integrated Pollution Prevention and Control. A number of other directives are currently under consideration, covering issues such as water management, air quality, and the management of waste using landfill.

The Agency also has to work in a wider international context because it is now generally accepted that environmental changes are occurring on a global scale. Individual countries contribute to

these changes, and respond to them, in different ways. The Agency's long-term strategy therefore has to reflect these global issues, and it has to be delivered within the framework of international and national commitments which has been developed to address them.

Perhaps the major international issue is that of climate change. The UK is a contributor to the emission of gases such as carbon dioxide into the atmosphere which are believed to contribute to long-term climate changes. The UK will also be affected in a complex way as and when the climate does change. It is therefore a signatory to the Framework Convention on Climate Change, as agreed at the Rio Summit in 1992, and is taking an active part in international negotiations to obtain commitments beyond the year 2000 for credible, effective and achievable reductions of greenhouse gas emissions.

Another outcome of the United Nations "Earth Summit" held in Rio de Janeiro in 1992 was agreement by governments that, in order to solve global environmental problems, local action is crucial: we must all therefore think globally but act locally. The Local Agenda 21 initiative set out actions needed to achieve sustainable development, including the need to make clear the links which exist between local life-styles and the use of resources. In the UK plans have now been formulated by local government and local communities to identify and address a wide range of environmental issues including natural resource use, pollution, health, local amenity and quality of life. These programmes set out long-term solutions that take account of global implications, such as the use of resources that affect the global environment and thus local communities in other parts of the world.

The Agency is committed to a programme of Local Environment Agency Plans (LEAPs) in order to produce a local agenda of integrated action for environmental improvement. These LEAPs will also allow the Agency to deploy its resources to best effect and optimise benefit for the local environment and will contribute towards achieving sustainable development.

The process of drawing up the plans will involve close consultation with all interested parties. It will promote the effective, accountable and integrated delivery of environmental improvement at the local level. The plans will translate policy and strategy into delivery on the ground and will result in actions, either for the Agency to fulfil, or for others to undertake through influence and partnership. We believe the process will benefit the local

1.0 THE ENVIRONMENT AGENCY

community by influencing and advising external decision makers and public opinion. It will build trust by being open and frank when dealing with all issues.

Action Plan

This Action Plan outlines areas of work and investment proposed by ourselves and other responsible parties over the next five years and will form the basis for improvements to the environment in the Plan area. Progress against the Action Plan will be monitored and reported annually.

1.1 AIMS

The Aims of the Environment Agency are:-

- to achieve major and continuous improvements in the quality of air, land and water;
- to encourage the conservation of natural resources, animals and plants;
- to make the most of pollution control and river-basin management;
- to provide effective defence and warning

systems to protect people and property against flooding from rivers and the sea;

- to reduce the amount of waste by encouraging people to re-use and recycle their waste;
- to improve standards of waste disposal;
- to manage water resources to achieve the proper balance between the Country's needs and the environment;
- to work with other organisations to reclaim contaminated land;
- to improve and develop salmon and freshwater fisheries;
- to conserve and improve river navigation;
- to tell people about environmental issues by educating and informing; and,
- to set priorities and work out solutions that society can afford.

We will do this by:

- being open and consulting others about our work;
- basing our decisions around sound science and research;
- valuing and developing our employees; and,
- being efficient and businesslike in all we do.



Skegness Beach

Photo: Chris Parker c/o East Lindsey District Council

2.0 THE LOUTH COASTAL PLAN AREA

2.1 INTRODUCTION

The Louth Coastal area extends down the East Coast of Lincolnshire from Tetney to Wainfleet All Saints and inland to the Lincolnshire Wolds. The northern extent of the area is the sub-catchment of the Waithe Beck and to the south that of the River Lymn/Steeping.

Within the Plan area there are two distinct landscapes. Between the Wolds and the Coast the land is generally flat and largely under cultivation. Despite this, there remain habitats rich in wildlife including meadow and pasture grasslands, saltmarsh, sand dunes and some woodland. In the past, large areas of saltmarsh and wet marsh have been reclaimed for agricultural use. Since the war, more and more grasslands have been ploughed up for arable farming and this has significantly reduced the wildlife value of the Area.

The broad coastal plain can be divided into three sub-groups which run approximately parallel with the edge of the Wolds. To the west is the Middle Marsh which comprises a softly undulating arable landscape that gently climbs up to the foot of the Wolds. This is a more enclosed landscape containing a greater number of woodlands and hedgerows with important Lincolnshire Trust reserves such as Hoplands, Rigsby and Muckton Woods. To the east lies the Outmarsh, a land of rich pasture, including some remnants of ridge and furrow divided by narrow dykes. Thirdly, the coastline itself; this is an area of saltmarsh, dunes and beaches, subject to the changing forces of coastal processes.

The Wolds themselves provide a rolling landscape, rising up to 150 metres above sea level, which supports interesting habitat variation in the form of chalk grasslands, rivers, streams and some woodland. Tetford Wood is the best example of semi-natural woodland in the Lincolnshire Wolds Natural Area and nationally important alder carr woodlands can be found scattered along some of the river valleys. As an Area of Outstanding Natural Beauty, the Lincolnshire Wolds has been designated as one of Britain's finest landscapes with many villages hidden within its folds. Here, the famous poet Alfred, Lord Tennyson (1809-92) was born in Somersby in the Lymn valley and later attended school in Louth. He left the Wolds in 1837, but it's landscape provided a source for many of his poems:

*'Calm and deep peace on this high wold
And on these dews that drench the furze
And all the silvery gossamers
That twinkle into green and gold.'*

The Plan area does not have a single major urban centre, instead it has a series of relatively small market towns which have grown to serve numerous scattered villages and holiday centres.

Louth is the largest market town in East Lincolnshire. It is a town in two hemispheres - east and west, as the Greenwich Meridian of zero degrees longitude passes through it. Dating back to Saxon times its markets and shops are the focus for a great deal of economic and tourist activity. It is an important employment centre and there are a number of industrial sites scattered throughout the predominantly residential areas. Local sites of interest include St James' Church, Louth, which is reputed to possess the tallest spire (90 metres) of any parish church in England. Elsewhere the town watermill has marked on its side one of several flood level marks, which record how far the River Lud rose during the flash flood of 29 May 1920, caused by a cloudburst over the Wolds. During that serious flood event 23 people were killed. Today, the town is still complete and unspoilt, with small squares and a market hall. At the eastern end of Louth lies the former hamlet of Riverhead which marks the beginning of the Louth Canal or Louth Navigation. The Canal was operational between 1767 and 1924, and linked the town with the North Sea at Tetney Haven, using the water of the River Lud. The Canal locks remaining at



St James Church, Louth

Photo: East Lindsey District Council

2.0 THE LOUTH COASTAL PLAN AREA

Ticklepenny, Willows, Salter Fen and Alvingham are the only unique examples of original barrel sided locks in the United Kingdom. Restoration of the navigation is sought by the Louth Navigation Trust.

In Skegness and Mablethorpe the holiday industry is the main economic base. In 1936 Sir Billy Butlin

for the largest percentage of agricultural land use. However, recent data indicates a decline of such crops compared with 10 years ago. Predominant crops are cereals such as wheat and barley.

Large scale industry is limited within the Plan area, however, the presence of Conoco (UK) Ltd at Theddlethorpe, Conoco Ltd at Tetney, and RVP (Vegetable processors) at North Thoresby provide examples of development of this nature.

2.2 HYDROLOGY AND WATER RESOURCES

Principal water resources are the Chalk and Spilsby Sandstone aquifers which are important sources of water for public water supplies. The Great Eau river is also an important source of water; during periods of low flow river water is transferred from Cloves Bridge to the Louth Canal at Alvingham (by Anglian Water Services Ltd), via a raw water pipeline. Water is subsequently abstracted from the Louth Canal to fill Covenham Reservoir which provides water to both the Louth catchment and further north for public supply and industrial use on the Humber Bank.

River water is the most significant source of water for spray irrigation, particularly the catchments of the Rivers Lymn and Steeping where a number of abstractions are closely concentrated.

Anglian Water Services Ltd (AWS) abstracts from 16 sources in the Chalk and Spilsby Sandstone, seven of which are located in the south of the Area. Overall, public water supply accounts for 97% of the water licensed for abstraction. Water abstracted is used to meet demand, including the peak summer demands of the East Coast holiday resorts.

There is concern that abstraction from the Chalk aquifer as a whole is leading to depleted spring flows which has an effect on channel morphology and the habitat of in-river flora and fauna. This is demonstrated by considerable fluctuations in groundwater levels which do not reflect the seasonality of recharge. There is a need to further understand the groundwater flow processes that occur and the relationship with springs and river flows across the Area to manage water resources in a sustainable manner.

The pressures of additional development, leading to increased demands for water in the longer term, will present a major challenge to both ourselves and AWS and alternative sources of water may need to be found. In the short and medium term it is anticipated that measures such as leakage control and demand management will enable needs to be met from existing sources.



"Jolly Fisherman", 1908

opened his first holiday camp to the north of Skegness, now called Funcoast World. The influence of the North Sea is significant in concentrating economic and recreational activities which are summarised by the old railway poster of the Jolly Fisherman: "Skegness is so bracing!". Both Skegness and Sutton on Sea have developed rapidly as retirement centres over the last decade.

From an archaeological perspective the Plan area offers in the region of 2100 sites ranging from those in urban locations (for example, Louth) to rural priory sites (for example, Markby), Roman settlements (for example, Binbrook), Neolithic and Bronze Age burial mounds, medieval settlement sites, maritime sites and so on. Of these sites approximately 77 are protected Scheduled Monuments.

Agriculture is the main economic activity within the Plan area, with arable crops and fallow accounting

2.0 THE LOUTH COASTAL PLAN AREA

2.3 POLLUTION PREVENTION AND ENVIRONMENT QUALITY

WATER QUALITY

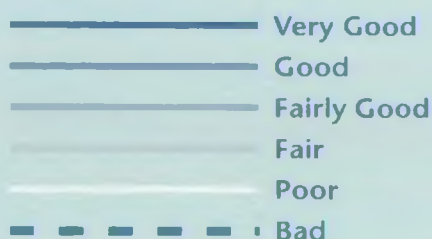
Water quality is generally fair to good reflecting the catchment's rural nature and the lack of major effluent discharges to the main watercourses. Only one stretch of river significantly fails to meet its target standard, the length of the Louth Canal downstream of Louth town to Alvingham footbridge. It is anticipated this will in part be remediated by improvement works to combined

sewer overflows, currently in hand by Anglian Water Services Ltd. However, a number of "marginal" quality failures exist within the Plan area and these are generally associated with drought related conditions and nutrient enrichment (eutrophication). The trend in the biological quality of rivers is one of steady improvement. Groundwater in the Plan area is of a reasonable quality, consistent with its use, however, elevated chloride concentrations are detected in the eastern part of the catchment, where saline intrusion is known to occur. In terms of Bathing Water quality all of the Bathing Waters identified comply with the EC Bathing Waters Directive.

Biological Water Quality (GQA)

General Quality Assessment (Biology)

1996 Data



2.0 THE LOUTH COASTAL PLAN AREA

AIR QUALITY

Air quality within this predominantly rural area is relatively good and has been improving in recent years. 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 volatile organic compounds and oxides of nitrogen and sulphur dioxide.

WASTE MANAGEMENT

Within the locality there are two major landfill sites, Middlemarsh near Skegness and Kenwick near Louth. Kenwick Landfill is licensed for the disposal of domestic, commercial and industrial waste and Middlemarsh Landfill, in contrast is licensed to accept limited amounts of Special Waste as defined under the Special Waste Regulations 1996. Material classed as special under previous regulations is not permitted for disposal here and the majority of Special Waste has to go out of the county for disposal.

In terms of construction and demolition waste, of the four landfill sites within the Area licensed to receive this waste, only one is currently accepting it (Saturday Pits, Louth). Since the introduction of the Landfill Tax in October 1996 disposal of this type of material to landfill has decreased with waste producers diverting their material to schemes exempt from waste management licensing where possible.

Two designated household waste recycling centres are located at Louth and Skegness, these provide facilities for the recycling of waste oil, paper, glass, car batteries and scrap metal. Licensed transfer stations and metal recycling facilities also contribute to the recycling of household, commercial and industrial waste within the Plan area.

The recently implemented Producer Responsibility Obligations (Packaging Waste) Regulations 1997 also place obligations on businesses of a certain size to recover and recycle specified tonnages of packaging waste. To date four businesses within the area have registered with the Agency, and one firm has been granted accreditation.

Opportunities for recycling have been exploited by the water industry for sometime. Sewage sludge for example, the main by-product of the sewage

treatment process, is widely recognised as a potential resource offering soil conditioning properties to farmland. When put to use in this way, careful management is required in order to maximise the benefits and at the same time minimise any risk to the environment. The Urban Waste Water Treatment Directive requirement to cease sewage sludge disposal to sea by 31 December 1998 has further encouraged the utilisation of sewage sludge on agricultural land. For example, Anglian Water Services Ltd have purchased farmland in North Cockerington, in order to try to demonstrate the benefits of using their product as a fertiliser.

2.4 FLOOD DEFENCE

Land drainage is provided for by three distinct systems reflecting the varying topography of the Area. Upland watercourses tend to be natural, swift flowing streams with narrow flood plains and with little in the way of major improvement for flood defence or land drainage purposes. As these streams flow off the high land, they cross the low lying flat coastal plain on their progression towards the sea. Much of the plain lies below the level reached by the highest tides and the streams change noticeably from swift flowing to sluggish typical fen type drains, often embanked and greatly improved from the land drainage and flood defence perspective.

Drainage within the coastal plain is provided by three Internal Drainage Boards (IDBs). Due to the low lying nature of the plain much of the drainage system is reliant on pumping stations operated by the IDBs to raise drainage waters sufficiently to discharge to the sea or to the arterial watercourses. Tidal defences are of particular significance along



Beach Nourishment-Huttoft Bank

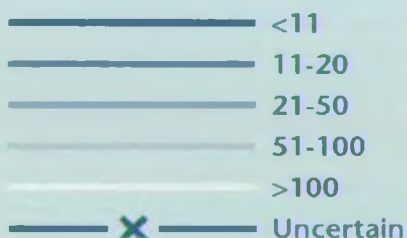
2.0 THE LOUTH COASTAL PLAN AREA

this stretch of the East Coast. Historically, the Area has been subject to tidal inundation - the event of 1953 being uppermost in peoples minds. Since then heavily engineered concrete defences fronting the most densely populated areas between Mablethorpe and Skegness have been constructed and maintained. Along this length of beach the Agency's Lincshire Beach Nourishment Scheme began in 1994 and is an ongoing programme to replace the sands which are constantly being

eroded by coastal processes. Defences to the north and south comprise natural sand dunes supplemented by man-made clay banks and salt marshes. These defences also have to be managed to maintain the standard of protection afforded. Beach levels along this stretch of coast are generally accreting or stable.

Standards of Fluvial and Tidal Defence

Standards of Flood Defence return Period (years):



2.0 THE LOUTH COASTAL PLAN AREA

2.5 NATURE CONSERVATION AND RECREATION USE

The coastline of the LEAP area contains habitat of national and international importance for wildfowl and waders. To the north is the North Lincolnshire Coast Ramsar/SPA, within which is the RSPB Reserve at Tetney and the Lincolnshire Trust Reserve at Donna Nook. To the south is the National Nature Reserve of Saltfleetby - Theddlethorpe Dunes SSSI. These sites are also important for their breeding colonies of grey seal and natterjack toad. Further south still is the SPA, candidate SAC, SSSI and National Nature Reserve at Gibraltar Point. This is important for its dunes and other coastal habitats, their associated invertebrates and migratory/breeding birds.

Wet grasslands and meadows near the Coast support large numbers of wildfowl and waders such as lapwing, snipe and redshank. Both of these meadow and pasture habitats have been declining due to drainage and conversion to arable land. Coastal and Floodplain Grasslands have been designated as a UK Biodiversity Action Plan (BAP) target.

Freshwater habitats along the Coast and its adjacent marsh area include slow flowing streams, drainage ditches, blow wells and disused sea bank clay pits, all supporting a wide diversity of wildlife. However, over two hundred years of land drainage activity and the needs of flood defence have left plant diversity along river corridors generally low.

River headwaters and chalk streams constitute the main aquatic and riparian habitats in the Wolds, with small areas of marsh and spring line flushes occurring in the steep river valleys. Important alder

carr and other woods on the valley bottoms have been highlighted in survey work, with a high diversity of woodland species on the upper River Lymn and Waithe Beck being noted. The most extensive woodland in the Plan area is to be found where the Wolds overlap the Coast and Marsh Natural Area particularly on the clay soils between Willoughby and Louth.

Rivers and canals form ideal links between the countryside and towns. Enhancement of these corridors should encourage both a use and enjoyment of recreational opportunities. The coastal fringe and Wolds are already popular recreational areas containing a wide variety of recreational walks, cycle routes and bridle ways. Recreational walking sites are located at Louth, Burgh le Marsh, Alford, and Tetford at the source of the River Lymn. There are also a number of cycle routes and bridle ways situated towards the edge of the Wolds escarpment which are mostly used during peak holiday periods by tourists visiting the East Coast. Recreational sailing activities take place on Covenham Reservoir near Louth and elsewhere along the East Coast.

The River Steeping is popular as a recreational fishery, it rises as the River Lymn in the Wolds above Tetford and drains a predominantly sandstone catchment located to the west of the Wolds chalk escarpment. Some trout angling is practised on the River Lymn with the bulk of recreational angling taking place further downstream on the River Steeping and the Wainfleet Relief Channel. The main species sought on the River Steeping are roach, bream, tench, and pike. The Louth Canal is a popular coarse fishery with roach being the most popular species caught. Small trout fisheries exist on the upper Great and Long Eau, the Waithe Beck and River Lud.



River Steeping, Wainfleet All Saints

Photo: East Lindsey District Council

3.0 REVIEW OF THE CONSULTATION PROCESS

3.1 THE CONSULTATION PROCESS

The Agency has undertaken rigorous consultation in the development of the Louth Coastal LEAP:-

- October 1997 ● Pre-consultation meeting held with a number of key "partners", in order that their views could be taken into consideration at an early stage of the Plan's formulation.
- May 1998 ● The general public were invited (through the media and other means) to comment on the Plan in terms of the range and extent of uses and activities in the Plan area, to express views on the issues and options, and to comment on how the development of strategies and plans should be progressed.
- May 1998 ● A meeting was held in the Plan area to allow an invited audience, including representatives from industry, local authorities, parish councils, environmental groups, sport and recreational groups with an interest in the Plan area, to discuss the details of the Plan in more depth.

In addition to this, during each of the developmental stages of the Plan, we have worked in close liaison with our customer consultative committee, the Area Environment Group for Lincolnshire.

We would like to acknowledge the help received from all organisations and their representatives who have contributed towards the development of this Action Plan.

We have recognised the links which exist between this and adjacent Plans and will work to ensure they are compatible. Catchment Management Plans for the Grimsby (November 1994), and Ancholme (January 1996) have already been produced with a combined LEAP due for production during June 1999. A Local Environment Agency Plan (LEAP) for the Upper Witham was produced in April 1997 and a combined Upper and Lower Witham LEAP* is due for release in August 1999. It is our aim to have complete coverage of LEAPs by 1999.

LEAP TEAM

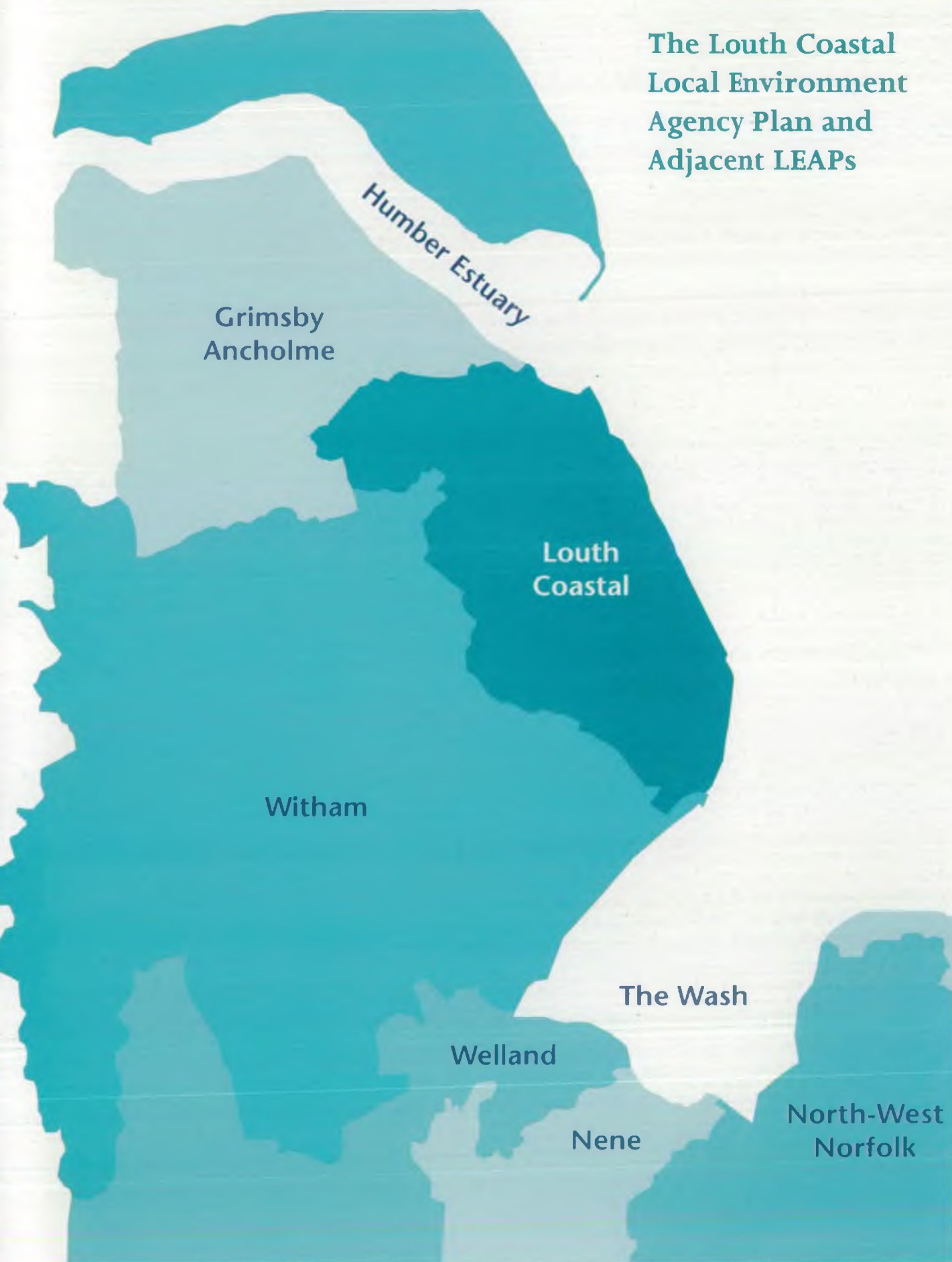
Graham Chantry	Project Leader
Richard Kisby	Team Leader Development Planning & LEAPs
John Leach	LEAPs / Water Quality
David Watling	Water Resources
Reuben Page	Fisheries, Recreation, Conservation & Navigation
John Ulyatt	Flood Defence
Faye Charlesworth	Environment Protection
Debbie Lloyd	Environment Protection
David Bugg	Environment Planning - Process Industry Regulation

LINCOLNSHIRE AREA ENVIRONMENT GROUP (AEG) MEMBERS

Robert Spaight	Salmon & Trout Association (Retiring Chairman)
Linda Clayton	Independent (New Chairman)
Nevison Boast	Millennium Inorganics
Paul Brooks	British Steel
Jack Turner	Lindsey Oil Refinery
Keith Saveal	Novartis
Tony Richards	Witham Joint Anglers
Tom Wilson	Lincolnshire Anglers Consultative
James Epton	LFDC Chairman
John Shackles	English Nature
Bud Shields	East Lindsey District Council
Jim Dodsworth	Lincolnshire County Council
Marianne Overton	North Kesteven District Council
Darrell Barkworth	North Lincolnshire Council
Ed Smith	Anglian Water Services Ltd
Hillary van Smirren	Royal Yacht Association (Wash)
Nick Davies	Wastewise
Roger Harvey	British Waterways
David Carnell	Inland Waterways Association
Roger Wardle	Farming & Rural Conservation Agency
Paul Fisher	RSPB
Heather Bingley	Lincolnshire Trust for Nature Conservation

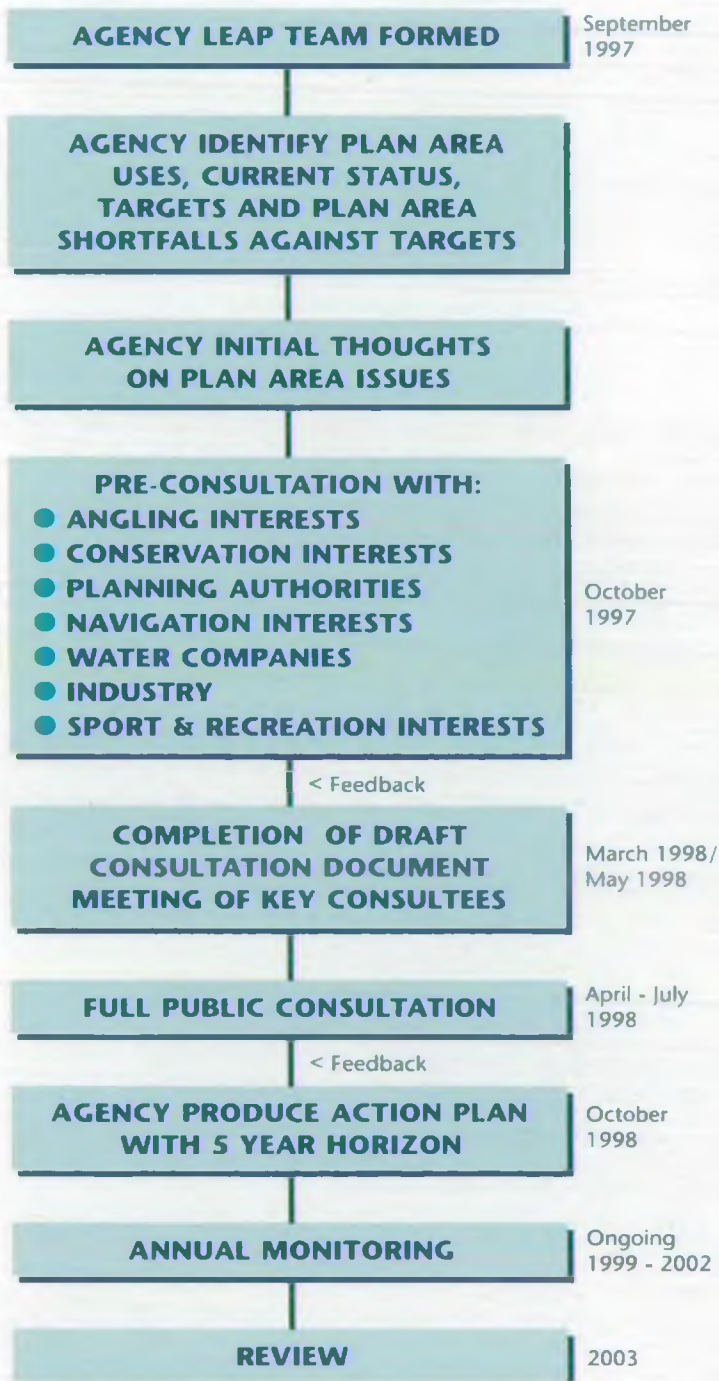
*(Currently a CMP released June 1995)

3.0 REVIEW OF THE CONSULTATION PROCESS



3.0 REVIEW OF THE CONSULTATION PROCESS

The LEAP Process - Louth Coastal LEAP Timetable



3.2 RESULTS OF CONSULTATION

Approximately 300 copies of the Consultation Report were distributed during the consultation period. Comments were received from 15 organisations and individuals (see Appendix 1) and a summary of these comments is included in the Statement of Consultation which has been prepared and sent to consultees.

The consultation process has given us a more comprehensive understanding of the issues and options presented in the Plan and of the public's concerns for the Plan area. The key messages and thoughts raised during the consultation process were:

- Actions pertaining to issues 1a and 1b in the Consultation Report are incorporated in the Protection through Partnership section and text - these are ongoing managerial issues and therefore through consultation it was felt better to reflect these concerns in this way.
- Concern has been expressed about the state of the sea banks on the sections north of Donna Nook as far north as North Coates Point. This has been accounted for in issue 5a.
- A new issue (4g) has been introduced due to concern over the ability to provide timely warnings to people in possession of property at risk of flooding in Louth.
- Issue 2a has been modified to accommodate concerns with respect to the reduction in the landscape character of rivers within the Plan area.

The range of responses to the Consultation Report and some of the conflicting points of view recorded have been of great value in the development of this Action Plan. They have influenced our perceptions of these issues which have been amended accordingly. It is our hope that the proposals set out in this Plan will achieve a proper balance of the needs of all the uses of the environment and deliver real and lasting improvements.

In September 1997 the Environment Agency produced a document entitled 'An Environmental Strategy for the Millennium and Beyond'. This strategy is essentially based upon the need to take an integrated approach to the management of the whole environment. In producing this Plan we have therefore used the principal and immediate concerns set out in the Strategy to collate the issues and show how LEAPs utilise integrated action for local environmental improvement.

4.0 ACTIVITY PLANS

Our principal and immediate environmental concerns relate to:

-  Managing our **WATER RESOURCES**
-  Enhancing **BIODIVERSITY**
-  Managing our **FRESHWATER FISHERIES**
-  Delivering **INTEGRATED RIVER-BASIN MANAGEMENT**
-  Conserving the **LAND**
-  Managing **WASTE**
-  Improving **AIR QUALITY**
-  Regulating **MAJOR INDUSTRIES**
-  Addressing **CLIMATE CHANGE**

This section sets out the issues identified during the development of this Plan. They are grouped according to which environmental theme they principally relate to and are addressed in terms of the following planned format:

- an overall objective;
- the action/s proposed;
- those organisations with a responsibility towards resolving the issue;
- the timescale of the proposed actions; and,
- an estimation of the costs involved (where possible).

The text at the beginning of each environmental theme explains what the Environment Agency are doing nationally and locally to meet these objectives. Each issue reflects local concerns relating to these themes.

It is recognised that for some of the issues identified, the solutions will be achieved within the timescale of this Plan (5 years), and for others it will take considerably longer. Proposed actions may be constrained by changing priorities of both the Agency and “interested parties” and by the availability of resources. All schemes promoted by ourselves are subject to strict cost benefit analysis before they are approved and in seeking the commitments from other organisations, we will seek to balance the interests of different users of the Plan area. Given these constraints, we expect the timescales denoted in the Plan will be accommodated.

(Please refer to the glossary and abbreviations - Appendix 2 & 3)

4.1 INDEX OF ISSUES



Managing Our **WATER RESOURCES**

- 1 There is a limited understanding of the groundwater hydrogeology south of Louth.



Enhancing **BIODIVERSITY**

- 2a Changes in land drainage and agricultural practices have reduced habitat diversity and the landscape character of rivers, their surrounding flood plains and the coastal marsh area.
- 2b Alien American Signal Crayfish are believed to have colonised the River Lymn.
- 2c On the Rivers Lymn and Steeping there are a number of spray irrigation licences that do not have adequate conditions to protect the water environment.
- 2d There is concern that abstraction from the Chalk aquifer is leading to depleted spring flows and there is limited understanding of the linkages between river flow regimes and water needs to sustain river life.



Managing Our **FRESHWATER FISHERIES**

- 3a Fish movement between river stretches is limited by river control structures.



Delivering **INTEGRATED RIVER-BASIN MANAGEMENT**

- 4a The discharge consent conditions for a number of Sewage Treatment Works' (STW) discharges will not protect downstream water quality if significant development occurs within the Catchment.
- 4b Inadequate local sewerage systems in some villages result in localised pollution and/or public health problems.
- 4c Nutrient enrichment of water bodies in the Plan area impacts on water quality and affects flora and fauna and other uses of water e.g. navigation, amenity and fishing. River Ecosystem quality targets can be compromised.
- 4d Routine biological and chemical monitoring has revealed a problem with water quality on the stretch of the Louth Canal downstream of Louth to Alvingham footbridge.

4.0 ACTIVITY PLANS

- 4e Salt water intrusion into East Coast streams can affect water quality.
- 4f The proposals by the Louth Navigation Trust to restore the Louth Navigation are constrained by water resource, water quality, flood defence and environmental concerns.
- 4g The ability to provide timely flood warnings to property at risk in Louth is hampered by the speed of response of the Lud to heavy rainfall.



Conserving the LAND

- 5a Flood protection provided to the coastal strip between Saltfleet Haven and North Coates Point may not meet Agency / MAFF standards.
- 5b The long term capability of Croft Lane Pumping Station, Wainfleet and the old Chapel St Leonards Pumping Station, to discharge flood waters, may not meet Agency standards.
- 5c The condition of a length of flood bank along the Waithe Beck may not meet Agency / MAFF standards.
- 5d Flood protection provided on the Woldgrift Drain may not meet Agency / MAFF standards.

- 5e Under certain conditions windblown sand may leave the beach and be deposited in urban areas.



Managing WASTE

- 6a Unauthorised disposal of waste from caravan sites takes place within the Plan area.
- 6b Odours from Kenwick Landfill site have caused local complaint.



Addressing CLIMATE CHANGE

- 7a A fuller understanding of coastal processes and their impact on sea defences is required to enable the further development of long term sustainable sea defence strategies.

4.0 ACTIVITY PLANS

ENVIRONMENTAL THEME: Managing our WATER RESOURCES

STRATEGIC ACTIONS

We will:

- demand a more efficient use of water by the water companies and by industry in general;
- encourage a more efficient use of water by the public and a change in public attitude to water usage;
- promote the development and sale of low-water usage domestic appliances;
- demand reductions in leakage by water companies before considering investment in new reservoirs;
- support the appropriate imposition of compulsory selective metering where water supplies are under stress;
- support the voluntary acceptance of water meters when accompanied by other water-saving incentives;
- vigorously apply our Groundwater Protection Policy to ensure that the quality and use of our groundwaters is improved;
- examine water transfer schemes to ensure no environmental damage results from their introduction;
- not approve the exploitation of new resources until water saving measures have been introduced;
- implement the current programme of alleviating low-flow rivers as quickly as possible;
- seek new legislative powers to reform the use of 'licences of right' to extract water;
- seek new powers to facilitate the inter-basin transfer of water, and for the open and transparent provision of plans and information relating to such schemes in order to broaden public debate;
- ensure that the practical limitations arising from water supply and treatment are fully considered by providing planning authorities with all information relevant to new housing or industrial developments;
- ensure that the UK's experience and needs are reflected in the scientific and technical discussions within the development of the EC's Water Framework Directive;
- ensure that all environmental needs are fully taken into account within the next Asset Management Plans (AMPs) negotiations with the water companies; and,
- research into more efficient methods for the management of water, and into the potential risks for the aquatic environment arising from its mis-management.

ISSUE 1

THERE IS LIMITED UNDERSTANDING OF THE GROUNDWATER HYDROGEOLOGY SOUTH OF LOUTH.

Background

Within the Plan area public water supplies abstract from the confined Southern Chalk aquifer, the underlying Spilsby Sandstone and the Northern Chalk aquifer. In order to meet demand the Southern Chalk aquifer relies on groundwater flowing from the Northern Chalk aquifer. In licence terms the Northern Chalk aquifer is over committed and the resources of the Spilsby Sandstone are considered fully committed. It is believed that there is some connection/ hydraulic continuity between the Chalk and Sandstone aquifers. There are mathematical models of each aquifer that were independently developed and there is a lack of agreement between the two models. There is a need to further our understanding of the availability of sustainable water resources. This is being addressed within the Environment Agency's "Strategy for Groundwater Investigations and Modelling - A Framework for Managing Groundwater Resources."

Effects

Without a greater understanding of the groundwater movement and availability, the Environment Agency would be failing in its duty to secure the proper use of water resources.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To better understand the groundwater hydrogeology south of Louth.	Carry out further investigation and groundwater modelling.	Agency		•	•	•	•			100

4.0 ACTIVITY PLANS

ENVIRONMENTAL THEME: Enhancing BIODIVERSITY

STRATEGIC ACTIONS

We will:

- play a full part in implementing the EC Habitats Directive;
- play a full and active part in delivering the UK's Biodiversity Action Plan by acting as the 'contact point' for twelve species of aquatic animals and plants, and by acting as the 'lead partner', either singly or in collaboration with others, for ten of them;
- ensure that all relevant aspects of the Biodiversity Action Plan are incorporated into the Agency's guidance and become part of its Local Environment Agency Plans;
- implement a series of projects, in partnership with local conservation groups, to deliver biodiversity targets at specific sites;
- allocate specific resources to conservation projects aimed at increasing biodiversity;
- control eutrophication, where feasible, in order to enhance biodiversity;
- improve the management of wetlands for conservation purposes;
- use and promote best environmental practice for the protection and restoration of river habitats;
- develop and set conservation criteria for all of the Agency's environmental licensing activities;
- implement specific projects to restore habitats in rivers and lakes, increase the area of reedbeds and other water plants, and improve river banks;
- ensure that there is no deterioration in the quality of the aquatic environment in particular, and deliver significant improvements in river and still water quality by tackling diffuse pollution of them; and,
- carry out research into the management of species in the aquatic environment in order to meet fully all biodiversity action plan targets.

ISSUE 2A

CHANGES IN LAND DRAINAGE AND AGRICULTURAL PRACTICES HAVE REDUCED HABITAT DIVERSITY AND THE LANDSCAPE CHARACTER OF RIVERS, THEIR SURROUNDING FLOOD PLAINS AND THE COASTAL MARSH AREA.

Background

For most of this century river management across the Region was heavily influenced by agricultural policy to improve drainage within low lying land to maximise crop production, notably cereals. This has resulted in the degradation and loss of many in-channel and flood plain habitats and a consequent reduction in biodiversity. Within the Long and Great Eau catchment for example, considerable changes in land drainage, flood defence, and more recently agricultural practice have taken place over the last 150 years resulting in a dramatic reduction in flora and fauna. Previously noted fauna included salmon, sea trout, otter and kingfisher, of these only kingfisher are now known to breed in small numbers. Further losses of habitat have occurred with the conversion of a significant proportion of the once extensive grazing marsh to areas of arable land.

4.0 ACTIVITY PLANS

Effects

The relationships between water level and surrounding flood plains has been broken leaving many rivers to flow within an over widened deep channel with very few riparian habitats upon which flora and fauna depend for their survival. Many rivers display poor habitat diversity together with limited plant communities. The arable conversion of grassland along the Coast has negated the need for 'wet fences' and 'cattle drinks' and allowed the dropping of groundwater levels by drainage practices, which in turn has facilitated more efficient arable cropping. This has led to a progressive drying out of sites including the Saltfleetby and Theddlethorpe Dunes and the many blow wells, areas that once provided habitat for a diversity of wetland species of both flora and fauna such as great burnet and breeding snipe. A loss of contiguity has occurred within the landscape. There is a need to reconnect the river with the landscape in the flood plain and re-establish habitats as key landscape features.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To maintain and enhance habitat diversity and landscape features associated with rivers, their surrounding flood plains and the coastal marsh area.	Collaboration with landowners to provide a range of landscape features, restore wetland habitats and create buffer zones where appropriate by:	Agency	MAFF EN Wildlife Trusts IDB's CC							
	(I) Identification of suitable sites.			•	•					(1)
	(II) Investigation & assessment of environmental impact.					•				(1)
	(III) Appropriate action.						•	•	•	TBE
	Identify sites where gravel bars and riffles could be installed without detriment to other environmental aspects, liaise with landowners, and carry out installation.	Agency	Landowners DC	•	•					TBE
	Install gravel bars and riffles in the River Lud, through Hubbards Hills.	Agency		•						(1)

4.0 ACTIVITY PLANS

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
As stated on page 23	Improve operational management of Main rivers by:-	Agency Landowners								
	(I) Identifying problem sites.			•	•					TBE
	(II) Implementing continued and progressive sympathetic river maintenance programmes.			•	•	•	•	•	•	TBE
	(III) Encouraging good grazing practice.			•	•	•	•	•	•	(2)
	Develop water level management plans for the following areas to assess the impact adjacent to, and within statutory and local sites of conservation importance:-	IDB'S	Agency MAFF EN Trusts Landowners							3 per plan plus any additional costs for structures / operating.
	(I) Stocks Drain / Braytoft Meadows.			•	•					
	(II) Tetney Blow Wells.			•	•					
	(III) Saltfleetby - Theddlethorpe Dunes.			•	•					

(1) Internal Staff Costs (2) Indeterminate TBE-To be established

4.0 ACTIVITY PLANS

ISSUE 2B

ALIEN AMERICAN SIGNAL CRAYFISH ARE BELIEVED TO HAVE COLONISED THE RIVER LYMN.

Background

Nationally the native crayfish (*Austropotamobius pallipes*) is a threatened species protected by both UK and EC legislation. Native crayfish and their associated habitat are identified for protection as part of the UK's Biodiversity Action Plan.

Since the 1970's the national population has come under increasing threat from several non-native species, such as the American signal crayfish, introduced for the aquarium and restaurant trade. The spread of introduced species eliminates native populations by competitive exclusion (food and habitat), predation, (such species being highly aggressive and difficult to confine), and the introduction of the fungal disease, "crayfish plague". Habitat modification and management of rivers are also factors causing loss or decline in native populations.

Prior to 1996, the keeping of non-native crayfish had to be licensed under the Import of Live Fish Act (1980). Following a review of that legislation, to allow the commercial development of non-native crayfish for the food market, the original legislation was relaxed and only certain waters were protected. With the exception of a small area, the majority of watercourses which are north of a line drawn from the Seven Estuary to the Wash are protected. The River Lymn falls within the protected zone.

A stillwater site close to the River Lymn has been identified that contains an abundant population of signal crayfish and there is concern that they might escape and inhabit the River Lymn and hence threaten the habitat and any native population.

Effects

The presence of non-native species presents an unacceptable risk of disease and damage to important habitats, leading ultimately to the extinction of the native species and decline in habitat diversity.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To protect the natural habitat of the white clawed crayfish.	Develop a strategy to contain or remove the signal crayfish in the affected pond.	Agency EN Landowner		•						(1)
	Appraise and if possible remove the immediate threat of the non-native crayfish from the site adjacent to the River Lymn.	Agency EN Landowner		•	•	•				TBE

(1) Internal Staff Costs TBE - To be established

Ongoing National Initiatives

- Biodiversity Action Plans (BAPs) - The Agency is working with a number of organisations to formulate habitat and species action plans at both regional and local levels, and is the contact point for the white clawed (native) crayfish (*Austropotamobius pallipes*).
- Education of landowners / restaurateurs to the potential dangers of non-natives.

4.0 ACTIVITY PLANS

ISSUE 2C

ON THE RIVERS LYMN AND STEEPING THERE ARE A NUMBER OF SPRAY IRRIGATION LICENCES THAT DO NOT HAVE ADEQUATE CONDITIONS TO PROTECT THE WATER ENVIRONMENT.

Background

The demand for surface water for spray irrigation from the River Lymn during dry summers can lead to very low river flows and insufficient protection for the water environment. There is insufficient surface water available in dry summers to reliably meet the needs of existing spray irrigation licence holders. A number of the spray irrigation licences are Licences of Right; others have no controls to protect the river environment. The Environment Agency has used its powers in recent years to restrict spray irrigation to protect the river environment when there is an exceptional shortage of rainfall.

Effects

During dry summers and periods of low flow, without some intervention, abstraction under current licences can lead to environmental impacts on the river. The current licences are not very reliable for their intended use and long term are not sustainable without causing environmental impact.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To ensure the water environment is adequately protected.	Encourage the construction of environmentally sympathetic winter storage reservoirs. (Abstraction of water in winter and storage for summer use).	Agency LA's NFU's Farmers		•	•	•	•	•	•	(1) Construction costs: 30 - 80 Per Winter Storage Reservoir
	Persuade abstractors to adopt new level/flow conditions on summer spray irrigation abstraction licences.	Agency Abstractors		•	•	•	•	•	•	(1)
	Adoption of a pro-active policy of reducing licensed quantities by requiring (any) existing summer licences to be traded in as a condition of granting winter storage licences.	Agency		•	•	•	•	•	•	(1)

(1) Internal Staff Costs

4.0 ACTIVITY PLANS

ISSUE 2D

THERE IS CONCERN THAT ABSTRACTION FROM THE CHALK AQUIFER IS LEADING TO DEPLETED SPRING FLOWS AND THERE IS LIMITED UNDERSTANDING OF THE LINKAGES BETWEEN RIVER FLOW REGIMES AND WATER NEEDS TO SUSTAIN RIVER LIFE.

Background

Within the Plan area public water supplies abstract from the confined Southern Chalk aquifer, the underlying Spilsby Sandstone and the Northern Chalk aquifer. In order to meet demand the Southern Chalk aquifer relies on groundwater flowing from the Northern Chalk aquifer. In licence terms the northern Chalk aquifer is over committed and the resources of the Spilsby Sandstone are considered fully committed.

There are particular concerns over the lack of flow in spring fed watercourses of the Catchment. From some initial research it is known that there are links between river flows, channel morphology and the habitat of in river flora and fauna. There is a need to better understand these links and identify species and habitats impacted by low flows and only then can steps be taken to manage the river flow regime to ensure the protection of river life.

Effects

Without greater understanding of the relationships between river flow and river life the Environment Agency would be failing in its role to ensure the long term protection of the river environment.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To ensure the long term protection of the river environment through the greater understanding of the relationships between river flow and river life.	Carry out investigations / studies to determine the requirements for flow in spring fed streams in the Catchment following the establishment of ecological targets for flora and fauna and amend abstraction licences accordingly.	Agency AWS			*	*	*			(2)

(2) Indeterminate

Ongoing National Initiative

- DETR review - aims to ensure that abstraction licensing and related arrangements provide full protection to the water environment while enabling fair and flexible measures for meeting properly managed demand for water resources. The review is concerned with the system of abstraction authorisation. It's proposals are intended to provide an improved framework within which decisions about particular existing or proposed abstractions can be taken and implemented to facilitate sustainable development.

4.0 ACTIVITY PLANS

ENVIRONMENTAL THEME: Managing Our FRESHWATER FISHERIES

STRATEGIC ACTIONS

We will:

- secure a more robust funding base for fisheries management by improved marketing and the setting of fair charges to anglers;
- review the economic basis of fisheries management;
- introduce a standard fisheries classification scheme;
- monitor every river fishery over a five year rolling cycle;
- restore spawning grounds for freshwater fish;
- implement a programme of minimum acceptable flows for rivers;
- develop specific longer-term strategies for salmon, trout and coarse fisheries;
- reduce poaching to a minimum and bring rod licence evasion to under 10%;
- consider the likely costs and benefits of fixed penalty fine schemes for rod licence offences;
- consider the desirability of introducing mandatory rod licence display systems; and,
- research into the factors which affect the viability of our unique freshwater fisheries populations.

ISSUE 3A

FISH MOVEMENT BETWEEN RIVER STRETCHES IS LIMITED BY RIVER CONTROL STRUCTURES.

Background

Obstructions and barriers prevent the free passage of fish on several rivers within the Plan area including the Waithe Beck, Long and Great Eau and River Lymn. Species such as brown trout, dace, chub, minnow, grayling, brook and river lamprey and eel, (all of which are present here), need to move freely throughout a river system during certain stages of their life cycle. Restriction of movement because of artificial barriers both within the river channel and at outfalls can have an adverse influence on the distribution of the natural fish population.

The UK Biodiversity Action Plan was published in 1994 as a result of the commitment of Government to the 1992 Earth Summit in Rio. The Agency is one of many organisations responsible for delivery of the Plan. The grayling and brook and river lamprey are fish species which have been particularly noted as being under threat and are included within the Biodiversity Long List for an action plan.

Effects

Barriers have restricted the movement of migratory fish species impacting directly on the diversity and density of all migratory species.

4.0 ACTIVITY PLANS

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To improve the movement of migratory fish species.	(I) Identify sites with structures currently impeding fish.	Agency		*						(1)
	(II) Develop plan for installation of fish passes on control structures or removal of redundant structures.	Agency			*					(1)
	(III) Implement an Action Plan.	Agency				*	*	*	*	TBE

(1) Internal staff costs TBE-To be established

Ongoing National Initiatives

- Biodiversity Action Plans (BAPs) - The Agency is working with a number of organisations to formulate habitat and species action plans at both regional and local levels.

4.0 ACTIVITY PLANS

ENVIRONMENTAL THEME: Delivering INTEGRATED RIVER-BASIN MANAGEMENT

STRATEGIC ACTIONS

We will:

- manage river-basins in an integrated way, via Local Environment Agency Plans;
- ensure that all waters are of sustainable quality for their different uses;
- deliver a continual improvement in overall water quality;
- provide effective flood defence;
- provide an effective flood warning system;
- increase the numbers of rivers and still waters capable of supporting viable fisheries;
- enhance and conserve inland navigations, as national assets of environmental, economic, social and recreational value;
- secure the most appropriate legislation, management systems and financial arrangements to ensure the sustainability of our navigational waters;
- work with others to improve and develop inland waterways as an integrated network;
- improve river habitat quality, as measured by river habitat surveys;
- improve wetland management;
- improve riverside landscapes;
- improve bathing water quality;
- improve estuarine waters for shellfisheries;
- increase the number of Agency-owned sites available for public recreation; and,
- work with local authorities to maximise the conservation and recreational use and value of our river-basins.

ISSUE 4A

THE DISCHARGE CONSENT CONDITIONS FOR A NUMBER OF SEWAGE TREATMENT WORKS' (STW) DISCHARGES WILL NOT PROTECT DOWNSTREAM WATER QUALITY IF SIGNIFICANT DEVELOPMENT OCCURS WITHIN THE CATCHMENT.

Background

Currently, some AWS Sewage Treatment Works (STWs) in the Plan area are operating to a better standard than that required by their discharge consent (in terms of volume discharged and/or quality of effluent). This occurs, for example, due to the provision in the consent for growth/development.

As growth occurs in the STW catchment or as STW performance approaches that required by the consent, a deterioration in water quality may occur resulting in a failure of the watercourse to meet its River Ecosystem target. The risk of deterioration in discharge performance in most cases is low, provided that current operational practices continue and only modest growth occurs within the sewerage catchment areas served by these STWs.

Effects

There are a number of "over performing" STWS in this Catchment, for example, Binbrook, Mablethorpe, and Tetford, which could result in the failure of a water quality objective.

Agency consenting policy and planned investment, as agreed by Government during negotiations on water charges (AMP2), did not allow the Agency to take steps to prevent this. However, AWS's third Asset Management Plan (AMP3) provides an opportunity to identify discharges with the potential to impact upon River Quality Objectives.

4.0 ACTIVITY PLANS

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To protect water quality downstream of STWs that have or in the future will experience significant development .	Review flow data upstream of discharges to confirm dilution flows; re-calculate "protective" consent conditions as required. Review the rate of development.	Agency		•	•					0.5
	Identify relevant STWs as priorities for future investment under the third Asset Management Plan (AMP3).	Agency AWS		•	•					(1)

(1) Internal staff costs

4.0 ACTIVITY PLANS

ISSUE 4B

INADEQUATE LOCAL SEWERAGE SYSTEMS IN SOME VILLAGES RESULT IN LOCALISED POLLUTION AND/OR PUBLIC HEALTH PROBLEMS.

Background

Traditionally sewage treatment in rural areas has mainly relied upon each dwelling having individual septic tanks. The overflow from such tanks are designed to drain into the soil via a below ground soakaway. In poorly drained areas with clay soils, or where the water table is high, common practice was to drain the tanks to the nearest watercourse.

Effects

The problem manifests itself in terms of localised pollution and public health concerns. These effects are worst during periods of dry weather and low dilution flows.

Where such watercourses run through the centre of villages, the pollution and smell nuisance resulted in the watercourses being piped-in and buried. In such cases, the piped watercourse became known as the 'village drain' or 'sewer' and many were maintained by the local council.

Recent changes in legislation enable applications to be made to AWS for the provision of a first time sewerage scheme. Applications are considered by AWS and assessed against certain technical and economic criteria. Where a duty exists to provide a sewerage scheme, the expenditure is planned. Applications have been made for several locations including Anderby, Firsby, Gayton Le Marsh, Saltfleet St Peter, South Reston, Station Road Tetney, South Somercotes, Tathwell and Theddlethorpe All Saints. At the time of going to press, the Agency is aware that AWS have accepted Station Road Tetney, Anderby, Saltfleet St Peter, and South Reston. The other applications are being considered.

First time sewerage schemes are included in AMP 3 negotiations with Anglian Water Services Ltd.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To protect water quality by the provision of an adequate sewerage infrastructure.	Complete accepted schemes:-	AWS	Agency							
	Thus far:-		Parish Councils / Co operatives							
	Station Road, Tetney			.						200
	Anderby					.				950
	Saltfleet St Peter						.			900
	South Reston					.				900

Options For Sewage Treatment

- Householders to provide adequate individual sewage disposal - cost in the region of £5,000.
- Co-operative investment in larger package treatment plant - cost in the region of £10,000 - £20,000.
- AWS provide first time sewerage schemes - cost in the region of £25,000 - £950,000.

4.0 ACTIVITY PLANS

ISSUE 4C

NUTRIENT ENRICHMENT OF WATER BODIES IN THE PLAN AREA IMPACTS ON WATER QUALITY AND AFFECTS FLORA AND FAUNA AND OTHER USES OF WATER E.G. NAVIGATION, AMENITY AND FISHING. RIVER ECOSYSTEM QUALITY TARGETS CAN BE COMPROMISED.

Background

The quality of many watercourses in the Plan area is adversely affected by eutrophication. Eutrophication arises as a consequence of the enrichment of water with nutrients, principally from sewage treatment works discharges and surface water run-off from agricultural land. Eutrophication is a difficult problem to solve - there are no quick or immediate solutions.

The Agency is currently developing a National Strategy on Eutrophication to address this issue.

Effects

As a consequence of eutrophication, water quality and aquatic communities sensitive to nutrient enrichment become adversely affected and the aquatic ecosystem becomes ecologically disturbed, giving rise to excessive weed growth and changes in the composition of plant and animal communities. Recreational use of the waterway may also at times be compromised by these effects, notably angling.

Under the Urban Waste Water Treatment Directive (UWWTD), watercourses directly/indirectly receiving a qualifying discharge (works serving populations greater than 10,000), and that fulfil certain criteria set out in DoE (now DETR) guidance can be designated as a Sensitive Area (Eutrophic) SA[E]. Designation as a SA[E] requires phosphate removal to Directive standards at implicated STWs, unless it can be demonstrated that such removal would have no effect on eutrophication.

The Louth Canal and Covenham Reservoir are designated as SA[E]. Louth STW effluent will have to achieve UWWTD nutrient standards by 31 December 1998.

The Steeping River also experiences the effects of eutrophication. However, there are no "qualifying" discharges to the river and thus nutrient removal from sewage effluent under the UWWTD is not an option.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To ensure water quality is suitable for its agreed uses.	To install phosphate removal at Louth STW in order to comply with the UWWTD.	AWS	Agency	•						55

Ongoing National Initiatives

- Investigation into the benefits of non-UWWTD driven phosphorous controls for new and existing discharges.
- Promote good agricultural practices to reduce diffuse inputs into watercourses (eg reductions in fertiliser application rates, the uses of buffer zones etc).
- Development of a National Strategy on Eutrophication.

4.0 ACTIVITY PLANS

ISSUE 4D

ROUTINE BIOLOGICAL AND CHEMICAL MONITORING HAS REVEALED A PROBLEM WITH WATER QUALITY ON THE STRETCH OF THE LOUTH CANAL DOWNSTREAM OF LOUTH TO ALVINGHAM FOOTBRIDGE.

Background

The River Ecosystem (RE) scheme provides, on a national basis, a set of water quality targets which the Agency uses as a basis for setting consents to discharge and in undertaking other water quality planning activities. The stretch below fails to meet its RE target:-

Louth Canal between Louth STW and Alvingham footbridge

This stretch has consistently failed its RE targets for Biochemical Oxygen Demand, ammonia and un-ionised ammonia. Furthermore, the diversity of the invertebrate community within this stretch of watercourse has reduced in favour of pollution tolerant species such that target diversity is not met. This failure was raised in the previous Louth Coastal Catchment Management Plan and is associated with unsatisfactory intermittent discharges from Louth town and the Louth STW discharge. AWS is currently undertaking improvements to the sewerage system in Louth in order to address the problem with intermittent discharges from the town's combined sewer overflows. In addition Louth STW is being assessed for inclusion in AWS's third Asset Management Plan (AMP3).

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
Ensure that water quality on the stretch of the Louth Canal downstream of Louth to Alvingham footbridge achieves its RE target.	Improvements to Louth sewerage system.	AWS	Agency	•	•					1,200
	Seek improvements to Louth Sewage Treatment Works through AMP3.	Agency AWS		•	•					(1)

(1) Internal Staff Costs.

4.0 ACTIVITY PLANS

ISSUE 4E

SALT WATER INTRUSION INTO EAST COAST STREAMS CAN AFFECT WATER QUALITY.

Background

As freshwater river systems reach the sea there is a risk that saline water will ingress causing changes in water quality. Due to the different densities of saline and freshwaters, saline water can under these circumstances be found creeping along the river bed as it migrates upstream.

A number of watercourses in the Louth Coastal Plan area have over recent years been impacted by saline intrusion resulting in the Agency taking appropriate actions as required. For example, the risk of saline intrusion problems in the Louth Canal has resulted in the coordination of efforts by ourselves the IDBs and AWS to remediate the situation.

A strategy to address the wider issue of saline intrusion within the Plan area does not exist.

Effects

The intrusion of salt water into freshwater systems upsets the ecological balance of a river and can result in fish mortality. In addition to this the quality of the water may be unsuitable for spray irrigation, industrial and potable use.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
Ensure that saline intrusion is appropriately managed to protect water quality in the Plan area.	Improve current monitoring system.	Agency		•	•					(1)
	Develop a proactive saline intrusion monitoring strategy.	Agency	IDB AWS	•	•					(1)

(1) Internal Staff Costs.

4.0 ACTIVITY PLANS

ISSUE 4F

THE PROPOSALS BY THE LOUTH NAVIGATION TRUST TO RESTORE THE LOUTH NAVIGATION ARE CONSTRAINED BY WATER RESOURCES, WATER QUALITY, FLOOD DEFENCE AND ENVIRONMENTAL CONCERNS.

Background

The Louth Canal was originally created in 1767 to increase trade and improve communications and drainage in and around the Louth area. The opening of the Canal marked the beginning of over 150 years of prosperity and business activity. The lease for maintaining the Canal ran out in 1876 and was put out to tender. At this time the railway network was expanding and beginning to have an effect on canal trade, resulting in a very low bid being accepted for the lease. The Navigation closed after several years of making a loss in 1924 following the great flood of Louth in 1920.

Restoration of the Canal is sought by the Louth Navigation Trust. The Trust are currently involved with a technical appraisal of the projects feasibility. The Agency is keen to support initiatives which increase water based recreation but has to balance this interest against our other responsibilities for the Louth Canal. Water resources are limited and should the Trusts plans go ahead water quality may be impacted due to the potential for reduced flows leading to algal blooms. Pollution from boats, siltation impacting on flora and fauna and the potential for an increased flood risk have been highlighted as other concerns.

In considering these proposals the needs and interests of all parties and users of the watercourse need to be carefully balanced.

Effects

Potential for under utilisation of the waterway resource by recreational users.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
Support the restoration of the Louth Navigation whilst ensuring the project has no detrimental impact on water resources, water quality, flood defence and other environmental concerns.	Produce a feasibility study to assess the impacts, development needs and opportunities of Canal restoration.	LNT	Agency CC DC GW	*	*					40

4.0 ACTIVITY PLANS

ISSUE 4G (NEW)

THE ABILITY TO PROVIDE TIMELY FLOOD WARNINGS TO PROPERTY AT RISK IN LOUTH IS HAMPERED BY THE SPEED OF RESPONSE OF THE LUD TO HEAVY RAINFALL.

Background

Louth sits in the bottom of a steep valley surrounded by hills and high land. During periods of intense rainfall, the water level within the River Lud rises quickly and in an extreme event this could lead to property in the centre of town being at risk of flooding. A major flood creating wide spread devastation within the town occurred following thunderstorms in May 1920. Louth is protected against a flood event with a return period in excess of 21 years.

Effects

In known areas at risk of flooding the Agency has target timescales in which flood warnings should be given. Due to the speed of river rise, during periods of extreme rainfall it is considered doubtful that these target times for issue of flood warnings to properties at risk of flooding could be achieved.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
Provide timely warning of flood risk to properties.	Investigate alternative methods of identifying and warning of flood risk situations.	Agency		•	•					(1)

(1) Internal Staff Costs.

4.0 ACTIVITY PLANS

ENVIRONMENTAL THEME: Conserving the LAND

STRATEGIC ACTIONS

We will:

- influence the Town and Country Planning Systems to prevent developments in the wrong places;
- implement the Flood and Coastal Defence policy as advised by MAFF and the Welsh Office;
- secure an adequate level of investment in flood defence;
- provide flood plain surveys to local planning authorities;
- discourage development in flood plains;
- work with nature to reduce coastal flooding;
- develop new methods to survey and manage flood defences;
- report regularly on the state of flood defences;
- identify the state and extent of the problem of soil erosion;
- develop a soil erosion alleviation strategy, including guidance on best practice;
- work with local authorities to identify, and report on the extent of, contaminated land;
- regulate identified 'special' contaminated land sites effectively;
- research into the specific risks and remediation needs of contaminated land;
- measure the effectiveness of steps taken to reduce nitrates in designated nitrate vulnerable zones; and,
- develop methods for monitoring the 'state' and quality of soil with respect to its potential pollution.

ISSUE 5A

FLOOD PROTECTION PROVIDED TO THE COASTAL STRIP BETWEEN SALTFLEET HAVEN AND NORTH COATES POINT MAY NOT MEET AGENCY / MAFF STANDARDS.

Background

Trends over the past 100 years have shown a generally advancing low water line indicating an accreting beach between Saltfleet Haven and North Coates Point. Extensive salt marshes have developed at the back of the beach. The low lying coastal strip landward of the marsh is protected by a clay embankment. The level and condition of the bank can not be stated in any confidence.

Effects

Up to 1000 Ha of high quality agricultural land together with residential properties in the village of North Somercotes would be affected by the failure of these sea defences. Since the level and condition of the bank is uncertain it is not possible to currently determine the level of flood protection provided.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To provide an appropriate standard of flood defence for people and property.	(I) Review existing standards of service.	Agency	MAFF	•	•					39
	(II) Promote improvements where justified.	Agency	MAFF EN						•	230

4.0 ACTIVITY PLANS

ISSUE 5B

THE LONG TERM CAPABILITY OF CROFT LANE PUMPING STATION, WAINFLEET AND THE OLD CHAPEL ST LEONARDS PUMPING STATION, TO DISCHARGE FLOOD WATERS, MAY NOT MEET AGENCY STANDARDS.

Background

The old Chapel St Leonards Pumping Station and Croft Lane Pumping Station Wainfleet are operated by the Agency to lift low lying drainage waters from the Willoughby High Drain and the Little River Lymn (Cowcroft Drain) into the North Sea and Steeping River respectively. Pumping plant and associated electrical controls are now approaching the end of their design lives. The standard of protection provided to property in Croft may be below the indicative standard for a mixed urban/rural catchment.

Effects

A reduction in reliability at either of these stations will result in increasing maintenance and repair costs. Failure of either station during a flood event will increase the risk of flooding to the urban residential areas of Chapel St Leonards and Wainfleet in addition to several 100 Ha. of high quality agricultural land.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To ensure Croft Lane and old Chapel St Leonards Pumping Station provides appropriate drainage to the area served.	(I) Determine existing standards of service.	Agency	MAFF				•	•		34
	(II) Promote works to maintain appropriate standards of drainage and flood protection.							•		200

4.0 ACTIVITY PLANS

ISSUE 5C

THE CONDITION OF A LENGTH OF FLOOD BANK ALONG THE WAITHE BECK MAY NOT MEET AGENCY / MAFF STANDARDS.

Background

Low lying agricultural land on the Waithe Beck relies on raised earth embankments for flood protection. Erosion of the front face of a 1 km length of bank (between the A16 road at Waithe and the railway line) is giving rise to concern for its structural integrity. If erosion continues that part of the bank will become unstable and may lead to collapse. During a flood event, flooding of the surrounding agricultural land would occur.

Effects

Failure of the bank could result in up to 100 Ha of high grade agricultural land and isolated properties being affected.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To ensure that appropriate flood protection along the 1 km length of the Waithe Beck is provided.	(I) Carry out investigations to determine the structural condition of the defence and areas at risk of flooding.	Agency	MAFF Landowners				*	*		33
	(II) If required seek to promote appropriately justified works.	Agency	MAFF Landowners					*		200

4.0 ACTIVITY PLANS

ISSUE 5D

FLOOD PROTECTION PROVIDED ON THE WOLDGRIFT DRAIN MAY NOT MEET AGENCY / MAFF STANDARDS.

Background

The Woldgrift drains a predominantly rural catchment of the Wolds above the market town of Alford. The Drain flows through an old brickarch culvert in the centre of the town before passing through the flat low lying coastal strip to its outfall at Trusthorpe. The system relies entirely on gravity discharge to drain to the sea. During periods of high tide no discharge to sea is possible.

Effects

- (a) During periods of tide lock when discharge to the sea is not possible flood water is stored within the lowland stretches of the Drain. This leads to increases in water level and a risk of flooding to adjacent land and property. Following the passing of high tide, discharges from the Drain to sea once again become possible and high levels in the Drain subside. When the Drain is running at maximum capacity the high water levels can lead to water flowing into the IDB lowland drainage system at Beesby Bridge and Trusthorpe.
- (b) The culvert passing beneath Alford will be approaching the end of its design life early in the next century. It may require refurbishment to enable the asset life to be extended and the current standard of flood protection to the town maintained. If it were to fail and a blockage resulted the restriction to flow could increase the risk of flooding in the town and the surrounding area.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
Provide appropriate standard of defence to people and property along the Woldgrift Drain.	(I) Carry out investigations to review the standard of defence along the Woldgrift Drain and recommend actions.	Agency	MAFF IDB					•		40
	(II) Undertake improvement works if appropriate.	Agency	MAFF						•	300
	(I) Assess the structural condition of the Alford culvert.	Agency	MAFF					•		38
	(II) Undertake remedial work if appropriate.	Agency	MAFF						•	200

4.0 ACTIVITY PLANS

ISSUE 5E

UNDER CERTAIN CONDITIONS WINDBLOWN SAND MAY LEAVE THE BEACH AND BE DEPOSITED IN URBAN AREAS.

Background

Beach levels have been raised through the Environment Agency's beach nourishment scheme. As a natural beach it is subject to the impact of tides, wind and waves; this reprofiling of the beach results in sand accumulating at the head of the beach. Easterly winds blow this material onto and over the sea defences. The Agency have implemented a strategy involving the erection of fencing in "sensitive" areas, to reduce the amount of sand leaving the beach and to carry out works on the beach to move accumulated sand away from the sea defence.

In remote areas it is not proposed to interfere with the natural movement of the sand and to allow hard defences, where they exist, to become covered by the sand so forming a dune.

Effects

The relative abundance of sand on the nourished beaches can lead to sand blowing onto and over the sea walls following periods of on-shore easterly winds. This may lead to sand blocking drains and accumulating on public highways in urban areas.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
Minimise the loss of sand from the renourished beaches.	Continue to implement the Agency's Sand Management Strategy produced to reduce the volumes of sand blowing off the beach by erecting sand baffles and recycling sand accumulation where necessary.	Agency ELDC Parish Councils		•	•	•	•	•	•	50 for current year and 20 per year after.

4.0 ACTIVITY PLANS

ENVIRONMENTAL THEME: Managing WASTE

STRATEGIC ACTIONS

We will:

- provide a high quality waste regulation service;
- develop an overall database of waste arisings and disposals;
- measure the effectiveness of taxation to reduce waste and to encourage its re-use and recycling;
- obtain information on fly-tipping and devise means of combatting it;
- implement the 'producer responsibility' regulations;
- develop life-cycle assessment methodologies for dealing with waste;
- encourage and inspire industry to develop new and improved techniques for the management of special and other industrial wastes;
- ensure achievement of national waste strategy targets for the reduction of waste disposed of to landfill;
- ensure achievement of national targets for the recovery, recycling and composting of municipal waste;
- combat organised crime, at national and international level, involving the illegal trading in waste;
- research into the technical needs of successful waste management, including best practice and best practicable environmental options;
- secure high quality management of radioactive waste in industry;
- ensure that any proposals for solid radioactive waste disposal will provide the necessary high level of protection for man and the environment; and,
- commission research into the potential effects of wastes entering the environment, including the potential effects of radioactive wastes.

ISSUE 6A

UNAUTHORISED DISPOSAL OF WASTE FROM CARAVAN SITES TAKES PLACE WITHIN THE PLAN AREA.

Background

The Lincolnshire Coast is a popular area for holiday makers. As a result over a number of years static caravan sites have been developed to cater for tourists. There is a positive demand for this type of accommodation, holiday or otherwise. However, from a waste disposal perspective such sites are not always managed as they should be.

Effects

The high concentration of static caravan sites along the Lincolnshire Coast gives rise to two waste disposal concerns:

- a) Caravan sites generate large amounts of putrescible waste which cannot be collected by the normal household waste collection round unless payment is made. These sites should ensure that their waste is properly disposed of in accordance with waste management legislation. However, the Agency is aware of instances where waste originating from these sources has been illegally dumped, causing pollution of the environment and a threat to human health.
- b) There have been incidents where waste caravans have been stripped of valuable metals and the remaining carcass disposed of by open burning. As a consequence highly noxious smoke has been released into the atmosphere and the potential for pollution of ground and surface waters has occurred.

The disposal of waste on unlicensed sites can give rise to pollution of the environment, harm to human health and cause serious detriment to local amenities.

4.0 ACTIVITY PLANS

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
Minimise Environmental Impact of Waste Disposal.	Enforce waste management legislation and educate the public.	Agency LA's Site Operators		•	•	•	•	•	•	(1)

(1) Internal Staff Costs.

ISSUE 6B

ODOURS FROM KENWICK LANDFILL SITE HAVE CAUSED LOCAL COMPLAINT.

Background

Kenwick Landfill site is situated on the A16 south of Louth. The site was opened over ten years ago for the landfilling of domestic, commercial and industrial waste. Landfill gas, a mixture of methane, carbon dioxide and trace gases, is being produced at the site as a result of the normal anaerobic breakdown of the waste materials deposited.

Effect

Landfill gas contains trace amounts of certain gases which may be odorous. The emission of strong odours from Kenwick Landfill site became evident in 1994, and as a consequence a number of complaints from members of the public have been received since that time. The site operator has already installed an active gas extraction system, whereby gas is pumped from gas vents to a flare stack and burned, and a deodoriser to mask residual smells. Odour assessment is very subjective but the extent to which the smell is detectable outside the site is closely connected to the wind direction and atmospheric conditions at any given time.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
To minimise odour problems from Kenwick Landfill site.	Continue with the Agency's / site operator's strategy to combat odour problems from Kenwick Landfill site.	Agency								
	i.e.:-	Lincwaste								
	(I) Review gas control measures at the site.			•	•	•	•	•	•	(1)
	(II) Completion of phase 1 of the site.			•						150
	(III) Continue to regulate the landfill operation through the waste management licence.			•	•	•	•	•	•	(1)

4.0 ACTIVITY PLANS

ENVIRONMENTAL THEME: Addressing CLIMATE CHANGE

STRATEGIC ACTIONS

We will:

- help to ensure that the Government's greenhouse gas emission reduction targets are met;
- develop methods to improve our estimates of the emission of methane into the atmosphere from landfill sites;
- promote tax incentives to reduce energy production from burning fossil fuels;
- set an example by reducing our own energy and fossil fuel consumption;
- invest in research to predict the likely effects of climate change on the environment of England & Wales, and how to manage them;
- provide improved mapping of low lying coastal areas at risk from sea level changes;
- develop techniques to identify changes in plant life, using remote sensing techniques, to measure the effects of different weather patterns in sensitive areas; and
- contribute our knowledge and expertise to national and international forums dealing with climate change.

ISSUE 7A

A FULLER UNDERSTANDING OF COASTAL PROCESSES AND THEIR IMPACT ON SEA DEFENCES IS REQUIRED TO ENABLE THE FURTHER DEVELOPMENT OF LONG TERM SUSTAINABLE SEA DEFENCE STRATEGIES.

Background

Coastal processes (wind, tide, wave action etc) are dynamic and require ongoing monitoring through beach/bathymetric, aerial and sea defence survey. Only with regular accurate data sets is it possible to determine whether observed changes in these processes are part of long term trends or short term cyclic changes. A great deal of research has been carried out in some areas, between Mablethorpe and Skegness for example, where the beach nourishment works are being carried out and a good level of understanding of the coastal processes exists. Continued monitoring is essential to enable future reviews of the Shoreline Management Plan (SMP) to be undertaken and sustainable sea defence strategies to be produced.

Effects

Without a better understanding of the coastal processes at work, the Agency will not be certain that it is promoting sustainable sea defence policies and appropriately managing existing defences. The SMP requires periodic 5 year reviews. Without good quality up to date data it is impossible to fully understand the coastal processes acting along the shoreline or promote sustainable flood defence policies. The financial and environmental implications of this would be profound.

Objective	Action	Responsibility		98/99	99/00	00/01	01/02	02/03	Future	Cost £K
		Lead	Other							
Management of the coast in a sustainable manner.	Continue with the Regional survey contract currently in place monitoring coastal processes.	Agency & other members of the Humber Estuary Coastal Authorities Group (HECAG)		•	•	•	•	•	•	115
	Review the SMP	Agency	MAFF HECAG				•			50

4.0 ACTIVITY PLANS

Other environmental Concerns in the Louth Coastal Plan area relate to:-

- Regulating MAJOR INDUSTRIES
- Improving AIR QUALITY

Regulating MAJOR INDUSTRIES

STRATEGIC ACTIONS

We will:

- continue the efficient and effective delivery of Integrated Pollution Control;
- implement the requirements of the EC Directive on Integrated Pollution Prevention and Control;
- implement the relevant requirements of the Control of Major Accident Hazards Directive;
- develop practical working relationships with fellow regulators, particularly the Health and Safety Executive;
- develop pollution prevention control tools including projects relating regulation to emission, efficiency and economic benefits;
- encourage the use by industry of BS 7750/ ISO 14001 accreditation;
- encourage registration under the EU Eco-management and Audit regulations;
- pay special attention to the needs of small and medium-sized enterprises;
- maintain and expand the Chemical Release Inventory;
- introduce Operator and Pollution Risk Appraisal;
- play a full and active part in the EU Network for the Implementation and Enforcement of Environmental Law;
- ensure that radioactive releases from nuclear sites which result in exposures to individual members of the public are well within accepted limits;
- ensure that the total potential impact of releases from nuclear sites are environmentally acceptable;
- develop and implement toxicity based consenting methods for releases from complex industrial sites;
- ensure improvements are made to the quality of discharges to estuarine and coastal waters;
- implement the requirements of the EC Urban Waste Water Treatment Directive;
- research into effective means of ensuring that disinfectant and sterilisation techniques are safe for the environment; and,
- develop and implement tools to assess risks, costs, benefits and options in relation to the major industrial pressures on the environment.

Improving AIR QUALITY

STRATEGIC ACTIONS

We will:

- help the Government deliver its Air Quality Strategy;
- ensure emissions from the major industrial processes to the atmosphere are reduced;
- ensure specific emissions of sulphur dioxide and oxides of nitrogen, which contribute to acid rain, are reduced;
- discourage the use of solvents in industry, which contribute to the production of ozone, the major photochemical pollutant; and
- set an example in reducing emissions from vehicles by reducing our own mileage and increasing the use of public transport.

5.0 PROTECTION THROUGH PARTNERSHIP

5.1 INTRODUCTION

The growing population and society's drive to create wealth and improve standards of living have increased the use of natural resources and waste production. Together these place the environment under increasing pressure.

In the Louth Coastal Plan area, intensive farming practices and to a lesser extent urban development have impacted significantly on natural flora and fauna. Increasing demand for water to meet public water supply needs and for agricultural use add to these pressures.

Whilst the Agency has powers to deal with some aspects of environmental concern (See Appendix 4) these are not comprehensive and in many areas we must rely on working with others to protect the environment and minimise potential threats. These threats, actions and relevant partnerships are set out below:-

5.2 ENVIRONMENTAL INFLUENCES

Urban development can have a potentially adverse impact upon the environment. It can result in:

- (i) an increased risk/occurrence of flooding as a consequence of changes to surface water drainage;
- (ii) an increased risk to surface and groundwater quality from both treated and untreated effluent discharges;
- (iii) increased pressure upon the sewerage infrastructure;
- (iv) an increased demand for water for industrial use and for public water supply;
- (v) a loss of habitat due to land take;
- (vi) increased levels of waste produced;
- (vii) a risk to air quality; and,
- (viii) a risk to flora and habitats as a consequence, directly or indirectly, of remedial flood defence works and/or water quality problems.

The responsibility for regulating changes in land use lies with local planning authorities. Through the development planning process, which sets out the framework for land use change, and the

implementation of development control, local councils decide on the location of new development, the redevelopment of existing areas and changes of use of land or buildings. We liaise closely with planning authorities in our role as a consultee, along with developers, and advise on proposals relevant to the Agency. We also liaise with local authorities in the development of air quality strategies and where appropriate air quality management plans.

The following policy issues are particularly relevant to the Louth Coastal Plan area and we will encourage their inclusion in local authority development plans where appropriate:

Policies which:

- resist development that poses an unacceptable risk to the quality of groundwater and surface waters;
- ensure that adequate foul and surface water provision is available to serve new development and that the ultimate discharge does not cause an environmental problem;
- locate development in areas where adequate water resources are available or where it can be made available without detriment to the water environment;
- reduce the demand for water and incorporate demand management measures;
- seek to protect flood plains and prevent development which would create an unacceptable increase in the risk of flooding on site or elsewhere;
- protect existing or proposed flood defences and prevent interference with the ability of the Agency or other bodies to carry out flood control works and maintenance activities;
- protect, enhance and restore, where appropriate, river corridors;
- encourage the provision of new habitats in appropriate locations;
- ensure that the disposal of waste does not have an adverse effect on any watercourse or groundwater; and,
- encourage reduction of waste at source.

5.0 PROTECTION THROUGH PARTNERSHIP

Agricultural land use

Economic and commercial pressures on farmers to be more efficient, increase productivity and improve product quality have resulted in agricultural practices that may impact on the environment. These impacts can have both local and wider ranging implications:-

- (i) The use of fertilisers, pesticides and farm derived waste can impact on both surface and groundwater quality. Pesticide contamination requires expensive remediation and fertilizers contribute to nutrient enrichment which impacts on the ecological balance of watercourses.
- (ii) Soil quality can be affected by the use of pesticides which may indirectly kill soil organisms and compaction from farm machinery which can damage soil structure. There is some concern that changing agricultural practices such as the removal of hedgerows have accelerated soil erosion and this can affect water quality in terms of a watercourses particulate loading, damage habitat by the deposition of silt on gravel beds and impact on drainage by blocking drainage pipes and culverts. Topsoil run-off can also carry other pollutants into rivers.
- (iii) River maintenance works and lowering of water levels to ensure effective land drainage, have a marked effect upon flora and fauna.
- (iv) Abstraction of water for irrigation affects both water levels and quality.
- (v) Ploughing land close to watercourses can cause large quantities of sediment to run-off following periods of heavy rain; the increased popularity of outdoor pig rearing exacerbates this problem.

In working to minimise potential risks involved, the Agency works with the agricultural community and other organisations such as MAFF, The Farming and Wildlife Advisory Group and the Countryside Commission to:

- Encourage the adoption of initiatives such as the Code of Good Agricultural Practices for the protection of Water, Soil and Air;
- promote Stewardship schemes such as the creation of wet grassland to improve habitat diversity;

- promote Countryside Access schemes;
- encourage the construction of winter storage reservoirs - as an alternative source of water for spray irrigation; and,
- reduce nitrates in surface and groundwater through the designation of Nitrate Vulnerable Zones and develop methods for monitoring the "state" and quality of soil with respect to its potential pollution.

We will also:

- adopt more environmentally sensitive practices in our own flood defence and land drainage works; and,
- be proactive in educational and awareness campaigns, disseminating relevant literature to farmers giving advice on how they can practice in a more environmentally friendly way.

Industrial Activity

Potentially polluting industrial emissions come in the form of:

- (i) discharges made after treatment directly to surface and tidal waters;
- (ii) effluents discharged to foul sewers;
- (iii) discharges to the atmosphere;
- (iv) discharges such as wastes to landfill sites and sewage sludge to land; and,
- (v) accidental spillages/discharges causing contamination of land and ultimately surface and groundwaters.

Industrial abstraction of water from watercourses may also impact on downstream water quality.

The responsibility for monitoring and authorising these discharges lies with both the Agency which issues permissions and consents where appropriate, with the sewerage undertaker and in the case of some industrial emissions to air, the local authorities.

As part of our regular contact with industry and commerce, we work with them to pre-empt and minimise risks involved, generally to our mutual benefit and using our enforcement powers where necessary. In addition we are particularly proactive with respect to waste management practices

5.0 PROTECTION THROUGH PARTNERSHIP

involving ourselves and others in Local Agenda 21 initiatives. By adopting good waste reduction practices, industry and commerce have an opportunity to improve their business performance. Many individual companies have successfully introduced waste minimisation practices, and remove hazardous material (eg mercury in domestic batteries) from the waste stream.

The Agency will, in partnership with industry:

- promote and implement waste reduction and minimisation processes;
- encourage waste recovery techniques such as recycling, composting and energy production;
- improve awareness of waste recycling/minimisation opportunities by publicity and education; and,
- seek improvements in the quality of industrial emissions and reduce the risk of accidental discharges to the environment.

5.3 EDUCATION AND AWARENESS

One of our key objectives for environmental protection and improvement is education. Damage is often caused, not through malicious intent to harm the environment but through carelessness and a lack of awareness.

The Agency believes it should have an involvement in education at all levels. It is important to direct education to all aspects of our society not just education through schools and colleges.

Our education strategy 'Green Shoots' which considers education into the next century, outlines the following actions:

- to help educate young people through teaching aids and other initiatives;
- to improve understanding of environmental issues, through links with education, work placements and an awards scheme;
- to work with industry and produce marketing campaigns to promote prevention of pollution rather than its remediation;
- to foster public awareness of environmental issues to encourage responsibility for the environment and its challenges; and

- to build on established and create new international relationships to further sustainable development.

Environmental education is a central means of furthering our commitment to sustainable development. Education provides industry, commercial interests and the public with an awareness of, and hopefully an impetus to address environmental issues; this 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. We hope to see environmental topics dovetail into the national curriculum and are committed to provide information to 'A' level and university students.

Local Agenda 21

Agenda 21 is a global action plan for the 21st century produced at the Rio Earth Summit in 1992. It brings together economic, environmental and social concerns into a 'blueprint' for a more sustainable way of life for everyone, recognising as well that environmental problems at all levels have their basis in local activities and emphasises the need for local action in the message 'Think Globally, Act Locally'. Local authorities across the world were seen as the focus of promoting and encouraging local community action and were charged with producing a Local Agenda 21.

The process in the UK has taken a variety of forms and names. Many Local Agenda 21 groups have also been involved in the development of local state of the environment reports, (such as the one for Lincolnshire), and sustainability indicators to help identify issues of importance to their area. These issues can then be developed into action plans and projects to deliver improvements.

The Environment Agency is obliged under the statutory guidance given by the Secretary of State to assist the Local Agenda 21 process, by providing appropriate consultation with local communities making a full contribution to initiatives under LA21. Also, under statutory sustainable development guidance given to the Agency from Ministers, the Agency should develop a close and responsive relationship with local communities and this will include LA21 groups, on matters related to our own functions.

In the Louth Coastal Plan area, we are closely involved in the forums set up by the relevant Unitary Authorities and District Councils in response

5.0 PROTECTION THROUGH PARTNERSHIP

to this initiative. Examples of specific projects we the Agency are involved in include:

- the Lincolnshire Environment Forum
- the Lincolnshire Wolds Area of Outstanding Natural Beauty Joint Advisory Committee

Biodiversity Action Plans

In June 1992, at the Earth Summit in Rio, the Convention on Biological Diversity was signed by the United Kingdom and over 150 other countries. The UK response to this commitment was launched in January 1994 with "Biodiversity: The UK Action Plan" and guidance was given on the production of Local Biodiversity Action Plans. The purpose of Local Biodiversity Action Plans is to focus resources to conserve and enhance biodiversity by means of local partnerships, taking account of national and local priorities.

A Local Biodiversity Action Plan is both a product and process. It identifies where action needs to be taken to implement targets for habitats and species

and it specifies appropriate mechanisms. Such plans also have a key role in monitoring progress of the conservation of biodiversity in the long term.

Local Biodiversity Action Plan "Frameworks" have been prepared by the Wildlife Trust for Lincolnshire. In keeping with Local Agenda 21, the formulation of Local Biodiversity Action Plans, should not be undertaken by a single organisation. Delivering the biodiversity targets will require inputs from Central and Local Government, conservation organisations, land managers, members of the public and ourselves. The conservation of biodiversity will be a key indicator of the successful implementation of sustainable development in the area.

We will:

- support and encourage the development and implementation of Local Biodiversity Plans and assist in the identification of targets and priorities.

6.0 FUTURE REVIEW AND MONITORING

The Environment Agency will be jointly responsible, with other identified organisations and individuals, for implementing this Action Plan. Progress will be monitored and reported annually. The Annual Reviews will also examine the need to introduce new issues as they arise, however, the period between major revisions will be five years.

If you require any further information or wish to make any comments, please contact:

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APPENDIX 1

Individuals and organisations who commented on the Louth Coastal LEAP Consultation Report:

Lindsey Marsh Drainage Consortium	Lincolnshire County Council	Inland Waterways Association
Countryside Commission	East Lindsey District Council	National Farmers Union
Anglian Water Services Ltd	Louth Navigation Trust	English Nature
Anglian WaterWatch	Ministry of Agriculture, Fisheries and Food	Seagull
Forestry Commission	Mr Frank Wright, Lincoln	Lincolnshire Trust for Nature Conservation

APPENDIX 2:

GLOSSARY

Abstraction -The removal of water from any source, either permanently or temporarily.

Abstraction Licence -A statutory document issued by the Agency to permit removal of water from a source of supply. It can limit the quantity of water taken daily etc.

Agenda 21 -A comprehensive programme of worldwide action to achieve a more sustainable pattern of development for the next century. UK Government adopted the declaration at the UN Conference on Environment and Development (the Earth Summit) held in Rio de Janeiro in 1992.

Algae -Microscopic (sometimes larger) plants, which may be floating or attached. Algae occur in still and flowing water.

AMP 3 -An acronym for the third Asset Management Plan produced by the Water Companies for the Office of Water Services (OFWAT). It sets out the water industry investment programme for the period 2000 - 2005.

Aquifer -A permeable geological stratum or formation that is capable of both storing and transmitting water in significant amounts.

Aquifer (Confined) -Where upper and lower layers have a low permeability which confine the groundwater under greater than atmospheric pressure.

Aquifer (Unconfined) -Where the upper surface of a saturated zone forms a water table within the water-bearing stratum.

Anaerobic -Oxygen free.

Anglian Water Services (AWS) -Water and Sewage undertaker local to the Louth Coastal Area.

Augmentation -The addition of water by artificial input. (Usually to "top up" low flows in summer by either groundwater pumping or via reservoir release.)

Beach Nourishment -The artificial creation or restoration of a beach by the use of imported material.

Biochemical Oxygen Demand (BOD) -A standard test which measures over 5 days the amount of oxygen taken up by aerobic bacteria to oxidise organic (and some inorganic) matter.

Biodiversity -Diversity of biological life, the number of species present.

Biodiversity Action Plans (BAPs) -The United Kingdom's response to its commitment to the June 1992, Earth Summit in Rio. The Convention on Biological Diversity was launched in January 1994 with "Biodiversity: The UK Action Plan" and guidance was given on the production of Local Biodiversity Action Plans. The purpose of BAPs is to focus resources to conserve and enhance biodiversity by means of local partnerships, taking account of national and local priorities.

Biomass -Total quantity or weight of organisms in a given area or volume e.g. Fish biomass is measured as grammes per square metre (gm²).

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Biota -Biological life.

Blow Well -Pond/lake formed by artesian waters bubbling to the surface.

Borehole -Generally a small diameter bored hole which is used to exploit an aquifer.

Catchment -The total area from which a single river system collects surface run-off.

Coarse Fish -Freshwater fish other than salmon and trout.

Coastal Plain -Low-lying land adjacent to the coast.

Combined Sewer Overflow -Overflow structure which permits a discharge from the sewerage system during wet weather conditions, and consists of both foul and surface water discharge.

Consent (Discharge) -A statutory document issued by the Agency. It can authorise entry and indicate any limits and conditions on the discharge of an effluent to a controlled water. A land drainage consent is an approval for specified structural works in areas under Agency control.

Controlled Waste -Industrial, household and commercial wastes - excludes mine and quarry waste, agricultural waste, sewage sludge, radio-active wastes and explosives.

Controlled Waters -All rivers, canals, groundwaters, estuaries and coastal waters to three nautical miles from the shore, including the bed and channel which may for the time being be dry.

Demand Management -Activities to manage the amount of water required from a source of supply: includes measures to control waste and/or to discourage use.

Development Plans -(Local/Structure Plans) - Planning documentation which makes provision for the control of the use of land through structure plans, local plans and the grant or refusal of planning permission.

EC Bathing Beach -Beach which meets criteria defined by EC Directive concerning the quality of bathing waters.

Ecology -The study of inter-relationships between organisms and their environment.

Ecosystem -A functioning, interacting system composed of one or more living organisms and their effective environment, in biological, chemical and physical sense.

Effluent -Liquid waste from industry, agriculture or sewage treatment plants.

Eutrophic -A description of water which is rich in nutrients. At worst, such waters are sometimes beset with unsightly growths of algae.

Fauna -Animal life.

Fish Biomass -A measure of the quality of a fishery as found in terms of surveys, weight by area ie. gm².

Fish Pass -A device to permit fish to transverse structures within a river.

Flood Plain -This includes all land adjacent to a watercourse over which water flows or would flow but for flood defences in times of flood.

Flora -Plant life.

Fluvial -Relating to the freshwater river.

Fluvial Defence -Structure providing protection from flooding from rivers.

Geomorphology -Scientific study of land forms and of the processes that formed them.

Groundwater -Water which saturates a porous soil or rock substratum (or aquifer). Water held in storage below ground level.

Hydrogeology -Branch of geology concerned with water within the Earth's crust.

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Hydrology -The study of water on and below the earth's surface.

Hydrometric -The measurement of water.

Impounded -The holding back of water behind a dam. Strictly a structure which raises water levels above their "normal" height. May need a licence and/or Land Drainage Consent from the Agency.

Integrated Pollution Control (IPC) -An approach to pollution control in the UK which recognises the need to look at the environment as a whole, so that solutions to particular pollution problems take account of potential effects upon all environmental media.

Internal Drainage Board (IDB) -Authorities responsible for dealing with land drainage within a district. They are primarily concerned with agricultural land drainage but also may be involved with water supply to their district for agricultural purposes.

IPC Authorisation -An authorisation issued by the Agency under Part A of the Environment Protection Act 1990 covering certain operation of processes.

Landfill -Site used for waste disposal into/onto land.

Leachate -Liquor formed by the act of leaching.

Macroinvertebrate -Animals without backbones eg. leeches, snails, worms, insects.

Main River -The watercourse shown on the statutory 'Main River maps' held by the Agency and MAFF. The Agency has permissive powers to carry out works of maintenance and improvement on these rivers.

Morphology -The form of the structure of plants and animals.

National Nature Reserve -An area of national importance for nature conservation.

Natural Area -Developed by English Nature, Natural Areas are parts of England with similar types of wildlife and natural features. In many cases they also share similar landscapes. Their boundaries do not follow existing administrative boundaries, but are defined by their wildlife and natural features, their land use and human history.

Nature Reserve -A tract of land managed to preserve its flora, fauna and physical features.

Nitrate Sensitive Area (NSA) -An area where nitrate concentrations in sources of public drinking water exceed, or are at risk of exceeding the limit of 50 mg/l laid down in the 1980 EC drinking Water Directive, and where voluntary, compensated agricultural measures were introduced in 1990 as a means of reducing those levels.

Nitrate Vulnerable Zone

(NVZ) -An area where nitrate concentrations in sources of public drinking water exceed, or are at risk of exceeding, the limit of 50mg/l laid down in the 1991 EC Nitrate Directive and, where compulsory, uncompensated agricultural measures will be introduced from 19 December 1998 as a means of reducing those levels.

Nutrient -Substance providing nourishment for plants and animals eg. Nitrogen, phosphorous.

Organic -Generally any substance containing carbon as part of its chemical make-up.

Outfall -The point at which a river discharges to a downstream source eg estuary, sea; it may also include an outfall structure to prevent sea waters backing up the system.

Over Commitment -Where the volume licensed for abstraction from an aquifer or river system, exceeds the availability of the water resource. In balancing supply and demand the Agency has to consider not only licensed abstraction eg spray irrigation, Public Water Supply and industrial use but also the environmental needs and riparian uses such as livestock watering.

Package Treatment Plant -Small sewage treatment plant built to treat effluents from small numbers of dwellings.

Permeability -The ease at which liquids (or gases) can pass through rocks or a layer of soil.

Permissive Powers -Powers which confer on the Agency the right to do things but not the duty to do them.

APPENDIX 2:

pH -Quantitative expression of acidity or alkalinity of a solution. A pH less than 7 is acidic, a pH greater than 7 is alkaline and a pH of 7 is neutral.

Public Water Supply -The supply of water by companies appointed as Water Undertakers by the Secretary of State for the Environment under the Water Industry Act 1991.

Ramsar -Wetland site of International importance that is designated under the Ramsar* convention (*a town in Iran where the international convention was originally agreed in 1975 to stem the progressive encroachment on, and loss of wetland).

Return Period -Refers to the frequency of a rainfall or flooding event. Flood events are described in terms of the frequency at which, on average, a certain severity of flow is exceeded. This frequency is usually expressed as a return period in years, eg. 1 in 50 years.

Riffle -A shallow area in a river where the substrate is composed of gravel and the flow is faster.

Riparian Owner -Owner of riverbank and/or land adjacent to a river. Normally owns river bed and rights to the midline of channel.

River Corridor -The continuous area of river, river banks and immediately adjacent land alongside a river and its tributaries.

River Quality Objective (RQO) -The level of water quality that a river should achieve, in order to be suitable for its agreed use. Is being replaced by Water Quality Objectives (WQOs).

Saline Ingress -Salt water may enter rivers through or around tidal structures. Once salt water has entered a watercourse it is difficult to remove other than by flushing with high flows during floods. It can have profound effects on the ecology of a river.

Saline Waters -Water containing salts.

Saltmarsh -Expanses of herbaceous plants in the supratidal zone.

Sewage -Liquid waste from cities, towns and villages which is normally collected and conveyed in sewers for treatment and/or discharge to the environment.

Sewerage -System of sewers usually used to transport sewage to a sewage treatment works.

Site of Special Scientific

Interest (SSSI) -A site given a statutory designation by English Nature or the Countryside Council for Wales because it is particularly important, on account of its nature conservation value.

Sludge -The accumulation of solids from treatment processes. Sludge can be incinerated or spread on farm land.

Special Protection Area (SPA) -Statutory protected habitats for wild birds under EC regulations.

Spray Irrigation -The watering of crops by spraying. Can have a high impact on water resources.

Storm Sewer Overflow -Overflow built into combined surface and foul sewerage systems to accommodate higher volumes generated during intense rainfall events thereby protecting the integrity of the sewer and preventing properties from flooding. These discharge diluted but untreated effluent direct to watercourses.

Surface Water -Water collecting on and running off the surface of the ground.

Sustainable Development -Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Telemetry -A means of directly collecting data from remote sites.

Tidal Floodplain -Land at risk to flooding from the sea in the event of overtopping or a breach of a sea or tidal defence.

Topography -Physical features of a geographical area.

Transfer Station -A place where refuse, collected from premises, is compacted into large containers and transported onward for disposal.

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Washlands -Extensive semi-natural area of flood plain adjacent to a river, where water is stored in time of flood. Structures can be added to control the amount of water stored in the washland and time its release to alleviate peak flood flows in areas downstream.

Waste Transfer Stations -Where waste is stored prior to its disposal/recycling.

Waste Minimisation -Reducing the quantity and/or hazard of waste produced.

Water Resource -The naturally replenished flow of recharge of water in rivers or aquifers.

Weir -A dam built across a river to raise upstream levels.

Wetland -An area of land where the water table is at or near the surface for most of the time, leading to characteristic habitats.

Winter Storage Reservoir -Reservoirs built by farmers to store water during the winter months when it is "plentiful" for re-use during the summer.

APPENDIX 3:

ABBREVIATIONS

LEAP	Local Environment Agency Plan	DC	District Council	STW	Sewage Treatment Works
SSSI	Site of Special Scientific Interest	CC	County Council	DETR	Department of the Environment, Transport and the Regions
IDB	Internal Drainage Board	GW	Groundwork	DoE	Former Department of the Environment replaced by DETR.
MAFF	Ministry of Agriculture, Fisheries and Food	LNT	Louth Navigation Trust	EC	European Community
AWS	Anglian Water Services Ltd	ELDC	East Lindsey District Council	ADAS	Agriculture Development Advisory Service
NFU	National Farmers Union	UWWTD	Urban Waste Water Treatment Directive		
LA	Local Authority	HECAG	Humber Estuary Coastal Authorities Group		

APPENDIX 4:

Duties, powers and interests of the Environment Agency

The Environment Agency has a wide range of interests in the areas of water management, waste management and pollution prevention and control. Whilst many of these interests are supported by statutory duties and powers, much of the Agency's work is advisory, with the relevant powers resting with other bodies such as local planning authorities. The following table, therefore, summarises the Agency's duties, powers and interests and their relationship to land-use planning in Anglian Region.

Agency Duty	The Agency has powers to:	The Agency has an interest (but no powers) in:	Partnership
Water Resources The Agency has a duty to conserve, redistribute, augment and secure the proper use of water resources.	<ul style="list-style-type: none"> ● Grant or vary water abstraction and impoundment licences on application. ● Revoke or vary existing licenses to reinstate flows or levels to surface waters or groundwaters which have become depleted as a result of abstraction, subject to a liability for compensation. ● Secure the proper use of water resources through its role in water resources planning, the assessment of reasonable need for abstraction and promotion of more efficient use for water resources. ● Monitor and enforce abstraction and impoundment licence conditions. 	<ul style="list-style-type: none"> ● The more efficient use of water by water companies, developers industry, agriculture and the introduction of water-efficiency measures and suitable design and layout of the infrastructure. 	The Agency is committed to water-demand management and will work closely with water companies and developers, local authorities and relevant organisations to promote the efficient use of water. The Agency acknowledges that new resources may be needed in the future and supports a twin-track approach of planning for water resource development alongside the proportion of demand-management measures. The Agency seeks to influence planning decisions for new development by encouraging the inclusion of water-conservation measures in new properties, particularly in areas where water resources are under stress, and by ensuring that planning authorities allow for the lead time for resource development.
Flood Defence The Agency has a duty to exercise general supervision over all matters relating to flood defence throughout each catchment.	<ul style="list-style-type: none"> ● Control, through Land Drainage consents, development within 9m of main river and tidal defences - Water Resources Act 1991 (Section 109). ● Control the construction of structures that would affect the flow of an ordinary watercourse Land Drainage Act 1991 (Section 23). ● Produce flood risk maps for all main rivers under Section 105 of the Water Resources Act 1991. ● Undertake works to main rivers using permissive powers. ● Issue flood warning relating to main river to the public, local authorities and the police. ● Provide and maintain coastal defences. ● Consent mineral workings within 10m of main rivers. 	<ul style="list-style-type: none"> ● Granting of planning permission throughout a catchment but especially flood plains where development can significantly increase flood risk. This permission is granted by Local Planning Authorities. ● Installation of surface water source control measures eg flood attenuation structures. ● Supervising the maintenance of ordinary watercourses which is a local authority remit, but may impact on main rivers. ● Installation of buffer zones which reduce flood risk and have significant environmental benefits. ● Urban and rural land use and measures that can reduce flood risk or the need for watercourse maintenance. 	As a statutory consultee on planning applications within main-river flood plains, the Agency offers advice based on knowledge of flood risk. It also advises on the environmental impacts of proposed flood plain development. The Agency will encourage best practice, including source - control measures and common standards, among local authorities and riparian owners to protect and enhance the environment. The Agency works with the civil authorities to prepare flood warning dissemination plans and supports their endeavours to protect communities at risk.

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Agency Duty	The Agency has powers to:	The Agency has an interest (but no powers) in:	Partnership
Water Quality The Agency has a duty to monitor, protect, manage and, where possible, enhance the quality of all controlled waters including rivers, groundwaters, lakes, canals, estuaries and coastal waters through the prevention and control of pollution.	<ul style="list-style-type: none"> ● Issue discharge consents to control pollution loads in controlled waters. ● Regulate discharges to controlled waters in respect of water quality through the issue and enforcement of discharges consents. ● Issue 'works notices' where action is required to reduce the risk of pollution. ● Prosecute polluters and recover the costs of clean-up operations. 	<ul style="list-style-type: none"> ● The control of run-off from roads and highways. This is a Highways Agency duty. ● The greater use of source control measures to reduce pollution by surface water run-off. 	<p>The Agency will liaise with local authorities, developers, the Highways Agency, industry and agriculture to promote pollution prevention and the adoption of source-control measures.</p> <p>As a statutory consultee on planning applications, the Agency will advise Local Planning Authorities on the water quality impact of proposed developments.</p>
Air Quality The Agency has a duty to implement Part 1 of the Environmental Protection Act 1990 to regulate the discharge of emissions to the atmosphere from certain industrial processes.	<ul style="list-style-type: none"> ● Regulate the largest technically complex and potentially most polluting prescribed industrial processes such as refineries, chemical works and power stations, including enforcement of, and guidance on, BATNEEC and BPEO. ● Have regard to the government's National Air Quality Strategy when setting standards for the releases to air from industrial processes. 	<ul style="list-style-type: none"> ● The vast number of smaller industrial processes which are controlled by local authorities. ● Control over vehicular emissions and transport planning. 	<p>The Agency provides data on IPC processes and advice on planning applications to local authorities. The Agency is willing to offer its technical experience to local authorities on the control of air pollution.</p> <p>The Agency wishes to liaise with local authorities in the production of their Air Quality Management Plans.</p> <p>The Agency will advise and contribute to the government's National Air Quality Strategy.</p>
Radio active Substances The Agency has a duty under the Radioactive Substances Act 1993 to regulate the use of radio active materials and the disposal of radio active waste.	<ul style="list-style-type: none"> ● To issue certificates to users of radioactive materials and disposers of radioactive waste, with an overall objective of protecting members of the public. 	<ul style="list-style-type: none"> ● The health effects of radiation. 	<p>The Agency will work with users of the radioactive materials to ensure that radioactive wastes are not unnecessarily created, and that they are safely and appropriately disposed of.</p> <p>The Agency will work with MAFF to ensure that the disposal of radioactive waste creates no unacceptable effects on the food chain. The Agency will work with the Nuclear Installations Inspectorate to ensure adequate protection of workers and the public at nuclear sites.</p> <p>The Agency will work with the HSE on worker protection issues at non-nuclear sites.</p>

APPENDIX 4:

Agency Duty	The Agency has powers to:	The Agency has an interest (but no powers) in:	Partnership
Waste Management The Agency has a duty to regulate the management of waste, including the treatment, storage, transport and disposal of controlled waste, to prevent pollution of the environment, harm to public health or detriment to local amenities.	<ul style="list-style-type: none"> ● Vary waste management licence conditions. ● Suspend and revoke licences. ● Investigate and prosecute illegal waste management operations. 	<ul style="list-style-type: none"> ● The siting and granting of planning permission for waste management facilities. This is conducted by the waste industry and Local Planning Authorities. The Agency, as a statutory consultee on planning applications, can advise on such matters. 	The Agency will work with waste producers, the waste management industry and local authorities to reduce the amount of waste produced, increase re-use and recycling and improve standards of disposal.
Contaminated Land The Agency has a duty to develop an integrated approach to the prevention and control of land contamination ensuring that remediation is proportionate to risks and cost-effective in terms of the economy and environment.	<ul style="list-style-type: none"> ● Regulate the remediation of contaminated land designated as special sites. ● Prevent future land contamination by means of its IPC, Water Quality and other statutory powers. ● Report on the state of contaminated land. 	<ul style="list-style-type: none"> ● Securing with others, including local authorities, landowners and developers, the safe remediation of contaminated land. 	The Agency supports land remediation and will promote this with developers, local authorities and other stakeholders.
Conservation The Agency will further conservation wherever possible, when carrying out water management functions; have regard to conservation when carrying out pollution control functions; and promote the conservation of flora and fauna which are dependent on an aquatic environment.	<ul style="list-style-type: none"> ● The Agency has no direct conservation powers, but uses its powers with regard to water management and pollution control to exploit opportunities for furthering and promoting conservation. 	<ul style="list-style-type: none"> ● The conservation impacts of new development. These are controlled by Local Planning Authorities. ● Protection of specific sites or species, which is a function of English Nature. The Agency does, however, provide advice to local authorities and developers to protect the integrity of such sites or species. ● Implementation of the UK Biodiversity Plan for which it is the contact point for 12 species and one habitat. 	The Agency supports action to sustain or improve natural and man-made assets so that they are made available for the benefit of present and future generations. Many development schemes have significant implications for conservation. The Agency will work with developers, local authorities, conservation bodies and landowners to conserve and enhance biodiversity.
Landscape The Agency will further landscape conservation and enhancement when carrying out water management functions; have regard to the landscape when carrying out pollution control functions; and promote the conservation and enhancement of the natural beauty of rivers and associated land.	<ul style="list-style-type: none"> ● The Agency must further the conservation and enhancement of natural beauty when exercising its water management powers and have regard to the landscape in exercising its pollution control powers. 	<ul style="list-style-type: none"> ● The landscape impact of new development, particularly within river corridors. This is controlled by Local Planning Authorities. 	The Agency produces River Landscape Assessments and Design Guidelines which it uses when working with local authorities and developers to conserve and enhance diverse river landscapes.

APPENDIX 4:

Agency Duty	The Agency has powers to:	The Agency has an interest (but no powers) in:	Partnership
Archaeology The Agency has a duty to consider the impact of all of its regulatory, operational and advising activities upon archaeology and heritage, and implement mitigation and enhancement measures where appropriate.	<ul style="list-style-type: none"> ● The Agency must promote its archaeological objectives through the exercise of its water management and pollution control powers and duties. 	<ul style="list-style-type: none"> ● Direct protection or management of sites of archaeological or heritage interest. This is carried out by LPAs, County Archaeologists and English Heritage. 	The Agency will liaise with those organisations which have direct control over archaeological and heritage issues to assist in the conservation and enhancement of these interests.
Fisheries The Agency has a duty to maintain, improve and develop salmon, trout, freshwater and eel fisheries.	<ul style="list-style-type: none"> ● Regulate fisheries by a system of licensing. ● Make and enforce fisheries byelaws to prevent illegal fishing. ● Promote the free passage of fish and consent fish passes. ● Monitor fisheries and enforce measures to prevent fish-entrainment in abstractions. ● Promote its fisheries duty by means of land drainage consents, water abstraction applications and discharge applications. 	<ul style="list-style-type: none"> ● The determination of planning applications which could affect fisheries. 	Many development schemes have significant implications for fisheries. The Agency will work with anglers, riparian owners, developers and Local Authorities to protect fisheries.
Recreation The Agency has a duty to promote rivers and water space for recreational use.	<ul style="list-style-type: none"> ● The Agency contributes towards its recreation duty through the exercise of its statutory powers and duties in water management. 	<ul style="list-style-type: none"> ● Promotion of water sports. This is carried out by the Sports Council and other sports bodies. 	The Agency will work with the Countryside Commission, the Sports Council, British Waterways and other recreational and amenity organisations to optimise recreational use of the water environment.
Navigation The Agency has a range of duties within Northern Area of Anglian Region to maintain and improve the following navigations: Ancholme, Witham, Glen, Welland, Nene. See issue 4F with respect to navigation in the Louth Coastal LEAP area.	<ul style="list-style-type: none"> ● Regulate navigation by a system of licensing. ● Enforce navigation legislation. 	<ul style="list-style-type: none"> ● The management and operation of British Waterways' navigations and other navigations within the region. 	The Agency will work with British Waterways, Port Authorities, other navigation groups and navigation users to improve navigations generally as valuable environmental, recreational, commercial and heritage resources.

MANAGEMENT AND CONTACTS:

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.

Head Office is responsible for overall policy and relationships with national bodies including Government.

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