

UPPER LEE  
CATCHMENT MANAGEMENT PLAN  
FINAL PLAN

HO



NRA

*National Rivers Authority  
Thames Region  
September 1994*

## CATCHMENT FACTS

### GENERAL

<i>Catchment area</i>	486 sq km (82% in Herts, 18% in Beds)
<i>Highest point</i>	210 m AOD (South of Dunstable)
<i>Lowest point</i>	35 m AOD (Hertford)
<i>Population</i>	391 400 (48 % in Herts, 52 % in Beds)

### WATER QUANTITY

Annual average rainfall 639 mm

Average flows in the River:

<i>Lee (Waterball)</i>	108 ML/d
<i>Mimram (Pansbanger)</i>	46 ML/d
<i>Beane (Hartham)</i>	52 ML/d

Percentage of average flows derived from groundwater - surface water - sewage effluent in the River:

<i>Lee</i>	22% - 29% - 49%
<i>Mimram</i>	79% - 18% - 3%
<i>Beane</i>	60% - 40% - 0%

Average abstraction of water from:

<i>Chalk aquifers</i>	98 ML/d
<i>Other aquifers</i>	3 ML/d
<i>Rivers</i>	4 ML/d

Typical uses of abstracted water:

<i>Public water supply</i>	88 %
<i>Industrial</i>	5 %
<i>Gravel washing</i>	2 %
<i>Other</i>	5 %

### Notes

- (1) 1 sq km (square kilometre) is equivalent to 0.36 square miles. 1 ha (hectare) is equivalent to 2.47 acres.
- (2) m AOD is metres above Ordnance Datum.
- (3) 1 mm (millimetre) is equivalent to 0.0394 inches. 1 m (metre) is equivalent to 39.37 inches. 1 km is equivalent to 0.621 miles.
- (4) 1 ML/d (mega litre per day) is equivalent to 0.224 million gallons per day.
- (5) The General Quality Assessment classes are determined based on the concentrations of dissolved oxygen, biochemical oxygen demand and ammonia in the water. Class A and B are 'good'; Class C and D 'fair', Class E is 'poor', Class F is 'bad'. The National Water Council (NWC) scheme has been replaced by a new scheme called the General Water Quality Assessment (GQA). This consists of a number of

### WATER QUALITY

Length of watercourse (km) categorised by General Quality Assessment classes:

		1991 - 1993
<i>River Lee</i>	Class B	28.0
	Class C	7.4
	Class D	11.9
<i>River Mimram</i>	Class A	10.3
	Class B	12.8
<i>River Beane</i>	Class C	12.2
<i>Stevenage Brook</i>	Class C	5.2

Pollution incidents in 1993

<i>Major</i>	0
<i>Significant</i>	7
<i>Minor</i>	100

Typical range of biological monitoring results in the River:

	BMWP (Diversity)	ASPT (Water Quality)
<i>Lee</i>	15 - 181	2.67 - 5.15
<i>Mimram</i>	71 - 151	3.84 - 5.16
<i>Beane</i>	35 - 138	3.53 - 5.12

### FLOOD DEFENCE

Length of 'main river' (km) and areas of floodplain (ha) at risk of flooding according to land use types on the River:

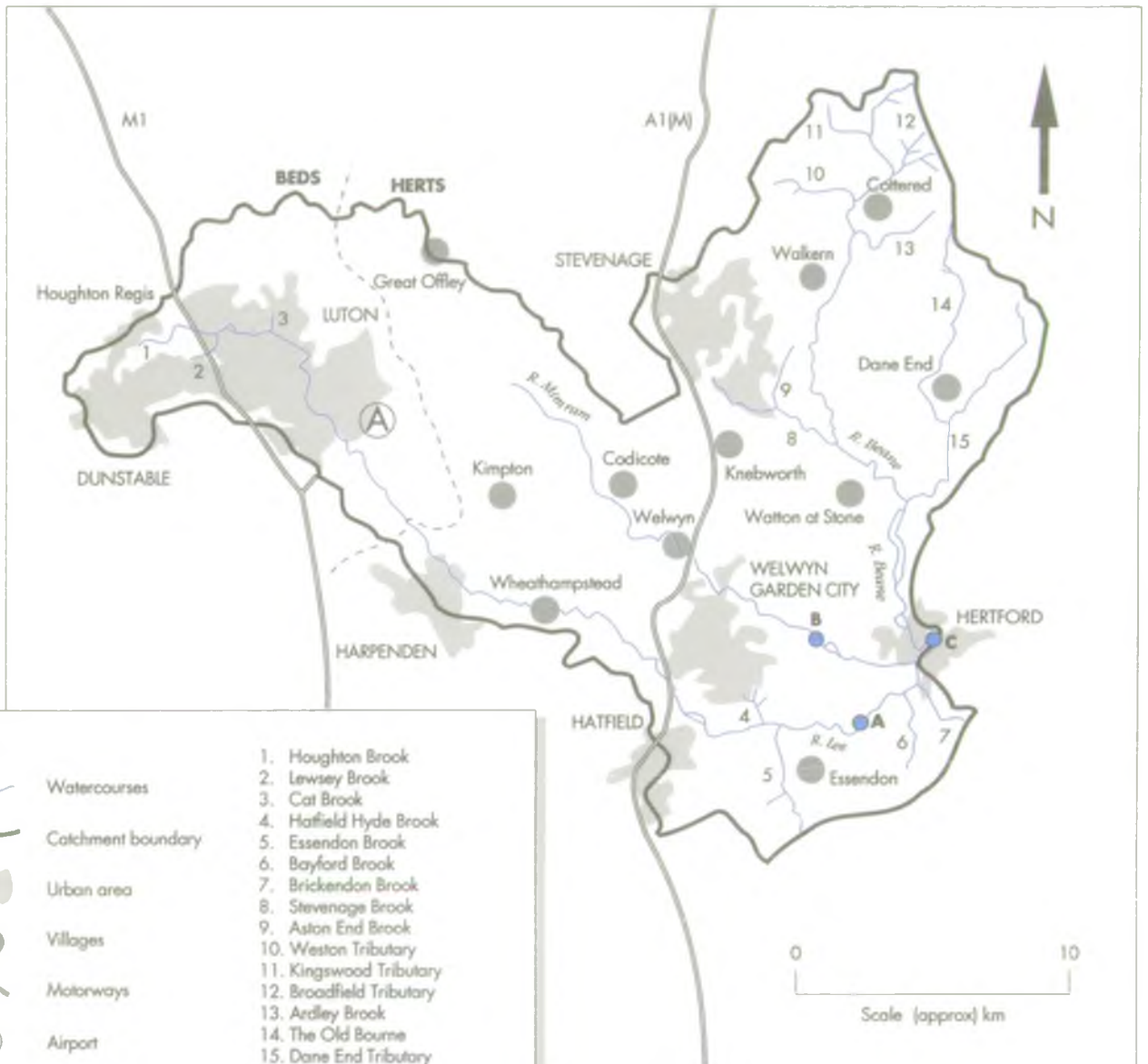
		Length	Area
<i>Lee</i>	Band B	11.8	117
	Band C	10.3	61
	Band D	13.5	123
	Band E	28.4	60
<i>Mimram</i>	Band C	5.2	28
	Band D	9.2	126
	Band E	9.2	41
<i>Beane</i>	Band C	8.2	155
	Band D	17.8	239
	Band E	52.9	140

separate water quality assessments, each providing a separate 'window' through which water quality can be viewed. The first of these windows to be developed is the chemical 'window'. It is intended that further 'windows' will be added, covering biology, nutrients and aesthetic quality, but this will depend on the successful development of suitable methods and classification systems.

(6) BMWP is Biological Monitoring Working Party score. This is a measure of species diversity (high values are indicative of a healthy river system - above 150 is excellent, below 50 is poor). ASPT is the average score per taxa and is indicative of water quality (high values indicate good water quality - above 4.81 is excellent, below 3.60 is poor).

(7) 'Main River' is a legal definition which gives certain discretionary powers to the NRA. Land Use Bands are defined as: Band A - Urban; Band B - partial Urban; Band C - Urban fringe/rural; Band D - partial agricultural; Band E - agricultural.

UPPER LEE CATCHMENT MAP



KEY	
	Watercourses
	Catchment boundary
	Urban area
	Villages
	Motorways
	Airport
	Flow Gauge
	County boundary
1.	Houghton Brook
2.	Lewsey Brook
3.	Cat Brook
4.	Hatfield Hyde Brook
5.	Essendon Brook
6.	Bayford Brook
7.	Brickendon Brook
8.	Stevenage Brook
9.	Aston End Brook
10.	Weston Tributary
11.	Kingswood Tributary
12.	Broadfield Tributary
13.	Ardley Brook
14.	The Old Bourne
15.	Dane End Tributary
<b>A</b>	River Lee at Waterhall
<b>B</b>	River Mimram at Panshanger
<b>C</b>	River Beane at Hartham



## VISION FOR THE UPPER LEE CATCHMENT

The Upper Lee Catchment is home to 400 000 people who depend on the water environment in many ways and value it for the quiet pleasure and enjoyment that it brings to their local communities.

The Chalk aquifer under the catchment is a source of water for domestic and industrial use. It is also the source of the Rivers Lee, Mimram and Beane which flow through or close to Luton, Welwyn Garden City, Stevenage and Hertford. These rivers are valued as important local amenities in an area subject to considerable development pressures. The protection of public health and the natural water environment demand that:

- *the quality of water in aquifers is not compromised*
- *abstractions of water are in balance with the ecological needs of rivers and where flows do not meet our reasonable expectations then, where justifiable, sustainable solutions must be sought.*

By returning locally treated sewage effluent we help replenish and sustain the River Lee downstream of Luton. Whilst recognising the river's self-cleansing capacity we must not inhibit its value and potential as a locally important ecological and fishery resource. The physical character of the River Lee and its catchment has suffered much in Luton through past land and water management policies. Revised policies can now be used to help stimulate action to enhance and restore the river corridor.

The River Minram is a high quality chalk stream of regional environmental importance. The value of many important habitats on the River Mimram depends on the maintenance of a particular river chemistry and water regime.

The River Beane offers opportunities for both environmental and informal recreational initiatives. The loss of wetland habitats throughout the catchment needs to be reversed. Flood risks suffered by properties in Luton, Batford and Wheathampstead along the River Lee and in villages in the Beane valley should be minimised. Key objectives will be to:

- *restore the River Lee as a natural open link between Luton Hoo and Houghton Regis through public and private sector initiatives by 2025*
- *minimise surface water run-off from Luton as part of a strategy to reduce flood risks on the River Lee*
- *maintain the highest possible level of protection for the landscape setting and habitats of the Mimram valley*
- *prepare a comprehensive conservation strategy which integrates the activities of the voluntary, public and private sectors*
- *restore 8 significant wetland habitat sites by 2005*
- *restore flows to an acceptable level in the River Beane by 2010*
- *integrate flood defence works on the River Beane with conservation and recreation initiatives.*

Establishing stronger NRA involvement with local communities and their representatives is seen to be necessary to ensure local views are respected and future development decisions support this vision for the catchment. We will therefore:

- *work with all relevant parties to implement the principles of sustainable development.*



## FOREWORD

Integrated management of the water environment of the Lee catchment area can be traced back to 1931 when the Lee Conservancy Catchment Board was established. As the current 'Guardians of the Water Environment' we are faced with a very different set of circumstances to our predecessors. Even if we look back only 30 years we can see dramatic changes in the Upper Lee catchment - the population was just over half the present total, the M1 motorway had just been built and was free of roadworks, and shopping centres and out of town superstores were still to come.

We cannot foresee clearly all the changes likely to occur over the next thirty years. However, in this plan we not only identify actions to protect and improve the water environment over the next few years, but also establish a catchment vision to guide policy and action for at least the next 10 years.

We recognise that the vision will only be achieved if we work with and influence others who also have an interest in the future health of the Lee, Mimram and Beane Rivers. I hope you can help us take this initiative forward and will continue to assist us in refining and developing the plan as we begin to implement it.



**John Dickinson**  
**Area Manager**  
**North East Area**  
**Thames Region**  
**National Rivers Authority**

*Further details about who to contact to discuss the Catchment Management Plan are given on the inside of the back cover.*

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## INTRODUCTION

### PLANNING FOR THE FUTURE: CATCHMENT MANAGEMENT PLANS

The water environment is subject to a wide variety of uses which invariably interact and sometimes conflict with each other. Catchment management plans are being developed to manage these interactions and conflicts for the overall benefit of the water environment and its users. They are non-statutory plans prepared by the National Rivers Authority (NRA) which seek to create a partnership between the public, private and voluntary sectors to deliver shared objectives.

The plan comprises a 'Consultation Report' and a 'Final Plan' which together:

- *assess catchment resources, uses and activities*
- *balance conflicting uses and identify actions*
- *consult with customers on issues to be tackled*
- *establish a long-term vision for individual catchments*
- *ensure that use-related environmental objectives are identified, agreed and met*
- *use effective and proactive planning to prevent future environmental damage and to provide lasting solutions to environmental problems.*

This Final Plan for the Upper Lee catchment is based on a wide range of views gathered from local authorities, government departments, local interest groups and private companies. We are committed to monitoring its implementation and will continue to revise and update both the policy and action elements of the plan through on-going liaison and consultation.



### THE NATIONAL RIVERS AUTHORITY

The NRA was created in 1989 as an independent environmental watchdog. Our prime purpose is to protect and improve the water environment in England and Wales and regulate the use of water by industry, agriculture and the private water and sewerage companies.

We look after inland waters including rivers, lakes and canals (surface waters) as well as underground waters (normally called groundwaters). We have statutory responsibilities for water quality, water resources, flood defence, fisheries, conservation, navigation and recreation. We also protect people and property from flooding caused by rivers and the sea.

Our core activities cover environmental regulatory and operational work. We have an important role in environmental emergencies and in influencing land use through the Town and Country Planning process.

We are a Non-Departmental Public Body sponsored by the Department of the Environment (DoE). The Ministry of Agriculture, Fisheries and Food (MAFF) also has important policy responsibilities in relation to flood defence and fisheries.



## INTRODUCTION

### OUR GUIDING PRINCIPLES

To achieve our Mission to protect and improve the water environment (see below), we apply three principles to all that we do:

- *making real improvements to the water environment through effective local operations*
- *integrating our services to balance the needs of water users with those of the environment*
- *providing value for money through economic efficiency and effective use of our resources.*

We work with a wide range of organisations and individuals, all of whom we regard as our customers.

### OUR APPROACH TO WATER MANAGEMENT

Our approach involves three phases: planning; acting; and reviewing.



## MISSION STATEMENT OF THE NRA

We will protect and improve the water environment by the effective management of water resources and by substantial reductions in pollution. We will aim to provide effective defence for people and property against flooding from rivers and the sea. In discharging our duties we will operate openly and balance the interests of all who benefit from and use rivers, groundwaters, estuaries and coastal waters. We will be businesslike, efficient and caring towards our employees.

### *Firstly we Plan*

- *For environmental sustainability and improvement through an integrated approach to river catchment management*

### *secondly we Act*

- *To protect and regulate the water environment and its various uses by achieving agreed standards and objectives.*
- *To identify and ensure implementation of balanced, lasting and cost-effective solutions to environmental problems.*
- *To provide customers with advice, information and incentive to influence behaviour and mitigate or prevent environmental damage.*
- *To use collaboration, partnership and consultation with others to further NRA objectives and make best use of available resource*

### *and finally we Review*

- *To assess and report on the state of the water environment and our success in ensuring its sustainable use.*
- *use effective and proactive planning to prevent future environmental damage and to provide lasting solutions to environmental problems.*

## DEVELOPING THE PLAN

### BACKGROUND

Production of this plan for the Upper Lee catchment has involved a number of stages over the last 15 months:

June 1993	<i>Work commences</i>
Autumn 1993	<i>Informal liaison with external interests</i>
January 1994	<i>Informal discussions with key external groups on draft of Consultation Report</i>
March 1994	<i>Public consultation commences on Consultation Report</i>
May 1994	<i>Public consultation period closes</i>
July 1994	<i>Review of public consultation responses completed</i>
September 1994	<i>Final Plan launched.</i>

The Upper Lee Catchment Management Plan comprises three public documents:

- *Consultation Report (March 1994)*
- *Report on Public Consultation (July 1994)*
- *Final Plan (September 1994).*

The first two reports provide the context and background to why the vision, strategies and action plans have developed into the form they are now presented.

### SUMMARY OF PUBLIC CONSULTATION AND LIAISON

The results of informal liaison undertaken in Autumn 1993 were discussed in the Consultation Report. This process enabled us to identify with some certainty the key issues for the local water environment.

To encourage formal responses to the Consultation Report during the 8 weeks to 8 May 1994 we:

- *held a formal launch of the plan in Hatfield on 8 March and an open public meeting in Luton on 22 March*
- *distributed over 300 copies of the report directly to key groups and individuals and placed information in libraries and local authority offices*
- *advertised the plan in newspapers and conducted radio and press interviews*
- *attended several ad-hoc meetings on request.*





## DEVELOPING THE PLAN

Responses were received from 42 organisations and these are detailed in the Report on Public Consultation. In summary we learnt the following:

- *there was support for the process of integrated catchment management*
- *there was concern that the NRA could not achieve its goal of involving others in joint actions*
- *the range and extent of catchment resources, uses and activities was confirmed as were the key issues*
- *a small number of factual errors were identified, none of which materially affected the plan's findings*
- *local people feel strongly about the spelling used for the River Lea/Lee (see below).*

Comments on the key issues were as follows:

### RIVER LEE AT LUTON

- *strong support, especially for the 'greening' of the river corridor*

## RIVER LEE OR RIVER LEA?

The spelling "Lee" has been used in various Acts of Parliament in recent times. In the earliest Act of Parliament in which the river is mentioned, 3 Henry 6, c.5 (1424), in which the language used was Norman French, it was spelt "Ley", and this spelling was used in another Act passed in 1430. In all subsequent Acts of Parliament and official documents, commencing with an Act passed in 1570, it is spelt "Lee".

It seems that the spelling "Lea" was first used by the cartographer Saxton in 1576 and it has been used by map makers and others ever since. More recently the

## THE BEANE VALLEY

- *support in principle but the timescale for action on low flows was considered too long*
- *stronger emphasis on environmentally sensitive flood defences and integration of low flow and flood defence work*

## PROTECTION OF THE MIMRAM VALLEY

- *very strong support expressed for prioritising action on this catchment*

## ECOLOGICAL PROJECTS

- *need for clearer targets for action*
- *greater emphasis on wetland restoration*

The GROUNDWATER PROTECTION and MANAGING THE CATCHMENT issues generated less attention.

We have considered the detailed responses made and developed the vision, strategies and action plans in a way which we believe reflects a reasonable balance between the opinions expressed and the desire to ensure the plan is feasible and robust.

Ordnance Survey have used "Lee" for the Lee Navigation but continued to use "Lea" for describing the remaining natural parts of the river system. The spelling "Lea" is often held to be correct because the name derives from the pasture land through which the river flows. According to Eckwall's Dictionary of English Place Names, however, the word has the same derivation as the word light and may mean "the river of the god Lugus". It is therefore possible to authenticate both "Lea" and "Lee".

## CATCHMENT OVERVIEW

### CATCHMENT DESCRIPTION

Bounded by the Chilterns to the north, the catchment forms part of the larger Lee Valley basin which drains southwards to join the River Thames in east London. Significant urban areas within the catchment include Luton, Dunstable, Stevenage, Welwyn Garden City and parts of Harpenden, Hatfield and Hertford. The area enjoys excellent access by road and rail to London and the Midlands which has been a major factor in the growth of the settlements along the M1 and A1(M) transport corridors. The influence of man's activities has greatly altered the flow regime and quality of the River Lee and although the River Mimram in particular has retained many natural qualities no river in the catchment is in a pristine state.

The upper River Lee covers a distance of approximately 50 km from its source to Hertford. There are several sewage effluent discharges to this section of the river and under dry weather conditions the flow of the river upstream of Hertford consists mainly of sewage effluent. Despite this fact water quality in the river is fair. In Hertford the River Lee is joined by the Rivers Mimram and Beane both of which receive very little sewage effluent and are predominately of a good water quality. The vast majority of water abstracted is for public water supplies and comes from the Chalk aquifer which underlies the whole catchment and which 'feeds' the rivers, with smaller amounts being abstracted for industrial processes and gravel washing from both surface and ground sources.

The extreme north-western part of the catchment falls within the Chilterns Area of Outstanding Natural Beauty which is a nationally recognised area designated by the Countryside Commission. The rest of the catchment, beyond the main urban areas, is predominately open

farmland and consists of a series of clay plateaux which are dissected by river valleys. Much of this part of the catchment has been defined as a Landscape Conservation Area by the relevant local authorities.

Historic parks and gardens are particularly prevalent, especially within the river valleys where many artificial lakes were created in the seventeenth and eighteenth centuries. A variety of important aquatic habitats, including spring sources, are found in the area. Of particular interest is the flora and fauna of the River Mimram, which is a relatively undisturbed chalk stream. The Rivers Lee and Mimram support good quality coarse and game fisheries respectively.

The major settlements within the catchment experienced rapid growth during the 1950s, 1960s and 1970s, but generally this rate of growth has not been maintained. Much of the catchment is designated as Green Belt under the Town and Country Planning legislation and recent housing, industrial and commercial development has been concentrated within or adjacent to the existing settlements. In the past, the lower sections of all the river valleys were worked for sand and gravel and it is anticipated that mineral working and waste disposal is likely to continue in the medium-term in these areas. Agricultural activity is mainly arable.



## CATCHMENT OVERVIEW

Provision for water based recreation is limited within the catchment. The most significant facilities are at Stanborough Lakes and Fairlands Valley Park although there are major sites in adjacent areas. The River Lee is navigable downstream of Hertford town centre. Public access to the River Lee has been improved by the completion in September 1993 of the Lee Valley Walk, a Regional Route running from the River Thames to the source of the River Lee at Luton. Several sites on the River Lee, notably at Luton, Batford and Wheathampstead, and on the River Beane, notably at Walkern, Watton-at-Stone, Stapleford, Waterford and Hertford are at risk from flooding. The October 1993 flood event highlighted this risk.

### REVIEW OF RESOURCES, USES AND ACTIVITIES

These are described in detail in the Consultation Report. The following are key extracts:

#### Geology and Soils

- *solid geology is primarily Chalk*
- *free draining loamy soils around Luton, heavy impermeable clay soils in the extreme south and north-east of the catchment, moderately impermeable soils elsewhere.*

#### Hydrogeology and Hydrology

- *chalk aquifer ideal to be used extensively as a source of water*
- *Rivers Lee and Mimram exhibit typical 'bourne' nature of chalk streams (i.e. upper sections are naturally dry in summer)*
- *River Beane has 'flashier' flow response due to clay soils*
- *natural hydrological response of River Lee dramatically altered by urbanisation in Luton/Dunstable.*

#### Ecology and Fisheries

- *important spring source habitats in upper Beane valley and on headwaters of the Essendon and Bayford Brooks*
- *River Mimram is of regional importance because of diversity, numbers and inter-linked nature of in-stream and wetland habitats*
- *loss of wetland sites adjacent to watercourse has been significant*
- *River Lee is a good coarse fishery; River Mimram a moderate game fishery; and, River Beane a moderate mixed fishery in its lower reaches.*





## CATCHMENT OVERVIEW

### Amenity and Recreation

- facilities include Regional Route alongside River Lee and formal water recreation facilities at Fairlands, Stevenage and Stanborough, Welwyn Garden City
- the River Lee in Luton and Stevenage Brook in Stevenage link open spaces within the urban areas.

### Landscape and Heritage

- Chiltern Area of Outstanding Natural Beauty and Areas of Great Landscape Value/ Landscape Conservation Areas cover most parts of catchment
- many significant historic parks and gardens
- important Bronze and Iron Age remains in river valleys.

### Water Abstraction

- 105 Ml/day abstracted primarily from the Chalk aquifer mostly for public water supplies (88% of abstracted water).

### Effluent Disposal

- major sewage works discharge effluent at East Hyde, near Luton (discharge of 44 000 m<sup>3</sup>/day), Harpenden (24 000 m<sup>3</sup>/day) and Hatfield (11000 m<sup>3</sup>/day) on the River Lee
- most sewage effluent from Stevenage, Hertford and Welwyn Garden City transferred to Rye Meads near Hoddesdon.

### Agriculture

- majority of land classified as Grade 3 (good to moderate quality)
- 600 farm units; 70% of land used for arable crops.

### Urban Development

- much of catchment is designated Green Belt; residential, industrial and commercial development pressures therefore focused on existing population centres
- major industrial centres at Dunstable, Luton, Welwyn Garden City, Stevenage and Hatfield.

### Mineral Extraction and Waste Disposal

- sand and gravel workings in the lower valleys of Rivers Lee, Mimram and Beane
- solid waste disposal primarily in lower River Lee valley.

### Flood Defence

- existing risks at Luton, Batford (Harpenden), Wheathampstead and in the Beane valley

Results of monitoring work to assess how the water environment is changing as a result of our actions were reported in the Consultation Report. The Annual Monitoring Report (see page 20) will update these indicators of the health of the water environment.



## ACTION PLANS AND STRATEGIES

We have already presented the vision for the Upper Lee catchment and listed the six key issues (page 5).

The vision is related to the issues in the following way:

- *the vision expresses our long-term (10 years or more) ambitions for the catchment*
- *the issues cover the key areas which require tackling. Activity is focused by establishing*
  - *an Aim, to which all actions should work*
  - *a Strategy which describes areas of work necessary to achieve the Aim*
  - *specific Action Plans linked to each point of the Strategy.*

The action plans are dynamic and will change and evolve on a regular basis as opportunities arise for the public, private and voluntary sectors to work together to deliver the strategies, aims and vision.



We have also prepared a **Land Use Statement**. The purpose of this is to identify how the planning and use of land for urban and rural activities can be made sustainable in relation to the water environment. It gives a catchment perspective to documents such as our "Guidance Notes for Local Planning Authorities on the Methods of Protecting the Water Environment through Development Plans" and will assist local authority planners, those involved in countryside management and agricultural activities integrate water issues into their decisions and actions.

Following the **Land Use Statement** on pages 10 and 11, **Aims, Strategies and Action Plans** are presented for the following issues:

- *River Lee at Luton*
- *The Beane Valley*
- *Protection of the Mimram Valley*
- *Ecological Projects*
- *Groundwater Protection*
- *Managing the Catchment.*

The action plans summarise:

- what will be done
- who will be involved in doing it
- when it will be done
- how much it will cost.

Plans, however, are always subject to change and therefore we will undertake monitoring and report back on progress in the Annual Monitoring Report (see page 20). We have only included in the action plans activities we believe have a significant chance of happening and for which resources are likely to be available.

Further guidance on the details of the action plans are given on page 19.

### SUSTAINABLE DEVELOPMENT

Sustainable development is at the heart of international and UK policy on the environment. To ensure development meets the needs of the present without compromising the ability of future generations to meet their own needs requires the consideration of environmental, social and economic concerns. The role of the NRA in supporting the principles of sustainable development is to ensure that decisions throughout society are taken with proper regard to their impact on the water environment.

### INTEGRATING LAND AND WATER MANAGEMENT

Agenda 21, the international blueprint for sustainable development, identifies the need for an integrated approach to the management of land and water resources. The purpose of this Land Use Statement is to highlight issues that local planning authorities and others involved in the management of the countryside need to consider and respond to if the water environment is to be managed in a sustainable way.

Government planning guidance (e.g. PPG12, PPG23, RPG9, Circular 30/92) highlights the importance of communication between local planning authorities and the NRA and the relationship between land use and water matters. It is just as important that contact is maintained with other agencies whose policies and actions impinge on the water environment.

We will use collaboration, partnership and consultation with others including relevant central government departments, local authorities, English Nature, English Heritage, Countryside Commission and the Sports Council to protect and enhance the water environment.

Integrating the efforts of public authorities and agencies - often across artificial political boundaries - to avoid duplication and ensure water environment related information and policy is clear and concise is considered to be particularly important.

We will seek to ensure that land and water use management policies are integrated and information on the status of the water environment is made available in an appropriate form. We recognise the need to ensure policy on water issues is clear, consistent and concise.

### CATCHMENT STATEMENT

We will encourage all relevant land use policy and strategy documents to reflect the range of issues described in our January 1994 booklet 'Guidance Notes for Local Planning Authorities on the Methods of Protecting the Water Environment through Development Plans'. In particular we will stress the importance of the following seven land use issues which reflect the particular characteristics of the catchment and the pressures being placed on it. These issues will be discussed with local planning authorities and other organisations who can contribute to their implementation. The following NRA Thames Region documents provide the background to this statement:

- *Upper Lee CMP Consultation Report (March 1994)*
- *Future Water Resources in the Thames Region (July 1994)*
- *Thames 21 - a Planning Perspective and a Sustainable Strategy for the Thames Region (Consultation Draft September 1994).*



**LU1** The NRA will encourage all authorities to adopt a precautionary approach to development which might affect the water environment. We will also work with others in evaluating the critical environmental capital of the catchment, initially in respect of minerals, in order to provide robust arguments for the protection of important natural assets associated with the water environment.

**LU2** Full account needs to be taken of water resources, supply, sewerage and sewage treatment issues in the location, timing and extent of any new significant development proposals such as might be expected in Luton/Dunstable, Stevenage and Welwyn Garden City. Public water supply by Three Valleys Water accounts for 88% of the water abstracted in the catchment. We believe that there is a strong possibility that public supply demands for new development up to 2021 can be met through a combination of methods including leakage control, domestic metering and improved water efficiency.

**LU3** Public water supplies are obtained from the Chalk aquifer underlying the catchment. It is important for public health and the health of rivers that the quality of water in the aquifer is given the strongest possible protection. Guidance given in the NRA document 'Policy and Practice for the Protection of Groundwater' on the location and nature of development will be strongly promoted to ensure protection of the aquifer resource in general, and over 20 individual major public supply sources and their associated groundwaters areas in particular. The catchment is classified as a major aquifer.

**LU4** The local river corridors (the land linked visually, physically and ecologically to the river) need particular consideration. The conservation, fisheries, landscape, recreational and heritage value of such areas needs to be both protected and enhanced. Such areas are also liable to flood and must therefore also be protected from development. Particular areas are:

- (a) **RIVER LEE DOWNSTREAM OF LUTON HOO** The Lee Valley Walk is an important Regional Trail and passes almost entirely within a County designated Landscape Conservation Area. Several Historic Parks and Gardens on the English Heritage Register; lakes for recreation at Stanborough; a thriving coarse fishery throughout its length; Iron Age archaeological finds between Wheathampstead and Welwyn Garden City; and, a range of water-dependent habitats between Harpenden and Hatfield illustrate the combination of interests worthy of protection. Environmental enhancement opportunities, however, exist throughout the length of the corridor which is prone to flooding problems. Protection of the floodplain is particularly important in the urban areas of Batford and Wheathampstead.
- (b) **STEVENAGE BROOK AND ITS TRIBUTARIES** The river corridors have been well preserved and are an essential part of the town's natural environment and green links network. The 11 water meadows, including Fairlands Valley Park, on the watercourses attenuate the flood waters generated by the town's paved surfaces which would otherwise cause flooding further downstream. Several meadows have the potential for environmental enhancement.
- (c) **UPPER TRIBUTARIES OF THE RIVER BEANE** Important spring habitats are associated with these tributaries which are in a County designated Landscape Conservation Area.

The development of multi-purpose (e.g. restoration, enhancement, protection) River Corridor Designations to cover floodplain and environmental issues in these areas will be discussed with relevant authorities with a view to including policies in development plans as they are reviewed.

**LU5** The River Mimram is a high quality chalk stream of regional importance in environmental terms. Its corridor contains a rich and diverse mosaic of habitats supporting typical chalk stream flora and fauna worthy of particular efforts to protect and enhance it. For this reason the NRA sets a **very high priority on establishing a land use strategy which can be supported by all relevant authorities**. The strategy must recognise the need not only to protect the corridor from direct adverse effects but also the groundwater sources which contribute 80% of its flow.

**LU6** Within Luton land and water use policy must be harnessed to reverse the past damage to the corridor of the River Lee and the quality of the local groundwater aquifer. In particular: surface water run-off from new and existing development must be very strongly controlled; channels and adjacent open areas restored and culverts systematically opened up as redevelopment opportunities arise; and, the amenity potential of the river corridors enhanced.

**LU7** The floodplain of the Beane Valley needs protection from development as many of its villages are already at risk of flooding. Paradoxically the river also suffers from low flows due to over abstraction. Active consideration is being given to how flows can be restored and flooding alleviated. Land use initiatives need to recognise the potential benefits of such action.

## RIVER LEE AT LUTON

**AIM** TO RESTORE THE RIVER LEE AS A NATURAL OPEN LINK BETWEEN LUTON HOO AND HOUGHTON REGIS BY 2025 AND TO REDUCE FLOOD RISKS IN AND DOWNSTREAM OF LUTON (A1)

Action	Responsibility	Cost (£ k)	1994	1995	1996	1997 on
<b>Establish a more natural hydrological regime in the River Lee by minimising flood flows and increasing dry weather flows (S1)</b>						
<b>S1/1</b> Review options for achieving an integrated programme of works to alleviate low flow/flood flow problems and improve watercourse quality. Aspects to be considered include: local (e.g. soakaways) and strategic (e.g. storage ponds) source control measures to increase groundwater recharge, minimise flood flows and reduce siltation; improvements to storm water overflows; impacts of lower volume storm flows and improved water quality on downstream reaches (inc. Luton Hoo lakes); data collection and modelling requirements; technical and financial feasibility. [Output - Report 1/95]	NRA TWUL LBC SBDC TVWS AWS	< 5				
<b>S1/2</b> Undertake technical analysis of surface water sewerage flows [Output - Report and Computer Model 3/96]	LBC SBDC TWUL AWS	n.a.				
<b>S1/3</b> Undertake technical analysis of river flows in Luton to ascertain potential benefits of storage for flood defence purposes. [Output - Report and Computer Model 2/95]	NRA	< 25				
(see also S4/1,S4/4,S16/2 - 3)						
<b>Implement justifiable flood defence works in and downstream of Luton (S2)</b>						
<b>S2/1</b> Implement flood defence works at New Bedford Road, Luton [Output - Construction works 3/98]	NRA	2365				
<b>S2/2</b> Consider flood defence works at Hyde Mill Farm, Batford and Harpenden [Output - Construction works after 97 if there is economic justification]	NRA	767				
<b>S2/3</b> Implement flood defence works at Wheathampstead [Output - Construction works 6/96]	NRA	604				
(see also S1/1,S1/3,S4/4)						
NB : All flood defence works subject to approval of the Ministry of Agriculture, Fisheries and Food						

**RIVER LEE AT LUTON**

Action	Responsibility	Cost (£ k)	1994	1995	1996	1997 on
<b>Reduce the risk of pollution from surface water overflows and other sources in Luton and Dunstable (S3)</b>						
S3/1 Agree extent and scope of complementary river water quality monitoring programmes to maximise information base [Output - Report 4/95]	NRA LBC SBDC UL	< 1		●		
S3/2 Undertake pollution prevention activity at Luton Airport [Output- Visits to local industry 3/95]	NRA	< 10	■			
S3/3 Undertake improvement works to stormwater overflows [Output - Priority listing for action 12/94]	TWUL LBC NRA	< 5	■			
[see also S1/1]						
<b>Protect and enhance green space adjacent to the watercourses in Luton and Dunstable and progressively restore natural riverine features (S4)</b>						
S4/1 Utilise local authority Town and Country Planning, NRA Land Drainage Consents and other relevant statutory controls to influence development decisions [Output - Developments constructed which contribute to overall aim]	NRA LBC SBDC BCC PrS	< 50	→			
S4/2 Undertake improvement works at Leagrave Common adjacent to the River Lee [Output - Conservation and amenity works 3/95]	LBC CoCo WP NRA	n.a.		■		
S4/3 Undertake improvement works at Croda Colloids site [Output - Conservation and amenity works 3/95]	WP CC	n.a.		■		
S4/4 Assess opportunities for environmental enhancements (and flow reduction) of Houghton Brook in association with M1 widening work [Output - Report 3/95]	DTp NRA BCC SBDC	< 10		■		
[see also S1/1,S2/1,S5/1,S14/1,S15/2]						
<b>Increase community awareness of the River Lee to minimise detrimental activity and increase local stewardship (S5)</b>						
S5/1 Undertake activity (e.g. guided walks, leaflets, local conservation groups) directly aimed at involving local people and reducing activities such as litter disposal in the rivers [Output - Leaflets, walks, conservation management work]	WP LDCP BTCV LDCV NRA LBC SBDC	n.a.	→			
[see also S1/1]						



## RIVER LEE AT LUTON

Action	Responsibility	Cost (£ k)	1994	1995	1996	1997 on
<b>Integrate voluntary, public and private sector initiatives (S6)</b>						
S6/1 Prepare quarterly bulletin detailing proposed activities of public, private and voluntary sectors to improve opportunities for joint working [Output - Activity Programme]	NRA LBC WP	< 5		→		
S6/2 Identify common ground between linked initiatives (e.g. Luton Nature Conservation Strategy, local plans, catchment plan) [Output - Report 3/95]	WP LBC BCC SBDC NRA	< 5	■			
S6/3 Establish an annual forum to review progress and maintain impetus [Output - Meeting]	NRA LBC	< 5		●	●	●
(see also S19/1)						

## THE BEANE VALLEY

Action	Responsibility	Cost (£ k)	1994	1995	1996	1997 on
<b>Implement justifiable action to restore river flows capable of sustaining a range of ecosystems uses by 2010 (S7)</b>						
S7/1 Assess feasibility of implementing a programme of works to overcome the detrimental environmental effects of water abstraction in the Beane valley [Output - Report covering environmental benefits and economic costs of potential actions and computer groundwater model 8/95]	NRA RBRA	100		■		
S7/2 Undertake ground and surface water monitoring programmes to provide information to support and develop work covered in S7/1 [Output - Report 3/97]	NRA	201	■			
S7/3 Construct additional ground (8/9 boreholes) and surface water monitoring sites (1 gauging station) to provide information to support S7/2 [Output - Construction works 7/95]	NRA	96		■		
(see also S9/2)						
<b>Extend the range of informal recreation opportunities in the lower valley (S8)</b>						
S8/1 Assess feasibility of developing a Beane Valley Way walk from Stevenage to Hertford and negotiating limited access for canoeing to lower Beane valley [Output - Report 6/95]	NRA SBC EHDC CoCo BCU RA HCC	< 5	■			

**THE BEANE VALLEY**

Action	Responsibility	Cost (£ k)	1994	1995	1996	1997 on
<b>Implement integrated flood defence and environmental works in the Beane valley (S9)</b>						
S9/1 Assess feasibility of environmentally sensitive flood alleviation works for Walkern, Watton-at-Stone, Waterford, Stapleford and Bengoe <b>[Output - Report 10/95]</b>	NRA	81				
S9/2 Undertake data collection in support of S9/1 and S7/1 (e.g. topographical survey, land searches, flood damage survey by loss adjusters). <b>[Output -Report 12/94]</b>	NRA	45				
S9/3 Develop operating objectives for optimal flood attenuation, amenity and ecological use of Stevenage water meadows <b>[Output - Report 3/96]</b>	NRA SBC HMWT	20				
S9/4 Undertake tree planting at Stapleford <b>[Output - Conservation works 3/95]</b>  (see also S14/1,S15/1)	NRA	10				
<b>Protect and enhance green space adjacent to the watercourses in Stevenage (S10)</b>						
S10/1 Utilise local authority Town and Country Planning, NRA Land Drainage Consents and other relevant statutory controls to influence development decisions <b>[Output - Developments constructed which contribute to overall aim]</b>	NRA SBC	< 15				
S10/2 Agree extent and scope of complementary river water quality monitoring programmes to maximise information base <b>[Output- Report 4/95]</b>  (see also S14/1,S15/1)	NRA SBC	< 1				

**PROTECTION OF THE MIMRAM VALLEY**

**AIM TO ENSURE THAT THE REGIONALLY IMPORTANT ENVIRONMENTAL QUALITIES OF THE MIMRAM VALLEY ARE PRESERVED AND ENHANCED (A3)**

Action	Responsibility	Cost (£ k)	1994	1995	1996	1997 on
<b>Monitor and review status of the valley through integrated environmental monitoring activities (S11)</b>						
<b>S11/1</b> Monitor and report on the quality and quantity of ground and river flows <b>[Output - Report]</b>	NRA	< 25	→			
<b>S11/2</b> Monitor and report on changes in the flora and fauna of the valley <b>[Output - Report]</b>	HMWT NRA EN HCC EHDC NHDC	< 50	→			
<b>S11/3</b> Prepare annual monitoring report covering the environmental status of the valley in order to identify areas requiring remedial action <b>[Output - Annual Monitoring Report from 6/95]</b>  (see also S14/1)	LBC SBDC WHDC WHEN VG PrS	< 5		●	●	●
<b>Ensure land use change is not to the detriment of environmental qualities of the valley (S12)</b>						
<b>S12/1</b> Utilise local authority Town and Country Planning, NRA Land Drainage Consents and other relevant statutory controls to influence development decisions <b>[Output - Developments constructed which contribute to overall aim]</b>	NRA WHDC EHDC NHDC HCC LBC SBDC BCC	< 20	→			
<b>S12/2</b> Prepare land use planning policy to protect and enhance the valley from direct and indirect effects of urban and rural land use change <b>[Output - Policy Statement for use by relevant authorities 6/95]</b>  (see also *)	EN MAFF CoCo WHEN HMWT VG PrS	< 10		—		
<b>Manage, protect and enhance the environmental qualities of the valley (S13)</b>						
<b>S13/1</b> Undertake environmental enhancement work at Digswell <b>[Output - Conservation works on banks and bed of river 9/94]</b>	NRA	55	●			
<b>S13/2</b> Undertake environmental enhancement work at Tewinwater School <b>[Output - Conservation works on the banks and bed of the river 3/95]</b>	NRA	n.a.		●		
<b>S13/3</b> Undertake flood defence and environmental enhancement work at Singlers Marsh/Fulling Mill Lane <b>[Output - Conservation and flood defence works 9/94]</b>  (see also S14/1)	NRA	3	●			



## ECOLOGICAL PROJECTS

**AIM** TO ACHIEVE IMPROVEMENTS IN THE ECOLOGICAL VALUE OF THE WATER ENVIRONMENT THROUGH A STRATEGIC APPROACH COVERING ALL SECTORS (A4)

Action	Responsibility	Cost (£ k)	1994	1995	1996	1997 on
<b>Develop and maintain a conservation strategy for the catchment covering ecological, fisheries and landscape interests (S14)</b>						
S14/1 Prepare in conjunction with all relevant parties a strategy for making the best use of public, voluntary and private sector resources [Output - Strategy 9/95]  (see also S11/3, S19/1, S20/1-2)	NRA plus others	20				
<b>Record, manage, protect and enhance the environmental qualities of the water environment (S15)</b>						
S15/1 Undertake Fisheries Survey of the River Beane [Output - Report 6/94]	NRA	< 25				
S15/2 Undertake Landscape Assessment of the River Lee [Output - Report 3/95]	NRA	< 20				
(See also S4/1-4, S5/1, S9/4, S10/1, S11/2, S11/3, S12/1, S12/2, S13/1-3, S18/1, S18/4-5, S20/2)						

## GROUNDWATER PROTECTION

**AIM** TO PROTECT PUBLIC HEALTH AND THE NATURAL ENVIRONMENT BY ENSURING THAT THE QUALITY AND QUANTITY OF GROUNDWATERS IS NOT COMPROMISED (A5)

Action	Responsibility	Cost (£ k)	1994	1995	1996	1997 on
<b>Implement the NRA's Policy for the Protection of Groundwater (S16)</b>						
S16/1 Prepare and promote 1:100 000 maps showing aquifers to be protected and detailed maps showing areas associated with key boreholes which need protection [Output - maps 3/96]	NRA	n.a.	●	●	●	
S16/2 Assess contamination at public supply sources and relate to land uses. Consider actions needed to prevent deterioration of groundwater and practicability of remedial action [Output - Report 1/97]	NRA TVWS LBC SBDC WHDC HCC	< 25				
S16/3 Prepare plan for the acceptable use of soakaways in urban areas [Output - Report and maps 6/96]  (see also S19/13)	NRA	< 5				
<b>Raise awareness and understanding of groundwater issues (S17)</b>						
S17/1 Hold technical seminar for local authority staff and other interested parties [Output - Seminar 3/95]  (see also S19/1)	NRA TVWS LBC	< 5		●		

## MANAGING THE CATCHMENT

**AIM** TO PROTECT AND IMPROVE THE WATER ENVIRONMENT THROUGH PARTNERSHIP WITH OTHERS AND TO PROMOTE, SUPPORT AND APPLY THE PRINCIPLES OF SUSTAINABLE DEVELOPMENT (A6)

Action	Responsibility	Cost (£ k)	1994	1995	1996	1997 on
<b>Implement action to protect and improve the water environment (S18)</b>						
<b>S18/1</b> Undertake dredging work at Brocket Hall Park lake [Output - Construction works 6/95]	NRA TWUL	n.a.		■		
<b>S18/2</b> Undertake improvement works at Kimpton STW (River Mimram) to improve effluent quality [Output - Construction works by 2000]	TWUL	n.a.				▶
<b>S18/3</b> Undertake dredging work on Essendon Brook at confluence with River Lee to reduce flood risks [Output - Construction works 3/95]	NRA	10		■		
<b>S18/4</b> Undertake dredging works on River Lee below A1(M) near Stanborough to reduce flood risks and reduce risk of footpath flooding [Output - Construction works 11/94]	NRA	7	■			
<b>Improve liaison and consultation between key partners involved in managing the water environment (S19)</b>						
<b>S19/1</b> Establish a formal liaison link between the NRA, local authority land use planners and key government agencies to pursue integrated land and water use management [Output - Catchment Liaison Group Meetings]  (see also S17/1, S20/2)	HCC plus all local auth. EN CoCo MAFF NRA	< 10		● ●	● ●	● ●
<b>Develop and implement the principles of sustainable development (S20)</b>						
<b>S20/1</b> Evaluate the environmental capacity of the Herts sand and gravel belt [Output - Report 6/95]	NRA HCC	20		■		
<b>S20/2</b> Support work by local authorities on Local Agenda 21 actions (e.g. environmental audits, sustainability indicators) and land use/natural resource plans and strategies [Output - Reports and Data]  (see also S19/1)	NRA plus all local auth.	n.a.	▶			

## ROUTINE WORK OF THE NRA

In addition to the activities highlighted in the action plans the NRA will continue to undertake routine activities to protect and improve the water environment. These activities include:

### Operations to

- *maintain flood defences and watercourse structures and manage NRA owned sites*

### Monitoring to

- *evaluate the quality and quantity of surface and ground waters evaluate the flora and fauna of the water environment*

### Authorisations to

- *control physical works on rivers and their floodplains and to enhance the environment*
- *control fisheries activities*
- *control discharges of effluent*
- *control abstractions of water*

### Enforcement to

- *ensure compliance with authorisations and legislation*

### Emergency response to

- *flooding incidents, pollution incidents and fish kills*

### Liaison to

- *ensure planning decisions do not lead to damage to the water environment.*

## GLOSSARY TO THE ACTION PLANS

### Key to Action Plan Partners:

<b>AWS</b>	Anglian Water Services	<b>MAFF</b>	Ministry of Agriculture, Fisheries and Food
<b>BCC</b>	Bedfordshire County Council	<b>NHDC</b>	North Herts District Council
<b>BCU</b>	British Canoe Union	<b>NRA</b>	National Rivers Authority
<b>BCWT</b>	Beds and Cambs Wildlife Trust	<b>PrS</b>	Private Sector
<b>BTCV</b>	British Trust for Conservation Volunteers	<b>RA</b>	Ramblers Association
<b>CC</b>	Croda Colloids	<b>RBRA</b>	River Beane Restoration Association
<b>CoCo</b>	Countryside Commission	<b>SBC</b>	Stevenage Borough Council
<b>DoE</b>	Department of the Environment	<b>SBDC</b>	South Bedfordshire District Council
<b>DTp</b>	Department of Transport	<b>TVWS</b>	Three Valleys Water Services
<b>EHDC</b>	East Herts District Council	<b>TWUL</b>	Thames Water Utilities Limited
<b>EN</b>	English Nature	<b>UL</b>	University of Luton
<b>HCC</b>	Hertfordshire County Council	<b>VG</b>	Voluntary Groups in general
<b>HMWT</b>	Herts and Middlesex Wildlife Trust	<b>WHDC</b>	Welwyn Hatfield District Council
<b>LBC</b>	Luton Borough Council	<b>WHEN</b>	Welwyn Hatfield Environmental Network
<b>LDCP</b>	Luton and Dunstable Countryside Project	<b>WP</b>	Luton and Dunstable Wildlife Project
<b>LDCV</b>	Luton and Dunstable Conservation Volunteers	<b>n.a.</b>	not available



## IMPLEMENTING THE PLAN

The NRA is jointly responsible with the other identified organisations, groups and interests for implementing this Final Plan for the Upper Lee Catchment. Progress will be monitored and reported annually by the NRA to all the key partners. The first report is therefore due in Autumn 1995.

The Annual Monitoring Report will:

- *examine the need to update the Catchment Management Plan in the light of changes in the catchment*

- *compare work achieved with that shown in the Action Plans and describe the reasons for changes to the content or timing of individual actions*
- *roll forward the detailed Action Plans*
- *report on the environmental status of the water environment.*

## STATUTORY WATER QUALITY OBJECTIVES

The Water Resources Act (1991) allows the government to set Statutory Water Quality Objectives (SWQOs).

These will replace the non-statutory River Quality Objectives (RQOs) set in the 1970s. Five uses have been proposed for rivers and to date regulations have been produced for just one, a River Ecosystem (RE) use. Five classes have been established for this use:

- |            |   |
|------------|---|
| <b>RE1</b> | Water of very good quality suitable for all fish species                |
| <b>RE2</b> | Water of good quality suitable for all fish species                     |
| <b>RE3</b> | Water of fair quality suitable for high class coarse fish populations   |
| <b>RE4</b> | Water of fair quality suitable for coarse fish populations              |
| <b>RE5</b> | Water of poor quality which is likely to limit coarse fish populations. |

Chemical standards have been derived for each of these classes. Implementation of these regulations is still awaited from government. In the interim, the current non-statutory RQOs have been directly translated into provisional water quality objectives (PWQOs). The PWQOs for the Upper Lee Catchment are shown opposite for information. The introduction of SWQOs will require full public consultation and we will use the Annual Monitoring Reports as well as other approaches to inform you of progress on this matter.

River	Reach	Length (km)	PWQO
<i>River Lee</i>	Sundon Park to Leagrave	0.570	4
	Leagrave to Luton Hoo Lakes	8.310	4
	Luton Hoo Lakes to Luton STW	3.050	4
	Luton STW to East Hyde	0.820	4
	East Hyde to Wheathampstead	6.570	4
	Wheathampstead to Stanborough	8.410	2
	Stanborough to Holwell Bridge	7.060	2
	Holwell Bridge to Waterhall	2.870	2
	Waterhall to River Rib	7.320	2
<i>River Mimram</i>	Kings Walden to Digswell	12.780	1
	Digswell to River Lee	10.300	2
<i>River Beane</i>	Stevenage Brook to Watton	1.400	2
	Watton to River Lee	10.760	2
<i>Stevenage Brook</i>	Source to Beane	5.200	3

## CONTACTING THE NRA

*The national head office of the NRA is in Bristol*

**Tel: 0454 - 624400**

*The Thames Region head office is in Reading*

**Tel: 0734 - 535000**

*The Area Manager for the North East Area of Thames Region is based at*

**Gade House,**

**London Road,**

**Rickmansworth, Herts,**

**WD3 1RS (Tel: 0992 - 635566).**

*Enquiries about the Upper Lee Catchment Management Plan should be directed to:*

**Mr Craig Woolhouse, Catchment Manager**

**National Rivers Authority**

**The Grange, 97 Crossbrook Street**

**Waltham Cross**

**Herts EN8 8HE Tel: 0992 645067**

A NATIONAL NRA EMERGENCY HOTLINE IS AVAILABLE TO REPORT POLLUTION, POACHING, FLOODING OR ANY SIGN OF DAMAGE OR DANGER TO THE NATURAL WATER ENVIRONMENT. THE FREEPHONE NUMBER FOR USE ANYWHERE IN ENGLAND OR WALES IS:

**0800 - 80 70 60**

**ANNUAL MONITORING REPORTS**